

1 WATT UNREGULATED DC/DC CONVERTER

HL01U

FEATURES

- LOW COST
- INTERNAL FILTERING
- SURFACE MOUNT CONSTRUCTION
- TEMPERATURE RANGE: -25°C TO +70°C
- HIGH EFFICIENCY
- NON-CONDUCTIVE CASE
- SURFACE MOUNT PACKAGE (SMD)

DESCRIPTION

The HL01U Series offers an extensive selection of input and output voltages to choose from. These miniature, unregulated DC/DC converters come in 24-pin DIP and SMD packages. This small size is possible through the use of surface mount manufacturing technologies.

The HL01U Series utilizes a 125KHz push-pull oscillator in the input stage with internal filtering to reduce the output noise.

The use of surface mount construction and automated manufacturing processes increase consistency and reliability while reducing overall cost.

ABSOLUTE MAXIMUM RATINGS

Internal Power Dissipation.....	30 Sec
Short Circuit Duration.....	Momentary
Lead Temperature (soldering, 10 seconds max).....	+300°C*

* Note: Refer to Reflow Profile for SMD Models.

ORDERING INFORMATION

	HL01U	xx	yy	zz	Y/Z	H
Device Family						
HL Indicates DC/DC Converter						
Model Number						
Where:						
xx = Input Voltage						
y = Number of Outputs (Single "S", Dual "D")						
zz = Output Voltage						
Package Option						
Screening Option						
DIP Package only						

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ELECTRICAL SPECIFICATIONS

Specifications typical at $T_A = +25^{\circ}\text{C}$, nominal input voltage, rated output current unless otherwise specified.

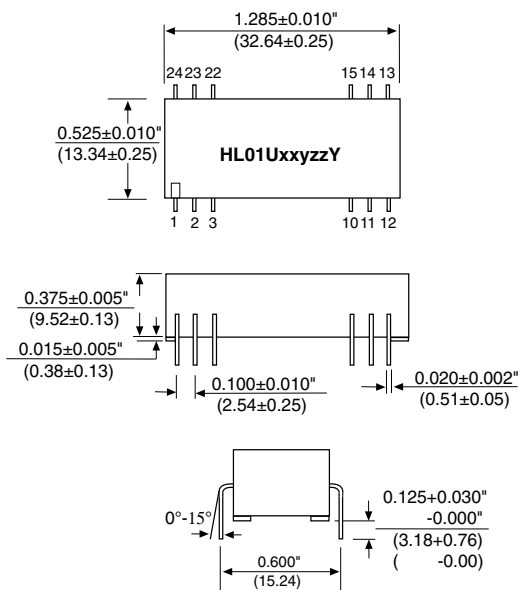
MODEL	NOMINAL INPUT VOLTAGE (VDC)	RATED OUTPUT VOLTAGE (VDC)	RATED OUTPUT CURRENT (mA)	INPUT CURRENT		EFFICIENCY (%)
				NO LOAD (mA)	RATED LOAD (mA)	
HL01U05S05 HL01U05S12 HL01U05S15	5 5 5	5 12 15	200 83 67	30 30 30	300 260 260	70 74 74
HL01U12S05 HL01U12S12 HL01U12S15	12 12 12	5 12 15	200 83 67	25 25 25	120 120 120	67 70 70
HL01U15S05 HL01U15S12 HL01U15S15	15 15 15	5 12 15	200 83 67	20 20 20	100 100 100	67 70 70
HL01U24S05 HL01U24S12 HL01U24S15	24 24 24	5 12 15	200 83 67	15 15 15	65 65 65	67 70 70
HL01U05D05 HL01U05D12 HL01U05D15	5 5 5	± 5 ± 12 ± 15	± 100 ± 41 ± 33	30 30 30	300 260 260	70 74 74
HL01U12D05 HL01U12D12 HL01U12D15	12 12 12	± 5 ± 12 ± 15	± 100 ± 41 ± 33	25 25 25	120 120 120	67 70 70
HL01U15D05 HL01U15D12 HL01U15D15	15 15 15	± 5 ± 12 ± 15	± 100 ± 41 ± 33	20 20 20	100 100 100	67 70 70
HL01U24D05 HL01U24D12 HL01U24D15	24 24 24	± 5 ± 12 ± 15	± 100 ± 41 ± 33	15 15 15	65 65 65	67 70 70

COMMON SPECIFICATIONS

Specifications typical at $T_A = +25^{\circ}\text{C}$, nominal input voltage, rated output current unless otherwise specified.

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
INPUT					
Voltage Range		4.5 10.8 13.5 22.6	5 12 15 24 30	5.5 13.2 16.5 26.4 100	VDC VDC mAp-p
Reflected Ripple Current					
ISOLATION					
Rated Voltage		500			VDC
Test Voltage	60 Hz, 10 Seconds	500			Vpk
Resistance			1		G Ω
Capacitance			25		pF
Leakage Current	$V_{\text{ISO}} = 240\text{VAC}$, 60Hz		2		μA_{rms}
OUTPUT					
Rated Power			1		W
Voltage Setpoint Accuracy			± 3	± 5	%
Temperature Coefficient			± 0.02		%/ $^{\circ}\text{C}$
Ripple & Noise	BW = DC to 10MHz BW = 10Hz to 2MHz High Line to Low Line		50 10 1	100	mVp-p mVrms %/%
Line Regulation				± 1.5	%/%
Load Regulation					%
5 Vout Models	25% Rated Load to Rated Load		± 5	± 10	%
All Others	10% Rated Load to Rated Load		± 3	± 10	%
GENERAL					
Switching Frequency			125		kHz
Package Weight			12		g
MTTF per MIL-HDBK-217, Rev. F	Circuit Stress Method		1100		kHr
Ground Benign	$T_A = +25^{\circ}\text{C}$ $T_A = +70^{\circ}\text{C}$		550		kHr
TEMPERATURE					
Specification		-25		+70	$^{\circ}\text{C}$
Operation		-40		+85	$^{\circ}\text{C}$
Storage		-40		+110	$^{\circ}\text{C}$

MECHANICAL Package/Pinout "Y" and "Z"



DIP PACKAGE

NU = Do Not Use.

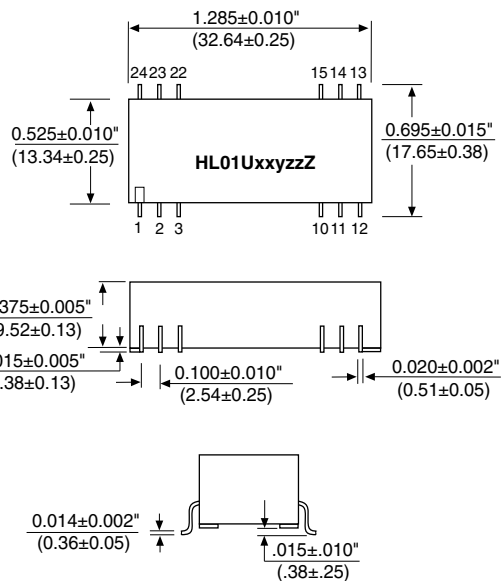
NC = No Internal Connection.

Duplicate pin functions are internally connected.

All dimensions are in inches (millimeters).

GRID: 0.100 inches (2.54 millimeters)

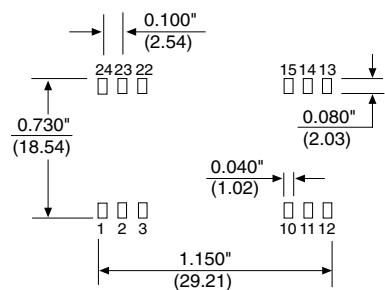
Typically Marked with: specific model ordered, date code, job code and Logo.



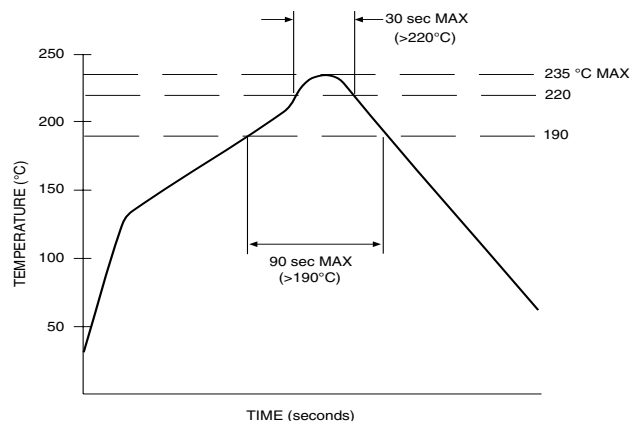
SMD PACKAGE

PIN CONNECTIONS		
PIN#	SINGLES	DUALS
1	+VIN	+VIN
2	NU	-VOUT
3	NU	Common
10	-VOUT	Common
11	+VOUT	+VOUT
12	-VIN	-VIN
13	-VIN	-VIN
14	+VOUT	+VOUT
15	-VOUT	Common
22	NU	Common
23	NU	-VOUT
24	+VIN	+VIN

RECOMMENDED LAND PATTERN

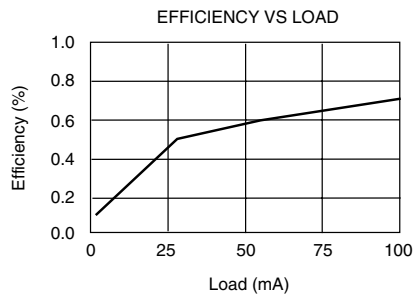
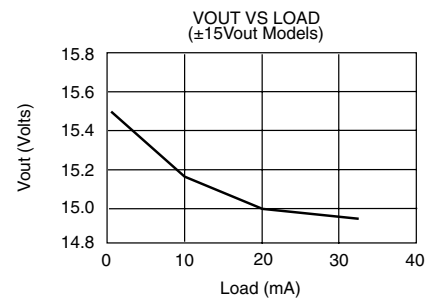
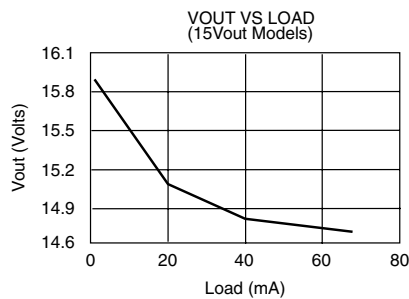
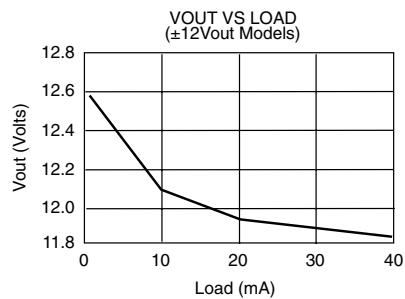
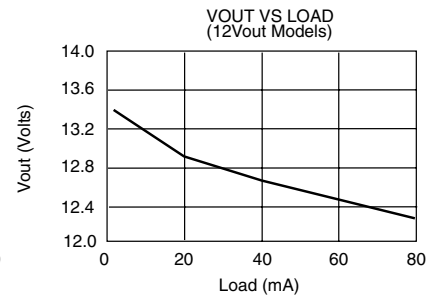
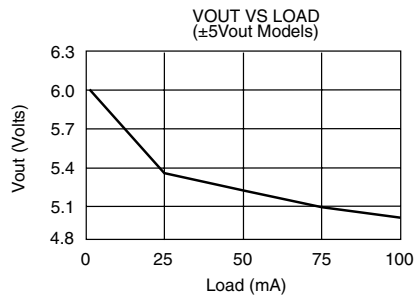
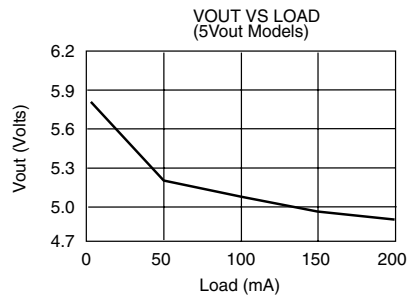


RECOMMENDED REFLOW PROFILE

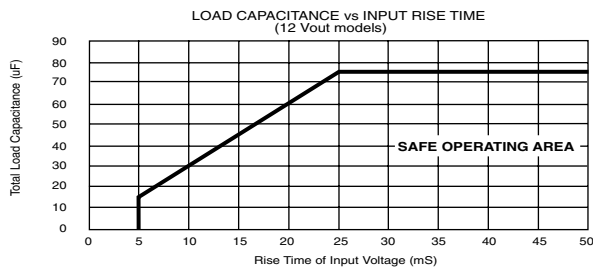
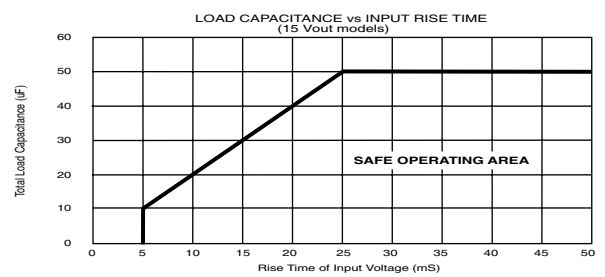
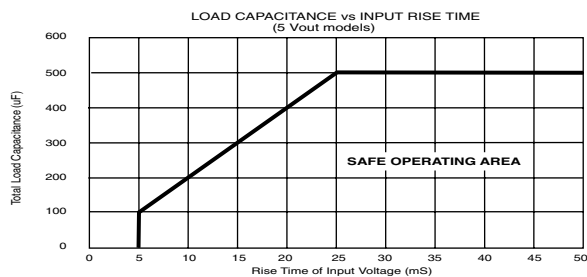


TYPICAL PERFORMANCE CURVES

Specifications typical at $T_A = +25^\circ\text{C}$, nominal input voltage, rated output current unless otherwise specified.



SAFE OPERATING AREA



NOTES:

- 1.) When operated within the SAFE OPERATING AREA as defined by the above curves, the output voltage of HL01U devices is guaranteed to be within 95% of its steady-state value within 100 milliseconds after the input voltage has reached 95% of its steady-state value.
- 2.) For dual output models, total load capacitance is the sum of the capacitances on the plus and minus outputs.