

# 1 Watt

# 8 Pin SIL Package Z8



- 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		
1Z8RS5W3.3M	4.5-9 VDC	3.3 VDC	76 mA	303 mA	15 mA	298 mA	67	3300 µF
1Z8RS5W5M		5 VDC	50 mA	200 mA				
1Z8RS5W9M		9 VDC	28 mA	111 mA	40 mA	285 mA	70	470 µF
1Z8RS5W12M		12 VDC	21 mA	83 mA	55 mA			
1Z8RS5W15M		15 VDC	17 mA	67 mA				
1Z8RS5W24M		24 VDC	10 mA	42 mA	70 mA	294 mA	68	220 µF
1Z8RD5W3.3M		±3.3 VDC	±38 mA	±152 mA	15 mA	285 mA	70	±1000 µF
1Z8RD5W5M		±5 VDC	±25 mA	±100 mA		270 mA	74	
1Z8RD5W9M		±9 VDC	±14 mA	±56 mA	20 mA	266 mA	75	±220 µF
1Z8RD5W12M		±12 VDC	±10 mA	±42 mA	20 mA	266 mA	75	
1Z8RD5W15M		±15 VDC	±8 mA	±33 mA	40 mA	285 mA	70	±100 µF
1Z8RD5W24M		±24 VDC	±5 mA	±21 mA	70 mA	298 mA	67	
1Z8RS12W3.3M	9-18 VDC	3.3 VDC	76 mA	303 mA	15 mA	119 mA	70	3300 µF
1Z8RS12W5M		5 VDC	50 mA	200 mA		115 mA	72	
1Z8RS12W9M		9 VDC	28 mA	111 mA		108 mA	77	470 µF
1Z8RS12W12M		12 VDC	21 mA	83 mA				
1Z8RS12W15M		15 VDC	17 mA	67 mA				
1Z8RS12W24M		24 VDC	10 mA	42 mA		114 mA	73	220 µF
1Z8RD12W3.3M		±3.3 VDC	±38 mA	±152 mA		119 mA	70	±1000 µF
1Z8RD12W5M		±5 VDC	±25 mA	±100 mA		115 mA	72	
1Z8RD12W9M		±9 VDC	±14 mA	±56 mA		109 mA	76	±220 µF
1Z8RD12W12M		±12 VDC	±10 mA	±42 mA				
1Z8RD12W15M		±15 VDC	±8 mA	±33 mA		112 mA	74	±100 µF
1Z8RD12W24M		±24 VDC	±5 mA	±21 mA		40 mA	124 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					
1Z8RS24W3.3M	18-36 VDC	3.3 VDC	76 mA	303 mA	8 mA	59 mA	70	3300 $\mu$ F			
1Z8RS24W5M		5 VDC	50 mA	200 mA		57 mA	72	3300 $\mu$ F			
1Z8RS24W9M		9 VDC	28 mA	111 mA		55 mA	75	470 $\mu$ F			
1Z8RS24W12M		12 VDC	21 mA	83 mA							
1Z8RS24W15M		15 VDC	17 mA	67 mA							
1Z8RS24W24M		24 VDC	10 mA	42 mA					220 $\mu$ F		
1Z8RD24W3.3M		$\pm$ 3.3 VDC	$\pm$ 38 mA	$\pm$ 152 mA					59 mA	70	$\pm$ 1000 $\mu$ F
1Z8RD24W5M		$\pm$ 5 VDC	$\pm$ 25 mA	$\pm$ 100 mA					54 mA	76	$\pm$ 220 $\mu$ F
1Z8RD24W9M		$\pm$ 9 VDC	$\pm$ 14 mA	$\pm$ 56 mA		77					
1Z8RD24W12M		$\pm$ 12 VDC	$\pm$ 10 mA	$\pm$ 42 mA		75					
1Z8RD24W15M		$\pm$ 15 VDC	$\pm$ 8 mA	$\pm$ 33 mA		70					
1Z8RD24W24M		$\pm$ 24 VDC	$\pm$ 5 mA	$\pm$ 21 mA		20 mA	59 mA	70	$\pm$ 100 $\mu$ F		
1Z8RS48W3.3M		36-72 VDC	3.3 VDC	76 mA		303 mA	6 mA	31 mA	66	3300 $\mu$ F	
1Z8RS48W5M			5 VDC	50 mA	200 mA	30 mA		68			
1Z8RS48W9M	9 VDC		28 mA	111 mA	29 mA	70		470 $\mu$ F			
1Z8RS48W12M	12 VDC		21 mA	83 mA							
1Z8RS48W15M	15 VDC		17 mA	67 mA							
1Z8RS48W24M	24 VDC		10 mA	42 mA					30 mA	68	220 $\mu$ F
1Z8RD48W3.3M	$\pm$ 3.3 VDC		$\pm$ 38 mA	$\pm$ 152 mA					30 mA	70	$\pm$ 1000 $\mu$ F
1Z8RD48W5M	$\pm$ 5 VDC		$\pm$ 25 mA	$\pm$ 100 mA					28 mA	74	$\pm$ 220 $\mu$ F
1Z8RD48W9M	$\pm$ 9 VDC		$\pm$ 14 mA	$\pm$ 56 mA	76						
1Z8RD48W12M	$\pm$ 12 VDC		$\pm$ 10 mA	$\pm$ 42 mA	72						
1Z8RD48W15M	$\pm$ 15 VDC		$\pm$ 8 mA	$\pm$ 33 mA	70						
1Z8RD48W24M	$\pm$ 24 VDC		$\pm$ 5 mA	$\pm$ 21 mA	12 mA	30 mA		70	$\pm$ 100 $\mu$ F		

**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 <sup>4)</sup>			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.	
	OFF idle current	3.5 to 15 mA max.	

**OUTPUT SPECIFICATIONS**

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

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<b>GENERAL SPECIFICATION</b>		
Efficiency		see table
Isolation Voltage	Input/Output 1 min (flash tetsed for 3 sec)	1000 VDC
Suffix "H3"		3000 VDC
Suffix "M"	Metal Case - Input/Output	1000 VDC
VO Isolation Resistance		1000 Mohms min.
VO Isolation Capacitance		60 pF
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)		>2.732 Mhrs
Safety Standard (designed to meet)		IEC 60950-1:2001
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 Voltage (100 mS)	5 V	-0.7 VDC to 12 VDC
	12 V	-0.7 VDC to 24 VDC
	24 V	-0.7 VDC to 40 VDC
	48 V	-0.7 VDC to 80 VDC
Models Lead Soldering Temperature (1.5 mm from case 10 sec.)		+260°C

## NOTE:

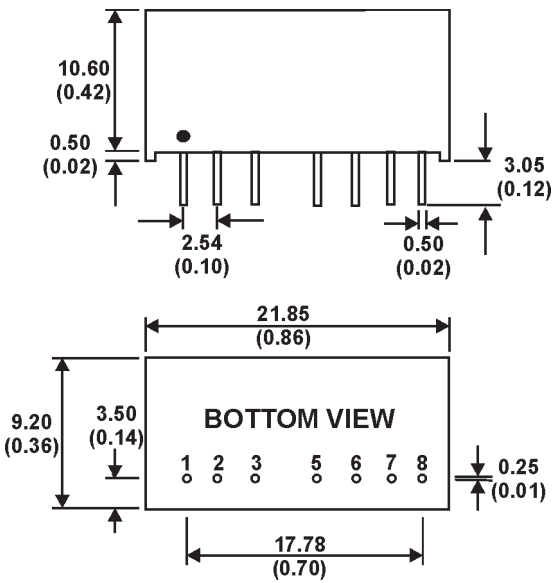
Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.  
 Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.

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**MECHANICAL SPECIFICATIONS**

CASE "Z8" (Plastic)

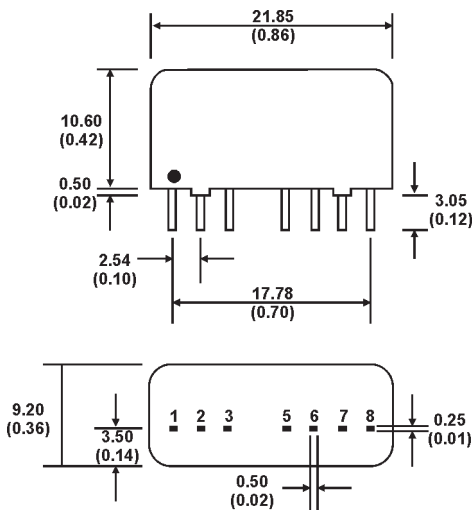


All Dimensions in mm (Inches)  
 Tolerances: Pin Diameter:  $0.5 \pm 0.05$  ( $0.02 \pm 0.002$ )  
 Pin Pitch:  $\pm 0.35$  ( $\pm 0.014$ )  
 Case:  $\pm 0.5$  ( $\pm 0.02$ )

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:  $0.5 \pm 0.05$  ( $0.02 \pm 0.002$ )  
 Pin Pitch:  $\pm 0.35$  ( $\pm 0.014$ )  
 Case:  $\pm 0.5$  ( $\pm 0.02$ )

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**DIAGRAMS & APPLICATION NOTES**

MCU (Master Control Unit)

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

ON: 0 to 0.8 VDC max.

(Short Circuit Pin1 and Pin3) or open Circuit

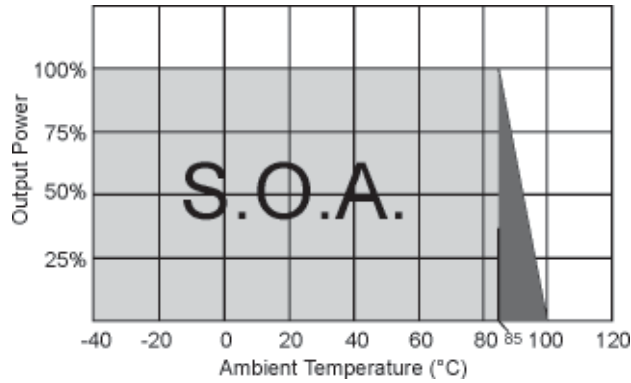
OFF: 4.5 to 15 VDC max.

OFF idle current: 3.5 mA to 15 mA max.

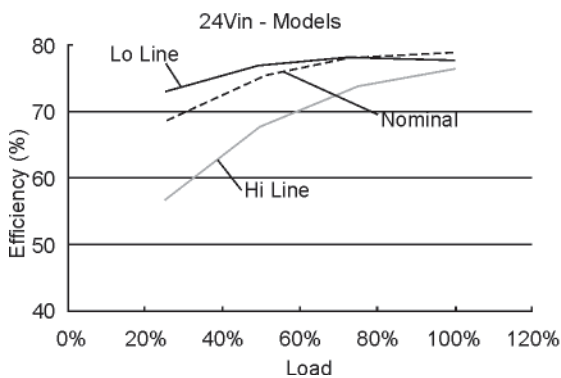
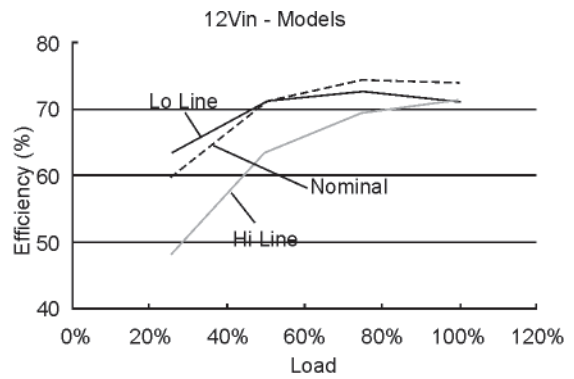
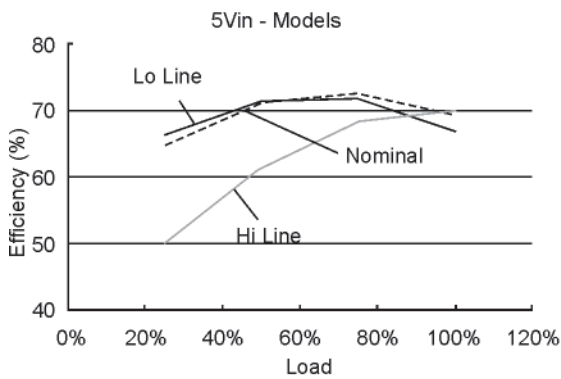
Connection for Remote Control



**Derating Curve**

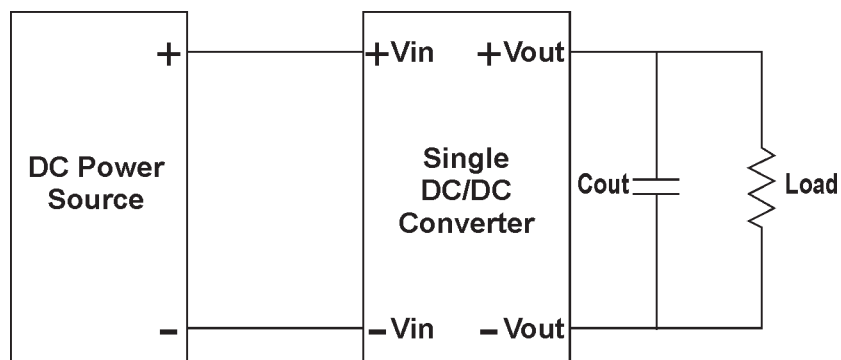
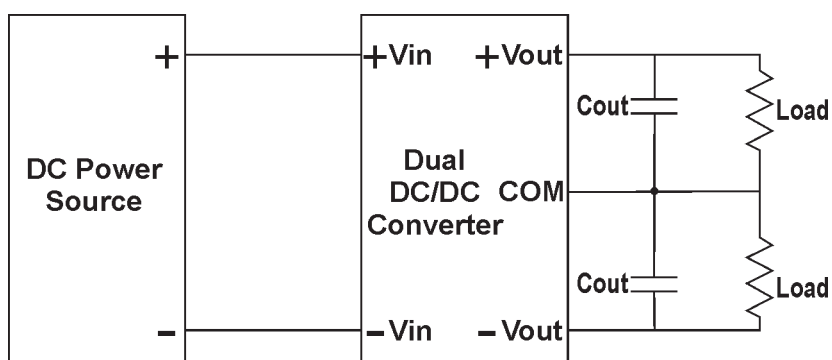


**Efficiency vs Output Current**



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**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.