

- o Wide 2:1 Input Range
- o Regulated Output
- o 1000 VDC Isolation
3000 VDC Isolation add Suffix „H3“ (only for Plastic Case)
- o Single & Dual Outputs
- o Continuous Short Circuit Protection
- o Plastic Case Standard, add Suffix „M“ for Metal Case
- o For Remote ON/OFF Control add Suffix „C“

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT		INPUT CURRENT		%EFF	CAPACITIVE LOAD
			MIN. LOAD	FULL LOAD	NO LOAD	FULL LOAD		
2Z8RS5W3.3M	4.5-9 VDC	3.3 VDC	125 mA	500 mA	15 mA	492 mA	67	3300 µF
2Z8RS5W5M		5 VDC	100 mA	400 mA		571 mA	70	
2Z8RS5W9M		9 VDC	56 mA	222 mA	30 mA	555 mA	72	470 µF
2Z8RS5W12M		12 VDC	42 mA	167 mA		547 mA	73	
2Z8RS5W15M		15 VDC	33 mA	133 mA		533 mA	75	
2Z8RS5W24M		24 VDC	21 mA	83 mA	60 mA	533 mA	75	220 µF
2Z8RD5W3.3M		±3.3 VDC	±63 mA	±250 mA	20 mA	471 mA	70	±1000 µF
2Z8RD5W5M		±5 VDC	±50 mA	±200 mA		571 mA	74	
2Z8RD5W9M		±9 VDC	±28 mA	±111 mA		540 mA	74	
2Z8RD5W12M		±12 VDC	±21 mA	±83 mA	25 mA	533 mA	75	±220 µF
2Z8RD5W15M		±15 VDC	±17 mA	±67 mA		533 mA	75	
2Z8RD5W24M		±24 VDC	±10 mA	±42 mA		60 mA	563 mA	
2Z8RS12W3.3M	9-18 VDC	3.3 VDC	125 mA	500 mA	15 mA	205 mA	67	3300 µF
2Z8RS12W5M		5 VDC	100 mA	400 mA		216 mA	77	
2Z8RS12W9M		9 VDC	56 mA	222 mA		213 mA	78	470 µF
2Z8RS12W12M		12 VDC	42 mA	167 mA		208 mA	80	
2Z8RS12W15M		15 VDC	33 mA	133 mA		213 mA	78	
2Z8RS12W24M		24 VDC	21 mA	83 mA		208 mA	80	220 µF
2Z8RD12W3.3M		±3.3 VDC	±63 mA	±250 mA		188 mA	73	±1000 µF
2Z8RD12W5M		±5 VDC	±50 mA	±200 mA		222 mA	75	
2Z8RD12W9M		±9 VDC	±28 mA	±111 mA		210 mA	79	
2Z8RD12W12M		±12 VDC	±21 mA	±83 mA		208 mA	80	±220 µF
2Z8RD12W15M		±15 VDC	±17 mA	±67 mA		210 mA	79	
2Z8RD12W24M		±24 VDC	±10 mA	±42 mA		30 mA	219 mA	

SPECIFICATIONS

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

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT		INPUT CURRENT		%EFF	CAPACITIVE LOAD			
			MIN. LOAD	FULL LOAD	NO LOAD	FULL LOAD					
2Z8RS24W3.3M	18-36 VDC	3.3 VDC	125 mA	500 mA	8 mA	98 mA	70	3300 µF			
2Z8RS24W5M		5 VDC	100 mA	400 mA		108 mA	77	3300 µF			
2Z8RS24W9M		9 VDC	56 mA	222 mA		104 mA	80	470 µF			
2Z8RS24W12M		12 VDC	42 mA	167 mA							
2Z8RS24W15M		15 VDC	33 mA	133 mA							
2Z8RS24W24M		24 VDC	21 mA	83 mA							
2Z8RD24W3.3M		±3.3 VDC	±63 mA	±250 mA					94 mA	73	±1000 µF
2Z8RD24W5M		±5 VDC	±50 mA	±200 mA					106 mA	78	
2Z8RD24W9M		±9 VDC	±28 mA	±111 mA		105 mA	79	±220 µF			
2Z8RD24W12M		±12 VDC	±21 mA	±83 mA		104 mA	80				
2Z8RD24W15M		±15 VDC	±17 mA	±67 mA							
2Z8RD24W24M		±24 VDC	±10 mA	±42 mA	20 mA	106 mA	78	±100 µF			
2Z8RS48W3.3M	36-72 VDC	3.3 VDC	125 mA	500 mA	6 mA	48 mA	71	3300 µF			
2Z8RS48W5M		5 VDC	100 mA	400 mA		56 mA	74				
2Z8RS48W9M		9 VDC	56 mA	222 mA		53 mA	78	470 µF			
2Z8RS48W12M		12 VDC	42 mA	167 mA							
2Z8RS48W15M		15 VDC	33 mA	133 mA							
2Z8RS48W24M		24 VDC	21 mA	83 mA							
2Z8RD48W3.3M		±3.3 VDC	±63 mA	±250 mA					47 mA	73	±1000 µF
2Z8RD48W5M		±5 VDC	±50 mA	±200 mA					56 mA	74	
2Z8RD48W9M		±9 VDC	±28 mA	±111 mA		53 mA	79	±220 µF			
2Z8RD48W12M		±12 VDC	±21 mA	±83 mA							
2Z8RD48W15M		±15 VDC	±17 mA	±67 mA					52 mA	80	
2Z8RD48W24M		±24 VDC	±10 mA	±42 mA	12 mA	55 mA	75	±100 µF			

SPECIFICATIONS

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

INPUT SPECIFICATIONS

Input Voltage Range			2:1
Input Filter			Capacitor Type
Input Reflected Ripple Current ⁴⁾			35 mA p-p
Remote ON/OFF Control	ON	0 to 0.8 VDC max. (Short Circuit Pin1 and Pin3) or open circuit	
	OFF	4.5 to 15 VDC max. or 3.5 to 15 mA max. (via R1-D1)	
	OFF idle current	5 mA typ.	

OUTPUT SPECIFICATIONS

Voltage Accuracy	±2%
Temperature Coefficient	±0.02%/°C
Capacitive Load ⁵⁾	see table
Ripple & Noise 20MHz BW ⁶⁾	80 mV p-p max.
Short Circuit Protection	Indefinite (Automatic Recovery)
Line Regulation	±0.5% max.
Load Regulation (25% to 100% Load)	±1.0% max.
Cross Regulation (Dual Output) ⁷⁾	±5%

NOTE:

1. Maximum value at nominal input voltage and full load.
2. Typical value at nominal input voltage and full load.
3. 25% minimum loading is needed.
4. Measured input reflected ripple current with a simulated source inductance of 12 µH.
5. Test by nominal input voltage and constant resistive load.
6. Ripple & Noise is measured with 20 MHz bandwidth.
7. One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.

SPECIFICATIONS

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

GENERAL SPECIFICATION		
Efficiency		see table
Isolation Voltage	Input/Output (tested for 3 sec)	1000 VDC
Suffix "H3"		3000 VDC
Suffix "M"	Metal Case - Input/Output	1000 VDC
I/O Isolation Resistance		1000 Mohms min.
I/O Isolation Capacitance		60 pF max.
Switching Frequency		100 to 650 kHz
Operating Temperature Range		-40°C to +85°C (see Derating Curve)
Storage Temperature Range		-40°C to +125°C
Case Temperature		+100°C max.
Cooling		Natural Convection
Humidity		95% rel H
Reliability Calculated MTBF (MIL-HDBK-217F)		>1.61 Mhrs
Safety Standard (designed to meet)		IEC/EN 60950-1
Dimensions		21.85 x 9.2 x 11.1 mm (0.86 x 0.36 x 0.44 Inches)
Case Material		Non-conductive black plastic (UL94V-0 rated)
Suffix "M"		Nickel-coated Copper
Pin Material		Alloy42 Solder-coated
Potting Material		Epoxy (UL94V-0 rated)
Weight		4.5 g
Suffix "M"		6.5 g

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 max.)	5 V	12 VDC max.
	12 V	24 VDC max.
	24 V	40 VDC max.
	48 V	80 VDC max.
Soldering Temperature (1.5 mm from case 10 sec. max.)		+260°C

NOTE:

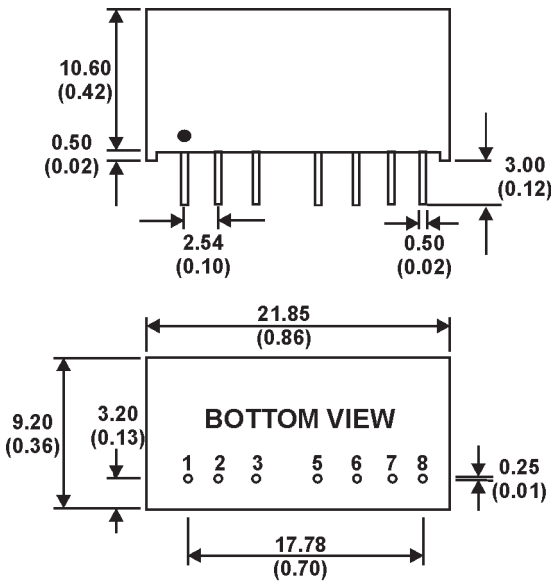
Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
 Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.

SPECIFICATIONS

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

MECHANICAL SPECIFICATIONS

CASE "Z8" (Plastic)

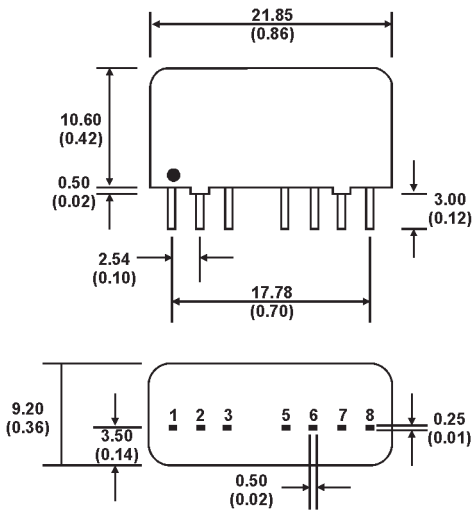


All Dimensions in mm (Inches)
 Tolerances: Pin Diameter: 0.5 ± 0.05 (0.02 ± 0.002)
 Pin Pitch: ± 0.35 (± 0.014)
 Case: ± 0.5 (± 0.02)

PIN CONNECTIONS		
	Single	Dual
1	-INPUT	-INPUT
2	+INPUT	+INPUT
3	NO PIN	NOT CONNECTED
5	NO PIN	NOT CONNECTED
6	+OUTPUT	+OUTPUT
7	-OUTPUT	-OUTPUT
8	NOT CONNECTED	COMMON

PIN CONNECTIONS FOR REMOTE CONTROL		
	Single	Dual
1	-INPUT	-INPUT
2	+INPUT	+INPUT
3	REMOTE CONTROL	REMOTE CONTROL
5	NOT CONNECTED	NOT CONNECTED
6	+OUTPUT	+OUTPUT
7	-OUTPUT	-OUTPUT
8	NOT CONNECTED	COMMON

CASE "Z8" (Metal)



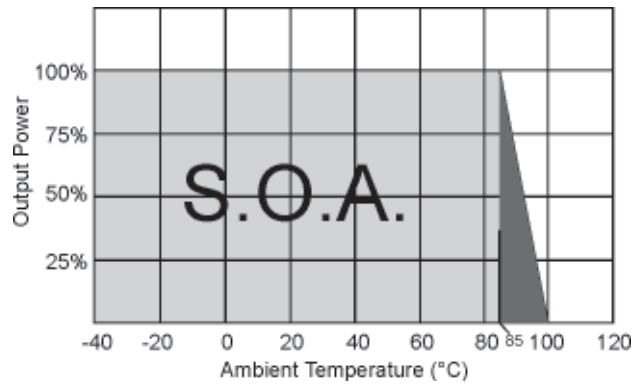
All Dimensions are typical in mm (inches)
 Tolerances: Pin Diameter: 0.5 ± 0.05 (0.02 ± 0.002)
 Pin Pitch: ± 0.35 (± 0.014)
 Case: ± 0.5 (± 0.02)

SPECIFICATIONS

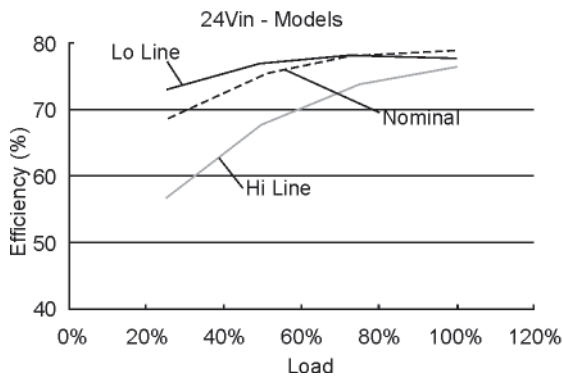
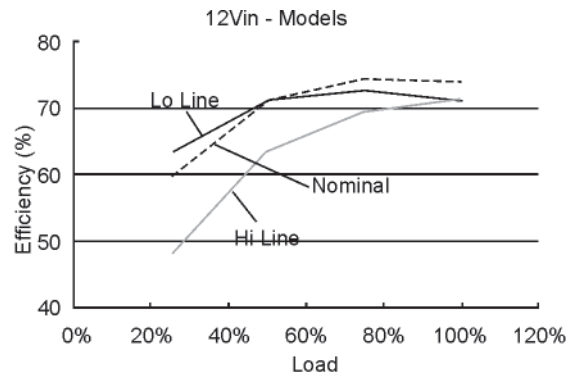
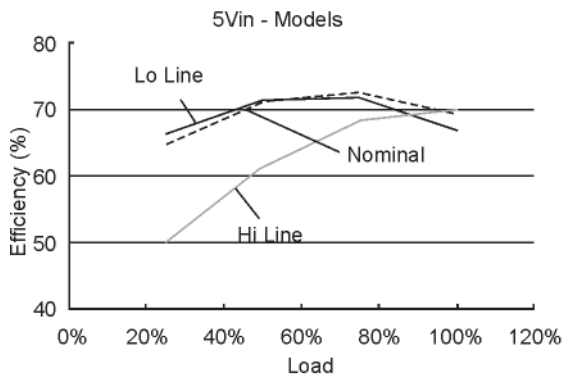
All Specifications Typical At Nominal Line, Full Load, and 25°C Unless Otherwise Noted

DIAGRAMS & APPLICATION NOTES

Derating Curve



Efficiency vs Output Current



SPECIFICATIONS

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

MCU (Master Control Unit)

The MCU Pin Voltage is referenced to -Vin (Pin1)

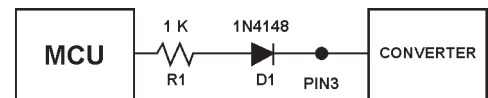
ON: 0 - 0.8 VDC max.

(Short Circuit Pin1 and Pin3) or open Circuit

OFF: 4.5 to 15 VDC max. (or 3.5 mA to 15 mA max.) (via R1 ` D1)

OFF idle current: 5 mA typ.

Connection Example

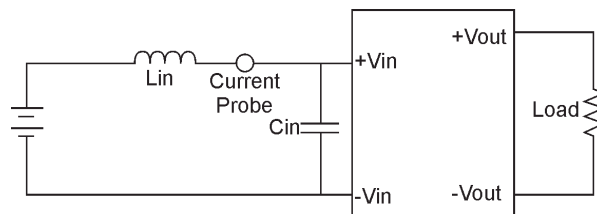


Input Filter components are required to help meet conducted emission class A, which application refer to the EMI Filter of design & test configuration.

An external filter capacitor M+R suggest: Nippon - chemi - con KY series, 220 µF/100 V.

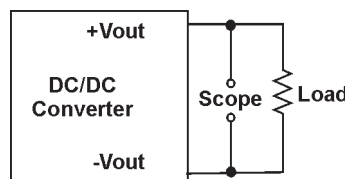
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor Lin (12 µH) and a source capacitor Cin (47 µF, ESR<1.0 Ohm at 100 kHz) at nominal input and full load.



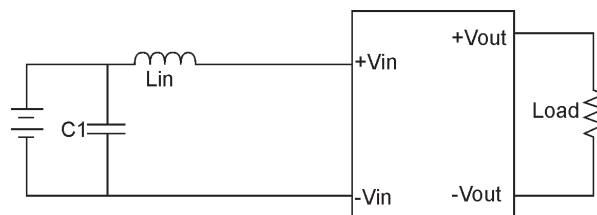
Output Ripple & Noise Measurement Test

The Scope measurement bandwidth is 20 MHz.



EMI Filter

Input filter components (C1, L) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



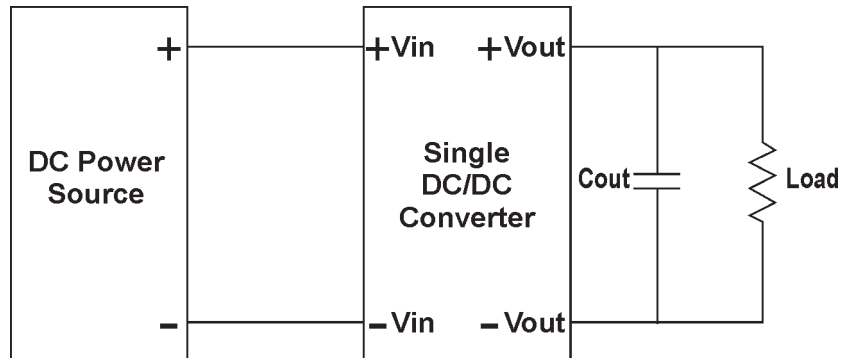
C1 = 100 µF/100 V
L = 12 µH

SPECIFICATIONS

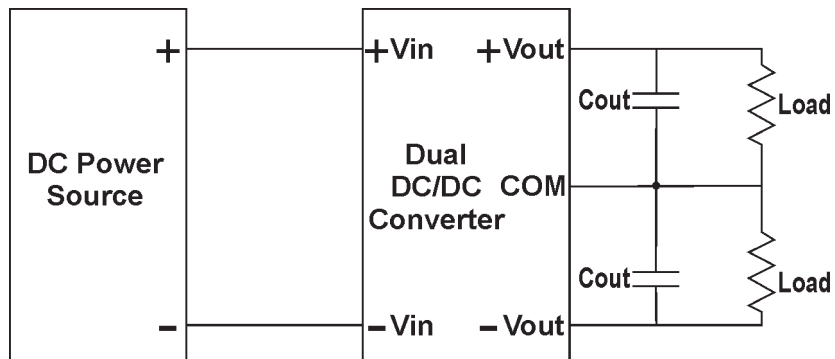
All Specifications Typical At Nominal Line, Full Load, and 25°C Unless Otherwise Noted

Recommendation for Filtering Ripple & Noise

Single



Dual



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.