

**1.5 Watt****24 Pin DIL Package V  
4:1 Input Range - Metal Case**

- o Wide Input Range
- o Regulated Single & Dual Output
- o Continuous Short Circuit Protection
- o 1500 VDC I/O-Isolation
- o Option Suffix „H“ 3500 VDC I/O-Isolation

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT		Eff. %	CAPACITIVE LOAD <sup>1)</sup>
				NO LOAD	FULL LOAD		
1.5VRS24X3.3M	9-36 VDC	3.3 VDC	454 mA	15 mA	83.3 mA	75	330 µF
1.5VRS24X5M		5 VDC	300 mA		82.2 mA	76	220 µF
1.5VRS24X9M		9 VDC	167 mA		80.1 mA	78	68 µF
1.5VRS24X12M		12 VDC	125 mA				47 µF
1.5VRS24X15M		15 VDC	100 mA				22 µF
1.5VRS24X24M		24 VDC	63 mA				10 µF
1.5VRD24X3.3M		±3.3 VDC	±227 mA		83.3 mA	75	±100 µF
1.5VRD24X5M		±5 VDC	±150 mA		82.2 mA	76	
1.5VRD24X9M		±9 VDC	±84 mA		80.1 mA	78	±33 µF
1.5VRD24X12M		±12 VDC	±63 mA				±22 µF
1.5VRD24X15M		±15 VDC	±50 mA				±10 µF
1.5VRD24X24M		±24 VDC	±32 mA				
1.5VRS48X3.3M	18-72 VDC	3.3 VDC	454 mA	12 mA	41.6 mA	75	330 µF
1.5VRS48X5M		5 VDC	300 mA		41.1 mA	76	220 µF
1.5VRS48X9M		9 VDC	167 mA		40.1 mA	78	68 µF
1.5VRS48X12M		12 VDC	125 mA				47 µF
1.5VRS48X15M		15 VDC	100 mA				22 µF
1.5VRS48X24M		24 VDC	63 mA				10 µF
1.5VRD48X3.3M		±3.3 VDC	±227 mA		41.6 mA	75	±100 µF
1.5VRD48X5M		±5 VDC	±150 mA		41.1 mA	76	
1.5VRD48X9M		±9 VDC	±84 mA		40.1 mA	78	±33 µF
1.5VRD48X12M		±12 VDC	±63 mA				±22 µF
1.5VRD48X15M		±15 VDC	±50 mA				±10 µF
1.5VRD48X24M		±24 VDC	±32 mA				

NOTE:

1. Tested by nominal input voltage and constant resistor load.

**SPECIFICATIONS**

All Specifications Typical At Nominal Line, Full Load, and 25°C Unless Otherwise Noted

**INPUT SPECIFICATIONS**

Input Voltage Range	4:1
Input Filter	Pi Type
Input Reflected Ripple Current <sup>1)</sup>	35 mA p-p

**OUTPUT SPECIFICATIONS**

Voltage Accuracy	±1% max.
Voltage Balance (Dual Output)	±1%
Temperature Coefficient	±0.02%/°C max.
Ripple and Noise, 20MHz BW <sup>2)</sup>	60 mV p-p max.
Short Circuit Protection	Continuous
Short Circuit Restart	Automatic
Line Regulation	±0.5%
Load Regulation	±0.5% ±1.5%

3.3 V / ±3.3 V Model

## NOTE:

1. Measured Input reflected ripple current with a simulated source inductance of 12 µH.
2. Ripple & Noise measured with a 1 µF ceramic capacitor.

**SPECIFICATIONS**

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**GENERAL SPECIFICATION**

Efficiency		see table
I/O Isolation Voltage (3 sec.)	Metal Case	1000 VDC
Suffix "P"	Plastic Case	1500 VDC
Suffix "H"		3500 VDC
Isolation Resistance		1000 Mohms min.
Isolation Capacitance		470 pF
Switching Frequency		266 kHz typ.
Operating Temperature Range		-40°C to +85°C (see Derating Curve)
Case Temperature		+100°C max.
Storage Temperature Range		-40°C to +125°C
Cooling		Natural Convection
Humidity		95% rel H
Case Material		Nickel-Coated Copper
Case Material Suffix "P"		Non-Conductive Black Plastic (UL94V-0 rated)
Base Material		Non-Conductive Black Plastic (UL94V-0 rated)
Pin Material		Ø0.5 mm Brass Solder-Coated
Potting Material		Epoxy (UL94V-0 rated)
Dimensions		31.75 x 20.32 x 10.16 mm (1.25 x 0.8 x 0.4 Inches)
Weight	Metal Case	17.0 g
Suffix "P"	Plastic Case	13.5 g
MTBF (MIL-HDBK-217F)		<1121 Mhrs
Safety Standard (designed to meet)		IEC60950-1

**ABSOLUTE SPECIFICATIONS**

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage (100 mS)	24 V Models	40 VDC max.
	48 V Models	80 VDC max.
Soldering Temperature (1.5 mm from case 10 sec. max.)		+260°C

## NOTE:

Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.

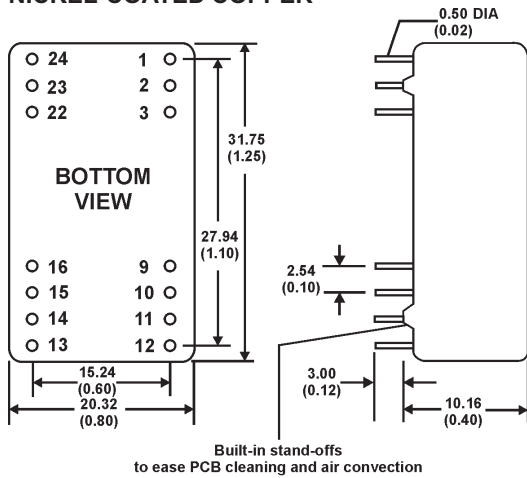
**SPECIFICATIONS**

All Specifications Typical At Nominal Line, Full Load, and 25°C Unless Otherwise Noted

**MECHANICAL SPECIFICATIONS**

**CASE "V"**

**NICKEL-COATED COPPER**

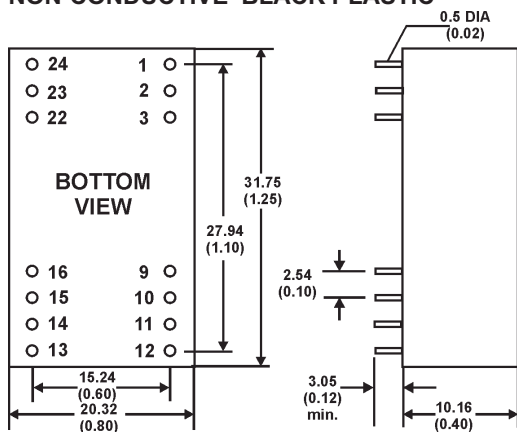


- All Dimensions in mm (Inches).  
 1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)  
 2. Pin pitch tolerance: ±0.35 (±0.014)  
 3. Case Tolerance: ±0.5 (±0.02)

**Metal/Plastic Case**

PIN CONNECTIONS		
PIN	SINGLE	DUAL
1 & 24	+INPUT	+INPUT
2 & 23	NOT CONNECTED	-OUTPUT
3 & 22	NOT CONNECTED	COMMON
9 & 16	NO PIN	NO PIN
10 & 15	-OUTPUT	COMMON
11 & 14	+OUTPUT	+OUTPUT
12 & 13	-INPUT	-INPUT

**NON-CONDUCTIVE BLACK PLASTIC**



- All Dimensions in mm (Inches)  
 1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)  
 2. Pin pitch tolerance: ±0.35 (±0.014)  
 3. Case Tolerance: ±0.5 (±0.02)

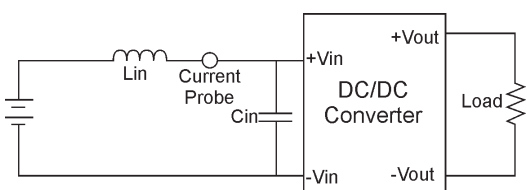
**Metal/Plastic Case**

PIN CONNECTIONS - SUFFIX "H"		
PIN	SINGLE	DUAL
1 & 24	NO PIN	NO PIN
2 & 3	-INPUT	-INPUT
9	NO PIN	COMMON
10 & 15	NO PIN	NO PIN
11	NOT CONNECTED	-OUTPUT
12 & 13	NO PIN	NO PIN
14	+OUTPUT	+OUTPUT
16	-OUTPUT	COMMON
22 & 23	+INPUT	+INPUT

**TEST CONFIGURATIONS**

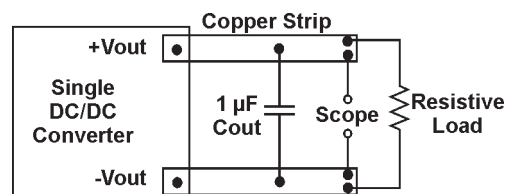
**Input Reflected Ripple Current Test Step**

Input reflected ripple current is measured through a source inductor  $L_{in}$  (12  $\mu$ H) and a source capacitor  $C_{in}$  (47  $\mu$ F, ESR < 1.0  $\Omega$  at 100 kHz) at nominal input and full load.



**Output Ripple & Noise Measurement Test**

Use a capacitor  $C_{out}$  (1.0  $\mu$ F) measurement. The Scope measurement bandwidth is 0-20 MHz.

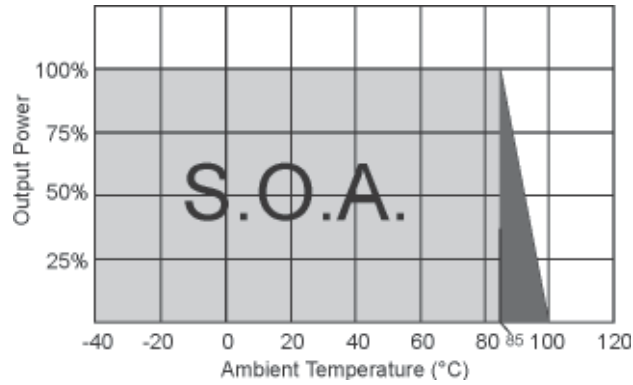


**SPECIFICATIONS**

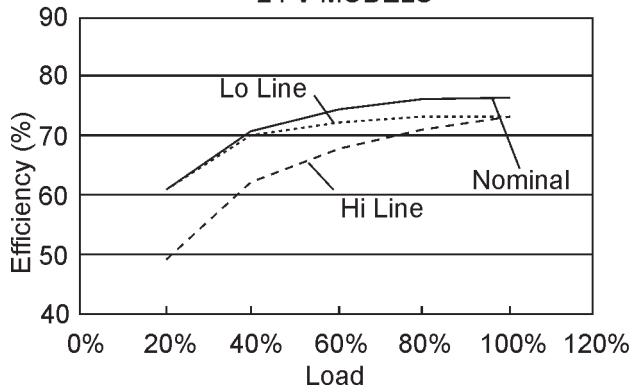
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**DIAGRAMS**

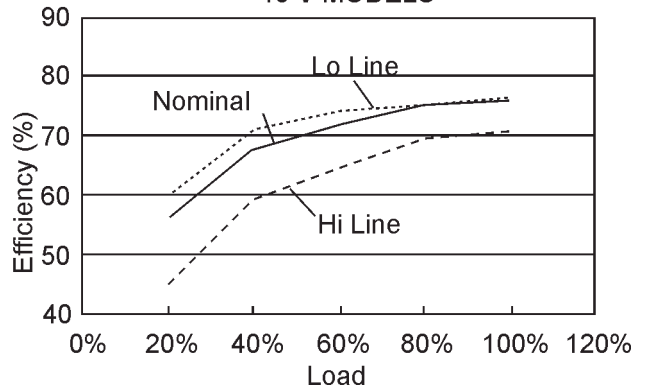
**Derating Diagram**



**EFFICIENCY VS OUTPUT CURRENT  
24 V MODELS**



**EFFICIENCY VS OUTPUT CURRENT  
48 V MODELS**



**NOTICE:**

The information in this document has been carefully checked. However, no responsibility is assumed for inaccuracies! Specifications can be changed without notice. The latest and most complete information can be found on our website.