

DC/DC CONVERTERS

24 PIN DUAL-IN-LINE PACKAGE AND SMD

FEATURES

- LOW COST
- INTERNAL FILTERING
- LOW OUTPUT NOISE
- SHORT CIRCUIT PROTECTION

- SURFACE MOUNT CONSTRUCTION
- TEMPERATURE RANGE: -25°C TO +70°C

DESCRIPTION

The HL02R Series offers an extensive selection of input and output voltage combinations to choose from. These miniature, regulated DC/DC converters come in a 24 pin DIP and SMD packages. This small size is possible through the use of surface mount manufacturing technologies.

The HL02R Series utilizes a 110KHz push-pull oscil-

lator in the input stage with low-drop regulators on the outputs reducing the output noise and 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.....	1.5W
Short Circuit Duration.....	Continuous
Lead Temperature (soldering, 10 seconds max).....	+300°C *

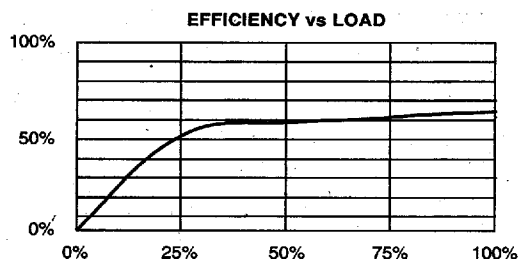
* Note: Refer to Reflow Profile for SMD Models.

ORDERING INFORMATION

	HL02R	xyzz	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				

TYPICAL PERFORMANCE CURVES

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



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)	
HL02R05S05	5	5	400	70	640	62
HL02R05S12	5	12	166	70	580	69
HL02R05S15	5	15	134	70	580	69
HL02R12S05	12	5	400	40	280	60
HL02R12S12	12	12	166	40	250	67
HL02R12S15	12	15	134	40	250	67
HL02R15S05	15	5	400	30	230	58
HL02R15S12	15	12	166	30	200	67
HL02R15S15	15	15	134	30	200	67
HL02R24S05	24	5	400	15	135	62
HL02R24S12	24	12	166	15	120	67
HL02R24S15	24	15	134	15	120	67
HL02R05D12	5	± 12	± 83	70	640	62
HL02R05D15	5	± 15	± 67	70	640	62
HL02R12D12	12	± 12	± 83	40	270	62
HL02R12D15	12	± 15	± 67	40	270	62
HL02R15D12	15	± 12	± 83	30	220	61
HL02R15D15	15	± 15	± 67	30	220	61
HL02R24D12	24	± 12	± 83	15	135	62
HL02R24D15	24	± 15	± 67	15	135	62

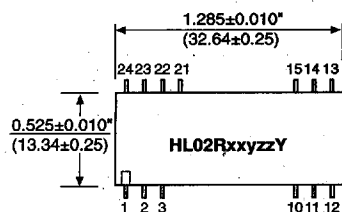
Note: Other input to output voltages may be available. Please consult factory.

COMMON SPECIFICATIONS

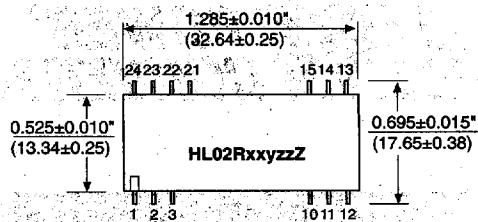
Specifications typical at $T_A = +25^{\circ}\text{C}$, nominal input voltage, rated output current unless otherwise specified.

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
INPUT					
Voltage Range		4.75 11.4 14.25 22.8	5 12 15 24	5.25 12.6 15.75 25.2	VDC VDC VDC VDC
Reflected Ripple Current			30	100	mAp-p
ISOLATION					
Rated Voltage		500			VDC
Test Voltage	60 Hz, 10 Seconds	500			Vpk
Resistance			1		G Ω
Capacitance			25		pF
Leakage Current	$V_{ISO} = 240\text{VAC}, 60\text{Hz}$		2		μArms
OUTPUT					
Rated Power			2		W
Voltage Setpoint Accuracy			± 0.5	± 5	%
Temperature Coefficient			± 0.02		%/ $^{\circ}\text{C}$
Ripple & Noise	BW = DC to 10MHz BW = 10Hz to 2MHz		25 10	100	mVp-p mVrms
5V Output - Singles Only			250	350	mVp-p
Line Regulation	High Line to Low Line		± 0.5	± 1.0	%
Load Regulation	Rated Load to No Load		± 0.1	± 0.5	%
GENERAL					
Switching Frequency			110		kHz
Package Weight			12		g
MTTF per MIL-HDBK-217, Rev. F	Circuit Stress Method		1100		kHr
Ground Benign	$T_A = +25^{\circ}\text{C}$ $T_A = +70^{\circ}\text{C}$		20		kHr
TEMPERATURE					
Specification		-25		+70	$^{\circ}\text{C}$
Operation		-40		+85	$^{\circ}\text{C}$
Storage		-40		+110	$^{\circ}\text{C}$

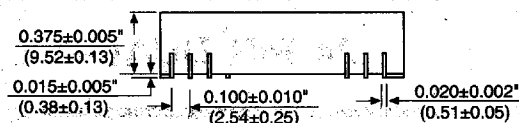
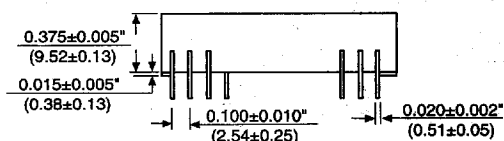
MECHANICAL Package/Pinout "Y" and "Z"



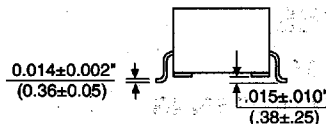
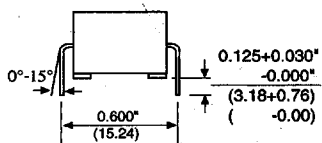
TOP VIEWS



SIDE VIEWS



END VIEWS



DIP PACKAGE

NC = No Internal Connection.

NU = Do Not Use.

Duplicate pin functions are internally connected.

All dimensions are in inches (millimeters).

GRID: 0.100 inches (2.54 millimeters)

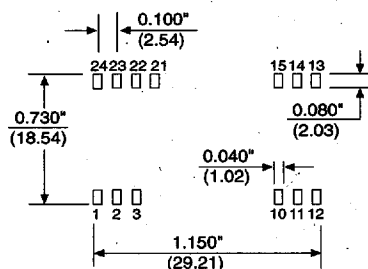
Typically Marked with: specific model ordered, date code, job code and Logo.

MATERIAL: Units are encapsulated with a low thermal resistance molding compound which has excellent chemical resistance, wide operating temperature range, and good electrical properties even in high humidity environments. The encapsulant and outer shell of the unit have UL94V-0 ratings. Lead material is phosphor bronze with a solder plated surface to allow ease of solderability.

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
21	NC	NC
22	NU	Common
23	NU	-VOUT
24	+VIN	+VIN

RECOMMENDED LAND PATTERN



RECOMMENDED REFLOW PROFILE

