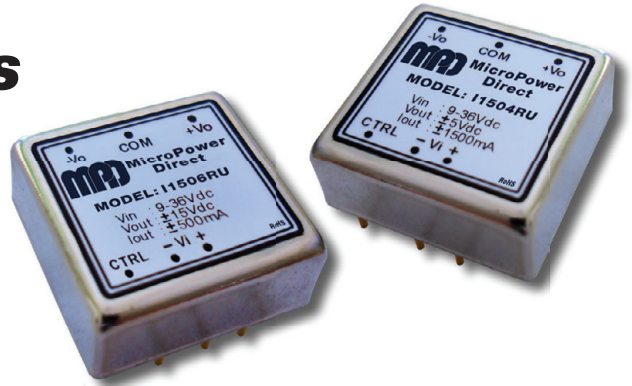


I1500RU Series

Ultra-Miniature 15W Wide 4:1 Input Range DC/DC Converters



Key Features:

- 15W Output Power
- 4:1 Input Range
- Ultra- Miniature Case
- Remote On/Off Control
- 1,600 VDC Isolation
- >560 kHour MTBF
- Standard Pin-Out

RoHS



Electrical Specifications

Specifications typical @ +25°C, nominal input voltage & rated output current, unless otherwise noted. Specifications subject to change without notice.

Input						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Input Voltage Range	24 VDC Input	9.0	24.0	36.0	VDC	
	48 VDC input	18.0	48.0	75.0		
Input Reflected Ripple Current			20		mA P - P	
Input Start Time			20		mS	
Input Filter	π (Pi) Filter					

Output						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Output Voltage Accuracy			±1.0		%	
Output Trim Range			±10.0		%	
Line Regulation	V _{IN} = Min to Max			±0.2	%	
Load Regulation, See Note 1	Single Output			±0.5	%	
	Dual Output			±1.0	%	
Ripple & Noise (20 MHz)	See Note 2			100	mV P - P	
Output Power Protection			170		%	
Transient Recovery Time , See Note 3	50% Load Step Change		250		μSec	
Transient Response Deviation				±3.0	%	
Temperature Coefficient			±0.02		%/°C	
Output Short Circuit	Continuous (Autorecovery)					

General						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Isolation Voltage, 60 Sec	Input - Output	1,600			VDC	
	Input/Output - Case	1,600				
Isolation Resistance		1,000			MΩ	
Isolation Capacitance				1,200	pF	
Switching Frequency			375		kHz	

Environmental			
Parameter	Standard	Criteria	Level
Radiated Emissions	EN 55022	Class A	
Conducted Emissions	See Note 4 EN 55022	Class A	
ESD	EN 61000-4-2	A	±6 kV/±8kV
RS	EN 61000-4-3	A	10V/m
EFT	See Note 4 EN 61000-4-4	A	±2 kV
Surge	See Note 4 EN 61000-4-5	A	±2 kV
CS	EN 61000-4-6	A	10 Vrms
PFMF	EN 61000-4-8	A	1A/m

Environmental						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Operating Temperature Range	Ambient	-40	+25	+85	°C	
	Case			+105		
Storage Temperature Range		-40		+105	°C	
Cooling	Free Air Convection					
Derating	See Curve					
Humidity	RH, Non-condensing			95	%	

Physical	
Case Size	See Mechanical Drawing (Page 2)
Case Material	Nickel Coated Copper With Non-Conductive Base (UL94-V0)
Weight	0.64 Oz (18g)

Reliability Specifications						
Parameter	Conditions	Min.	Typ.	Max.	Units	
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	560			kHours	

Absolute Maximum Ratings						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Input Voltage Surge (1 Sec)	24 VDC Input			50.0	VDC	
	48 VDC Input			100.0		
Lead Temperature	1.5 mm From Case For 10 Sec			260	°C	

Caution: Exceeding Absolute Maximum Ratings may damage the module. These are not continuous operating ratings.

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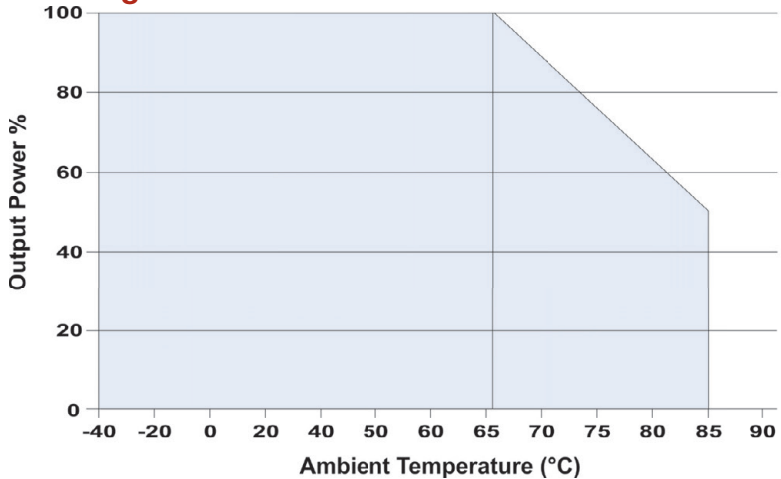
Model Number	Input				Output			Over Voltage Protection (VDC)	Efficiency (% Typ)	Capacitive Load (μ F Max)	Fuse Rating Slow-Blow (mA)
	Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA, Max)	Current (mA, Min)				
	Nominal	Range	Full-Load	No-Load							
I1501RU	24	9.0 - 36.0	647	15	3.3	4,000	0.0	3.9	86	1,000	3,000
I1502RU	24	9.0 - 36.0	727	15	5.0	3,000	0.0	6.2	87	1,000	4,000
I1503RU	24	9.0 - 36.0	747	15	12.0	1,300	0.0	15.0	88	330	4,000
I1504RU	24	9.0 - 36.0	710	15	15.0	1,000	0.0	18.0	89	220	4,000
I1505RU	24	9.0 - 36.0	744	15	\pm 5.0	\pm 1,500	\pm 0.0	\pm 6.2	85	\pm 470	4,000
I1506RU	24	9.0 - 36.0	718	15	\pm 12.0	\pm 625	\pm 0.0	\pm 15.0	88	\pm 220	4,000
I1507RU	24	9.0 - 36.0	710	15	\pm 15.0	\pm 500	\pm 0.0	\pm 18.0	89	\pm 100	4,000
I1511RU	48	18.0 - 75.0	331	10	3.3	4,000	0.0	3.9	84	1,000	1,500
I1512RU	48	18.0 - 75.0	368	10	5.0	3,000	0.0	6.2	86	1,000	2,000
I1513RU	48	18.0 - 75.0	378	10	12.0	1,300	0.0	15.0	87	330	2,000
I1514RU	48	18.0 - 75.0	360	10	15.0	1,000	0.0	18.0	88	220	2,000
I1515RU	48	18.0 - 75.0	376	10	\pm 5.0	\pm 1,500	\pm 0.0	\pm 6.2	84	\pm 470	2,000
I1516RU	48	18.0 - 75.0	363	10	\pm 12.0	\pm 625	\pm 0.0	\pm 15.0	87	\pm 220	2,000
I1517RU	48	18.0 - 75.0	359	10	\pm 15.0	\pm 500	\pm 0.0	\pm 18.0	88	\pm 100	2,000

Notes:

- Output load regulation is specified for a load change of 0% to 100%.
- When measuring output ripple, it is recommended that a 1 μ F ceramic capacitor be connected in parallel with a 10 μ F electrolytic capacitor from the +V_{OUT} pin to the -V_{OUT} pin for single output units and from each output to common for dual output units.
- Transient recovery is measured to within a 1% error band for a 25% load step change of 75% to 50% to 25%.
- All models meet the EMC requirements of EN 55022 (Conducted) Class A and EN 61000-4-4/EN 61000-4-5 Criteria A; with the minimum addition of external components. Contact the factory for recommended filter values.
- Operation at no-load will not damage the unit, but they may not meet all specifications.
- The On/Off Control input (Pin 3) is referenced to -V_{IN} (Pin 1). If it is not used, the control pin should be left open. Shorting Pin 3 and Pin 2 will shut the unit off. The off idle current is typically 5 mA.
- It is recommended that a fuse be used on the input of a power supply for protection. See the Model Selection table above for the correct rating.

	Min	Max
On	3.0 VDC	12.0 VDC
Off	0.0 VDC	1.2 VDC

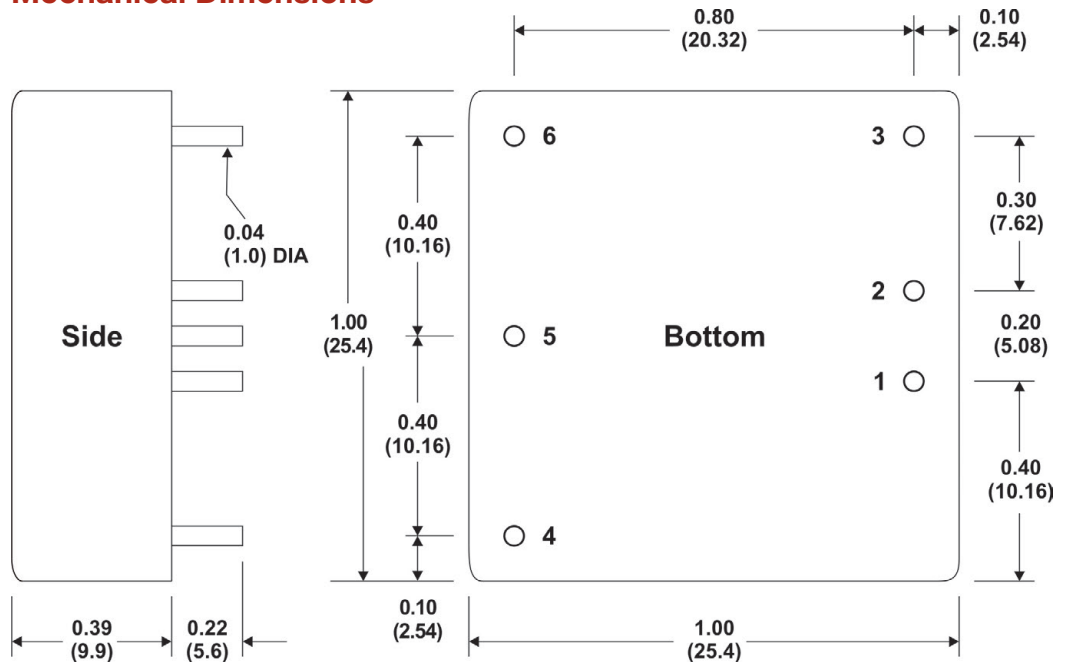
Derating Curve



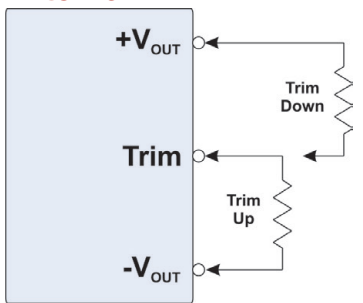
Pin Connections

Pin	Single	Dual
1	+V _{IN}	+V _{IN}
2	-V _{IN}	-V _{IN}
3	Control	Control
4	+V _{OUT}	+V _{OUT}
5	Trim	Common
6	-V _{OUT}	-V _{OUT}

Mechanical Dimensions



External Trim



The output voltage on single output models may be adjusted by approximately \pm 10%. To do so, external trim resistors should be connected as shown above.

Notes:

- All dimensions are typical in inches (mm)
- Tolerance x.xx = \pm 0.02 (\pm 0.5)
- Pin 1 is marked by a "dot" on the top of the unit



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