Murata Power Solutions

IHB60TC

60 Watt Triple Output Half Brick DC/DC Converter



- RoHS Compliant
- 18 - 40 & 33 - 75V Input Range
- Each Channel Independently Current Limited
- High Efficiency: 87% Typical
- 1500VDC Isolation Between Input and Output
- Operation to 100°C Baseplate Temperature
- 50mS Transient Recovery, 0-90% Load Step
- Primary & Secondary Remote On/Off
- IHB60TC48 Series Approved to UL/CUL 1950, EN60950

The IHB60TC series triple output 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 voltages and minimal need for minimum loading on main (V1) output.

PRODUCT SELECTION CHART

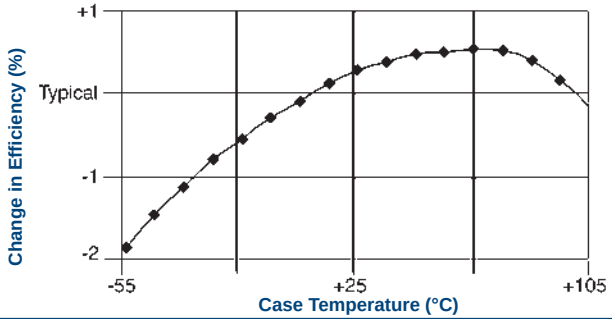
MODEL	INPUT VOLTAGE (VDC)	RATED VOUT (VDC)			RATED MAXIMUM IOUT (A)		
		V1 (±)	V2 (±)	V3 (±)	V1(±)	V2(±)	V3(±)
~~IHB60T240312C~~	~~24 (18-40)~~	~~3.3~~	~~12~~	~~12~~	~~18~~	~~2.5~~	~~2.5~~
~~IHB60T240315C~~	~~24 (18-40)~~	~~3.3~~	~~15~~	~~15~~	~~18~~	~~2.0~~	~~2.0~~
IHB60T240512C	24 (18-40)	5.1	12	12	12	2.5	2.5
~~IHB60T240515C~~	~~24 (18-40)~~	~~5.0~~	~~15~~	~~15~~	~~12~~	~~2.0~~	~~2.0~~
~~IHB60T480312C~~	~~48 (33-75)~~	~~3.3~~	~~12~~	~~12~~	~~18~~	~~2.5~~	~~2.5~~
~~IHB60T480315C~~	~~48 (33-75)~~	~~3.3~~	~~15~~	~~15~~	~~18~~	~~2.0~~	~~2.0~~
~~IHB60T480512C~~	~~48 (33-75)~~	~~5.1~~	~~12~~	~~12~~	~~12~~	~~2.5~~	~~2.5~~
~~IHB60T480515C~~	~~48 (33-75)~~	~~5.0~~	~~15~~	~~15~~	~~12~~	~~2.0~~	~~2.0~~

ABSOLUTE MAXIMUM RATINGS

Output Short-Circuit Duration	Continuous
Baseplate Temperature	+100°C
Storage Temperature	+125°C
Input to Output Isolation	1500 VDC

EFFICIENCY vs TEMPERATURE

T_{CASE} = +40°C, nominal input voltage, nominal load, recommended external components applied, unless otherwise specified.*



RoHS COMPLIANT 2002/95/EC

For full details go to www.murata-ps.com/rohs

ISO9001 CERTIFIED

SPECIFICATIONS, ALL MODELS

Specifications are at T_{CASE} = +40°C nominal input voltage unless otherwise specified.

	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
INPUT	Voltage Range					
	IHB60T24XXC Series		18	24	40	VDC
	IHB60T48XXC Series		33	48	75	VDC
	Reflected Ripple Current	Peak - Peak			220	mA
	Input Ripple Rejection	DC to 1KHz	50	60		dB
	Maximum Input Current	Output Power = 60W				
	IHB60T24XXC Series	V_{IN} = 16V			6	A
	IHB60T48XXC 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					
	IHB60TC24XX Series				0.29	mC
	IHB60TC48XX Series				0.165	mC
	Quiescent Operating Current					
	Primary On/Off Disabled			7.5	10	mA
	Secondary On/Off Disabled			15	25	mA

	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
GENERAL	**ISOLATION**					
	Input to Output	Peak Test	1500			VDC
	Input to Baseplate		1500			VDC
	Channel to Channel	Any Channel to Any Channel	500			VDC
	Resistance, Input - Output		10			MΩ
	Capacitance, Input - Output			2000		pF
	Leakage Current	V_{ISO} = 240VAC, 60Hz		180		µA, rms
	GENERAL					
	Set Point Accuracy	V_{IN} = Nominal, 50% Load			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
	Vlow				0.8	V
	Vhigh				Open Collector	
	Secondary	Open Collector/Drain				
	Sink Current-Logic Low				100	µA
	Vlow				0.4	V
	Vhigh				Open Collector	
	External Synchronization Input					
	Frequency		440		520	KHz
	Pulse Width		150		320	nSec
	Source Impedence				47	Ω
	Input High Voltage		4		5	V
	Input Low Voltage		0		1	V
	Input Impedance			470		Ω
	Switching Frequency		470	480	490	KHz
	Weight				3 (85)	oz (g)
	TEMPERATURE	Case Temperature				
	Operation/Specification		-40		+100	°C
	Storage		-55		+125	°C
	Shutdown		+100		+115	°C
	Thermal Inpedance	Case to Ambient		8.2		°C/W

	PARAMETER	CONDITIONS	V1 Min	V1 Nom	V1 Max	V2 Min	V2 Nom	V2 Max	V3 Min	V3 Nom	V3 Max	UNITS
IHB60TX0312C** OUTPUT	Output Power	Total Combined O/P Power = 60 Watts Max.		30	60		15	30		15	30	W
	Set Point Voltage	$I_{O Nom}$		3.3			12.2			12.2		V
	Output Current, I_{OUT}		0.5	9	18	0	1.25	2.5	0	1.25	2.5	A
	Output Ripple, p-p	DC to 20MHz*		100	200		150	250		150	250	mV
	Output Adjust Range	*	3.15		3.80		Dependent on V1					V
	Output Temperature Drift			.02	.05		.02	.05		.02	.05	%/°C
	Line Regulation	$V_{IN, Min}$≤V_{IN}≤$V_{IN, Max}$ I_O = $I_{O, Nom}$		0.05	1.0		1.0	2.0		1.0	2.0	%
	Load Regulation	Min Load to Rated Load		0.50	1.0		See Regulation Curves			See Regulation Curves		%
	Current Limit Inception	Other Outputs Min Load		23			5.0			5.0		A
	Short-Circuit Current			19	25		4.0	5.0		4.0	5.0	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	I_{OUT1}=9A, (I_{OUT2}+I_{OUT3})=2.5A F.L. V_{IN}=Nominal	85	86								%

* See Application Notes available on the web at www.cd4power.com

** X = Either 24 or 48

SPECIFICATIONS, ALL MODELS

Specifications are at T_{CASE} = +40°C nominal input voltage unless otherwise specified.

IHB60TX0315C** OUTPUT

PARAMETER	CONDITIONS	V1 Min	V1 Nom	V1 Max	V2 Min	V2 Nom	V2 Max	V3 Min	V3 Nom	V3 Max	UNITS
Output Power	Total Combined O/P Power = 60 Watts Max.		30	60		15	30		15	30	W
Set Point Voltage	$I_{O\ Nom}$		3.3			15.85			15.85		V
Output Current, I_{OUT}		0.5	9	18	0	1	2	0	1	2	A
Output Ripple, p-p	DC to 20MHz*		100	200		125	250		125	250	mV
Output Adjust Range	See Application Notes*	3.15		3.80		Dependent on V1					V
Output Temperature Drift			.02	.05		.02	.05		.02	.05	%/°C
	Line Regulation $V_{IN,Min} \le V_{IN} \le V_{IN,Max}$ $I_O = I_{O,Nom}$		0.05	1.0		1.0	2.0		1.0	2.0	%
Load Regulation	Min Load to Rated Load		0.50	1.0	See Regulation Curves			See Regulation Curves			%
Current Limit Inception	Other Outputs Min Load		23			4.0			4.0		A
Short-Circuit Current			19	25		3.2	4.0		3.2	4.0	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	I_{OUT1}=9A, (I_{OUT2}+I_{OUT3})=2A F.L. V_{IN}=Nominal	85	86								%

IHB60TX0512C** OUTPUT

PARAMETER	CONDITIONS	V1 Min	V1 Nom	V1 Max	V2 Min	V2 Nom	V2 Max	V3 Min	V3 Nom	V3 Max	UNITS
Output Power	Total Combind O/P Power = 60 Watts Max		30	60		15	30		15	30	W
Set Point Voltage	$I_{O\ Nom}$		5.1			12			12		V
Output Current, I_{OUT}		0.5	6.0	12	0	1.25	2.5	0	1.25	2.5	A
Output Ripple, p-p	DC to 20MHz*		125	200		150	250		150	250	mV
Output Adjust Range	*	4.75		5.50		Dependent on V1					V
Output Temperature Drift			.02	.05		.02	.05		.02	.05	%/°C
Line Regulation	$V_{IN,Min} \le V_{IN} \le V_{IN,Max}$ $I_O = I_{O,Nom}$		0.05	0.10		1.0	2.0		1.0	2.0	%
Load Regulation	Min Load to Rated Load		0.50	1.0	See Regulation Curves			See Regulation Curves			%
Current Limit Inception	Other Outputs Min Load		16			5.0			5.0		A
Short-Circuit Current			12.6	16		4.0	5.0		4.0	5.0	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	I_{OUT1}=6A, (I_{OUT2}+I_{OUT3})=2.5A F.L. V_{IN}=Nominal	86	87								%

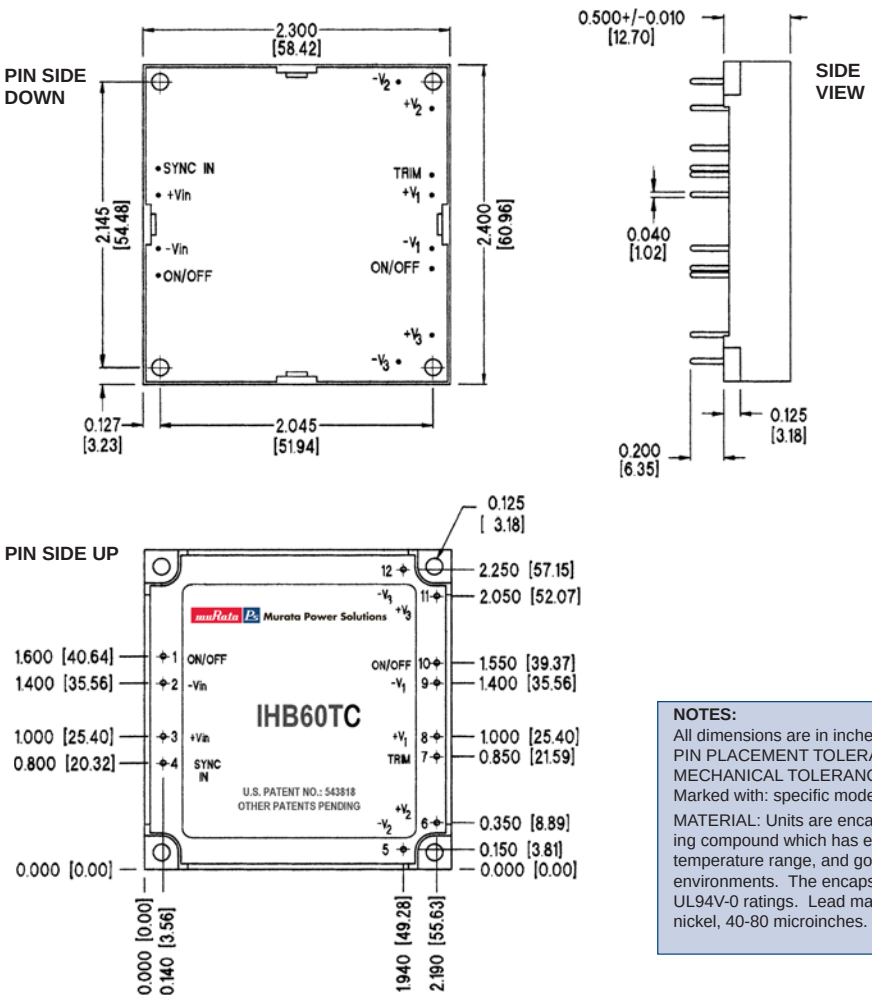
IHB60TX0515C** OUTPUT

PARAMETER	CONDITIONS	V1 Min	V1 Nom	V1 Max	V2 Min	V2 Nom	V2 Max	V3 Min	V3 Nom	V3 Max	UNITS
Output Power	Total Combined O/P Power = 60 Watts Max		30	60		15	30		15	30	W
Set Point Voltage	$I_{O\ Nom}$		5.0			15.3			15.3		V
Output Current, I_{OUT}		0.5	6	12	0	1	2	0	1	2	A
Output Ripple, p-p	DC to 20MHz*		100	200		125	250		125	250	mV
Output Adjust Range	*	4.60		5.50		Dependent on V1					V
Output Temperature Drift			.02	.05		.02	.05		.02	.05	%/°C
Line Regulation	$V_{IN,Min} \le V_{IN} \le V_{IN,Max}$ $I_O = I_{O,Nom}$		0.05	0.10		1.0	2.0		1.0	2.0	%
Load Regulation	Min Load to Rated Load		0.50	1.0	See Regulation Curves			See Regulation Curves			%
Current Limit Inception	Other Outputs Min Load		16			4.0			4.0		A
Short-Circuit Current			12.6	16		3.2	4.0		3.2	4.0	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	I_{OUT1}=6A, (I_{OUT2}+I_{OUT3})=2A F.L. V_{IN}=Nominal	86	87								%

* See Application Notes available on the web at www.cd4power.com

** X = Either 24 or 48

MECHANICAL



PIN CONNECTIONS	
1	PRIMARY ON/OFF
2	-VIN
3	+VIN
4	SYNC IN
5	-V2
6	+V2
7	TRIM
8	+V1
9	-V1
10	SECONDARY ON/OFF
11	+V3
12	-V3

NOTES:
All dimensions are in inches (millimeters).
PIN PLACEMENT TOLERANCE: ± 0.005"
MECHANICAL TOLERANCE: ± 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, wide operating temperature range, and good electrical properties under high humidity environments. The encapsulant and outer shell of the unit have UL94V-0 ratings. Lead material is matte tin 100 microinches min., over nickel, 40-80 microinches.

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.

Murata Power Solutions

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