

TECHNICAL DATA
DATASHEET SCP-5282-780-1200-3, Preliminary

High Voltage, 780V, High Pulse Power Transorb
(For 480 V Line to Line 3-phase Applications)

Application:

- Stand-Off Voltage of +/- 780V DC systems, or 550V rms Line to Line 3-phase.
- Stand-Off Voltage of +/- 450V DC systems, or 318V rms Line to Neutral 3-phase
- Bi-Directional for AC systems.
- Three Phase TVS Protection for each Line to Line and Line to Neutral.

Protection Level:

- Capable of handling 10/1000 μ s single pulse up to I_{PP} at 1200 A
- Capable of handling 5 pulses of I_{PP} , 10/1000 μ s pulse, with 25 sec intervals.
- **SCP-5282-780-1200-3** is designed to meet MIL-STD-1399 voltage spike requirements for 480V_{rms} systems under the following conditions:
 - ✓ 2500V spike, 1 ohm source impedance, up to 50usec, per FIGURE 6 of MIL-STD-1399. At least one TVS unit of **SCP-5282-780-1200-3** is needed. The corresponding spike peak current is ~ 1500A, and the clamping voltage is ~ 1000V peak.
- **SCP-5282-780-1200-3** is designed to meet DO-160 Induced Lightning, Section 22, Table 22-2 at above level 5A (Voc/Isc = 1600V/1600A, waveform 5B), Figure 22-5 and Figure 22-7.
- **SCP-5282-780-1200-3** is designed to meet DO-160 Induced Lightning, Section 22, Table 22-2 at level 5 (Voc/Isc = 1600V/1600A, waveform 5B), Figure 22-5 and Figure 22-7.

Key Features:

- Increase system reliability through eliminating avalanche of sensitive components.
- Line to Neutral Clamping below 632V, and Line to Line Clamping below 1096V, at 1100A for 10/1000 μ s pulse.
- High Pulse Power Capability
- MTBF (MIL STD 217F amended to reflect ANSI Vita S1.0-2008 (2013): 84818 hours for AUC environment and 50°C temperature

Part Number Ordering:

Part Number	Bi-Directional
SCP-5282-780-1200-3	X

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TECHNICAL DATA @ 25°C

Rating	Condition	Symbol	Min	Max	Units
Peak Pulse Power Dissipation Line to Line Line to Neutral	10/1000 usec waveform, Can handle 5 pulses in 125 sec (When Mounted to a heatsink)	P_{pk}	-	1200 690	KW
Device Energy Capability Line to Line Line to Neutral	5 pulses in 125 sec (When Mounted to a heatsink)	E		8500 4900	Joules
Line to Line DC Stand-Off Voltage AC Vrms	-	V_{WM}	-	780 550	V dc V rms
Line to Neutral DC Stand-Off Voltage AC Vrms	-	V_{WM}	-	450 318	V dc V rms
Reverse Leakage at V_{WM}	@ V _{WM} dc	I_D	-	50	μA dc
Breakdown Voltage Line to Line peak ⁽¹⁾ Line to Neutral peak ⁽²⁾	@ 1 mA	V_(BR)	830 480	910 525	Volts
Clamping Voltage ⁽³⁾ Line to Line peak Line to Neutral peak	@ I _{PP}	V_C	1020 585	1096 632	Volts
Peak Pulse Current ⁽³⁾ Line to Line peak Line to Neutral peak	10/1000 usec waveform, 5 pulses in 125 sec (When Mounted to a heatsink)	I_{PP}		1100	Amps
TVS Resistance Line to Line Line to Neutral	at 1100A	R_S (Typical)		0.169 0.097	Ohms
Operating & Storage Temp.	-	Top & Tstg	-55	+ 150	°C

(1) Breakdown voltage can be trimmed down by 66V (by shorting trimming terminals Pins 1&2, 3&4 in Fig 3).

(2) Breakdown voltage can be trimmed down by 33V (by shorting trimming terminals Pins 1&2, 3&4 in Fig 3).

(3) Peak Current I_P at any line to line spike voltage, with a source resistance of R_{SP}, is (V_S - 830V)/(R_S + R_{SP}), the corresponding TVS maximum clamping voltage is (830 + I_P * R_S).

To calculate VBR vs. junction temperature, use the following formula:

(VBR at T_J) = (VBR at 25 °C) * (1 + αT * (T_J - 25)), where αT is typically 0.001/°C.

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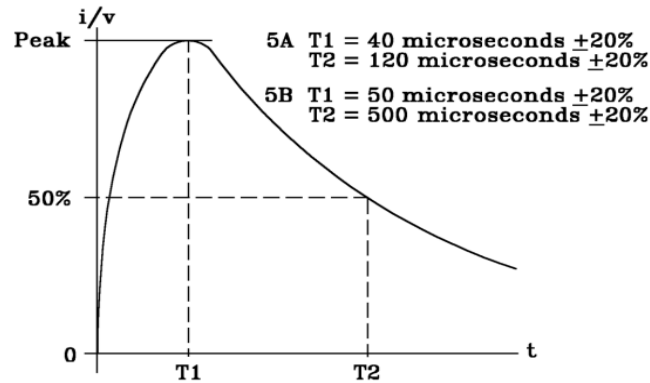


Figure 22-5 Current/Voltage Waveform 5

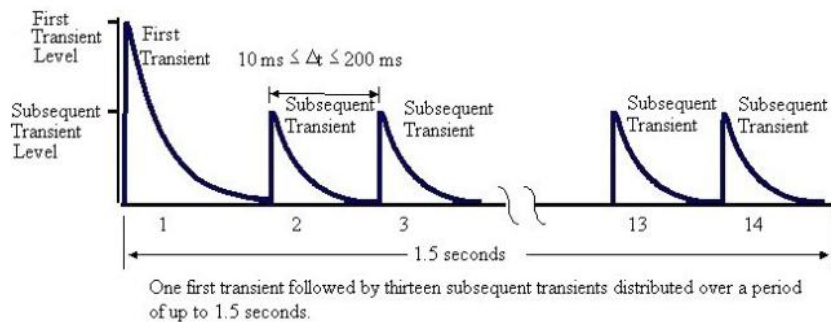


Figure 22-7 Multiple Stroke Application

Table 22-2 Generator Setting Levels for Pin Injection

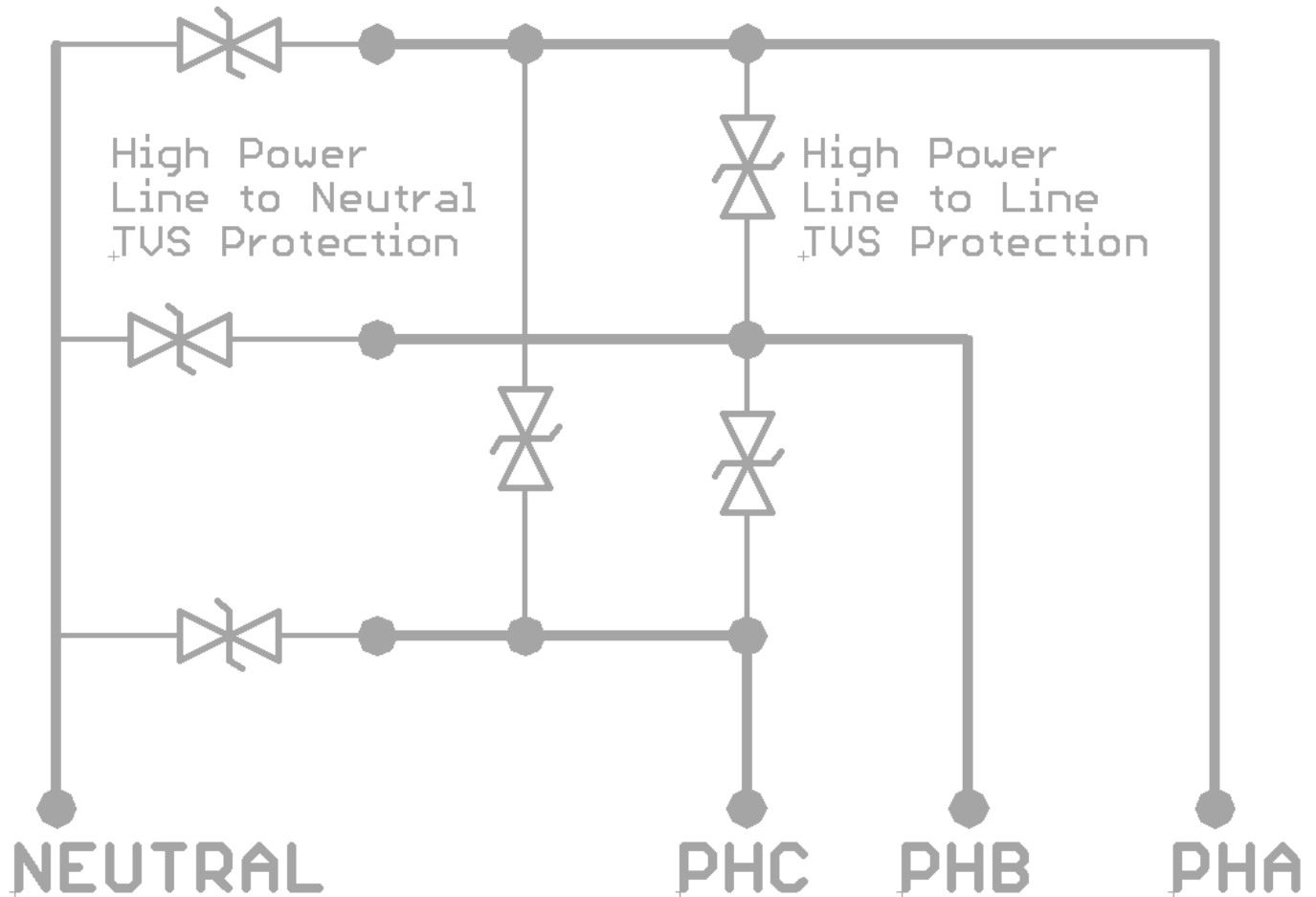
Level	Waveforms		
	3/3	4/1	5A/5A
	Voc/Isc	Voc/Isc	Voc/Isc
1	100/4	50/10	50/50
2	250/10	125/25	125/125
3	600/24	300/60	300/300
4	1500/60	750/150	750/750
5	3200/128	1600/320	1600/1600

NOTES:

1. Voc = Peak Open Circuit Voltage (Volts) available at the calibration point shown in Figure 22-10, Figure 22-11, or Figure 22-12.
2. Isc = Peak Short Circuit Current (Amps) available at the calibration point shown in Figure 22-10, Figure 22-11, or Figure 22-12.
3. Amplitude Tolerances +10%, -0%.
4. The ratio of Voc to Isc is the generator source impedance to be used during the calibration procedure.
5. Waveforms 3, 4 and 5A are identified in Figure 22-3, Figure 22-4 and Figure 22-5.

DO-160 Section 22 Test Waveforms
Fig. 1

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**Fig. 2 Three Phase TVS Module Symbol
(Line to Line & Line to Neutral Protection)**

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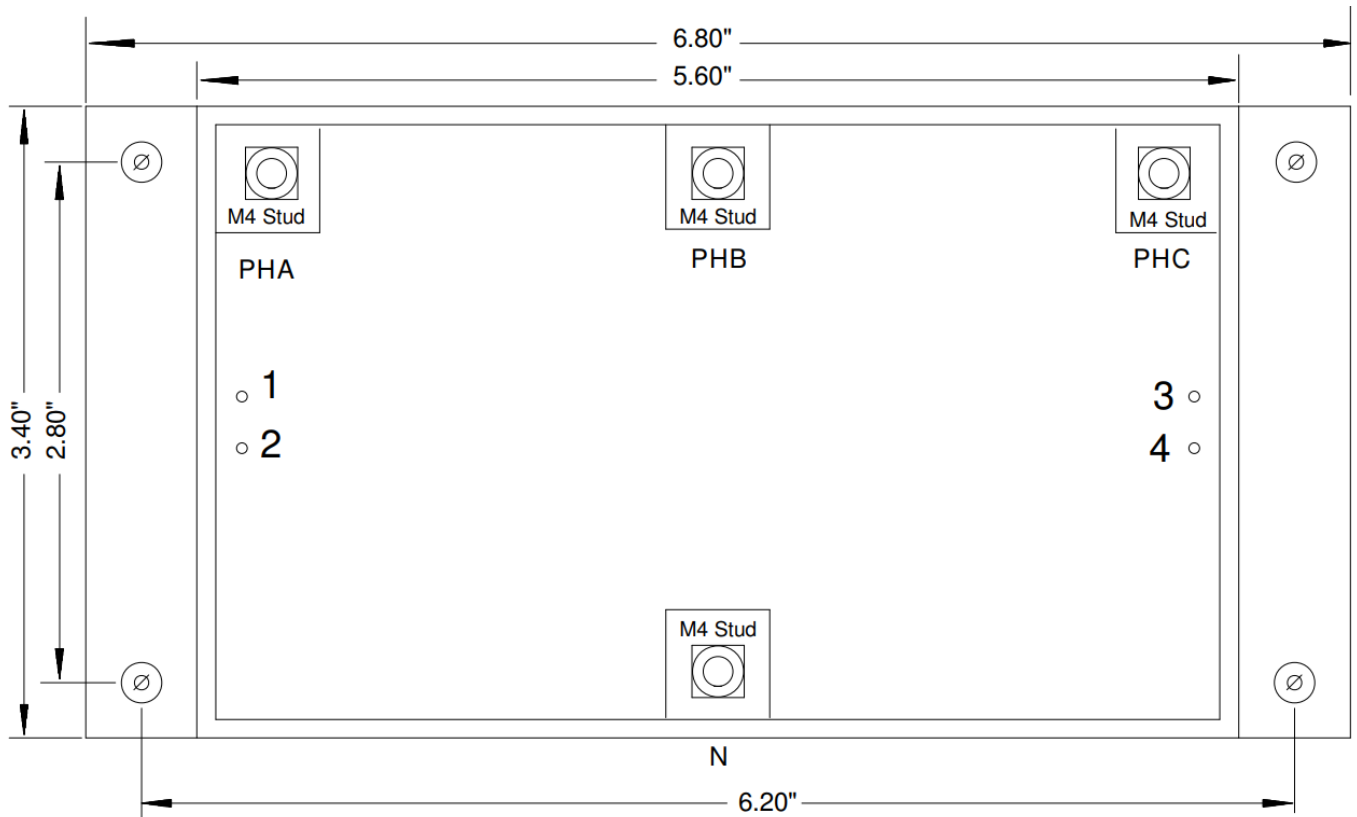


Fig. 3 Preliminary Package Outline
(Package Height is TBD)

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