

HDD60 SERIES



DC - DC CONVERTER

50 ~ 60W SINGLE, DOUBLE & TRIPLE OUTPUT

FEATURES

- 50W TO 60W DC/DC CONVERTER
- 2:1 INPUT RANGE, Pi INPUT FILTER
- ISOLATION INPUT AND OUTPUT
- HIGH PERFORMANCE UP TO 86%
- SHORT CIRCUIT PROTECTION
- 2 YEARS WARRANTY

MODEL LIST

MODEL NO.	INPUT VOLTAGE	OUTPUT WATTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	EFF. (min.)
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Single Output Models

HDD60 - 12S05-X	9~18 VDC	60 WATTS	+ 5 VDC	12000 mA	79%
HDD60 - 12S12-X	9~18 VDC	60 WATTS	+ 12 VDC	5000 mA	82%
HDD60 - 12S15-X	9~18 VDC	60 WATTS	+ 15 VDC	4000 mA	82%
HDD60 - 12S24-X	9~18 VDC	60 WATTS	+ 24 VDC	2500 mA	84%
HDD60 - 24S05-X	18~36 VDC	60 WATTS	+ 5 VDC	12000 mA	80%
HDD60 - 24S12-X	18~36 VDC	60 WATTS	+ 12 VDC	5000 mA	84%
HDD60 - 24S15-X	18~36 VDC	60 WATTS	+ 15 VDC	4000 mA	84%
HDD60 - 24S24-X	18~36 VDC	60 WATTS	+ 24 VDC	2500 mA	85%
HDD60 - 48S05-X	36~72 VDC	60 WATTS	+ 5 VDC	12000 mA	83%
HDD60 - 48S12-X	36~72 VDC	60 WATTS	+ 12 VDC	5000 mA	85%
HDD60 - 48S15-X	36~72 VDC	60 WATTS	+ 15 VDC	4000 mA	85%
HDD60 - 48S24-X	36~72 VDC	60 WATTS	+ 24 VDC	2500 mA	86%

Double Output Models

HDD60 - 12D05-X	9~18 VDC	50 WATTS	5V / 5V	5 A / 5 A	78%
HDD60 - 12D12-X	9~18 VDC	60 WATTS	12V / 12V	2.5A / 2.5A	80%
HDD60 - 12D15-X	9~18 VDC	60 WATTS	15V / 15V	2 A / 2 A	80%
HDD60 - 12D512-X	9~18 VDC	55 WATTS	5V / 12V	5 A / 2.5A	79%
HDD60 - 24D05-X	18~36 VDC	50 WATTS	5V / 5V	5 A / 5 A	80%
HDD60 - 24D12-X	18~36 VDC	60 WATTS	12V / 12V	2.5A / 2.5A	82%
HDD60 - 24D15-X	18~36 VDC	60 WATTS	15V / 15V	2 A / 2 A	82%
HDD60 - 24D512-X	18~36 VDC	60 WATTS	5V / 12V	6 A / 2.5A	80%
HDD60 - 48D05-X	36~72 VDC	50 WATTS	5V / 5V	5 A / 5 A	80%
HDD60 - 48D12-X	36~72 VDC	60 WATTS	12V / 12V	2.5A / 2.5A	84%
HDD60 - 48D15-X	36~72 VDC	60 WATTS	15V / 15V	2 A / 2 A	84%
HDD60 - 48D512-X	36~72 VDC	60 WATTS	5V / 12V	6 A / 2.5A	81%

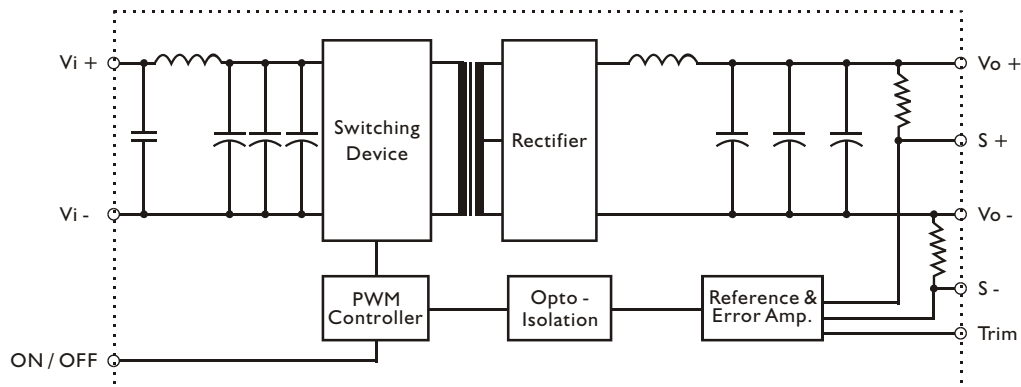
MODEL LIST

MODEL NO.	INPUT VOLTAGE	OUTPUT WATTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	EFF. (min.)
Triple Output Models					
HDD60 - 12T512-X	9~18 VDC	55 WATTS	+ 5V / ± 12 V	+ 5A / ± 1.25 A	78%
HDD60 - 24T512-X	18~36 VDC	55 WATTS	+ 5V / ± 12 V	+ 5A / ± 1.25 A	79%
HDD60 - 48T512-X	36~72 VDC	55 WATTS	+ 5V / ± 12 V	+ 5A / ± 1.25 A	80%

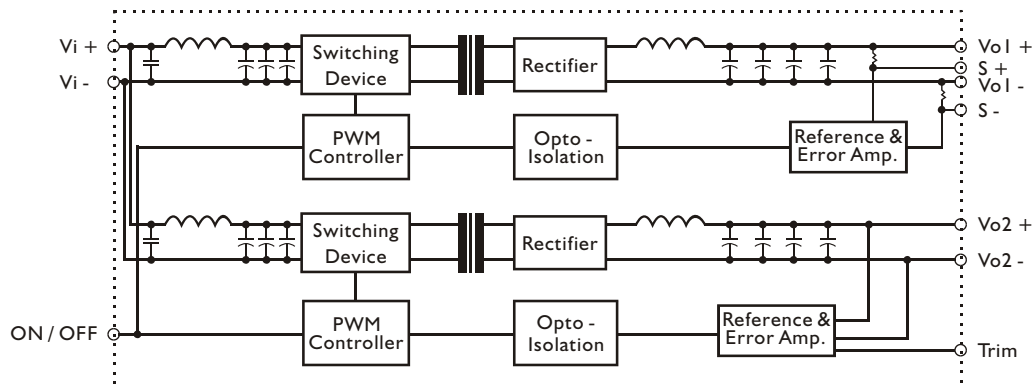
- SUFFIX "X=P" : PCB MOUNTING TYPE, HEAT SINK WILL BE ADDED ON MODULE.
- SUFFIX "X=T" : CHASSIS MOUNTING TYPE:(TERMINAL BLOCK), NO HEAT SINK.
USE CHASSIS AS HEAT SINK OR FAN FORCE COOLING.
INDICATE SUFFIX WHEN ORDER.

CIRCUIT SCHEMATIC

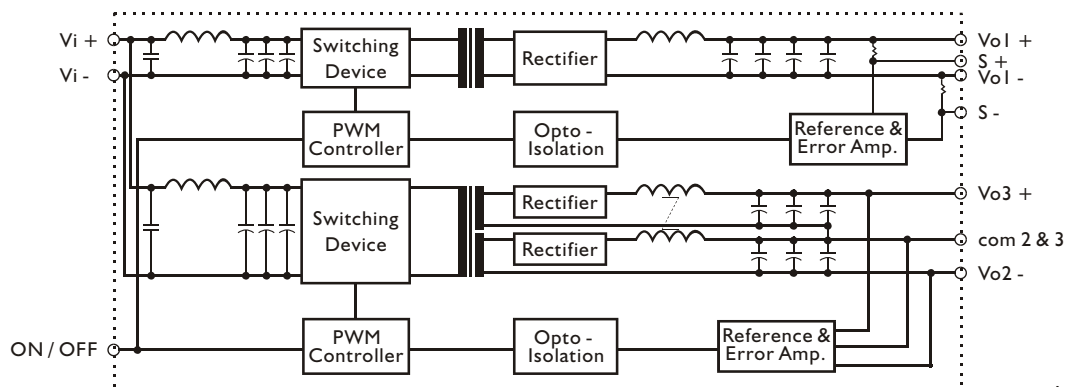
- Block diagram for HDD60 series with single output



- Block diagram for HDD60 series with double output



- Block diagram for HDD60 series with triple output



SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

GENERAL

Characteristics	Conditions	min.	typ.	max.	unit
Switching frequency	Vi nom, Io nom		80		KHz
Isolation voltage	Input / Output	1,500			VDC
Isolation resistance	Input / Output, @ 500VDC	1G			Ω
Ambient temperature	Operating at Vi nom, Io nom	-25		+ 71	°C
Case temperature	Operating at Vi nom, Io nom			+ 95	°C
Derating	Vi nom	See derating curve			% / °C
Storage temperature	Non operational	-25		+ 100	°C
M.T.B.F.	According to MIL-HDBK-217F, GF40		122,500		Hrs
Dimension	L88.9 x W139.7 x H35.6 for "P" type				mm
	L88.9 x W139.7 x H32.9 for "T" type				mm
Cooling	Free air convection				
Case material	Metal				

INPUT SPECIFICATIONS

Characteristics	Conditions		min.	typ.	max.	unit
Input voltage range	Ta min ... Ta max, Io nom		9	12	18	VDC
			18	24	36	VDC
			36	48	72	VDC
No load input current	Vi nom, Io = 0	12V models			20	mA
		24V models			15	mA
		48V models			10	mA
Input voltage w/o damage	Io nom	12V models			20	VDC
		24V models			40	VDC
		48V models			75	VDC
Input filter	Pi type					

OUTPUT SPECIFICATIONS

Characteristics	Conditions		min.	typ.	max.	unit
Output voltage accuracy	Vi nom, Io nom				± 1	%
Minimum load	Vi nom	single & double output models	0			%
		+ 5V of triple output	0			%
		± 12V of triple output	20			%
Line regulation	Io nom, Vi min ... Vi max				± 1	%
Load regulation	Vi nom, Io min ... Io nom	single output models			± 2	%
		double output models			± 2	%
		triple output models			± 5	%
Transient recovery time	25% load, step changed			500		μs
Temperature coefficient	Vi nom, Io nom				± 0.02	% / °C
Ripple & noise	Vi nom, Io nom, BW = 20MHz				Vout x ± 1%	mV
Voltage trim range	Vi nom			10		%
Efficiency	Vi nom, Io nom, Po / Pi		Up to 86%, See model list			

SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

CONTROL AND PROTECTION

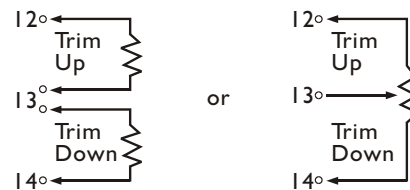
Remote ON / OFF	ON: opened or +5.5VDC applied, reference to input GND OFF: -1.8VDC applied, reference to input GND
Input reversed	Shunt diode built in, external fuse recommended
Output short circuit	Continuous

MECHANISM & PIN CONFIGURATION

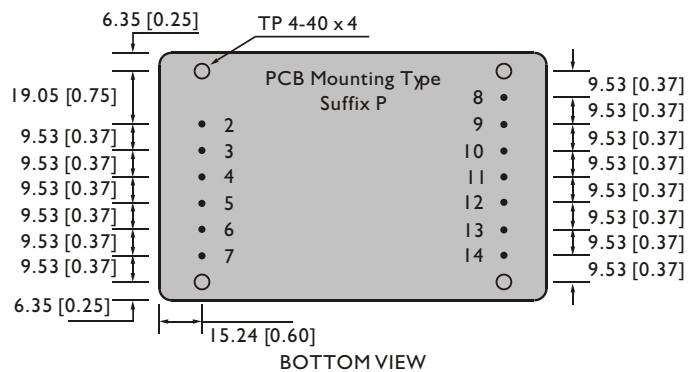
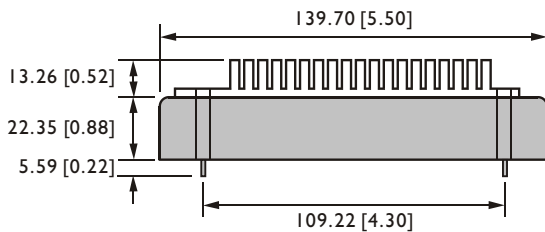
REMOTE ON / OFF CONTROL

TERMINAL 6 CONTROL
LOGIC COMPATIBILITY :OPEN COLLECTOR TTL
CONTROL VOLTAGE. ON +5.5V MIN. OR OPEN CIRCUIT.
OFF +1.8V MAX.
CONVERTER SHUTDOWN IDLE CURRENT10 mA
CONTROL COMMONINPUT TERMINAL 2

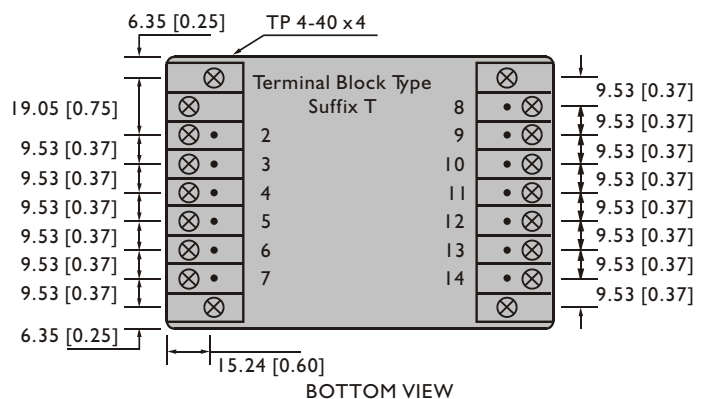
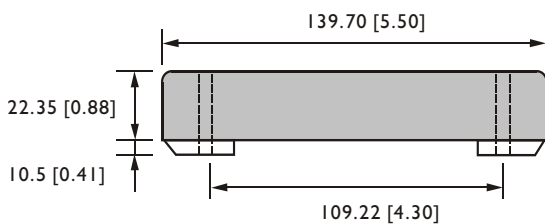
EXTERNAL OUTPUT TRIMMING



CASE : HH- P- 60



CASE : HH- T



PHYSICAL CHARACTERISTICS

CASE SIZE	88.9 x 139.7 x 35.6 mm 3.5 x 5.5 x 1.4 inches for "P" type 88.9 x 139.7 x 32.9 mm 3.5 x 5.5 x 1.29 inches for "T" type
CASE MATERIAL	Metal
WEIGHT	690 g for "P" type / 570 g for "T" type

PIN ASSIGNMENT

GENERAL

PIN NO.	SINGLE	DOUBLE	TRIPLE
1	NO PIN	NO PIN	NO PIN
2 & 3	Vi -	Vi -	Vi -
4 & 5	Vi +	Vi +	Vi +
6	REMOTE ON/OFF CONTROL		
7	N. C.	N. C.	N. C.
8	Vo -	SENSOR1 -	SENSOR1 -
9	Vo -	Vo1 -	Vo1 -
10	Vo +	Vo1 +	Vo1 +
11	Vo +	SENSOR1 +	SENSOR1 +
12	SENSOR -	Vo2 -	Vo2 -
13	Trim	Trim	Com2 & 3
14	SENSOR +	Vo2 +	Vo3 +

DERATING

