PH Series — High power DC-DC converters

Wide Range Input

High Density

Output Adjustment Capability

Simple Or Full Function Modules

Remote On/off

Fixed Switching Frequency

Low Cost

International Safety Approvals

Parallel Operation

Remote Sense

Full Function Modules. Lambda's Full Function PH Series modules achieve 5 million hours MTBF. Active single wire current sharing coupled with a module good signal enables these low cost converters to easily accommodate N+1 and scalable power systems. They feature an auxiliary power supply output designed to power external monitoring signals, +20%/-60% output adjustability and up to 90% efficiency-ideal for all computer and leading edge communications applications.

Simple Function Modules. The PH Series Simple Function modules are the highest density converters on the market today, achieving 62W/in^3. They demonstrated 5 million hours MTBF and are designed for non-redundant applications-yet they can operate in a brute force parallel mode. The high density and low cost of the PH Series Simple Function modules makes distributed power viable in virtually any application. Additional features include remote on/off and a ±10% output adjustment.

Similar products		Page
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PM	Low Power DC-DC	76
KW	Board Mount AC-DC	10
SM	Surface Mount, Low Power	78

DC Input ..... 200 - 400VDC for 280V PH Module.
88 - 185VDC for 110V PH Module.
36 - 76VDC for 48V PH Module.
18 - 36VDC for 24V PH Module.

Output Voltage Adj Range .. The output voltage on all PH Series modules can be programmed by an external potentiometer or voltage source (±10% on Simple Function Modules, +20/-60% on Full Function Modules). Adjustment below the -60% range is possible with the appropriate preload. Consult the P Series Application Notes for further details.

Line Regulation ..... 0.4% or 20mV (whichever is greater) over entire input range with constant load.

Load Regulation ..... 0.8% or 40mV (whichever is greater) from no load to full load with constant input line.

Ripple and Noise ..... 2V & 5V, 100mV pk-pk; 12V & 15V, 150mV pk-pk; 24V, 240mV pk-pk; 28V, 280mV pk-pk.

Auxiliary Bias Supply ..... Full Function PH Series modules have an auxiliary bias supply (8V @10mA) which can be used to power interface circuits(i.e., optocouples).

Parallel Operation ..... Full Function PH Series modules have a single star point connection of PC terminal which enables modules to current share. Current sharing guaranteed within 5% when connected per the application notes (typically within 2%).

Series Operation ..... All modules can be operated in series. Refer to the PH Series Application Notes for detailed requirements.

Overvoltage Protection .... 150%-180% on 2V and 3V models 125%-145% on 5V through 28V models. Inverter shutdown. Input power must be recycled to restore operation.

Overload Protection ..... Overcurrent protection will protect the module and load from overload with automatic recovery. Limit is set at ~105% to 140%.

Cooling ..... PH Series modules are conduction cooled. Contact the factory for cooling recommendations.

Operating Temperature Range -20°C to +85°C base plate. -20°C to +100°C on PH300S, PH600S. Consult the factory for -40°C startup on all models.

Storage Temperature ..... -40°C to +85°C. -40°C to +100°C on the PH300S and PH600S.

Temperature Coefficient .... 0.02% per °C.

Isolation ..... Input to Output – 3kVAC.
Input to Baseplate – 2.5kVAC.

Isolation Resistance ..... Output to Baseplate –100MOhm @ 500VDC @ 70% RH.

Inverter Good Signal ..... Full Function PH Series modules provide an inverter good status at the IOG terminal when the module is operating within limits.

Remote On/Off ..... Short terminal CNT to SG to turn on. Open circuit to turn OFF.

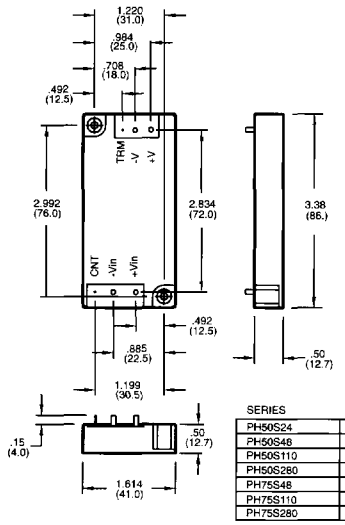
Remote Sensing ..... Sensing connections are provided to the regulation caused by the resistive drops in the output trace/leads. (Not available on PH50S, PH75S modules).

Safety Agency Approval .... UL1950, CSA234, EN60950 and CE Mark.

Warranty ..... 2 years.

VOLTAGE (V)	CURRENT (A)	POWER (W)	24V INPUT	48V INPUT	MODEL 110V INPUT	280V INPUT
Full Function Inputs						
2.0	15.00	30	–	PH75F48-2	PH75F110-2	PH75F280-2
2.0	20.00	40	PH100F24-2	–	–	–
2.0	30.00	60	–	PH150F48-2	PH150F110-2	PH150F280-2
2.0	60.00	120	–	PH300F48-2	PH300F110-2	PH300F280-2
3.3	15.00	45	–	PH75F48-3	PH75F110-3	PH75F280-3
3.3	20.00	60	PH100F24-3	–	–	–
3.3	30.00	90	–	PH150F48-3	PH150F110-3	PH150F280-3
3.3	60.00	180	–	PH300F48-3	PH300F110-3	PH300F280-3
5.0	15.00	75	–	PH75F48-5	PH75F110-5	PH75F280-5
5.0	20.00	100	PH100F24-5	–	–	–
5.0	30.00	150	–	PH150F48-5	PH150F110-5	PH150F280-5
5.0	60.00	300	–	PH300F48-5	PH300F110-5	PH300F280-5
12.0	6.30	75	–	PH75F48-12	PH75F110-12	PH75F280-12
12.0	8.40	100	PH100F24-12	–	–	–
12.0	12.50	150	–	PH150F48-12	PH150F110-12	PH150F280-12
12.0	25.00	300	–	PH300F48-12	PH300f110-12	PH300F280-12
15.0	5.00	75	–	PH75F48-15	PH75F110-15	PH75F280-15
15.0	6.70	100	PH100F24-15	–	–	–
15.0	10.00	150	–	PH150F48-15	PH150F110-15	PH150F280-15
15.0	20.00	300	–	PH300F48-15	PH300F110-15	PH300F280-15
24.0	3.20	75	–	PH75F48-24	PH75F110-24	PH75F280-24
24.0	4.20	100	PH100F24-24	–	–	–
24.0	6.30	150	–	PH150F48-24	PH150F110-24	PH150F280-24
24.0	12.60	300	–	PH300F48-24	PH300F110-24	PH300F280-24
28.0	2.70	50	–	PH75F48-28	PH75F110-28	PH75F280-28
28.0	3.60	100	PH100F24-28	–	–	–
28.0	5.40	150	–	PH150F48-28	PH150F110-28	PH150F280-28
28.0	10.80	300	–	PH300F48-28	PH300F110-28	PH300F280-28
Simple Function Inputs						
3.3	50.00	181.5	–	PH300S48-3	–	PH300S280–3
3.3	100.00	330	–	-	–	PH600S280–3
5.0	10.00	50	PH50S24-5	PH50S48-5	PH50S110-5	PH50S280–5
5.0	15.00	75	–	PH75S48-5	PH75S110-5	PH75S280–5
5.0	20.00	100	–	PH100S48-5	–	PH100S280–5
5.0	30.00	150	–	PH150S48-5	PH150S110-5	PH150S280–5
5.0	50.00	275	–	PH300S48-5	–	PH300S280–5
5.0	100.00	500	–	-	–	PH600S280–5
12.0	4.20	50	PH50S24-12	PH50S48-12	PH50S110-12	PH50S280–12
12.0	6.30	75	–	PH75S48-12	PH75S110-12	PH75S280-12
12.0	8.40	100	–	PH100S48-12	–	PH100S280-12
12.0	12.50	150	–	PH150S48-12	PH150S110-12	PH150S280-12
12.0	25.00	300	–	PH300S48-12	–	PH300S280-12
12.0	50.00	600	–	-	–	PH600S280-12
15.0	3.40	50	PH50S24-15	PH50S48-15	PH50S110-15	PH50S280-15
15.0	5.00	75	–	PH75S48-15	PH75S110-15	PH75S280-15
15.0	6.70	100	–	PH100S48-15	–	PH100S280-15
15.0	10.00	150	–	PH150S48-15	PH150S110-15	PH150S280-15
15.0	20.00	300	–	PH300S48-15	–	PH300S280-2
15.0	40.00	600	–	-	–	PH600S280-15
24.0	2.10	50	PH50S24-24	PH50S48-24	PH50S110-24	PH50S280-24
24.0	3.20	75	–	PH75S48-24	PH75S110-24	PH75S280-24
24.0	4.20	100	–	PH100S48-24	–	PH100S280-24
24.0	6.30	150	–	PH150S48-24	PH150S110-24	PH150S280-24
24.0	12.50	300	–	PH300S48-24	–	PH300S280-24
24.0	25.00	600	–		–	PH600S280-24
28.0	1.80	50	PH50S24-28	PH50S48-28	PH50S110-28	PH50S280-28
28.0	2.70	75	–	PH75S48-28	PH75S110-28	PH75S280-28
28.0	3.60	100	–	PH100S48-28	–	PH100S280-28
28.0	5.40	150	–	PH150S48-28	PH150S110-28	PH150S280-28
28.0	10.71	300	–	PH300S48-28	–	PH300S280-28
28.0	21.43	600	–	-	–	PH600S280-28
48.0	6.25	300	–	PH300S48-48	–	PH300S280-48
48.0	12.50	600	–	-	–	PH600S280-48

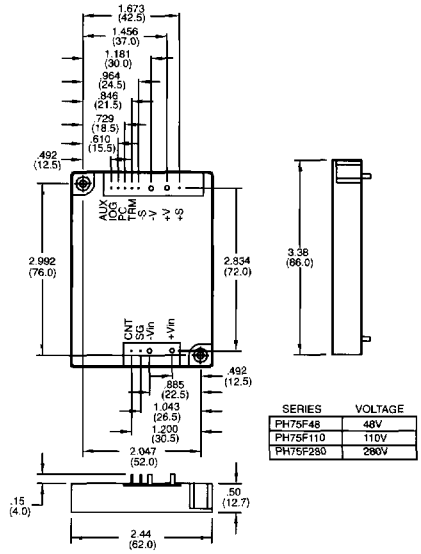
PH 50S/75S



SERIES	VOLTAGE
PH50S24	24V
PH50S48	48V
PH50S110	110V
PH50S280	280V
PH75S48	48V
PH75S110	110V
PH75S280	280V

NOTE:
1. M3 TAPPED HOLES FOR CUSTOMER CHASSIS MOUNTING 2 PLS.
2. SCREWS MUST NOT PROTRUDE INTO PWR MODULE BY MORE THAN (12.7) MM. (BACK SIDE FOR HEAT SINK).
3. DIMENSIONS ARE IN INCHES EXCEPT DIMENSIONS ( ) ARE IN MM.
4. WEIGHT: 100 GRAMS

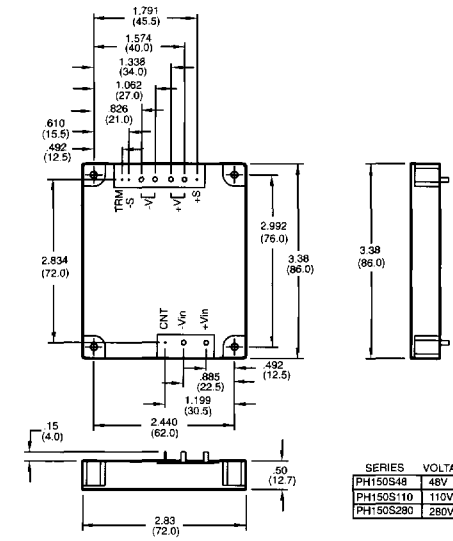
PH 75F



SERIES	VOLTAGE
PH75F48	48V
PH75F110	110V
PH75F280	280V

NOTE:
1. M3 TAPPED HOLES FOR CUSTOMER CHASSIS MOUNTING 2 PLS.
2. SCREWS MUST NOT PROTRUDE INTO PWR MODULE BY MORE THAN (12.7) MM. (BACK SIDE FOR HEAT SINK).
3. DIMENSIONS ARE IN INCHES EXCEPT DIMENSIONS ( ) ARE IN MM.
4. INPUT AND OUTPUT ARE 2, INPUT AND OUTPUT ARE 0.6 .
5. WEIGHT: 150 GRAMS

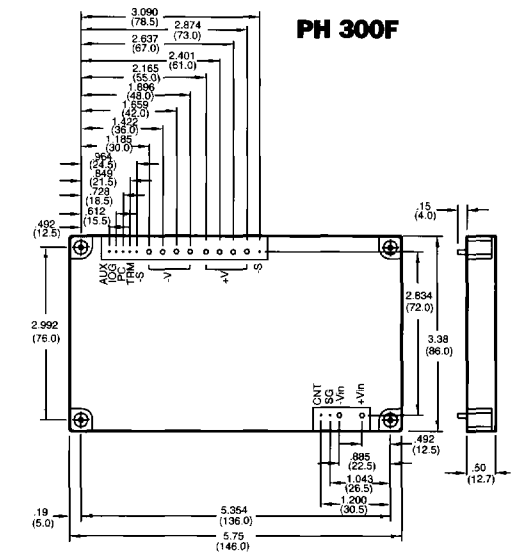
PH 150S



SERIES	VOLTAGE
PH150S48	48V
PH150S110	110V
PH150S280	280V

NOTE:
1. DIMENSIONS ARE IN INCHES EXCEPT DIMENSIONS ( ) ARE IN MM.
2. 4x M3 TAPPED HOLES FOR CUSTOMER CHASSIS MOUNTING.
3. SCREWS MUST NOT PROTRUDE INTO PWR MODULE BY MORE THAN (12.7) MM. (BACK SIDE FOR HEAT SINK).
4. WEIGHT: 150 GRAMS.

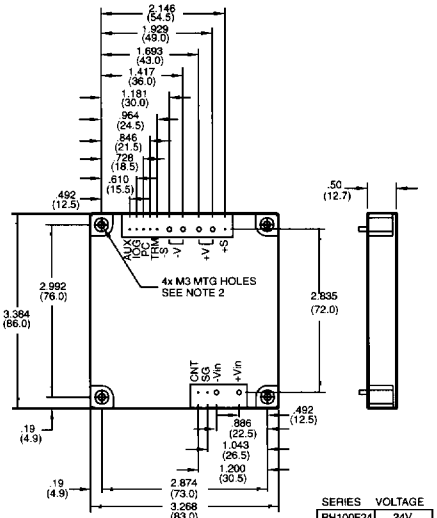
PH 300F



SERIES	VOLTAGE
PH300F48	48V
PH300F110	110V
PH300F280	280V

NOTE:
1. M3 TAPPED HOLES FOR CUSTOMER CHASSIS MOUNTING 4 PLS.
2. SCREWS MUST NOT PROTRUDE INTO PWR MODULE BY MORE THAN (12.7) MM. (BACK SIDE FOR HEAT SINK).
3. DIMENSIONS ARE IN INCHES EXCEPT DIMENSIONS ( ) ARE IN MM.
4. INPUT AND OUTPUT ARE 2, INPUT AND OUTPUT ARE 0.6 .
5. WEIGHT: 250 GRAMS.

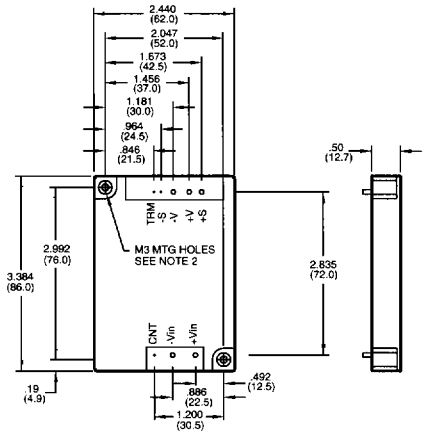
PH 100F/150F



SERIES	VOLTAGE
PH100F24	24V

NOTES:
1. DIMENSIONS ARE IN INCHES EXCEPT DIMENSIONS ( ) ARE IN MM.
2. 4x M3 TAPPED HOLES FOR CUSTOMER MOUNTING.
3. SCREWS MUST NOT PROTRUDE INTO P.S. BY MORE THAN 12.7
4. WEIGHT: 180 GRAMS

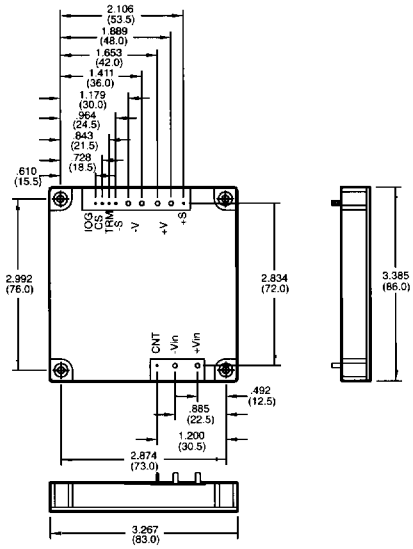
PH 100S



SERIES	VOLTAGE
PH100S48	48V
PH100S110	110V
PH100S280	280V

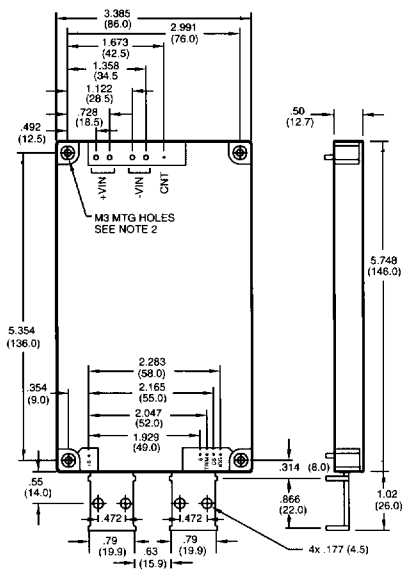
NOTES:
1. DIMENSIONS ARE IN INCHES EXCEPT DIMENSIONS ( ) ARE IN MM.
2. 2x M3 TAPPED HOLES FOR CUSTOMER MOUNTING.
3. SCREWS MUST NOT PROTRUDE INTO P.S. BY MORE THAN 12.7
4. WEIGHT: 150 GRAMS

PH 300S



NOTE:
1. M3 TAPPED HOLES FOR CUSTOMER CHASSIS MOUNTING 2 PLS.
2. SCREWS MUST NOT PROTRUDE INTO PWR MODULE BY MORE THAN (12.7) MM. (BACK SIDE FOR HEAT SINK).
3. DIMENSIONS ARE IN INCHES EXCEPT DIMENSIONS ( ) ARE IN MM.
4. INPUT AND OUTPUT PINS ARE (2, INPUT AND OUTPUT PINS ARE (0.6).
5. WEIGHT: 200 GRAMS.

PH 600S



NOTES:
1. DIMENSIONS ARE IN INCHES EXCEPT DIMENSIONS ( ) ARE IN MM.
2. 4x M3 TAPPED HOLES FOR CUSTOMER MOUNTING.
SCREWS MUST NOT PROTRUDE INTO P.S. BY MORE THAN 12.7.
3. TERMINALS: 4x .078 (2.0), 6x TERMINALS: 4x .031 (0.8).
4. WEIGHT: 300 GRAMS.