

ETI Services Inc.

APS High Power Multi Purpose Airborne Power Supply Unit

General Description

The APS unit functions as a central Power Supply for various electronic assemblies. It is installed indoor of passenger aircraft and meet the environment conditions as applicable for this class of aircraft. The APS is powered by the aircraft 28VDC supply per MIL-STD-704B.

All APS modules outputs are fully isolated from the main input and chassis (20M Ω min).

All of the outputs return lines are common.

Power Supply	Output Power	Tolerance
+5VDC	800W	$\pm 2\%$
-5VDC	60W	$\pm 1\%$
-15VDC	250W	$\pm 1\%$
+15VDC	750W	$\pm 1\%$
+36VDC	75W	$\pm 2\%$
+28VDC	500W	$\pm 10\%$

The APS is remote controlled. The control data is supplied via its front panel interface.

Fault Monitoring and Recording

The APS contains both current and output voltage monitoring display. During flight, the voltage, current and temperature of each power supply is measured and reported via RS-232.

Measurements are compared to fixed thresholds programmed during maintenance. Event occurs when the measurement passes a pre-defined limit and disappears when measurement is back within limits. The refresh rate is $\sim 1-2$ sec. Thresholds setting is End User defined.

Only events that are above or below the normal thresholds are stored in a non-volatile memory with the following parameters:

- Elapsed time from POWER ON
- Power Supply for which the event occurred
- Measurement type and value – voltage, current or temperature

The raw data values stored in the memory are translated to real values in a maintenance

Ripple & Spikes

The Ripple & Spikes amplitudes originated from the switching frequency or it's harmonics do not extend the values shown in the table:

Ripple & Spikes	Output
100mv	28V
50mv	5V
50mv	+15V
50mv	-15V
50mv	-5V
50mv	+36V

The ripple values are measured in adjacent to the power supply output connectors, with a 1uF ceramic capacitor connected in parallel to the inspection points. The inspection bandwidth is 20MHZ.

Output Voltage Characteristics

All modules output voltages are easily adjustable in $\pm 12\%$ range.

Voltage Stability Static variation

For the 5V outputs - 0.1V max.

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Continuous overload with no damage

110% of nominal for 10 minutes over all environmental conditions.

Minimum efficiency

80% over all temperature and maximum load

Maximum overshoot

105% of nominal, for 50ms max.

over voltage protection

Each module has an over voltage protection in it's output, activated by voltages as shown in table:

O.V event	Outputs
6V	+5V
16.2V	± 15V
38V	36V

Over current & short circuit current protection

The APS is not damaged by over load or short circuit conditions in any of its outputs for indefinite period of time as required in MIL STD 454 req. #8 for class 1 equipment.

The minimal current, which triggers the protection when overload occurs, is 110% of Max. current. In the event of over-load the power supply makes periodical attempts to recover, and to return to normal operation within 0.5 Sec. after the removal of the over-load.

Thermal protection

In the event of over-temperature the APS shall shut down, without causing any damage to its components.

The Power Supply Overtemp protection will not trigger when the power supply will operate at full load over the full ambient operation range (0 to 60±C)

When triggered , the Overtemp protection will automatically reset when the failure that has caused the Overtemp has been removed.

Size & weight

APS unit dimensions are:

Length: 22.02 inch including gripping handles.

Width: 15.47 inch.

Height: 7.80 inch

APS weigh is 27 Kg

Environmental

Temperature range:

Operating -40°C - +71°C;

Non-operating: -40°C - +85°C;

Relative humidity: Humidity

The APS shall operate when exposed to a relative humidity of 95% in temperature of 55° C with condensation according to MIL-E-5400T, par 3.2.24.4.

Fungus

The APS shall operate when exposed to fungus growth according to MIL-E-5400T, Par. 3.2.24.8.

Salt fog

The APS shall operate when exposed to Salt fog according to MIL-E-5400T par. 3.2.24.9.

Explosive atmosphere

The APS shall operate in explosive atmosphere without causing an explosion according to MIL-E-5400T, par. 3.2.24.10

EMI/RFI

MIL-STD-461C Categories CE03, RE02, RS03, CS02

Reliability

MTBF

APS MTBF shall be 5000 operating hrs.

The calculation is in accordance with MIL - HDBK - 217 in a base temperature of 55° C.

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