

DC20W-12V-500-PBF / DC20W-12VP-500-PBF

(OPTIONAL MOUNTING PLATE)

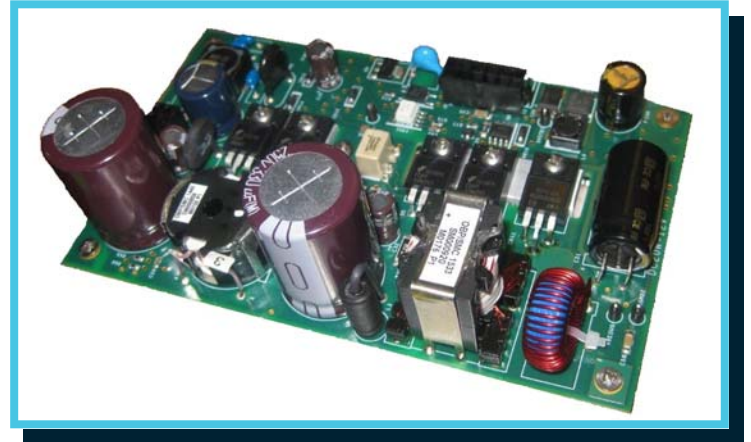
20W / 12Vdc, 5Vdc DUAL OUTPUT

28Vdc INPUT POWER SUPPLY



Providing two isolated output voltages and up to 20W continuous output power, the **DC20W-12V-500-PBF** is optimized for 28Vdc RTCA/DO-160G airborne applications. The **DC20W-12V-500-PBF** is capable of providing up to 20W output during momentary input DC brown-out conditions for greater than 200mSec and supply efficiency exceeds 70% at full rated output load.

Weighing less than 6 ounces, the **DC20W-12V-500-PBF** is constructed on a multi-layer PWB occupying ~15in². 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 1.20". Five TO-220 power devices need to be fastened to external sheetmetal surface or pedestal. Interconnection is accomplished using two right angle TE vertical header connectors. The **DC20W-12V-500-PBF** is designed and manufactured to stand-up to the harsh operating environments encountered in today's air-



FEATURES

	Efficiency: 71% typical at full rated output load
	Wide input range: 18 – 32Vdc
	Active inrush current limiting
	Size: 15in²; Weight: less than 6 ounces
	Two isolated DC outputs: +12V (switched), +5Vstby (unswitched)
	Independent over-current and over-voltage protection on each output
	Output DC valid status line (TTL)
	Over-temperature fault signal (TTL)
	MTBF: 1,754,385 Hours, RIAC 217Plus, Aic category, 50°C case temperature, 65%DC, 2190 Cycles/ year

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STANDARD OUTPUTS

PARAMETER	OUTPUT VOLTAGE	
	+12V	+5Vstby
Voltage Regulation	12V \pm 2%	5.05V \pm 2%
Output Current	1.65A	500mA
Maximum Load	19.8W	2.5W
Minimum Load	0A	0A
Pk-pk Ripple + Noise (20MHz)	120mVpp	75mVpp
Overcurrent Trip-point	2.25A	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 required
	Storage temperature: -55°C to +85°C



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INTERCONNECTION

SUPPLY SIDE CONNECTORS AND PIN-OUTS

Connector	J1	J2
Pin #	TE P/N 3-794630-6	TE P/N 4-794630-2
1	28V Return	n/c
2	Chassis Gnd	DCRTN
3	+28V	DCRTN
4	28V Return	DCRTN
5	Chassis Gnd	+12Vout
6	+28V	DCGOOD-L
7	--	n/c
8	--	OUTPUTEN-L
9	--	DCRTN
10	--	OVERTEMP-L
11	--	+12Vout
12	--	+5Vstby

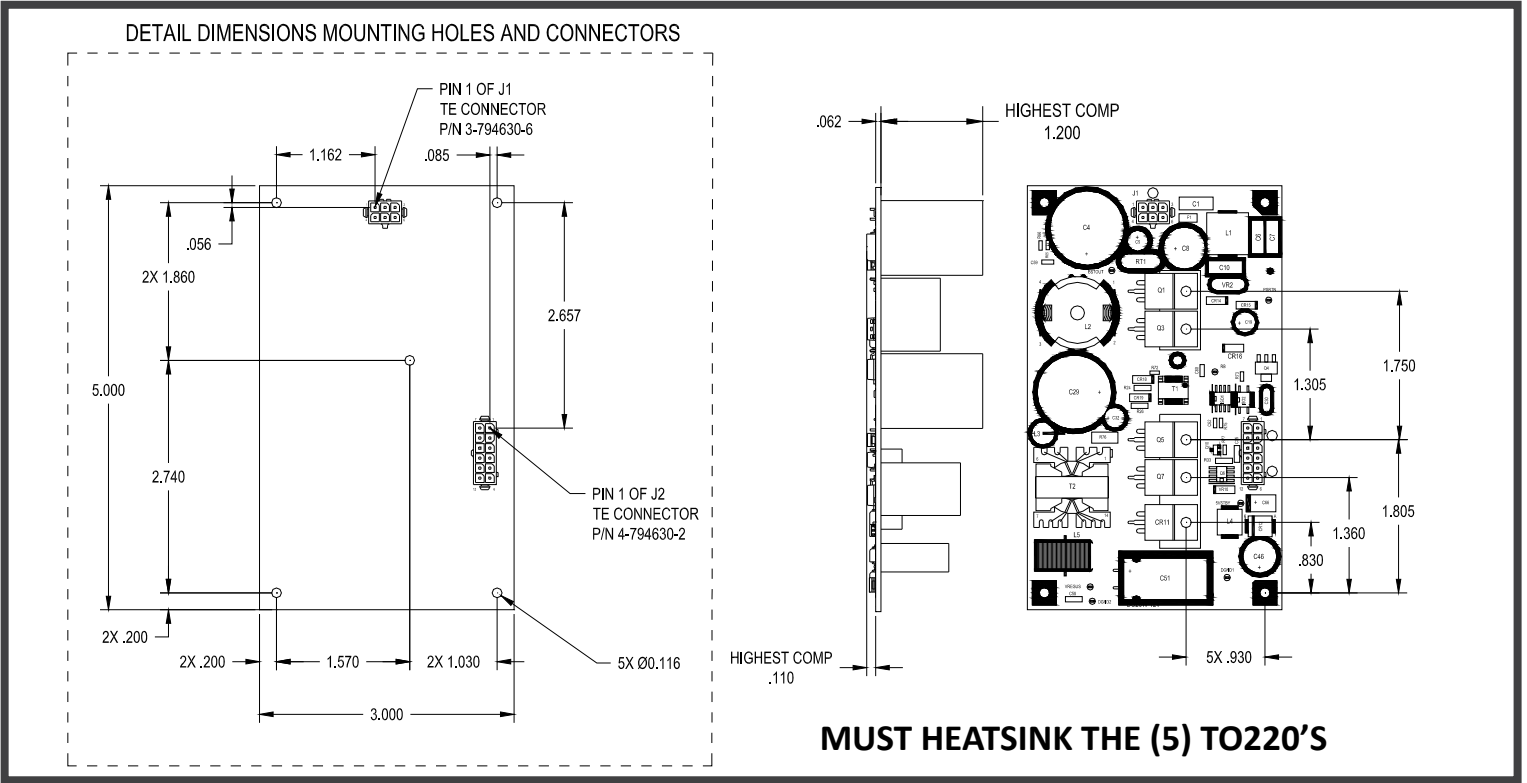


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MECHANICAL DIAGRAM



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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-12V-500-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	3
EFFICIENCY (FULL LOAD)	71% typical at 28Vdc input	Full rated output load (22W)	2
EFFICIENCY (50% LOAD)	65% typical at 28Vdc input	Half rated output load (11W)	1
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	<16.5Vdc	Input boost converter will shutdown and remain disabled for input voltages detected at or below 16.5Vdc, residual voltage may be present on +12V output	1
INPUT CURRENT	1.12A at 28Vdc input 1.74A at 18Vdc input	Full rated output load (22W)	2
INRUSH CURRENT	<14.2Apk for first 3mSec, <6.3Apk up to 500mSec, <3.2Apk up to 2Secs	Per RTCA/DO-160G, Section 16, Category A. Cold or warm start	1
START-UP TIME	<750mSec	Outputs within regulation	2
CONDUCTED EMISSIONS	RTCA/DO-160G, Section 21	Category M equipment, requires external power line filter (such as Schaffner p/n FN2030-3-06)	1
QUIESCENT POWER	2.3W typical	Pout = 0W	2
STORAGE TEMPERATURE RANGE	-55°C TO +100°C	Non operational	1
OPERATING TEMPERATURE RANGE	-25°C TO +70°C	Five TO220 devices attached to external sheet-metal	1
OUTPUTEN-L	Pull to <2Vdc with respect to DCRTN in order to enable the +12V output	Internally pulled high to 5Vstby through 5.1k pull-up resistor. Pull to <2Vdc with respect to DCRTN in order to enable +12V output. 5Vstby output is unaffected by this signal	1

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OUTPUT CHARACTERISTICS

PARAMETER	DC20W-12V-500-PBF	REMARKS	NOTES
RATED OUTPUT POWER	22W	Continuous	2
OUTPUT VOLTAGE TOLERANCE	+12V \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: +12Voutput <75mVpp: +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 = 20W	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 +12V 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)	+12V output is limited to 110% of nominal set point	Pulse-by-pulse protection, 4mSec fault to activation delay, auto-restart	1
OUTPUT OVERVOLTAGE PROTECTION (latching)	+12V set point = 15V +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 +/- 7°C	Supply provides status signal OVERTEMP-L that asserts low when supply PWB temperature is sensed at 100°C, with ~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.
3. 18-32V input range 100% tested for specification compliance in production. Section 16 power quality testing performed during supply level verification testing.

