

**IEEE 802**

**PROPOSAL**

**DTE POWER SUPPLY SPECIFICATION**

**By**

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### **Revision log**

8/2/00	Added timing requirement.
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## 1.0 Document Overview

### 1.1 Scope

This specification establishes the performance requirements for a 15 watt DC to DC power supply, having a wide-range input (36 VDC to 60 VDC) and a 50 VDC regulated output. These regulated outputs supply power to a device considered to be office equipment. The power supply shall incorporate over current protection and OVP on its output.

The power supply input shall accept the above referenced voltage range. The output shall comply with and contain all requirements stated in the output section.

## 2.0 Safety and Compliance Requirements

Must comply with IEEE 802. Other compliance requirements omitted for this version of the specification.

## 3.0 Environmental Requirements

- |     |                                   |   |
|-----|-----------------------------------|---|
| 3.1 | <b>Operating Temperature:</b>     | -5 to +50 degrees C   |
| 3.2 | <b>Storage Temperature:</b>       | -40 to +85 degrees C  |
| 3.3 | Operating Relative Humidity:      | <b>20 to 90% non-condensing</b>   |
| 3.4 | <b>Storage Relative Humidity:</b> | 10 to 95% non-condensing  |
| 3.5 | <b>Operating Altitude:</b>        | Up to 8,000 or 13,000 feet above sea level.<br><br><i>Dependent on product class definitions.</i> |
| 3.6 | <b>Storage Altitude:</b>          | Up to 30,000 feet above sea level   |
| 3.7 | <b>Cooling:</b>                   | Forced air required (100 LFM, minimum).   |

## 4.0 Generic Electrical Input and Interface Requirements

### 4.1 Input Under Voltage Lockout

35 VDC, + 1 volt, - 2 volts.

### 4.2 Remote On/Off interface (one required for each output)

Positive, open collector logic, for fail-safe operation, is required. With logic low or open inputs (opto's diode being the input), the module is off. With logic high (positive voltage at anode with respect to cathode), power supply is on.

### 4.3 Unplug

The power supply output shall be shut off if <40 mA of current is sourced by its output.

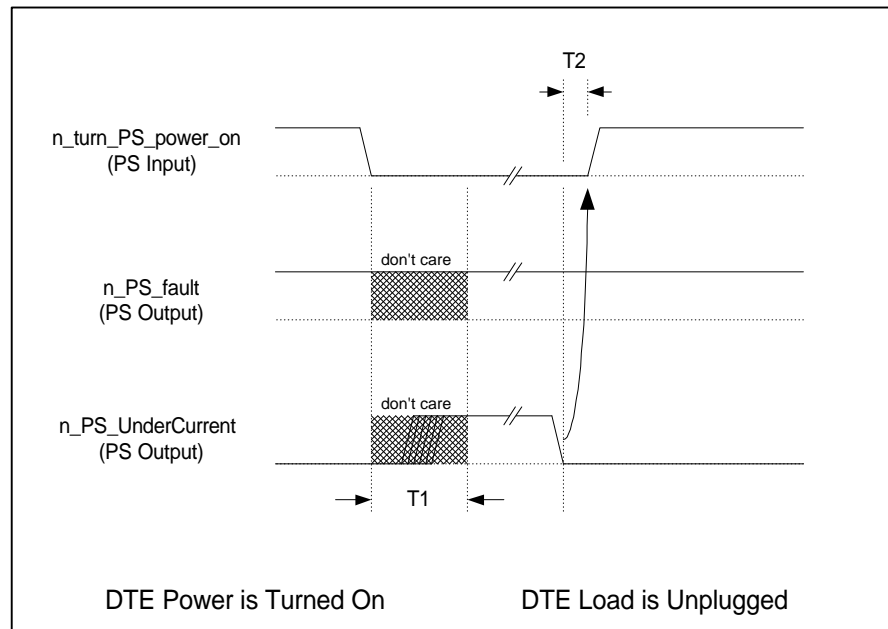
#### 4.4 Status output – Over Voltage or Over Current (open collector outputs of opto-isolator)

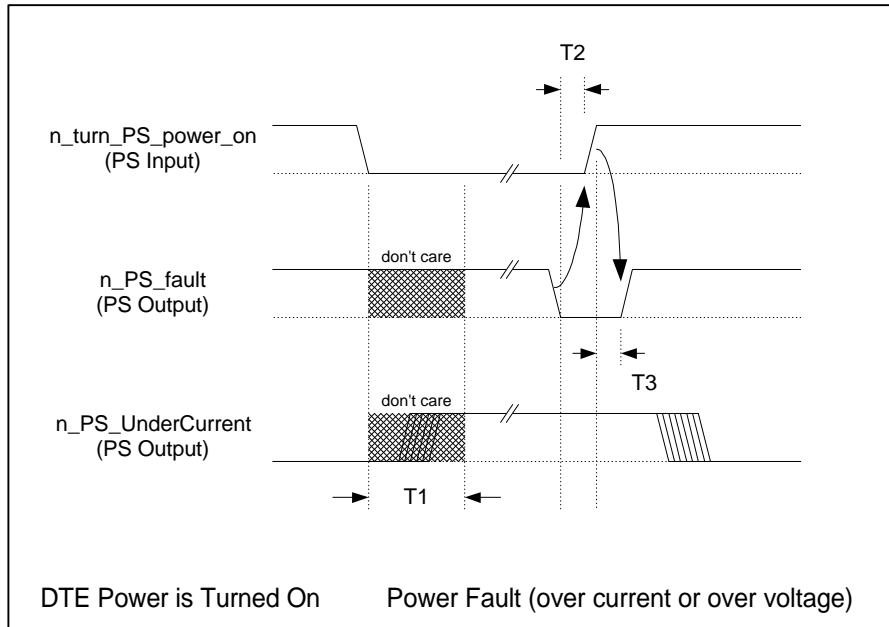
The opto-isolator output shall be off or open if an over current or over voltage condition exists.

#### 4.5 Status output – Unplug Condition (open collector outputs of opto-isolator)

The opto-isolator output shall be off or open if an Unplug Condition exists.

#### 4.6 Timing requirements





#### Delay Time Starting Values:

<u>delay</u>	<u>min</u>	<u>max</u>	<u>description</u>
T1:	10ms (min)	100ms (max)	PLD waits for this time before recognizing the condition (UC or fault)
T2:	40ns (min)	10us (max)	PS asserts the output until the PLD recognizes it
T3:	40ns (min)	10us (max)	PS recognizes loss of "power on" request, then de-asserts the output: (UC or fault)

## DTE Power Module Timing

R. Brooks  
6/21/00

## 5.0 Electrical Output Requirements

### 5.1 Output Voltage and Current

Table 1

OUTPUT	Nominal Output Voltage Set Point	Set Point Tolerance	Total Error Band	Minimum Current	Maximum Current
1	50 VDC	+/- 0.5%	42 - 56 VDC	40 mA	350 mAmp

### 5.2 Set Point Adjustment

Power supplies are to be shipped with the output adjusted to the set point shown above, in Table 1, at 70% load, with a 48 VDC, +/- 50 mV input.

### 5.3 Total Error Band

The total error band is the maximum total variation from the output voltage set points for all effects including set point tolerance, minimum to maximum input voltage variations, minimum to maximum load variations, operating ambient temperature variations and drift. This measurement shall be performed at the output connector.

*To be measured under all line, load, and temperature extremes.*

### 5.4 Ripple and Noise

Maximum ripple and noise is 500 mV, peak to peak up to 200 Hz, 100 mV, peak to peak, from 200 Hz to 60 KHz over all operating conditions when measured directly at the output connector of the supply. From 1 MHz to 100 MHz the maximum noise is limited to TBD.

*To be measured under all line, load, and temperature extremes.*

### 5.5 Remote Sense:

N/A.

### 5.6 Line Transient Deviation and Response (If required)

The maximum transient amplitude on all outputs shall be less than 1% of the nominal output voltage following an input line step of +/- 30% of nominal line voltage.

#### 5.6.1 C62.41-1980, Categories A and B (If required)

When any of the above referenced transients, attenuated to 1 KV and generated from a generator with a source impedance of 10 ohms, are applied, in either normal or common mode, to the power supply input, the resulting transient variation at the power supply output shall be less than 2 V, peak. Fifty applications in common mode plus fifty applications in normal mode, of the Category B pulse (10 ohms source impedance), attenuated to 1 KV, shall not cause any damage to the power supply.

**5.7 Load Transient Deviation and Response**

The maximum transient amplitude on any output shall be less than 5% of the nominal output voltage set point following a load change of 20% with a slew rate of .2 amperes per microsecond. The power supply output shall return to 1% of steady state load within 1 mS, maximum.

**5.8 Turn-On Time and Rise Time**

All outputs shall be within their error band within 200 milliseconds after application of DC input power under all operating conditions. The output rise times (5% to 90%) shall be less than 50 milliseconds, but greater than 1 millisecond under all operating conditions. The output rise shall be monotonic.

**5.8.1 Number of outputs**

TBD

**5.8.2 Isolation**

Port to port isolation shall be greater than 500 VDC, and port to chassis ground isolation shall be greater than 2200 VDC for one minute.

**5.9 Over/Undershoot**

There shall be no overshoot or undershoot outside the error band during turn-on or turn-off.

**5.10 No Load Operation**

See Table 1.

**5.11 Over current**

The supply shall be internally protected against output overload or short circuit applied to the output. No damage shall result to the power supply as the result of either short term or long-term short circuits of the output to its return.

*To be measured under all line and load extremes.*

**5.12 Redundant Operation**

N/A.

**5.13 Over voltage**

The output shall be over voltage protected. The OVP trip levels shall be preset to 57 volts +/- 0.1 volts. When the OVP circuitry is activated, it is required that the power supply recover automatically.

**5.14 Hold-Up Time**

Each output shall remain within its error band for a minimum of 200 microseconds from a complete line loss with maximum output loadings.

**5.15 Over Temperature:**

No over temperature reset is required.

**5.16 Stability Over Time**

Once thermal equilibrium has been reached (30 minutes, minimum), the maximum allowable percent change in output voltages over 24 hours shall be +/- 0.1% on all outputs. Input voltage for stability over time is 100 VAC.

**5.17 Output bleeder**

The power supply output shall be equipped with a bleed circuit ensuring that the output voltage is attenuated to <5 volts in <10 mS.

**6.0 Mechanical Requirements**

**6.1 Size in Inches**

TBD

**6.2 Pin Out**

TBD.

**6.3 Fan**

No fan is required as part of the power supply. When up to 4 watts is sourced by each and every output of the power supply, the power supply should operate continuously within all defined parameters of this specification with convection cooling only. When any output is operated over 4 watts output, a minimum of 100 LF/M of forced air will flow across the power supply.

**6.4 Output Connector**

None in addition the Ethernet input Cables

None.

**6.5 Markings/Labels**

Not applicable for this version.

**6.6 Shock/Vibration**

TBD

**6.7 Thermal dissipation**

$(\text{efficiency})(\text{maximum power})(3.41)=(0.9)(15\text{W})(3.41)=46 \text{ BTU}$



**6.8 MTBF**

The manufacturer shall certify that the power supply has a minimum MTBF of 200,000 hours using the part stress analysis method of MIL-STD-217 (latest edition) with ground benign environment and 30 degrees C ambient at full load.