

1 Watt

7 Pin SIL Package Z



- o Ultra-Miniature Size
- o Semi-regulated Output
- o 1000 VDC Isolation
3000 VDC Isolation add Suffix „H3“
- o Efficiency up to 89%
- o Low Ripple and Noise



MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT		% Load Regulation	% EFF	CAPACITIVE LOAD
				NO LOAD	FULL LOAD			
1ZMS5N5M	5 VDC	5 VDC	200 mA	20 mA	250 mA	6	84	220 µF
1ZMS5N9M		9 VDC	111.1 mA		230 mA	5.5	86	
1ZMS5N12M		12 VDC	83.3 mA				5	87
1ZMS5N15M		15 VDC	66.7 mA			6		84
1ZMD5N5M		±5 VDC	±100 mA				5.5	86
1ZMD5N9M		±9 VDC	±55.55 mA			5		87
1ZMD5N12M		±12 VDC	±41.67 mA				228 mA	5
1ZMD5N15M		±15 VDC	±33.33 mA					
1ZMS12N5M	12 VDC	5 VDC	200 mA	15 mA	98 mA	4	84	220 µF
1ZMS12N9M		9 VDC	111.1 mA		96 mA	3.5	86	
1ZMS12N12M		12 VDC	83.3 mA		95 mA		3	88
1ZMS12N15M		15 VDC	66.7 mA		98 mA	4		85
1ZMD12N5M		±5 VDC	±100 mA				95 mA	3.5
1ZMD12N9M		±9 VDC	±55.55 mA		94 mA	3	89	
1ZMD12N12M		±12 VDC	±41.67 mA				94 mA	3
1ZMD12N15M		±15 VDC	±33.33 mA					
1ZMS15N5M	15 VDC	5 VDC	200 mA	10 mA	79 mA	4	84	220 µF
1ZMS15N9M		9 VDC	111.1 mA		77 mA	3.5	86	
1ZMS15N12M		12 VDC	83.3 mA		76 mA		3	87
1ZMS15N15M		15 VDC	66.7 mA		78 mA	3.5		89
1ZMD15N5M		±5 VDC	±100 mA				76 mA	2.5
1ZMD15N9M		±9 VDC	±55.55 mA		76 mA	2.5		
1ZMD15N12M		±12 VDC	±41.67 mA				75 mA	2.5
1ZMD15N15M		±15 VDC	±33.33 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		% Load Regulation	% EFF	CAPACITIVE LOAD
				NO LOAD	FULL LOAD			
1ZMS24N5M	24 VDC	5 VDC	200 mA	7 mA	51 mA	4	82	220 μ F
1ZMS24N9M		9 VDC	111.1 mA		49 mA	3.5	86	
1ZMS24N12M		12 VDC	83.3 mA				3	87
1ZMS24N15M		15 VDC	66.7 mA		51 mA	3.5		82
1ZMD24N5M		\pm 5 VDC	\pm 100 mA				48 mA	
1ZMD24N9M		\pm 9 VDC	\pm 55.55 mA		26 mA	3		79
1ZMD24N12M		\pm 12 VDC	\pm 41.67 mA				26 mA	
1ZMD24N15M		\pm 15 VDC	\pm 33.33 mA					
1ZMS48N5M	48 VDC	5 VDC	200 mA	5 mA	27 mA	4	79	220 μ F
1ZMS48N9M		9 VDC	111.1 mA		26 mA	3.5	82	
1ZMS48N12M		12 VDC	83.3 mA				27 mA	3
1ZMS48N15M		15 VDC	66.7 mA		26 mA	2		
1ZMD48N5M		\pm 5 VDC	\pm 100 mA				26 mA	3
1ZMD48N9M		\pm 9 VDC	\pm 55.55 mA		26 mA	2		
1ZMD48N12M		\pm 12 VDC	\pm 41.67 mA				26 mA	2
1ZMD48N15M		\pm 15 VDC	\pm 33.33 mA					

INPUT SPECIFICATIONS	
Input Voltage Range	\pm 10%
Input Filter	Capacitors
Input Reflected Ripple Current	5 V, 12 V 20 mA p-p 15 V 30 mA p-p 24 V 40 mA p-p 48 V 50 mA p-p

OUTPUT SPECIFICATIONS	
Voltage Accuracy	\pm 3%
Temperature Coefficient	\pm 0.02%/°C
Capacitor Load ¹⁾	see table
Ripple & Noise (20 MHz bandwidth)	50 mV p-p
Line Regulation	\pm 1.2%/1% Vin Change
Load Regulation (10% Load to Full Load)	see table

NOTE:

1. Tested by minimal Vin and constant resistive full load.

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GENERAL SPECIFICATION		
Efficiency		see table
Isolation Voltage (3 sec) Suffix "H3"	Input/Output	1000 VDC 3000 VDC
Isolation Resistance		1000 Mohms
Isolation Capacitance		60 pF
Switching Frequency		variable 70 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 Mhrs
Safety Standard (designed to meet)		IEC 60950-1
EMC Specifications	Radiated Emissions ESD RS	EN55022 Class A IEC61000-4-2 Perf. Criteria A IEC61000-4-3 Perf. Criteria A
Dimensions	48 V	0.76x0.24x0.39 Inches (19.5x6.0x10.0 mm) 0.76x0.28x0.39 Inches (19.5x7.2x10.0 mm)
Case Material		Non-conductive black plastic (UL94V-0 rated)
Pin Material		C5191R-H Solder-coated
Potting Material		Epoxy (UL94V-0 rated)
Weight	48 V	2.4 g 2.8 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	9 VDC
	12 V	18 VDC
	15 V	20 VDC
	24 V	30 VDC
	48 V	54 VDC
Lead Soldering Temperature (1.5 mm from case 10 sec.)		+260°C

NOTE:

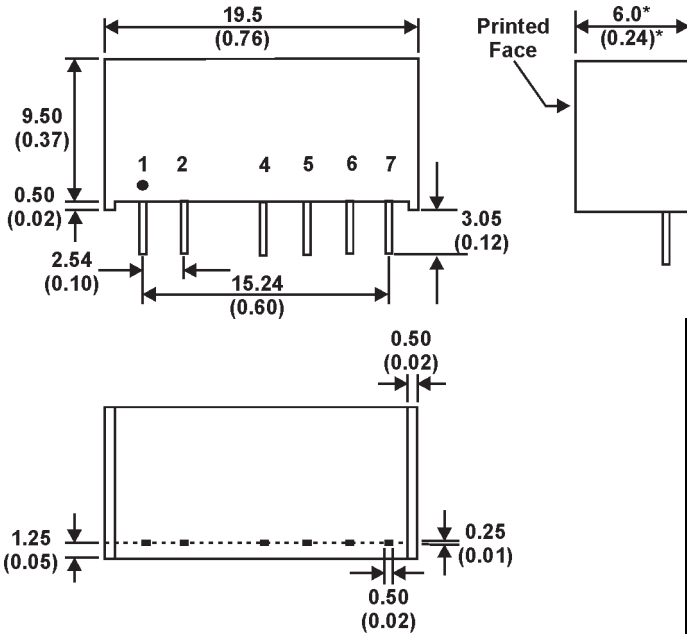
Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.

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MECHANICAL SPECIFICATIONS

Case „Z“



PIN CONNECTIONS				
Pins	Single	Dual	Single-H3	Dual-H3
1	+INPUT	+INPUT	+INPUT	+INPUT
2	-INPUT	-INPUT	-INPUT	-INPUT
4	-OUTPUT	-OUTPUT	NO PIN	NO PIN
5	NO PIN	COMMON	-OUTPUT	-OUTPUT
6	+OUTPUT	+OUTPUT	NO PIN	COMMON
7	NO PIN	NO PIN	+OUTPUT	+OUTPUT

All Dimensions in mm (Inches).

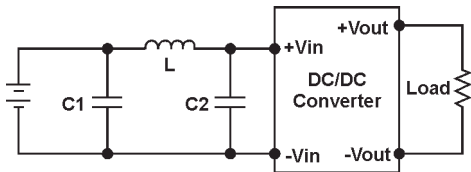
- 1. Pin Diameter: 0.5 ±0.05 (0.02 ±0.002)
- 2. Pin pitch Tolerance: ±0.35 (±0.014)
- 3. Case Tolerance: ±0.5 (±0.02)

*The thickness of 48V input voltage model is 7.2 mm (0.28 Inches)

APPLICATION NOTES & DIAGRAMS

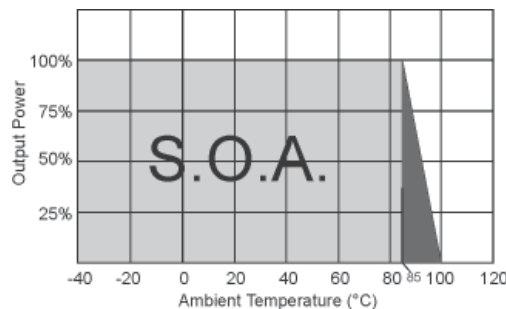
Input Filter

Input filter components (C1, C2, L) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module. All leads should be minimized to decrease radiated noise.



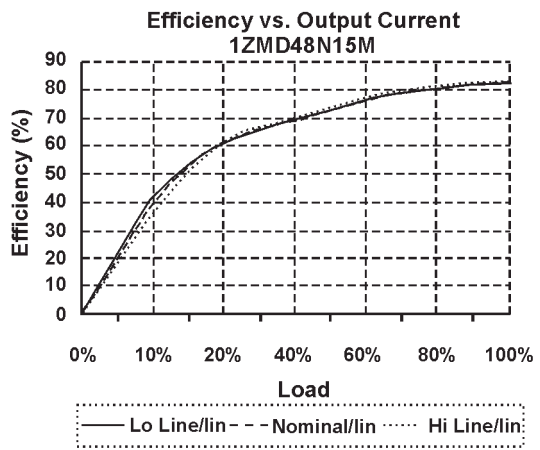
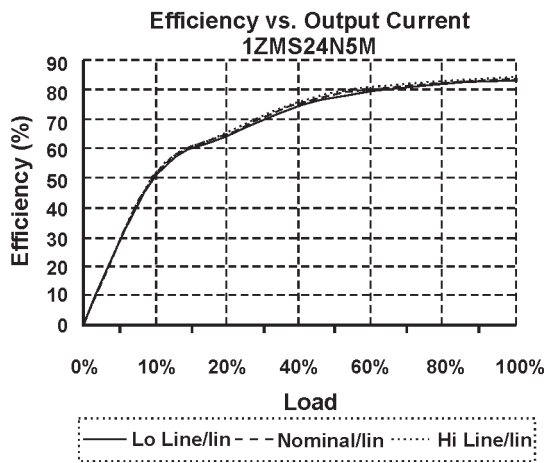
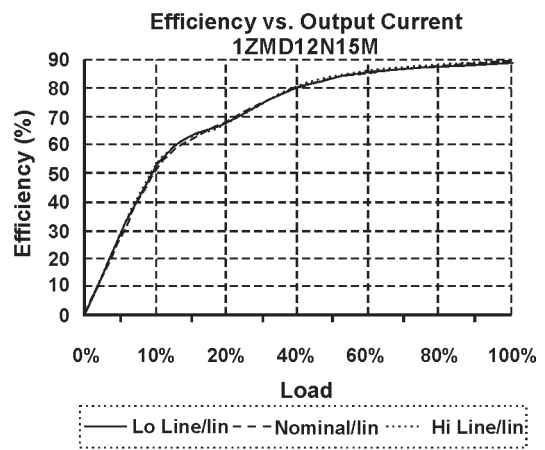
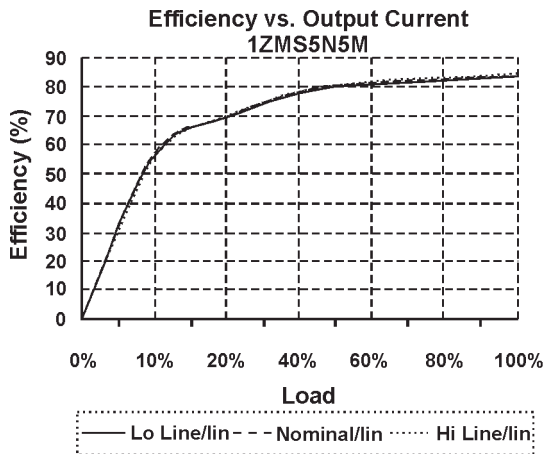
INPUT FILTER			
Model	C1	L	C2
1ZMS/D5N...	1210, 10 µF/35V	10 µH	
1ZMS/D12N...	1210, 10 µF/35V	10 µH	
1ZMS/D15N...	1210, 10 µF/35V	10 µH	
1ZMS/D24N...	1210, 10 µF/35V	10 µH	
1ZMS/D48N...	1210, 2.2 µF/100V	18 µH	1210, 2.2 µF/100 V

Derating Curve



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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.