

## FEATURES

- LOW COST
- INTERNAL FILTERING
- SURFACE MOUNT CONSTRUCTION
- TEMPERATURE RANGE:  
-25°C TO +70°C
- INDUSTRY STANDARD PINOUT
- ROHS COMPLIANT

## DESCRIPTION

The HL02RYC Series offers an extensive selection of input and output voltage combinations to choose from. These miniature, regulated 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 HL02RYC Series utilizes a 110 KHz 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.....	30 Sec
Lead Temperature (soldering, 10 seconds max).....	+300°C*

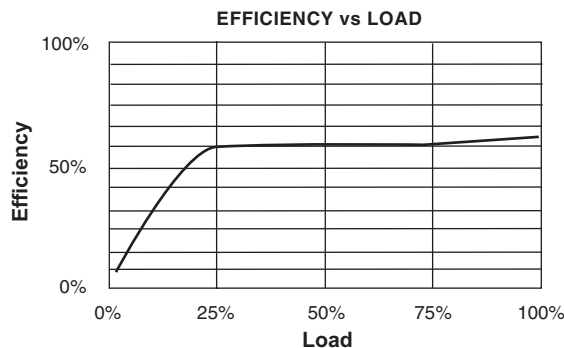
\*Note: Refer to Reflow Profile for SMD Models.

### ORDERING INFORMATION

Device Family	HL02R	xyzz	Y	C
HL Indicates DC/DC Converter				
Model Number				
Where:				
xx = Input Voltage				
y = Number of Outputs (Single "S", Dual "D")				
zz = Output Voltage				
Package Option				
RoHS Compliant				

## 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 (%)
				MIN LOAD (mA)	RATED LOAD (mA)	
HL02R05S05YC HL02R05S12YC HL02R05S15YC	5 5 5	5 12 15	400 166 134	70 70 70	640 580 580	62 69 69
HL02R12S05YC HL02R12S12YC HL02R12S15YC	12 12 12	5 12 15	400 166 134	40 40 40	280 250 250	60 67 67
HL02R15S05YC HL02R15S12YC HL02R15S15YC	15 15 15	5 12 15	400 166 134	30 30 30	230 200 200	58 67 67
HL02R24S05YC HL02R24S12YC HL02R24S15YC	24 24 24	5 12 15	400 166 134	15 15 15	135 120 120	62 67 67
HL02R05D12YC HL02R05D15YC	5 5	$\pm 12$ $\pm 15$	$\pm 83$ $\pm 67$	70 70	640 640	62 62
HL02R12D12YC HL02R12D15YC	12 12	$\pm 12$ $\pm 15$	$\pm 83$ $\pm 67$	40 40	270 270	62 62
HL02R15D12YC HL02R15D15YC	15 15	$\pm 12$ $\pm 15$	$\pm 83$ $\pm 67$	30 30	220 220	61 61
HL02R24D12YC HL02R24D15YC	24 24	$\pm 12$ $\pm 15$	$\pm 83$ $\pm 67$	15 15	135 135	62 62

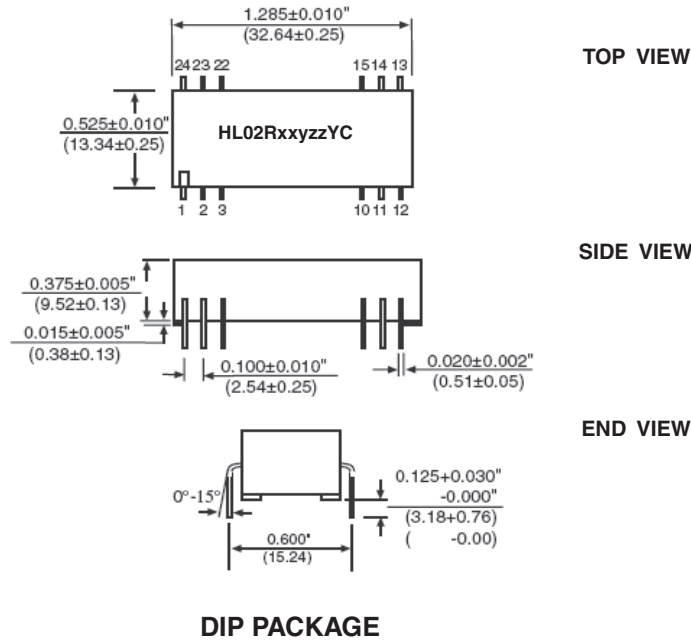
Note: Other input to output voltages may be available. Please contact factory.

### 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 11.4 14.25 22.8	5 12 15 24 30	5.25 12.6 15.75 25.2 100	VDC VDC VDC VDC mAp-p
Reflected Ripple Current					
<b>ISOLATION</b>					
Rated Voltage		500			VDC
Test Voltage	60 Hz, 10 Seconds	500			Vpk
Resistance			1		GΩ
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 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		$\pm 0.5$	$\pm 1$	%
Load Regulation	Rated Load to No Load		$\pm 0.5$	$\pm 1$	%
<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	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$		20		kHr
<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"**



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.  
 Pin base metal is phosphor bronze. Pin finish is matte tin (100-300 microinches) over a nickel barrier layer (5-40 microinches).

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

**THROUGH-HOLE SOLDERING INFORMATION**

These devices are intended for wave soldering or manual soldering.  
**They are not intended to be subject to surface mount processes under any circumstances.**

The normal wave soldering process can be used with these devices where the device is subjected to a maximum wave temperature of 260°C for a period of no more than 10 seconds. Within this time and temperature range, the integrity of the device's plastic body will not be compromised and internal temperatures within the converter will not exceed 175°C. Care should be taken to control manual soldering limits identical to that of wave soldering.