DELPHI SERIES

FEATURES

- High efficiency: 90.5% @ 3.3V/15A, 48Vin
  88.5% @ 3.3V/12A, 24Vin
- Size: 33.0x22.8x9.3mm (1.30"x0.90"x0.37")
- Industry standard 1/16th brick size & pinout
- Input UVLO
- OTP and output OCP, OVP (default is auto-recovery)
- Output voltage trim: -20%, +10%
- Monotonic startup into normal and pre-biased loads
- 2250V isolation and basic insulation
- No minimum load required
- SMD and Through-hole versions
- ISO 9001, TL 9000, ISO 14001, QS 9000, OHSAS 18001 certified manufacturing facility
- UL/cUL 60950-1 (US & Canada) Recognized

Delphi Series V36SE, 1/16th Brick DC/DC Power Modules: 18~75Vin, 3.3Vo, 50W

The Delphi Series V36SE, 1/16th Brick, 18~75V wide input, single output, isolated DC/DC converter, is the latest offering from a world leader in power systems technology and manufacturing — Delta Electronics, Inc. This product family provides up to 50 watts of power in the industry standard 1/16th brick form factor (1.30"x0.90") and pinout. With creative design technology and optimization of component placement, these converters possess outstanding electrical and thermal performance, as well as extremely high reliability under highly stressful operating conditions. For the 3.3V output module, it delivers 50W (15A) output with 36 to 75V input and delivers 40W (12A) output while the input is 18 to 36V to the same module. Typical efficiency of the 3.3V/15A module is greater than 90.5%. All modules are protected from abnormal input/output voltage, current, and temperature conditions. For lower power needs, but in a similar small form factor, please check out Delta S48SP (36W or 10A) and S36SE (17W or 5A) series standard DC/DC modules.

OPTIONS

- SMD pins
- Positive remote On/Off

APPLICATIONS

- Optical Transport
- Data Networking
- Communications
- Servers

ΔELTA
Delta Electronics, Inc.

TECHNICAL SPECIFICATIONS

(T_A=25°C, airflow rate=300 LFM, V_{in}=48Vdc, nominal Vout unless otherwise noted.)

PARAMETER	NOTES and CONDITIONS	V36SE3R315 (Standard)			
		Min.	Typ.	Max.	Units
ABSOLUTE MAXIMUM RATINGS					
Input Voltage					Vdc
Continuous		0		80	Vdc
Transient (100ms)	100ms	0		100	Vdc
Operating Temperature	Refer to figure 19 for measuring point	-40		118	°C
Storage Temperature		-55		125	°C
Input/Output Isolation Voltage				2250	Vdc
INPUT CHARACTERISTICS					
Operating Input Voltage		18	48	75	Vdc
Input Under-Voltage Lockout					
Turn-On Voltage Threshold		16	17	18	Vdc
Turn-Off Voltage Threshold		15	16	17	Vdc
Lockout Hysteresis Voltage		0.5	1	1.8	Vdc
Maximum Input Current	100% Load, 18Vin			3.9	A
No-Load Input Current			30		mA
Off Converter Input Current			8		mA
Inrush Current (I^2t)				1	A^2s
Input Reflected-Ripple Current	P-P thru 12µH inductor, 5Hz to 20MHz		10		mA
Input Voltage Ripple Rejection	120 Hz		50		dB
OUTPUT CHARACTERISTICS					
Output Voltage Set Point	Vin=48V, Io=Io.max, Tc=25°C	3.267	3.300	3.333	Vdc
Output Voltage Regulation					
Over Load	Io=Io, min to Io, max		±3	±10	mV
Over Line	Vin=36V to 75V		±3	±10	mV
Over Temperature	Tc=-40°C to 85°C		±33		mV
Total Output Voltage Range	Over sample load, line and temperature	3.20	3.30	3.40	V
Output Voltage Ripple and Noise	5Hz to 20MHz bandwidth				
Peak-to-Peak	Full Load, 1µF ceramic, 100µF tantalum		60		mV
RMS	Full Load, 1µF ceramic, 100µF tantalum		10		mV
Operating Output Current Range	Vin = 18V-36V	0		12	A
	Vin = 36V-75V	0		15	A
Output Over Current Protection	Output Voltage 10% Low	110		140	%
DYNAMIC CHARACTERISTICS					
Output Voltage Current Transient	48V, 10µF Tan & 1µF Ceramic load cap, 0.1A/µs				
Positive Step Change in Output Current	25% Io.max to 50% Io.max		100		mV
Negative Step Change in Output Current	50% Io.max to 25% Io.max		100		mV
Settling Time (within 1% Vout nominal)			200		µs
Turn-On Transient					
Start-Up Time, From On/Off Control			30		ms
Start-Up Time, From Input			30		ms
Maximum Output Capacitance (note1)	Full load; 5% overshoot of Vout at startup			10000	µF
EFFICIENCY					
100% Load	Vin = 48V		90.5		%
100% Load	Vin = 24V		88.5		%
60% Load	Vin = 48V		90.0		%
ISOLATION CHARACTERISTICS					
Input to Output				2250	Vdc
Isolation Resistance		10			MΩ
Isolation Capacitance			1000		pF
FEATURE CHARACTERISTICS					
Switching Frequency			580		KHz
ON/OFF Control, Negative Remote On/Off logic					
Logic Low (Module On)	Von/off			0.8	V
Logic High (Module Off)	Von/off	2.4		18	V
ON/OFF Control, Positive Remote On/Off logic					
Logic Low (Module Off)	Von/off			0.8	V
Logic High (Module On)	Von/off	2.4		18	V
ON/OFF Current (for both remote on/off logic)	Ion/off at Von/off=0.0V			1	mA
Leakage Current (for both remote on/off logic)	Logic High, Von/off=15V				
Output Voltage Trim Range	Pout ≦ max rated power,Io ≦ Io.max	-20		10	%
Output Voltage Remote Sense Range	Pout ≦ max rated power,Io ≦ Io.max			10	%
Output Over-Voltage Protection	Over full temp range; % of nominal Vout	115		140	%
GENERAL SPECIFICATIONS					
MTBF	Io=80% of Io, max; Ta=25°C, airflow rate=300FLM		5.8		M hours
Weight			12.1		grams
Over-Temperature Shutdown	Refer to figure 19 for measuring point		128		°C

Note1: For applications with higher output capacitive load, please contact Delta

ELECTRICAL CHARACTERISTICS CURVES
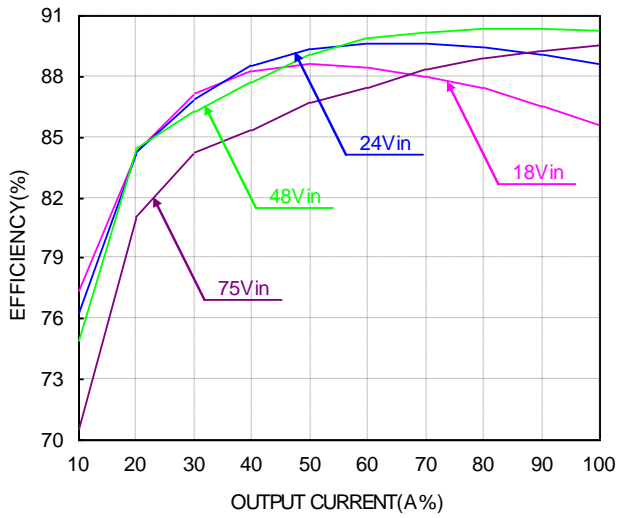
Figure 1: *Efficiency vs. load current for minimum, nominal, and maximum input voltage at 25°C*
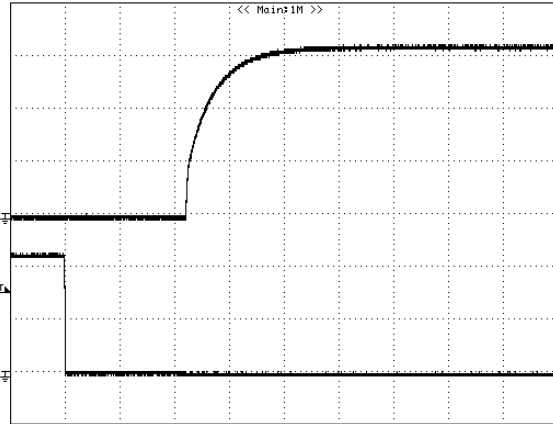*18V~36Vin, Io,max is 12A, 36V~75Vin, Io,max is 15A*
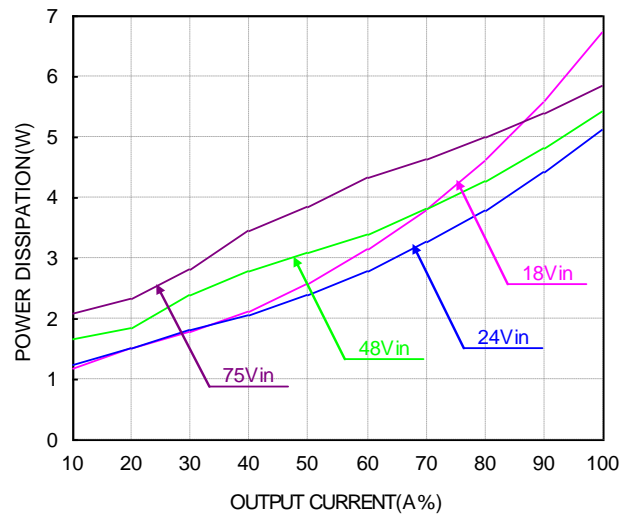
Figure 2: *Power dissipation vs. load current for minimum, nominal, and maximum input voltage at 25°C*
18V~36Vin, Io,max is 12A, 36V~75Vin, Io,max is 15A
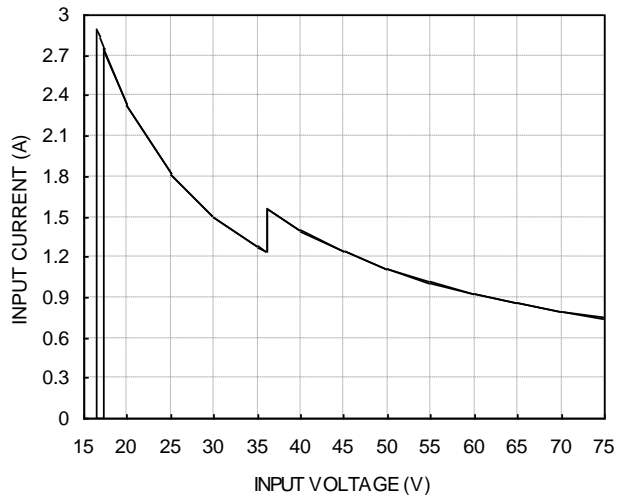
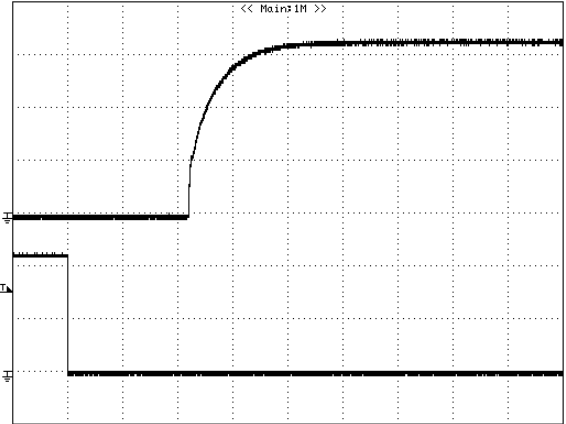**Figure 3:** *Typical full load input characteristics at room temperature*

V36SE3R315_10252013

ELECTRICAL CHARACTERISTICS CURVES

For Negative Remote On/Off Logic


Figure 4: *Turn-on transient at full rated load current (resistive load) (10 ms/div). Vin=48V. Top Trace: Vout, 1.0V/div; Bottom Trace: ON/OFF input, 2V/div*

Figure 5: *Turn-on transient at zero load current (10 ms/div). Vin=48V. Top Trace: Vout: 1.0V/div, Bottom Trace: ON/OFF input, 2V/div*
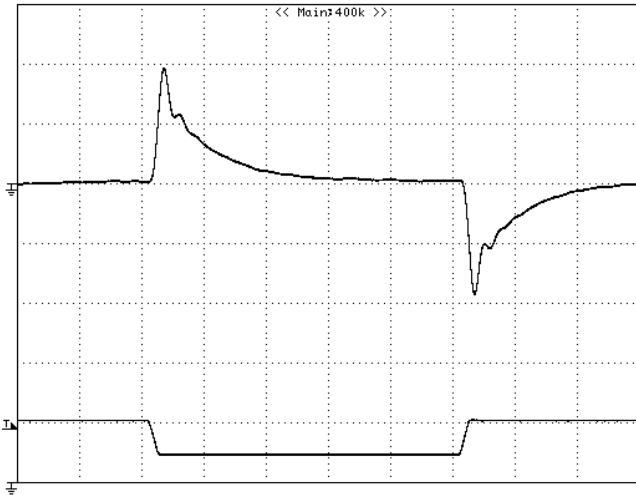

Figure 6: *Output voltage response to step-change in load current (50%-25%-50% of Io, max; di/dt = 0.1A/µs; Vin is 24v). Load cap: 10µF tantalum capacitor and 1µF ceramic capacitor. Top Trace: Vout (50mV/div, 200us/div), Bottom Trace: Iout (5A/div). Scope measurement should be made using a BNC cable (length shorter than 20 inches). Position the load between 51 mm to 76 mm (2 inches to 3 inches) from the module.*
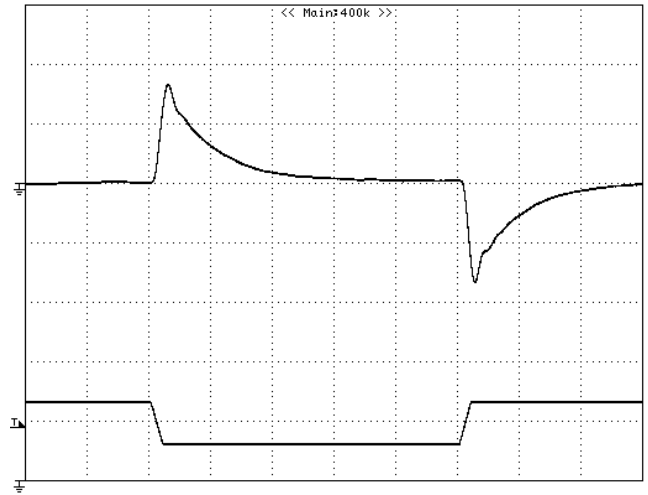

Figure 7: *Output voltage response to step-change in load current (50%-25%-50% of Io, max; di/dt = 0.1A/µs; Vin is 48v). Load cap: 10µF tantalum capacitor and 1µF ceramic capacitor. Top Trace: Vout (50mV/div, 200us/div), Bottom Trace: Iout (5A/div). Scope measurement should be made using a BNC cable (length shorter than 20 inches). Position the load between 51 mm to 76 mm (2 inches to 3 inches) from the module.*

ELECTRICAL CHARACTERISTICS CURVES
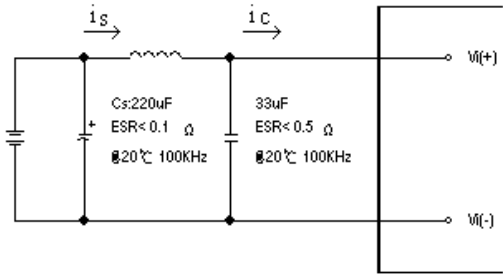
Figure 8: *Test set-up diagram showing measurement points for Input Terminal Ripple Current and Input Reflected Ripple Current.*
*Note: Measured input reflected-ripple current with a simulated source Inductance (L_{TEST}) of 12 µH. Capacitor Cs offset possible battery impedance. Measure current as shown above*
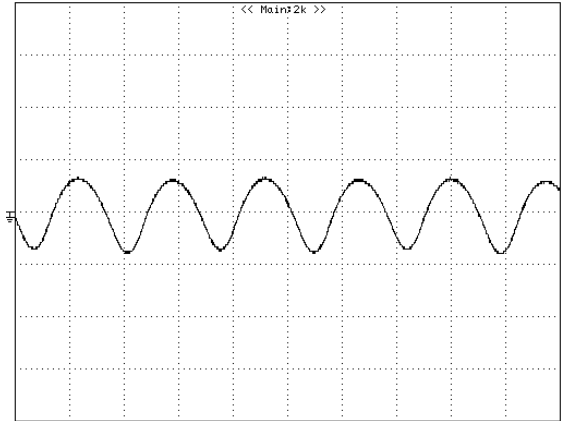

Figure 9: *Input Terminal Ripple Current, i_c, at full rated output current and nominal input voltage (Vin=48v) with 12µH source impedance and 33µF electrolytic capacitor (200 mA/div, 1us/div)*
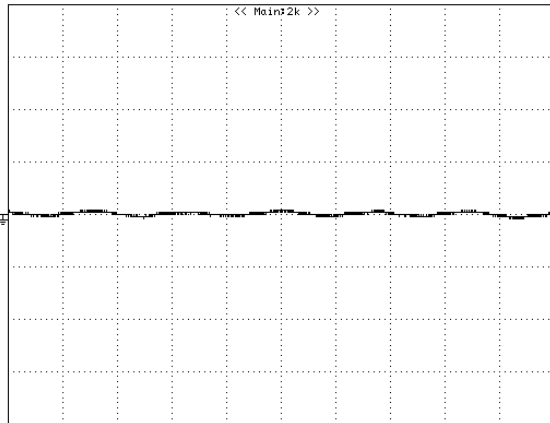


Figure 10: *Input reflected ripple current, i_s, through a 12µH source inductor at nominal input voltage (vin=48v) and rated load current (20 mA/div, 1us/div)*
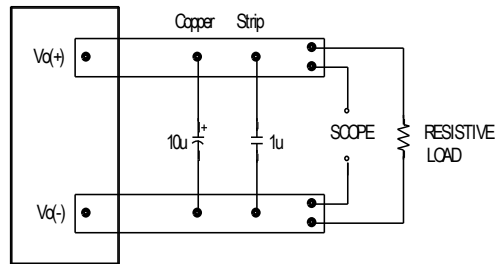
Figure 11: *Output voltage noise and ripple measurement test setup*
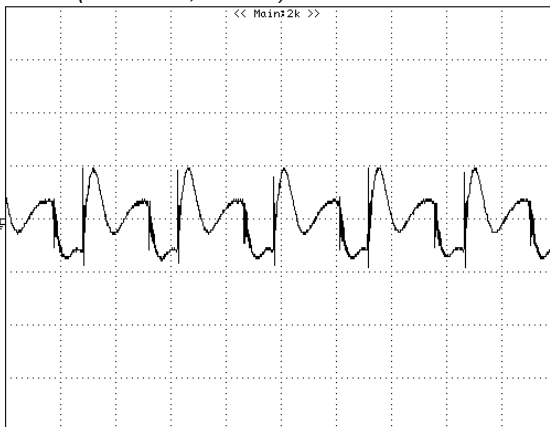
Figure 12: *Output voltage ripple at nominal input voltage (vin=48v) and rated load current (Io=15A) (50 mV/div, 1us/div).Load capacitance: 1µF ceramic capacitor and 100µF tantalum capacitor. Bandwidth: 20 MHz. Scope measurements should be made using a BNC cable (length shorter than 20 inches). Position the load between 51 mm to 76 mm (2 inches to 3 inches) from the module*
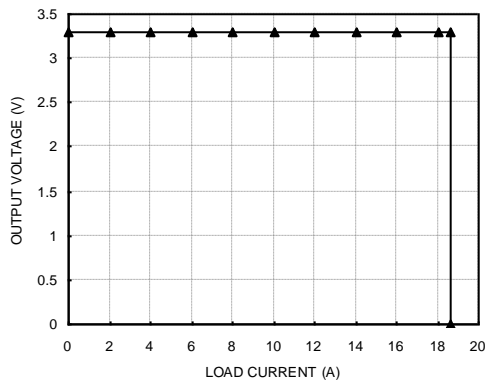
Figure 13: *Output voltage vs. load current showing typical current limit curves and converter shutdown points (Vin=48v)*

V36SE3R315_10252013

DESIGN CONSIDERATIONS

Input Source Impedance

The impedance of the input source connecting to the DC/DC power modules will interact with the modules and affect the stability. A low ac-impedance input source is recommended. If the source inductance is more than a few µH, we advise adding a 10 to 100 µF electrolytic capacitor (ESR < 0.7 Ω at 100 kHz) mounted close to the input of the module to improve the stability.

Layout and EMC Considerations

Delta's DC/DC power modules are designed to operate in a wide variety of systems and applications. For design assistance with EMC compliance and related PWB layout issues, please contact Delta's technical support team. An external input filter module is available for easier EMC compliance design. Customers could refer to the Delta Filter Module datasheets (for example, FL75L07A) for application needs or contact Delta's technical support team.

Safety Considerations

The power module must be installed in compliance with the spacing and separation requirements of the end-user's safety agency standard, i.e., UL60950-1, CAN/CSA-C22.2, No. 60950-1 and EN60950-1+A11 and IEC60950-1, if the system in which the power module is to be used must meet safety agency requirements.

Basic insulation based on 75 Vdc input is provided between the input and output of the module for the purpose of applying insulation requirements when the input to this DC-to-DC converter is identified as TNV-2 or SELV. An additional evaluation is needed if the source is other than TNV-2 or SELV.

When the input source is SELV circuit, the power module meets SELV (safety extra-low voltage) requirements. If the input source is a hazardous voltage which is greater than 60 Vdc and less than or equal to 75 Vdc, for the module's output to meet SELV requirements, all of the following must be met:

- The input source must be insulated from the ac mains by reinforced or double insulation.

- The input terminals of the module are not operator accessible.

- If the metal baseplate / heatspreader is grounded the output must be also grounded, one Vi pin and one Vo pin shall also be grounded.

- A SELV reliability test is conducted on the system where the module is used, in combination with the module, to ensure that under a single fault, hazardous voltage does not appear at the module's output.

When installed into a Class II equipment (without grounding), spacing consideration should be given to the end-use installation, as the spacing between the module and mounting surface have not been evaluated.

The power module has extra-low voltage (ELV) outputs when all inputs are ELV.

This power module is not internally fused. To achieve optimum safety and system protection, an input line fuse is highly recommended. The safety agencies require a normal-blow fuse with 5A maximum rating to be installed in the ungrounded lead. A lower rated fuse can be used based on the maximum inrush transient energy and maximum input current.

Soldering and Cleaning Considerations

Post solder cleaning is usually the final board assembly process before the board or system undergoes electrical testing. Inadequate cleaning and/or drying may lower the reliability of a power module and severely affect the finished circuit board assembly test. Adequate cleaning and/or drying is especially important for un-encapsulated and/or open frame type power modules. For assistance on appropriate soldering and cleaning procedures, please contact Delta's technical support team.

FEATURES DESCRIPTIONS

Over-Current Protection

The modules include an internal output over-current protection circuit, which will endure current limiting for an unlimited duration during output overload. If the output current exceeds the OCP set point, the modules will automatically shut down, and enter hiccup mode or latch mode, which is optional.

For hiccup mode, the module will try to restart after shutdown. If the over current condition still exists, the module will shut down again. This restart trial will continue until the over-current condition is corrected.

For latch mode, the module will latch off once it shutdown. The latch is reset by either cycling the input power or by toggling the on/off signal for one second.

Over-Voltage Protection

The modules include an internal output over-voltage protection circuit, which monitors the voltage on the output terminals. If this voltage exceeds the over-voltage set point, the module will shut down, and enter in hiccup mode or latch mode, which is optional.

For hiccup mode, the module will try to restart after shutdown. If the over voltage condition still exists, the module will shut down again. This restart trial will continue until the over-voltage condition is corrected.

For latch mode, the module will latch off once it shutdown. The latch is reset by either cycling the input power or by toggling the on/off signal for one second.

Over-Temperature Protection

The over-temperature protection consists of circuitry that provides protection from thermal damage. If the temperature exceeds the over-temperature threshold the module will shut down, and enter in hiccup mode or latch mode, which is optional.

For hiccup mode, the module will try to restart after shutdown. If the over temperature condition still exists, the module will shut down again. This restart trial will continue until the over-temperature condition is corrected.

For latch mode, the module will latch off once it shutdown. The latch is reset by either cycling the input power or by toggling the on/off signal for one second.

Remote On/Off

The remote on/off feature on the module can be either negative or positive logic. Negative logic turns the module on during a logic low and off during a logic high. Positive logic turns the modules on during a logic high and off during a logic low.

Remote on/off can be controlled by an external switch between the on/off terminal and the Vi(-) terminal. The switch can be an open collector or open drain.

For negative logic if the remote on/off feature is not used, please short the on/off pin to Vi(-). For positive logic if the remote on/off feature is not used, please leave the on/off pin floating.
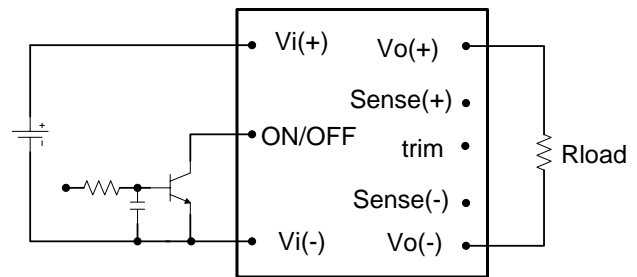

Figure 14: *Remote on/off implementation*

Remote Sense

Remote sense compensates for voltage drops on the output by sensing the actual output voltage at the point of load. The voltage between the remote sense pins and the output terminals must not exceed the output voltage sense range given here:

[Vo(+) − Vo(–)] − [SENSE(+) − SENSE(–)] ≤ 10% × Vout

This limit includes any increase in voltage due to remote sense compensation and output voltage set point adjustment (trim).
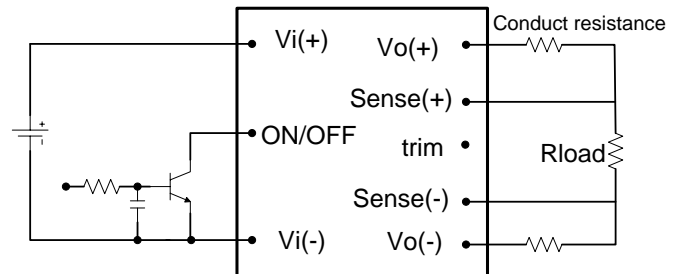

Figure 15: *Effective circuit configuration for remote sense operation*

FEATURES DESCRIPTIONS (CON.)

If the remote sense feature is not used to regulate the output at the point of load, please connect SENSE(+) to Vo(+) and SENSE(−) to Vo(−) at the module.

The output voltage can be increased by both the remote sense and the trim; however, the maximum increase is the larger of either the remote sense or the trim, not the sum of both.

When using remote sense and trim, the output voltage of the module is usually increased, which increases the power output of the module with the same output current.

Care should be taken to ensure that the maximum output power does not exceed the maximum rated power.

Output Voltage Adjustment (TRIM)

To increase or decrease the output voltage set point, connect an external resistor between the TRIM pin and either the SENSE(+) or SENSE(-). The TRIM pin should be left open if this feature is not used.
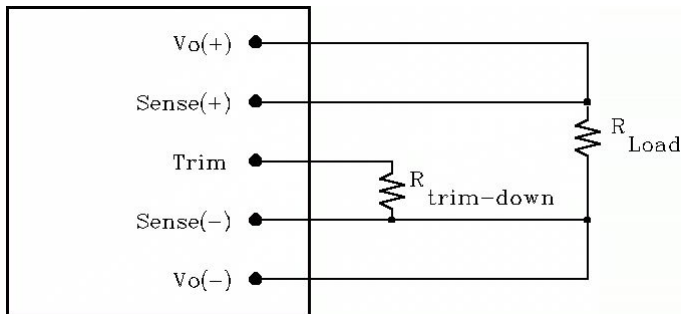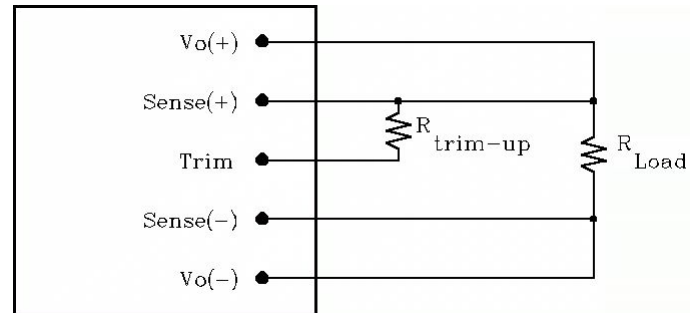

Figure 16: Circuit configuration for trim-down (decrease output voltage)

If the external resistor is connected between the TRIM and SENSE (-) pins, the output voltage set point decreases (Fig. 18). The external resistor value required to obtain a percentage of output voltage change $\triangle$% is defined as:

$$Rtrim-down=\left[\frac{511}{\Delta}-10.22\right](K\Omega)$$

Ex. When Trim-down -20% (3.30V×0.8=2.64V)

$$Rtrim-down=\left[\frac{511}{20}-10.22\right](K\Omega)=15.33(K\Omega)$$

Figure 17: Circuit configuration for trim-up (increase output voltage)

If the external resistor is connected between the TRIM and SENSE (+) the output voltage set point increases (Fig. 19). The external resistor value required to obtain a percentage output voltage change $\triangle$% is defined as:

$$Rtrim-up=\frac{5.11Vo(100+\Delta)}{1.24\Delta}-\frac{511}{\Delta}-10.22(K\Omega)$$

Ex. When Trim-up +10% (3.3V×1.1=3.63V)

$$Rtrim-up=\frac{5.11\times3.3\times(100+10)}{1.24\times10}-\frac{511}{10}-10.22=88.27(K\Omega)$$

The output voltage can be increased by both the remote sense and the trim, however the maximum increase is the larger of either the remote sense or the trim, not the sum of both.

When using remote sense and trim, the output voltage of the module is usually increased, which increases the power output of the module with the same output current.

Care should be taken to ensure that the maximum output power of the module remains at or below the maximum rated power.

THERMAL CONSIDERATIONS

Thermal management is an important part of the system design. To ensure proper, reliable operation, sufficient cooling of the power module is needed over the entire temperature range of the module. Convection cooling is usually the dominant mode of heat transfer.

Hence, the choice of equipment to characterize the thermal performance of the power module is a wind tunnel.

Thermal Testing Setup

Delta's DC/DC power modules are characterized in heated vertical wind tunnels that simulate the thermal environments encountered in most electronics equipment. This type of equipment commonly uses vertically mounted circuit cards in cabinet racks in which the power modules are mounted.

The following figure shows the wind tunnel characterization setup. The power module is mounted on a test PWB and is vertically positioned within the wind tunnel. The space between the neighboring PWB and the top of the power module is constantly kept at 6.35mm (0.25'').
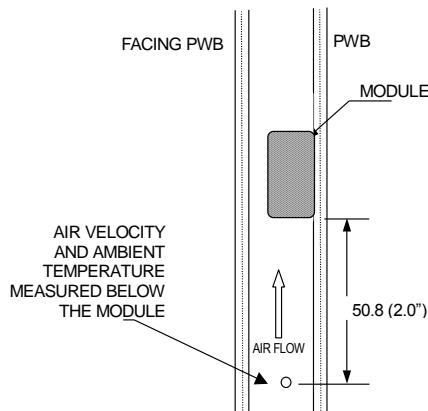
Note: Wind Tunnel Test Setup Figure Dimensions are in millimeters and (Inches)

Figure 18: Wind tunnel test setup

Thermal Derating

Heat can be removed by increasing airflow over the module. To enhance system reliability, the power module should always be operated below the maximum operating temperature. If the temperature exceeds the maximum module temperature, reliability of the unit may be affected.
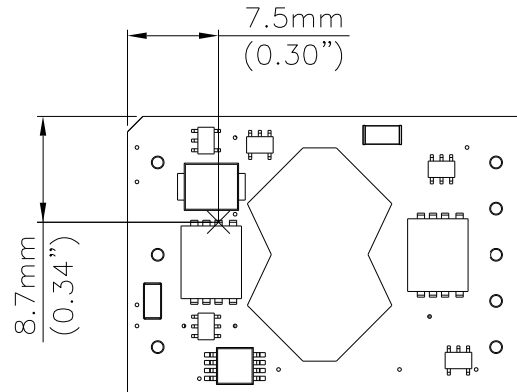
THERMAL CURVES

Figure 19: Temperature measurement location
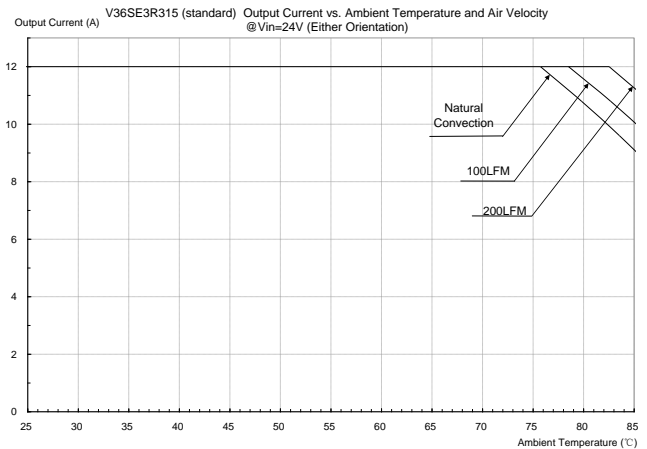* The allowed maximum hot spot temperature is defined at 118℃.

Figure 20: Output current vs. ambient temperature and air velocity @ V_{in}=24V (Either Orientation)
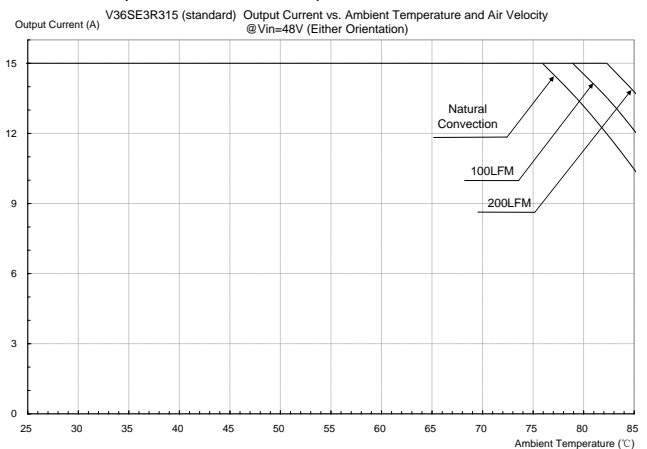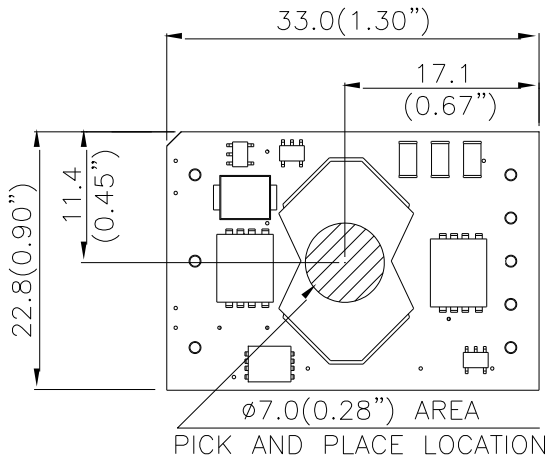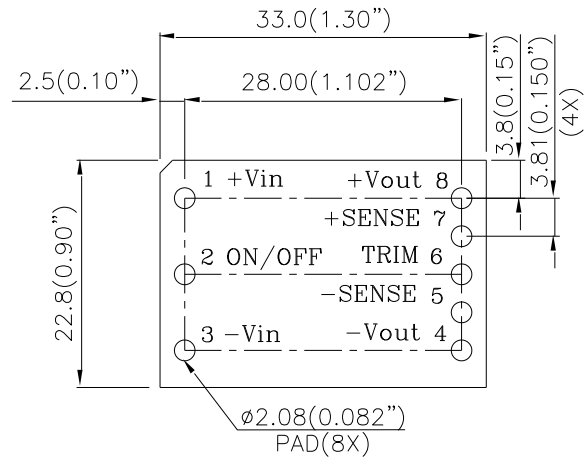

Figure 21: Output current vs. ambient temperature and air velocity @ V_{in}=48V (Either Orientation)

PICK AND PLACE LOCATION

33.0(1.30")

17.1
(0.67")

22.8(0.90")

11.4
(0.45")
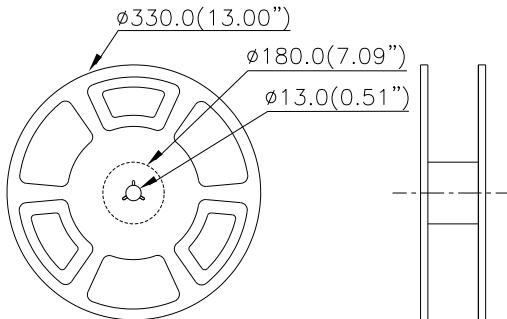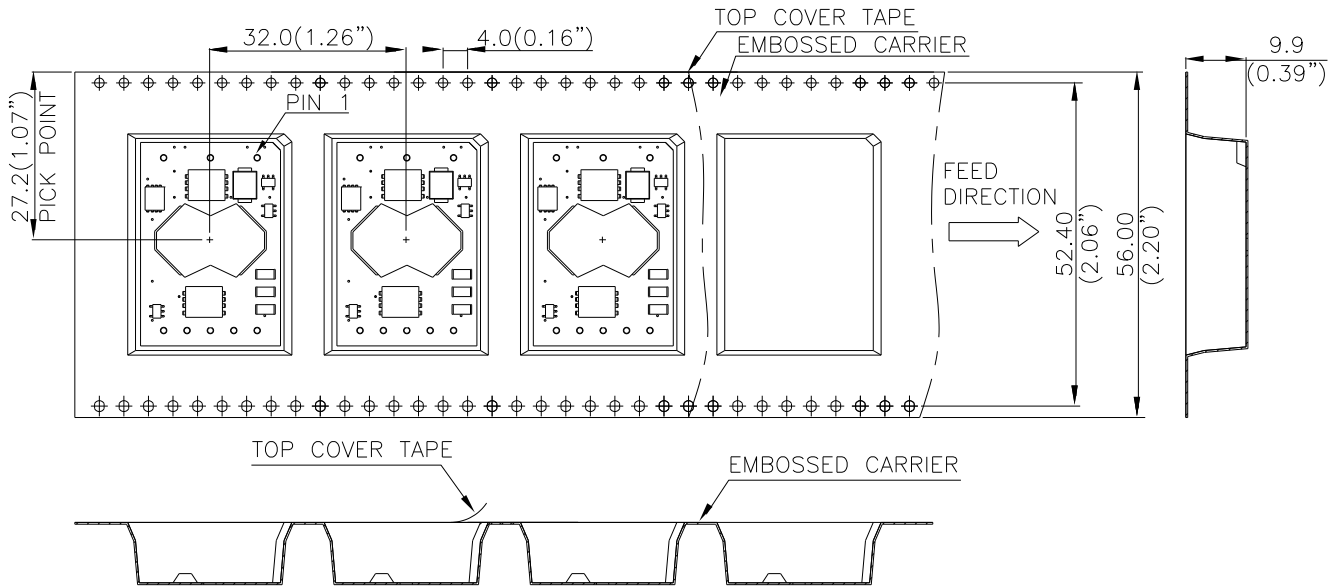
Ø7.0(0.28") AREA
PICK AND PLACE LOCATION

NOTES:
DIMENSIONS ARE IN MILLIMETERS AND (INCHES)
TOLERANCES: X.Xmm±0.5mm(X.XX in.±0.02 in.)
X.XXmm±0.25mm(X.XXX in.±0.010 in.)

RECOMMENDED PAD LAYOUT (SMD)

33.0(1.30")

2.5(0.10")   28.00(1.102")

3.8(0.15")
3.81(0.150")
(4X)

22.8(0.90")

1 +Vin	+Vout 8
	+SENSE 7
2 ON/OFF	TRIM 6
	−SENSE 5
3 −Vin	−Vout 4

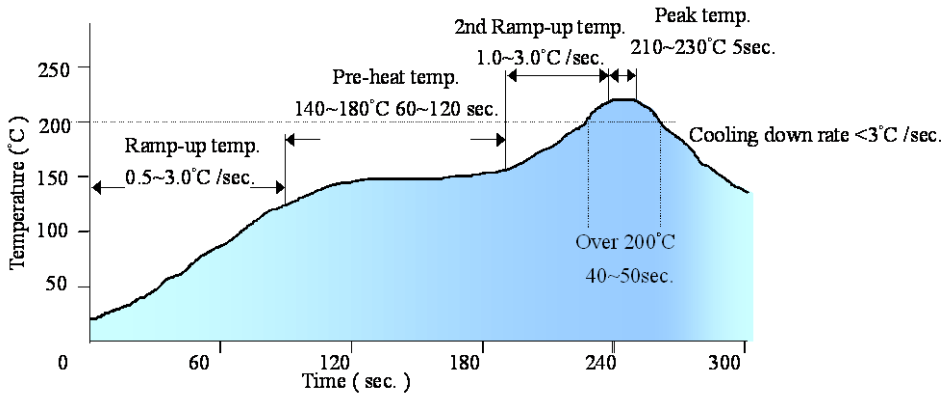Ø2.08(0.082")
PAD(8X)

RECOMENDED P.W.B PAD LAYOUT
NOTES:
DIMENSIONS ARE IN MILLIMETERS AND (INCHES)
TOLERANCES: X.Xmm±0.5mm(X.XX in.±0.02 in.)
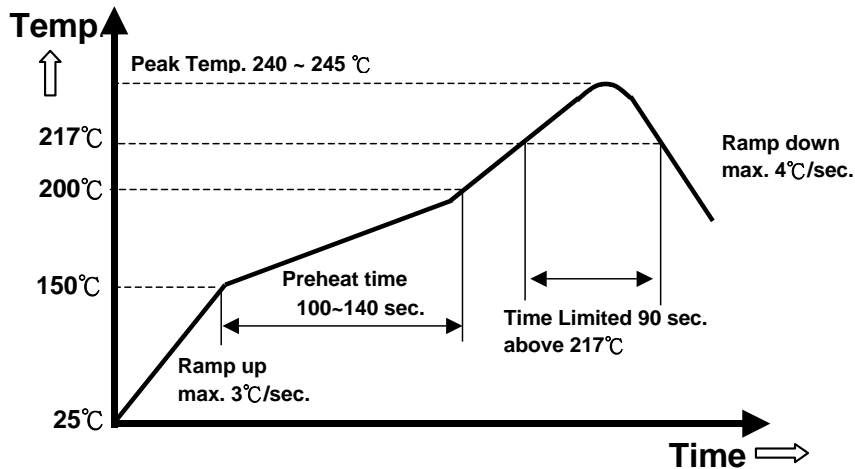X.XXmm±0.25mm(X.XXX in.±0.010 in.)

SURFACE-MOUNT TAPE & REEL

32.0(1.26")   4.0(0.16")

TOP COVER TAPE
EMBOSSED CARRIER

9.9
(0.39")

27.2(1.07")
PICK POINT

PIN 1

FEED
DIRECTION

52.40
(2.06")

56.00
(2.20")

TOP COVER TAPE

EMBOSSED CARRIER

Ø330.0(13.00")
Ø180.0(7.09")
Ø13.0(0.51")

NOTES
CONFORMS TO EIA−481 STANDARD
MODULES ARE SHIPPED IN QUANTITIES OF 100 PER REEL.
ALL DIMENSIONS ARE IN MILLIMETERS ADN INCHS
TOLLERANCE: X.Xmm±0.5mm(X.XX±0.02in.)
X.XXmm±0.25mm(X.XX±0.010in.)

LEADED (Sn/Pb) PROCESS RECOMMENDED TEMPERATURE PROFILE

Note: The temperature refers to the pin of V36SE, measured on the pin +Vout joint.
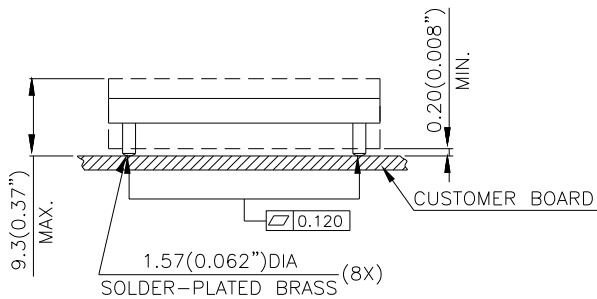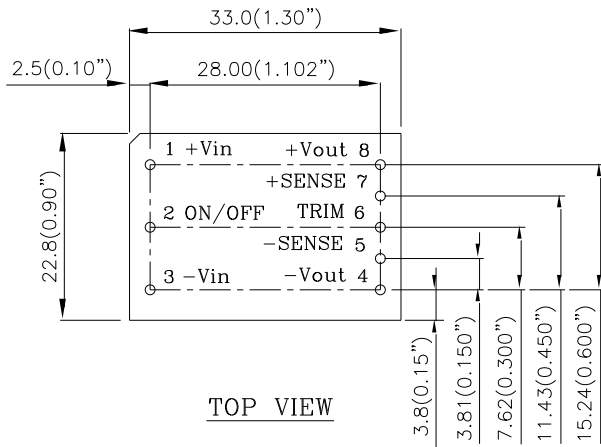
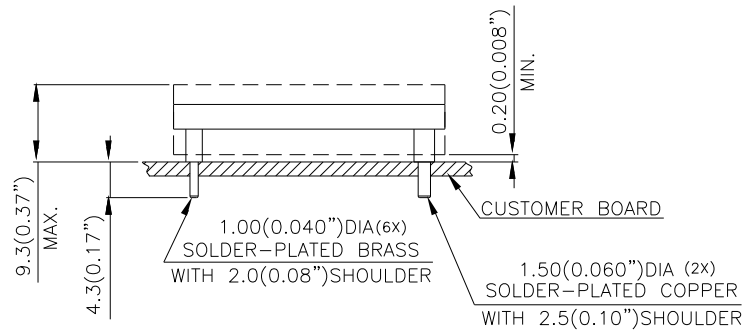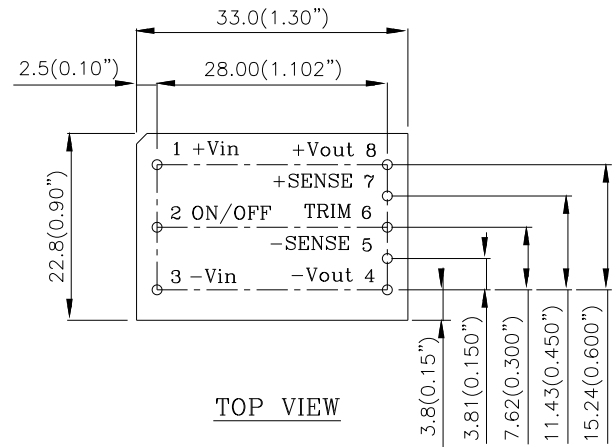# LEAD FREE (SAC) PROCESS RECOMMENDED TEMPERATURE PROFILE

Note: The temperature refers to the pin of V36SE, measured on the pin +Vout joint.

V36SE3R315_10252013

MECHANICAL DRAWING

Surface-mount module

33.0(1.30")

28.00(1.102")

2.5(0.10")

22.8(0.90")

```
1 +Vin      +Vout 8
            +SENSE 7
2 ON/OFF    TRIM 6
            -SENSE 5
3 -Vin      -Vout 4
```

3.8(0.15")
3.81(0.150")
7.62(0.300")
11.43(0.450")
15.24(0.600")

TOP VIEW

0.20(0.008") MIN.

9.3(0.37") MAX.

CUSTOMER BOARD

0.120

1.57(0.062")DIA
SOLDER-PLATED BRASS (8X)

SIDE VIEW

Through-hole module

33.0(1.30")

28.00(1.102")

2.5(0.10")

22.8(0.90")

```
1 +Vin      +Vout 8
            +SENSE 7
2 ON/OFF    TRIM 6
            -SENSE 5
3 -Vin      -Vout 4
```

3.8(0.15")
3.81(0.150")
7.62(0.300")
11.43(0.450")
15.24(0.600")

TOP VIEW

0.20(0.008") MIN.

9.3(0.37") MAX.

4.3(0.17")

1.00(0.040")DIA(6X)
SOLDER-PLATED BRASS
WITH 2.0(0.08")SHOULDER

CUSTOMER BOARD

1.50(0.060")DIA (2X)
SOLDER-PLATED COPPER
WITH 2.5(0.10")SHOULDER

SIDE VIEW

NOTES:
DIMENSIONS ARE IN MILLIMETERS AND (INCHES)
TOLERANCES: X.Xmm±0.5mm(X.XX in.±0.02 in.)
X.XXmm±0.25mm(X.XXX in.±0.010 in.)

Pin No.	Name	Function
1	+Vin	Positive input voltage
2	ON/OFF	Remote ON/OFF
3	-Vin	Negative input voltage
4	-Vout	Negative output voltage
5	-SENSE	Negative remote sense
6	TRIM	Output voltage trim
7	+SENSE	Positive remote sense
8	+Vout	Positive output voltage

PART NUMBERING SYSTEM

V	36	S	E	3R3	15	N	R	F	A
Type of Product	Input Voltage	Number of Outputs	Product Series	Output Voltage	Output Current	ON/OFF Logic	Pin Length/Type		Option Code
V - 1/16 Brick	36 - 18V~75V	S - Single	E - Regular	3R3 - 3.3V	15 - 15A	N- Negative P- Positive	M - SMD N - 0.145" R - 0.170" K – 0.110"	Space - RoHS 5/6 F - RoHS 6/6 (Lead Free)	A - Standard Functions

MODEL LIST

MODEL NAME	INPUT		OUTPUT		EFF @ 100% LOAD
V36SE3R315NRFA	18V~75V	3.9A	3.3V	12A (18~36Vin) & 15A (36~75Vin)	88.5% @ 24Vin, 90.5% @ 48Vin
V36SE3R315NMFA	18V~75V	3.9A	3.3V	12A (18~36Vin) & 15A (36~75Vin)	88.5% @ 24Vin, 90.5% @ 48Vin
V36SE3R315NNFA	18V~75V	3.9A	3.3V	12A (18~36Vin) & 15A (36~75Vin)	88.5% @ 24Vin, 90.5% @ 48Vin

Default remote on/off logic is negative and pin length is 0.170"

WARRANTY

Delta offers a two (2) year limited warranty. Complete warranty information is listed on our web site or is available upon request from Delta.

V36SE3R315_10252013

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Isolated DC/DC Converters *category:*

Click to view products by Delta *manufacturer:*

Other Similar products are found below :

ESM6D044440C05AAQ FMD15.24G PSL486-7LR Q48T30020-NBB0 JAHW100Y1 SPB05C-12 SQ24S15033-PS0S 18952 19-130041 CE-1003 CE-1004 GQ2541-7R RDS180245 MAU228 J80-0041NL DFC15U48D15 XGS-0512 XGS-1205 XGS-1212 XGS-2412 XGS-2415 XKS-1215 06322 NCT1000N040R050B SPB05B-15 SPB05C-15 L-DA20 DCG40-5G QME48T40033-PGB0 XKS-2415 XKS-2412 XKS-1212 XKS-1205 XKS-0515 XKS-0505 XGS-2405 XGS-1215 XGS-0515 PS9Z-6RM4 73-551-5038I AK1601-9RT VI-N61-CM VI-R5022-EXWW PSC128-7iR RPS8-350ATX-XE DAS1004812 PQA30-D24-S24-DH VI-M5F-CQ VI-LN2-EW VI-PJW01-CZY