

## 2 WATTS REGULATED DC/DC CONVERTER



### HL02R

#### 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

oscillator 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*

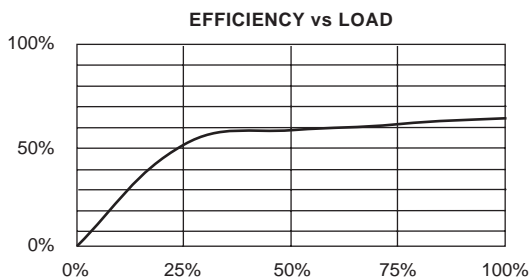
\*Note: Refer to Reflow Profile for SMD Models.

#### ORDERING INFORMATION

Device Family	HL02R	xy	yz	Y/Z	/H
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					

#### 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	$\pm 12$	$\pm 83$	70	640	62
HL02R05D15	5	$\pm 15$	$\pm 67$	70	640	62
HL02R12D12	12	$\pm 12$	$\pm 83$	40	270	62
HL02R12D15	12	$\pm 15$	$\pm 67$	40	270	62
HL02R15D12	15	$\pm 12$	$\pm 83$	30	220	61
HL02R15D15	15	$\pm 15$	$\pm 67$	30	220	61
HL02R24D12	24	$\pm 12$	$\pm 83$	15	135	62
HL02R24D15	24	$\pm 15$	$\pm 67$	15	135	62

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

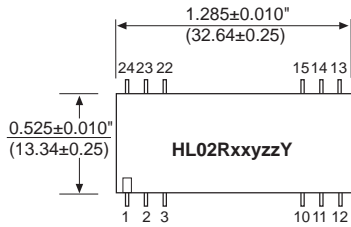
# COMMON SPECIFICATIONS

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

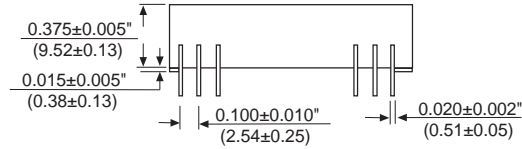
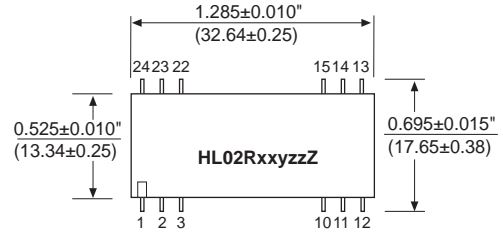
PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
<b>INPUT</b>					
Voltage Range		4.75	5	5.25	VDC
		11.4	12	12.6	VDC
		14.25	15	15.75	VDC
		22.8	24	25.2	VDC
Reflected Ripple Current			30	100	mAp-p
<b>ISOLATION</b>					
Rated Voltage		500			VDC
Test Voltage	60 Hz, 10 Seconds	500			Vpk
Resistance			1		G $\Omega$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

# MECHANICAL

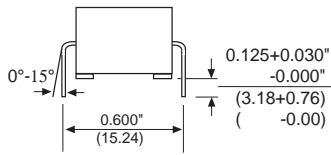
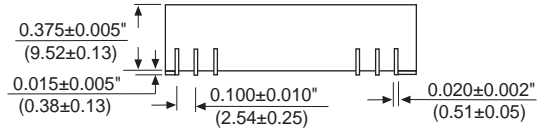
## Package/Pinout "Y" and "Z"



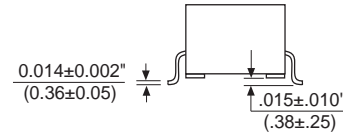
TOP VIEWS



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).

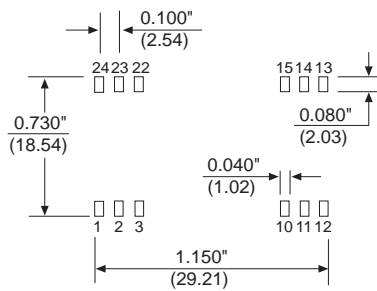
GRID: 0.100 inches (2.54 millimeters)

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

### 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

