

# IHB60S

## 60 Watt Single Output Half Brick DC/DC Converter



- 18 - 40 & 33 - 75V Input Range
- High Efficiency: 84% Typical
- 1500VDC Isolation Between Input and Output
- Operation to 100°C Baseplate Temperature
- 50µs Transient Recovery, 0-90% Load Step
- Primary & Secondary Remote On/Off
- Adjustable Output Voltage
- IHB60S Series Approved to UL/CUL 1950, EN60950

The IHB60S series standard half brick modules are designed for today's demanding industrial applications. Available in two wide range inputs, these isolated converters offer many features in the standard models. With a complement of safety agency approvals and low noise operations, the converters respond extremely fast to change in load conditions. Inherent in the design are very well-controlled output voltage and no need for minimum loading.

### PRODUCT SELECTION CHART

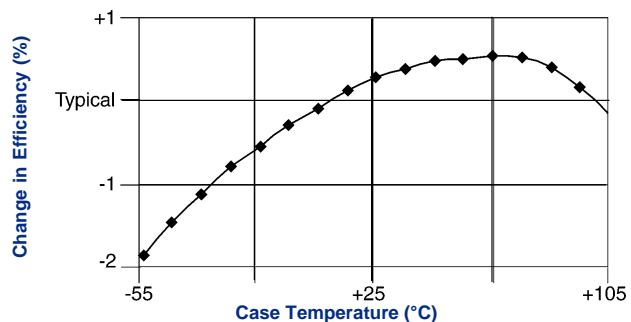
MODEL	INPUT VOLTAGE (VDC)	RATED VOUT (VDC)	RATED MAXIMUM IOUT (A)
IHB60S2403	24 (18-40)	3.3	18
IHB60S2405	24 (18-40)	5.1	12
IHB60S4803	48 (33-75)	3.3	18
IHB60S4805	48 (33-75)	5.1	12

### ABSOLUTE MAX. RATINGS

Output Short-Circuit Duration	Continuous
Baseplate Temperature	+100°C
Lead Temperature (soldering, 10 seconds max)	+300°C
Storage Temperature	+125°C
Input to Output Isolation	1500 VDC

### EFFICIENCY vs TEMPERATURE

$T_{CASE} = +40^{\circ}\text{C}$ , nominal input voltage, nominal load, recommended external components applied, unless otherwise specified.



# SPECIFICATIONS, ALL MODELS

Specifications are at  $T_{CASE} = +40^{\circ}C$  nominal input voltage unless otherwise specified.

INPUT	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
	Voltage Range	IHB60S24X Series IHB60S48X Series		18 33	24 48	40 75
Reflected Ripple Current		Peak - Peak			220	mA
Input Ripple Rejection		DC to 1KHz	50	60		dB
Maximum Input Current		Output Power = 60W				
IHB60S24X Series		$V_{IN} = 16V$			6	A
IHB60S48X Series		$V_{IN} = 30V$			3	A
No Load Power Dissipation		$P_{OUT} = 0, V_{IN,Min} < V_{IN} < V_{IN,Max}$			6	W
Inrush Charge						
IHB60S24X Series					0.29	mC
IHB60S48X Series					0.165	mC
Quiescent Operating Current						
Primary On/Off Disabled				7.5	10	mA
Secondary On/Off Disabled				15	25	mA

GENERAL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
	<b>ISOLATION</b>					
Input to Output		Peak Test	1500			V <sub>DC</sub>
Input to Baseplate			1500			V <sub>DC</sub>
Resistance, Input - Output			10			M $\Omega$
Capacitance, Input - Output				2000		pF
Leakage Current		$V_{ISO} = 240V_{AC}, 60Hz$		180		$\mu A, rms$
<b>GENERAL</b>						
Set Point Accuracy		$V_{IN} = \text{Nominal}, I_O = I_{Nom}$			1	%
Turn-on Time		Within 1% of Nominal $V_{OUT}$		3.5	5	mSec
Remote On/Off Control Inputs						
Primary		Open Collector/Drain				
Sink Current-Logic Low		$V_{IN} = V_{MAX}$			7	mA
V <sub>low</sub>					0.8	V
V <sub>high</sub>					Open Collector	
Secondary		Open Collector/Drain				
Sink Current-Logic Low					100	$\mu A$
V <sub>low</sub>					0.4	V
V <sub>high</sub>					Open Collector	
External Synchronization Input						
Frequency			440		520	KHz
Pulse Width			150		320	nSec
Source Impedance					47	$\Omega$
Input High Voltage			4		5	V
Input Low Voltage			0		1	V
Input Impedance				470		$\Omega$
Switching Frequency			470	480	490	KHz
Weight					3 (85)	oz (g)
<b>TEMPERATURE</b>						
Operation/Specification		Case Temperature	-40		+100	$^{\circ}C$
Storage			-55		+125	$^{\circ}C$
Shutdown			+100		+115	$^{\circ}C$
Thermal Impedance		Case to Ambient		8.2		$^{\circ}C/W$

# SPECIFICATIONS, ALL MODELS

Specifications are at  $T_{CASE} = +40^{\circ}C$  nominal input voltage unless otherwise specified.

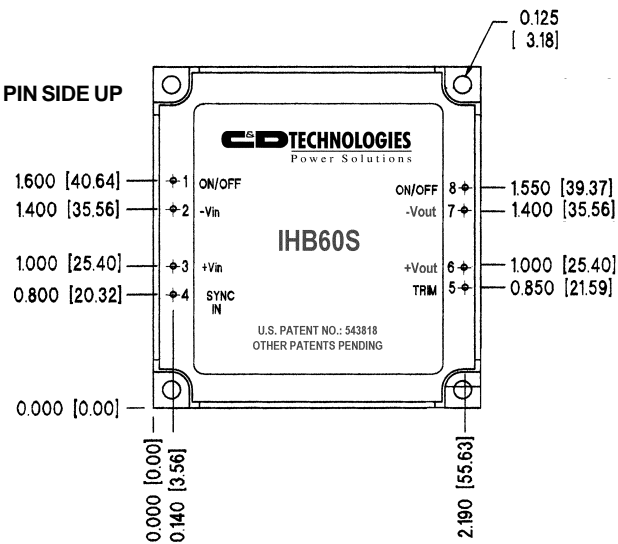
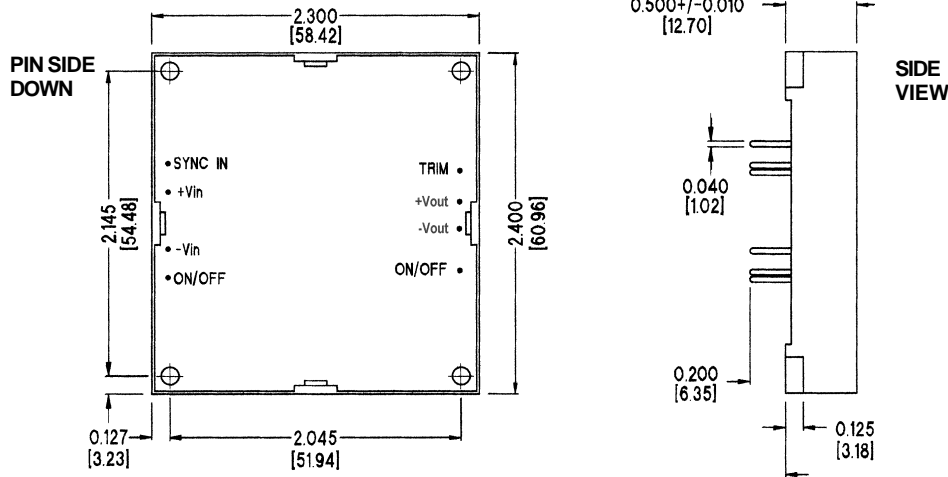
PARAMETER	CONDITIONS	$V_{OUT}$			UNITS	
		Min	Nom	Max		
IHB60SX03** OUTPUT	Output Power	60 Watts Max	30	60	W	
	Set Point Voltage	$I_{O,Nom}$	3.3		V	
	Output Current, $I_{OUT}$		0	18.0	A	
	Output Ripple, p-p	DC to 20MHz*	100	200	mV	
	Output Adjust Range	*	3.15	3.80	V	
	Output Temperature Drift			.02	%/°C	
	Line Regulation	$V_{IN,Min} \leq V_{IN} \leq V_{IN,Max}$				
		$I_O = I_{O,Nom}$		0.05	0.10	%
	Load Regulation	Min Load to Rated Load		0.50	1.00	%
	Current Limit Inception	Other Outputs Min Load		23		A
	Short-Circuit Current			19	25	A
	Transient Response	50 to 100% Load Step				
	Peak Deviation			150	250	mV
	Settling Time	$V_{OUT}, 1\%$ of $V_{OUT,Nom}$		35	50	μSec
	Overvoltage Limit		4.2		5.0	V
Efficiency	$V_{IN}=NOM, I_O=18A$	83	84		%	

PARAMETER	CONDITIONS	$V_{OUT}$			UNITS	
		Min	Nom	Max		
IHB60SX05** OUTPUT	Output Power	60 Watts Max	30	60	W	
	Set Point Voltage	$I_{O,Nom}$	5.1		V	
	Output Current, $I_{OUT}$		0	12	A	
	Output Ripple, p-p	DC to 20MHz*	100	200	mV	
	Output Adjust Range	*	4.60	5.50	V	
	Output Temperature Drift			.02	%/°C	
	Line Regulation	$V_{IN,Min} \leq V_{IN} \leq V_{IN,Max}$				
		$I_O = I_{O,Nom}$		0.05	0.10	%
	Load Regulation	Min Load to Rated Load		0.50	1.0	%
	Current Limit Inception			16.0		A
	Short-Circuit Current			12.6	16.0	A
	Transient Response	50 to 100% Load Step				
	Peak Deviation			200	300	mV
	Settling Time	$V_{OUT}, 1\%$ of $V_{OUT,Nom}$		35	50	μSec
	Overvoltage Limit		6.0		6.8	V
Efficiency	$V_{IN}=NOM, I_O=12A$	86	87		%	

\* See Application Notes available on the web at [www.cdpowerelectronics.com](http://www.cdpowerelectronics.com)

\*\* X = Either 24 or 48

# MECHANICAL



PIN CONNECTIONS	
1	PRIMARY ON/OFF
2	-VIN
3	+VIN
4	SYNC IN
5	TRIM
6	-VOUT
7	+VOUT
8	SECONDARY ON/OFF

**NOTES:**  
 All dimensions are in inches (millimeters).  
 PIN PLACEMENT TOLERANCE:  $\pm 0.005$ "  
 MECHANICAL TOLERANCE:  $\pm 0.015$ "  
 Marked with: specific model ordered, date code, job code.  
**MATERIAL:** Units are encapsulated in a low thermal resistance molding compound which has excellent chemical resistance and electrical properties in high humidity environments and over a wide operating temperature range. The encapsulant and outer shell of the unit have UL94V-0 ratings. Lead material is solder plated to allow ease of solderability.

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