

# DC20W-48V-PbF

20W / 48Vdc, 5Vdc DUAL OUTPUT,  
28Vdc INPUT POWER SUPPLY



Providing two isolated output voltages and up to 20W continuous output power, the **DC20W-48V-PbF** is optimized for 28Vdc RTCA/DO-160G airborne applications. The supply does not require external heatsinking or forced airflow; supply efficiency exceeds 75% at full rated output load. The **DC20W-48V-PbF** is capable of providing up to 20W output during momentary input DC brown-out conditions for greater than 200mSec.

Weighing less than 10 ounces, the **DC20W-48V-PbF** is constructed on a multi-layer PWB occupying ~28in<sup>2</sup>. Component height is less than 0.70" except for the area of the supply containing hold-up capacitors; in this area maximum height is less than 1.25". Interconnection is accomplished using three right angle Molex connectors. The **DC20W-48V-PbF** is designed and manufactured to stand-up to the harsh operating environments encountered in today's aircraft installations.



## FEATURES

	<b>Efficiency: 76% typical at full rated output load</b>
	<b>Wide input range: 18 – 32Vdc</b>
	<b>Active inrush current limiting: 3.9Apk (first 500mSec)</b>
	<b>Size: 28in<sup>2</sup>; Weight: less than 10 ounces</b>
	<b>Two isolated DC outputs: +48V (switched), +5Vstby (unswitched)</b>
	<b>Independent over-current and over-voltage protection on each output</b>
	<b>Output DC valid status line (TTL)</b>
	<b>Over-temperature fault signal (TTL)</b>
	<b>MTBF: 578,000 Hours, RIAC 217Plus, Aic category, 50°C case temperature, 65%DC, 2190 Cycles/ year</b>

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## STANDARD OUTPUTS

PARAMETER	OUTPUT VOLTAGE	
	+48V	+5Vstby
Voltage Regulation	48V $\pm$ 2%	5.05V $\pm$ 2%
Output Current	400mA	250mA
Maximum Load	19.2W	1.3W
Minimum Load	0A	0A
Pk-pk Ripple + Noise (20MHz)	120mVpp	50mVpp
Overcurrent Trip-point	0.5A	0.6A

## SPECIFICATIONS

	RTCA/DO-160G, section 4, altitude/ temperature (operating) to 15,000 feet, category A1 equipment
	RTCA/DO-160G, section 6, humidity (operating) category A
	RTCA/DO-160G, section 7, shock (operating) category S, curve C
	RTCA/DO-160G, section 8, vibration (operating) category S, curve C
	RTCA/DO-160G, section 15, magnetic effect, category B
	RTCA/DO-160G, section 16, power input requirements for DC input, category A equipment
	RTCA/DO-160G, section 17, voltage spike, category B equipment
	RTCA/DO-160G, section 18, conducted susceptibility, category Z equipment
	RTCA/DO-160G, section 19, induced signal susceptibility, category Z equipment
	RTCA/DO-160G, section 20, conducted and radiated susceptibility, category T equipment
	RTCA/DO-160G, section 21, conducted and radiated emissions, category M equipment
	Operating temperature: -25°C to +70°C, no forced air or heatsinking required
	Storage temperature: -55°C to +85°C

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## INTERCONNECTION

### SUPPLY SIDE CONNECTORS AND PIN-OUTS

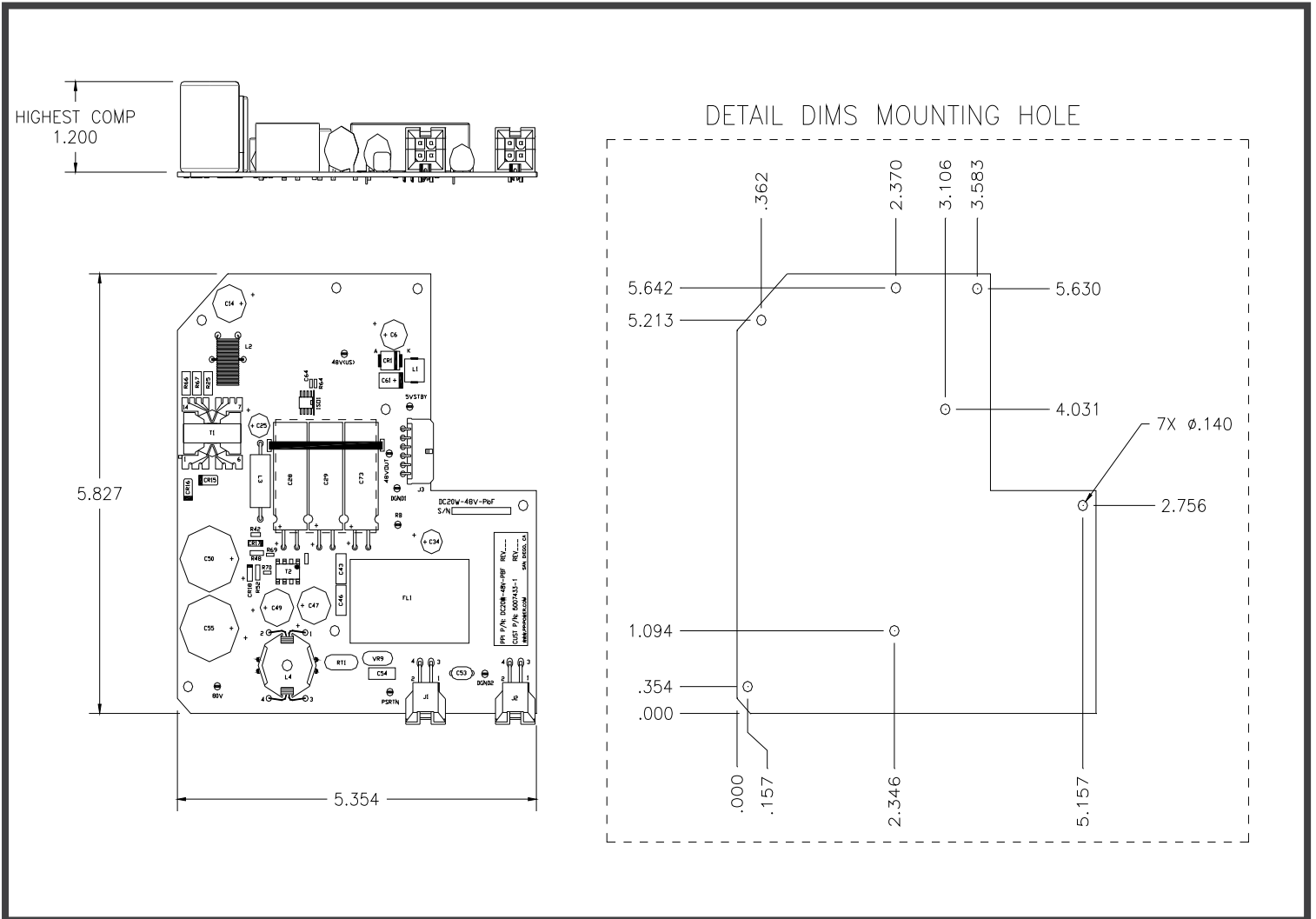
Connector	J1	J2	J3
Pin #	Molex P/N 15-24-9044	Molex P/N 15-24-9044	Molex P/N 43045-1200
1	28Vdc (+) Input	+48Vout	n/c
2	28Vdc (+) Input	+5Vstby	DCRTN
3	28Vdc (-) Return	DCRTN	DCRTN
4	Chassis Gnd	DCRTN	DCRTN
5	--	--	+48Vout
6	--	--	DCPWRGD-L
7	--	--	n/c
8	--	--	OUTPUTEN-L
9	--	--	DCRTN
10	--	--	OVERTEMP-L
11	--	--	+48Vout
12	--	--	+5Vstby

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## MECHANICAL DIAGRAM



A DETAILED SOLIDWORKS DRAWING FURNISHED UPON REQUEST



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## ELECTRICAL SPECIFICATIONS

UNLESS OTHERWISE SPECIFIED THE FOLLOWING TEST CONDITIONS APPLY: Ta = 25°C. CONSTANT ACTIVE LOADS APPLIED TO OUTPUTS, Vin = 28Vdc.

## INPUT CHARACTERISTICS

PARAMETER	DC20W-48V-PbF	REMARKS	NOTES
INPUT VOLTAGE RANGE	18 – 32Vdc	Complies with normal/ abnormal input voltages for DC operation per RTCA/DO-160G, Section 16, Category A	2
EFFICIENCY (FULL LOAD)	76% typical at 28Vdc input 74% typical at 18Vdc input	Full rated output load (20.5W)	2
EFFICIENCY (50% LOAD)	67% typical at 28Vdc input	Half rated output load (10.3W)	2
INPUT VOLTAGE ABNORMAL SURGE WITHSTAND	48Vdc @ 100mSec 38Vdc @ 1 Sec	Per RTCA/DO-160G, Section 16, Category A. Outputs remain in proper regulation during and after application of input surges	1
INPUT UNDERVOLTAGE	<16Vdc	Input boost converter will shutdown and remain disabled for input voltages detected at or below 16Vdc, residual voltage may be present on +48V output	1
INPUT CURRENT	1.02A max at 28Vdc input 1.58A max at 18Vdc input	Full rated output load (20.5W)	2
INRUSH CURRENT	<8.7Apk for first 3mSec, <3.9Apk up to 500mSec, <1.9Apk up to 2Secs	Per RTCA/DO-160G, Section 16, Category A. Cold or warm start	2
START-UP TIME	<750mSec	Outputs within regulation	2
CONDUCTED EMISSIONS	RTCA/DO-160G, Section 21	Category M equipment	1
QUIESCENT POWER	2.5W typical	Pout = 0W	2
STORAGE TEMPERATURE RANGE	-55°C TO +100°C	Non operational	1
OPERATING TEMPERATURE RANGE	-25°C TO +70°C	No external airflow or heatsinking required	1
OUTPUTEN-L	Pull to <2Vdc with respect to DCRTN in order to enable the +48V output	Internally pulled high to 5Vstby through 5.1k pull-up resistor. Pull to <2Vdc with respect to DCRTN in order to enable +48V output. 5Vstby output is unaffected by this signal	1

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## OUTPUT CHARACTERISTICS

PARAMETER	DC20W-48V-PbF	REMARKS	NOTES
RATED OUTPUT POWER	20W	Continuous	2
OUTPUT VOLTAGE TOLERANCE	+48V $\pm$ 2% +5.05V $\pm$ 2%	See "STANDARD OUTPUTS" table	2
TEMPERATURE STABILITY COEFFICIENT	0.01% / °C	Maximum output voltage drift with temperature	1
OUTPUT RIPPLE + NOISE (pk-pk)	<120mVpp: +48Voutput <50mVpp: +5Vstby output	20MHz Bandwidth	2
MINIMUM OUTPUT LOAD	0A, each output	No output load required for supply stability or for maintaining proper output regulation	2
LINE REGULATION	<0.5%	Individual output deviation for $\pm$ 20% step change in input voltage	1
LOAD REGULATION (TRANSIENT LOAD RECOVERY)	Outputs remain within regulation limits	50% step change in individual output load currents	1
HOLD-UP TIME	200mSec @ Pout = 20.5W	Uninterrupted ride through for 28Vdc (input) interrupt	2
ISOLATION VOLTAGE INPUT TO OUTPUT	500Vdc	No arcing or damage for 60 second test duration	1
ISOLATION VOLTAGE INPUT TO CHASSIS	100Vdc	No arcing or damage for 60 second test duration	1
DC OUTPUT STATUS "DCGOOD-L"	Transitions to TTL high (4V min) upon detection of +48V output outside of 2% regulation window	Secondary side referenced (w/ respect to DCRTN), 10mSec delay time, TTL level, 1mA max source current; 16mA max sink current	2
OUTPUT OVERVOLTAGE PROTECTION (non-latching)	+48V output is limited to 115% of nominal set point	Pulse-by-pulse protection, 4mSec fault to activation delay, auto-restart	1
OUTPUT OVERVOLTAGE PROTECTION (latching)	+48V set point = 56V +5Vstby set point = 6.2V	Supply will shutdown and remain disabled until input DC power is recycled if OVP set points are detected internally	1
OVERTEMP-L STATUS SIGNAL	Transitions to 0.5V max level upon detecting an internal operating temperature of +100°C $\pm$ 7°C	Supply provides status signal OVERTEMP-L that asserts low when supply PWB temperature is sensed at 100°C, with $\sim$ 2°C hysteresis. OVERTEMP-L signal is secondary side referenced w/ respect to DCRTN), capable of sinking 16mA	1

### Notes:

1. Ensured by design, not 100% tested in production.
2. 100% tested for specification compliance in production.

