

Make-Ps®

DC/DC CONVERTER

Single Output DC/DC Converter

Series M-78H-NZ

Up to 12 Watt | DC-DC Converter



FEATURES:

- 3 Pin SIP Package
- Pin-out compatible with LM78XX Linear Regulators
- Short Circuit Protection
- Non-Isolated Regulated Outputs
- Operating temperature -40°C to +85°C
- Wide input range
- Very High Efficiency Up To 96%
- Low ripple and noise



Models

Single output

Model	Input Voltage (V)	Output Voltage (V)	Output Current max (A)	Efficiency Vin Min (%)	Efficiency Vin Max (%)
M-78H3.3-NZ	4.75-28	3.3	1	90	83
M-78H5.0-NZ	6.5-32	5	1	93	88
M-78H6.5-NZ	9.0-32	6.5	1	94	90
M-78H9.0-NZ	12-32	9	1	95	92
M-78H12-NZ	16-32	12	1	96	94

Input Specifications

Input Specifications	Nominal	Typical	Maximum	Units
Voltage range	See the table above			VDC
Filter	Capacitor			
Quiescent Current	Vin=(LL-HL) at full load	5	7	mA
Short Circuit consumption		0.5	1.2	W

Output Specifications

Output Specifications	Conditions	Typical	Maximum	Units
Voltage accuracy	100% load	±3		%
Short Circuit protection		Continuous.		
Short circuit restart		Auto recovery		
Output current limit			2	A
Thermal shutdown	Internal IC junction	150		°C
Dynamic load stability	10-100% load		±100	mV
Line voltage regulation	Vin=(LL-HL) at full load	±0.4		%
Load voltage regulation	10-100% load	±0.6		%
Temperature coefficient	-40°C to +85°C ambient	±0.02		%/°C
Ripple & Noise	20MHz Bandwidth	35		mV p-p
Maximum Capacitive Load			2000	µF

General Specifications

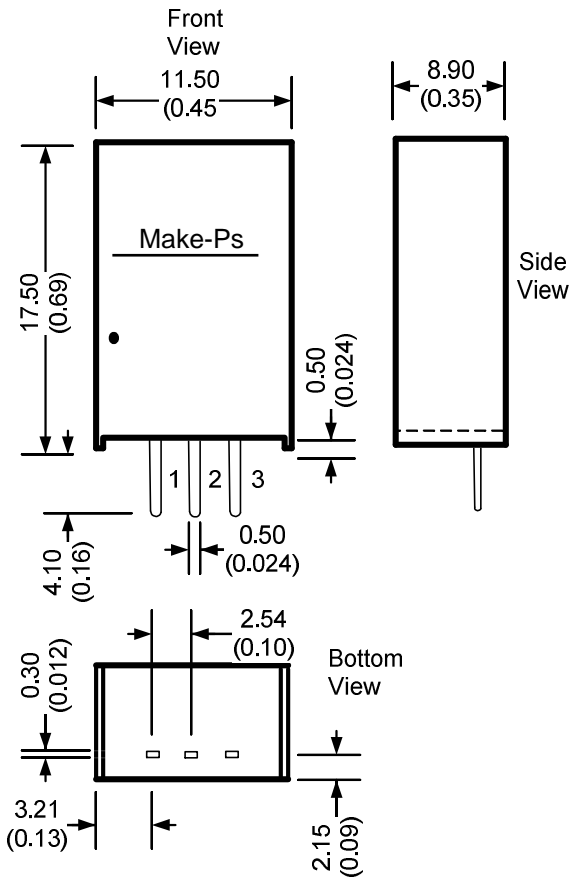
Input Specifications	Conditions	Typical	Maximum	Units
Switching frequency	100% load	330		KHz
Operating temperature	With derating above 71°C	-40 to +85		°C
Storage temperature		-55 to +125		°C
Max Case temperature			100	°C
Cooling	Free air convection			
Humidity			95	%
Case material	Non-conductive black plastic (UL94V-0 rated)			
Weight		3.7		g
Dimensions (L x W x H)		0.45 X 0.35 X 0.69 inch	11.50 X 8.90 X 17.50 mm	
MTBF		> 2 000 000 hrs (MIL-HDBK-217F, Ground Benign, t=+25°C)		
Soldering Temperature	1.5 mm from case for 10 sec		300	°C

NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.

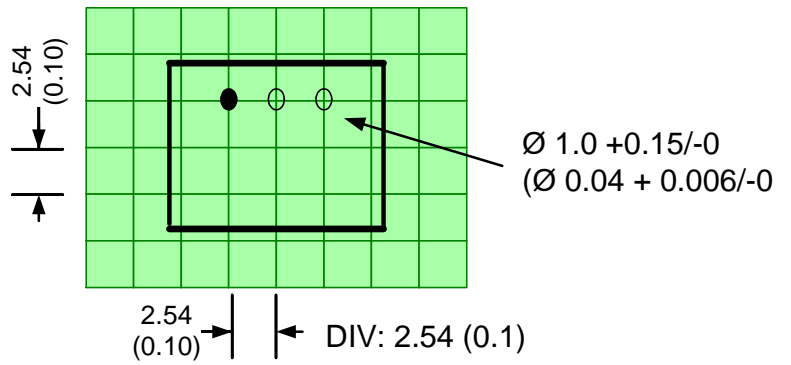
Pin Out Specifications

Pin	Single
1	+Vin
2	GND
3	+Vout

Dimensions

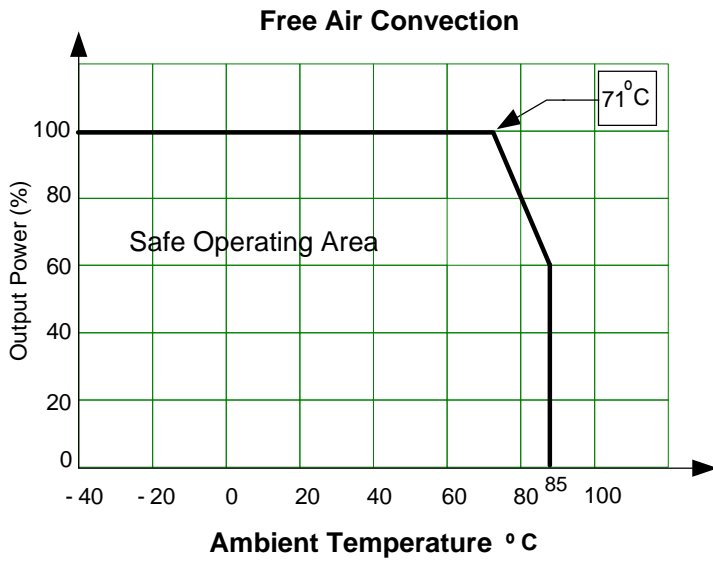


Footprint

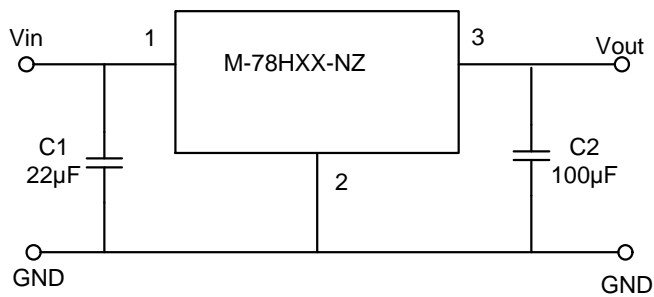


Dimensions are typical values: mm (inch)
 General Tolerance: ± 0.25 (± 0.01)
 Pin Tolerance: ± 0.1 (± 0.004)

Derating



Typical Application Circuit



C1: A low ESR capacitor is required to keep the noise of the converter to a minimum.

Ceramic capacitors are recommended, but tantalum or electrolytic may be used. Typical value is 22 μ F / 50V.

C2: Installation of C2 is recommended but optional. Typical recommended value is 100 μ F / 25V electrolytic.

NOTE: This part is not designed for parallel operation.