

# 1 Watt

# 8 Pin DIL Package L



- o Ultra-Miniature Size
- o Unregulated Output
- o 1000 VDC Isolation
- o 3000 VDC Isolation add Suffix „H3“
- o Only Single Output
- o Efficiency up to 83%
- o Low Ripple & Noise
- o EMI Complies with EN55022 Class B



MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT (FULL LOAD)	INPUT CURRENT		%EFF	CAPACITOR LOAD
				NO-LOAD	FULL LOAD		
1LUS3.3N3.3M	3.3 VDC	3.3 VDC	303 mA	25 mA	410 mA	74	220 µF
1LUS3.3N5M		5 VDC	200 mA		394 mA	77	
1LUS3.3N7.2M		7.2 VDC	139 mA	30 mA	404 mA	75	
1LUS3.3N9M		9 VDC	111 mA		399 mA	76	
1LUS3.3N12M		12 VDC	100 mA	45 mA	485 mA	75	
1LUS3.3N15M		15 VDC	67 mA	25 mA	384 mA	79	
1LUS3.3N18M		18 VDC	56 mA	35 mA	399 mA	76	
1LUS3.3N24M		24 VDC	50 mA	90 mA	485 mA	75	
1LUS5N3.3M	5 VDC	3.3 VDC	303 mA	16 mA	256 mA	78	220 µF
1LUS5N5M		5 VDC	200 mA	15 mA	253 mA	79	
1LUS5N7.2M		7.2 VDC	139 mA	16 mA	241 mA	83	
1LUS5N9M		9 VDC	111 mA	25 mA	253 mA	79	
1LUS5N12M		12 VDC	100 mA		296 mA	81	
1LUS5N15M		15 VDC	67 mA		244 mA	82	
1LUS5N18M		18 VDC	56 mA		241 mA	83	
1LUS5N24M		24 VDC	50 mA	28 mA	293 mA	82	
1LUS12N3.3M	12 VDC	3.3 VDC	303 mA	15 mA	108 mA	77	220 µF
1LUS12N5M		5 VDC	200 mA	16 mA	105 mA	79	
1LUS12N7.2M		7.2 VDC	139 mA		100 mA	83	
1LUS12N9M		9 VDC	111 mA	15 mA	105 mA	79	
1LUS12N12M		12 VDC	100 mA	8 mA	125 mA	80	
1LUS12N15M		15 VDC	67 mA	17 mA	105 mA	79	
1LUS12N18M		18 VDC	56 mA	15 mA	103 mA	81	
1LUS12N24M		24 VDC	50 mA	25 mA	127 mA	79	

**SPECIFICATIONS**

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

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT (FULL LOAD)	INPUT CURRENT		%EFF	CAPACITOR LOAD
				NO-LOAD	FULL LOAD		
1LUS15N3.3M	15 VDC	3.3 VDC	303 mA	15 mA	89 mA	75	220 $\mu$ F
1LUS15N5M		5 VDC	200 mA	10 mA	83 mA	80	
1LUS15N7.2M		7.2 VDC	139 mA	12 mA	88 mA	76	
1LUS15N9M		9 VDC	111 mA	10 mA	85 mA	78	
1LUS15N12M		12 VDC	100 mA	13 mA	98 mA	82	
1LUS15N15M		15 VDC	67 mA	15 mA	83 mA	80	
1LUS15N18M		18 VDC	56 mA	12 mA	85 mA	78	
1LUS15N24M		24 VDC	50 mA	10 mA	99 mA	81	
1LUS24N3.3M	24 VDC	3.3 VDC	303 mA	8 mA	53 mA	79	220 $\mu$ F
1LUS24N5M		5 VDC	200 mA				
1LUS24N7.2M		7.2 VDC	139 mA	10 mA	56 mA	74	
1LUS24N9M		9 VDC	111 mA	7 mA	53 mA	79	
1LUS24N12M		12 VDC	100 mA	8 mA	63 mA	80	
1LUS24N15M		15 VDC	67 mA		52 mA		
1LUS24N18M		18 VDC	56 mA		51 mA	82	
1LUS24N24M		24 VDC	50 mA	9 mA	61 mA		

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**INPUT SPECIFICATIONS**

Input Voltage Range	±10 %
Max. Input Current	see table
No-Load Input Current	see table
Input Filter	Capacitor Type
Input Reflected Ripple Current <sup>1)</sup>	20 mA p-p

**OUTPUT SPECIFICATIONS**

Voltage Accuracy	±3%	
Temperature Coefficient	±0.02%/°C	
Capacitive Load <sup>2)</sup>	see table	
Ripple and Noise <sup>3)</sup> , 20MHz BW	100 mV p-p	
Line Regulation	±1.2%/1% of Vin Change	
Load Regulation	20% to 100% Load 3.3 V Models	±10% ±20%

## NOTE:

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

**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.
Models Soldering Temperature (1.5 mm from case 10 sec. max.)		+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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<b>GENERAL SPECIFICATION</b>	
Efficiency	see table
Isolation Voltage (3 sec) add Suffix "H3"	Input/Output 1000 VDC 3000 VDC
Isolation Resistance	1000 Mohms
Isolation Capacitance	60 pF
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
Cooling	Natural Convection
Humidity	95% rel H
Reliability Calculated MTBF (MIL-HDBK-217F)	>1.121 Mhrs
Safety Standard (designed to meet)	IEC60950-1
Radiated Emissions	EN55022 Class B
Conducted Emissions <sup>4)</sup>	EN55022 Class B
ESD (Electrostatic Discharge)	IEC61000-4-2 Perf. Criteria A
RS (Radiated, Radio-Frequency, Electromagnetic Field)	IEC61000-4-3 Perf. Criteria A
EFT <sup>5)</sup>	IEC61000-4-4 Perf. Criteria A
Surge <sup>5)</sup>	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	Ø0.5 mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	1.8 g
Dimensions	12.70 x 10.16 x 6.85 mm (0.5 x 0.4 x 0.27 Inches)

## NOTE:

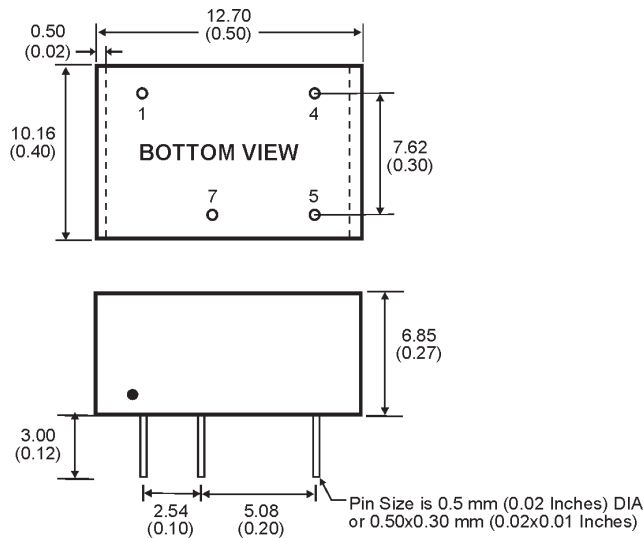
- Input filter components are required to help meet conducted emission class B, which application refer to the EMI Filter of design & feature configuration.
- An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5.  
The filter capacitor M+R suggest: Nippon-chemi-con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

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**MECHANICAL SPECIFICATIONS**

CASE "L"

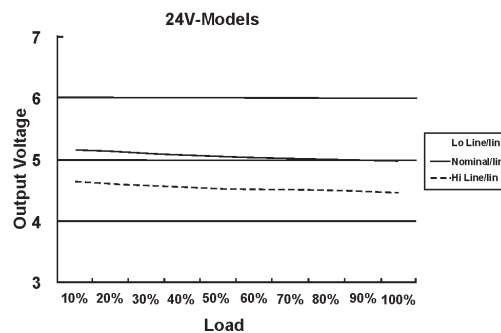
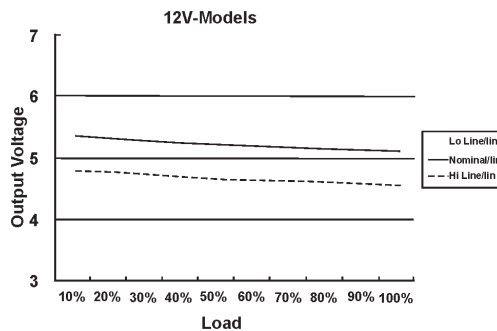
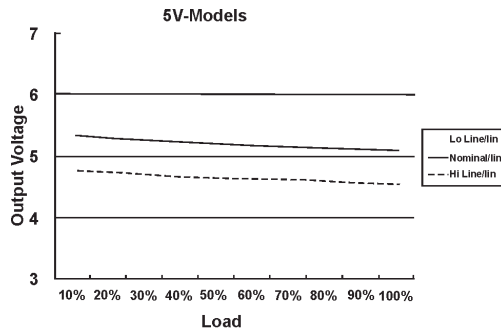


PIN CONNECTIONS	
1	-INPUT
4	+INPUT
5	+OUTPUT
7	-OUTPUT

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)

**DIAGRAMS & APPLICATION NOTES**

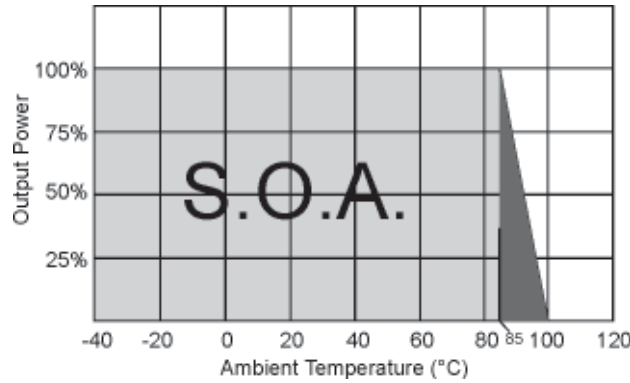
**Loading vs Output Voltage**



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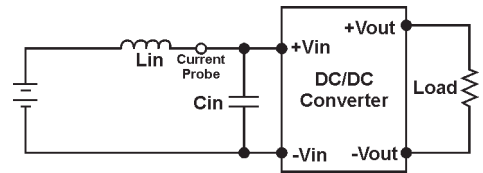
**Derating Curve**



**TEST CONFIGURATIONS**

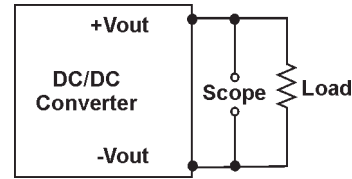
**Input Reflected Ripple Current Test Step**

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.



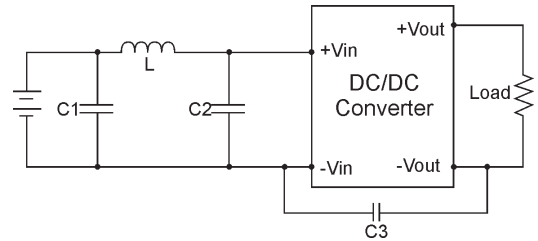
**Output Ripple & Noise Measurement Test**

The Scope measurement bandwidth is 20 MHz.



**EMI Filter**

Input filter components (C1, L, 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
1LUS3.3NxxM	1210, 2,2 µF/100 V	18 µH	-	-
1LUS5NxxM	1210, 2,2 µF/100 V			
1LUS12NxxM	1210, 2,2 µF/100 V			
1LUS15NxxM	1210, 2,2 µF/100 V			
1LUS24NxxM	1210, 2,2 µF/100 V			
			1210, 2,2 µF/100 V	1206, 470 pF/2 kV

**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.