

■ Embedded Power For  
Business-Critical Continuity

*Astec and Artesyn AC-DC and DC-DC Products*





# During 2006, Artesyn Technologies was acquired by Emerson and now forms part of Emerson Network Power.

**Emerson Network Power** and its divisions – including Liebert, ASCO, Astec, Artesyn, Knürr and Lorain – are recognized global leaders in the fields of power conversion, power systems and connectivity solutions. Astec and Artesyn power conversion products use highly innovative technology and design techniques to deliver market-leading performance and value. The products are used for diverse applications across a wide variety of industries, including telecommunications, networking, computing, office systems, medical, process control, test and instrumentation.

The standard Astec and Artesyn product lines offer thousands of configuration options, and are backed by extensive engineering facilities to meet customers' needs for modified and application-specific power conversion solutions.

## About Emerson

Emerson (NYSE: EMR), based in St. Louis, is a global leader in bringing technology and engineering together to provide innovative solutions to customers through its network power, process management, industrial automation, climate technologies, and appliance and tools businesses. Sales in fiscal 2006 were \$20.1 billion. For more information, visit [www.gotoemerson.com](http://www.gotoemerson.com).

## About this shortform catalog

This catalog lists all standard Astec and Artesyn AC-DC and DC-DC products, and is designed to provide you with a fast, easy-to-use means of finding the ideal power source for your application.

Each product entry lists key performance data. After selecting the product you need, you can download more detailed information, such as datasheets, from the web. A new combined Astec and Artesyn

web site is currently under construction. In the meantime, please refer to [www.astecpower.com](http://www.astecpower.com) or [www.artesyn.com](http://www.artesyn.com), as appropriate. For your convenience, this catalog shows all Astec products on a white background and all Artesyn products on a gray shaded background.



## RoHS

Emerson Network Power supports the EU Directive 2002/95/EC on the restriction of hazardous substances (RoHS). Most standard Astec and Artesyn products are available in versions featuring full RoHS 6/6 compliance. Certain applications can use RoHS 5/6 (also known as TSE-RoHS compliant) products. Various environment-related publications, including comprehensive RoHS roadmaps and a company position statement, can be downloaded from [www.astecpower.com](http://www.astecpower.com) and [www.artesyn.com/powergroup/environmental.htm](http://www.artesyn.com/powergroup/environmental.htm)

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	Available 1U and 3U	29
	Compatible racks hold up to 4 modules	

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	Available 1U and 2U	31
	Compatible racks hold up to 5 modules	

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# Low Power

## 25-350 Watts

### Special Features

All models feature:

- Industry standard footprints
- Wide-range AC input
- Full power to 50°C
- High demonstrated MTBF
- Overvoltage protection
- Overload protection
- Built-in EMI Filtering
- Extensive safety approvals
- Derated operation to 70°C

Many models feature:

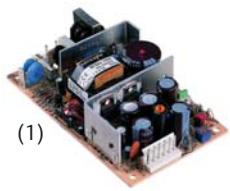
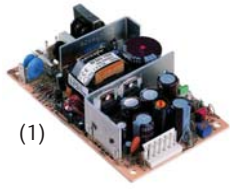
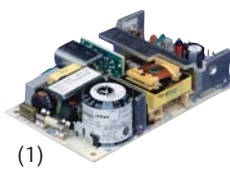
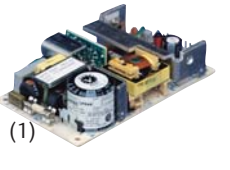
- EN61000-3-2 Compliance
- Supervisory outputs (5V/12V)
- Wide-adjust floating 4th output
- Single wire current share
- Medical approvals
- Remote sense
- Adjustable outputs
- Power fail
- Wide-adjust on single output models

Astec products are in unshaded boxes; Artesyn in gray boxes.

Output Power		Output				Size W x L x H (mm)	Model		
[Forced Air]	Free Air	V1	V2	V3	V4				
<b>[25W]</b>	<b>25W</b>	<b>NLP25 Series</b>				2.07" x 4" x 0.91" (52.57 x 101.6 x 23.2)	NLP25-7605J NLP25-7612J NLP25-7624J NLP25-7617J		
		5V@5A*							
		12V@2.1A							
		24V@1.0A*							
48V@0.5A*									
<b>[20W]</b>	<b>20W</b>	5V @ 2A				NLP25-7629J NLP25-7607J NLP25-7608J			
		12V @ 0.8A		-5V @ 0.1A					
		12V @ 0.8A		-12V @ 0.1A					
<b>[40W]</b>	<b>25W</b>	<b>LP20 Series</b>				3" x 5" x 1.2" (76.2 x 127 x 30.5)	LPS22 LPS23 LPS24 LPS25 LPT22 LPT23 LPT24 LPT25		
		5V@5A[8A]*							
		12V@2.1A[3.3A]*							
		15V@1.7A[2.7]*							
		24V@1.1A[1.8A]*							
		5V@3A[4A]		12V@1.5A[2A]				-12V@0.5A[0.7A]	
		5V@4A[5A]		12V@0.5A[0.7A]				-12V@0.5A[0.7A]	
		5V@3A[4A]		12V@1.5A[2A]				-5V@0.5A[0.7A]	
		5V@3A[4A]		15V@1.5A[2A]				-15V@0.5A[0.7A]	
		5V@3A[4A]		15V@1.5A[2A]				-15V@0.5A[0.7A]	
<b>[47W] Enclosed</b>	<b>LCT43-E</b>	5V@4A [7A]				3.2" x 6.2" x 1.5" (81.3 x 157.5 x 38.1)	LCT43-E		
		12V@1A [1.2A]		-12V@0.5A [0.5A]					
<b>[50W]</b>	<b>40W</b>	<b>NLP40 Series</b>				2.5" x 4.25" x 1.15" (63.5 x 108 x 29.2)	NLP40-76S3J NLP40-7605J NLP40-7612J NLP40-7615J NLP40-7624J NLP40-7617J NLP40-7629J NLP40-7627J NLP40-76T366J NLP40-7608J NLP40-7610J		
		3.3V@9A*							
		5V@9A*							
		12V@4A*							
		15V@3.3A*							
		24V@2A*							
		48V@1A*							
		5V@4.5A		12V@3A					
		12V@2.1A		-12V@2.1A					
		3.3V@4.5A		12V@3A				-12V@0.5A	
		5V@4.5A		12V@3A				-12V@0.5A	
		5V@4.5A		15V@2A				-15V@0.5A	


Options:  
 [ ] Rating with 30 CFM of air  
 (1) Optional cover/enclosure  
 \* Floating output

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Output Power		Output				Size W x L x H (mm)	Model		
[Forced Air]	Free Air	V1	V2	V3	V4				
<b>[50W]</b>	<b>40W</b>	<b>NFS40 Series</b>							
		 (1)	3.3V@8A*					3" x 5" x 1.2"	NFS40-76S3J
			5.1V@8A*					(76.2 x 127 x 30.5)	NFS40-7605J
			12V@4A*						NFS40-7612J
			15V@3.3A*						NFS40-7615J
			24V@2A*						NFS40-7624J
			5.1V@5A	12V@0.5A	-12V@0.5A				NFS40-7628J
			5.1V@5A	12V@2A	-5V@0.5A				NFS40-7607J
			5.1V@5A	12V@2A	-12V@0.5A				NFS40-7608J
	5.1V@5A	12V@2A	-15V@0.5A				NFS40-7610J		
<b>[50W]</b>	<b>40W</b>	<b>NFS40 Series - Medical</b>							
		 (1)	12V@4A*					3" x 5" x 1.2"	NFS40-7912J
			15V@3.3A*					(76.2 x 127 x 30.5)	NFS40-7915J
			24V@2A*						NFS40-7924J
			5.1V@7A	12V@1A	-12V@1A				NFS40-7928J
			5.1V@5A	12V@2A	-12V@0.5A				NFS40-7908J
	5.1V@5A	15V@2A	-15V@0.5A				NFS40-7910J		
<b>[55W]</b>	<b>40W</b>	<b>LP40 Series</b>							
		 (1)	3.3V @ 8A[11A]*					3" x 5" x 1.2"	LPS41
			5V@8A[11A]*					(76.2 x 127 x 30.5)	LPS42
			12V@3.3A[4.5]*						LPS43
			15V@2.6A[3.6A]*						LPS44
			24V@1.6A[2.3A]*						LPS45
			48V@0.9A[1.2A]*						LPS48
			3.3V@4A[7A]	5V@1.5A[2A]	+12V@0.5A[0.7A]				LPT41
			5V@4A[5A]	12V@2A[2.5A]	-12V@0.5A[0.7A]				LPT42
			5V@6A[8A]	12V@0.5A[0.7A]	-12V@0.5A[0.7A]				LPT43
			5V@4A[5A]	12V@2A[2.5A]	-5V@0.5A[0.7A]				LPT44
			5V@4A[5A]	15V@2A[2.5A]	-15V@0.5A[0.7A]				LPT45
	5V@4A[5A]	24V@1A[1.5A]	+12V@0.5A[0.7A]				LPT46		
<b>[55W]</b>	<b>40W</b>	<b>LP40-M Series - Medical</b>							
		 (1)	5V@8A[11A]*					3" x 5" x 1.2"	LPS42-M
			12V@3.3A[4.5]*					(76.2x 127 x 30.5)	LPS43-M
			15V@2.6A[3.6A]*						LPS44-M
			24V@1.6A[2.3A]*						LPS45-M
			5V@4A[5A]	12V@2A[2.5A]	-12V@0.5A[0.7A]				LPT42-M
	5V@4A[5A]	15V@2A[2.5A]	-15V@0.5A[0.7A]				LPT45-M		

Options:  
 [ ] Rating with 30 CFM of air  
 (1) Optional cover/enclosure  
 \* Floating output

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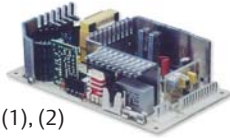
Output Power		Output				Size W x L x H (mm)	Model
[Forced Air]	Free Air	V1	V2	V3	V4		
<b>[50W]</b>	<b>50W</b>	<b>LP50 Series</b>				2" x 4" x 1.3" (50.8 x 101.6 x 33)	LPT51
	(1)	3.3V@8A	5V@3A	12V@0.5A			LPT52
		5V@8A	12V@3A	-12V@0.5A			LPT53
		5V@8A	15V@2.4A	-15V@0.5A			LPT54
		5V@8A	24V@1.5A	12V@0.5A			
<b>[60W]</b>	<b>60W</b>	12V@5A*				LPS53	
	(1)	15V@4A*				LPS54	
		24V@2.5A*				LPS55	
		48V@1.25A*				LPS58	
<b>[50W]</b>	<b>50W</b>	<b>LP50-M Series Medical</b>				2" x 4" x 1.3" (50.8 x 101.6 x 33)	LPT51-M
	(1)	3.3V@8A	5V@3A	12V@0.5A			LPT52-M
		5V@8A	12V@3A	-12V@0.5A			LPT53-M
		5V@8A	15V@2.4A	-15V@0.5A			LPT54-M
		5V@8A	24V@1.5A	12V@0.5A			
<b>[60W]</b>	<b>60W</b>	5V@11A*				LPS52-M	
	(1)	12V@5A*				LPS53-M	
		15V@4A*				LPS54-M	
		24V@2.5A*				LPS55-M	
		48V@1.25A*				LPS58-M	
<b>[70W]</b>	<b>53W</b>	<b>NLP70 Series</b>				3 x 5.5 x 1.26 (76.2 x 139.7 x 32)	NLP70-9693J <sup>(5)</sup>
		5V@13A	3.3V@13A	12V@0.8A			
<b>[75W]</b>	<b>65W</b>	<b>NLP65 Series</b>				3 x 5 x 1.26 (76.2 x 127 x 32)	NLP65-7605J
		5V@12A*					NLP65-9605J <sup>(5)</sup>
		5V@12A*					NLP65-7612J G
		12V@6.5A*					NLP65-9612J <sup>(5)</sup> G
		12V@6.5A*					NLP65-7624J G
		24V@3.5A*					NLP65-9624J <sup>(5)</sup> G
		24V@3.5A*					NLP65-7629J
		5V@8A	12V@3A				NLP65-9629J <sup>(5)</sup>
		5V@8A	12V@3A				NLP65-7608J G
		5V@8A	12V@3A	-12V@0.8A			NLP65-9608J <sup>(5)</sup> E, G
		5V@8A	12V@3A	-12V@0.8A			NLP65-7610GJ
		5V@8A	15V@2.5A	-15V@0.8A			NLP65-9610J <sup>(5)</sup> G
		5V@8A	15V@2.5A	-15V@0.8A			NLP65-7620J
		5V@8A	24V@2A				NLP65-9620J <sup>(5)</sup> G
		5V@8A	24V@2A				

Options:

- E To order an enclosed version of the NLP65-9608J, add suffix 'EJ' to the end of the model number, e.g. NLP65-9608EJ. The enclosed version includes: IEC connector, on/off switch, wire harness output connector and fitted cover.
- G A safety earth ground pin and ground choke are available as an option. To order, please add the suffix 'GJ' to the end of the model number e.g. NLP65-9612GJ.

- [ ] Rating with 30 CFM of air
- (1) Optional cover/enclosure
- (5) These models feature harmonic current correction to EN61000-3-2
- \* Floating output

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Output Power		Output				Size W x L x H (mm)	Model
[Forced Air]	Free Air	V1	V2	V3	V4		
<b>[75W]</b>	<b>65W</b>	<b>NLP65 Series - Medical</b>					
		12V@6.5A*				3x 5 x 1.26	NLP65-9912J <sup>(6)</sup>
		15V@5.3A*				(76.2 x 127 x 32)	NLP65-9915J <sup>(6)</sup>
		24V@3.5A*					NLP65-9924J <sup>(6)</sup>
		5V@8A	12V@3A				NLP65-9929J <sup>(6)</sup>
		5V@8A	24V@2A				NLP65-9920J <sup>(6)</sup>
		5V@8A	12V@3A	-12V@1A			NLP65-9908J <sup>(6)</sup>
<b>[80W]</b>	<b>60W</b>	<b>LP60 Series</b>					
		3.3V@12A[16A]*				3" x 5" x 1.65"	LPS61
(1)		5V @12A[16A]*				(76.2 x 127 x 41.9)	LPS62
		12V@5A[6.7A]*					LPS63
		15V@4A[5.3A]*					LPS64
		24V@2.5A[3.3A]*					LPS65
		48V@1.3A[1.7A]*					LPS68
		3.3V@5A[8.5A]	5V@2.5A[3A]	+12V@0.5A[1A]			LPT61
		5V@7A [8A]	12V@3A[3.5A]	-12V@0.7A[1A]			LPT62
		5V@7A [8A]	15V@2.8A[3.3A]	-15V@0.7A[1A]			LPT63
		5V@7A [8A]	12V@3A[3.5A]	-5V@0.7A[1A]			LPT64
		5V@7A [8A]	24V@1.5A[2A]	+12V@0.7A[1A]			LPT65
<b>[80W]</b>	<b>60W</b>	<b>LP60-M Series - Medical</b>					
		12V@5A[6.7A]*				3" x 5" x 1.65"	LPS63-M
(1)		15V@4A[5.3A]*				(76.20 x 127 x 41.9)	LPS64-M
		24V@2.5A[3.3A]*					LPS65-M
		5V@7A [8A]	12V@3A [3.5A]	-12V@0.7A [1A]			LPT62-M
		5V@7A [8A]	15V@2.8A [3.3A]	-15V@0.7A [1A]			LPT63-M
<b>[85W]</b>	<b>60W</b>	<b>LP80 Series</b>					
		3.3V@8A[13A] (1.8V - 3.5V)	5V@4A [13A] (3.3V - 5.5V)	+12V@0.7A [1A]		3" x 5" x 1.29" (76.2 x 127 x 82.8)	LPT81
(1)		5V@8A[13A] (3.3V - 5V)	12V@3A[4A]	-12V@0.7A[1A]			LPT82
		5V@8A[13A] (3.3V - 5V)	15V@2.4A[3.2A]	-15V@0.7A [1A]			LPT83
<b>[110W]</b>	<b>80W</b>	<b>LP110 Series</b>					
		12V@6.7A [9.2A]*				4" x 7" x 1.8" (101.6 x 177.8 x 45.7)	LPS113
(1), (2)		15V@5.3A [7.3A]*					LPS114
		24V@3.3A [4.6A]*					LPS115
		48V@1.7A [2.3A]*					LPS118
		5V@9A [11A]	12V@4.5A [5A]	-12V@0.7A [1A]	±5-25V@2.5A[3A]*		LPQ112
		5V@9A [11A]	15V @4.5A[5A]	-15V@0.7A[1A]	±5-25V@2.5A[3A]*		LPQ113
		5V@9A [11A]	12V@4.5A[5A]	-12V@0.7A[1A]	24V@3.5A[4.5A]		LPQ114
<b>[110W]</b>	<b>80W</b>	<b>NFS80 Series</b>					
		5V@15A	24V@2.5A	12V@3A	12V@3A*	4.25" x 7" x 1.8"	NFS80-7602J
		5V@15A	24V@2.5A	15V@3A	15V@3A*	(107.95 x 177.8 x 45.72)	NFS80-7606J

Options:

[ ] Rating with 30 CFM of air




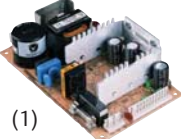
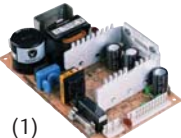

(1) Optional cover/enclosure

(2) Optional bracket

(5) These models feature harmonic current correction to EN61000-3-2

\* Floating output

Astec products are in unshaded boxes; Artesyn in gray boxes.

Output Power [Forced Air] Free Air	Output				Size W x L x H (mm)	Model
	V1	V2	V3	V4		
<b>[110W]</b> <b>80W</b>	<b>NLP110 Series</b>					
	5V@22A*				3" x 6.5" x 1.26" (76.2 x 165.1 x 32)	NLP110-9605J <sup>(5)</sup>
	12V@9.2A*					NLP110-9612J <sup>(5)</sup>
	24V@4.6A*				NLP110-9624J <sup>(5)</sup>	
	48V@2.3A*				NLP110-9617J <sup>(5)</sup>	
	5V@18A		3.3V@20A	12V@1A		NLP110-9693J <sup>(5)</sup>
	12V@8.5A		5V@18A	-12V@1A		NLP110-9608J <sup>(5)</sup>
	<b>NLP110 Series - Medical</b>					
	5V@22A*				3" x 6.5" x 1.26" (76.2 x 165.1 x 32)	NLP110-9905J <sup>(5)</sup>
	12V@9.2A*					NLP110-9912J <sup>(5)</sup>
	24V@4.6A*				NLP110-9924J <sup>(5)</sup>	
	48V@2.3A*				NLP110-9917J <sup>(5)</sup>	
	3.3V@20A		2.5V@20A	12V@1A		NLP110-9994J <sup>(5)</sup>
	5V@18A		3.3V@20A	12V@1A		NLP110-9993J <sup>(5)</sup>
	12V@8.5A		3.3V@20A	-12V@1A		NLP110-9995J <sup>(5)</sup>
	12V@8.5A		5V@18A	-12V@1A		NLP110-9908J <sup>(5)</sup>
<b>[110W]</b> <b>80W</b>	<b>NLS110 Series</b>					
	5.1V@10A	24V@4.5A	12V@5A	-12V@1A	4.25" x 7" x 1.26" (107.95 x 177.8 x 32)	NLS110-9602J <sup>(5)</sup>
<b>[110W]</b> <b>80W</b>	<b>NFS110 Series</b>					
 (1)	12V@9A*				4.25" x 7" x 1.8" (107.95 x 177.8 x 45.72)	NFS110-7612J
	24V@4.5A*					NFS110-7624J
	5.1V@10A		12V@5A	-12V@1A	-5V@1A	NFS110-7601PJ
	5.1V@10A		15V@5A	-15V@1A	-5V@1A	NFS110-7604PJ
	5.1V@10A		24V@4.5A	12V@5A	-12V@1A	NFS110-7602PJ
<b>[110W]</b> <b>80W</b>	<b>NFS110 Series - Medical</b>					
 (1)	12V@9A*				4.25" x 7" x 1.8" (107.95 x 177.8 x 45.72)	NFS110-7912J
	15V@7.3A*					NFS110-7915J
	24V@4.5A*				NFS110-7924J	
	5.1V@10A		12V@5A	-12V@1A	-5V@1A	NFS110-7901PJ
	5.1V@10A		24V@4.5A	12V@5A	-12V@1A	NFS110-7902PJ
<b>[120W]</b> <b>70W</b>	<b>NTQ120 Series</b>					
	3.3V@14A [25A]	5V@12.5A [24A]	+12V@1A[2A]	-12V@0.5A[1A]	4" x 7" x 1.5" (101.6 x 177.8 x 38.1)	NTQ123
	3.3V@14A [25A]	5V@12.5A [24A]	+12V@1A[2A]	-12V@0.5A[1A]		NTQ123-DC

Options:

P Power fail detect option available, please add the suffix "P" to the model; e.g. NFS110-7601PJ






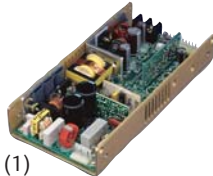

[ ] Rating with 30 CFM of air

(5) These models feature harmonic current correction to EN61000-3-2

\* Floating output



Astec products are in unshaded boxes; Artesyn in gray boxes.

Output Power	[Forced Air]	Free Air	Output				Size W x L x H (mm)	Model
			V1	V2	V3	V4		
<b>[130W]</b>		<b>80W</b>	<b>LP120 Series</b>					
			3.3V@16A [26A]*				3" x 5" x 1.29"	LPS121
			5V@16A [26A]*				(101.6x177.8x38.1)	LPS122
			12V@6.6A [10.8A]*					LPS123
			15V5.3A [8.6A]*					LPS124
			24V@3.4A [5.4A]*					LPS125
			48V@1.7A [2.7A]*					LPS128
<b>[145W]</b>		<b>80W</b>	<b>LP140 Series</b>					
			5V@12A [25A] (3.3V - 5V)	12V@5A [6A]	-12V@1A [1.5A] (-12V - 15V)	±3.3-25V@1.5A[4.5A]*	4" x 7" x 1.5" (101.6 x 177.8x38.1)	LPQ142
			(1), (3)					
<b>[150W]</b>		<b>100W</b>	<b>TLP150 Series</b>					
			12V@12.5A*				3 x 5 x 1.25	TLP150R-96S12J <sup>(5)</sup> F
			24V@6.3A*				(76.2x127x31.75)	TLP150R-96S24J <sup>(5)</sup> F
			48V@3.2A*					TLP150R-96S48J <sup>(5)</sup> F
<b>[150W]</b>		<b>100W</b>	<b>TLP150 Series - Medical</b>					
			12V@12.5A*				3 x 5 x 1.25	TLP150N-99S12J <sup>(5)</sup> F
			24V@6.3A*				(76.2x127x31.75)	TLP150N-99S24J <sup>(5)</sup> F
<b>[150W]</b>		<b>110W</b>	<b>NLP150 Series</b>					
			3.3V@30A*					NLP150L-96S93J <sup>(5)</sup>
			12V@12.5A*				3.8 x 6.8 x 1.26	NLP150L-96S6J <sup>(5)</sup>
			24V@6.5A*				(96.52 x 172.72 x 32)	NLP150L-96S8J <sup>(5)</sup>
			48V@3.2A*					NLP150L-96S9J <sup>(5)</sup>
			5.1V@30A*					NLP150L-96S5J <sup>(5)</sup>
			5.1V@30A	3.3V@15A	12V@3A			NLP150L-96T536J <sup>(5)</sup>
			12V@12.5A	5.1V@8A	24V@3A			NLP150L-96T658J <sup>(5)</sup>
			5.1@30A	3.3V@15A	12V@3A	12V, iso@1A	3.80 x 7.80x 1.26 (96.52 x 198.12 x 32)	NLP150L-96Q5366J <sup>(5)</sup>
<b>[150W]</b>		<b>110W</b>	<b>LP150 Series</b>					
			5V@22A [30A]*				4.25" x 8.5" x 1.5"	LPS152
			12V@9.1A[12.5A]* (12V - 15V)				(108x215.9x38.1)	LPS153
			24V@4.5A [6.2A]* (24V - 28V)					LPS155
			5V@15A[22A]	12V@2.6A [8A]	-12V@2A [2.5A]	±5-25V@2.5A[3A]*		LPQ152
			5V@15A[22A]	15V@4.8A[6.4A]	-15V@1.6A[2A]	±5-25V@2.5A[3A]*		LPQ153
			5V@15A[22A]	12V@6A[8A]	-12V@2A[2.5A]	24V@3.5A[4.5A]		LPQ154
<b>[165W]</b>		<b>50W</b>	<b>NTQ160 Series</b>					
			3.3V@15A[30A] (1.8V - 3.5V)	5V@10A [20A] (3V - 5.5V)	12v@2A [4.5A]*	12V@2A [4.5A]*	4.25" x 8.5" x 1.5" (108 x 215.9 x 38.1)	NTQ162
			5V@15A[30A] (3.3V - 5V)	3.3V@10A[20A]	12V@2A[4.5A]*	12V@2A [4.5]*		NTQ163
			3.3V@15A [30A] (3.3V - 5V)	2.5V@10A [20A] (1.8V - 3.5V)	5V@2A [4A]*	12V@2A [4A]*		NTQ165

Options:

F Replace the 'J' at the end of the model number with 'FJ' when the optional standby output and / or remote ON / OFF control is required e.g. TLP150N-99S12FJ


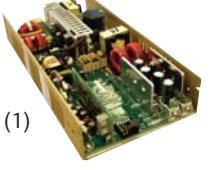



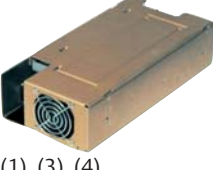
[ ] Rating with 30 CFM of air

(1) Optional cover/enclosure

(3) Optional fan cover (see data sheet for increased dimensions)

(5) These models feature harmonic current correction to EN61000-3-2 Floating output

Astec products are in unshaded boxes; Artesyn in gray boxes.

Output Power		Output				Size W x L x H (mm)	Model	
[Forced Air]	Free Air	V1	V2	V3	V4			
<b>[175W]</b>	<b>110W</b>	<b>LP170 Series</b>						
	(1)	5V@22A[35A]* (2.5V - 6V)				4.25 x 8.5 x 1.5 (108 x 215.9 x 38.1)	LPS172	
		12V@9.1A[15A]* (6V - 12V)					LPS173	
		15V@7.3A [12A]* (12V - 24V)					LPS174	
		24V@4.5A [7.5]* (24V - 54V)					LPS175	
		5V@15A [30A] (3.3V - 5.5V)	12V@6A [8A]	-12V@0.2A [3A] (-12V - 15V)	±3.3-25V@2A[5A]*			LPQ172
		5V@10A [24A] (3.3V - 5.5V)	12V@6A [8A]	-12V@1.2A [3A] (-12V - 15V)	5V@10A[24A]* (3.3 - 5V)			LPQ173
<b>[175W]</b>	<b>110W</b>	<b>LP170-M Series - Medical</b>						
	(1)	5V@22A[35A]* (2.5V - 6V)				4.25" x 8.5" x 1.5" (108 x 215.9 x 38.1)	LPS172-M	
		12V@9.1A[15A]* (6V - 12V)					LPS173-M	
		15V@7.3A [12A]* (12V - 24V)					LPS174-M	
		24V@4.5A [7.5]* (24V - 54V)					LPS175-M	
<b>[250W]</b>	<b>175W</b>	<b>NLP250 Series</b>						
	(1)	12V@21A*				4 x 7 x 1.5	NLP250R-96S12J <sup>(5)</sup>	
		24V@10.5A*				(101.6 x 177.8 x 38.1)	NLP250R-96S24J <sup>(5)</sup>	
		48V@5.3A*					NLP250R-96S48J <sup>(5)</sup>	
<b>[250W]</b>	<b>175W</b>	<b>NLP250 Series - Medical</b>						
	(1)	12V@21A*				4 x 7 x 1.5	NLP250N-99S12J <sup>(5)</sup>	
		24V@10.5A*				(101.6 x 177.8 x 38.1)	NLP250N-99S24J <sup>(5)</sup>	
<b>[250W]</b>		<b>LP250 Series</b>						
	(1), (3), (4)	5V (3-6V)@[50A]*				5" x 9" x 2"	LPS252-C	
		12V(6-12V)@[21A]*				(127 x 228.6 x 50.8)	LPS253-C	
		15V(12-24V)@[16.7A]*					LPS254-C	
		24V(24-48V)@[10.4A]*					LPS255-C	
		5V@[35A]	12V@[10A]	-12V@[6A]	±5-25V@[6A]*			LPQ252-C
		5V@[35A]	15V@[10A]	-15V@[6A]	±5-25V@[6A]*			LPQ253-C
<b>[350W]</b>		<b>LP350 Series</b>						
	(1), (3), (4)	5V(3-6V)@[70A]*				5" x 9" x 2.5"	LPS352-C	
		12V(6-12V)@[29.2A]*				(127 x 228.6 x 63.5)	LPS353-C	
		15V(12-24V)@[23.3A]*					LPS354-C	
		24V(24-48V)@[14.6A]*					LPS355-C	
		5V@[50A]	12V@[12A]	-12V@[6A]	±3.3 - 24V@[6A]*			LPQ352-C
		5V@[50A]	12V@[12A]	-12V@[6A]	±3.3 - 24V@[6A]*			LPQ353-C
<b>[350W]</b>	<b>200W</b>	<b>NTS350 Series</b>						
	(3)	12V@16.6A [29.2A]*				4" x 7" x 1.5"	NTS353	
		24V@8.3A [14.6A]*				(101.6 x 177.8 x 38)	NTS355	
		48V@8.3A [14.6A]*					NTS358	
		54V@3.7A [6.5A]*					NTS359	

Options:

[ ] Rating with 30 CFM of air

(1) Optional cover/enclosure (see data sheet for increased dimensions)

(3) Optional fan cover (see data sheet for increased dimensions)

(4) Optional end fan cover (see data sheet for increased dimensions)

(5) These models feature harmonic current correction to EN61000-3-2

\* Floating output

# External Power Adapters

## 4-60 Watts

### Special Features

All models feature:

- Wide-range AC input
- High demonstrated MTBF
- Overvoltage protection
- Overload protection
- Built-in EMI filtering
- Extensive safety approvals

Many models feature:

- EN61000-3-2 compliance
- Medical approvals

AC Input *Wallmount*





- U.S. - 2-prong
- China - 2-prong
- Europe - 2-prong
- United Kingdom - 3-prong
- Australia - 2-prong

*Desktop*

- IEC320 2-pin (C14)
- IEC320 2-pin (C8)

Single output 2.5mm barrel plug  
Triple output 5-pin DIN

**Astec products are in unshaded boxes; Artesyn in gray boxes.**

Output Power	V1	V2	V3	Size W x L x H (mm)	Model
<b>4W</b> 	<b>DA4 Series</b>				
	5.5V@0.75A			1.8" x 2.4" x 1" (45.8 x 60 x 26)	DA4-050US
	5.5@0.75A			2.23" x 2.4" x 1" (58.3 x 60 x 26)	DA4-050EU
	5.5V@0.75A			1.8" x 2.4" x 1.0" (45.8 x 60 x 76)	DA4-050CH
<b>16W</b> 	<b>DA16 Series</b>				
	+12V@1.33A			2.1" x 3" x 1.2" (53.3 x 76.2 x 30.5)	DA16-120US
	+12V@1.33A				DA16-120EU
	+12V@1.33A				DA16-120UK
	+12V@1.33A				DA16-120AU
<b>20W</b> 	<b>SSL20C Series</b>				
	5V@4A (4.8A)			2.40" x 4.65" x 1.08" (60.96 x 118.11 x 27.43)	SSL20C-7605J
	12V@1.67A (2A)				SSL20C-7612J
	15V@1.34A (1.6A)				SSL20C-7615J
	18V@1.11A (1.33A)				SSL20C-7618J
	24V@0.83A (1A)				SSL20C-7624J
	48V@0.42A (0.5A)				SSL20C-7617J
<b>40W</b> 	<b>SSL40C Series</b>				
	12V@3.00A (3.6A)			2.40" x 4.65" x 1.08" (60.96 x 118.11 x 27.43)	SSL40C-7612J
	15V@2.66A (3A)				SSL40C-7615J
	18V@2.22A (2.6A)				SSL40C-7618J
	24V@1.66A (1.9A)				SSL40C-7624J
	48V@0.83A (1A)				SSL40C-7617J

## External Power Adapters

Astec products are in unshaded boxes; Artesyn in gray boxes.

Output Power	V1	V2	V3	Size W x L x H (mm)	Model
<b>50W</b> 	<b>DPT50 Series</b>				
	3.3V@9A	5V@3A	-12V@0.5A	2.39" x 5.24" x 1.62" (60.7 x 133 x 41.15)	DPT51
	5V@8A	12V@3A	-12V@0.5A		DPT52
	5V@8A	15V@2.4A	-15V@0.5A		DPT53
	5V@8A	24V@1.5A	12V@0.5A		DPT54
<b>50W</b> 	<b>DPT50-M Series - Medical</b>				
	3.3V@9A	5V@3A	-12V@0.5A	2.39" x 5.24" x 1.62" (60.7 x 133 x 41.15)	DPT51-M
	5V@8A	12V@3A	-12V@0.5A		DPT52-M
	5V@8A	15V@2.4A	-15V@0.5A		DPT53-M
	5V@8A	24V@1.5A	12V@0.5A		DPT54-M
<b>60W</b> 	<b>DPS50 Series</b>				
	5V@6A			2.39" x 5.24" x 1.62" (60.7 x 133 x 41.15)	DPS52
	12V@5A				DPS53
	15 V@4A				DPS54
	24V@2.5A				DPS55
48V@1.25A			DPS58		
<b>60W</b> 	<b>DPS50-M Series - Medical</b>				
	5V@6A			2.39" x 5.24" x 1.62" (60.7 x 133 x 41.15)	DPS52-M
	12V@5A				DPS53-M
	15 V@4A				DPS54-M
	24V@2.5A				DPS55-M
48V@1.25A			DPS58-M		

# Medical AC-DC Power Supplies

## Up to 4860 Watts

Astec and Artesyn produce a wide range of AC-DC power supplies certified for use in medical equipment requiring lower safety ground leakage and higher isolation. The power supplies listed below are designed for use in non-patient critical applications: medical, dental and laboratory applications such as dialysis machines, monitoring equipment, instrumentation and infusion pump controls. All these power supplies are high efficiency switch-mode design, and feature full medical safety approval to 60601-1.



### Special Features

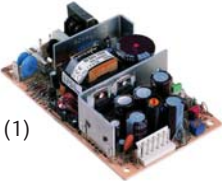
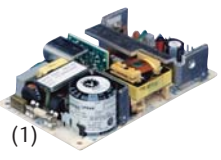


All models feature:

- Industry standard footprints
- Wide-range AC input
- Remote sense
- Adjustable outputs
- Power fail
- Full power to 50°C
- High demonstrated MTBF
- Overvoltage protection
- Overload protection
- Built-in EMI filtering
- Medical approvals
- Extensive safety approvals
- Derated operation to 70°C

Many models feature:

- EN61000-3-2 compliance
- Supervisory outputs (5V/12V)
- Wide-adjust floating 4th output
- Single wire current share
- Wide-adjust on single output models

**Astec products are in unshaded boxes; Artesyn in gray boxes.**

Output Power [Forced Air]	Free Air	Output				Size W x L x H (mm)	Model	
		V1	V2	V3	V4			
<b>[50W]</b>  (1)	<b>40W</b>	<b>NFS40 Series - Medical</b>				3" x 5" x 1.2" (127 x 76.2 x 30.5)	12V@4A*	NFS40-7912J
		15V@3.3A*	NFS40-7915J					
		24V@2A*	NFS40-7924J					
		5V@7A	12V@1A	-12V@1A	NFS40-7928J			
		5.1V@5A	12V@2A	-12V@0.5A	NFS40-7908J			
		5.1V@5A	15V@2A	-15V@0.5A	NFS40-7910J			
<b>[55W]</b>  (1)	<b>40W</b>	<b>LP40-M Series - Medical</b>				3" x 5" x 1.2" (76.2 x 127 x 30.5)	5V@8A[11A]*	LPS42-M
		12V@3.3A[4.5]*	LPS43-M					
		15V@2.6A[3.6A]*	LPS44-M					
		24V@1.6A[2.3A]*	LPS45-M					
		5V@4A[5A]	12V@2A[2.5A]	-12V@0.5A[0.7A]	LPT42-M			
		5V@4A[5A]	15V@2A[2.5A]	-15V@0.5A[0.7A]	LPT45-M			
<b>[50W]</b>  (1)	<b>50W</b>	<b>LP50-M Series - Medical</b>				2" x 4" x 1.3" (50.8 x 101.6 x 33)	3.3V@8A	LPT51-M
		5V@8A	12V@3A	-12V@0.5A	LPT52-M			
		5V@8A	15V@2.4A	-15V@0.5A	LPT53-M			
		5V@8A	24V@1.5A	12V@0.5A	LPT54-M			
<b>[60W]</b>  (1)	<b>60W</b>	<b>LPS52-M Series - Medical</b>					5V@11A*	LPS52-M
		12V@5A*	LPS53-M					
		15V@4A*	LPS54-M					
		24V@2.5A*	LPS55-M					
		48V@1.25A*	LPS58-M					

Options:




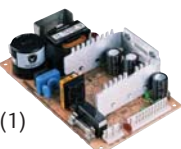

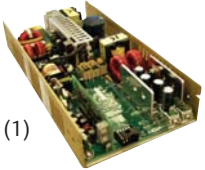

[ ] Rating with 30 CFM of air

(1) Optional cover/enclosure

(5) These models feature harmonic current correction to EN61000-3-2

\* Floating output

Astec products are in unshaded boxes; Artesyn in gray boxes.

Output Power		Output				Size W x L x H (mm)	Model
[Forced Air]	Free Air	V1	V2	V3	V4		
<b>[75W]</b>	<b>65W</b>	<b>NLP65 Series - Medical</b>					
		12V@6.5A*				3 x 5 x 1.26 (127 x 76.2 x 32)	NLP65-9912J <sup>(5)</sup>
		15V@5.3A*					NLP65-9915J <sup>(5)</sup>
		24V@3.5A*					NLP65-9924J <sup>(5)</sup>
		5V@8A	12V@3A				NLP65-9929J <sup>(5)</sup>
		5V@8A	24V@2A				NLP65-9920J <sup>(5)</sup>
		5V@8A	12V@3A	-12V@1A			NLP65-9908J <sup>(5)</sup>
<b>[80W]</b>	<b>60W</b>	<b>LP60-M Series - Medical</b>					
		12V@5A[6.7A]*				3" x 5" x 1.65" (76.2 x 127 x 41.9)	LPS63-M
(1)		15V@4A[5.3A]*					LPS64-M
		24V@2.5A[3.3A]*					LPS65-M
		5V@7A [8A]	12V@3A [3.5A]	-12V@0.7A [1A]			LPT62-M
		5V@7A [8A]	15V@2.8A [3.3A]	-15V@0.7A [1A]			LPT63-M
<b>[110W]</b>	<b>80W</b>	<b>NLP110 Series - Medical</b>					
		5V@22A*				3" x 6.5" x 1.26" (76.2 x 165.1 x 45.72)	NLP110-9905J <sup>(5)</sup>
		12V@9.2A*					NLP110-9912J <sup>(5)</sup>
		24V@4.6A*					NLP110-9924J <sup>(5)</sup>
		48V@2.3A*					NLP110-9917J <sup>(5)</sup>
		3.3V@20A	2.5V@20A	12V@1A			NLP110-9994J <sup>(5)</sup>
		5V@18A	3.3V@20A	12V@1A			NLP110-9993J <sup>(5)</sup>
		12V@8.5A	3.3V@20A	-12V@1A			NLP110-9995J <sup>(5)</sup>
		12V@8.5A	5V@18A	-12V@1A			NLP110-9908J <sup>(5)</sup>
<b>[110W]</b>	<b>80W</b>	<b>NFS110 Series - Medical</b>					
		12V@9A*				4.25" x 7" x 1.8" (107.95 x 177.8 x 32)	NFS110-7912J
(1)		15V@7.3A*					NFS110-7915J
		24V@4.5A*					NFS110-7924J
		5.1V@10A	24V@5A	-12V@1A	-5V@1A		NFS110-7901PJ
		5.1V@10A	24V@4.5A	12V@5A	-12V@1A		NFS110-7902PJ
<b>[150W]</b>	<b>100W</b>	<b>TLP150 Series - Medical</b>					
		12V@12.5A*				3 x 5 x 1.25 (177.8x101.6x31.75)	TLP150N-99S12J <sup>(5)</sup> F
		24V@6.3A*					TLP150N-99S24J <sup>(5)</sup> F
<b>[175W]</b>	<b>110W</b>	<b>LP170-M Series - Medical</b>					
		5V@22A[35A]* (2.5V - 6V)				4.25" x 8.5" x 1.5" (108 x 215.9 x 38.1)	LPS172-M
(1)		12V@9.1A[15A]* (6V - 12V)					LPS173-M
		15V@7.3A [12A]* (12V - 24V)					LPS174-M
		24V@4.5A [7.5]* (24V - 54V)					LPS175-M
<b>[250W]</b>	<b>175W</b>	<b>NLP250 Series - Medical</b>					
		12V@21A*				4 x 7 x 1.5 (101.6 x 177.8 x 38.1)	NLP250N-99S12J <sup>(5)</sup>
(1)		24V@10.5A*					NLP250N-99S24J <sup>(5)</sup>

Options:

F Replace the 'J' at the end of the model number with 'FJ' when the optional standby output and / or remote ON / OFF control is required e.g. TLP150N-99S12FJ


[ ] Rating with 30 CFM of air


(1) Optional cover/enclosure (see data sheet for increased dimensions)


(5) These models feature harmonic current correction to EN61000-3-2

\* Floating output


Astec products are in unshaded boxes; Artesyn in gray boxes.

Output Power	Output			Size W x L x H (mm)	Model
	V1	V2	V3		
<b>50W</b> 	<b>DPT50-M Series - Medical</b>				
	3.3V@9A	5V@3A	-12V@0.5A	2.39" x 5.24" x 1.62" (60.7 x 133 x 41.15)	DPT51-M
	5V@8A	12V@3A	-12V@0.5A		DPT52-M
	5V@8A	15V@2.4A	-15V@0.5A		DPT53-M
	5V@8A	24V@1.5A	12V@0.5A		DPT54-M

Output Power	Output			Size W x L x H (mm)	Model
	V1	V2	V3		
<b>60W</b> 	<b>DPS50-M Series - Medical</b>				
	5V@6A			2.39" x 5.24" x 1.62" (60.7 x 133 x 41.15)	DPS52-M
	12V@5A				DPS53-M
	15 V@4A				DPS54-M
	24V@2.5A				DPS55-M
	48V@1.25A				DPS58-M

Output Power	Output			Size H x W x L (mm)	Model
	V1	V2	V3		
<b>Up to 1500W</b> 	<b>iMP Medium Power Series</b>				
	2-60V	1-21 outputs	Fully configurable and Intelligent	2.5" x 5" x 10" (63.5 x 127 x 254)	iMP1, iMP4, iMP8 See iMP section

Astec products are in unshaded boxes; Artesyn in gray boxes.

Output Power	Output			Size H x W x L (mm)	Model
	V1	V2	V3		
<b>1500-4860W</b> 	<b>iVS High Power Series</b>				
	2-60V	1-21 outputs	Fully configurable and Intelligent	5" x 5" x 11" (63.5 x 127 x 279.4)	iVS1, iVS6
				5" x 8" x 11" (63.5 x 203.2 x 279.4)	iVS3, iVS8 See iVS section

# MP Series

## Up to 1200 Watts

Total Power: Up to 1200W  
 Input Voltage: 85-264VAC  
 120-350VDC  
 Number Outputs: Up to 21

### New Options Now Available

- Optional battery charger
- Optional 2A standby
- Optional extended hold-up module

### Special Features

- Current share on all outputs with ratings of 10A or greater
- Remote sense on all outputs with ratings greater than 2A
- Overload protection on all outputs
- Voltage adjustment on all outputs
- Margining on all single output modules
- Input OK signal and status indicator LED
- Global DC OK signal and status indicator LED
- Global and individual module inhibits/enable
- 2 year warranty
- Forced air cooling, field replaceable fan or customer provided air option
- Isolated 5V bias voltage
- Power factor correction
- EN61000-3-2 harmonic distortion compliance
- CISPR 22, EN55022 Curve B conducted / radiated EMI
- European CE Mark requirements
- Optional VME timing and system DC OK module
- Low leakage option
- EN61000 immunity standards
- Standard modification flexibility (see datasheet)

MP4



MP6



MP8



MP1



## Electrical Specifications

Input	
Input voltage	85-264VAC 120-350VDC
Frequency	47-440Hz
Inrush current	40A peak maximum (soft start)
Efficiency	70-80% typ. @ full case load
Power factor	0.99 typ. meets EN61000-3-2 (N/A @ 440Hz)
Turn-on time	AC on 1.5 second typical Inhibit/enable 150 ms typical
EMI filter standard	CISPR 22 EN55022 Level "B"
EMI filter (low leakage option)	CISPR 22 EN55022 Level "A"
Leakage current standard	2.0 mA maximum @ 240VAC
Leakage current (low leakage option)	300 µA maximum @ 240VAC
Radiated EMI	CISPR 22 EN55022 Level "B"
Holdover storage	20ms minimum (independent of input VAC)
AC OK	>5ms early warning minimum before outputs lose regulation Full cycle ride thru (50 Hz)
Harmonic distortion	Meets EN61000-3-2
Isolation	Meets EN60950
Global inhibit/enable	TTL, Logic "1" and Logic "0"; configurable
Input fuse (internal)	MP4: 10A ; MP6: 15A; MP8: 20A ; MP1: 20A
Warranty	2 years



## Environmental Specifications

Operating temperature	-20°C to 50°C (start @ 0°C) (derate each output linearly to 50% at 70°C) (-20°C to 40°C max. with rear air option)
Storage/vibration	MIL-HDBK 810E
Humidity	95% non-condensing
Storage temperature	-40°C to 85°C
Temperature coefficient	0.02% per °C
Cooling:	Internal DC fan or customer provided air (option)

## Safety

UL	UL1950
CSA	CSA22.2 No. 234 Level 5
IEC	IEC950, Class 1
VDE	EN60950
BABT	Compliance to EN 60950, BS 7002
CB	Certificate and report
CE	Mark

- Notes:
1. Single output modules only
  2. Single and main of dual output modules only
  3. Contact factory for optional preload if required

Output	
Adjustment range	±10% minimum all outputs
Margining	±4-6% nominal
Overall reg	0.4% or 20 mV maximum (36 W modules 4% maximum)
Ripple	RMS: 0.1% or 10 mV, whichever is greater; Pk-Pk: 1.0% or 50 mV, whichever is greater; bandwidth limited to 20 MHz
Dynamic response	<2% or 100 mV, with 25% load step
Recovery time	To within 1% in <300 μsecond
Overcurrent protection	Single, main of dual output module 105-120% of rated output current
Short circuit protection	Protected for continuous short circuit Recovery is automatic upon removal of short
Overvoltage protection (measured at sense connection)	Single output modules
Reverse voltage protection	100% of rated output current
Thermal protection	All outputs disabled when internal temp exceeds safe operating range >5ms warning (AC OK signal) before shutdown
Remote sense	Up to 0.5V total drop (not available on triple output module)
Single wire parallel	Current share to within 2% of total rated current <sup>2</sup>
DC OK	-2% to -8% of nominal for any monitored output <sup>2</sup>
Minimum load	Not required on single or triple output modules. 10% required on main of dual output modules <sup>3</sup>
Housekeeping standby	5VDC @1.0A mA maximum present whenever AC input is applied (optional 2.0A available)
Module inhibit	TTL, isolated, singles and dual (both outputs) only
Switching frequency	250kHz
Output/output isolation	>1 Megohm
VME signal option board	POR signal & quad external DC OK

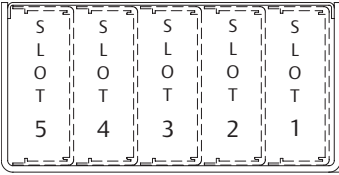
## Ordering Information

Sample below is 1200W case with 12V@50A; 5V@60A; 24V@8.5A; 12V@10A; 12V @ 4A; extended hold-up with no options.

Case Size	Module/Voltage(s) First - Module Code Second - Voltage Code	Add-on Modules Requires 1 slot each	Case Option Codes	Hardware Code
<b>MP1</b>	<b>- 3L - 2E - 1Q - 4LL</b>	<b>- HUP</b>	<b>- 00</b>	<b>- ###</b>
<b>Case Size (mm)</b> 4 = 2.5" x 5" x 10"; 400W-600W, 5 Slots (63.5 x 127 x 254) 6 = 2.5" x 5" x 11"; 600W-800W, 5 Slots (63.5 x 127 x 279.4) 8 = 2.5" x 7" x 10"; 800W-1000W, 6 Slots (63.5 x 177.8 x 254) 1 = 2.5" x 8" x 11"; 1000W-1200W, 7 Slots (63.5 x 203.2 x 279.4)	<b>Module Codes</b> Module/Voltage/Option Codes Module Codes: (None) = 36W Triple O/P (1 slot) 1 = 210W Single O/P (1 slot) 2 = 360W Single O/P (2 slot) 3 = 750W Single O/P (3 slot) 4 = 144W Dual O/P (1 slot) 5 - 9 = Future  <b>Voltage Codes:</b> See <i>Output Module Voltage/Current</i> table	<b>Add-on Modules</b> HUP = Hold up module VME = VME POR signal and isolated DC	<b>Case Option Codes</b>  <b>First Digit</b> 0 - 9 = parallel code (See MP parallel codes table on following page)  <b>Second Digit</b> Standard Options <b>0</b> = no options <b>1</b> = rear air exhaust <b>3</b> = global enable <b>5</b> = option package (options 1 & 3) <b>M</b> = low leakage <b>N</b> = low leakage plus option 1 <b>P</b> = low leakage plus option 3 <b>R</b> = low leakage plus option 5	Factory assigned for modifications

## MP Case Specifications

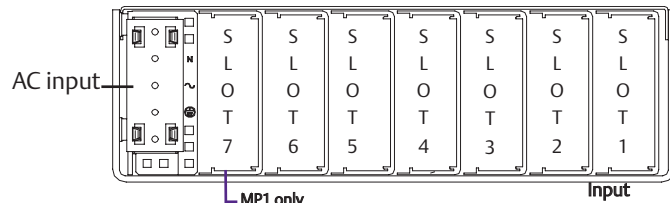
**MP4 and MP6 (AC input on opposite side)**



**MP4** = 2.5" x 5" x 10" 5 available slots (63.5 x 127 x 254mm)  
**MP6** = 2.5" x 5" x 11" 5 available slots (63.5 x 127 x 279.4mm)

Input	
<b>85-264 VAC</b> 400W max.	<b>180-264VAC</b> 600W max.
600W max.	800W max.

## MP8 and MP1



Input	
<b>85-264 VAC</b> 800W max.	<b>180-264VAC</b> 1000W max.
1000W max.	1200W max.

**MP8** = 2.5" x 7" x 10" 6 available slots (63.5 x 177.8 x 254mm)  
**MP1** = 2.5" x 8" x 11" 7 available slots (63.5 x 203.2 x 279.4mm)

## MP Module Specifications



Module code	Output				
	Single 1	Single 2	Single 3	Dual 4	Triple
Max output power	210W	360W	600W	144W	36W
Max output current	35A	60A	120A	10A	2A
Output voltages available	2-60V	2-60V	2-60V	2-28V	2-28V
Standard voltage increments	25	25	25	19	18
Remote sense on outputs	Yes	Yes	Yes	Yes, both	No
Remote margin/V-Program	Yes	Yes	Yes	No	No
Module inhibit (isolated)	Yes	Yes	Yes	No	No
Single wire active current share	Yes	Yes	Yes	Yes, main only	No
Over voltage/over current protection	Yes	Yes	Yes	Yes	OCP only
Minimum load required	No	No	No	10% main only	No
Slots occupied in any MP case	1	2	3	1	1

### Designers' tip:

Visit the Astec Power Wizard at [www.astecpower.com](http://www.astecpower.com) to configure the model number for the power supply that meets your specific requirements.

Voltage	Voltage Code	Single Output Module Code			Dual Output		Triple Output		
		1	2	3	V1	V2	V1	V2	V3
2V	A	35A	60A	120A	—	10A	—	—	2A
2.2V	B	35A	60A	120A	—	10A	—	—	2A
3V	C	35A	60A	120A	—	10A	—	—	2A
3.3V	D	35A	60A	120A	—	10A	—	—	2A
5V	E	35A	60A	120A	10A	10A	—	—	2A
5.2V	F	35A	60A	115A	—	10A	—	—	2A
5.5V	G	34A	58A	109A	—	10A	—	—	2A
6.0V	H	23A	42A	78A	—	10A	—	—	2A
8.0V	I	20A	36A	68A	—	—	1A	1A	1A
10V	J	18A	32A	60A	—	—	1A	1A	1A
11V	K	17A	31A	54.5A	—	—	1A	1A	1A
12V	L	17A	30A	50A	10A	4A	1A	1A	1A
14V	M	14A	21A	40.5A	9A	4A	1A	1A	1A
15V	N	14A	20A	39A	8A	4A	1A	1A	1A
18V	O	11A	19A	33.3A	—	—	—	0.5A	0.5A
20V	P	10.5A	18A	30A	—	—	—	0.5A	0.5A
24V	Q	8.5A	15A	23.5A	4A	2A	—	0.5A	0.5A
28V	R	6.7A	12.8A	21.4A	3A	2A	—	0.5A	0.5A
30V	S	6.5A	12A	20A	—	—	—	—	—
33V	T	6.2A	10.9A	18.2A	—	—	—	—	—
36V	U	5.8A	10A	16.6A	—	—	—	—	—
42V	V	4.2A	7.5A	12.5A	—	—	—	—	—
48V	W	4.0A	7.5A	12.5A	—	—	—	—	—
54V	X	3.7A	6.0A	11A	—	—	—	—	—
60V	Y	3.5A	6.0A	10A	—	—	—	—	—

### Parallel Codes

Slot 7	Slot 6	Slot 5	Slot 4	Slot 3	Slot 2	Slot 1	MP4 and MP6 available slots
7	6	5	4	3	2	1	MP4 and MP6 available slots
7	6	5	4	3	2	1	MP8 available slots
7	6	5	4	3	2	1	MP1 available slots

0 = no parallel  
 1 = 1 & 2  
 2 = 2 & 3  
 3 = 3 & 4  
 4 = 4 & 5  
 5 = 3 & 4 & 5  
 6 = 5 & 6  
 7 = 4 & 5 & 6  
 8 = 6 & 7  
 9 = 3 & 4, 6 & 7

Non-std\* Z *Special Voltage - Consult Factory for specifications*

\*Note: Increments of current not shown can be achieved by paralleling modules (add currents of each module selected)

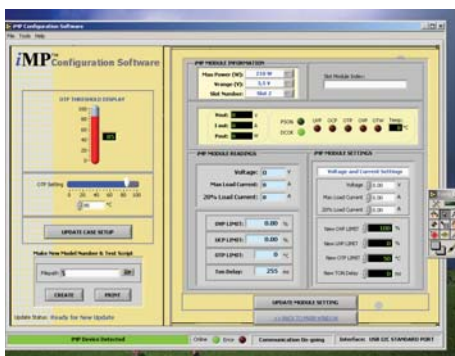
# Intelligent MP Series *iMP*<sup>TM</sup>

## Up to 1500 Watts

Total Power: Up to 1500 Watts  
 Input Voltage: 85 - 264VAC  
 120 - 300 VDC  
 # of Outputs: Up to 21

### Special Features

- Full Medical EN60601 approval
- Intelligent I<sup>2</sup>C control
- Configurable current share on all outputs >10A
- Voltage adjustment on all outputs (Manual or I<sup>2</sup>C)
- Configurable input and output (case and module) OK signals and indicators
- Configurable inhibit/enable
- Configurable output UP/DOWN sequencing
- Configurable current limit (foldback or constant current)
- High power density (8.8W/cu-in)
- Intelligent fan (speed control/fault status)
- Customer provided air option
- uP controlled PFC input with active inrush protection
- I<sup>2</sup>C monitor of voltage, current, and temp
- Programmable voltage, current limit, inhibit/enable through I<sup>2</sup>C
- Optional extended hold-up module (SEMI F47 compliance)
- Increased power density to 50%
- Backward compatibility with standard MP
- External switching frequency sync input
- Optional conformal coating
- Industrial temp range (-40°C to 70°C)
- No preload required



## Electrical Specifications

Input	
Input range	85-264VAC 120-350VDC (limited to 300VDC in medical applications)
Frequency	47-440 Hz
Inrush current	40A peak max. (soft start)
Efficiency	Up to 85% @ full case load
Power Factor	0.99 typ. meets EN61000-3-2 (n/a @ 440Hz)
Turn-on time	AC on 1.5 sec typ., inhibit/enable 150ms typical Programmable
EMI Filter	CISPR 22/EN55022 Level "B"
Leakage current	300µA max. @ 240VAC; 47 - 63Hz
Radiated EMI	CISPR 22/EN55022 Level "B"
Holdover storage	20 ms minimum (independent of input VAC) additional 34mSEC holdover storage with optional HUP module (SEMI F47 compatible)
AC OK	>5 ms early warning min. before outputs lose regulation Programmable; Full cycle ride thru (50Hz)
Harmonic distortion	Meets EN61000-3-2
Isolation	Meets EN60950 and EN60601
Global Inhibit/Enable	TTL, Logic "1" and Logic "0"; configurable
Input fuse (internal)	iMP4: 16A; iMP8: 20A; iMP1: 20A (both lines fused)
Warranty	2 years

Output	
<b>Adjustment range*</b>	±10% minimum all outputs (manual) (full module adjustment range using <b>PC</b> )
Margining	±4-6% nominal analog (single output module only)
Overall regulation	0.4% or 20mV max. (36W modules 4% maximum)
Ripple	RMS: 0.1% or 10mV, whichever is greater Pk-Pk: 1.0% or 50mV, whichever is greater Bandwidth limited to 20MHz
Dynamic response	<2% or 100mV, with 25% load step
Recovery time	To within 1% in <300 µsec
<b>Overcurrent protection*</b>	Configurable through <b>PC</b> (calibration required). Single output module and main output of the dual output module 105-120% of rated output current. Aux output of dual output module 105-140% of rated output current Triple output module internally protected
Short circuit protection	Protected for continuous short circuit Recovery is automatic upon removal of short
<b>Overvoltage protection*</b>	Configurable through <b>PC</b>
Single output module	2-5.5V 122-134% ; 6-60V 110-120%
Dual output module	2-6V 122-134% ; 8-28V 110-120%
Triple output module	No overvoltage protection provided
Reverse voltage protection	100% of rated output current
<b>Thermal protection*</b> (OTP and OTW)	Configurable through <b>PC</b> All outputs disabled when internal temp exceeds safe operating range. >5ms warning (AC OK signal) before shutdown
Remote sense	Up to 0.5V total drop (not available on triple output module)
Single wire parallel	Configurable through firmware Current share to within 2% of total rated current
<b>DC OK*</b>	±5% of nominal. Configurable through <b>PC</b>
Minimum load	Not required
Housekeeping standby	5 VDC @ 1.0A max. present whenever AC input is applied
<b>Module inhibit*</b>	Configured and controlled through <b>PC</b>
Switching frequency	250kHz accepts external sync signal
Output/Output isolation	>1 Megohm, 500V
<b>VME signal*</b>	DC OK signal programmable through <b>PC</b> to function as POR signal

\* Can be controlled via **PC**

## Environmental Specifications

Operating temperature	-40° to 70°C ambient. Derate each output 2.5% per degree from 50° to 70°C. (-20°C start up)
Storage temperature	-40°C to 85°C
Electromagnetic susceptibility	Designed to meet EN61000-4; -2, -3, -4, -5, -6, -8, -11 Level 3
Humidity	Operating; non-condensing 10% to 95% RH
Vibration	IEC68-2-6 to the levels of IEC721-3-2
MTBF demonstrated	>550,000 hours at full load, 220VAC and 25°C ambient conditions

## Safety

UL	UL60950/UL2601 (through CSA)
CSA	CSA22.2 No. 234 Level 5
VDE	EN60950/EN60601
BABT	Compliance to EN60950/EN60601 BS7002
CB	Certificate and report
CE	Mark to LVD

## Output Module Line-up

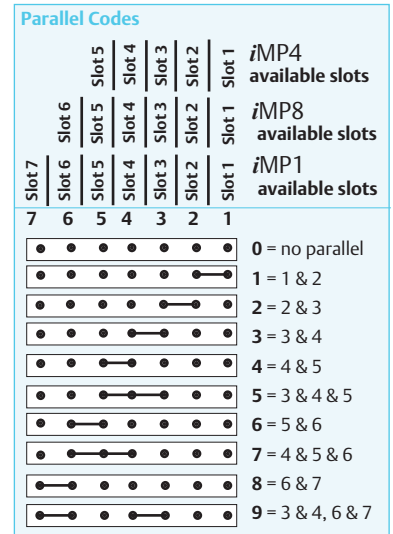
Module Code	1	2	3	4	None	
Module Type	Single	Single	Single	Dual	Triple+	
Max output power	210W	360W	750W	144W	36W	
Max output current	35A	60A	150A	10A	2A	
Output voltages available*	2-60V	2-60V	2-60V	5, 12-15, 28-30V	2-6, 12-15, 28-30V	8-15V 8-28V 2-28V
Standard voltage increments	25	25	25	19	18	
Remote sense	Yes	Yes	Yes	Yes	Yes	No No No
Remote margin	Yes	Yes	Yes	No	No	No No No
V-Program - <b>PC</b> control	Yes	Yes	Yes	Yes	Yes	Yes Yes Yes
Active current share	Yes	Yes	Yes	Yes	No	No No No
Module Inhibit - <b>PC</b> control	Yes	Yes	Yes	Yes	Yes	Yes Yes Yes
Module Inhibit - analog	Yes	Yes	Yes	No	No	No No No
Over voltage / over current protection	Yes	Yes	Yes	Yes	Yes	Yes Yes Yes
Minimum load required	No	No	No	No	No	No No No
Slots occupied in any iMP case	1	2	3	1	1	

\*Programmable +Triple output module is not programmable through **PC**.

# Output Module Voltage/Current

Voltage	Voltage Code	Single Output Module Code			Dual Output		Triple Output			PC Adjustment Ranges
		1	2	3	V1	V2	V1	V2	V3	
2V	A	35A	60A	150A	—	10A	—	—	2A	1.8-6.1
2.2V	B	35A	60A	150A	—	10A	—	—	2A	
3V	C	35A	60A	150A	—	10A	—	—	2A	
3.3V	D	35A	60A	150A	—	10A	—	—	2A	
5V	E	35A	60A	150A	10A	10A	—	—	2A	
5.2V	F	35A	60A	150A	—	10A	—	—	2A	
5.5V	G	34A	58A	137A	—	10A	—	—	2A	
6.0V	H	23A	42A	80A	—	10A	—	—	2A	
8.0V	I	20A	36A	80A	—	—	1A	1A	1A	5.4-13.2
10V	J	18A	32A	75A	—	—	1A	1A	1A	
11V	K	17A	31A	68A	—	—	1A	1A	1A	
12V	L	17A	30A	62.5A	10A	4A	1A	1A	1A	
14V	M	14A	21A	53.5A	9A	4A	1A	1A	1A	12.6-22.0
15V	N	14A	20A	50A	8A	4A	1A	1A	1A	
18V	O	11A	19A	41.6A	—	—	—	0.5A	0.5A	
20V	P	10.5A	18A	37.5A	—	—	—	0.5A	0.5A	
24V	Q	8.5A	15A	31.3A	4A	2A	—	0.5A	0.5A	21.6-39.6
28V	R	6.7A	12.8A	26.8A	3A	2A	—	0.5A	0.5A	
30V	S	6.5A	12A	25A	—	—	—	—	—	
33V	T	6.2A	11A	22.7A	—	—	—	—	—	
36V	U	5.8A	10A	20.8A	—	—	—	—	—	
42V	V	4.2A	7.5A	17.9A	—	—	—	—	—	
48V	W	4.0A	7.5A	15.6A	—	—	—	—	—	37.8-60.0
54V	X	3.7A	6.0A	13.9A	—	—	—	—	—	
60V	Y	3.5A	6.0A	12.5A	—	—	—	—	—	
Non-std*	Z	Special Voltage - Consult Factory for specifications								

\* Note: Increments of current not shown can be achieved by paralleling modules (add currents of each module selected).



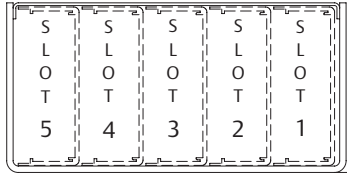
## Ordering Information

Sample below is 1500W case with 12V@62.5A; 5V@60A; 24V@8.5A; 12V@10A; 12V @ 4A; with no options.

Case Size	Module/Voltage/Option Codes	Case Option Codes	Software Code	Hardware Code
<b>iMP1*</b>	<b>3L0 - 2E2 - 1Q1 - 4LL0</b>	<b>00</b>	<b>A</b>	<b>###</b>
<p><b>Case Size (mm)</b>                      4 = 2.5" x 5" x 10"; 750W-1100W, 5 Slots (63.5 x 127 x 254)                      8 = 2.5" x 7" x 10"; 1000W-1200W, 6 Slots (63.5 x 177.8 x 254)                      1 = 2.5" x 8" x 11"; 1200W-1500W, 7 Slots (63.5 x 203.2 x 279.4)</p> <p>*Note: Add "E" after iMP4 to denote IEC input option, eg. iMP4E (Not available on iMP8 or iMP1)</p>	<p><b>Module Codes</b>                      Module/voltage/option codes                      Module codes:                      (None) = 36W triple O/P (1 slot)                      1 = 210W single O/P (1 slot)                      2 = 360W single O/P (2 slot)                      3 = 750W single O/P (3 slot)                      4 = 144W dual O/P (1 slot)                      5 - 9 = future</p> <p><b>Voltage Codes:</b>                      See Output Module Voltage/Current table above</p> <p><b>Option Codes:</b>                      0 = Standard                      1 = Module enable                      2 = Constant current                      3 - 9 = Future</p>	<p><b>Case Option Codes</b></p> <p><b>First digit</b>                      0 - 9 = parallel code (See Parallel Codes table above)</p> <p><b>Second digit</b>                      0 = No options                      1 = Reverse air                      3 = Global enable                      4 = Fan off w/inhibit                      5 = Opt 1 + Opt 3                      6 = Opt 1 + Opt 4                      7 = Opt 3 + Opt 4                      8 = Opt 1 +3 +4                      9 = Future                      *Meets SEMI F47</p>	<p>Factory assigned for modified standards                      Standard is "A" - Software code                      "Blank" - Hardware code</p>	

## iMP Case Specifications

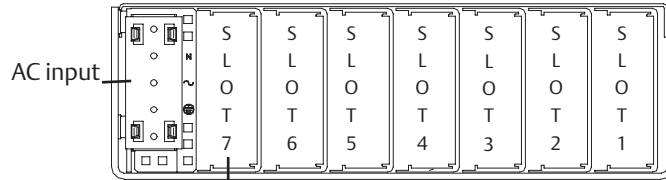
**iMP4** (AC input on opposite side)



**iMP4** = 2.5" x 5" x 10" 5 available slots  
(63.5 x 127 x 254)

Input	
<b>90-264VAC</b> 750W max.	<b>180-264VAC</b> 1100W max.

**iMP8 and iMP1**



**iMP8** = 2.5" x 7" x 10" 6 available slots  
(63.5 x 177.8 x 254mm)  
**iMP1** = 2.5" x 8" x 11" 7 available slots  
(63.5 x 203.2 x 279.4mm)

Input	
<b>85-264VAC</b> 1000W max.	<b>180-264VAC</b> 1200W max.
<b>1200W max.</b>	<b>1500W max.</b>

## Pin Connectors

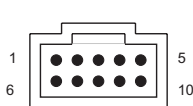
Figure 1. AC Input



### AC Input

Pin No.	Function
1	AC neutral
2	AC line (hot)
3	Chassis (earth) ground

Figure 2. Connector J1

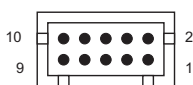


Mates with  
Molex 90142-0010  
Amp 87977-3

### PFC Input Connector (control and signals)

Pin No.	Function
1	Input AC OK - "emitter"
2	Input AC OK - "collector"
3	Global DC OK - "emitter"
4	Global DC OK - "collector"
5	External Sync
6	Global inhibit/optional enable logic "0"
7	Global inhibit/optional enable logic "1"
8	Global inhibit/optional enable return
9	+5VSB housekeeping
10	+5VSB housekeeping return

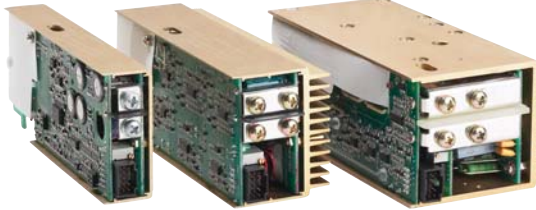
Figure 3. Connector J2



Mates with  
Landwin 205051000 Housing  
2053T011P Pin

### I<sup>2</sup>C Bus Output Connector

Pin No.	Function
1	No connection
2	No connection
3	No connection
4	Serial clock signal (SCL)
5	Serial data signal (SDA)
6	Address bit 0 (AO)
7	Address bit 1 (A1)
8	Address bit 2 (A2)
9	Secondary return (GND)
10	5Vcc external bus (5VCC. Bus)



Single



Dual



Triple

# High Power (VS)

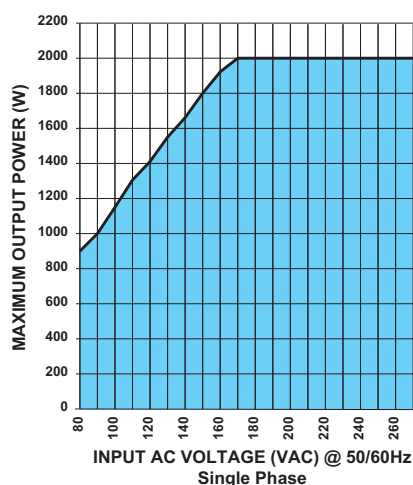
## Up to 2500 Watts/1-18 Outputs

### Special Features

- Power factor correction
- EN61000-3-2 harmonic distortion compliance
- CISPR 22, EN55022 Level B conducted/radiated EMI
- EN61000 immunity standards
- European CE Mark
- Current share on all outputs
- Remote sense on all outputs
- Overload protection on all outputs
- Voltage adjustment on all outputs
- Margining on all outputs
- AC OK signal (logics “1” or “0”)
- Global DC OK (logics “1” or “0”)
- DC OK signal and status indicator LED on all outputs
- Global and individual module inhibits/enable
- 2500W with 3-phase input
- 3 year warranty



### Input Operating Curve



### Electrical Specifications

#### Input

Fuse rating	600V/25A (internal)1Ø; 250V/20A (internal)3Ø
Input voltage	85-264VAC 1Ø; VS1, VS3 & VS4 (see operating curve) 180-264VAC 3Ø; VS6, VS8 & VS9
Frequency	47-440Hz
Inrush current	40A peak maximum
Efficiency	75%-82%
Power factor	0.99 typical: (0.9 on VS6, VS8 & VS9)
Turn-on time	AC/1 sec; inhibit/100ms max.
EMI filter	CISPR 22, EN55022 Level B conducted/radiated
Leakage current	2mA max. at 240VAC
Holdover storage	20ms minimum/40ms typical independent of VAC
AC OK warning time	>5ms (power fail)
Loss of phase	On VS6, VS8 & VS9, unit will continue to operate with loss of phase

#### Output

Adjustment range	±10% minimum
Margining	±4-6% nominal
Line/load reg	0.2% or 5 mV max.
Ripple	RMS: 0.1% or 10mV; P-P: 1.0% or 50mV Bandwidth limited to 20MHz
Dynamic response	2% or 100 mV with 25% load step (any output)
Recovery time	To within 1% in <300 µsec
Oversvoltage protection	2-5 V 122% to 134% of output voltage; 12-48V 110% to 120%; recycle AC
Overload protection	Main: 105% to 120% of rated current ; Auxiliaries: 105% to 140%
Short circuit protection	Protected for continuous short circuit, recovery automatic
Reverse voltage protection	100% of rated output current
Thermal protection	Each module thermally protected. Input module: auto recovery. Output modules: recycle AC
Remote sense	Up to 0.5V - total drop
Single wire parallel	Current share to 2% of total rated current
Switching frequency	200kHz (900-1500W module, 400kHz)
DC OK	-2% to -6% of nominal
Output/output isolation	>1Megohm

## Environmental Specifications

Operating temperature	-10°C to 50°C (derate each output linearly to 60% at 70°C) 40°C max. for reverse air (option #1)
Shock/vibration	MIL-HDBK 810E
Humidity	95% non-condensing
Storage temperature	-55°C to 85°C
Temperature coefficient	0.02% per °C
Cooling	Internal DC fan 24V

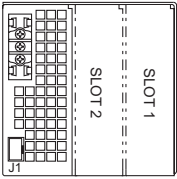
## Safety

UL	UL1950	E133211
CSA	CSA22.2-950	LR42001B
IEC	IEC950, Class 1	
VDE	EN60950	79579 & 79580
TUV	EN60950	R9272192 & R9272191
CB	Certificate and report	
CE	Mark	

## VS Case Specifications

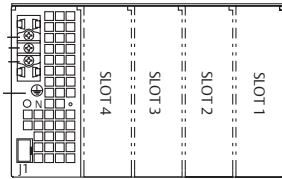
Available Slots

VS1 and VS6



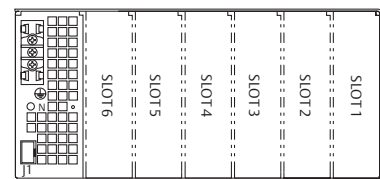
**VS1** = 5" x 5" x 11" 2 slot, 1500W max 1Ø  
**VS6** = 5" x 5" x 11" 2 slot, 1500W max 3Ø  
 (127 x 127 x 279.4mm)

VS3 and VS8



**VS3** = 5" x 8" x 11" 4 slot, 2000W max 1Ø  
**VS8** = 5" x 8" x 11" 4 slot, 2500W max 3Ø  
 (127 x 203.2 x 279.4mm)

VS4 and VS9



**VS4** = 5" x 11" x 11" 6 slot, 2000W max 1Ø  
**VS9** = 5" x 11" x 11" 6 slot, 2500W max 3Ø  
 (127 x 279.4 x 279.4mm)

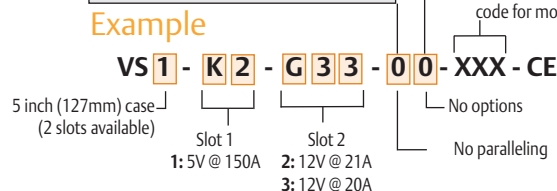
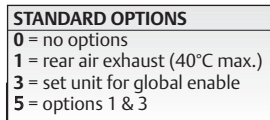
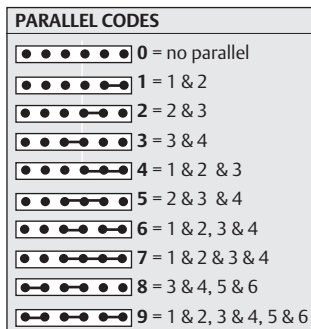
## VS Module Specifications

Output Voltage Identification		Module Identification							
Output Voltage Code	Output Voltage	A (1 slot) 300W Single	B (1 slot) 600W Single	C (2 slots) 900W Single	D (2 slots) 1200W Single	E, F (1 slot) 250W Multi Main Output	G, H (1 slot) 500W Multi Main Output	K (1 slot) 750W Single	L (2 slots) 1500W Single
0	2V	60A	120A	180A	240A	25A	50A	150A	300A
1	3.3V	60A	120A	180A	240A	25A	50A	150A	300A
2	5V	60A	120A	180A	240A	25A	50A	150A	300A
3	12V	25A	50A	75A	100A	10.5A	21A	62.5A	125A
4	15V	20A	40A	60A	80A	8.3A	16.6A	50A	100A
5	24V	12.5A	25A	37.5A	50A	5.3A	10.5A	31.2A	62.4A
6	28V	10.7A	21.4A	32.1A	42.8A	4.5A	9A	26.7A	53.4A
7	36V	8.3A	16.6A	24.9A	33.2A	N/A	N/A	20.8A	41.6A
9	48V	6.3A	12.5A	18.75A	25A	N/A	N/A	15.6A	31.2A
8	Special Voltage - Consult Factory for specifications								

Auxiliary Output Table:  
Output(s) 2 and/or 3 of Module

Voltage Identification		Module Identification			
Output Voltage Code	Output Voltage	E 250W Dual Aux. Output	F 250W Triple Aux. Output	G 500W Dual Aux. Output	H 500W Triple Aux. Output
0	2V	10A	5A	20A	10A
1	3.3V	10A	5A	20A	10A
2	5V	10A	5A	20A	10A
3	12V	10A	5A	20A	10A
4	15V	10A	5A	20A	10A
5	24V	5A	2.5A	10A	5A
6	28V	5A	2.5A	10A	5A
8	Special Voltage - Consult Factory for specifications				

## Ordering Information



### Designers' tip:

Visit the Astec Power Wizard at [www.astecpower.com](http://www.astecpower.com) to configure the model number for the power supply that meets your specific requirements.



# Intelligent VS Series *iVS*<sup>TM</sup>

## Up to 4860 Watts

**COMING  
SOON!**



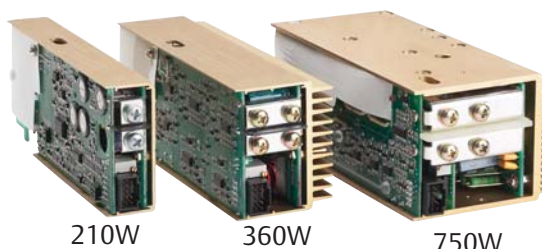
Total Power: Up to 4860 Watts  
 Input Voltage: 85-264VDC  
 120-300 VDC  
 # of Outputs: Up to 10

### Special Features

- Full medical EN60601 approval
- Intelligent I<sup>2</sup>C control
- Configurable current share on all outputs >10A
- Voltage adjustment on all outputs (manual or I<sup>2</sup>C)
- Configurable input and output OK signals and indicators
- Configurable inhibit/enable
- Configurable output UP/DOWN sequencing
- High power density (12W/cu-in)
- Intelligent fan (speed control/fault status)
- uP controlled PFC input with active Inrush protection
- I<sup>2</sup>C monitor of voltage, current, and temp
- Programmable voltage, current limit, inhibit/enable through I<sup>2</sup>C
- Optional extended hold-up module (SEMI F47 compliance)
- Increased power density to 150%
- Optional conformal coating
- Industrial temp range (-40°C to 70°C)
- Uses standard iMP modules
- Field upgradeable firmware
- RoHS compliant

### Electrical Specifications

Input	
Input range	
iVS1 & iVS3	90-264VAC: 120 - 350VDC (Limited to 300VDC medical)
iVS6 & iVS8	170-264VAC 3Ø
iVS8H	480VAC nominal 3Ø
Frequency	47-440Hz
Inrush current	40A peak maximum (soft start)
Efficiency	Up to 85% @ full case load
Power Factor	0.99 typ. meets EN61000-3-2
Turn-on time	AC on 1.5 sec typical, inhibit/enable 150ms typical Programmable
EMI Filter	CISPR 22/EN55022 Level "B"
Leakage current	300 µA max. @ 240 VAC; 47-63Hz
Radiated EMI	CISPR 22/EN55022 Level "B"
Holdover storage	10ms minimum (independent of input VAC) additional 20mSEC holdover storage with optional HUP module (SEMI F47 compatible)
AC OK	>5ms early warning minutes before outputs lose regulation Full cycle ride thru (50 Hz). Programmable
Harmonic distortion	Meets EN61000-3-2
Isolation	Meets EN60950 and EN60601
Global inhibit / enable	TTL, Logic "1" and Logic "0"/configurable
Input fuse (internal)	iVS1: TBD; iVS3: TBD; iVS6: TBD; iVS8:TBD; iVS8H:TBD
Warranty	3 years



210W

360W

750W



1500W

Single



144W

Dual



36W

Triple

**Output**

<b>Adjustment range*</b>	±10% minimum all outputs (manual) (full module adjustment range using <b>PC</b> )
Margining	±4-6% nominal analog (single output module only)
Overall regulation	0.4% or 20 mV max. (36W modules 4% max.)
Ripple	RMS: 0.1% or 10 mV, whichever is greater Pk-Pk: 1.0% or 50 mV, whichever is greater Bandwidth limited to 20 MHz
Dynamic response	<2% or 100 mV, with 25% load step
Recovery time	To within 1% in <300 µsecond
<b>Overcurrent protection*</b>	Configurable through <b>PC</b> . single output module and main output of the dual output module 105-120% of rated output current. Aux output of dual output module 105-140% of rated output current Triple output module internally protected
Short circuit protection	Protected for continuous short circuit Recovery is automatic upon removal of short
<b>Overvoltage protection*</b>	Configurable through <b>PC</b>
Single output module	2-5.5V 122-134% ; 6-60V 110-120%
Dual output module	2-6V 122-134% ; 8-28V 110-120%
Triple output module	No overvoltage protection provided
Reverse voltage protection	100% of rated output current
<b>Thermal protection*</b>	Configurable through <b>PC</b> All outputs disabled when internal temp exceeds safe operating range. >5ms warning (AC OK signal) before shutdown
Remote sense	Up to 0.5V total drop (not available on triple output module)
Singlewire parallel	Configurable through firmware Current share to within 2% of total rated current
<b>DC OK*</b>	+/-5% of nominal. Configurable through <b>PC</b>
Minimum load	Not required
Housekeeping bias voltage	5VDC @1.0Amp max. present whenever AC input is applied
<b>Module inhibit*</b>	Configured and controlled through <b>PC</b>
Switching frequency	250kHz accepts external sync signal
Output/Output isolation	>1 Megohm, 500V
<b>VME signal*</b>	DC OK signal programmable through <b>PC</b> to function as POR signal

\* Can be controlled via **PC**

## Environmental Specifications

Operating temperature	-40° to 70°C ambient. Derate each output 2.5% per degree from 50° to 70°C. (-20°C start up)
Storage temperature	-40°C to 85°C
Electromagnetic susceptibility	Designed to meet EN61000-4; -2, -3, -4, -5, -6, -8, -11 Level 3
Humidity	Operating; non-condensing 10% to 95% RH
Vibration	IEC68-2-6 to the levels of IEC721-3-2
MTBF demonstrated	>550,000 hours at full load, 220VAC and 25°C ambient conditions

## Safety

UL	UL60950/UL2601
CSA	CSA22.2 No. 234 Level 5
VDE	EN60950/EN60601
BABT	Compliance to EN 60950/EN60601 BS 7002
CB	Certificate and report
CE	Mark to LVD

## Output Module Line-up

Module Code	1	2	3	5	4	None			
Module Type	Single	Single	Single	Single	Dual	Triple			
Max output power	210W	360W	750W	1500W	144W	36W			
Max output current	35A	60A	150A	300A	10A	2A			
Output voltages available*	2-60V	2-60V	2-60V	2-60V	5, 12-15, 28-30V	2-6, 12-15, 28-30V	8-15V	8-28V	2-28V
Standard voltage increments	25	25	25	25	19		18		
Remote sense	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Remote margin*	Yes	Yes	Yes	Yes	No	No	No	No	No
V-Program - I <sup>2</sup> C Control*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Active Current Share	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Module Inhibit - I <sup>2</sup> C Control*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Module Inhibit - Analog	Yes	Yes	Yes	Yes	No	No	No	No	No
Over voltage/Overcurrent protection*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Minimum load required	No	No	No	No	No	No	No	No	No
Slots occupied in any IMP case	1	2	3	4	1		1		

\* Programmable

## Output Module Voltage/Current\*

Voltage	Voltage Code	Single Output Module Code				Dual Output		Triple Output			PC Adjustment Ranges
		1	2	3	5	V1	V2	V1	V2	V3	
2V	A	35A	60A	150A	300A	—	10A	—	—	2A	1.8 - 2.2
2.2V	B	35A	60A	150A	300A	—	10A	—	—	2A	2.0 - 2.4
3V	C	35A	60A	150A	300A	—	10A	—	—	2A	2.7 - 3.3
3.3V	D	35A	60A	150A	300A	—	10A	—	—	2A	3.0 - 3.6
5V	E	35A	60A	150A	300A	10A	10A	—	—	2A	4.5 - 5.5
5.2V	F	35A	60A	150A	300A	—	10A	—	—	2A	4.7 - 5.7
5.5V	G	34A	58A	137A	274A	—	10A	—	—	2A	5.0 - 6.1
6.0V	H	23A	42A	80A	160A	—	10A	—	—	2A	5.4 - 6.6
8.0V	I	20A	36A	80A	160A	—	—	1A	1A	1A	7.2 - 8.8
10V	J	18A	32A	75A	150A	—	—	1A	1A	1A	9.0 - 11.0
11V	K	17A	31A	68A	136A	—	—	1A	1A	1A	9.9 - 12.1
12V	L	17A	30A	62.5A	125A	10A	4A	1A	1A	1A	10.8 - 13.2
14V	M	14A	21A	53.5A	107A	9A	4A	1A	1A	1A	12.6 - 15.4
15V	N	14A	20A	50A	100A	8A	4A	1A	1A	1A	13.5 - 16.5
18V	O	11A	19A	41.6A	83.2A	—	—	—	0.5A	0.5A	16.2 - 19.8
20V	P	10.5A	18A	37.5A	75A	—	—	—	0.5A	0.5A	18.0 - 22.0
24V	Q	8.5A	15A	31.3A	62.6A	4A	2A	—	0.5A	0.5A	21.6 - 26.4
28V	R	6.7A	12.8A	26.8A	53.6A	3A	2A	—	0.5A	0.5A	25.2 - 30.8
30V	S	6.5A	12A	25A	50A	—	—	—	—	—	27.0 - 33.0
33V	T	6.2A	11A	22.7A	45.4	—	—	—	—	—	29.7 - 36.3
36V	U	5.8A	10A	20.8A	41.6	—	—	—	—	—	32.4 - 39.6
42V	V	4.2A	7.5A	17.9A	35.8	—	—	—	—	—	37.8 - 46.2
48V	W	4.0A	7.5A	15.6A	31.2	—	—	—	—	—	43.2 - 52.8
54V	X	3.7A	6.0A	13.9A	27.8	—	—	—	—	—	48.6 - 59.4
60V	Y	3.5A	6.0A	12.5A	25	—	—	—	—	—	54.0 - 66.0
<b>Contact Factory</b>											
Special	Z	35A	60A	150A	300A	—	10A	—	—	2A	2.3 - 2.6
Special	Z	35A	60A	150A	300A	—	10A	—	—	2A	3.7 - 4.4
Special	Z	20A	36A	80A	160A	—	8A	—	—	1A	6.7 - 7.1

\* Note: Increments of current not shown can be achieved by paralleling modules (add currents of each module selected)

## Ordering Information

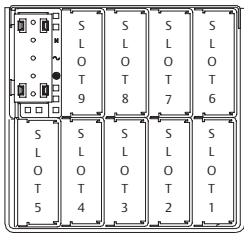
Sample below is 3210W case with 12V @ 125A; 24V @ 8.5A; 5V @ 60A; 12V @ 10A and 12V @ 4A; with no options.

Case Size	Module/Voltage/Option Codes First - Module Code Second - Voltage Code Third - Option Code	Case Option Codes	Software Code	Hardware Code
<b>iVS1</b>	<b>5L1 - 1Q1 - 2EO - 4LLO</b>	<b>00</b>	<b>A</b>	<b>###</b>
<b>Case Size (mm)</b> <b>1-Phase Input</b> 1 = 5" x 5" x 11"; 1500W - 3210W, 9 Slots (127 x 127 x 279.4) 3 = 5" x 8" x 11"; 1800W - 4170W, 15 Slots (127 x 203.2 x 279.4) <b>3-Phase Input</b> 6 = 5" x 5" x 11"; 3120W, 9 Slots (127 x 127 x 279.4) 8 = 5" x 8" x 11"; 4170W, 15 Slots (127 x 203.2 x 279.4) 8H= 5" x 8" x 11"; 4860W, 14 Slots (127 x 203.2 x 279.4)	<b>Module Codes</b> Module/voltage/option codes Module Codes: (None) = 36W triple O/P (1 slot) 1 = 210W single O/P (1 slot) 2 = 360W single O/P (2 slot) 3 = 750W single O/P (3 slot) 5 = 1500W single O/P (slot 4) 4 = 144W dual O/P (1 slot) HUP = Extra 30mS hold-up (1 slot)	<b>Case Option Codes</b> First Digit 0 - 9 = Parallel code (See parallel codes table above) Second Digit 0 = No options 1 = Reverse air 2 = Not used 3 = Global dnable 4 = Fan Off w/inhibit 5 = Opt 1 + Opt 3 6 = Opt 1 + Opt 4 7 = Opt 3 + Opt 4 8 = Opt 1 +3 +4 9 = Future	Factory assigned for modified standards	
	<b>Voltage Codes:</b> See <i>Output Module Voltage/Current</i> table above <b>Option Codes:</b> 0 = Standard 1 = Module enable 2 = Constant eurrent 3 - 9 = Future			

Parallel Code	iVS1, 6	iVS3, 8, 8H	Possible Configurations
1		1 & 2	210 210; 210 144; 144 144
2		2 & 3	360 360; 360 210; 360 144; +above
3		3 & 4	750 750; 750 360; 750 210; 750 144; + above
4		4 & 5	1500 1500; 1500 750; 1500 360; 1500 210; 1500 144; + above
5		3, 4 & 5	750 210 210; 750 210 144; 750 144 144
6		4 & 6	1500 1500
7		4, 5 & 6	1500 210 210; 1500 210 144; 1500 144 144
8		4, 5 & 9	1500 1500 1500; 1500 1500 750; 1500 1500 360; 1500 1500 210; 1500 1500 144
9		4, 5, 9, 12 & 13	1500 1500 1500 750; 1500 1500 1500 360 1500 1500 1500 210; 1500 1500 1500 144

## iVS Case Specifications

### iVS1 and iVS6



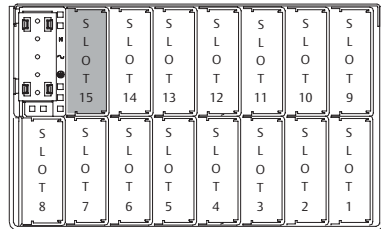
**iVS1** = 5" x 5" x 11"  
(127 x 127 x 254)  
9 available slots

**iVS6** = 5" x 5" x 11"  
(127 x 127 x 254)  
9 available slots  
3-phase only

**Input**  
100-264VAC 1500W max.    180-264VAC 3210W max.

3240W max.

### iVS3 and iVS8



**iVS3 & 8** = 5" x 8" x 11"  
(127 x 177 x 254)  
15 available slots

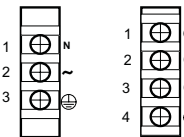
**iVS8H** = 5" x 8" x 11"  
(127 x 177 x 254)  
14 available slots, Slot 15 not available on 8H

**Input**  
100-264VAC 1800W max.    180-264VAC 4120W max.

480VAC  
4860W max.

## Pin Connectors

Figure 1. AC Input



### AC Input Single Phase 3 Phase

Pin No.	Function
1	AC neutral $\phi 1$
2	AC line (hot) $\phi 2$
3	Chassis (earth) ground $\phi 3$
4	Chassis (earth) ground $\oplus$

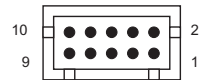
Figure 2. Connector J1



### PFC Input Connector (control and signals)

Pin No.	Function
1	Input AC OK - "emitter"
2	Input AC OK - "collector"
3	Global DC OK - "emitter"
4	Global DC OK - "collector"
5	External sync
6	Global inhibit/optional enable logic "0"
7	Global inhibit/optional enable logic "1"
8	Global inhibit/optional enable return
9	+5VSB housekeeping
10	+5VSB housekeeping return

Figure 3. Connector J2



Mates with  
Landwin 205051000 housing  
2053T011P pin

### I<sup>2</sup>C Bus Output Connector

Pin No.	Function
1	No connection
2	No connection
3	No connection
4	Serial clock signal (SCL)
5	Serial data signal (SDA)
6	Address bit 0 (A0)
7	Address bit 1 (A1)
8	Address bit 2 (A2)
9	Secondary return (GND)
10	SVCC external bus (5VCC bus)

Mates with Molex 90142-0010  
Amp 87977-3

# Bulk Power (HPS)

## 350-3000 Watts

### Special Features

- EN61000-3-2 harmonic compliance
- Built-in EMI filter
- Low output ripple
- +5V standby output
- Built-in cooling fans
- Over current protection
- Over voltage protection
- Over temperature protection
- Hot swap/N + 1 redundant
- Built-in OR'ing diodes
- Active power factor correction

### New Features Coming Soon

- I<sup>2</sup>C option on HPS35
- HPR1 split Rack (dual output voltage)
- 500W HPS50



HPS35

## Electrical Specifications

### Input HPS35

Input voltage	90-264VAC typical
Frequency	47-440Hz
Inrush current	40A peak max. @ 25°C
Efficiency	80% typical @ full load, 230VAC
Power factor	0.99 typical @ 115VAC, full load
Turn-on time	AC on 2 sec; inhibit/enable 160ms typical
EMI filter standard	CISPR 22; EN55022 Level "B"
Leakage current standard	<0.5mA max @ 230VAC @ 60Hz per module
Radiated EMI	CISPR 22; EN55022 Level "B"
Holdover time	20ms minimum (independent of input VAC)
AC OK	5ms early warning minutes before outputs lose regulation
Harmonic distortion	Meets EN61000-3-2
Isolation	Meets EN60950

### Output HPS35

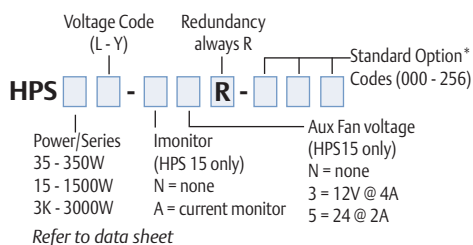
Adjustability	±5% of nominal output voltage
Overall req	±2%
Ripple	1% of V <sub>out</sub> Pk-Pk (20MHz bandwidth)
Dynamic response	4% with 25% load step
Recovery time	To within 1% in <300 μsec
Over current protection	115%-130% of rated output current
Short circuit protection	Protected for continuous short circuit Auto recovery
Over voltage protection	120-140%. AC Reset
Reverse voltage protection	100% of rated output current
Thermal protection	Main and Aux disabled when internal temperature exceeds safe operating range
Remote sense	Up to 0.5V total drop
Single wire parallel	Current share to within 10% of total rated current on main output
DC OK	±5% of nominal
Minimum load*	Not required (when used as stand-alone module)
Standby voltage	5VDC @2A maximum present whenever AC input is applied
Global inhibit	Logic "0"

\*3A minimum for current share operation

## Voltage Availability

Model	HPS35	HPS15	HPS3KW
Wattage	350W	1500W <sup>3</sup>	3000W
Input Voltage	90-264VAC	90-264VAC	180-264VAC
<b>Available Standard Output Voltages (order code)<sup>1</sup></b>			
12 (L)	•		
24 (Q)	•	•	
28 (R)		•	
30 (S)		•	
48 (W)	•	•	•
54 (X)	•	•	
60 (Y)		•	
Available Options	See Note 1	See Note 1	See Note 2
Corresponding Rack	HPR1-00	HPR3-00	HPR3KW-00

Notes: 1 = Consult factory for other output voltages and options  
2 = Comes with I<sup>2</sup>C interface  
3 = 1200W@90-264VAC; 1500W@180-264VAC



## Environmental Specifications

### HPS15 and HPS35

Operating temperature: -10°C to 50°C ambient (derate output @ 2.5% per degree from 50°C to 70°C)

### HPS3KW

Operating temperature: 5°C to 40°C (50% power derating at 70°C)  
 Cooling: Internal DC fans

## Safety

<b>UL</b>	UL60950 (UL recognized)
<b>NEMKO</b>	EN60950
<b>TUV</b>	EN60950
<b>CE</b>	Mark
<b>CB</b>	Report



HPS15 Modules in HPR3 Rack



HPS3KW

## Electrical Specifications

Input HPS15	
Input voltage	1200W @90-264VAC 1500W @180-264VAC
Frequency	47-440Hz
Inrush current	40A peak max.@ 25°C
Efficiency	85% typ. @ full load, 230VAC
Power factor	0.99 typ. meets EN61000-3-2
Turn-on time	AC on 1.5 sec typical Inhibit/enable 100ms typical
EMI filter standard	CISPR 22; EN55022 Level "B"
Leakage current standard	2mA max @ 264VAC @ 60Hz per module
Radiated EMI	CISPR 22; EN55022 Level "B"
Holdup time	20 ms minimum (independent of input VAC)
AC OK	>5ms early warning min. before outputs lose regulation Full cycle ride thru (50Hz)
Harmonic distortion	Meets EN61000-3-2
Isolation	Meets EN60950
Output	
Margining	±5% of nominal
Overall req	±1%
Ripple	1% of Vout Pk-Pk limited to 20MHz
Dynamic response	2% with 25% load step
Recovery time	To within 1% in <300µsec
Over current protection	105%-120% of rated output current
Short circuit protection	Protected for continuous short circuit Recovery is automatic upon removal of short
Over voltage protection	105-120%. Recycle AC input voltage to reset OVP circuit
Reverse voltage protection	100% of rated output current
Thermal protection	Main and Aux disabled when internal temp exceeds safe operating range.
Remote sense	Up to 0.5V total drop
Single wire parallel	Current share to within 10% of total rated current
DC OK	±5% of nominal
Minimum load*	Not required
Standby voltage	5VDC @5A max. present whenever AC input is applied (3.3V @ 5A optional)
Global inhibit	Logic "0" standard logic "1" optional

\*3A minimum for current share operation

## Electrical Specifications

Input HPS3KW	
Input voltage	180-264VAC
Frequency	47-63Hz
Inrush current	100A peak
Efficiency	85% typical at full load
Power factor	0.98 typical
EMI filter standard	CISPR 22 Class A
Leakage current	1.16 mA max @ 264VAC
Output	
DC voltage	48V @ 57A; 5Vsb @ 5A
Maximum power	3000W
Adjustment range	±5%
Supervisory output	5V @ 5A
Hold up time	20ms
Over current	48V: 110% - 150%; 5Vsb: 101% - 125%
Over voltage	125% above nominal output
Logic	
Enable	Requires contact closure from 'PSON' to 5V sb return
AC OK	TTL signal LOW
Power fail	TTL signal LOW; goes HIGH in the event of failure
Power good	TTL logic signal goes high 100 - 1000 msec after 48V DC output. It goes LOW at least 1ms before loss of regulation

## Ordering Information

Module	HPS35	HPS15	HPS3KW
Rack #	HPR1-00*	HPR3-00*	HPR3K-00*
# of Slots	4	4	6
Total Power	1400W	6000W	18,000W

\*See web site for option codes on HPR racks.

# Distributed Power Systems (DS)

## 450-1500 Watts

### Special Features

- Active power factor correction
- EN61000-3-2 harmonic compliance
- Active AC inrush control
- High density
- Outputs +12VDC with some +48VDC models available
- 3.3VDC standby
- Options for 5V standby voltage (DS650/850 only)
- No minimum load required
- Hot plug operation
- N+1 redundant
- Internal OR'ing FETs
- Active current sharing
- Built-in cooling fans
- I<sup>2</sup>C Interface with EEPROM for FRU data
- Internal fan speed control with fan fail signal

### New Products and Features Coming Soon

- DSR1 rack for DS650/850. Standard 19" 1U fits up to 5 modules (4250 Watts)
- DSR2 rack for DS1300/1500. Standard 19" 2U fits up to 3 modules (4500 Watts)
- Options for low leakage
- Options for reverse airflow
- 1200W 1U x 2U model
- 1800W 1U x 3U model
- DC input



### Safety

UL	UL60950 (UL recognized)
NEMKO	EN60950
TUV	EN60950
CE	Mark
CB	Report



### Voltage Availability

Model	12V	24V	48V
	(-3)	(-5)	(-9)
DS450	•		
DS550	•		
DS650	•		•
DS850	•	*	•
DS1300	•		
DS1500	•		

Notes: • = Available  
\* = Coming in 2007



## Electrical Specifications

Data	DS450-3	DS550-3	DS650-3	DS650-9	DS657-9-3	DS850-3	DS850-9	DS1300-3	DS1500-3
<b>Input</b>									
Input Range	90-264 VAC	90-264 VAC	90-264 VAC	90-264 VAC	90-264 VAC	90-264 VAC	90-264 VAC	90-264 VAC	90-264 VAC
Frequency	47-63 Hz	47-63 Hz	47-63 Hz	47-63 Hz	47-63 Hz	47-63 Hz	47-63 Hz	47-63 Hz	47-63 Hz
Efficiency	80% Typ	80% Typ	80% Typ	80% Typ	80% Typ	80% Typ	80% Typ	80% Typ	80% Typ
EMI/RFI	Class A	Class A	Class B	Class B	Class A	Class B	Class B	Class A	Class A
Leakage Current	1.4mA @ 240V	1.4mA @ 240V	1.4mA @ 240V	1.4mA @ 240V	2uA Max @ 240V	1.4mA @ 240V	1.4mA @ 240V	1.4mA @ 240V	1.4mA @ 240V
<b>Outputs</b>									
Output Main									
<i>High Line</i>	12V / 37A	12V / 45A	12V / 52.5A	48V / 13.1A	48V/10A:12V/12A	12V/70.0A	48V/17.5A	12V/106A	12V/123A
<i>Low Line</i>	12V / 37A	12V / 45A	12V / 52.5A	48V / 13.1A	48V/10A:12V/12A	12V/70.0A	48V/17.5A	12V/74A	12V/74A
Output Stand-By	3.3vsb/3A	3.3vsb/3A	3.3vsb/6A	3.3vsb/6A	12vsb/0.5A	3.3vsb/6A	3.3vsb/6A	3.3vsb/7A	3.3vsb/7A
OCP/OVP/OTP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
I <sup>2</sup> C Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
<b>Environmental</b>									
Operating Temp	-10°C to 50°C	-10°C to 50°C	-10°C to 50°C	-10°C to 50°C	0°C to 50°C	-10°C to 50°C	-10°C to 50°C	-10°C to 50°C	-10°C to 50°C
Derating	50% at 70°C	50% at 70°C	50% at 70°C	50% at 70°C	50% at 70°C	50% at 70°C	50% at 70°C	50% at 70°C	50% at 70°C
Storage	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
RoHS Compliant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demonstrated MTBF	400K Hours	400K Hours	500K Hours	500K Hours	500K Hours	500K Hours	500K Hours	500K Hours	500K Hours
<b>Other</b>									
Size (inch)	1.57 x 3.07 x 11.05		1.57 x 3.20 x 11.00		1.57 x 13.5 x 5.0	1.57 x 3.20 x 11.00		2.8 x 4.9 x 7.5	
Size (mm)	40 x 78 x 280		40 x 81.3 x 279.4		40 x 343 x 127	40 x 81.3 x 279.4		71.1 x 124.5 x 190.5	
Power Density	8.42	10.30	11.76	11.76	6.2	15.38	15.38	12.63	12.63
Cubic Inches	53.42	53.42	55.44	55.44	105.98	55.44	55.44	102.9	102.9
Pro-E Files	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Thermal Data	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PQ Airflow Curves	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mating Connector FCI					51741-10002406CC			51939-055	
Unit Connector FCI					51721-10002406AA			51915-023	
Fan	1 x 40mm			2 x 40mm			2 x 60mm		
Warranty	1 year	1 year	1 year	1 year	1 year	1 year	1 year	1 year	1 year
<b>Ordering Codes</b>									
<i>Standard</i>	DS450-3	DS550-3	DS650-3	DS650-9	DS657-9-3	DS850-3	DS850-9	DS1300-3	DS1500-3
<i>5V Standby</i>			DS650-3-002	DS850-9-002	DS850-3-002				
<i>Reverse Air</i>	DS450-3-002								
<i>Fan Off with Inhibit</i>						DS850-3-004			



# DIN Rail (ADN)

## 60-960 Watts

### Special Features

- Power factor correction
- Auto select 115/230 VAC, 50/60Hz input
- 380-480VAC 3-phase
- All single phase models meet SEMI F47 Sag Immunity
- Class 1, Div 2 Hazardous Locations
- DC OK signal
- Adjustable voltage
- Industrial grade design (no derating to 60°C)
- User-friendly front panel
- Single and three-phase inputs available
- Highly efficient >90% switching technology
- High MTBF and reliability
- Available plastic case (PP) or metal (PM)
- 3 year warranty



## Electrical Specifications

### Input Single Phase

Nominal voltage	115/230VAC auto select
Power factor (PFC)	EN6100-3-2
AC Input range	85-123/176-264VAC
DC Input range	210-375VDC
Frequency	47-63Hz, 500Hz

### Input 3 - Phase

Nominal voltage	380-480VAC
Power factor (PFC)	EN6100-3-2
AC Input range	340-576VAC
DC Input range	450-820VDC
Frequency	47-63Hz, 500Hz
Phase	1Ø or 3Ø on 5, 10 & 20A models 30A and 40A models are 3Ø only

### Output

Nominal voltage	24V (22.5-28.5VDC adj.)
Hold up time	> 20ms at full load (25° C)
Tolerance	< ±2% overall (combination line/load/time/temp)
Line regulation	< 0.5%
Load regulation	< 0.5%
Time & temp. drift	< 1%
Initial voltage setting	24.5V ± 1%
Ripple	< 50mVpp
Power back immunity	> 35V
Parallel operation	
ADN20-24-1PM	Switch selectable
ADN40-24-3PM	Active single wire parallel
All others	Jumper selectable via front panel
Over voltage protection	> 30.5 < 33VDC

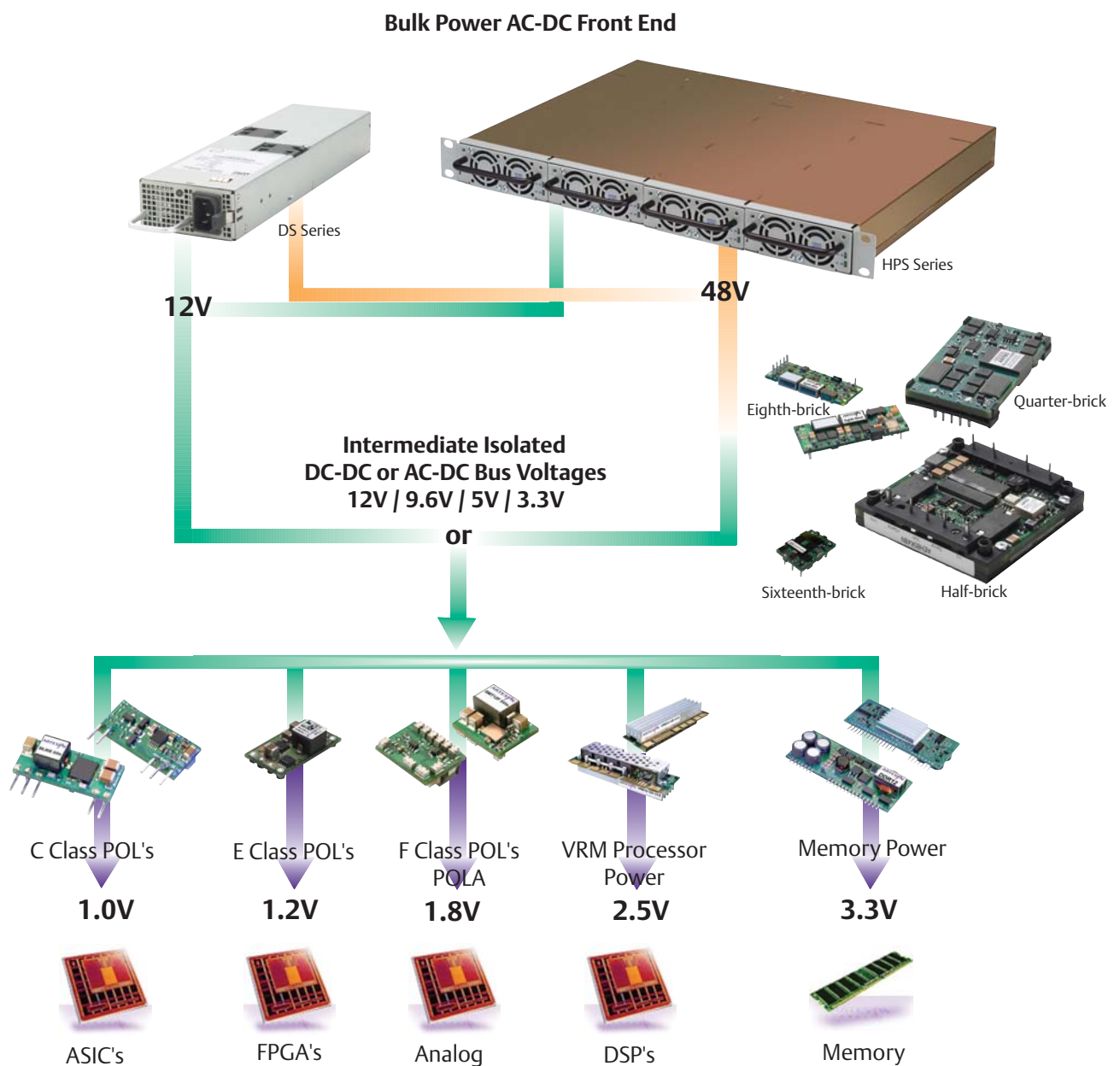
Power	Voltage	Current	Size L x W x H (mm)	Weight	Model Number
<b>60W</b>	85-264VAC	2.5A	4.88" x 1.97" x 4.55" (124 x 50 x 116)	1.6 lbs. (725g)	ADN2.5-24-1PM
<b>100W</b>	85-132/176-264VAC	3.8A	2.95" x 2.85" x 3.80" (75 x 72.4 x 96.5)	2.4 lbs. (1055g)	ADN3.8-24-1PP
	85-132/176-264VAC	4.0A	4.88" x 2.56" x 4.55" (124 x 65 x 116)	2.4 lbs. (1055g)	ADN4-24-1PM
	85-132/176-264VAC	4.2A	2.95" x 2.85" x 3.80" (75 x 72.4 x 96.5)	2.4 lbs. (1055g)	ADN4.2-24-1PP
<b>120W</b>	85-132/176-264VAC	5A	4.88" x 2.56" x 4.55" (124 x 65 x 116)	2.4 lbs. (1055g)	ADN5-24-1PM
	85-132/176-264VAC	5A	4.88" x 2.91" x 4.55" (124 x 73 x 116)	2.4 lbs. (1055g)	ADN5-24-3PM
<b>240W</b>	85-132/176-264VAC	10A	4.88" x 3.26" x 4.55" (124 x 82.8 x 116)	3.3 lbs. (1480g)	ADN10-24-1PM
	380-480VAC	10A	4.88" x 6.88" x 4.66" (124 x 174.8 x 118.4)	2.16 lbs. (980g)	ADN10-24-3PM
<b>480W</b>	85-132/176-264VAC	20A	4.88" x 3.50" x 4.55" (124 x 89 x 116)	3.4 lbs. (1520g)	ADN20-24-1PM
	380-480VAC	20A	4.88" x 6.88" x 4.55" (124 x 174.8 x 116)	3.97 lbs. (1800g)	ADN20-24-3PM
<b>720W</b>	380-480VAC	30A	4.88" x 9.72" x 4.55" (124 x 247 x 116)	4.0 lbs. (2000g)	ADN30-24-3PM
<b>960W</b>	380-480VAC	40A	4.88" x 11.10" x 4.55" (124 x 282 x 116)	6.6 lbs. (3300g)	ADN40-24-3PM

# DC-DC Converters

## Distributed Power Architecture

Astec Power and Artesyn understand the needs and nuances of developing power systems using Distributed Power Architecture. We know it is your job to create the most efficient, cost-effective, quality system, and deliver it in a timely fashion. From full-system power to board-

level components, high-power isolated front ends to a full line of isolated and non-isolated DC-DC modules, **Astec and Artesyn are *the* source for today's power systems.**



# Sixteenth-Brick



## Special Features

- Industry leading: sixteenth-brick standard package and feature sets
- Small form factor delivering up to 25A/60 W
- Mechanical options for optimum mounting flexibility: Through-hole (default) or surface mount (suffix "-S") termination; 5mm (default) or 3.7 mm through-hole pin length option
- Meets basic insulation
- Power densities as high as 146.5W per cubic inch
- RoHS compliant

Astec products are in unshaded boxes; Artesyn in gray boxes.

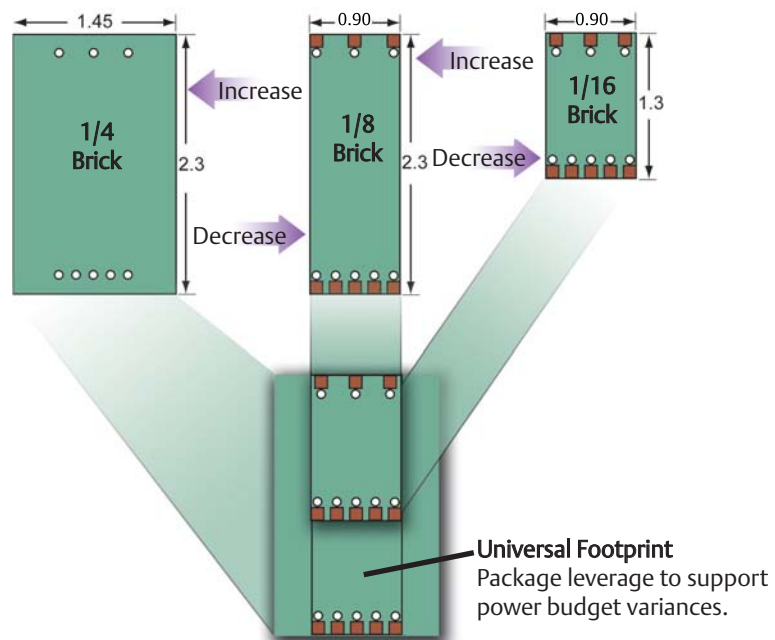
Vout	Iout	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
1.2V	<b>Open-frame</b>				
	25A	48V (36-75V)	1.3" x 0.9" x 0.35" (33 x 22.86 x 8.89)	84%	ALD25K48N-L
1.5V	<b>Open-frame</b>				
	25A	48V (36-75V)	1.3" x 0.9" x 0.35" (33 x 22.86 x 8.89)	85%	ALD25M48N-L
1.8V	<b>Open-frame</b>				
	25A	48V (36-75V)	1.3" x 0.9" x 0.35" (33 x 22.86 x 8.89)	88%	ALD25Y48N-L
2.5V	<b>Open-frame</b>				
	20A	48V (36-75V)	1.3" x 0.9" x 0.35" (33 x 22.86 x 8.89)	89%	ALD20G48N-L
3.3V	<b>Open-frame</b>				
	18A	48V (36-75V)	1.3" x 0.9" x 0.35" (33 x 22.86 x 8.89)	90%	ALD18F48N-L
5V	<b>Open-frame</b>				
	12A	48V (36-75V)	1.3" x 0.9" x 0.35" (33 x 22.86 x 8.89)	91%	ALD12A48N-L

## Footprint/Package Leverage

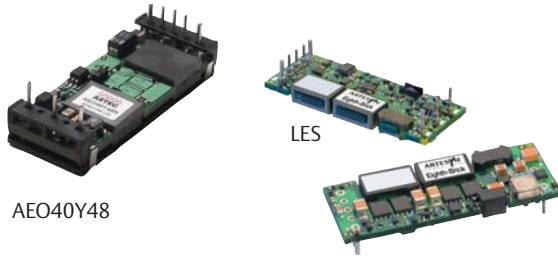
### Common Features

- Open-frame or baseplate
- Thru-hole or SMT
- 3.7mm or 5mm pin length
- Negative or Positive enable

Designing multiple footprints maximizes product availability (supply) and creates greatest cost/price leverage



# Eighth-Brick



## Special Features

- Industry leading: eighth-brick standard package and feature-sets
- Low power (66W) and high power (120W) platform offering
- Mechanical options for optimum mounting flexibility: Open-frame (ALO or LES) or baseplate (AEO) construction; Through-hole (default) or surface mount (suffix "-S") termination; 5 mm (default) or 3.7mm through-hole pin length option
- Meets basic insulation
- Power densities as high as 181W per cubic inch
- Wide-operating temperature range
- RoHS compliant

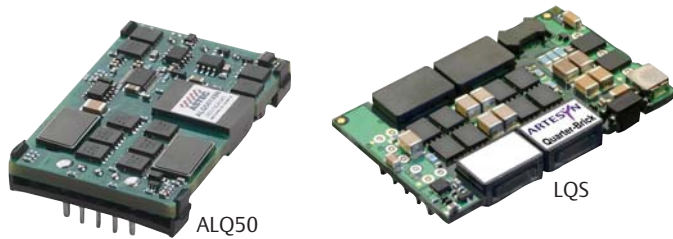
Astec products are in unshaded boxes; Artesyn in gray boxes.

Vout	Iout	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
<b>1.2V</b>	<b>Open-frame</b>				
	25A	48V (36-75V)	2.3" x 0.9" x 0.32" (58.42 x 22.86 x 8.13)	87%	ALO25K48N-L
	50A	48V (36-75V)	2.3" x 0.9" x 0.34" (58.42 x 22.86 x 8.64)	86%	LES50A48-1V2REJ
	<b>Baseplate</b>				
	25A	48V (36-75V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	85%	AEO25K48N-L
	40A	48V (36-75V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	86%	AEO40K48N-L
<b>1.5V</b>	<b>Open-frame</b>				
	25A	48V (36-75V)	2.3" x 0.9" x 0.32" (58.42 x 22.86 x 8.13)	86%	ALO25M48N-L
	40A	48V (36-75V)	2.3" x 0.9" x 0.32" (58.42 x 22.86 x 8.13)	88%	ALO40M48N-L
	<b>Baseplate</b>				
	25A	48V (36-75V)	2.3" x 0.9" x 0.42" (58.42 x 22.86 x 10.67)	86%	AEO25M48N-L
	40A	48V (36-75V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	88%	AEO40M48N-L
<b>1.8V</b>	<b>Open-frame</b>				
	20A	24V (18-36V)	2.3" x 0.9" x 0.34" (58.42 x 22.86 x 8.64)	91%	LES20A24-1V8REJ
	25A	48V (36-75V)	2.3" x 0.9" x 0.34" (58.42 x 22.86 x 8.64)	87%	ALO25Y48N-L
	40A	48V (36-75V)	2.3" x 0.9" x 0.32" (58.42 x 22.86 x 8.13)	90%	ALO40Y48N-L
	<b>Baseplate</b>				
	25A	48V (36-75V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	87%	AEO25Y48N-L
40A	48V (36-75V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	90%	AEO40Y48N-L	
<b>2.5V</b>	<b>Open-frame</b>				
	20A	48V (36-75V)	2.3" x 0.9" x 0.32" (58.42" x 22.86 x 8.13)	90%	ALO20G48N-L
	22A	48V (36-75V)	2.3" x 0.9" x 0.36" (58.42" x 22.86 x 9.14)	91%	LES22B48-2V5REJ
	40A	48V (36-75V)	2.3" x 0.9" x 0.34" (58.42" x 22.86 x 8.64)	91%	LES40A48-2V5REJ
	<b>Baseplate</b>				
	20A	48V (36-75V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	90%	AEO20G48N-L
35A	48V (36-75V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	90%	AEO35G48N-L	
<b>3.3V</b>	<b>Open-frame</b>				
	20A	24V (18-36V)	2.3" x 0.9" x 0.34" (58.42 x 22.86 x 8.64)	90%	LES20A24-3V3REJ
	20A	24V/48V (19-60V)	2.3" x 0.9" x 0.32" (58.42 x 22.86 x 8.13)	91%	ALO20F36N-L
	20A	48V (36-75V)	2.3" x 0.9" x 0.32" (58.42 x 22.86 x 8.13)	91%	ALO20F48N-L
	20A	48V (36-75V)	2.3" x 0.9" x 0.34" (58.42 x 22.86 x 8.64)	91%	LES20B48-3V3REJ
	25A	24V (18-36V)	2.3" x 0.9" x 0.32" (58.42 x 22.86 x 8.13)	88%	ALO25F24N-L
	30A	48V (36-75V)	2.3" x 0.9" x 0.32" (58.42 x 22.86 x 8.13)	91%	ALO30F48N-L
	<b>Baseplate</b>				
	20A	48V (36-75V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	91%	AEO20F48N-L
	30A	48V (36-75V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	91%	AEO30F48N-L

Astec products are in unshaded boxes; Artesyn in gray boxes.

Vout	Iout	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
<b>5V</b>	<b>Open-frame</b>				
	12A	48V (36-75V)	2.3" x 0.9" x 0.32" (58.42 x 22.86 x 8.13)	93%	ALO12A48N-L
	13A	48V (36-75V)	2.3" x 0.9" x 0.32" (58.42 x 22.86 x 8.13)	93%	LES13B48-5V0REJ
	20A	48V (36-75V)	2.3" x 0.9" x 0.32" (58.42 x 22.86 x 8.13)	93%	ALO20A48N-L
	<b>Baseplate</b>				
	12A	48V (36-75V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	93%	AEO12A48N-L
	20A	48V (36-75V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	92%	AEO20A48N-L
<b>12V</b>	<b>Open-frame</b>				
	4A	48V (36-75V)	2.3" x 0.9" x 0.32" (58.42 x 22.86 x 8.13)	93%	ALO04B48N-L
	10A	48V (36-75V)	2.3" x 0.9" x 0.32" (58.42 x 22.86 x 8.13)	92%	ALO10B48N-L
	<b>Baseplate</b>				
	4A	48V (36-75V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	93%	AEO04B48N-L
	10A	48V (36-75V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	92%	AEO10B48N-L

# Quarter-Brick



## Special Features

- Single output quarter-brick, 6.3A-100A
- Wide operating temperature range
- Rich feature sets: UVLO, enable, on/off, OCP, OVP, OTP, differential remote sense, output trim
- Meets basic insulation
- Exceptional dynamic response and reactive loading capability
- Monotonic start-up characteristic
- Open and baseplated versions
- RoHS compliant

Astec products are in unshaded boxes; Artesyn in gray boxes.

Vout	Iout	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
<b>1.2V</b>	<b>Open-frame</b>				
	12A	48 V (36-75 V)	2.3" x 1.45" x 0.35" (58.42 x 36.83 x 8.89)	82%	ALQ12K48N-L
	50A	48 V (36-75 V)	2.3" x 1.45" x 0.34" (58.42 x 36.83 x 8.64)	89%	LQS50A48-1V2REJ
	100A	48 V (36-75 V)	2.3" x 1.45" x 0.34" (58.42 x 36.83 x 8.64)	86%	LQS100A48-1V2REJ
<b>1.5V</b>	<b>Open-frame</b>				
	12A	48V (36-75V)	2.3" x 1.45" x 0.35" (58.42 x 36.83 x 8.89)	82%	ALQ12M48N
	50A	48V (36-75V)	2.3" x 1.45" x 0.34" (58.42 x 36.83 x 8.64)	89%	LQS50A48-1V5REJ
	80A	48V (36-75V)	2.3" x 1.45" x 0.34" (58.42 x 36.83 x 8.64)	89%	LQS80A48-1V5REJ
	100A	48V (36-75V)	2.3" x 1.45" x 0.34" (58.42 x 36.83 x 8.64)	89%	LQS100A48-1V5REJ
	<b>Baseplate</b>				
	12A	48V (36-75V)	2.3" x 1.45" x 0.45" (58.42 x 36.83 x 11.43)	82%	AEQ12M48N
	<b>1.8V</b>	<b>Open-frame</b>			
12A		48V (36-75V)	2.3" x 1.45" x 0.35" (57.42 x 36.83 x 8.89)	84%	ALQ12Y48N
30A		24V (18-36V)	2.3" x 1.45" x 0.34" (57.42 x 36.83 x 8.64)	91%	LQS30A24-1V8REJ
50A		48V (36 - 75V)	2.3" x 1.45" x 0.34" (57.42 x 36.83 x 8.64)	90%	LQS50A48-1V8REJ
80A		48V (36 - 75V)	2.3" x 1.45" x 0.34" (57.42 x 36.83 x 8.64)	90%	LQS80A48-1V8REJ
100A		48V (36 - 75V)	2.3" x 1.45" x 0.34" (57.42 x 36.83 x 8.64)	90%	LQS100A48-1V8REJ
<b>Baseplate</b>					
12A		48V (36-75V)	2.3" x 1.45" x 0.45" (58.42 x 36.83 x 11.43)	84%	AEQ12Y48N
75A	48V (36-75V)	2.3" x 1.48" x 0.44" (58.42 x 37.59 x 11.18)	89%	AEQ75Y48N-3L	
<b>2.5V</b>	<b>Open-frame</b>				
	25A	48V (36-75V)	2.3" x 1.45" x 0.35" (58.42 x 36.83 x 8.89)	88%	ALQ25G48N
	50A	48V (36-75V)	2.3" x 1.45" x 0.34" (58.42 x 36.83 x 8.64)	90%	LQS50A48-2V5REJ
	80A	48V (36-75V)	2.3" x 1.45" x 0.34" (58.42 x 36.83 x 8.64)	91%	LQS80A48-2V5REJ
<b>Baseplate</b>					
25A	48V (36-75V)	2.3" x 1.45" x 0.50" (58.42 x 36.83 x 12.7)	88%	AEQ25G48N	
<b>3.3V</b>	<b>Open-frame</b>				
	12A	48V (36-75V)	2.3" x 1.45" x 0.35" (58.42 x 36.83 x 8.89)	88%	ALQ12F48N
	25A	48V (36-75V)	2.3" x 1.45" x 0.35" (58.42 x 36.83 x 8.89)	89%	ALQ25F48N
	30A	24V (18-36V)	2.3" x 1.45" x 0.34" (58.42 x 36.83 x 8.64)	90%	LQS30A24-3V3REJ
	50A	48V (36-75V)	2.3" x 1.45" x 0.34" (58.42 x 36.83 x 8.64)	91%	LQS50A48-3V3REJ
	60A	48V (36-75V)	2.3" x 1.45" x 0.34" (58.42 x 36.83 x 8.64)	91%	LQS60A48-3V3REJ
	<b>Baseplate</b>				
	25A	48V (36-75V)	2.3" x 1.45" x 0.50" (58.42 x 36.83 x 12.7)	88%	AEQ25F48N

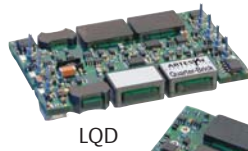
Astec products are in unshaded boxes; Artesyn in gray boxes.

Vout	Iout	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
<b>5V</b>	<b>Open-frame</b>				
	20A	48V (36 - 75V)	2.3" x 1.45" x 0.4" (58.42 x 36.83 x 10.16)	90%	ALQ20A48N
	40A	48V (36 - 75V)	2.3" x 1.45" x 0.34" (58.42 x 36.83 x 8.64)	92%	LQS40A48-5V0REJ
	<b>Baseplate</b>				
	20A	48V (36-75V)	2.3" x 1.45" x 0.5" (58.42 x 36.83 x 12.7)	91%	AEQ20A48N
<b>8V</b>	<b>Baseplate</b>				
	6.3A	48V (36 - 75V)	2.3" x 1.45" x 0.5" (57.91" x 36.83 x 12.7)	89%	AEQ06L48N
<b>12V</b>	<b>Open-frame</b>				
	8.33A	48V (36 - 75V)	2.3" x 1.45" x 0.35" (58.42 x 36.83 x 8.89)	90%	ALQ08B48N
	20A	48V (36 - 75V)	2.3" x 1.45" x 0.36" (58.42 x 36.83 x 9.14)	93%	ALQ20B48N-L
	<b>Baseplate</b>				
	8.33A	48V (36-75V)	2.3" x 1.45" x 0.5" (58.42 x 36.83 x 12.7)	90%	AEQ08B48N
	20A	48V (36-75V)	2.3" x 1.45" x 0.42" (58.42 x 36.83 x 10.67)	93%	AEQ20B48N-L

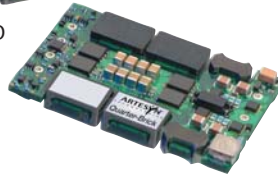
# Quarter Brick Dual



ALQ15Y48N



LQD



## Special Features

- Drop-in replacement for several widely used dual output quarter-bricks
- Independent control loop eliminates cross regulation
- Tightly regulated individual output channels
- Clean, fast transient load response
- Open-frame construction
- 6-20 Amps per channel - up to 116W total output power
- RoHS compliant

Astec products are in unshaded boxes; Artesyn in gray boxes.

Vout	Iout	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
<b>2.5V / 1.5V</b>	<b>Open-frame</b>				
	15/15A	48V (36-75V)	2.3" x 1.48" x 0.5" (58.42 x 37.59 x 12.7)	84%	ALQ15GM48N-L
<b>3.3V / 1.2V</b>	<b>Open-frame</b>				
	6/7A	48V (36-75V)	2.3" x 1.45" x 0.43" (58.42 x 36.83 x 10.92)	82%	ALQ07FK48N
	15/15A	48V (36-75V)	2.3" x 1.45" x 0.34" (58.42 x 36.83 x 8.64)	90%	LQD30A48-3V31V2REJ
	20/20A	48V (36-75V)	2.3" x 1.45" x 0.3" (58.42 x 36.83 x 7.62)	90%	LQD40A48-3V31V2REJ
<b>3.3V / 1.5V</b>	<b>Open-frame</b>				
	6/7A	48V (36-75V)	2.3" x 1.45" x 0.43" (58.42 x 36.83 x 10.92)	82%	ALQ07FM48N
	15/15	48V (36-75V)	2.3" x 1.45" x 0.3" (58.42 x 36.83 x 7.62)	91%	LQD30A48-3V31V5REJ
	20/20A	48V (36-75V)	2.3" x 1.45" x 0.3" (58.42 x 36.83 x 7.62)	91%	LQD40A48-3V31V5REJ
<b>3.3V / 1.8V</b>	<b>Open-frame</b>				
	6/7A	48V (36-75V)	2.3" x 1.45" x 0.43" (58.42 x 36.83 x 10.92)	82%	ALQ07FY48N
	15/15A	48V (36-75V)	2.3" x 1.45" x 0.3" (58.42 x 36.83 x 7.62)	91%	LQD30A48-3V31V8REJ
	20/20A	48V (36-75V)	2.3" x 1.45" x 0.3" (58.42 x 36.83 x 7.62)	91%	LQD40A48-3V31V8REJ
<b>3.3V / 2.5V</b>	<b>Open-frame</b>				
	15/15A	48V (36-75V)	2.3" x 1.45" x 0.3" (58.42 x 36.83 x 7.62)	91%	LQD30A48-3V32V5REJ
	20/20A	48V (36-75V)	2.3" x 1.45" x 0.3" (58.42 x 36.83 x 7.62)	91%	LQD40A48-3V32V5REJ
	<b>Baseplate</b>				
	12/16A	48V (36-75V)	2.3" x 1.50" x 0.5" (58.42 x 38.10 x 12.7)	91%	EXQ60-48D3V3-2V5-RJ
<b>5.0V / 3.3V</b>	<b>Open-frame</b>				
	10/15A	48V (36-75V)	2.3" x 1.45" x 0.3" (58.42 x 36.83 x 7.62)	91%	LQD25A48-5V03V3REJ
	<b>Baseplate</b>				
12/15A	48V (36-75V)	2.3" x 1.5" x 0.5" (58.42 x 38.10 x 12.7)	92%	EXQ60-48D05-3V3-RJ	



# Half Brick



EXB250



AEH80

## Special Features

- Industry standard half-brick available up to 80A
- Open-frame and baseplate construction
- Open-frame has heat sink adapter for conductive cooling applications
- Highest efficiencies available
- Optimum transient load performance and reactive loading capacity
- Wide operating temperature range
- RoHS compliant

Astec products are in unshaded boxes; Artesyn in gray boxes.

Vout	Iout	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
<b>1.2V</b>	<b>Open-frame</b>				
	60A	48V (36-75V)	2.4" x 2.3" x 0.42" (60.96 x 58.42 x 10.67)	86%	ALH60K48N-L
	80A	48V (36-75V)	2.4" x 2.3" x 0.42" (60.96 x 58.42 x 10.67)	83%	ALH80K48N-3L
	<b>Baseplate</b>				
	40A	48V (36-75V)	2.4" x 2.3" x 0.5" (60.96 x 58.42 x 12.7)	81%	AEH40K48N
	60A	48V (33-75V)	2.4" x 2.28" x 0.5" (60.96 x 57.91 x 12.7)	85%	EXB250-48S1V2-RJ
<b>1.5V</b>	<b>Open-frame</b>				
	80A	48V (36-75V)	2.3" x 2.4" x 0.4" (58.42 x 60.96 x 10.16)	86%	ALH80M48N-3L
	<b>Baseplate</b>				
	30A	48V (36-75V)	2.4" x 2.3" x 0.5" (60.96 x 58.42 x 12.7)	78%	AEH30M48N
	60A	48V (33-75V)	2.4" x 2.28" x 0.5" (60.89 x 57.91 x 12.7)	86%	EXB250-48S1V5-RJ
	80A	48V (36-75V)	2.3" x 2.4" x 0.5" (58.42 x 60.96 x 12.7)	86%	AEH80M48N-3L
<b>1.8V</b>	<b>Open-frame</b>				
	60A	48V (36-75V)	2.4" x 2.3" x 0.42" (60.96 x 58.42 x 10.67)	89%	ALH60Y48N-L
	60A	48V (36-75V)	2.4" x 2.3" x 0.42" (60.96 x 58.42 x 10.67)	87%	ALH80Y48N-3L
	<b>Baseplate</b>				
	20A	48V (36-75V)	2.4" x 2.3" x 0.5" (60.96 x 58.42 x 12.7)	81%	AEH20Y48N
	30A	48V (36-75V)	2.4" x 2.3" x 0.5" (60.96 x 58.42 x 12.7)	82%	AEH30Y48N
<b>2.0V</b>	<b>Open-frame</b>				
	8A	48V (36-75V)	2.4" x 2.28" x 0.43" (60.96 x 57.91 x 10.92)	86%	EXB30-48S2V0J
	<b>Baseplate</b>				
	10A	24V (18-36V)	2.4" x 2.3" x 0.5" (60.96 x 58.42 x 12.7)	85%	AEH10G24N
	10A	48V (36-75V)	2.4" x 2.3" x 0.5" (60.96 x 58.42 x 12.7)	87%	AEH10G48N
	15A	48V (36-75V)	2.4" x 2.3" x 0.5" (60.96 x 58.42 x 12.7)	87%	AEH15G48N
<b>2.5V</b>	<b>Open-frame</b>				
	60A	48V (36-75V)	2.40" x 2.3" x 0.42" (60.96 x 58.42 x 10.67)	90%	ALH60G48N-L
	<b>Baseplate</b>				
	10A	24V (18-36V)	2.4" x 2.3" x 0.5" (60.96 x 58.42 x 12.7)	85%	AEH20G24N
	20A	48V (36-75V)	2.4" x 2.3" x 0.5" (60.96 x 58.42 x 12.7)	86%	AEH20G48N
	30A	48V (36-75V)	2.4" x 2.3" x 0.5" (60.96 x 58.42 x 12.7)	85%	AEH30G48N
<b>3.3V</b>	<b>Open-frame</b>				
	8A	48V (36-75V)	2.4" x 2.28" x 0.43" (60.96 x 57.91 x 10.92)	90%	EXB30-48S3V3J
	10A	48V (36-75V)	2.4" x 2.28" x 0.43" (60.96 x 57.91 x 10.92)	90%	EXB50-48S3V3J
	30A	48V (36-75V)	2.4" x 2.28" x 0.39" (60.96 x 57.91 x 9.91)	91%	EXB100-48S3V3-RJ
	60A	48V (36-75V)	2.4" x 2.3" x 0.42" (60.96 x 58.42 x 10.67)	91%	ALH60F48N-L

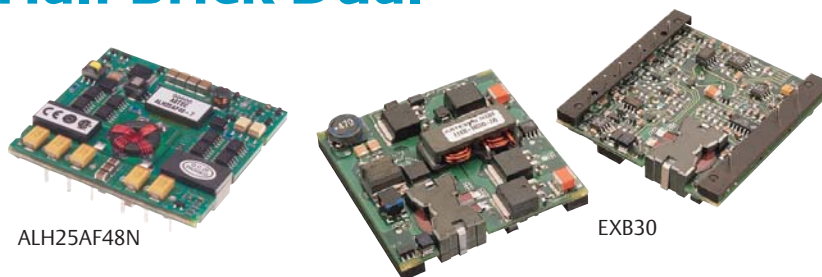
## Industry Standard Isolated - Half-Brick Single and Half-Brick Dual

Astec products are in unshaded boxes; Artesyn in gray boxes.

Vout	Iout	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
<b>3.3V</b>	<b>Baseplate</b>				
	10A	24V (18-36V)	2.4" x 2.3" x 0.5" (60.96 x 58.42 x 12.7)	87%	AEH10F24N
	10A	48V (36-75V)	2.4" x 2.3" x 0.5" (60.96 x 58.42 x 12.7)	87%	AEH10F48N
	15A	48V (36-75V)	2.4" x 2.3" x 0.5" (60.96 x 58.42 x 12.7)	88%	AEH15F48N
	20A	24V (18-36V)	2.4" x 2.3" x 0.5" (60.96 x 58.42 x 12.7)	87%	AEH20F24N
	20A	48V (36-75V)	2.4" x 2.3" x 0.5" (60.96 x 58.42 x 12.7)	88%	AEH20F48N
	30A	24V (18-36V)	2.4" x 2.3" x 0.5" (60.96 x 57.91 x 12.7)	77%	BXB150-24S3V3FLTJ
	30A	48V (36-75V)	2.4" x 2.3" x 0.5" (60.96 x 58.42 x 12.7)	85%	AEH30F48N
	40A	48V (36-75V)	2.4" x 2.3" x 0.5" (60.96 x 58.42 x 12.7)	89%	AEH40F48N
	50A	48V (33-75V)	2.4" x 2.3" x 0.5" (60.96 x 57.91 x 12.7)	90%	EXB250-48S3V3-RJ
60A	48V (36-75V)	2.4" x 2.3" x 0.5" (60.96 x 58.42 x 12.7)	91%	AEH60F48N-L	
<b>5V</b>	<b>Open-frame</b>				
	10A	48V (36-75V)	2.4" x 2.28" x 0.43" (60.96 x 57.91 x 10.92)	91%	EXB50-48S05-RJ
	20A	48V (36-75V)	2.4" x 2.28" x 0.39" (60.96 x 57.91 x 9.91)	92%	EXB100-48S05-RJ
	<b>Baseplate</b>				
	10A	24V (18-36V)	2.4" x 2.30" x 0.5" (60.96 x 58.42 x 12.7)	88%	AEH10A24N
	10A	48V (36-75V)	2.4" x 2.30" x 0.5" (60.96 x 58.42 x 12.7)	89%	AEH10A48N
	15A	48V (36-75V)	2.4" x 2.30" x 0.5" (60.96 x 58.42 x 12.7)	89%	AEH15A48N
	20A	24V (18-36V)	2.4" x 2.30" x 0.5" (60.96 x 58.42 x 12.7)	88%	AEH20A24N
	20A	48V (36-75V)	2.4" x 2.30" x 0.5" (60.96 x 58.42 x 12.7)	89%	AEH20A48N
	30A	48V (36-75V)	2.4" x 2.30" x 0.5" (60.96 x 58.42 x 12.7)	88%	AEH30A48N
33A	48V (33-75V)	2.4" x 2.28" x 0.5" (60.96 x 57.91 x 12.7)	92%	EXB250-48S05-RJ	
<b>12V</b>	<b>Open-frame</b>				
	2.5A	48V (36-75V)	2.4" x 2.28" x 0.43" (60.96 x 57.91 x 10.92)	90%	EXB30-48S12J
	4.2A	48V (36-75V)	2.4" x 2.28" x 0.43" (60.96 x 57.91 x 10.92)	90%	EXB50-48S12J
	<b>Baseplate</b>				
	8.33A	24V (18-36V)	2.4" x 2.28" x 0.5" (60.96 x 57.91 x 12.7)	85%	BXB100-24S12FLTJ
	13.75A	48V (33-75V)	2.4" x 2.28" x 0.5" (60.96 x 57.91 x 12.7)	92%	EXB250-48S12-RJ
	25A	48V (36-75V)	2.4" x 2.30" x 0.5" (60.96 x 58.42 x 12.7)	94%	AEH25B48N-L
29.17A	48V (36-75V)	2.4" x 2.30" x 0.5" (60.96 x 58.42 x 12.7)	94%	AEH30B48N-L	
<b>15V</b>	<b>Baseplate</b>				
	8.33A	24V (18-36V)	2.40" x 2.28" x 0.50" (60.96 x 57.91 x 12.70)	83%	BXB50-24S15FLTJ

## Industry Standard Isolated - Half-Brick Dual

# Half Brick Dual



Astec products are in unshaded boxes; Artesyn in gray boxes.

	Current	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
<b>1.8 - 3.3V</b>	<b>Open-frame</b>				
	8.5/8.5A	48V (36-75V)	2.4" x 2.28" x 0.39" (60.96 x 57.91 x 9.91)	86%	EXB50-48D3V3-1V8J
<b>3.3/5V</b>	<b>Open-frame</b>				
	6/6A	24V (18-36V)	2.4" x 2.28" x 0.5" (60.96 x 57.91 x 12.7)	87%	EXB30-24D05-3V3J
	6/6A	48V (36-75V)	2.4" x 2.28" x 0.5" (60.96 x 57.91 x 12.7)	88%	EXB30-48D05-3V3J
	7.5/7.5A	48V (36-75V)	2.4" x 2.28" x 0.39" (60.96 x 57.91 x 9.91)	89%	EXB50-48D05-3V3-RJ
	25/20A	48V (36-75V)	2.4" x 2.28" x 0.5" (60.96 x 57.91 x 12.7)	88%	ALH25AF48N
<b>3.3/5V</b>	<b>Baseplate</b>				
	15/15A	48V (36-75V)	2.4" x 2.28" x 0.5" (60.96 x 57.91 x 12.7)	88%	AEH15AF48N

# RF Power Bricks



RFF700



RFB300

## Special Features

- Specialized high power bricks for RF applications such as base station power amplifiers
- Offered in 24V and 48V input voltages
- Wide output voltage adjustability
- -40°C to 100°C baseplate temperature with no derating at rated power for the RFB and RFF series
- RoHS 5/6 availability

## Half-Brick

Astec products are in unshaded boxes; Artesyn in gray boxes.

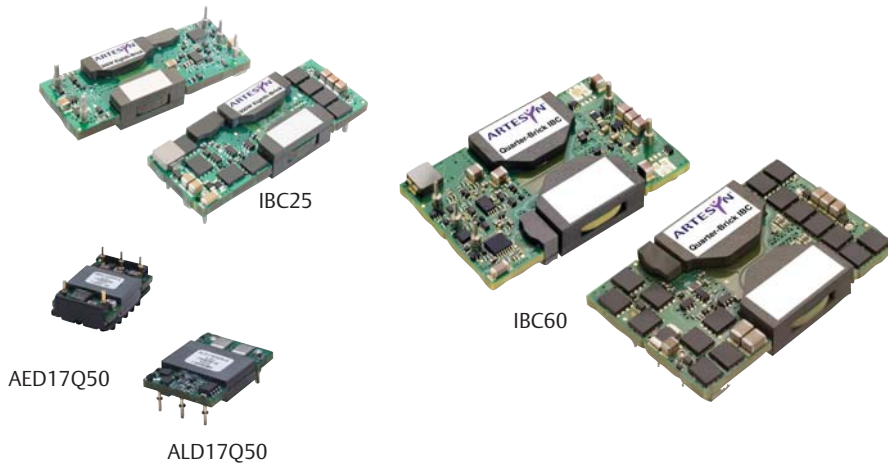
Vout	Iout	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
<b>7.2 - 13.2V</b>	<b>Baseplate</b>				
	<b>25A</b>	24V (18-36V)	2.4" x 2.27" x 0.5" (60.96 x 57.66 x 12.7)	86%	RFB300-24S12-R5Y
	<b>29.2A</b>	48V (36-75V)	2.4" x 2.27" x 0.5" (60.96 x 57.66 x 12.7)	86%	RFB350-48S12-R5Y
<b>16.8 - 29.4V</b>	<b>Baseplate</b>				
	<b>11A</b>	24V (18-36V)	2.4" x 2.27" x 0.5" (60.96 x 57.66 x 12.7)	90%	RFB300-24S28-R5Y
	<b>11A</b>	48V (36-75V)	2.4" x 2.27" x 0.5" (60.96 x 57.66 x 12.7)	91%	RFB300-48S28-R5Y
	<b>12.5A</b>	48V (36-75V)	2.4" x 2.27" x 0.5" (60.96 x 57.66 x 12.7)	91%	RFB350-48S28-R5Y
<b>28V</b>	<b>Baseplate</b>				
	<b>9A</b>	48V (36-75V)	2.4" x 2.27" x 0.5" (60.71 x 57.66 x 12.7)	91%	AEH09R48N

## Full-Brick

Astec products are in unshaded boxes; Artesyn in gray boxes.

Vout	Iout	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
<b>16.8 - 29.4V</b>	<b>Baseplate</b>				
	<b>17.9A</b>	24V (18-36V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	90%	RFF500-24S28-5Y
	<b>17.9A</b>	48V (36-75V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	91%	RFF500-48S28-5Y
	<b>21.4A</b>	24V (18-36V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	90%	RFF600-24S28-5Y
	<b>21.4A</b>	48V (36-75V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	91%	RFF600-48S28-5Y
	<b>25A</b>	48V (36-75V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	91%	RFF700-48S28-5Y

# Bus Converters



## Special Features

- Specialized industry standard bricks for intermediate bus architectures
- Optimized for driving non-isolated Point-of-Load (POL)
- Wide-operating temperature range  
-40°C to 100°C case (baseplate)  
-40°C to 85°C ambient (open-frame)
- Rich feature sets: overvoltage, over temperature protection, on/off enable
- Meets basic insulation
- Wide or narrow input voltage range, open loop or semi-regulated output for telecom and enterprise applications
- RoHS 6/6 compliant

## Sixteenth-Brick

Astec products are in unshaded boxes; Artesyn in gray boxes.

	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number	
<b>9.6V</b>	<b>Open-frame</b>				
	17A	48V (38 - 55V)	1.3" x 0.9" x 0.35" (33.02 x 22.86 x 8.89)	96%	ALD17Q50N-L
	<b>Baseplate</b>				
	17A	48V (38 - 55V)	1.4" x 0.9" x 0.54" (35.56 x 22.86 x 13.72)	96%	AED17Q50N-L

## Eighth-Brick

Astec products are in unshaded boxes; Artesyn in gray boxes.

	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number	
<b>9.6V</b>	<b>Open-frame</b>				
	32A	48V (38 - 55V)	2.3" x 0.9" x 0.48" (58.42 x 22.86 x 12.19)	97%	IBC32AEN4896-REJ
<b>12V</b>	<b>Open-frame</b>				
	15A	48V (36-55V)	2.3" x 0.9" x 0.38" (58.42 x 22.86 x 9.65)	96%	ALO15B50N-L
	17A	48V (36-75V)	2.3" x 0.9" x 0.45" (58.42 x 22.86 x 11.43)	94%	IBC17AEW4812-REJ
	20A	48V (42-53V)	2.3" x 0.9" x 0.45" (58.42 x 22.86 x 11.43)	95%	IBC20AES4812-REJ
	25A	48V (42-53V)	2.3" x 0.9" x 0.45" (58.42 x 22.86 x 11.43)	96%	IBC25AET4812-REJ

## Quarter-Brick

Astec products are in unshaded boxes; Artesyn in gray boxes.

	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number	
<b>9.6V</b>	<b>Open-frame</b>				
	60A	48V (38 - 55V)	2.3" x 1.45" x 0.48" (58.42 x 36.83 x 12.19)	97%	IBC60AQN4896-REJ
<b>12V</b>	<b>Open-frame</b>				
	14A	48V (36-75V)	2.3 x 1.46" x 0.41" (58.42 x 37.08 x 10.41)	95%	TQW14A-48S12-RJ
	20A	48V (43.2-52.8V)	2.3" x 1.45" x 0.43" (57.91 x 36.83 x 10.92)	95%	TQN20A48S12-RJ
	25A	48V (43.2-52.8V)	2.3" x 1.45" x 0.43" (57.91 x 36.83 x 10.92)	95%	TQN25A48S12-RJ
	28A	48V (36-75V)	2.3" x 1.45" x 0.45" (58.42 x 36.83 x 11.43)	95%	IBC28AQW4812-REJ
	30A	48V (42-53V)	2.3" x 1.45" x 0.45" (58.42 x 36.83 x 11.43)	95%	IBC30AQS4812-REJ
	37.5A	48V (42-53V)	2.3" x 1.45" x 0.45" (58.42 x 36.83 x 11.43)	96%	IBC38AQT4812-REJ

# Advanced Telecommunication Computing Architecture (ATCA)



ATC210

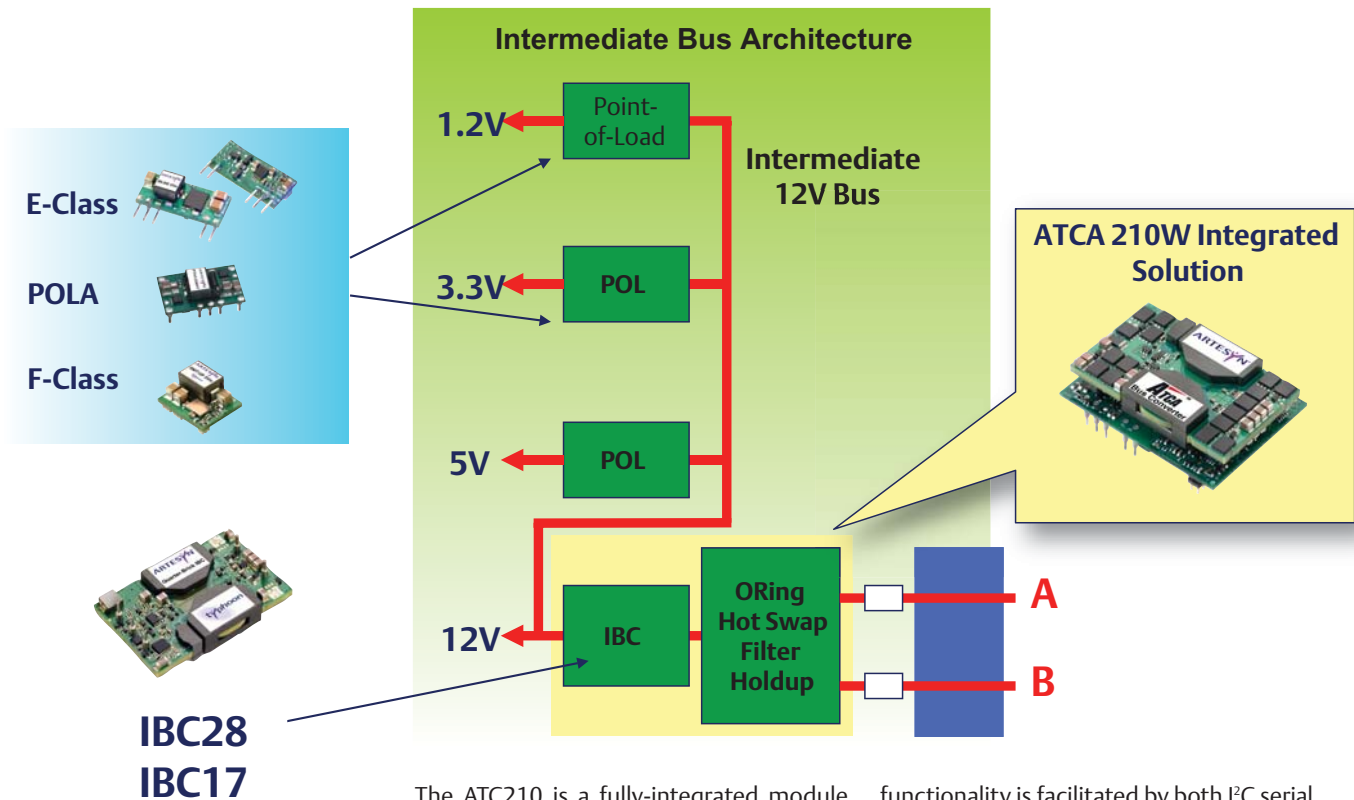
## Special Features

- Fully integrated input power module and intermediate bus converter solution for high density ATCA applications
- OR'ing for A/B Dual 48VDC power feeds
- High swap capability with inrush protection
- EMI filtering
- Independent 50V clamp output for charging external hold up capacitors
- 6W of 3.3VDC management supply
- 210W of 12VDC intermediate bus
- Hardware alarms via opto-isolators for loss of A or B feeds
- I<sup>2</sup>C serial bus interface for monitoring and reporting
- Programmable alarm thresholds via I<sup>2</sup>C
- International safety standards approvals- UL, CSA, TÜV and CB report
- RoHS compliant

Astec products are in unshaded boxes; Artesyn in gray boxes.

Vout	Iout	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
<b>3.3/12.0V</b>	<b>ATCA Open-frame</b>				
1.8/17.5		-48V (-36 to -72V)	2.32" x 1.81" x 0.83" (58.93 x 45.97 x 21.08)	89%	ATC210-48D12-03J

**Note:**  
ATCA and the ATCA logo are trademarks of the PCI Industrial Computers Manufacturers Group.

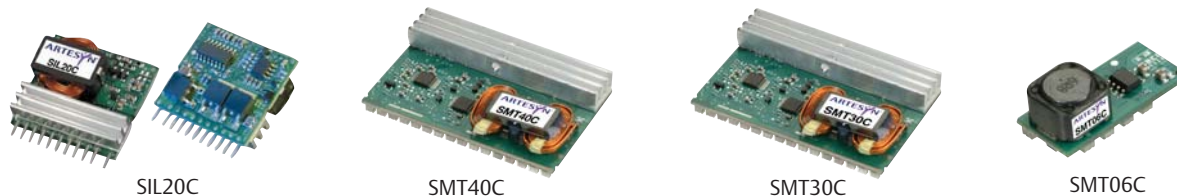


The ATC210 is a fully-integrated module that is more than just a power converter. It also provides power interface and power management functionality. The power interface functions include OR'ing, filtering, inrush control and auxiliary 6W 3.3VDC output, while power management

functionality is facilitated by both I<sup>2</sup>C serial bus and direct hardware alarms for loss of A or B -48VDC input feeds or open fuses. The ATC210 provides ATCA board designers with a compact and optimized solution for space constrained blades and AMC's.

# C Class - Economy

The 1st generation C Class POLs are designed to provide good efficiency and performance.



## Special Features

- Input voltage ranges: 4.5-5.5V or 10.2-13.8V
- Wide output voltage trim/adjustability: 0.9 to 5VDC
- Output current: 6A to 40A
- High efficiency up to 92%
- Remote on/off
- Power good
- Parallel operation/current share (SIL30C and SIL40C)
- Remote sense (SIL30C and SIL40C)
- Excellent transient response
- Operating temperature range: 0°C to 80°C
- Protection: over current/short circuit
- Cost optimized design – industry leading value
- Compact footprint, vertical, horizontal and horizontal SMT options
- International safety standard approvals – UL, CSA, TÜV & CB Report
- RoHS 6/6 compliant

**Astec products are in unshaded boxes; Artesyn in gray boxes.**

### General-Purpose C Class Point of Load DC/DC Converters

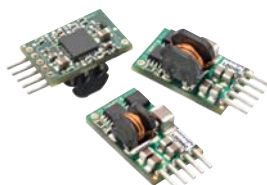
Output Current	Input Voltage	Output Voltage	Efficiency	Package LxWxH (mm)	Model Number
<b>Single-In-Line, Through-hole Mounting</b>					
6A	4.5 to 5.5VDC	0.9 to 3.3V	89%	1.2" x 0.45" x 0.61" (30.48 x 11.43 x 15.49)	SIL06C-05SADJ-VJ
6A	10.2 to 13.8VDC	0.9 to 5.0V	91%	1.2" x 0.45" x 0.61" (30.48 x 11.43 x 15.49)	SIL06C-12SADJ-VJ
15A	4.5 to 5.5VDC	0.9 to 3.3V	89%	1.2" x 0.4" x 1.1" (30.48 x 10.16 x 27.94)	SIL15C-05SADJ-VJ
15A	10.2 to 13.8VDC	0.9 to 5.0V	91%	1.2" x 0.4" x 1.1" (30.48 x 10.16 x 27.94)	SIL15C-12SADJ-VJ
20A	4.5 to 5.5VDC	0.9 to 3.3V	87%	1.2" x 0.45" x 1.1" (30.48 x 10.16 x 27.94)	SIL20C-05SADJ-VJ
20A	10.2 to 13.8VDC	0.9 to 5.0V	91%	1.2" x 0.45" x 1.1" (30.48 x 10.16 x 27.94)	SIL20C-12SADJ-VJ
25A	10.2 to 13.8VDC	-4.5 to -5.5V	90%	2.4" x 0.52" x 1.25" (60.96 x 13.21" x 31.75)	SIL25C-12SNEG-VJ
30A	10.2 to 13.8VDC	0.9 to 5.0V	91%	2.4" x 0.52" x 1.25" (60.96 x 13.21" x 31.75)	SIL30C-12SADJ-VJ
40A	10.2 to 13.8VDC	0.9 to 5.0V	92%	2.4" x 0.52" x 1.25" (60.96 x 13.21" x 31.75)	SIL40C-12SADJ-VJ
<b>Surface-Mounting</b>					
6A	4.5 to 5.5VDC	0.9 to 3.3V	89%	1.2" x 0.53" x 0.47" (30.48 x 13.46 x 11.94)	SMT06C-05SADJJ
6A	10.2 to 13.8VDC	0.9 to 5.0V	91%	1.2" x 0.53" x 0.47" (30.48 x 13.46 x 11.94)	SMT06C-12SADJJ
15A	4.5 to 5.5VDC	0.9 to 3.3V	89%	1.2" x 1.1" x 0.46" (30.48 x 27.94 x 11.68)	SMT15C-05SADJJ
15A	10.2 to 13.8VDC	0.9 to 5.0V	91%	1.2" x 1.1" x 0.46" (30.48 x 27.94 x 11.68)	SMT20C-12SADJJ
20A	4.5 to 5.5VDC	0.9 to 3.3V	87%	1.2" x 1.14" x 0.46" (30.48 x 28.96 x 11.68)	SMT15C-12SADJJ
20A	10.2 to 13.8VDC	0.9 to 5.0V	91%	1.2" x 1.14" x 0.46" (30.48 x 28.96 x 11.68)	SMT20C-05SADJJ
30A	10.2 to 13.8VDC	0.9 to 5.0V	91%	2.28 x 1.45 x 0.43 (57.91" x 36.83 x 10.92)	SMT30C-12SADJJ
40A	10.2 to 13.8VDC	0.9 to 5.0V	92%	2.28 x 1.45 x 0.43 (57.91" x 36.83 x 10.92)	SMT40C-12SADJJ

# C Class - High Density

The 2nd generation C Class POLs are designed to provide good efficiency and performance, a smaller footprint, and integrated input and output capacitors combined.



LDO03C



LDO06C



SIL40C2

## Special Features

- Wide input voltage ranges: 3 to 13.8V or 4.5–13.8V
- Wide output voltage trim/adjustability: 0.59 to 5.1V
- Output current: 3A to 40A
- High efficiency up to 94%
- Remote on/off
- Power good
- Remote sense (SIL20C2 and SIL40C2)
- Excellent transient response
- Current sink capability for termination applications
- Operating temperature range: 0°C to 70°C
- Protection: over current/short circuit
- No added input or output capacitors needed for ripple current capability or stability
- Cost optimized design – industry leading value
- Compact footprint, vertical, horizontal and horizontal SMT options
- International safety standard approvals – UL, CSA, TUV & CB Report
- RoHS 6/6 compliant

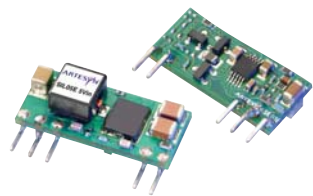
**Astec products are in unshaded boxes; Artesyn in gray boxes.**

### General-Purpose C Class Point of Load DC/DC Converters

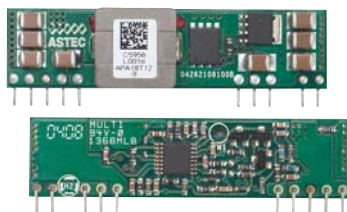
Output Current	Input Voltage	Output Voltage	Efficiency	Package LxWxH (mm)	Model Number
<b>Single-In-Line, Through-hole Mounting</b>					
3A	3.0 to 13.8VDC	0.59 to 5.1V	90%	0.37" x 0.21" x 0.61" (9.4 x 5.33 x 15.49)	LDO03C-005W05-VJ
6A	3.0 to 13.8VDC	0.59 to 5.1V	92%	0.41" x 0.37" x 0.65" (10.41 x 9.4 x 16.51)	LDO06C-005W05-VJ
10A	3.0 to 13.8VDC	0.59 to 5.1V	94%	0.41" x 0.45" x 0.65" (10.41 x 11.43 x 16.51)	LDO10C-005W05-VJ
20A	4.5 to 13.8VDC	0.59 to 5.1V	93%	1.2" x 0.46" x 0.61" (30.48 x 11.68 x 15.49)	SIL20C2-00SADJ-VJ
40A	4.5 to 13.8VDC	0.6 to 5.0V	94%	1.2" x 0.43" x 1.1" (30.48 x 10.92 x 27.94)	SIL40C2-00SADJ-VJ
<b>Surface-Mounting</b>					
3A	3.0 to 13.8VDC	0.59 to 5.1V	90%	0.61" x 0.37" x 0.29" (15.49 x 9.4 x 7.37)	LDO03C-005W05-SJ
6A	3.0 to 13.8VDC	0.59 to 5.1V	92%	0.65" x 0.41" x 0.44" (16.51 x 10.41 x 11.18)	LDO06C-005W05-SJ
10A	3.0 to 13.8VDC	0.59 to 5.1V	94%	0.65" x 0.41" x 0.52" (16.51 x 10.41 x 13.21)	LDO10C-005W05-SJ
20A	4.5 to 13.8VDC	0.59 to 5.1V	93%	1.2" x 0.61" x 0.48" (30.48 x 15.49 x 12.19)	SMT20C2-00SADJJ
40A	4.5 to 13.8VDC	0.6 to 5.0V	94%	1.2" x 1.1" x 0.44" (30.48 x 27.94 x 11.18)	SMT40C2-00SADJJ

# E Class - Performance

Efficiencies as high as 96% and current densities up to 140A/in<sup>3</sup>.



SIL05E



APA18

## Special Features

- Input voltage ranges: 3-5.5V, 4.5-5.5V, 8-14V, 10-14V
- Wide output voltage trim ranges: 0.8 to 3.63V and 0.75 to 5.5V
- Output current: 5 to 30A and 0.8 to 3.63V
- Remote on/off
- Remote sense
- Industry standard footprint—vertical and horizontal mounting (low profile SMT/SIP—through-hole)
- Operating temperature range: -40°C to 85°C
- Built-in I<sup>2</sup>C bus interface feature for precision setting of both output voltage and voltage margining product series (SIL15E-12M)
- Protection: over current/short circuit
- International safety standard approvals – UL, CSA, TÜV & CB Report
- RoHS 6/6 compliant

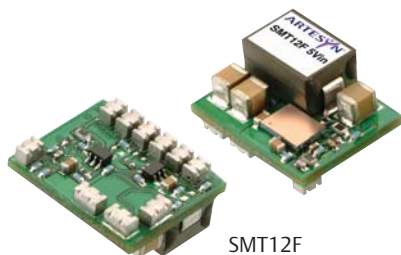
**Astec products are in unshaded boxes; Artesyn in gray boxes.**

General - Purpose E Class Point of Load DC-DC Converters					
Output Current	Input Voltage	Output Voltage	Efficiency	Package LxWxH (mm)	Model Number
<b>Single-In-Line, Through-hole Mounting</b>					
5A	3.0 to 5.5VDC	0.75 to 3.63V	94%	0.9" x 0.28" x 0.4" (22.86 x 7.11 x 10.16)	SIL05E-05W3V3-VJ
10A	4.5 to 5.5VDC	0.8 to 3.63V	95%	2" x 0.31" x 0.5" (50.8 x 7.87 x 12.7)	SIL10E-05W3V3-VJ
10A	10 to 14VDC	0.8 to 3.63V	94%	2" x 0.31" x 0.5" (50.8 x 7.87 x 12.7)	SIL10E-12W3V3-VJ
15A	3.0 to 5.5VDC	0.8 to 3.63V	94%	2" x 0.31" x 0.5" (50.8 x 7.87 x 12.7)	SIL15E-05W3V3-VJ
15A	10 to 14VDC	0.8 to 3.63V	92%	2" x 0.34 x 0.5 (50.8 x 8.64 x 12.7)	SIL15E-12M001J
15A	10 to 14VDC	0.8 to 3.63V	94%	2" x 0.31" x 0.5" (50.8 x 7.87 x 12.7)	SIL15E-12W3V3-VJ
18A	3.0 to 5.5VDC	0.75 to 5.5V	92%	2" x 0.39" x 0.5" (50.8 x 9.91 x 12.7)	APA18T04-9L
18A	10 to 14VDC	0.75 to 5.5V	92%	2" x 0.39" x 0.5" (50.8 x 9.91 x 12.7)	APA18T12-9L
30A	8.0 to 14VDC	0.8 to 3.63V	93%	2" x 0.31" x 0.5" (50.8 x 7.87 x 12.7)	SIL30E-12W3V3-VJ
<b>Surface Mounting</b>					
5A	3.0 to 5.5VDC	0.75 to 3.63V	94%	0.8" x 0.45" x 0.26" (20.32 x 11.43 x 6.6)	SMT05E-05W3V3J
5A	10 to 14VDC	0.8 to 3.63V	91%	0.8" x 0.45" x 0.24" (20.32 x 11.43 x 6.1)	SMT05E-12W3V3J
10A	3.0 to 5.5VDC	0.8 to 3.63V	96%	1.3" x 0.53" x 0.32" (33.02 x 13.46 x 8.13)	SMT10E-05W3V3J
10A	10 to 14VDC	0.8 to 3.63V	94%	1.3" x 0.53" x 0.32" (33.02 x 13.46 x 8.13)	SMT10E-12W3V3J
15A	3.0 to 5.5VDC	0.8 to 3.63V	95%	1.3" x 0.53" x 0.32" (33.02 x 13.46 x 8.13)	SMT15E-05W3V3J
15A	10 to 14VDC	0.8 to 3.63V	94%	1.3" x 0.53" x 0.32" (33.02 x 13.46 x 8.13)	SMT15E-12W3V3J
18A	3.0 to 5.5VDC	0.75 to 5.5V	92%	1.3" x 0.53 x 0.34 (33.02 x 13.46 x 8.64)	APC18T04-9L
18A	10 to 14VDC	0.75 to 5.5V	92%	1.3" x 0.53 x 0.34 (33.02 x 13.46 x 8.64)	APC18T12-9L
30A	8.0 to 14VDC	0.8 to 3.63V	91%	1.3" x 0.53" x 0.32" (33.02 x 13.46 x 8.13)	SMT30E-12W3V3J



# F Class - Fast Transient Response

Highly integrated POL modules, combining transient response up to 300A/μs. Expressly designed to minimize the number of external capacitors needed.



SMT12F



SMT15F

## Special Features

- Input voltage ranges: 3–5.5VDC, 10.8–13.2VDC
- Wide output voltage trim range: 0.9 to 3.3V (SMT12F)
- Output current: 12A to 15A
- High efficiency: 95% @ 5V in 3.3VDC output/full load
- Remote on/off
- Differential remote sense
- Power good
- Separate digital inputs for +5% and –5% output voltage margining
- Industry standard surface-mount footprint (SMT15F)
- Current densities in excess of 72A/in<sup>2</sup>
- Operating temperature range: -40°C to 85°C
- Protection: over current (non-latching) and over temperature
- International safety standard approvals – UL, CSA, TÜV & CB Report
- RoHS 6/6 compliant

**Astec products are in unshaded boxes; Artesyn in gray boxes.**

### General-Purpose F Class Point of Load DC-DC Converters

Output Current	Input Voltage	Output Voltage	Efficiency	Package LxWxH (mm)	Model Number
<b>Surface Mounting</b>					
12A	3 to 5.5VDC	0.9 to 3.3V	95%	0.63" x 0.52" x 0.31" (16 x 13.21 x 7.87)	SMT12F-05W3V3J
15A	10.8 to 13.2VDC	1.0V	85%	1.3" x 0.53" x 0.3" (33.02 x 13.46 x 7.62)	SMT15F-12S1V0J
15A	10.8 to 13.2VDC	1.2V	86%	1.3" x 0.53" x 0.3" (33.02 x 13.46 x 7.62)	SMT15F-12S1V2J
15A	10.8 to 13.2VDC	1.5V	87%	1.3" x 0.53" x 0.3" (33.02 x 13.46 x 7.62)	SMT15F-12S1V5J
15A	10.8 to 13.2VDC	1.8V	88%	1.3" x 0.53" x 0.3" (33.02 x 13.46 x 7.62)	SMT15F-12S1V8J

# POLA - Powerful Industry Alliance

The Point-of-Load Alliance (POLA) was formed by Astec, Artesyn, and Texas Instruments in June 2003. Ericsson and Murata have since joined as members.

The alliance aims to address the principal component sourcing concerns of electronics OEMs - competitive pricing and long-term security of supply - by standardizing leading technology for high performance POL converters. Under the terms of the alliance, all alliance companies are developing POL converters that have the same functionality, pin-outs and form factors, ensuring true product inter-operability.

### Commitment to standards

Astec and Artesyn are fully committed to the POLA initiative, believing that product standardization will accelerate the growth of the POL converter market by providing customers with unprecedented design flexibility and multiple sourcing capabilities.

### Choose POLA for multi-sourcing flexibility

Astec and Artesyn's POLA converters are pin-for-pin compatible with those produced by other members of the Point-of-Load Alliance. An exceptionally wide range of configuration options maximizes applications flexibility.

## POLA-DDR/Memory

Choose POLA for memory bus termination modules.



PTH12060Y



PTH12010Y



PTH05050Y

### Special Features

- Input voltage ranges: 2.95 - 3.65VDC , 4.5 – 5.5V , 10.8 – 13.2V
- Wide VTT output voltage trim / adjustability: 0.55 to 1.8V
- Output current: 6A to 15A
- High efficiency up to 88%
- VTT bus termination output (output the system VREF)
- Current sink capability for termination applications
- DDR and QDR compatible
- Pre-bias start-up capability
- Remote on/off
- Remote sense
- Under-voltage lockout
- Point-of-Load Alliance (POLA) compatible
- True multi-sourcing flexibility (form, fit and function)
- Operating temperature range: -40°C to 85°C
- Protection: over current/short circuit
- International safety standard approvals – UL, CSA, TÜV & CB Report
- RoHS compliant

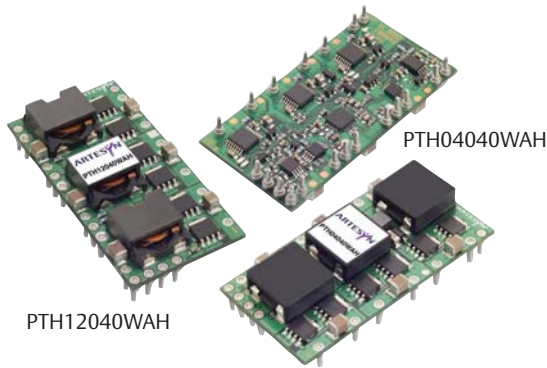
**Astec products are in unshaded boxes; Artesyn in gray boxes.**

POLA Non-isolated DDR/QDR Memory Bus Termination Modules

Output Current	Input Voltage	Output Voltage	Efficiency	Package LxWxH (mm)	Model Number
6A	2.95 to 3.65VDC	0.55 to 1.8V	88%	0.87" x 0.495" x 0.335" (22.01 x 12.57 x 8.51)	PTH03050YAH
6A	4.5 to 5.5VDC	0.55 to 1.8V	87%	0.87" x 0.495" x 0.335" (22.01 x 12.57 x 8.51)	PTH05050YAH
6A	10.8 to 13.2VDC	0.55 to 1.8V	84%	0.87" x 0.495" x 0.335" (22.01 x 12.57 x 8.51)	PTH12050YAH
10A	2.95 to 3.65VDC	0.55 to 1.8V	86%	0.995" x 0.620" x 0.354" (25.27 x 15.75 x 8.99)	PTH03060YAH
10A	4.5 to 5.5VDC	0.55 to 1.8V	86%	0.995" x 0.620" x 0.354" (25.27 x 15.75 x 8.99)	PTH05060YAH
10A	10.8 to 13.2VDC	0.55 to 1.8V	83%	0.995" x 0.620" x 0.354" (25.27 x 15.75 x 8.99)	PTH12060YAH
15A	2.95 to 3.65VDC	0.55 to 1.8V	88%	1.37" x 0.620" x 0.354" (34.80 x 15.75 x 8.99)	PTH03010YAH
15A	4.5 to 5.5VDC	0.55 to 1.8V	88%	1.37" x 0.620" x 0.354" (34.80" x 15.75 x 8.99)	PTH05010YAH
15A	10.8 to 13.2VDC	0.55 to 1.8V	85%	1.37" x 0.620" x 0.354" (34.80 x 15.75 x 8.99)	PTH12010YAH

# POLA- General Purpose

Choose POLA for multi-sourcing.



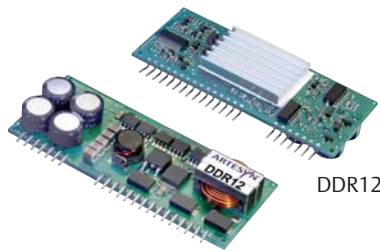
## Special Features

- Input voltage ranges: 2.95-3.65V, 4.5-5.5V, 10.8-13.2V
- Wide output voltage trim and adjustability: 0.8-5.5V
- Output current: 6A-60A
- High efficiency up to 96%
- Auto-Track™ Sequencing
- Margin up/down controls
- Pre-bias start up capability
- Remote on/off
- Remote sense
- Point-of-Load Alliance (POLA) compatible
- True multi-sourcing flexibility (form, fit and function)
- Operating temperature range: -40°C to 85°C
- Protection: over current / short circuit
- International safety standard approvals – UL, CSA, TÜV & CB Report
- RoHS compliant

Astec products are in unshaded boxes; Artesyn in gray boxes.

Output Current	Input Voltage	Output Voltage	Efficiency	Package LxWxH (mm)	Model Number
6A	2.95 to 3.65VDC	0.8 to 2.5V	94%	0.87" x 0.495" x 0.335" (22.01 x 12.57 x 8.51)	PTH03050WAH
6A	4.5 to 5.5VDC	0.8 to 3.6V	95%	0.87" x 0.495" x 0.335" (22.01 x 12.57 x 8.51)	PTH05050WAH
6A	10.8 to 13.2VDC	0.8 to 1.8V	88%	0.87" x 0.495" x 0.335" (22.01 x 12.57 x 8.51)	PTH12050LAH
6A	10.8 to 13.2VDC	1.2 to 5.5V	93%	0.87" x 0.495" x 0.335" (22.01 x 12.57 x 8.51)	PTH12050WAH
8A	2.95 to 3.65VDC	0.8 to 2.5V	93%	0.9" x 0.33" x 0.4" (22.86 x 8.38 x 10.16)	PTV03010WAH
8A	4.5 to 5.5VDC	0.8 to 3.6V	95%	0.9" x 0.33" x 0.4" (22.86 x 8.38 x 10.16)	PTV05010WAH
8A	10.8 to 13.2VDC	0.8 to 1.8V	87%	0.9" x 0.33" x 0.4" (22.86 x 8.38 x 10.16)	PTV12010LAH
8A	10.8 to 13.2VDC	1.2 to 5.5V	92%	0.9" x 0.33" x 0.4" (22.86 x 8.38 x 10.16)	PTV12010WAH
10A	2.95 to 3.65VDC	0.8 to 2.5V	93%	0.995" x 0.62" x 0.354" (25.27 x 15.75 x 8.99)	PTH03060WAH
10A	4.5 to 5.5VDC	0.8 to 3.6V	94%	0.995" x 0.62" x 0.354" (25.27 x 15.75 x 8.99)	PTH05060WAH
10A	10.8 to 13.2VDC	0.8 to 1.8V	88%	0.995" x 0.62" x 0.354" (25.27 x 15.75 x 8.99)	PTH12060LAH
10A	10.8 to 13.2VDC	1.2 to 5.5V	94%	0.995" x 0.62" x 0.354" (25.27 x 15.75 x 8.99)	PTH12060WAH
12A	10.8 to 13.2VDC	0.8 to 1.8V	89%	1.370" x 0.62" x 0.354" (34.80" x 15.75 x 8.99)	PTH12010LAH
12A	10.8 to 13.2VDC	1.2 to 5.5V	94%	1.370" x 0.62" x 0.354" (34.80" x 15.75 x 8.99)	PTH12010WAH
15A	2.95 to 3.65VDC	0.8 to 2.5V	93%	1.370" x 0.62" x 0.354" (34.80" x 15.75 x 8.99)	PTH03010WAH
15A	4.5 to 5.5VDC	0.8 to 3.6V	95%	1.370" x 0.62" x 0.354" (34.80" x 15.75 x 8.99)	PTH05010WAH
16A	10.8 to 13.2VDC	0.8 to 1.8V	87%	1.750" x 0.37" x 0.500" (44.45 x 9.4 x 12.7)	PTV12020LAH
16A	10.8 to 13.2VDC	1.2 to 5.5V	93%	1.750" x 0.37" x 0.500" (44.45 x 9.4 x 12.7)	PTV12020WAH
18A	2.95 to 3.6VDC	0.8 to 2.5V	95%	1.750" x 0.37" x 0.500" (44.45 x 9.4 x 12.7)	PTV03020WAH
18A	4.5 to 5.5VDC	0.8 to 3.6V	94%	1.750" x 0.37" x 0.500" (44.45 x 9.4 x 12.7)	PTV05020WAH
18A	10.8 to 13.2VDC	0.8 to 1.8V	89%	1.495" x 0.87" x 0.354" (37.97 x 22.01 x 8.99)	PTH12020LAH
18A	10.8 to 13.2VDC	1.2 to 5.5V	95%	1.495" x 0.87" x 0.354" (37.97 x 22.01 x 8.99)	PTH12020WAH
22A	2.95 to 3.65VDC	0.8 to 2.5V	95%	1.495" x 0.87" x 0.354" (37.97 x 22.01 x 8.99)	PTH03020WAH
22A	4.5 to 5.5VDC	0.8 to 3.6V	96%	1.495" x 0.87" x 0.354" (37.97 x 22.01 x 8.99)	PTH05020WAH
26A	10.2 to 13.8VDC	0.8 to 1.8V	89%	1.37" x 1.12" x 0.354" (34.80 x 28.45 x 8.99)	PTH12030LAH
26A	10.2 to 13.8VDC	1.2 to 5.5V	95%	1.37" x 1.12" x 0.354" (34.80 x 28.45 x 8.99)	PTH12030WAH
30A	2.95 to 3.65VDC	0.8 to 2.5V	93%	1.37" x 1.12" x 0.354" (34.80 x 28.45 x 8.99)	PTH03030WAH
30A	4.5 to 5.5VDC	0.8 to 3.6V	94%	1.37" x 1.12" x 0.354" (34.80 x 28.45 x 8.99)	PTH05030WAH
30A	8.0 to 14VDC	0.8 to 3.63V	93%	2" x 0.31" x 0.5" (50.8 x 7.87 x 12.7)	SIL30E-12W3V3-VJ
30A	8.0 to 14VDC	0.8 to 3.63V	91%	1.3" x 0.53" x 0.32" (33.02 x 13.46 x 8.13)	SMT30E-12W3V3J
50A	8.0 to 14VDC	0.8 to 5.5V	96%	2.045" x 1.045" x 0.357" (51.94 x 26.54 x 9.07)	PTH12040WAH
60A	2.95 to 5.5VDC	0.8 to 3.6V	96%	2.045" x 1.045" x 0.357" (51.94 x 26.54 x 9.07)	PTH04040WAH

# DDR Memory Power Module



**Designers' tip:**  
Check out the POLA memory bus termination models on page 48.

## Special Features

- High current dual-output power module for DDR memory
- Input voltage range: 10.8-13.2V
- Output voltage adjustability: 2.32-2.75 Vddq
- Single Compact Module provides 25A @ 2.5V for Vddq supply and 8A @ 1.25V for Vtt termination
- Vtt output has sink capability for logic terminations
- Remote sense (Vddq output only)
- Tracking dual output voltages
- Remote on/off
- Power good (open collector)
- Under voltage lockout
- Protection: over current/short circuit/over voltage
- Operating temperature range: 0°C to 80°C
- International safety standard approvals – UL, CSA, TÜV and CB Report
- RoHS compliant

**Astec products are in unshaded boxes; Artesyn in gray boxes.**

### Memory Power Point of Load DC-DC Converters

Output Current	Input Voltage	Output Voltage	Efficiency	Package LxWxH (mm)	Model Number
25A & 8A	10.8 to 13.2VDC	2.5V & 1.25V	84%	3" x 0.5" x 1.2" (76.20 x 12.7 x 30.48)	DDR12-25D08-AJ

# Voltage Regulator Modules (VRM)



Astec and Artesyn closely track leading semiconductor manufacturers' (Intel and AMD) roadmaps and offer processor power converters (VRMs) designed specifically to match demands.

## Special Features

- Voltage regulator modules (VRMs) for both Intel and AMD64 microprocessors
- Input voltage ranges: 10.8-13.2V , 11-12.6V and 11-13.2V
- Output currents up to 105A
- Output voltage adjustability
- 5 Bit and 6 Bit VID inputs
- Allows dynamic VID code changes
- High efficiency up to 87%
- Exceptionally fast transient response in excess of 900A/ $\mu$ s
- Remote on/off
- Differential remote sense
- Low profile to meet 1U applications
- Current sharing - no need for master/slave configurations
- Protection: over current / short circuit/over voltage (with on board fuse)
- International safety standard approvals - VDE
- RoHS 5/6 compliant

**Astec products are in unshaded boxes; Artesyn in gray boxes.**

VRM Processor Power Point of Load DC-DC Converters

VRM Specifications	Output Current	Input Voltage	Output Voltage	Efficiency	Package LxWxH (mm)	Model Number
AMD64	80A	10.8 to 13.2VDC	0.8 to 1.55V	84%	3.68" x 0.75" x 1.25" (93.47 x 19.05 x 31.75)	VRM64-80-12-UY
VRM10.0, VRM10.1	105A	11 to 12.6VDC	0.8375 to 1.6000V	84%	3.68" x 1.00" x 1.25" (93.35 x 25.4 x 31.75)	VRM10-105-12-EY
VRM10.0, VRM10.1	80A	11 to 12.6VDC	0.8375 to 1.6000V	85%	3.19" x 0.77" x 1.24" (81.03 x 19.78 x 31.75)	VRM10-80-12-PY
VRM10.0, VRM10.1	85A	11 to 12.6VDC	0.8375 to 1.6000V	85%	3.19" x 0.77" x 1.24" (81.03 x 19.78 x 31.75)	VRM10-85-12-UY
VRM9.0, VRM9.1	81A	11 to 12.6VDC	1.1 to 1.85V	87%	3.80" x 0.82" x 0.83" (96.52 x 20.83 x 21.08)	NX1100-12P1V8CY
VRM9.1	81A	11 to 12.6VDC	1.1 to 1.85V	85%	3.80" x 0.57" x 2.30" (96.52 x 14.48 x 58.42)	NX1150-12P1V8CY
VRM9.0	60A	11 to 13.2VDC	1.1 to 1.85V	84%	3.80" x 0.57" x 2.30" (96.52 x 14.48 x 58.42)	NX1110-12P1V8CY

# PFC Products



PFC module  
1600W

## Special Features

- 1600W
- Unity power factor
- Universal input and frequency range
- Positive and negative enable
- Paralleling with current share
- IEC 1000-3.2 compliance
- 100°C baseplate
- Clock synch (in/out)
- Current monitoring
- Vout adjust
- On/off enable
- Remote sense
- 95% efficiency
- Fast transient response

Astec products are in unshaded boxes; Artesyn in gray boxes.

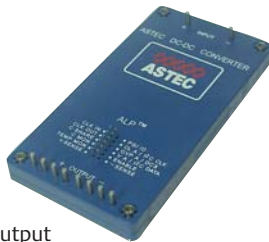
	Input	Output	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
<b>AIF04ZPFC</b>	PFC Module - Baseplate					
	380V	4.2A	85-264Vac	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	95%	AIF04ZPFC-01L
	380V	4.2A	85-264Vac	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	95%	AIF04ZPFC-02L

## High Power 300Vin

# High Power 300Vin



300V input 250-600W output



## Special Features

- 300V input (250V to 420V PFC-ready)
- 2nd generation product
- Standard thru-hole full and half-bricks
- 250W (50A); 600W (120A)
- Power density >100W/in<sup>2</sup>
- Baseplate construction - 100 °C max
- Embedded controls on secondary side:  
Temp monitor  
Current sharing  
Power good signal  
Current limit & OVP adjust

Astec products are in unshaded boxes; Artesyn in gray boxes.

	Input	Output	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
<b>AIF 300Vin</b>	Full Brick - Baseplate					
	1.80V	120A	300V (250-420V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	80%	AIF120Y300-L
	3.3V	120A	300V (250-420V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	87%	AIF120F300-L
	5V	80A	300V (250-420V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	90%	AIF80A300-L
	12V	50A	300V (250-420V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	90%	AIF50B300-L
	15V	40A	300V (250-420V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	90%	AIF40C300-L
	24V	25A	300V (250-420V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	90%	AIF25H300-L
	48V	12A	300V (250-420V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	91%	AIF12W300-L
<b>AIH 300Vin</b>	Half Brick - Baseplate					
	1.8V	50A	300V (250-420V)	2.3" x 2.4" x 0.5" (58.42 x 60.96 x 12.7)	80%	AIH50Y300-L
	3.3V	50A	300V (250-420V)	2.3" x 2.4" x 0.5" (58.42 x 60.96 x 12.7)	85%	AIH50F300-L
	5V	40A	300V (250-420V)	2.3" x 2.4" x 0.5" (58.42 x 60.96 x 12.7)	88%	AIH40A300-L
	12V	20A	300V (250-420V)	2.3" x 2.4" x 0.5" (58.42 x 60.96 x 12.7)	90%	AIH20B300-L
	15V	16A	300V (250-420V)	2.3" x 2.4" x 0.5" (58.42 x 60.96 x 12.7)	90%	AIH16C300-L
	24V	10A	300V (250-420V)	2.3" x 2.4" x 0.5" (58.42 x 60.96 x 12.7)	90%	AIH10H300-L

# ASA & AEE Low Power



ASA03A36-L



ASA01A36-L

## Special Features

- Input voltages 9-36V, 18-36V, 18-75V and 36-75V
- Single and dual outputs
- Power 6-15W
- Regulated outputs
- Operating temperature -40° to 71°C (ambient)
- Overcurrent protection
- 1500VDC isolation
- CE Mark Safety (not UL certified)
- RoHS 6/6 compliant

Astec products are in unshaded boxes; Artesyn in gray boxes.

	Input Voltage	Output Voltage	Package L x W x H (mm)	I/O Isolation	Efficiency	Model Number
<b>6W</b>	Enclosed					
	9-36V	12V@0.5A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	82%	ASA00B18-L
	9-36V	15V@0.4A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	83%	ASA00C18-L
	9-36V	5V@1A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	81%	ASA01A18-L
	9-36V	3.3V@1.2A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	78%	ASA01F18-L
	9-36V	5V@±0.5A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	81%	ASA00AA18-L
	9-36V	12V@±0.25A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	82%	ASA00BB18-L
	9-36V	15V@±0.2A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	83%	ASA00CC18-L
	18-75V	12V@0.5A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	82%	ASA00B36-L
	18-75V	15V@0.4A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	83%	ASA00C36-L
	18-75V	5V@1A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	81%	ASA01A36-L
	18-75V	3.3V@1.2A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	78%	ASA01F36-L
	18-75V	5V@±0.5A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	81%	ASA00AA36-L
	18-75V	12V@±0.25A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	82%	ASA00BB36-L
18-75V	15V@±0.2A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	83%	ASA00CC36-L	
<b>10W</b>	Enclosed					
	18-36V	12V@0.835A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	83%	ASA00B24-L
	18-36V	5V@2A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	82%	ASA02A24-L
	18-36V	3.3V@3A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	79%	ASA03F24-L
	18-36V	2.5V@3A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	77%	ASA03G24-L
	36-75V	12V@0.835A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	83%	ASA00B48-L
	36-75V	5V@2A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	82%	ASA02A48-L
	36-75V	3.3V@3A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	79%	ASA03F48-L
36-75V	2.5V@3A	DIP 1.25" x 0.8" x 0.4" (31.75 x 20.32 x 10.16)	1500VDC	87%	ASA03G48-L	
<b>15W</b>	Enclosed					
	9-36V	12V@0.5A	1" x 2" x 0.44" (25.4 x 50.8 x 11.30)	1500VDC	84%	AEE01B18-L
	9-36V	15V@1A	1" x 2" x 0.44" (25.4 x 50.8 x 11.30)	1500VDC	84%	AEE01C18-L
	9-36V	3.3V@4A	1" x 2" x 0.44" (25.4 x 50.8 x 11.30)	1500VDC	80%	AEE04F18-L
	9-36V	5V@3A	1" x 2" x 0.44" (25.4 x 50.8 x 11.30)	1500VDC	84%	AEE03A18-L
	9-36V	12V@± 0.625A	1" x 2" x 0.44" (25.4 x 50.8 x 11.30)	1500VDC	83%	AEE00BB18-L
	9-36V	15V@± 0.5A	1" x 2" x 0.44" (25.4 x 50.8 x 11.30)	1500VDC	83%	AEE00CC18-L
	9-36V	5V@±1.5A	1" x 2" x 0.44" (25.4 x 50.8 x 11.30)	1500VDC	79%	AEE01AA18-L
	18-75V	12V@1.25A	1" x 2" x 0.44" (25.4 x 50.8 x 11.30)	1500VDC	84%	AEE01B36-L
	18-75V	15V@1A	1" x 2" x 0.44" (25.4 x 50.8 x 11.30)	1500VDC	84%	AEE01C36-L
	18-75V	3.3V@4A	1" x 2" x 0.44" (25.4 x 50.8 x 11.30)	1500VDC	80%	AEE04F36-L
	18-75V	5V@3A	1" x 2" x 0.44" (25.4 x 50.8 x 11.30)	1500VDC	84%	AEE03A36-L
	18-75V	12V@±0.625A	1" x 2" x 0.44" (25.4 x 50.8 x 11.30)	1500VDC	83%	AEE00BB36-L
	18-75V	15V@± 0.5A	1" x 2" x 0.44" (25.4 x 50.8 x 11.30)	1500VDC	83%	AEE00CC36-L
	18-75V	5V@±1.5A	1" x 2" x 0.44" (25.4 x 50.8 x 11.30)	1500VDC	79%	AEE01AA36-L

# BXA Low Power



BXA30

## Special Features

- Input voltages 9-18V, 18-75V, 36-75V
- Single and dual outputs
- Power 3- 40W
- Regulated outputs
- Operating temperature -40°C to 105°C (ambient with derating)
- Protection: over current/short circuit
- 500 to 1500VDC isolation
- Enclosed and baseplate models
- UL, CSA and VDE safety approvals
- RoHS compliant

Astec products are in unshaded boxes; Artesyn in gray boxes.

	Input Voltage	Output Voltage	Package L x W x H (mm)	I/O Isolation	Efficiency	Model Number
<b>3W</b>	Enclosed					
	18-36V	5V@0.5A	1.25" x 0.8" x 0.5" (31.75 x 20.32 x 12.70)	500V	76%	BXA3-24S05J
	36-75V	5V@0.5A	1.25" x 0.8" x 0.5" (31.75 x 20.32 x 12.70)	500V	76%	BXA3-48S05J
	36-75V	5V@0.2A	1.25" x 0.8" x 0.5" (31.75 x 20.32 x 12.70)	500V	76%	BXA3-48S15J
<b>25W</b>	Baseplate					
	36-75V	5V@5A	3.02" x 2.41" x 0.52" (76.71 x 61.21 x 13.21)	1500V	80%	BXA30-48S05-FJ
	36-75V	5V@5A	3.02" x 2.41" x 0.52" (76.71 x 61.21 x 13.21)	1500V	80%	BXA30-48S05J
<b>30W</b>	Baseplate					
	36-75V	15V@2A	3.02" x 2.41" x 0.52" (76.71 x 61.21 x 13.21)	1500V	87%	BXA30-48S15J
	36-75V	5V@±2.5A	3.02" x 2.41" x 0.52" (76.71 x 61.21 x 13.21)	1500V	80%	BXA30-48D05-FJ
	36-75V	12V@±1.25A	3.02" x 2.41" x 0.52" (76.71 x 61.21 x 13.21)	1500V	84%	BXA30-48D12J
	36-75V	15V@±1.0A	3.02" x 2.41" x 0.52" (76.71 x 61.21 x 13.21)	1500V	86%	BXA30-48D15J
<b>40W</b>	Baseplate					
	18-36V	3.3V@7A	2.20" x 2.2" x 0.5" (55.88 x 55.88 x 12.70)	1500V	75%	BXA40-2453V3-MJ
	36-75V	12V@3.3A	2.20" x 2.2" x 0.5" (55.88 x 55.88 x 12.70)	1500V	87%	BXA40-48S12-MJ



# CXA Low Power



CXA20

## Special Features

- 4:1 input voltage range, 18-75V
- Single and dual outputs
- Power 10-20W
- Regulated outputs
- Remote on/off
- ± 10% output voltage trim (CXA20)
- Operating temperature -40°C to 70°C (ambient)
- Protection: over current/short circuit/over voltage
- Basic insulation, 1500VDC
- Enclosed and baseplate models
- UL, CSA & VDC safety approvals
- RoHS compliant

Astec products are in unshaded boxes; Artesyn in gray boxes.

	Input Voltage	Output Voltage	Package L x W x H (mm)	I/O Isolation	Efficiency	Model Number
<b>20W</b>	<b>Open-frame</b>					
	18 - 75V	5V@4A	2" x 1.6" x 0.41" (50.80 x 40.64 x 10.41)	1500V	83%	CXA20-48S05J
	18 - 75V	12V@1.66A	2" x 1.6" x 0.41" (50.80 x 40.64 x 10.41)	1500V	83%	CXA20-48S12J
	18 - 75V	3.3A@6A	2" x 1.6" x 0.41" (50.80 x 40.64 x 10.41)	1500V	80%	CXA20-48S3V3J
	18 - 75V	5V@±2.0A	2" x 1.6" x 0.41" (50.80 x 40.64 x 10.41)	1500V	84%	CXA20-48D05J
	18 - 75V	12V@±0.83A	2" x 1.6" x 0.41" (50.80 x 40.64 x 10.41)	1500V	84%	CXA20-48D12J
	18 - 75V	12V@±0.83A	2" x 1.6" x 0.41" (50.80 x 40.64 x 10.41)	1500V	84%	CXA20-48D12-SJ

# ALT Low Power



ALT05A48

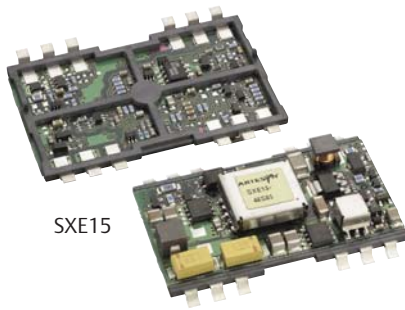
## Special Features

- Input voltages 9-18V, 18-36V and 36-75V
- Single and dual outputs
- Power 10-25W
- Regulated outputs
- Remote on/off
- Operating temperature -40°C to 85°C (ambient)
- Protection: over current/short circuit/over voltage /under voltage
- 1500VDC isolation
- RoHS compliant

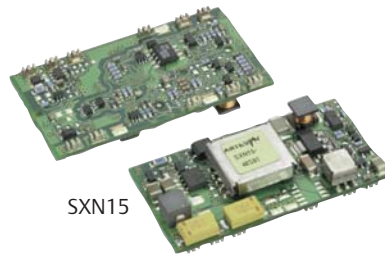
Astec products are in unshaded boxes; Artesyn in gray boxes.

	Input Voltage	Output Voltage	Package L x W x H (mm)	I/O Isolation	Efficiency	Model Number
<b>25W</b>	<b>Industrial Open-frame</b>					
	18-36V	3.3V @ 6A	1.6" x 2" x 0.38" (40.64 x 50.8 x 9.65)	1500VDC	83%	ALT06F24
	18-36V	5.5 V@ 5A	1.6" x 2" x 0.38" (40.64 x 50.8 x 9.65)	1500VDC	85%	ALT05A24
	36-72V	3.3V@600A	1.6" x 2" x 0.38" (40.64 x 50.8 x 9.65)	1500VDC	85%	ALT06F48
	36-72V	±5V@3A	1.6" x 2" x 0.38" (40.64 x 50.8 x 9.65)	1500VDC	84%	ALT03AA48
	36-72V	5V@5A	1.6" x 2" x 0.38" (40.64 x 50.8 x 9.65)	1500VDC	87%	ALT05A48
	36-72V	8V@3.13A	1.6" x 2" x 0.38" (40.64 x 50.8 x 9.65)	1500VDC	85%	ALT03L48
	36-72V	±12V@1.25A	1.6" x 2" x 0.38" (40.64 x 50.8 x 9.65)	1500VDC	87%	ALT01BB48
	36-72V	12V@2A	1.6" x 2" x 0.38" (40.64 x 50.8 x 9.65)	1500VDC	87%	ALT02B48
	36-72V	15V@1.67A	1.6" x 2" x 0.38" (40.64 x 50.8 x 9.65)	1500VDC	87%	ALT01C48

# SXE & SXN Low Power



SXE15



SXN15

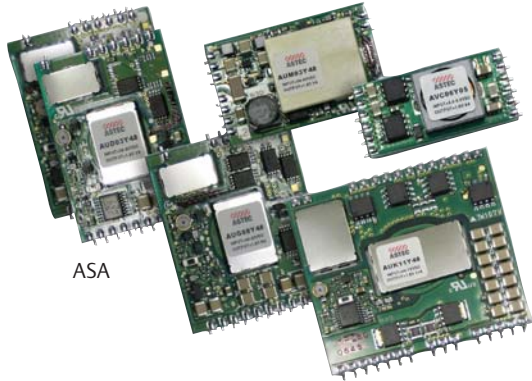
## Special Features

- Input voltages 33-75VDC
- Single and dual outputs
- Power 10.8-15W
- Regulated outputs
- High efficiency topology - 87% @ 5VDC
- Remote on/off
- ±10% output voltage trim
- Operating temperature -40°C to 70°C (ambient)
- Protection: over current/short circuit/over voltage
- 1500VDC isolation
- UL, CSA & VDE safety approvals
- Surface-mount
- RoHS compliant

Astec products are in unshaded boxes; Artesyn in gray boxes.

	Input Voltage	Output Voltage	Package L x W x H (mm)	I/O Isolation	Efficiency	Model Number
<b>15W</b>	Open-frame Surface-mounting					
	33-75V	5V@3A	1.9" x 1.39" x 0.34" (48.26 x 35.31 x 8.64)	1500V	87%	SXE15-48S05-RJ
	33-75V	12V@1.25A	1.9" x 1.39" x 0.34" (48.26 x 35.31 x 8.64)	1500V	85%	SXE15-48S12-RJ
	33-75V	1.8V@6A	1.9" x 1.39" x 0.34" (48.26 x 35.31 x 8.64)	1500V	83%	SXE15-48S1V8-RJ
	33-75V	2.5V@6A	1.9" x 1.39" x 0.34" (48.26 x 35.31 x 8.64)	1500V	85%	SXE15-48S2V5-RJ
	33-75V	3.3V@4.5A	1.9" x 1.01" x 0.34" (48.26 x 25.65 x 8.64)	1500V	86%	SXE15-48S3V3-RJ
	33-75V	5V@3A	1.9" x 1.01" x 0.34" (48.26 x 25.65 x 8.64)	1500V	83%	SXN15-48S05-RJ
	33-75V	1.8V@6A	1.9" x 1.01" x 0.34" (48.26 x 25.65 x 8.64)	1500V	85%	SXN15-48S1V8-RJ
	33-75V	2.5V@6A	1.9" x 1.01" x 0.34" (48.26 x 25.65 x 8.64)	1500V	85%	SXN15-48S2V5-RJ
	33-75V	3.3V@4.5A	1.9" x 1.01" x 0.34" (48.26 x 25.65 x 8.64)	1500V	86%	SXN15-48S3V3-RJ
	33-75V	5V@3A & 3.3V@4.5A	1.9" x 1.39" x 0.34" (48.26 x 35.31 x 8.64)	1500V	86%	SXE15-48D05-3V3-RJ
	33-75V	3.3V@3.5A & 2.5V@4.5A	1.9" x 1.01" x 0.34" (48.26 x 25.65 x 8.64)	1500V	85%	SXN15-48D3V3-2V5RJ
	33-75V	5V@3A & 3.3V@4.5A	1.9" x 1.01" x 0.34" (48.26 x 25.65 x 8.64)	1500V	86%	SXN15-48D05-3V3-RJ
	33-75V	3.3V@3.5A & 2.5V@4.5A	1.9" x 1.01" x 0.34" (48.26 x 25.65 x 8.64)	1500V	85%	SXN15-48D3V3-2V5RJ

# Ultra Low Profile



## Special Features

- Ultra low profile - 4.3mm - for low profile applications
- Input voltage: 36-75V and 36-60V
- Power: 10W-30W
- Output voltage: 1.5, 1.8, 2.5, 3.3 and 5 volts
- Output current: 2A-10A
- High efficiency: 89% at 5 volts output
- Regulation to zero load
- Operating temperature: -40°C to 85°C (ambient)
- Protection: OVP, OCP, LVP
- Remote on/off
- Current sharing for parallel application
- Meets CISPR22, Class A on conducted and radiated EMI
- 1500VDC isolation
- Platform reflow compatibility and available in RoHS 6/6 only

Astec products are in unshaded boxes; Artesyn in gray boxes.

	Input Voltage	Output	Package L x W x H (mm)	I/O Isolation	Efficiency	Model Number
<b>10W</b>	Isolated Open-frame					
	48V (36-60V)	1.5V@3A	1.39" x 0.92" x 0.3" (35.31 x 23.37 x 7.62)	1500VDC	78%	AUM03M48-L
	48V (36-60V)	1.8V@3A	1.39" x 0.92" x 0.3" (35.31 x 23.37 x 7.62)	1500VDC	80%	AUM03Y48-L
	48V (36-60V)	2.5V@3A	1.39" x 0.92" x 0.3" (35.31 x 23.37 x 7.62)	1500VDC	84%	AUM03G48-L
	48V (36-60V)	3.3V@3A	1.39" x 0.92" x 0.3" (35.31 x 23.37 x 7.62)	1500VDC	86%	AUM03F48-L
	48V (36-60V)	5.0V@2A	1.39" x 0.92" x 0.3" (35.31 x 23.37 x 7.62)	1500VDC	88%	AUM02A48-L
	48V (36-60V)	1.8V@3A	1.47" x 1.07" x 0.17" (37.34 x 27.18 x 4.32)	1500VDC	84%	AUD03Y48-L
	48V (36-60V)	2.5V@3A	1.47" x 1.07" x 0.17" (37.34 x 27.18 x 4.32)	1500VDC	86%	AUD03G48-L
	48V (36-60V)	3.3V@3A	1.47" x 1.07" x 0.17" (37.34 x 27.18 x 4.32)	1500VDC	88%	AUD03F48-L
	48V (36-60V)	5.0V@3A	1.47" x 1.07" x 0.17" (37.34 x 27.18 x 4.32)	1500VDC	89%	AUD02A48-L
<b>15W</b>	Isolated Open-frame					
	48V (36-75V)	1.8V@4.5A	1.47" x 1.23" x 0.17" (37.34 x 31.24 x 4.32)	1500VDC	84%	AUG04Y48-L
	48V (36-75V)	2.5V@4.5A	1.47" x 1.23" x 0.17" (37.34 x 31.24 x 4.32)	1500VDC	86%	AUG04G48-L
	48V (36-75V)	3.3V@4.5A	1.47" x 1.23" x 0.17" (37.34 x 31.24 x 4.32)	1500VDC	88%	AUG04F48-L
	48V (36-75V)	5.0V@3A	1.47" x 1.23" x 0.17" (37.34 x 31.24 x 4.32)	1500VDC	89%	AUG03A48-L
<b>20W</b>	Isolated Open-frame					
	48V (36-75V)	1.8V@8A	1.47" x 1.23" x 0.19" (37.34 x 31.24 x 4.83)	1500VDC	84%	AUG08Y48-L
	48V (36-75V)	5.5V@5A	1.47" x 1.23" x 0.19" (37.34 x 31.24 x 4.83)	1500VDC	86%	AUG07G48-L
	48V (36-75V)	3.3V@600A	1.47" x 1.23" x 0.19" (37.34 x 31.24 x 4.83)	1500VDC	88%	AUG06F48-L
	48V (36-75V)	±5.0V@3A	1.47" x 1.23" x 0.19" (37.34 x 31.24 x 4.83)	1500VDC	88%	AUG04A48-L
<b>30W</b>	Isolated Open-frame					
	48V (36-75V)	1.8V@11A	1.77" x 1.77" x 0.17" (44.96 x 44.96 x 4.32)	1500VDC	86%	AUK11Y48-L
	48V (36-75V)	2.5V@10A	1.77" x 1.77" x 0.17" (44.96 x 44.96 x 4.32)	1500VDC	89%	AUK10G48-L
	48V (36-75V)	3.3V@9A	1.77" x 1.77" x 0.17" (44.96 x 44.96 x 4.32)	1500VDC	90%	AUK09F48-L
	48V (36-75V)	5.0V@6A	1.77" x 1.77" x 0.17" (44.96 x 44.96 x 4.32)	1500VDC	91%	AUK06A48-L

Astec products are in unshaded boxes; Artesyn in gray boxes.

	Input Voltage	Output	Package L x W x H (mm)	I/O Isolation	Efficiency	Model Number
<b>20W</b>	Non-Isolated Open-frame					
	3.3V (2.97V-3.63)	1.5V@6A	1.33" x 0.61" x 0.24" (33.78 x 15.49 x 6.10)	Non-isolated	89%	AVC06M04-L
	3.3V (2.97V-3.63)	1.8V@6A	1.33" x 0.61" x 0.24" (33.78 x 15.49 x 6.10)	Non-isolated	90%	AVC06Y04-L
	3.3V (2.97V-3.63)	2.0V@6A	1.33" x 0.61" x 0.24" (33.78 x 15.49 x 6.10)	Non-isolated	92%	AVC06D04-L
	3.3V (2.97V-3.63)	2.5V@6A	1.33" x 0.61" x 0.24" (33.78 x 15.49 x 6.10)	Non-isolated	93%	AVC06G04-L
	5V (4.5-5.5V)	1.2V@6A	1.33" x 0.61" x 0.24" (33.78 x 15.49 x 6.10)	Non-isolated	84%	AVC06K04-L
	5V (4.5-5.5V)	1.5V@6A	1.33" x 0.61" x 0.24" (33.78 x 15.49 x 6.10)	Non-isolated	86%	AVC06M05-L
	5V (4.5-5.5V)	1.8V@6A	1.33" x 0.61" x 0.24" (33.78 x 15.49 x 6.10)	Non-isolated	88%	AVC06Y05-L
	5V (4.5-5.5V)	2.0V@6A	1.33" x 0.61" x 0.24" (33.78 x 15.49 x 6.10)	Non-isolated	89%	AVC06D05-L
	5V (4.5-5.5V)	2.5V@6A	1.33" x 0.61" x 0.24" (33.78 x 15.49 x 6.10)	Non-isolated	91%	AVC06G05-L
	5V (4.5-5.5V)	3.3V@6A	1.33" x 0.61" x 0.24" (33.78 x 15.49 x 6.10)	Non-isolated	93%	AVC06F05-L

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1. **PRICES:** Unless otherwise specified in writing by Seller, the price quoted or specified by Seller for the Goods shall remain in effect for thirty (30) days after the date of Seller's quotation or acknowledgment of Buyer's order for the Goods, whichever occurs first, provided an unconditional authorization from Buyer for the shipment of the Goods is received and accepted by Seller within such time period. If such authorization is not received by Seller within such thirty (30) day period, Seller shall have the right to change the price for the Goods to Seller's price for the Goods at the time of shipment. All prices and licensee fees are exclusive of taxes, transportation and insurance, which are to be borne by Buyer.

2. **TAXES:** Any current or future tax or governmental charge (or increase in same) affecting Seller's costs of production, sale, or delivery or shipment, or which Seller is otherwise required to pay or collect in connection with the sale, purchase, delivery, storage, processing, use or consumption of Goods, shall be for Buyer's account and shall be added to the price or billed to Buyer separately, at Seller's election.

3. **TERMS OF PAYMENT:** Unless otherwise specified by Seller, terms are net thirty (30) days from date of Seller's invoice in U.S. currency. Seller shall have the right, among other remedies, either to terminate this agreement or to suspend further performance under this and/or other agreements with Buyer in the event Buyer fails to make any payment when due, which other agreements Buyer and Seller hereby amend accordingly. Buyer shall be liable for all expenses, including attorneys' fees, relating to the collection of past due amounts. If any payment owed to Seller is not paid when due, it shall bear interest, at a rate to be determined by Seller, which shall not exceed the maximum rate permitted by law, from the date on which it is due until it is paid. Should Buyer's financial responsibility become unsatisfactory to Seller, cash payments or security satisfactory to Seller may be required by Seller for future deliveries and for the Goods theretofore delivered. If such cash payment or security is not provided, in addition to Seller's other rights and remedies, Seller may discontinue deliveries.

4. **SHIPMENT AND DELIVERY:** While Seller will use all reasonable commercial efforts to maintain the delivery date(s) acknowledged or quoted by Seller, all shipping dates are approximate and not guaranteed. Seller reserves the right to make partial shipments. Seller, at its option, shall not be bound to tender delivery of any Goods for which Buyer has not provided shipping instructions and other required information. If the shipment of the Goods is postponed or delayed by Buyer for any reason, Buyer agrees to reimburse Seller for any and all storage costs and other additional expenses resulting therefrom. Risk of loss and legal title to the Goods shall transfer to Buyer for sales in which the end destination of the Goods is outside of the United States immediately after the Goods have passed beyond the territorial limits of the United States. For all other shipments, risk of loss for damage and responsibility shall pass from Seller to Buyer upon delivery to and receipt by carrier at Seller's shipping point. All shipments are F.C.A. Seller's shipping point. Any claims for shortages or damages suffered in transit are the responsibility of Buyer and shall be submitted by Buyer directly to the carrier. Shortages or damages must be identified and signed for at the time of delivery.

Buyer shall inspect Goods delivered to it by Seller immediately upon receipt, and, any course of dealing to the contrary notwithstanding, failure of Buyer to give Seller notice of any claim within 30 days after receipt of such Goods shall be an unqualified acceptance of such Goods.

5. **LIMITED WARRANTY:** Subject to the limitations of Section 6, Seller warrants that the Goods manufactured by Seller will be free from defects in material and workmanship and meet Seller's published specifications at the time of shipment under normal use and regular service and maintenance for the period specified in Seller's then current product data sheets available on Seller's website from the date of manufacture of the Goods by Seller, unless otherwise specified by Seller in writing. Seller does not warrant that the operation of the Software shall be uninterrupted or error free. **THE WARRANTIES SET FORTH IN THIS SECTION 5 AND THE WARRANTY SET FORTH IN SECTION 7, ARE THE SOLE AND EXCLUSIVE WARRANTIES GIVEN BY SELLER WITH RESPECT TO THE GOODS AND ARE IN LIEU OF AND EXCLUDE ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ARISING BY OPERATION OF LAW OR OTHERWISE, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHETHER OR NOT THE PURPOSE OR USE HAS BEEN DISCLOSED TO SELLER IN SPECIFICATIONS, DRAWINGS OR OTHERWISE, AND WHETHER OR NOT SELLER'S PRODUCTS ARE SPECIFICALLY DESIGNED AND/OR MANUFACTURED BY SELLER FOR BUYER'S USE OR PURPOSE.**

These warranties do not extend to any losses or damages due to misuse, accident, abuse, neglect, normal wear and tear, negligence (other than Seller's), unauthorized modification or alteration, use beyond rated capacity, unsuitable power sources or environmental conditions, improper installation, repair, handling, maintenance or application or any other cause not the fault of Seller. To the extent that Buyer or its agents has supplied specifications, information, representation of operating conditions or other data to Seller in the selection or design of the Goods and the preparation of seller's quotation, and in the event that actual operating conditions or other conditions differ from those represented by Buyer, any warranties or other provisions contained herein which are affected by such conditions shall be null and void.

If within thirty (30) days after Buyer's discovery of any warranty defects within the warranty period, Buyer notifies Seller thereof in writing, Seller shall, at its option and as Buyer's exclusive remedy, repair, correct or replace per its return policy, or refund the purchase price for, that portion of the Goods found by Seller to be defective. Failure by Buyer to give such written notice within the applicable time period shall be deemed an absolute and unconditional waiver of Buyer's claim for such defects. Advance written permission to return Goods must be obtained from Seller. Such Goods must be unused and must be shipped transportation prepaid to Seller. Returns made without proper written permission will not be accepted by Seller. Seller reserves the right to inspect Goods prior to authorizing return. Goods repaired or replaced during the warranty period shall be covered by the foregoing warranties for the remainder of the original warranty period or ninety (90) days from the date of shipment, whichever is longer.

Buyer assumes all other responsibility for any loss, damage, or injury to persons or property arising out of, connected with, or resulting from the use of Goods, either alone or in combination with other products/components.

Section 5 applies to any entity or person who may buy, acquire or use the Goods, including any entity or person who obtains the Goods from Buyer, and shall be bound by the limitations therein, including Section 6. Buyer agrees to provide such subsequent transferee conspicuous, written notice of the provisions of Sections 5 and 6.

To the extent that Seller has been provided by or on behalf of Buyer any specifications, description of operating conditions or other data and information in connection with the selection or design of the Goods and/or the provision of Services, and the actual operating conditions or other circumstances differ from those provided by Buyer and relied upon by Seller, any warranties or other provisions contained herein which are affected by such conditions shall be null and void.

6. **LIMITATION OF REMEDY AND LIABILITY: THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF ANY WARRANTY HEREUNDER (OTHER THAN THE WARRANTY PROVIDED UNDER SECTION 7) SHALL BE LIMITED TO REPAIR, CORRECTION OR REPLACEMENT, OR REFUND OF THE PURCHASE PRICE UNDER SECTION 5.**

SELLER SHALL NOT BE LIABLE FOR DAMAGES CAUSED BY DELAY IN PERFORMANCE AND THE REMEDIES OF BUYER SET FORTH IN THIS AGREEMENT ARE EXCLUSIVE. IN NO EVENT, REGARDLESS OF THE FORM OF THE CLAIM OR CAUSE OF ACTION (WHETHER BASED IN CONTRACT, INFRINGEMENT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE), SHALL SELLER'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXCEED THE PRICE PAID BY BUYER FOR THE SPECIFIC GOODS PROVIDED BY SELLER GIVING RISE TO THE CLAIM OR CAUSE OF ACTION. BUYER AGREES THAT IN NO EVENT SHALL SELLER'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXTEND TO INCLUDE INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES. The term "consequential damages" shall include, but not be limited to, loss of anticipated profits, business interruption, loss of use, revenue, reputation and data, costs incurred, including without limitation, for capital, fuel, power and loss or damage to property or equipment.

It is expressly understood that any technical advice furnished by Seller with respect to the use of the Goods is given without charge, and Seller assumes no obligation or liability for the advice given, or results obtained, all such advice being given and accepted at Buyer's risk.

7. **PATENTS AND COPYRIGHTS:** Subject to the limitations of the second paragraph of Section 6, Seller warrants that the Goods sold, except as are made specifically for Buyer according to Buyer's specifications, do not infringe any valid U.S. patent or copyright in existence as of the date of shipment. This warranty is given upon the condition that Buyer promptly notify Seller of any claim or suit involving Buyer in which such infringement is alleged and cooperate fully with Seller and permit Seller to control completely the defense, settlement or compromise of any such allegation of infringement. Seller's warranty as to use patents only applies to infringement arising solely out of the inherent operation according to the applicable specifications and instructions of such Goods. In the event such Goods are held to infringe such a U.S. patent or copyright in such suit, and the use of such Goods is enjoined, or in the case of a compromise or settlement by Seller, Seller shall have the right, at its option and expense, to procure for Buyer the right to continue using such Goods, or replace them with non-infringing Goods, or modify same to become non-infringing, or grant Buyer a credit for the depreciated value of such Goods and accept return of them. In the event of the foregoing, Seller may also, at its option, cancel the agreement as to future deliveries of such Goods, without liability.

## Terms and Conditions of Sale

8. **EXCUSE OF PERFORMANCE:** Seller shall not be liable for delays in performance or for non-performance due to acts of God; acts of Buyer; war; fire; flood; weather; sabotage; strikes or labor disputes; civil disturbances or riots; governmental requests, restrictions, allocations, laws, regulations, orders or actions; unavailability of or delays in transportation; default of suppliers; or unforeseen circumstances or any events or causes beyond Seller's reasonable control. Deliveries or other performance may be suspended for an appropriate period of time or canceled by Seller upon notice to Buyer in the event of any of the foregoing, but the balance of the agreement shall otherwise remain unaffected as a result of the foregoing.

If Seller determines that its ability to supply the total demand for the Goods, or to obtain material used directly or indirectly in the manufacture of the Goods, is hindered, limited or made impracticable due to causes set forth in the preceding paragraph, Seller may allocate its available supply of the Goods or such material (without obligation to acquire other supplies of any such Goods or material) among its purchasers on such basis as Seller determines to be equitable without liability for any failure of performance which may result therefrom.

9. **CANCELLATION:** Unless otherwise agreed in writing by Seller, orders under this agreement may not be canceled by Buyer for any reason.

10. **CHANGES:** Buyer may request changes or additions to the Goods and/or Software consistent with Seller's specifications and criteria. In the event such changes or additions are accepted by Seller, Seller may revise the price, license fees and dates of delivery.

Seller reserves the right to change designs and specifications for the Goods and/or Software without prior notice to Buyer, except with respect to Goods being made to order for Buyer. Seller shall have no obligation to install or make such change in any Goods manufactured prior to the date of such change.

11. **NUCLEAR/MEDICAL. GOODS AND SERVICES SOLD HEREUNDER ARE NOT FOR USE IN CONNECTION WITH ANY NUCLEAR, MEDICAL, LIFE-SUPPORT AND RELATED APPLICATIONS.** Buyer accepts goods and services with the foregoing understanding, agrees to communicate the same in writing to any subsequent purchasers or users and to defend, indemnify and hold harmless Seller from any claims, losses, suits, judgments and damages, including incidental and consequential damages, arising from such use, whether the cause of action be based in tort, contract or otherwise, including allegations that the Seller's liability is based on negligence or strict liability.

12. **ASSIGNMENT:** Buyer shall not assign its rights or delegate its duties hereunder or any interest herein without the prior written consent of Seller, and any such assignment, without such consent, shall be void.

13. **SOFTWARE:** Notwithstanding any other provision herein to the contrary, Seller or applicable third party licensor to Seller shall retain all rights of ownership and title in its respective Software, including without limitation all rights of ownership and title in its respective copies of such Software. Except as otherwise provided herein, Buyer is hereby granted a nonexclusive, non-transferable royalty free license to use the Software incorporated into the Goods solely for purposes of Buyer properly utilizing such Goods purchased from Seller. All other Software shall be furnished to, and used by, Buyer only after execution of Seller's (or the licensor's) applicable standard license agreement, the terms of which are incorporated herein by reference.

14. **TOOLING:** Tool, die, and pattern charges, if any, are in addition to the price of the Goods and are due and payable upon completion of the tooling. All such tools, dies and patterns shall be and remain the property of Seller. Charges for tools, dies, and patterns do not convey to Buyer, title, ownership interest in, or rights to possession or removal, or prevent their use by Seller for other purchasers, except as otherwise expressly provided by Seller and Buyer in writing with reference to this provision.

15. **DRAWINGS:** Seller's prints and drawings (including without limitation, the underlying technology) furnished by Seller to Buyer in connection with this agreement are the property of Seller and Seller retains all rights, including without limitation, exclusive rights of use, licensing and sale. Possession of such prints or drawings does not convey to Buyer any rights or license, and Buyer shall return all copies (in whatever medium) of such prints or drawings to Seller immediately upon request therefor.

16. **BUYER'S COMPLIANCE WITH LAWS:** In connection with the transactions contemplated by this agreement, Buyer is familiar with and shall fully comply with all applicable laws, regulations, rules and other requirements of the United States and of any applicable state, foreign and local governmental body in connection with the purchase, receipt, use, transfer and disposal of the Goods.

17. **EXPORT/IMPORT:** Buyer agrees that all applicable import and export control laws, regulations, orders and requirements, including without limitation those of the United States and the European Union, and the jurisdictions in which the Seller and Buyer are established or from which Goods and Services may be supplied, will apply to their receipt and use. In no event shall Buyer use, transfer, release, import, export, Goods in violation of such applicable laws, regulations, orders or requirements.

18. **GENERAL PROVISIONS:** These terms and conditions supersede all other communications, negotiations and prior oral or written statements regarding the subject matter of these terms and conditions. No change, modification, rescission, discharge, abandonment, or waiver of these terms and conditions shall be binding upon the Seller unless made in writing and signed on its behalf by a duly authorized representative of Seller. No conditions, usage of trade, course of dealing or performance, understanding or agreement purporting to modify, vary, explain, or supplement these terms and conditions shall be binding unless hereafter made in writing and signed by the party to be bound, and no modification or additional terms shall be applicable to this agreement by Seller's receipt, acknowledgment, or acceptance of purchase orders, shipping instruction forms, or other documentation containing terms at variance with or in addition to those set forth herein. Any such modifications or additional terms are specifically rejected and deemed a material alteration hereof. If this document shall be deemed an acceptance of a prior offer by Buyer, such acceptance is expressly conditional upon Buyer's assent to any additional or different terms set forth herein. No waiver by either party with respect to any breach or default or of any right or remedy, and no course of dealing, shall be deemed to constitute a continuing waiver of any other breach or default or of any other right or remedy, unless such waiver be expressed in writing and signed by the party to be bound. All typographical or clerical errors made by Seller in any quotation, acknowledgment or publication are subject to correction.

(A) If Seller is a U.S. incorporated entity: This Agreement shall be governed by the laws of the State of Delaware, U.S.A., without reference to its choice or conflict of laws principles. The parties agree to submit to the exclusive jurisdiction of the courts of the State of Delaware for all actions arising in connection herewith.

(B) If Seller is a European incorporated entity: This Agreement shall be governed by the laws of England. Any dispute arising out of or in connection with this Agreement that cannot be resolved through friendly consultation shall be referred to and finally resolved by arbitration in London, England before the London Court of International Arbitration in accordance with its arbitration rules. The arbitral award shall be final and binding on the parties.

(C) If Seller is a Hong Kong incorporated entity: This Agreement shall be governed by the laws of the Hong Kong Special Administrative Region of the People's Republic of China. Any dispute arising out of or in connection with this Agreement that cannot be resolved through friendly consultation shall be referred to and finally resolved by arbitration in Hong Kong before the Hong Kong International Arbitration Centre in accordance with its arbitration rules. The arbitral award shall be final and binding on the parties.

(D) No action, regardless of form, arising out of transactions relating to this agreement, may be brought by either party more than two (2) years after the cause of action has accrued. The U.N. Convention on Contracts for the International Sales of Goods shall not apply to this agreement.

06/20/2006



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