Murata Power Solutions

NREGULATED DC/DC CONVERTER

OBSOLETE PRODUCT
HL02U
Contact Factory for Replacement Model

FEATURES

- LOW COST
- INTERNAL FILTERING
- SURFACE MOUNT CONSTRUCTION
- TEMPERATURE RANGE: -25°C TO +70°C
- HIGH EFFICIENCY
- LOW OUTPUT NOISE
- NON-CONDUCTIVE CASE

DESCRIPTION

The HL02U 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 HL02U Series utilizes a 110KHz push-pull oscillator in the input stage with internal filtering to reduce the output noise while maintaining good efficiency.

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

ABSOLUTE MAXIMUM RATINGS

Internal Power Dissipation	0.90W
Short Circuit Duration	30 Sec
Lead Temperature (soldering, 10 seconds max)	+300°C *

* Note: Refer to Reflow Profile for SMD Models.

ORDERING INFORMATION

HL02U xxyzz Y/Z /H

- Device Family: HL Indicates DC/DC Converter
- Model Number: Where:
  - xx = Input Voltage
  - y = Number or 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°C, nominal input voltage, rated output current unless otherwise specified.

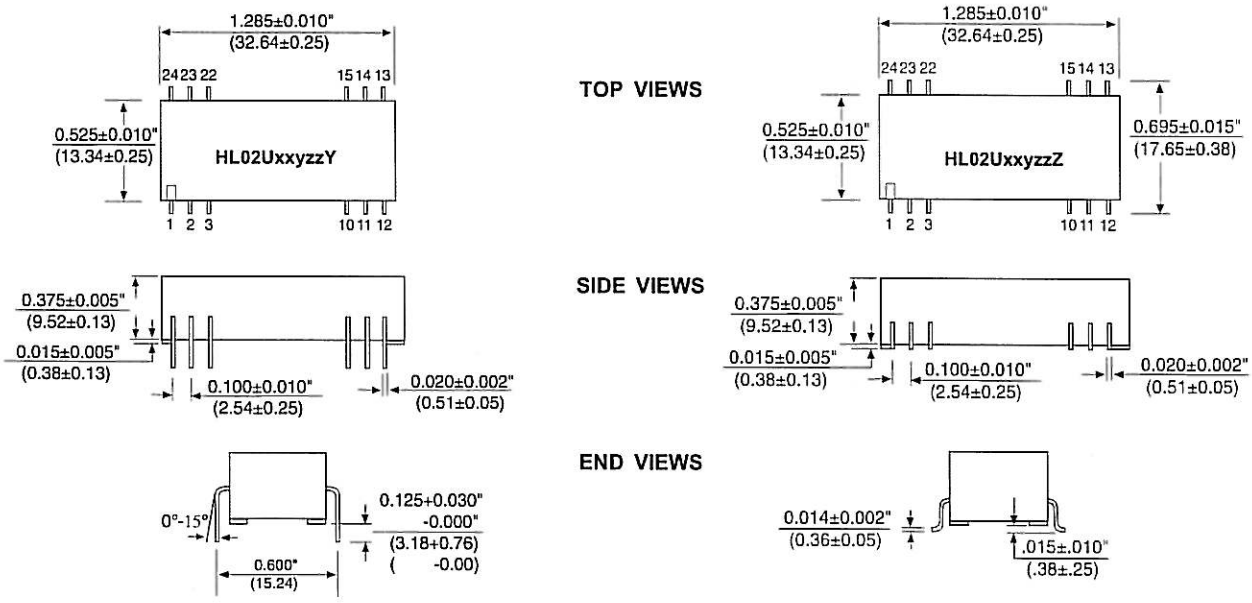
MODEL	NOMINAL INPUT VOLTAGE (VDC)	RATED OUTPUT VOLTAGE (VDC)	RATED OUTPUT CURRENT (mA)	INPUT CURRENT NO LOAD (mA)	INPUT CURRENT RATED LOAD (mA)	EFFICIENCY (%)
HL02U05S05	5	5	400	40	540	74
HL02U05S12	5	12	167	40	480	83
HL02U05S15	5	15	133	40	480	83
HL02U12S05	12	5	400	30	230	72
HL02U12S12	12	12	167	30	210	79
HL02U12S15	12	15	133	30	210	79
HL02U15S05	15	5	400	30	190	70
HL02U15S12	15	12	167	30	170	78
HL02U15S15	15	15	133	30	170	78
HL02U24S05	24	5	400	20	125	72
HL02U24S12	24	12	167	20	110	78
HL02U24S15	24	15	133	20	110	78
HL02U05D05	5	±5	±200	40	540	74
HL02U05D12	5	±12	±83	40	490	82
HL02U05D15	5	±15	±67	40	490	82
HL02U12D05	12	±5	±200	30	230	72
HL02U12D12	12	±12	±83	30	210	79
HL02U12D15	12	±15	±67	30	210	79
HL02U15D05	15	±5	±200	30	190	70
HL02U15D12	15	±12	±83	30	170	78
HL02U15D15	15	±15	±67	30	170	78
HL02U24D05	24	±5	±200	20	120	72
HL02U24D12	24	±12	±83	20	110	78
HL02U24D15	24	±15	±67	20	110	78

COMMON SPECIFICATIONS

Specifications typical at T_A = +25°C, nominal input voltage, rated output current unless otherwise specified.

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
INPUT					
Voltage Range		4.75	5	5.25	VDC
		11.4	12	12.6	
		14.25	15	15.75	
		22.8	24	26.2	
Reflected Ripple Current			30	100	mAp-p
ISOLATION					
Rated Voltage		500			VDC
Test Voltage	60 Hz, 10 Seconds	500			Vpk
Resistance			1		GΩ
Capacitance			25		pF
Leakage Current	V_{ISO}= 240VAC, 60Hz		2		µArms
OUTPUT					
Rated Power			2		W
Voltage Setpoint Accuracy			±3	±5	%
Temperature Coefficent			±0.02		%/°C
Ripple & Noise	BW = DC to 10MHz		50	100	mVp-p
	BW =10Hz to 2MHz		10		mVrms
Line Regulation	High Line to Low Line		±1	±1.5	%/%
Load Regulation	Rated Load to 1/4 Load		±3	±15	%
GENERAL					
Switching Frequency			110		kHz
Package Weight			12		g
MTTF per MIL-HDBK-217, Rev. F	Circuit Stress Method				
Ground Benign	T_A = +25°C		200		kHr
	T_A = +70°C		40		kHr
TEMPERATURE					
Specification		-25		+70	°C
Operation		-40		+85	°C
Storage		-40		+110	°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).

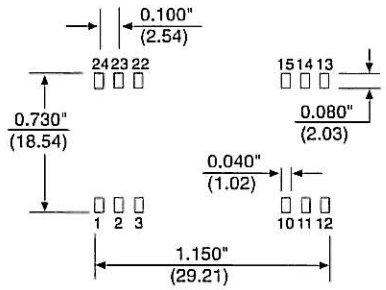
GRID: 0.100 inches (2.54 millimeters)

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

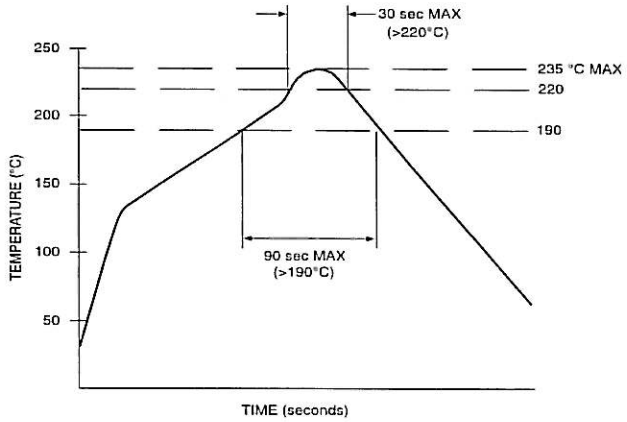
SMD PACKAGE

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

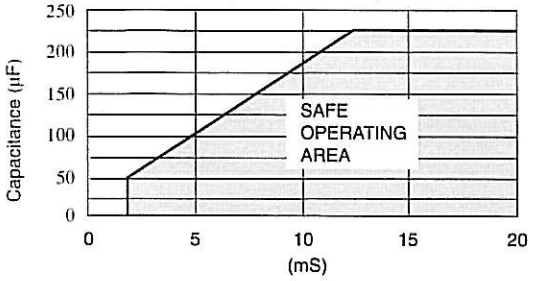


RECOMMENDED REFLOW PROFILE

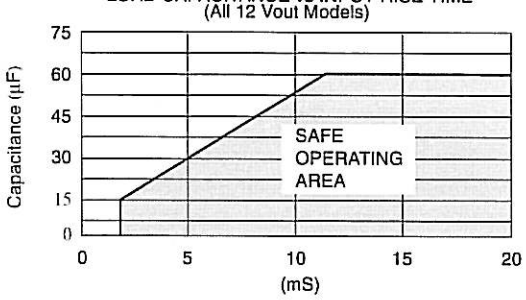


TYPICAL PERFORMANCE CURVES

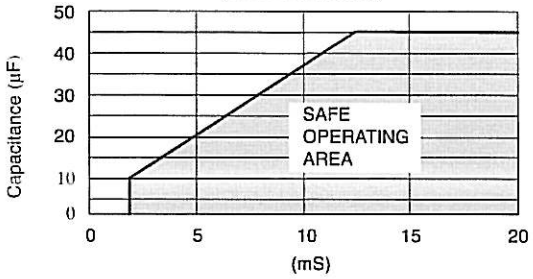
LOAD CAPACITANCE vs INPUT RISE TIME
(All 5 Vout Models)



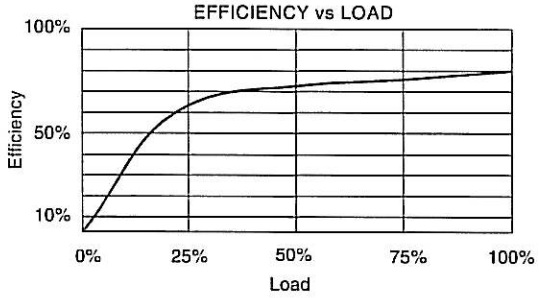
LOAD CAPACITANCE vs INPUT RISE TIME
(All 12 Vout Models)



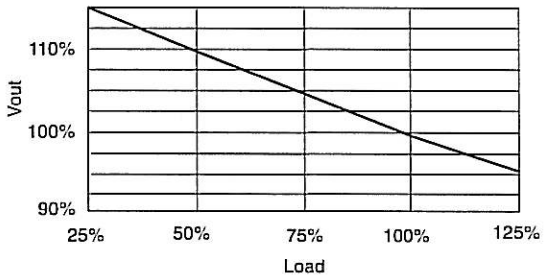
LOAD CAPACITANCE vs INPUT RISE TIME
(All 15 Vout Models)



EFFICIENCY vs LOAD



VOUT vs LOAD
(All Models Normalized)



NOTES:

1.) When operated within the SAFE OPERATING AREA as defined by the above curves, the output voltage of HL02U 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.