



EC3SAWH SERIES 3 WATT 4:1 INPUT ISOLATED DC-DC CONVERTER

Features

- Efficiency Up to 84.5%
- Regulated Outputs
- Positive Remote On/Off
- 3000Vdc I/O Isolation
- Continuous Short Circuit Protection
- Input Under Voltage Protection
- Safety Meets IEC/EN/UL 62368-1
- Shock & Vibration MIL-STD-810F Compliant



MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT		INPUT CURRENT		% EFF.	CAPACITOR LOAD MAX.
			MIN.	MAX.	NO LOAD	FULL LOAD		
EC3SAW-24S33HP	9-36 VDC	3.3 VDC	0 mA	700 mA	6 mA	123 mA	78	1800uF
EC3SAW-24S05HP	9-36 VDC	5 VDC	0 mA	600 mA	4 mA	154 mA	81	1000uF
EC3SAW-24S12HP	9-36 VDC	12 VDC	0 mA	250 mA	14 mA	151 mA	83	220uF
EC3SAW-24S15HP	9-36 VDC	15 VDC	0 mA	200 mA	15 mA	152 mA	82.5	120uF
EC3SAW-24D05HP	9-36 VDC	±5 VDC	0 mA	±300 mA	8 mA	155 mA	80.5	470uF
EC3SAW-24D12HP	9-36 VDC	±12 VDC	0 mA	±125 mA	25 mA	150 mA	83.5	100uF
EC3SAW-24D15HP	9-36 VDC	±15 VDC	0 mA	±100 mA	28 mA	152 mA	82	47uF
EC3SAW-48S33HP	18-74 VDC	3.3 VDC	0 mA	700 mA	3 mA	61 mA	79	1800uF
EC3SAW-48S05HP	18-74 VDC	5 VDC	0 mA	600 mA	3 mA	76 mA	82	1000uF
EC3SAW-48S12HP	18-74 VDC	12 VDC	0 mA	250 mA	7 mA	74 mA	84.5	220uF
EC3SAW-48S15HP	18-74 VDC	15 VDC	0 mA	200 mA	12 mA	74 mA	84	120uF
EC3SAW-48D05HP	18-74 VDC	±5 VDC	0 mA	±300 mA	5 mA	76 mA	82	470uF
EC3SAW-48D12HP	18-74 VDC	±12 VDC	0 mA	±125 mA	12 mA	74 mA	84	100uF
EC3SAW-48D15HP	18-74 VDC	±15 VDC	0 mA	±100 mA	13 mA	75 mA	83	47uF

NOTE:

1. Nominal Input Voltage 24 or 48VDC

PART NUMBER

Series	Nominal Input Voltage	Number of Outputs	Nominal Output Voltage	Isolation Voltage	Remote On/Off Logic
EC3SAW	II	O	XX	L	Y
EC3SAW	24: 24 VDC 48: 48 VDC	S: Single D: Dual	33: 3.3VDC 05: 5.0VDC 12: 12VDC 15: 15VDC	H: 3000Vdc	P: Positive

Part Number Example:

EC3SAW-24S12HP: 3W, 4:1 9-36Vdc Input, Single 12Vdc Output, 3000VDC Isolation, Positive Logic



EC3SAWH Series

TECHNICAL SPECIFICATIONS

(All specifications are typical at nominal input, full load at 25°C unless otherwise noted.)

ABSOLUTE MAXIMUM RATINGS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input Voltage	Continuous	24Vin	-0.3		36	V _{dc}
		48Vin	-0.3		74	
Input Surge Voltage	100ms max.	24Vin			50	V _{dc}
		48Vin			100	
Operating Ambient Temperature	With de-rating, above 68°C	24S(D)05HP	-40		85	°C
	With de-rating, above 71°C	Others				
Maximum Case Temperature	At the center part of case plate	All			100	°C
Storage Temperature		All	-55		125	°C

INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Input Voltage		24Vin	9	24	36	V _{dc}
		48Vin	18	48	74	
Under Voltage Protection						
Turn-On Voltage Threshold		24Vin			7.5	V _{dc}
		48Vin			15.5	
Turn-Off Voltage Threshold		24Vin	6			V _{dc}
		48Vin	12			
Maximum Input Current	V _{in} =9V, Full load.	24Vin		427		mA
	V _{in} =18V, Full load	48Vin		213		
No-Load Input Current	V _{in} =24, 48V, I _o =0A	See Model Number Table				mA
Input Filter	Capacitive	All				
Inrush Current (I ² t)	As per ETS300 132-2.	All			0.01	A ² s
Input Reflected Ripple Current	V _{in} =Nominal, L=12uH, C=33uF, Load=Full load	All		30		mA

OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Voltage Set Point Accuracy	V _{in} =24, 48V, Full load, T _c =25°C	All	-1.5		+1.5	%
Output Voltage Balance	V _{in} =24, 48V, Full load, T _c =25°C	Dual	-1.0		+1.0	%
Output Voltage Regulation						
Load Regulation	Full load to 10% load	Single			±0.5	%
		Dual			±1.0	
Line Regulation	V _{in} =High line to low line, full load	All			±0.5	%
Cross Regulation	Asymmetrical load 25%/100%	Dual			±5	%
Temperature Coefficient	T _c =-40°C to 85°C	All			±0.03	%/°C
Output Voltage Ripple and Noise (5Hz to 20MHz bandwidth)						
Peak-to-Peak	Full load, T _c =25°C, With 0.1uF MLCC across output and Y-cap 470pF	All			50	mV
Output Current Range	V _{in} = 9 to 36V, 18 to 74V	See Model Number Table				A
Over Current Protection	Foldback mode. Auto recovery	All	120			%
Short Circuit Protection		All	Continuous, Auto Recovery			
External Load Capacitance	Full load (resistive)	See Model Number Table				uF



EC3SAWH Series

EFFICIENCY

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
100% Load	V _{in} =24V, 48V	See Model Number Table				%

DYNAMIC CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Current Transient						
Error Band	75% to 100% of I _{o,max} step load change d/d _t =0.1A/us (within 1% V _{out} nominal)	All			±6	%
Recovery Time		All			500	us
Turn-On Delay and Rise Time						
Full load (Constant resistive load)						
Turn-On Delay Time, From On/Off Control	V _{on/off} to 10%V _{o,set} , Remote on	All		1	2	ms
Turn-On Delay Time, From Input	V _{in,min} to 10%V _{o,set} , Power up	All		1	2	ms
Output Voltage Rise Time	10%V _{o,set} to 90%V _{o,set}	All		1.5	3	ms

ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Isolation Voltage (100% factory Hi-Pot tested @2sec.)	1 minute; Input to output	All			3000	V _{dc}
Isolation Resistance	Input to output	All	1000			MΩ
Isolation Capacitance	Input to output	All		45		pF

FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency	Pulse frequency modulation (PFM)	All	100			KHz
On/Off Control, Positive Remote On/Off logic, Refer to -V _{in} pin						
Logic Low (Module Off)	V _{on/off} at I _{on/off} =1.0mA	All	0		1.2	V
Logic High (Module On)	Pin open=On, high impedance	All				
Off Converter Input Current	Shutdown input idle current	All			1	mA

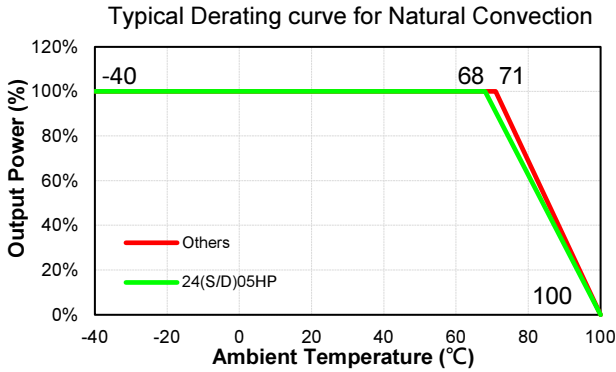
GENERAL SPECIFICATIONS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	I _o =100% of I _{o,max} ; MIL-HDBK - 217F_Notice 1, GB, 25°C	Single Dual		2.8 2.1		M hours
Weight		All		4.8		grams
Case Material	Non-Conductive Black Plastic, UL 94V-0					
Potting Material	UL 94V-0					
Pin Material	Base: Copper Plating: Matte Tin					
Shock/Vibration	MIL-STD-810F Compliant					
Humidity	95% RH max. Non Condensing					
Altitude	2000m Operating Altitude, 12000m Transport Altitude					
Thermal Shock	MIL-STD-810F					
EMI	Meets EN55032 (with external filter)					Class A
ESD	Meets EN61000-4-2 Level 2: Air ±8kV, Contact ±4kV					Perf. Criteria A
Radiated immunity	Meets EN61000-4-3 Level 2: 80~1000MHz, 3V/m					Perf. Criteria A
Fast Transient	Meets EN61000-4-4 Level 2: On power input port, ±0.5kV, external input TVS required					Perf. Criteria A
Surge	Meets EN61000-4-5 Level 2: Line to line, ±0.5kV, external input TVS required					Perf. Criteria A
Conducted immunity	Meets EN61000-4-6 Level 2: 0.15~80MHz, 3V					Perf. Criteria A
Magnetic Field Immunity	Meets EN61000-4-8 Level 2: 50 or 60Hz, 3A/m (rms)					Perf. Criteria A
Application Note Link	EC3SAWH Series App Notes					
Packaging Information Link	Packaging Information					

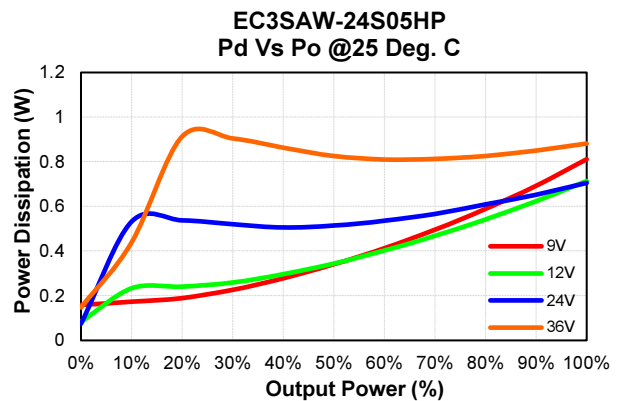
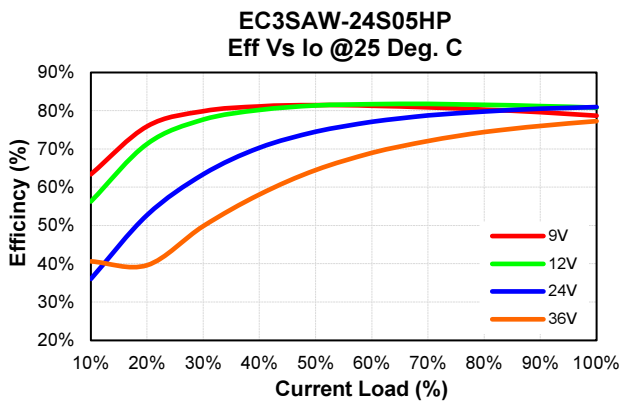
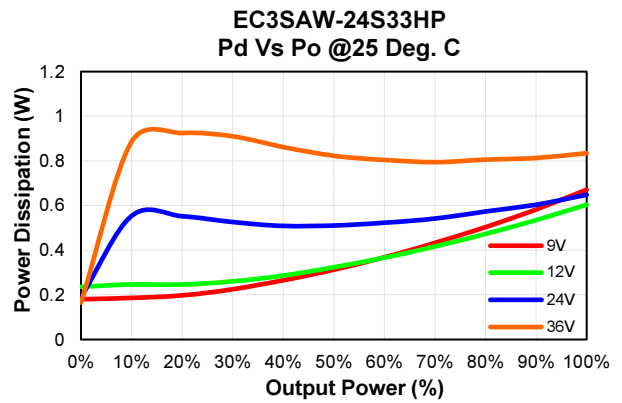
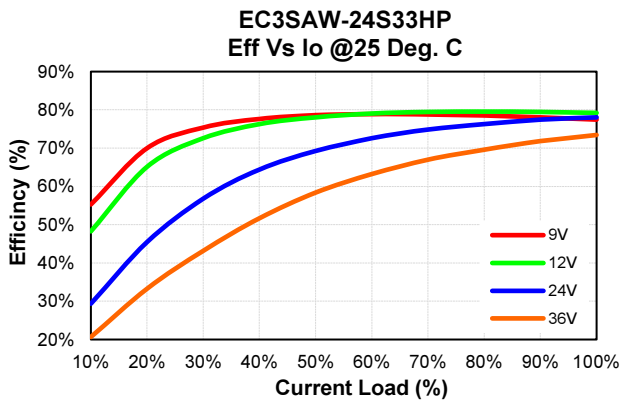


CHARACTERISTIC CURVE

Power Derating Curve



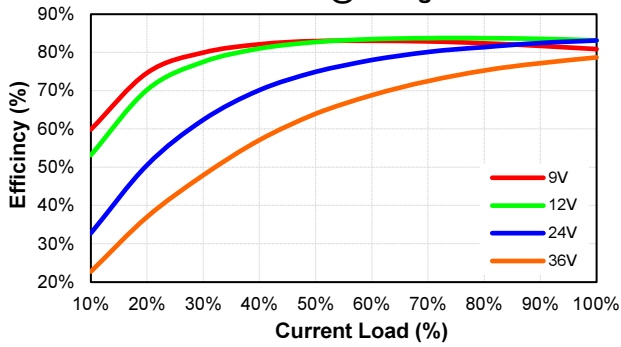
Performance Data



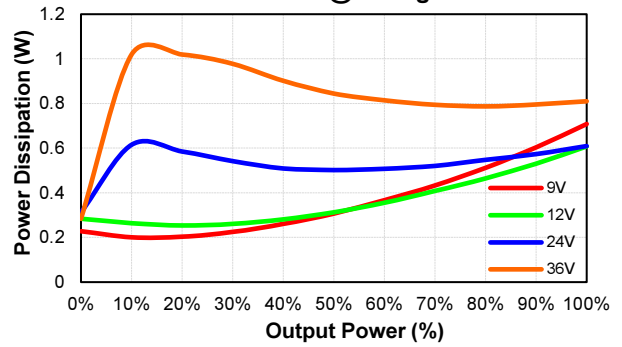


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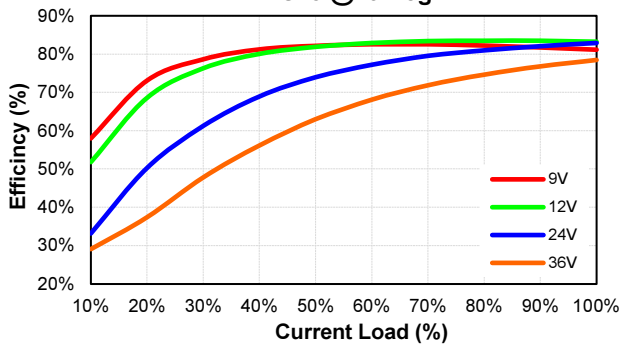
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Eff Vs Io @25 Deg. C



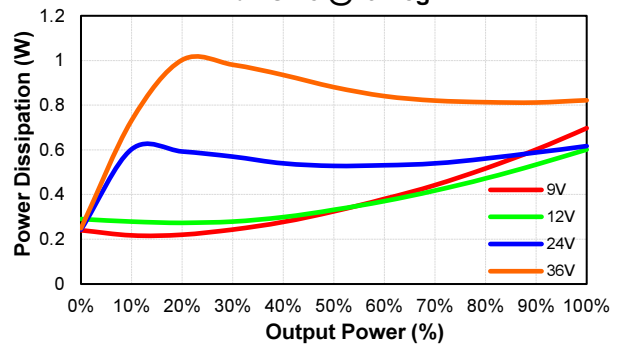
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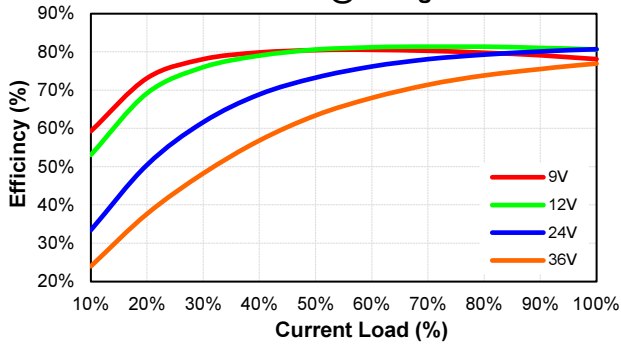
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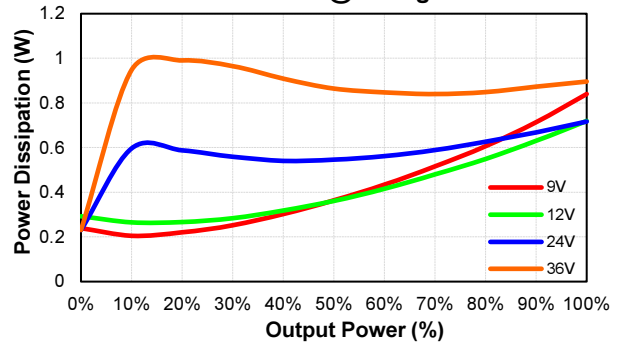
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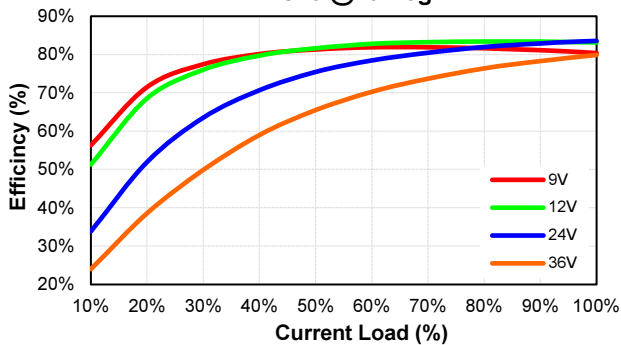
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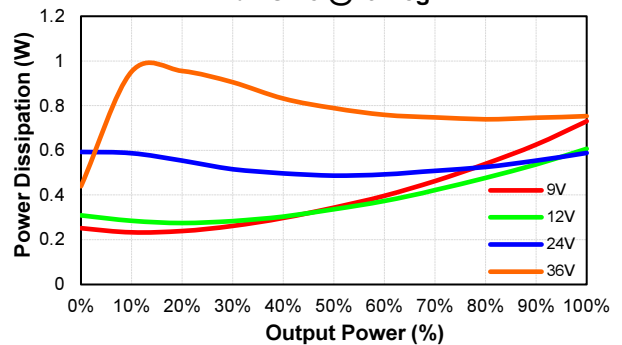
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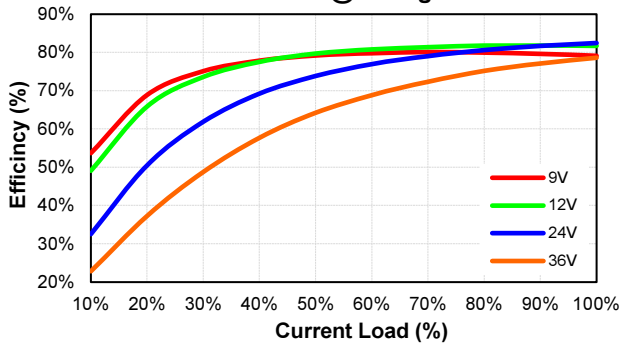
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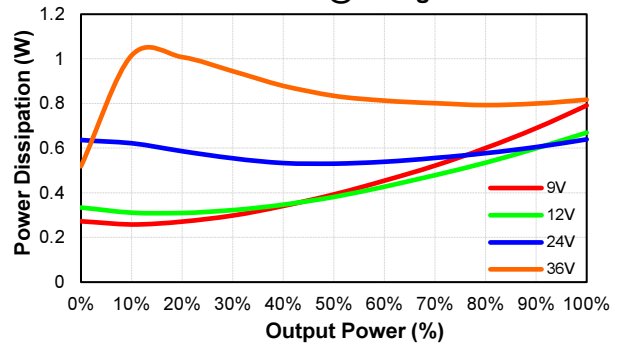


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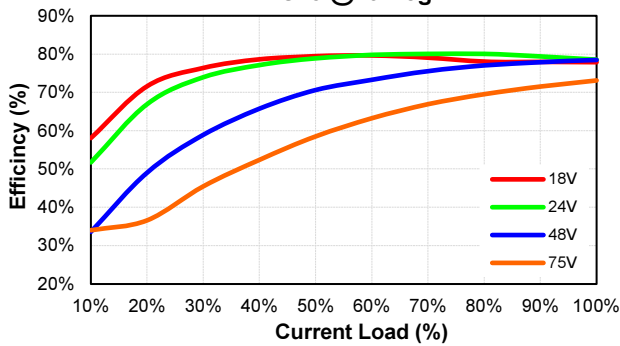
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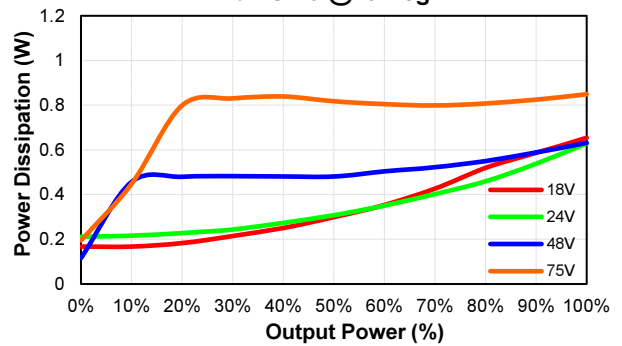
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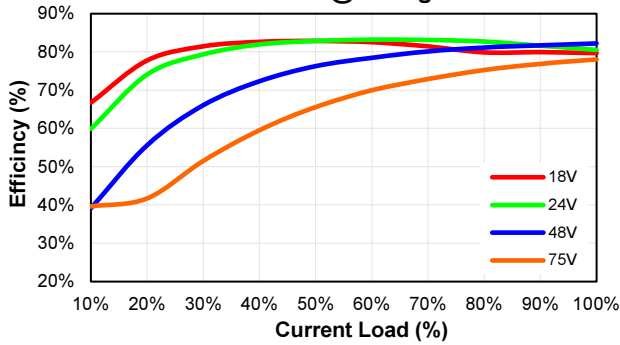
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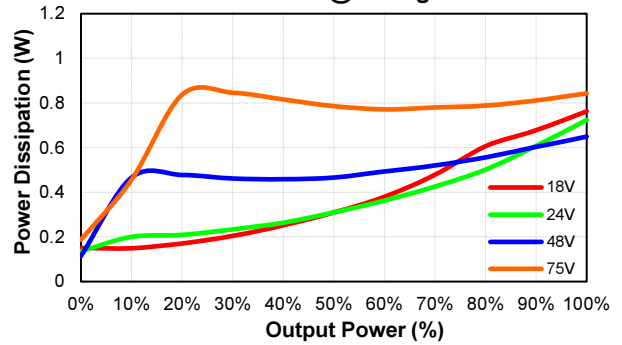
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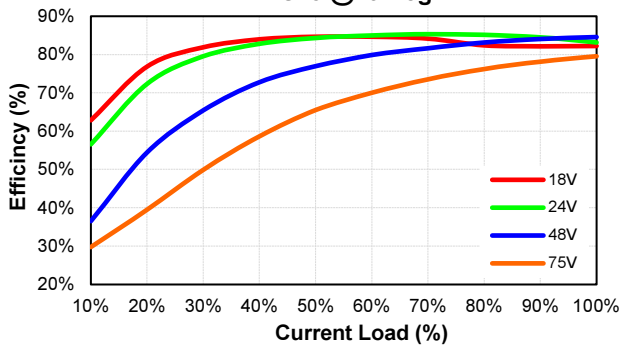
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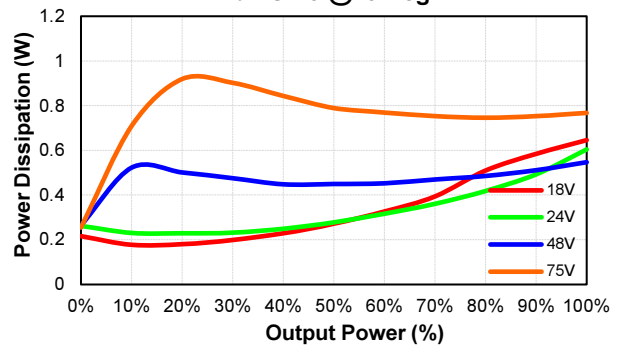
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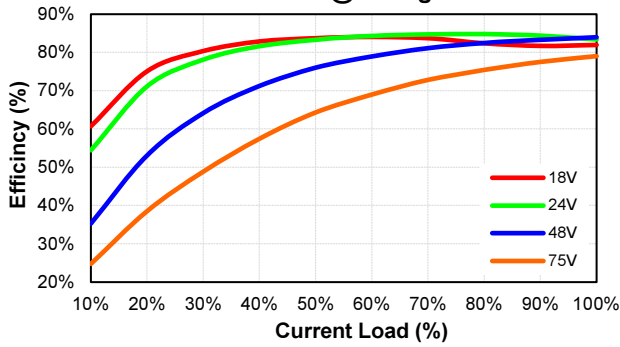
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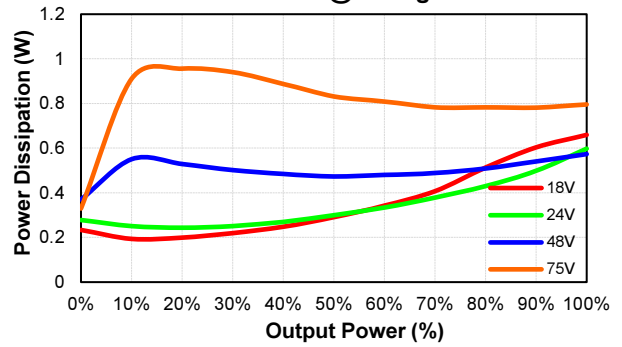


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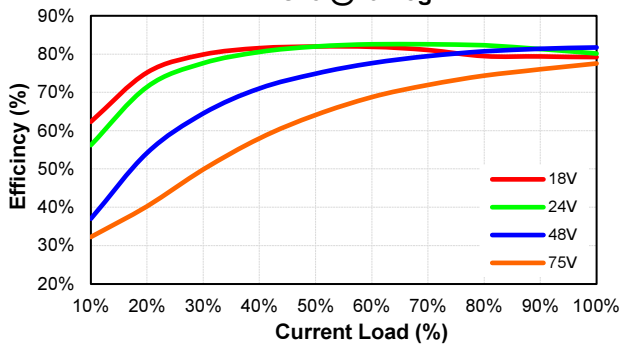
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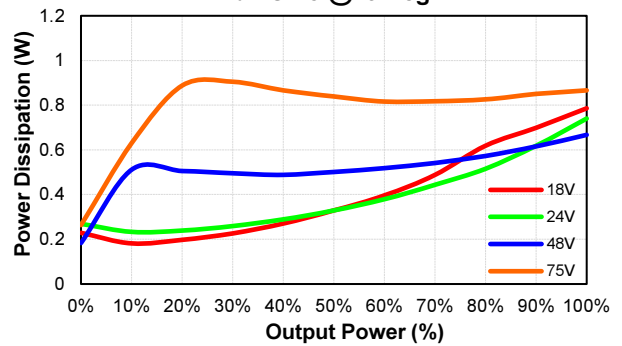
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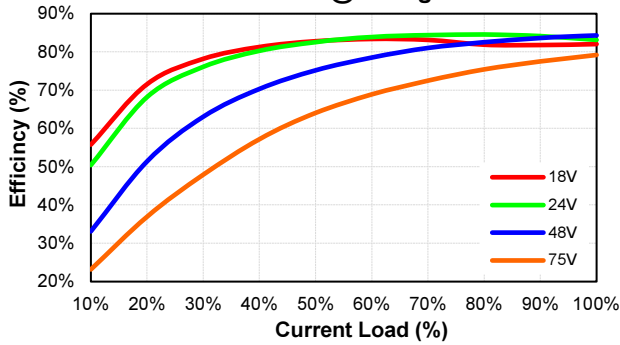
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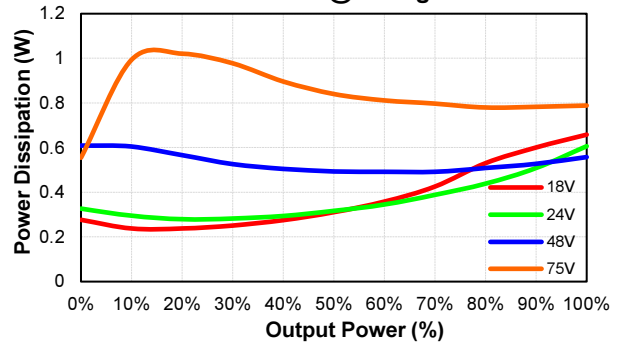
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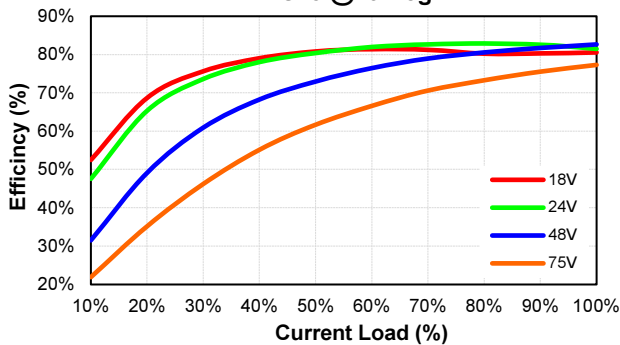
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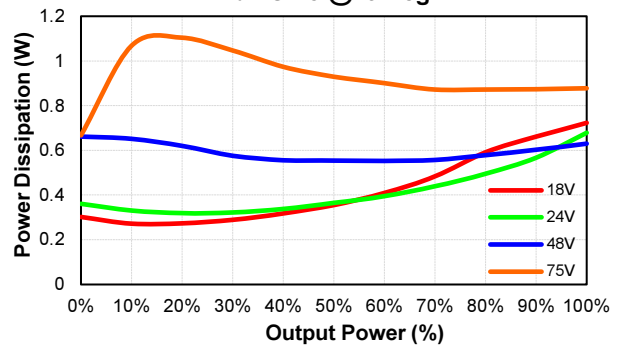
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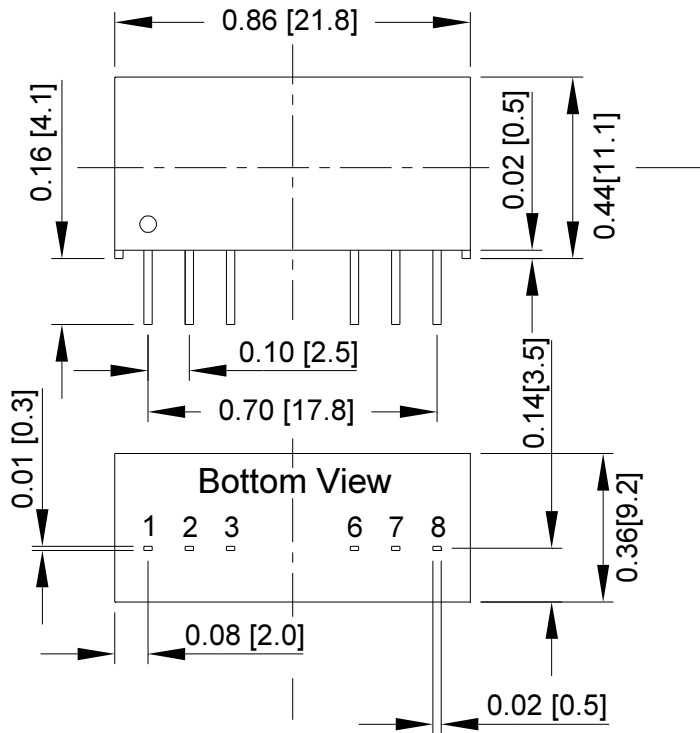
EC3SAW-48D15HP
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EC3SAWH Series

MECHANICAL SPECIFICATION



PIN CONNECTION		
Pin	Single	Dual
1	-V Input	-V Input
2	+V Input	+V Input
3	On/Off	On/Off
6	+V Output	+V Output
7	-V Output	Common
8	NC	-V Output

All Dimensions In Inches(mm)

Tolerances : Inches millimeters

X.XX±0.02 X.X±0.5
Pin ±0.002 ±0.05

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