General Semiconductor Industries, Inc.

TRANSZORB®
TRANSIENT VOLTAGE SUPPRESSORS
BIDIRECTIONAL
PHP8.4 THRU PHP500
AND
PIP8.4 THRU PIP500

FEATURES

- **7,500 and 15,000 watts Peak Pulse Power dissipation**
- **Available in ranges from 8.4 to 500 volts**
- **Designed for Military (PHP series) ‡ and commercial (PIP series)**
- **UL Recognized (PIP120)**
- **Each device 100% tested**

MAXIMUM RATINGS

- 7,500 and 15,000 watts Peak Pulse power dissipation at the 1 msec pulse and 25° C (see derating curve)
- Operating and Storage temperatures: -65° to + 150° C
- Average Steady State power dissipation at 50° C: 7.5 watts
- $t_{clamping}$ (0 volts to BV): Less than 1×10^{-8} seconds

MECHANICAL CHARACTERISTICS

- Molded Case
- Weight: 46 grams (approximate)
- Bipolar for AC Applications
- Body marked with Logo and type number

‡ Military Applications: PHP SERIES Modules can have design consistency with the following MILITARY requirements as controlling specifications.

- MIL-STD-1399
- MIL-E-16400
- MIL-STD-704
- MIL-S-19500/507

APPLICATION

PHP/PIP series is designed for applications requiring "across-the-line" AC power protection. These TransZorb® modules are used in applications where extreme voltage transients can permanently damage voltage sensitive systems or components. These devices are most often used when discrete TransZorbs do not have high enough power requirements to suppress large power surges.

DESCRIPTION

TransZorb modules can be used to protect equipment from induced lightning, power surges and transients originating from inductive switching or power interrupt. The modules have been successfully used for both commercial and military applications, including telecommunications, aircraft, shipboard, central office switching and PABX, CATV distribution, computers, distributed data processing, and power supplies.

For military applications, the PHP module sub-assemblies are packaged in a hermetically sealed glass-to-metal package. The screening would consist of 100% TX level environmental testing per MIL-S-19500/507A (Para. 4.3). For ordering these options, use the following suffix.

H1 — Submodule Screening,
H2 — Submodule and Module Screening,
H3 — Submodule and Module Screening. Module Group B & C lot testing. See Appendix for Processing Test Plan.

CASE 22

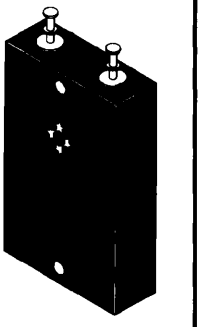


FIGURE 1—Peak Pulse Power vs Pulse Time

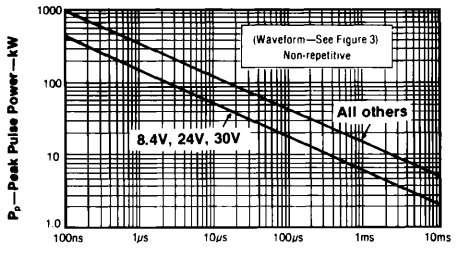
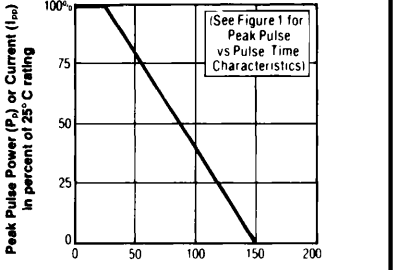


FIGURE 2—Derating Curve



TRANSZORB®

BIDIRECTIONAL

PHP8.4 THRU PHP500
AND
PIP8.4 THRU PIP500

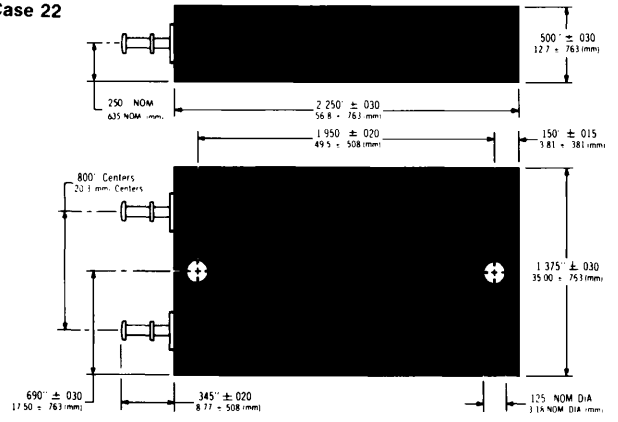
ELECTRICAL CHARACTERISTICS @ 25 C

GENERAL SEMICONDUCTOR PART NUMBER	AVERAGE RMS VOLTAGE VOLTAGE VOLTS AC	REVERSE STAND-OFF VOLTAGE (NOTE 1) VR VOLTS DC	MINIMUM BREAKDOWN VOLTAGE BV VOLTS @ IT mA	MAXIMUM REVERSE LEAKAGE (IR) @ VR MICRO AMPERES	MAXIMUM CLAMPING VOLTAGE Vc @ Ipp VOLTS DC	MAXIMUM PEAK PULSE CURRENT (FIG. 3) Ipp A	MAXIMUM PEAK PULSE POWER (1 MSEC) (Pp) KILOWATTS
PHP 8.4	8.4	12.0	14 10	250	22	341	7.5
PHP 24	24.0	34.0	40 10	250	67	112	7.5
PHP 30	30.0	42.5	50 1.0	250	84	90	7.5
PHP 60	60.0	85.0	100 1.0	250	167	90	15.0
PHP 120*	120.0	170.0	200 1.0	250	319	47	15.0
PHP 208	208.0	295.0	347 1.0	250	536	28	15.0
PHP 250*	250.0	354.0	418 1.0	250	652	23	15.0
PHP 440	440.0	623.0	735 1.0	250	1138	13.2	15.0
PHP 500*	500.0	708.0	835 1.0	250	1292	11.6	15.0
PIP 8.4	8.4	12.0	14 10	250	22	341	7.5
PIP 24	24.0	34.0	40 10	250	67	112	7.5
PIP 30	30.0	42.5	50 1.0	250	84	90	7.5
PIP 60	60.0	85.0	100 1.0	250	167	90	15.0
PIP 120*†	120.0	170.0	200 1.0	250	319	47	15.0
PIP 208	208.0	295.0	347 1.0	250	536	28	15.0
PIP 250*	250.0	354.0	418 1.0	250	652	23	15.0
PIP 440	440.0	623.0	735 1.0	250	1138	13.2	15.0
PIP 500*	500.0	708.0	835 1.0	250	1292	11.6	15.0

Special Voltages available from factory. *Recommended for marine applications †UL Listed

CASE OUTLINE

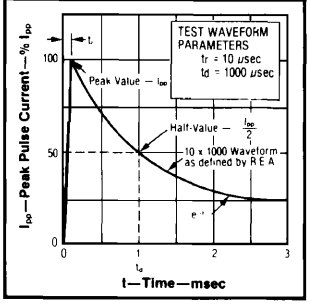
Case 22



MILITARY APPLICATIONS: PHP series sub-assemblies are packaged in a hermetically sealed glass-to-metal package, available with design consistency to MIL-S-19500/507.

COMMERCIAL APPLICATIONS: PIP series sub-assemblies are packaged in a molded epoxy case.

FIGURE 3—Pulse Waveform



NOTES

Note 1: A TransZorb is normally selected according to the reverse "Stand Off Voltage" (V_R) which should be equal to or greater than the DC or continuous peak operating voltage level.

ABBREVIATIONS & SYMBOLS

V_R Stand-Off Voltage: Applied Reverse Voltage to assure a nonconductive condition (See Note 1)

BV(min) This is the minimum Breakdown Voltage the device will exhibit and is used to assure that conduction does not occur prior to this voltage level at 25°C

V_C(max) Maximum Clamping Voltage. The maximum peak voltage appearing across the TransZorb when subjected to the peak pulse current in a one millisecond time interval. The peak pulse voltages are the combination of voltage rise due to both the series resistance and thermal rise.

I_{pp} Peak Pulse Current — See Figure 3

P_p Peak Pulse Power

I_R Reverse Leakage