



Size:
2.28 x 1.45 x 0.50 inches
(57.9 x 36.8 x 12.7 mm)

Applications:

- Automation
- Telecom/Datacom
- Industry Control Systems
- IPC
- Measurement

FEATURES

- Soft Start
- Single Outputs
- Input Under Voltage Protection
- High Efficiency up to 92%
- Remote ON/OFF Control
- 2:1 Wide Input Voltage Ranges
- No Minimum Load Required
- 2250VDC I/O Basic Insulation
- Voltage Adjustability
- Low Stand-by Power Consumption
- Industry Standard Quarter-brick Package
- Up to 150 Watts Maximum Output Power
- Short Circuit, Over Voltage, Over Load, & Over Temp. Protection
- UL60950-1, EN60950-1, and IEC60950-1 Safety Approvals
- CE Marked
- RoHS & REACH Compliant
- Optional Heatsinks Available (Suffix "HS")
- Threaded (Standard) or Thru-Hole (Optional) Inserts Available

DESCRIPTION

The DCQA150 series of DC/DC power converters provides up to 150 Watts of output power in a 2.28" x 1.45" x 0.5" industry standard quarter-brick package. This series has single output models with 2:1 wide input voltage ranges of 8.5-22VDC, 16.5-36VDC, and 33-75VDC. Some features include high efficiency up to 92%, 2250VDC I/O basic insulation, and remote ON/OFF control. These converters are also protected against input under voltage, short circuit, over voltage, over load, and over temperature conditions. All models are RoHS compliant and have UL60950-1, EN60950-1, and IEC60950-1 safety approvals. Several different options are available for this series including negative logic remote ON/OFF, heatsinks, and thru-hole inserts.

MODEL SELECTION TABLE

Model Number	Input Voltage Range	Output Voltage	Output Current		Output Ripple & Noise	No Load Input Current	Output Power	Efficiency	Maximum Capacitive Load
			Min Load	Max Load					
DCQA150-12S33	12 VDC (8.5 - 22 VDC)	3.3 VDC	0mA	30A	75mVp-p	50mA	99W	89%	91000µF
DCQA150-12S05		5 VDC	0mA	24A	75mVp-p	50mA	120W	90%	48000µF
DCQA150-12S12		12 VDC	0mA	10A	100mVp-p	50mA	120W	91%	8300µF
DCQA150-12S15		15 VDC	0mA	8A	100mVp-p	50mA	120W	91%	5300µF
DCQA150-12S24		24 VDC	0mA	5A	200mVp-p	50mA	120W	90%	2100µF
DCQA150-12S30		30 VDC	0mA	4A	200mVp-p	50mA	120W	90%	1300µF
DCQA150-12S48		48 VDC	0mA	2.5A	300mVp-p	50mA	120W	89%	520µF
DCQA150-24S33		24 VDC (16.5 - 36 VDC)	3.3 VDC	0mA	30A	75mVp-p	25mA	99W	89%
DCQA150-24S05	5 VDC		0mA	24A	75mVp-p	25mA	120W	90%	48000µF
DCQA150-24S12	12 VDC		0mA	10A	100mVp-p	25mA	120W	91%	8300µF
DCQA150-24S15	15 VDC		0mA	8A	100mVp-p	25mA	120W	91%	5300µF
DCQA150-24S24	24 VDC		0mA	5A	200mVp-p	25mA	120W	91%	2100µF
DCQA150-24S30	30 VDC		0mA	4A	200mVp-p	25mA	120W	91%	1300µF
DCQA150-24S48	48 VDC		0mA	2.5A	300mVp-p	25mA	120W	89%	520µF
DCQA150-48S33	48 VDC (33 - 75 VDC)		3.3 VDC	0mA	30A	75mVp-p	15mA	99W	89%
DCQA150-48S05		5 VDC	0mA	25A	75mVp-p	15mA	125W	91%	50000µF
DCQA150-48S12		12 VDC	0mA	12A	100mVp-p	15mA	144W	90%	10000µF
DCQA150-48S15		15 VDC	0mA	10A	100mVp-p	15mA	150W	90%	6670µF
DCQA150-48S24		24 VDC	0mA	6A	200mVp-p	15mA	144W	92%	2500µF
DCQA150-48S30		30 VDC	0mA	5A	200mVp-p	15mA	150W	91%	1670µF
DCQA150-48S48		48 VDC	0mA	3A	300mVp-p	15mA	144W	92%	630µF

NOTES

1. Input Source Impedance: The power modules will operate to specifications without external components, assuming that the source voltage has very low impedance and reasonable input voltage regulation. Highly inductive source impedances can affect the stability of the power module. Since real-world voltage sources have finite impedance, performance is improved by adding an external filter capacitor. We recommend using Nippon Chemi-con KY series, 100µF/100V.
2. Maximum output deviation is +10% inclusive of remote sense and trim. If remote sense is not being used, sense pins should connect to the output pins with the same polarity.
3. The DCQA150 series can only meet EMI Class A or Class B with external components added. Please contact factory for more information.
4. An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5. We recommend connecting 2pcs of aluminum electrolytic capacitors (Nippon chemi-con KY series, 220µF/100V).
5. Both positive logic and negative logic remote ON/OFF control is available. Positive logic remote ON/OFF comes standard; for negative logic remote ON/OFF add the suffix "R" to the model number (Ex: DCQA150-48S24R).
6. Optional heatsinks available. See page 5 for ordering details.
7. M3 x 0.5 threaded-thru inserts come standard. For Ø.126 thru-hole inserts add the suffix "TH" to the model number (Ex: DCQA150-48S24TH). Models with thru-hole inserts cannot be equipped with a heatsink.
8. BASE-PLATE GROUNDING: EMI can be reduced when you connect two screw bolts to shield plane..

CAUTION: This power module is not internally fused. An input line fuse must always be used.

SPECIFICATIONS: DCQA150 SERIES

All specifications are based on 25°C, Nominal Input Voltage, and Full Load unless otherwise noted.
We reserve the right to change specifications based on technological advances.

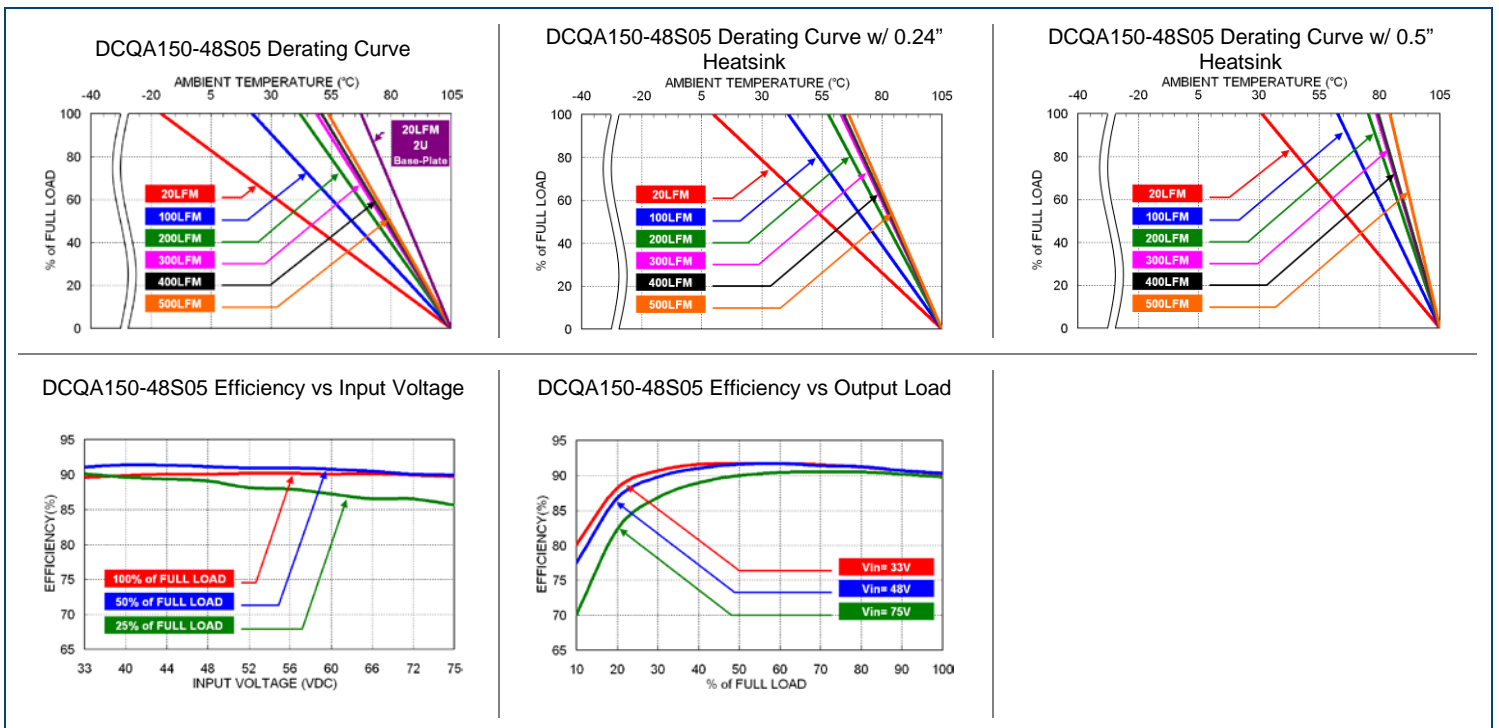
SPECIFICATION	TEST CONDITIONS	Min	Typ	Max	Unit	
INPUT SPECIFICATIONS						
Input Voltage Range	12VDC nominal input models	8.5	12	22	VDC	
	24VDC nominal input models	16.5	24	36		
	48VDC nominal input models	33	48	75		
Start-Up Voltage	12VDC nominal input models			9	VDC	
	24VDC nominal input models			18		
	48VDC nominal input models			36		
Shutdown Voltage	12VDC nominal input models	7.3	7.7	8.1	VDC	
	24VDC nominal input models	15.5	15.9	16.3		
	48VDC nominal input models	31.6	32	32.5		
Input Surge Voltage (1sec, max.)	12VDC nominal input models			30	VDC	
	24VDC nominal input models			50		
	48VDC nominal input models			100		
Input Current	No Load	See Table				
Input Filter (See Note 1)		Pi type				
OUTPUT SPECIFICATIONS						
Output Voltage		See Table				
Voltage Accuracy		-1.0		+1.0	%	
Line Regulation	Low line to high line at full load	-0.1		+0.1	%	
Load Regulation	No load to full load	3.3V & 5V Output Models		+0.2	%	
		Others		+0.1		
Voltage Adjustability	Maximum output deviation is inclusive of remote sense	-20		+10	%	
Remote Sense (See Note 2)	% of Vo (nom)			10	%	
Output Power		See Table				
Output Current		See Table				
Minimum Load		0			%	
Maximum Capacitive Load	Minimum input and constant resistive load	See Table				
Ripple & Noise (20MHz BW)	Measured with a 22µF/25V X7R MLCC	3.3V & 5V Output Models		75	mVp-p	
	Measured with a 22µF/25V X7R MLCC	12V & 15V Output Models		100		
	Measured with a 4.7µF/50V X7R MLCC	24V & 30V Output Models		200		
	Measured with a 2.2µF/100V X7R MLCC	48V Output Models		300		
Transient Response Recovery Time	25% load step change		250		µs	
Start-Up Time	Constant resistive load	Power Up		75	100	ms
		Remote On/Off		75	100	
Temperature Coefficient		-0.02		+0.02	%/°C	
PROTECTION						
Short Circuit Protection		Continuous, automatic recovery				
Over Load Protection	% of rated Iout; hiccup mode	110		140	%	
Over Voltage Protection	% of Vo (nom); hiccup mode	115		130	%	
Over Temperature Protection			+110		°C	
GENERAL SPECIFICATIONS						
Efficiency	Nominal input voltage and full load	See Table				
Switching Frequency		270	300	330	kHz	
Isolation Voltage	1 minute (basic insulation)	Input to Output	2250		VDC	
		Input/Output to Base-plate	2250		VDC	
Isolation Resistance	500VDC	1			GΩ	
Isolation Capacitance				1500	pF	
REMOTE ON/OFF (See Note 5)						
Positive Logic (standard)	Referenced to -Input pin	DC/DC ON	Open or 3~12 VDC		VDC	
		DC/DC OFF	Short or 0~1.2VDC			
Negative Logic (optional)	Referenced to -Input pin	DC/DC ON	Short or 0~1.2 VDC		VDC	
		DC/DC OFF	Open or 3~12VDC			
Input Current of Remote Control Pin	Nominal Vin	-0.5		1	mA	
Remote OFF State Input Current	Nominal Vin		3		mA	

SPECIFICATIONS: DCQA150 SERIES

All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS	Min	Typ	Max	Unit
ENVIRONMENTAL SPECIFICATIONS					
Operating Base-Plate Temperature		-40		+105	°C
Storage Temperature Range		-55		+125	°C
Thermal Impedance (See Note 6)	Vertical direction by natural convection (20LFM)	Without Heatsink	9		°C/W
		With 0.24" Height Heatsink	7.1		
		With 0.5" Height Heatsink	5.5		
		Mounted on 2U iron base-plate	2.8		
Relative Humidity		5		95	% RH
Thermal Shock			MIL-STD-810F		
Vibration			MIL-STD-810F		
MTBF	MIL-HDBK-217F, full load		387,000 hours		
PHYSICAL SPECIFICATIONS					
Weight			2.26oz (64g)		
Dimensions (L x W x H)			2.28x1.45x0.50 inch (57.9x36.8x12.7 mm)		
Case Material			Aluminum base-plate with plastic case		
Potting Material			Silicon (UL94-V0)		
SAFETY & EMC CHARACTERISTICS					
Safety Approvals		IEC60950-1, UL60950-1, EN60950-1			
EMI (See Note 3)	EN55032		Class A, Class B		
ESD	EN61000-4-2	Air ±8kV Contact ±6kV		Perf. Criteria A	
Radiated Immunity	EN61000-4-3	20 V/m		Perf. Criteria A	
Fast Transient (See Note 4)	EN61000-4-4	±2kV		Perf. Criteria A	
Surge (See Note 4)	EN61000-4-5	EN55024: ±2kV		Perf. Criteria A	
Conducted Immunity	EN61000-4-6	10 Vrms		Perf. Criteria A	
Power Frequency Magnetic Field	EN61000-4-8	100A/m continuous; 1000A/m 1 sec.		Perf. Criteria A	

CHARACTERISTIC CURVES



OUTPUT VOLTAGE ADJUSTMENT

Output is adjustable for 10% trim up or -20% trim down of nominal output voltage by connecting an external resistor between the TRIM pin and either the +SENSE or -SENSE pins.

With an external resistor between the TRIM and -SENSE pin, the output voltage set decreases.

With an external between the TRIM and +SENSE pin, the output voltage set point increases.

Maximum output deviation is +10% inclusive of remote sense. The external trim resistor needs to be at least 1/8W of rated power.

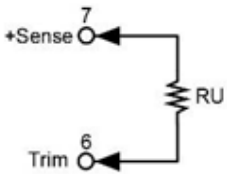
Trim Up Equation

$$R_U = \left(\frac{5.11V_{OUT}(100 + \Delta\%)}{1.225\Delta\%} - \frac{(511 + 10.22\Delta\%)}{\Delta\%} \right) k\Omega$$

Trim Down Equation

$$R_D = \left(\frac{511}{\Delta\%} - 10.22 \right) k\Omega$$

TRIM UP



3.3VDC Output Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	3.333	3.366	3.399	3.432	3.465	3.498	3.531	3.564	3.597	3.630
RU (kΩ)	869.117	436.331	292.07	219.939	176.66	147.808	127.198	111.742	99.72	90.103

5VDC Output Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	5.05	5.10	5.15	5.20	5.25	5.30	5.35	5.40	5.45	5.50
RU (kΩ)	1585.35	797.994	535.542	404.316	325.58	273.09	235.596	207.476	185.605	168.109

12VDC Output Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	12.12	12.24	12.36	12.48	12.60	12.72	12.84	12.96	13.08	13.20
RU (kΩ)	4534.55	2287.19	1538.08	1163.52	938.78	788.956	681.939	601.676	539.25	489.309

15VDC Output Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	15.15	15.30	15.45	15.60	15.75	15.90	16.05	16.20	16.35	16.50
RU (kΩ)	5798.49	2925.42	1967.73	1488.89	1201.58	1010.04	873.229	770.619	690.812	626.966

24VDC Output Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	24.24	24.48	24.72	24.96	25.20	25.44	25.68	25.92	26.16	26.40
RU (kΩ)	9590.32	4840.11	3256.7	2465	1989.98	1673.3	1447.1	1277.45	1145.5	1039.94

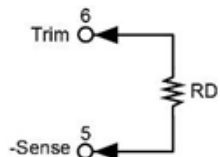
30VDC Output Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	30.3	30.6	30.9	31.2	31.5	31.8	32.1	32.4	32.7	33
RU (kΩ)	12118.2	6116.57	4116.02	3115.74	2515.58	2115.47	1829.68	1615.33	1448.62	1315.25

48VDC Output Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	48.48	48.96	49.44	49.92	50.40	50.88	51.36	51.84	52.32	52.80
RU (kΩ)	19701.9	9945.94	6693.96	5067.97	4092.38	3441.99	2977.42	2628.99	2357.99	2141.19

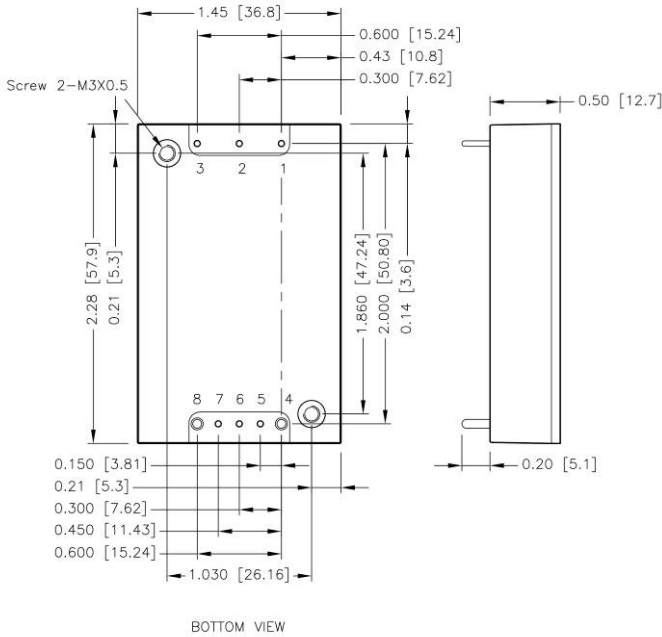
TRIM DOWN



All Outputs

ΔV (%)	1	2	3	4	5	6	7	8	9	10
RD (kΩ)	500.78	245.28	160.113	117.53	91.98	74.947	62.78	53.655	46.558	40.88
ΔV (%)	11	12	13	14	15	16	17	18	19	20
RD (kΩ)	36.235	32.363	29.088	26.28	23.847	21.718	19.839	18.169	16.675	15.33

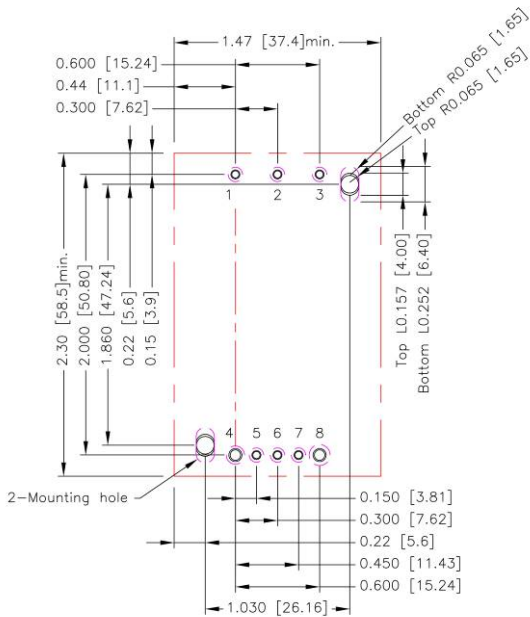
MECHANICAL DRAWING



PIN	DEFINE	DIAMETER
1	-Vin	0.04 Inch
2	Ctrl	0.04 Inch
3	+Vin	0.04 Inch
4	-Vout	0.06 Inch
5	-Sense	0.04 Inch
6	Trim	0.04 Inch
7	+Sense	0.04 Inch
8	+Vout	0.06 Inch

- Notes:
1. All dimensions in inch [mm]
 2. Tolerance: x.xx±0.02 [x.x±0.5]
x.xxx±0.01 [x.xx±0.25]
 3. Pin pitch tolerance ±0.01 [x.xx±0.25]
 4. Pin dimension tolerance ±0.004 [0.10]
 5. The screw locked torque: MAX 3.5kgf-cm [0.34N-m]

RECOMMENDED PAD LAYOUT



- Notes:
- All dimensions in inch [mm]
- Pad size (lead free recommended)
- Through hole 1.2.3.5.6.7: Ø0.05 [1.30]
- Through hole 4.8: Ø0.075 [1.90]
- Through hole of mounting: Ø0.126 [3.20]
- Top view pad 1.2.3.5.6.7: Ø0.064 [1.63]
- Top view pad 4.8: Ø0.094 [2.38]
- Top view pad of mounting: Groove R0.065 [1.65] L0.157 [4.00]
- Bottom view pad 1.2.3.5.6.7: Ø0.102 [2.60]
- Bottom view pad 8: Ø0.150 [3.80]
- Bottom view pad 4: Ø0.130 [3.30]
- Bottom view pad of mounting: Groove R0.065 [1.65] L0.252 [6.40]

HEATSINK OPTIONS

<p>Horizontal Fin Orientation (Suffix Option: H) 7G-0029B-F</p>	<p>Horizontal Fin Orientation (Suffix Option: H1) 7G-0030B-F</p>
<p>Vertical Fin Orientation (Suffix Option: H2) 7G-0031B-F</p>	<p>Vertical Fin Orientation (Suffix Option: H3) 7G-0032B-F</p>

Note: Models with thru-hole inserts cannot be equipped with a heatsink
All dimensions in inch [mm]
Tolerance: x.xx±0.02 [x.x±0.5]

THERMAL CONSIDERATIONS

This power module operates in a variety of thermal environments. Sufficient cooling should be provided to help ensure reliable operation of the unit. Heat is removed by conduction, convection, and radiation to the surrounding environment. Proper cooling can be verified by measuring the point in the figure below. The temperature at this location should not exceed 105°C. When operating, adequate cooling must be provided to maintain the test point temperature at or below 105°C. Although the maximum point temperature of the power modules is 105°C, you can limit this temperature to a lower value for extremely high reliability.

- Thermal test condition with vertical direction by natural convection (20LFM)
- The iron base-plate dimension is 1.9" x 3.5" x 0.063" (the height is EIA standard 2U)
- The heat-sink is optional and P/N: 7G-0029B-F, 7G-0030B-F, 7G-031B-F, 7G-0032B-F

BASE PLATE

FUSE CONSIDERATION

This power module is not internally fused. An input line fuse must always be used.

This encapsulated power module can be used in a wide variety of applications, ranging from simple stand-alone operation to an integrated part of sophisticated power architecture.

To maximum flexibility, internal fusing is not included; however, to achieve maximum safety and system protection, always use an input line fuse.

Suggested input line fuses are below:

Model	Fuse Rating	Fuse Type
12VDC nominal input models	25A	Fast-Acting
24VDC nominal input models	12A	Fast-Acting
48VDC nominal input models	8A	Fast-Acting

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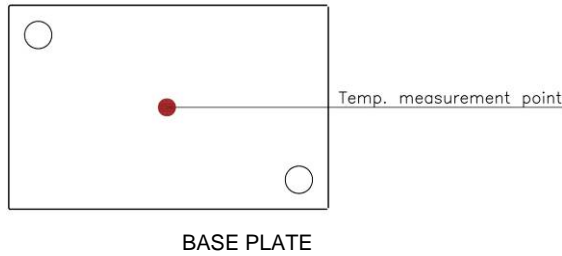
Proper cooling can be verified by measuring the point in the figure below.

The temperature at this location should not exceed 105°C.

When operating, adequate cooling must be provided to maintain the test point temperature at or below 105°C.

Although the maximum point temperature of the power modules is 105°C, you can limit this temperature to a lower value for extremely high reliability.

- Thermal test condition with vertical direction by natural convection (20LFM)
- The iron base-plate dimension is 19" x 3.5" x 0.063" (the height is EIA standard 2U)
- The heat-sink is optional and P/N: 7G-0029B-F, 7G-0030B-F, 7G-031B-F, 7G-0032B-F



MODEL NUMBER SETUP

DCQA	150	-	48	S	05	R	H ⁽¹⁾
Series Name	Output Power		Input Voltage	Output Quantity	Output Voltage	Remote ON/OFF	Hole Thread & Heatsink Options
	150: 150 Watts		12: 8.5~22 VDC 24: 16.5~36 VDC 48: 33~75 VDC	S: Single Output	33: 3.3 VDC 05: 5 VDC 12: 12 VDC 15: 15 VDC 24: 24 VDC 30: 30 VDC 48: 48 VDC	None: Positive Logic R: Negative Logic	None: M3x0.5 Threaded-thru Inserts TH: Ø.126 Thru-hole Inserts ⁽¹⁾ H: 0.24" Horizontal Heatsink H1: 0.5" Horizontal Heatsink H2: 0.24" Vertical Heatsink H3: 0.5" Vertical Heatsink

(1) Models with thru-hole inserts cannot be equipped with a heatsink.

COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001-2008 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

Contact **Wall Industries** for further information:

Phone: ☎ (603)778-2300
Toll Free: ☎ (888)597-9255
Fax: ☎ (603)778-9797
E-mail: sales@wallindustries.com
Web: www.wallindustries.com
Address: 37 Industrial Drive
Exeter, NH 03833