

1 Watt**7 Pin SIL Package Z**

- o Ultra-Miniature Size
- o Unregulated Output
- o 1000 VDC Isolation

3000 VDC Isolation add Suffix „H3“

4000 VDC Isolation add Suffix „H4“

5200 VDC Isolation add Suffix „H5“

6000 VDC Isolation add Suffix „H6“

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT		%EFF	
				NO-LOAD	FULL LOAD		
1ZUS3.3N3.3M	3.3 VDC	3.3 VDC	303 mA	28 mA	399 mA	76	
1ZUS3.3N5M		5 VDC	200 mA	22 mA	389 mA	78	
1ZUS3.3N9M		9 VDC	111 mA	35 mA	379 mA	80	
1ZUS3.3N15M		15 VDC	67 mA	30 mA	389 mA	78	
1ZUS3.3N18M		18 VDC	56 mA		415 mA	73	
1ZUS3.3N24M		24 VDC	42 mA	30 mA	459 mA	66	
1ZUD3.3N3.3M		±3.3 VDC	±152 mA		433 mA	70	
1ZUD3.3N5M		±5 VDC	±100 mA		421 mA	72	
1ZUD3.3N7.2M		±7.2 VDC	±69 mA		404 mA	75	
1ZUD3.3N9M		±9 VDC	±56 mA	26 mA	404 mA	75	
1ZUD3.3N12M		±12 VDC	±42 mA	30 mA	394 mA	77	
1ZUD3.3N15M		±15 VDC	±33 mA	25 mA	389 mA	78	
1ZUD3.3N18M		±18 VDC	±28 mA		404 mA	75	
1ZUD3.3N24M		±24 VDC	±21 mA				
1ZUS5N3.3M		5 VDC	3.3 VDC	303 mA	15 mA	256 mA	78
1ZUS5N5M			5 VDC	200 mA	17 mA	247 mA	81
1ZUS5N7.2M	7.2 VDC		139 mA	16 mA	244 mA	82	
1ZUS5N9M	9 VDC		111 mA	15 mA	244 mA	82	
1ZUS5N12M	12 VDC		83 mA	17 mA	253 mA	79	
1ZUS5N15M	15 VDC		67 mA		233 mA	86	
1ZUS5N18M	18 VDC		56 mA	16 mA	241 mA	83	
1ZUS5N24M	24 VDC		42 mA	20 mA	244 mA	82	
1ZUD5N3.3M	±3.3 VDC		±152 mA	20 mA	299 mA	67	
1ZUD5N5M	±5 VDC		±100 mA		270 mA	74	
1ZUD5N7.2M	±7.2 VDC		±69 mA	15 mA	253 mA	79	
1ZUD5N9M	±9 VDC		±56 mA		247 mA	81	
1ZUD5N12M	±12 VDC		±42 mA	20 mA	250 mA	80	
1ZUD5N15M	±15 VDC		±33 mA		244 mA	82	
1ZUD5N18M	±18 VDC		±28 mA		247 mA	81	
1ZUD5N24M	±24 VDC		±21 mA	22 mA	247 mA	81	

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	
				NO-LOAD	FULL LOAD		
1ZUS12N3.3M	12 VDC	3.3 VDC	303 mA	12 mA	111 mA	75	
1ZUS12N5M		5 VDC	200 mA	14 mA	105 mA	79	
1ZUS12N7.2M		7.2 VDC	139 mA		111 mA	75	
1ZUS12N9M		9 VDC	111 mA	9 mA	104 mA	80	
1ZUS12N12M		12 VDC	83 mA	13 mA	105 mA	79	
1ZUS12N15M		15 VDC	67 mA	10 mA	102 mA	82	
1ZUS12N18M		18 VDC	56 mA	11 mA	103 mA	81	
1ZUS12N24M		24 VDC	42 mA	20 mA	110 mA	76	
1ZUD12N3.3M		±3.3 VDC	±152 mA	13 mA	123 mA	68	
1ZUD12N5M		±5 VDC	±100 mA	10 mA		74	
1ZUD12N7.2M		±7.2 VDC	±69 mA		13 mA	110 mA	76
1ZUD12N9M		±9 VDC	±56 mA	78			
1ZUD12N12M		±12 VDC	±42 mA	10 mA	102 mA	82	
1ZUD12N15M		±15 VDC	±33 mA				
1ZUD12N18M		±18 VDC	±28 mA	20 mA	111 mA	75	
1ZUD12N24M		±24 VDC	±21 mA				
1ZUS15N3.3M		15 VDC	3.3 VDC	303 mA	10 mA	83 mA	80
1ZUS15N5M			5 VDC	200 mA	7 mA	82 mA	81
1ZUS15N7.2M			7.2 VDC	139 mA	10 mA	85 mA	78
1ZUS15N9M			9 VDC	111 mA			
1ZUS15N12M	12 VDC		83 mA	8 mA	83 mA	80	
1ZUS15N15M	15 VDC		67 mA	12 mA	84 mA	79	
1ZUS15N18M	18 VDC		56 mA	10 mA	83 mA	80	
1ZUS15N24M	24 VDC		42 mA	5 mA	80 mA	83	
1ZUD15N3.3M	±3.3 VDC		±152 mA	20 mA	89 mA	75	
1ZUD15N5M	±5 VDC		±100 mA				
1ZUD15N7.2M	±7.2 VDC		±69 mA	18 mA	87 mA	77	
1ZUD15N9M	±9 VDC		±56 mA				
1ZUD15N12M	±12 VDC		±42 mA	20 mA	89 mA	75	
1ZUD15N15M	±15 VDC		±33 mA				
1ZUD15N18M	±18 VDC		±28 mA	15 mA	89 mA	75	
1ZUD15N24M	±24 VDC		±21 mA				

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MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT		%EFF				
				NO-LOAD	FULL LOAD					
1ZUS24N3.3M	24 VDC	3.3 VDC	303 mA	8 mA	56 mA	74				
1ZUS24N5M		5 VDC	200 mA	6 mA	54 mA	77				
1ZUS24N7.2M		7.2 VDC	139 mA		57 mA	73				
1ZUS24N9M		9 VDC	111 mA		55 mA	76				
1ZUS24N12M		12 VDC	83 mA		53 mA	78				
1ZUS24N15M		15 VDC	67 mA		5 mA	52 mA	80			
1ZUS24N18M		18 VDC	56 mA	51 mA		82				
1ZUS24N24M		24 VDC	42 mA	8 mA	52 mA	80				
1ZUD24N3.3M		±3.3 VDC	±152 mA	7 mA	62 mA	67				
1ZUD24N5M		±5 VDC	±100 mA	6 mA		74				
1ZUD24N7.2M		±7.2 VDC	±69 mA	7 mA	56 mA	78				
1ZUD24N9M		±9 VDC	±56 mA			6 mA	52 mA	80		
1ZUD24N12M		±12 VDC	±42 mA	6 mA	51 mA	81				
1ZUD24N15M		±15 VDC	±33 mA	8 mA			51 mA	82		
1ZUD24N18M		±18 VDC	±28 mA	6 mA	8 mA	82				
1ZUD24N24M		±24 VDC	±21 mA	8 mA			48 VDC	3.3 VDC	303 mA	
1ZUS48N3.3M		5 VDC	200 mA	5 mA	29 mA	73				
1ZUS48N5M		7.2 VDC	139 mA							28 mA
1ZUS48N7.2M		9 VDC	111 mA		27 mA	76				
1ZUS48N9M		12 VDC	83 mA							27 mA
1ZUS48N12M		15 VDC	67 mA		28 mA	75				
1ZUS48N15M		18 VDC	56 mA							6 mA
1ZUS48N18M		24 VDC	42 mA		6 mA	34 mA				
1ZUS48N24M		±3.3 VDC	±152 mA							5 mA
1ZUD48N3.3M	±5 VDC	±100 mA	5 mA	29 mA	72					
1ZUD48N5M	±7.2 VDC	±69 mA				6 mA				28 mA
1ZUD48N7.2M	±9 VDC	±56 mA	5 mA	27 mA	77					
1ZUD48N9M	±12 VDC	±42 mA				5 mA	28 mA	75		
1ZUD48N12M	±15 VDC	±33 mA	6 mA	28 mA	74					
1ZUD48N15M	±18 VDC	±28 mA				6 mA	28 mA	74		
1ZUD48N18M	±24 VDC	±21 mA	6 mA	28 mA	74					
1ZUD48N24M										

SPECIFICATIONS

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INPUT SPECIFICATIONS

Input Voltage Range	±10%
Input Filter	Capacitor Type
Input Reflected Ripple Current ¹⁾	20 mA p-p

OUTPUT SPECIFICATIONS

Voltage Accuracy	±3% max.				
Temperature Coefficient	0.02% per °C				
Ripple and Noise, 20MHz BW ²⁾	75 mV p-p max.				
Capacitive Load ³⁾	<table border="0"> <tr> <td>Single</td> <td>220 µF</td> </tr> <tr> <td>Dual</td> <td>±100 µF</td> </tr> </table>	Single	220 µF	Dual	±100 µF
Single	220 µF				
Dual	±100 µF				
Line Regulation	±1.2%/1% of Vin Change				
Load Regulation (20% - 100%)	<table border="0"> <tr> <td>3.3 V</td> <td>±20%</td> </tr> <tr> <td></td> <td>±10%</td> </tr> </table>	3.3 V	±20%		±10%
3.3 V	±20%				
	±10%				

NOTE:

1. Measured Input reflected ripple current with a simulated source inductance of 12 µH.
2. Ripple and Noise is measured with 20 MHz bandwidth.
3. Tested by minimal Vin and constant resistive load.

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)	3.3 V	6 VDC max.
	5 V	7 VDC max.
	12 V	15 VDC max.
	15 V	18 VDC max.
	24 V	28 VDC max.
	48 V	54 VDC max.
Lead Soldering Temperature (1.5 mm from case 10 sec.)		+260°C max.

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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GENERAL SPECIFICATION	
Efficiency	see table
Isolation Voltage (60 sec)	1000 VDC
add Suffix "H3"	3000 VDC
add Suffix "H4"	4000 VDC
add Suffix "H5"	5200 VDC
add Suffix "H6"	6000 VDC
Isolation Capacitance	60 pF
Isolation Resistance	1000 Mohms
Switching Frequency	variable 80 kHz
Operating Temperature Range	-40°C to +85°C (see Derating Curve)
Case Temperature	+100°C max.
Storage Temperature Range	-40°C to +125°C
Derating	see diagram
Humidity	95% rel H
Cooling	Natural Convection
Reliability Calculated MTBF (MIL-HDBK-217F)	>1.121 Mhrs
Safety Standard (designed to meet)	UL/cUL60950-1, IEC60950-1, EN60950-1
Radiated Emissions	EN55022 Class B
Conducted Emissions ⁴⁾	EN55022 Class B
ESD (Electrostatic Discharge)	IEC61000-4-2 Perf. Criteria A
RS (Radiated, Radio-Frequency Disturbances)	IEC61000-4-3 Perf. Criteria A
EFT ⁵⁾	IEC61000-4-4 Perf. Criteria A
Surge ⁵⁾	IEC61000-4-5 Perf. Criteria A
CS	IEC61000-4-6 Perf. Criteria A
PFMF	IEC61000-4-8 Perf. Criteria A
Case Material	Non-Conductive Black Plastic (UL94V-0 rated)
Pin Material	0.5 mm Alloy42 Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	2.3 g
Case Dimensions	19.5 x 6.0 x 10.0 mm (0.76 x 0.24 x 0.39 Inches)

NOTE:

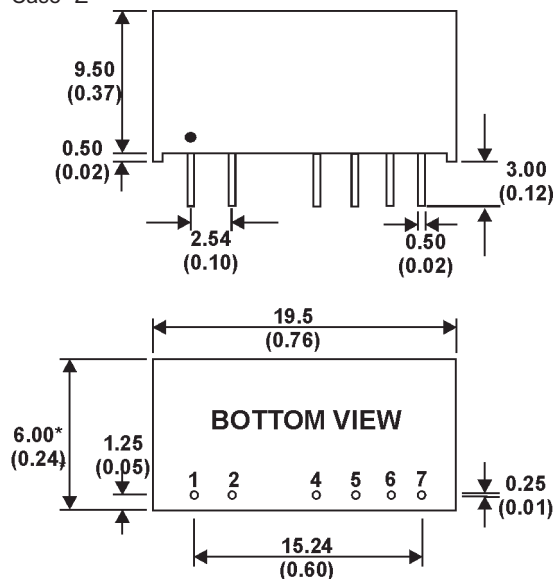
4. Input filter components are be required to help meet conducted emission class B, which application refer to the EMI Filter o f design & feature configuration.
5. An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5.
The filter capacitor M+R Multitronik suggest: Nippon-chemi-con KY series, 470 µF/100 V.

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MECHANICAL SPECIFICATIONS

Case "Z"



PIN CONNECTIONS				
Pins	Single	Dual	Single-H	Dual-H
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

*The thickness of 48 V input voltage model is 7.20 (0.28)

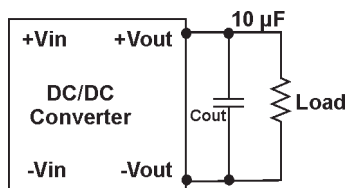
All Dimensions in mm (Inches).

1. Pin diameters 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance ±0.35 (±0.014)
3. Case Tolerance ±0.5 (±0.02)

APPLICATION NOTES & DIAGRAMS

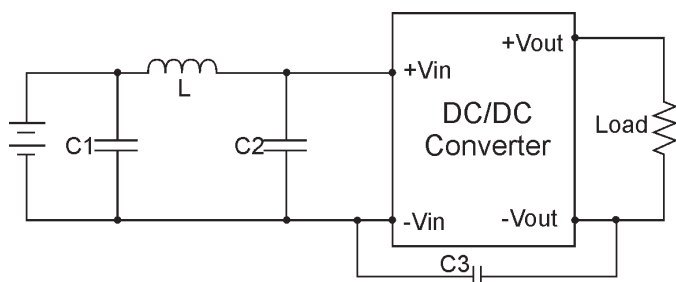
Output Ripple & Noise Reduction

To reduce ripple & noise, it is recommended to use a 10 µF electrolytic capacitor at the output.



EMI Filter

Input filter components (C1, L, C2, C3) 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.



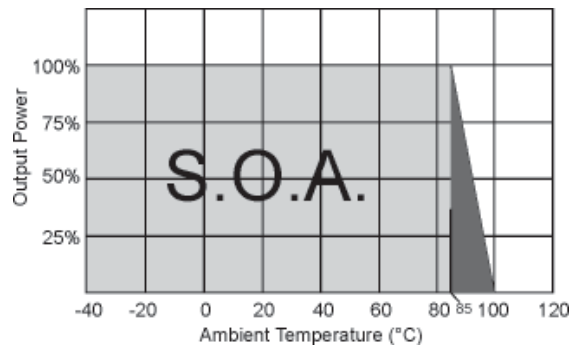
	EMI FILTER			
	C1	L	C2	C3
1ZUS/D3.3NxxM	1210, 2.2 µF/100 V	18 µH		
1ZUS/D5NxxM	1210, 2.2 µF/100 V	18 µH		
1ZUS/D12NxxM	1210, 2.2 µF/100 V	18 µH		
1ZUS/D15NxxM	1210, 2.2 µF/100 V	18 µH		
1ZUS/D24NxxM	1210, 2.2 µF/100 V	18 µH	1210, 2.2 µF/100 V	1206, 470 pF/2 kV
1ZUS/D48NxxM	Electrolyt capacitor, 10 µF/100 V	18 µH	1210, 2.2 µF/100 V	1206, 470pF/2 kV

SPECIFICATIONS

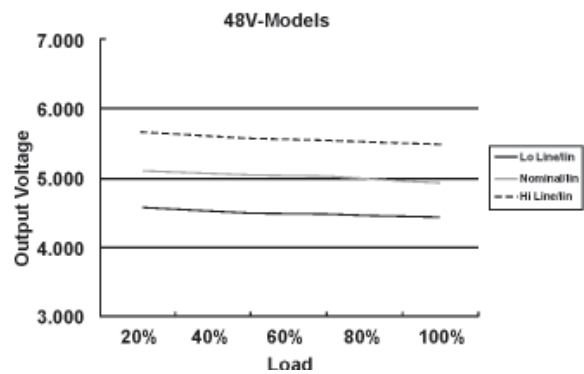
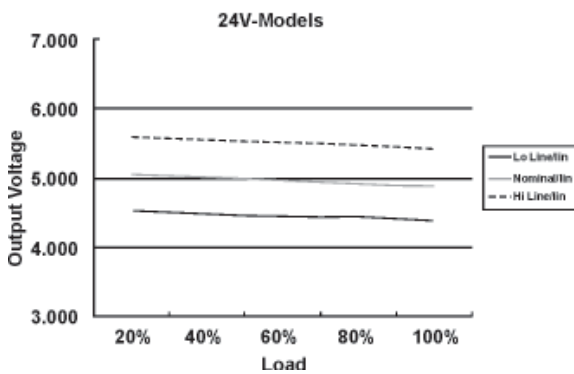
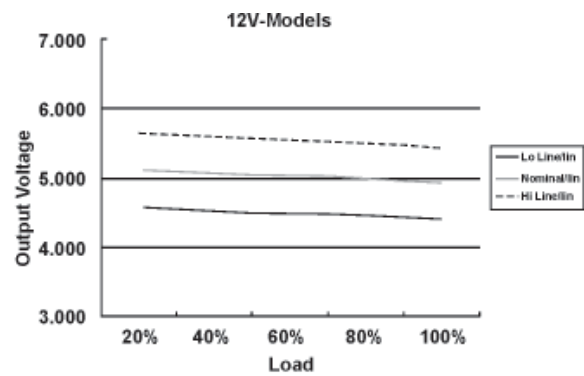
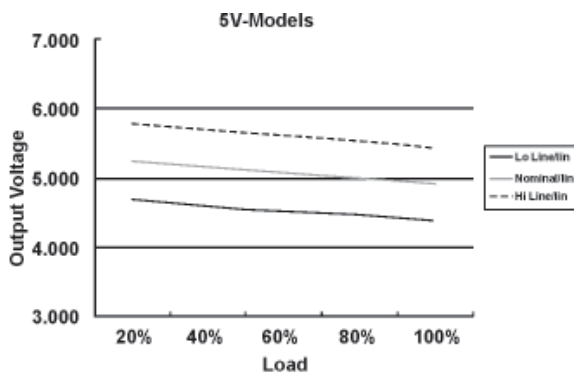
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Input Voltage	Slow Burning Fuses
3.3 VDC	800 mA
5 VDC	500 mA
12, 15, 24, 48 VDC	300 mA

Derating Curve



Loading vs Output Voltage



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.