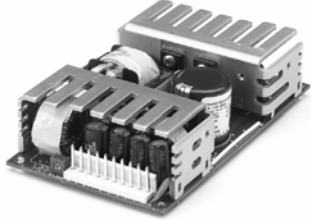


# 110 WATTS

## DC4-110 SERIES DC-DC

### FEATURES:

- RoHS Compliant
- 36-72 VDC INPUT
- Advanced SMT Design
- Compact 3" x 5" x 1.32" Size
- 2 Year Warranty
- One to Four Outputs
- 4242 VDC Reinforced Insulation
- Fits 1U Applications
- EN 60950-1 ITE Certification
- EN 60601-1 Medical Certification
- Size & Pin compatible with REL-110 Series
- Optional Chassis and Cover



OPEN FRAME



CHASSIS/COVER

### SAFETY SPECIFICATIONS

	Underwriters Laboratories	UL 60950-1 2 <sup>nd</sup> Edition, 2007
	Laboratories	UL 60601-1 1 <sup>st</sup> Edition, 2006
	File E137708/E140259	AAMI/ANSI ES6060-1, 2005
		CB Reports/Certificates (including all National and Group Deviations)
	UL Recognition	IEC 60950-1/A1:2009, Second Edition
	Mark for Canada	IEC 60601-1:1988 +A1:1991 +A2:1995
	File E137708/E140259	IEC 60601-1:2005 Third Edition
		CAN/CSA-C22.2 No. 60950-1-07, 2 <sup>nd</sup> Edition
		CAN/CSA-C22.2 No. 601-1-M90, 2005
		CAN/CSA-C22.2 No. 60601-1:2008
	TUV	EN 60950-1/A12:2011
		EN 60601-1/A2:1995
		EN 60601-1:2006
		RoSH Directive (Recast)
		(2011/65/EU of June 2011)

### MODEL LISTING

MODEL	OUTPUT 1 <sup>(8)</sup>	OUTPUT 2 <sup>(8)</sup>	OUTPUT 3 <sup>(7)</sup>	OUTPUT 4 <sup>(7)</sup>
DC4-110-4001	+3.3V/10A <sup>(1)</sup>	+5V/6A	+12V/2A	-12V/2A
DC4-110-4002	+5V/10A <sup>(1)</sup>	+3.3V/6A	+12V/2A	-12V/2A
DC4-110-4003	+5V/10A <sup>(1)</sup>	+3.3V/6A	+15V/2A	-15V/2A
DC4-110-4004	+5V/10A <sup>(1)</sup>	-5V/6A	+12V/2A	-12V/2A
DC4-110-4005	+5V/10A <sup>(1)</sup>	-5V/6A	+15V/2A	-15V/2A
DC4-110-4006	+5V/10A <sup>(1)</sup>	+24V/2A	+12V/2A	-12V/2A
DC4-110-4007	+5V/10A <sup>(1)</sup>	+24V/2A	+15V/2A	-15V/2A
DC4-110-3001	+5V/10A <sup>(1)</sup>	+12V/3A		-12V/3A
DC4-110-3002	+5V/10A <sup>(1)</sup>	+15V/2A		-15V/2A
DC4-110-2001	+3.3V/10A <sup>(1)</sup>	+5V/6A		
DC4-110-2002	+5V/10A <sup>(1)</sup>	+12V/5A		
DC4-110-2003	+5V/10A <sup>(1)</sup>	+24V/3A		
DC4-110-2004	+12V/5A	-12V/4A		
DC4-110-2005	+15V/4A	-15V/3A		
DC4-110-1001	2.5V/22A <sup>(2)</sup>			
DC4-110-1002	3.3V/22A <sup>(2)</sup>			
DC4-110-1003	5V/22A <sup>(2)</sup>			
DC4-110-1004	12V/9.2A			
DC4-110-1005	15V/7.3A			
DC4-110-1006	24V/4.6A			
DC4-110-1007	28V/3.9A			
DC4-110-1008	48V/2.3A			

### NOTES

Consult factory for alternate output configurations.  
 Consult factory for positive, negative or floating outputs.  
 Refer to Applications Information for complete output power ratings.  
 All specifications are maximum at 25° C, 110W unless otherwise stated, may vary by model and are subject to change without notice.  
 Specify optional chassis and cover, power good or reverse input protection when ordering.

### OUTPUT SPECIFICATIONS

Total Output Power at 50° C	80W	Convection Cooled
	110W	300 LFM Forced Air
Output Voltage Centering	Output 1: ± 0.5%	(All outputs at 50% load)
	Output 2: ± 5.0%	
	Output 3: ± 5.0%	
	Output 4: ± 5.0%	
Output Voltage Adjust Range	Output 1: 95 - 105%	
Load Regulation	Output 1: 0.5%	(10-100% load change)
	Output 2: 5.0%	
	(4001-5 Models) 8.0%	
	(2001 Model) 6.0%	
	Output 3: 5.0%	
	Output 4: 5.0%	
Source Regulation	Outputs 1 - 4: 0.5%	
Cross Regulation	Outputs 2 - 4: 5.0%	
Output Noise	Outputs 1 - 4: 1.0%	
Turn on Overshoot	None	
Transient Response	Outputs 1 - 4	
	Voltage Deviation 5.0%	
	Recovery Time 500µS	
	Load Change 50% to 100%	
Output Overvoltage Protection	Output 1: 110% to 150%	
Output Overpower Protection	110-160% rated Pou, cycle on/off, auto recovery	
Start Up Time	5 Seconds	

### INPUT SPECIFICATIONS

Input Voltage Range	36-72 VDC
Input Under-Voltage Lockout	
	Turn-On Voltage 29.0-35.0 VDC
	Turn-Off Voltage 28.0-34.0 VDC
Input Overvoltage Shutdown	77.0-85.0 VDC
Maximum Input Current	4.2 A
Reflected Ripple Current	5 %
Efficiency	82% Typ., Full Power, 48VDC, varies by model

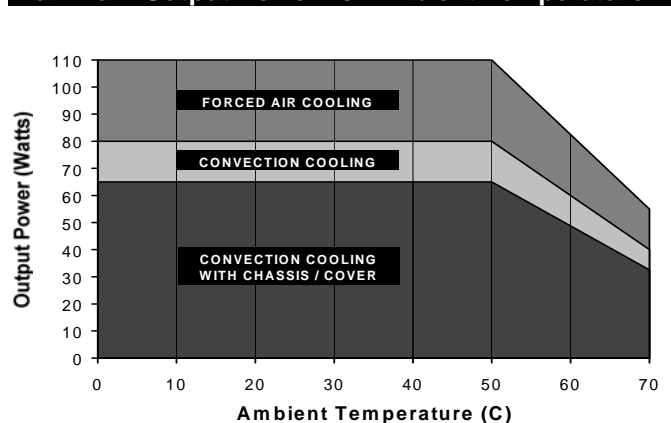
### ENVIRONMENTAL SPECIFICATIONS

Ambient Operating	0° C to + 70° C
Temperature Range	Derating: See Power Rating Chart
Ambient Storage Temp. Range	- 40° C to + 85° C
Temperature Coefficient	Outputs 1 - 4: 0.02%/°C

### GENERAL SPECIFICATIONS

Means of Protection	
Primary to Secondary	2MOOP (Means of Operator Protection)
Primary to Ground	1MOOP (Means of Operator Protection)
Secondary to Ground	Operational Insulation(Consult factory for 1MOOP or 1MOPP)
Dielectric Strength <sup>(17)</sup>	
Reinforced Insulation	4242 VDC, Primary to Secondary, 1 Sec.
Basic Insulation	2121 VDC, Primary to Ground, 1 Sec.
Operational Insulation	707 VDC, Secondary to Ground, 1 Sec.
Power Good Signal	Logic high with input voltage above Vin min.
Remote Sense (singles only)	250mV compensation of output cable losses
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	0.65 Lbs. Open Frame
	1.15 Lbs. Chassis and Cover

### Maximum Output Power vs. Ambient Temperature



# DC4-110 SERIES MECHANICAL SPECIFICATIONS

# APPLICATIONS INFORMATION

- Rated 8A maximum with convection cooling.
- Rated 16A maximum with convection cooling.
- Total power must not exceed 80 watts with convection cooling on open frame models except where noted.
- Total power must not exceed 110 watts with 300 LFM forced air cooling on open frame models.
- Total power must not exceed 65 watts with convection cooling and chassis/cover option.
- Total power must not exceed 110 watts with 300 LFM forced air cooling and chassis/cover option.
- Total current from Outputs 3 & 4 must not exceed 3 amps with convection cooling.
- Total current from Outputs 1 & 2 must not exceed 12 amps with convection cooling.
- Semiconductor case temperatures must not exceed 110°C.
- Each output can deliver its rated current but total output power must not exceed maximum power as determined by the cooling method stated above.
- Sufficient area must be provided around convection cooled power supplies to allow natural movement of air to develop.
- 300 linear feet per minute of airflow must be maintained one inch above any point of the heatsink in the direction shown when forced air cooling is required.
- This product is intended for use as a professionally installed component within information technology and medical equipment.
- A minimum load of 10% is required on output one to ensure proper regulation of remaining outputs.
- Remote sense terminals may be used to compensate for cable losses up to 250mV (single output models only). The use of a twisted pair is recommended as well as a decoupling capacitor (0.1 - 10µF) and a capacitor of 100µF/amp connected across the load side.
- Peak to peak output ripple and noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip, 20 MHz bandwidth.
- This product was type tested and safety certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to insure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary to ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1<sup>st</sup> Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
- This power supply has been safety approved and final tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
- Maximum screw penetration into bottom chassis mounting holes is .100 inches.
- Maximum screw penetration into side chassis mounting holes is .250 inches.
- To meet emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/cover option recommended.

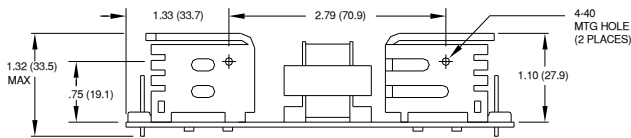
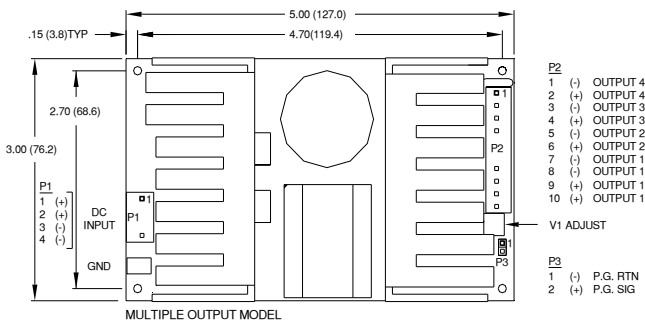
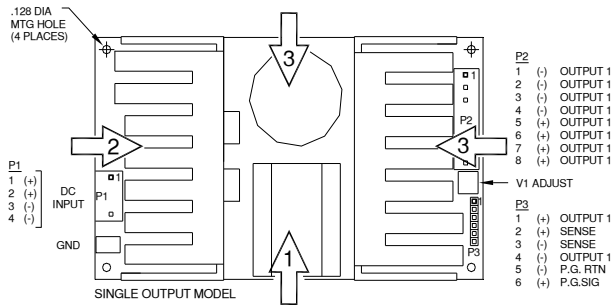
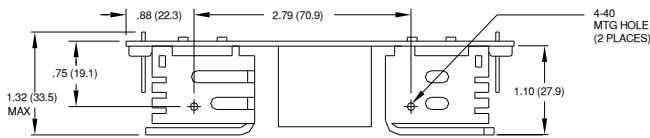
# CONNECTOR SPECIFICATIONS

P1	DC Input	.156 friction lock header mates with Tyco 640250-4 or equivalent crimp terminal housing with Tyco 3-640706-1 or equivalent crimp terminal.
P2	DC Output (Single)	.156 friction lock header mates with Tyco 770849-8 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.
P2	DC Output (Multiple)	.156 friction lock header mates with Tyco 1-770849-0 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.
G	Ground	.187 quick disconnect terminal.
P3	P.G./Sense (Single)	.100 breakaway header mates with Molex 50-57-9006 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.
P3	P.G. (Multiple)	.100 breakaway header mates with Molex 50-57-9002 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.

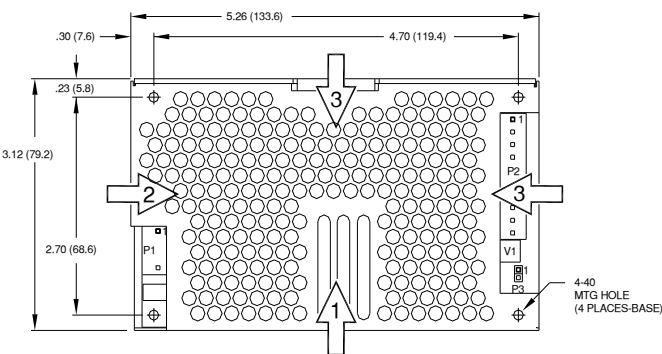
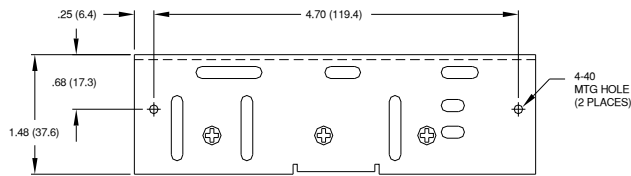
# RECOMMENDED AIR FLOW DIRECTION

- 1 – Optimum      2 – Good      3 – Fair

## OPEN FRAME



## OPTIONAL CHASSIS/COVER



ALL DIMENSIONS IN INCHES (MM)