

PENTA TVS/ZENER ARRAY FOR ESD AND LATCH-UP PROTECTION

This 5 TVS/Zener Array family have been designed to Protect Sensitive Equipment against ESD and to prevent Latch-Up events in CMOS circuitry operating at 5V, 12V, 15V and 24V. This TVS array offers an integrated solution to protect up to 5 data lines where the board space is a premium.

SPECIFICATION FEATURES

- 350W Power Dissipation (8/20µs Waveform)
- Low Leakage Current, Maximum of 5µA at rated voltage
- Very Low Clamping Voltage
- IEC61000-4-2 ESD 20kV air, 15kV Contact Compliance
- Industry Standard Surface Mount Package SOT23-6L
- 100% Tin Matte Finish (RoHS Compliant)

APPLICATIONS

- Personal Digital Assistant (PDA)
- SIM Card Port Protection (Mobile Phone)
- Portable Instrumentation
- Mobile Phones and Accessories
- Memory Card Port Protection

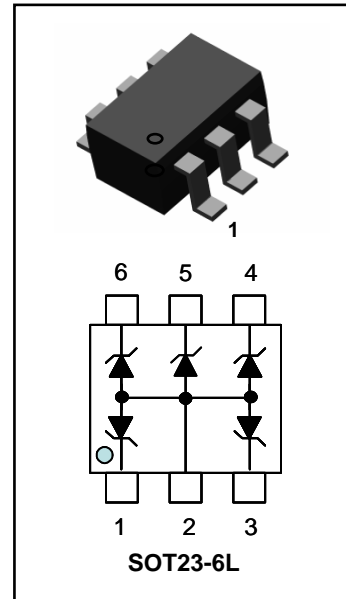
MAXIMUM RATINGS (Per Device)

| Rating | Symbol | Value | Units |
|------------------------------------|-----------|-------------|-------|
| Peak Pulse Power (8/20µs Waveform) | P_{pp} | 350 | W |
| ESD Voltage (HBM) | V_{ESD} | >25 | kV |
| Operating Temperature Range | T_J | -50 to +125 | °C |
| Storage Temperature Range | T_{stg} | -50 to +150 | °C |

ELECTRICAL CHARACTERISTICS (Per Device) $T_j = 25^\circ\text{C}$

PJSMS05C

| Parameter | Symbol | Conditions | Min | Typical | Max | Units |
|--------------------------------|-----------|--|-----|---------|-----|-------|
| Reverse Stand-Off Voltage | V_{WRM} | | | | 5 | V |
| Reverse Breakdown Voltage | V_{BR} | $I_{BR} = 1\text{mA}$ | 6 | | | V |
| Reverse Leakage Current | I_R | $V_R = 5\text{V}$ | | | 5 | µA |
| Clamping Voltage (8/20µs) | V_C | $I_{pp} = 5\text{A}$ | | | 9.5 | V |
| Clamping Voltage (8/20µs) | V_C | $I_{pp} = 24\text{A}$ | | | 13 | V |
| Off State Junction Capacitance | C_j | 0 Vdc Bias $f = 1\text{MHz}$ Between I/O pins and pin 2 | | | 200 | pF |
| Off State Junction Capacitance | C_j | 5 Vdc Bias $f = 1\text{MHz}$ Between I/O pins and pin 2 | | | 110 | pF |



| Device | Marking Code |
|----------|--------------|
| PJSMS05C | MD5 |
| PJSMS12C | MA2 |
| PJSMS15C | MA5 |
| PJSMS24C | MB4 |



ELECTRICAL CHARACTERISTICS (Per Device) Tj = 25°C

PJSMS12C

| Parameter | Symbol | Conditions | Min | Typical | Max | Units |
|----------------------------------|-----------|---|------|---------|-----|---------|
| Reverse Stand-Off Voltage | V_{WRM} | | | | 12 | V |
| Reverse Breakdown Voltage | V_{BR} | $I_{BR} = 1mA$ | 13.3 | | | V |
| Reverse Leakage Current | I_R | $V_R = 12V$ | | | 5 | μA |
| Clamping Voltage (8/20 μs) | V_C | $I_{pp} = 5A$ | | | 17 | V |
| Clamping Voltage (8/20 μs) | V_C | $I_{pp} = 15A$ | | | 21 | V |
| Off State Junction Capacitance | C_j | 0 Vdc Bias f = 1MHz Between I/O pins and pin 2 | | | 90 | pF |

PJSMS15C

| Parameter | Symbol | Conditions | Min | Typical | Max | Units |
|----------------------------------|-----------|---|------|---------|-----|---------|
| Reverse Stand-Off Voltage | V_{WRM} | | | | 15 | V |
| Reverse Breakdown Voltage | V_{BR} | $I_{BR} = 1mA$ | 16.7 | | | V |
| Reverse Leakage Current | I_R | $V_R = 15V$ | | | 5 | μA |
| Clamping Voltage (8/20 μs) | V_C | $I_{pp} = 5A$ | | | 24 | V |
| Clamping Voltage (8/20 μs) | V_C | $I_{pp} = 12A$ | | | 29 | V |
| Off State Junction Capacitance | C_j | 0 Vdc Bias f = 1MHz Between I/O pins and pin 2 | | | 70 | pF |

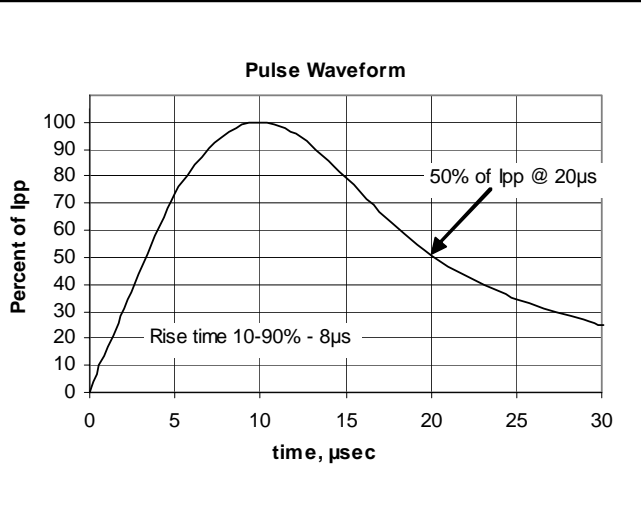
PJSMS24C

| Parameter | Symbol | Conditions | Min | Typical | Max | Units |
|----------------------------------|-----------|---|------|---------|-----|---------|
| Reverse Stand-Off Voltage | V_{WRM} | | | | 24 | V |
| Reverse Breakdown Voltage | V_{BR} | $I_{BR} = 1mA$ | 26.7 | | | V |
| Reverse Leakage Current | I_R | $V_R = 24V$ | | | 5 | μA |
| Clamping Voltage (8/20 μs) | V_C | $I_{pp} = 5A$ | | | 40 | V |
| Clamping Voltage (8/20 μs) | V_C | $I_{pp} = 8A$ | | | 44 | V |
| Off State Junction Capacitance | C_j | 0 Vdc Bias f = 1MHz Between I/O pins and pin 2 | | | 50 | pF |

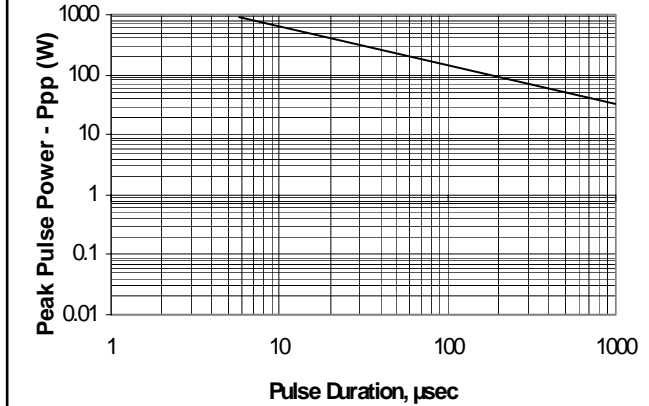


TYPICAL CHARACTERISTICS TJ = 25°C unless otherwise noted

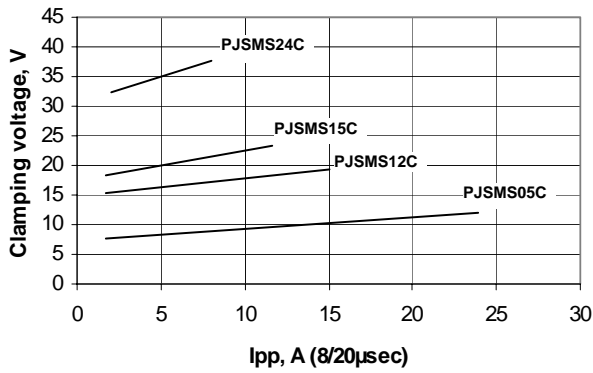
Surge Pulse Waveform Definition



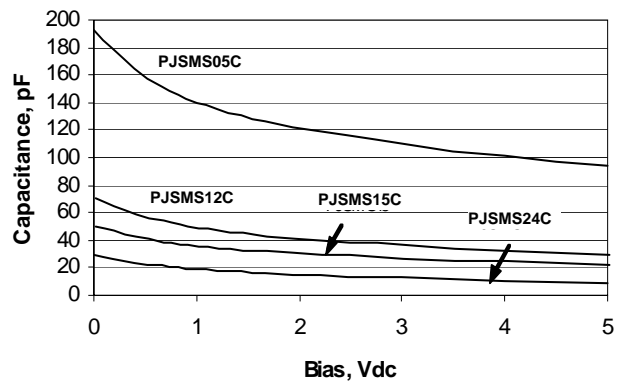
Non-Repetitive Peak Pulse Power vs Pulse Time

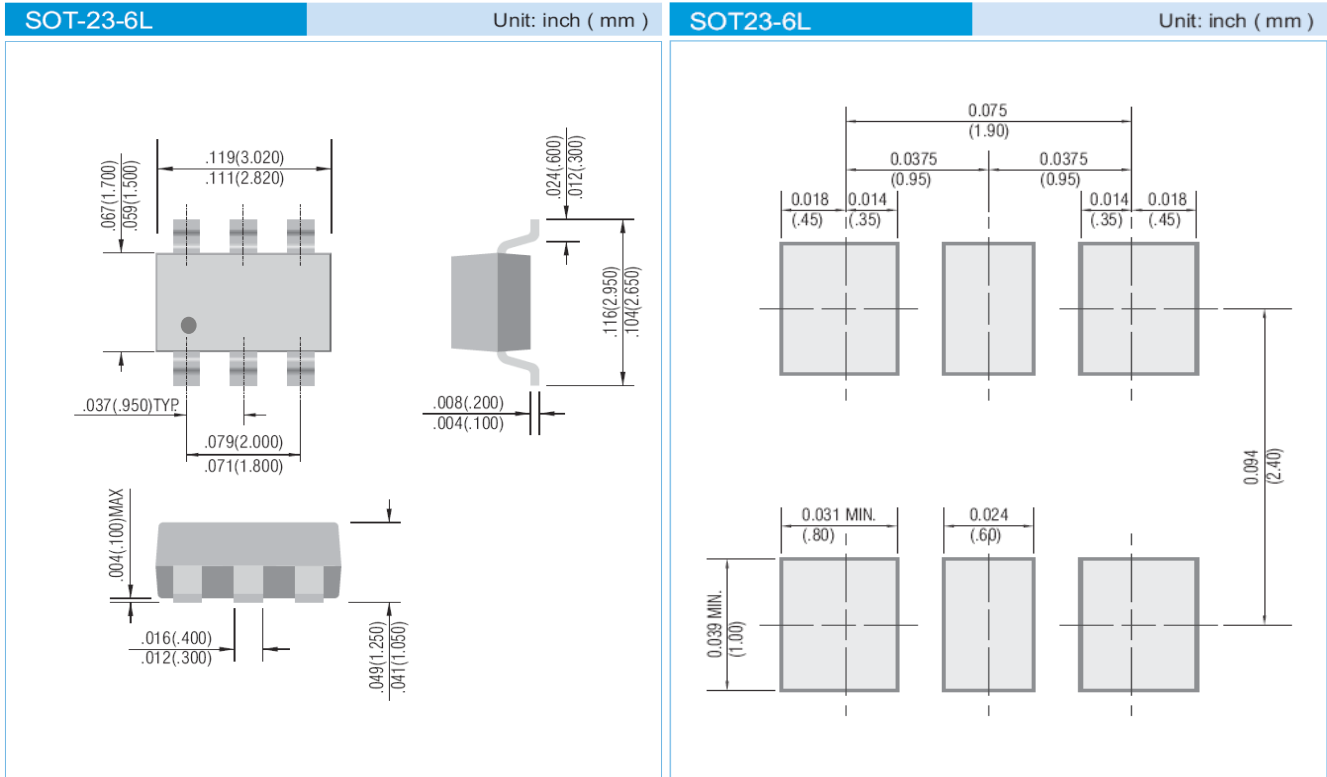


Clamping Voltage vs. Peak current



Off-State Capacitance per Device - 1MHz



PACKAGE AND PAD LAYOUT DIMENSIONS

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