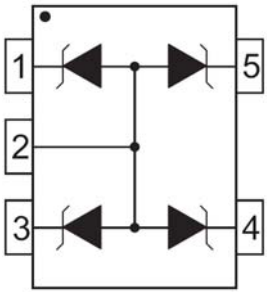
## Feature

- 100W peak pulse power per line ($t_P$ = 8/20μS)
- SC-70-5L package
- Up to four lines of protection
- Monolithic structure
- Working voltage: 5V
- Low clamping voltage
- ESD protection > 25KV
- Low leakage current
- RoHS compliant
- Transient protection for data lines to IEC 61000-4-2(ESD) ±15KV(air), ±8KV(contact); IEC 61000-4-4 (EFT) 40A (5/50ns)




## Applications

- Cellular phones
- MP3 players
- Notebook
- PDAs
- Digital cameras
- Cellular phone base stations

## Electrical characteristics per line@25°C(unless otherwise specified) note1

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Reverse stand-off voltage | $V_{RWM}$ | | | | 5 | V |
| Reverse Breakdown voltage | $V_{BR}$ | $I_t$ = 1mA | 6 | | | V |
| Reverse Leakage Current | $I_R$ | $V_{RWM}$ = 5V T=25°C | | | 5 | μA |
| Clamping Voltage | $V_C$ | $I_{PP}$ = 1A $t_P$ = 8/20μS | | | 8.8 | V |
| Clamping Voltage | $V_C$ | $I_{PP}$=10A $t_P$ = 8/20μS | | | 10.0 | V |
| Junction Capacitance | $C_j$ | $V_R$=0V f = 1MHz | | 60 | | pF |

## Absolute maximum rating @25°C note1

| Rating | Symbol | Value | Units |
|---|---|---|---|
| Peak Pulse Power ($t_p$=8/20μs) | $P_{pp}$ | 100 | Watts |
| Forward voltage@1A, 8/20μs | $V_F$ | 1.5 | V |
| Operating Temperature | $T_J$ | -55 to +150 | °C |
| Storage Temperature | $T_{STG}$ | -55 to +150 | °C |

- Note1: Pin 1, 3, 4, 5 to Pin 2

## Typical Characteristics

FIGURE 1
PEAK PULSE POWER VS PULSE TIME

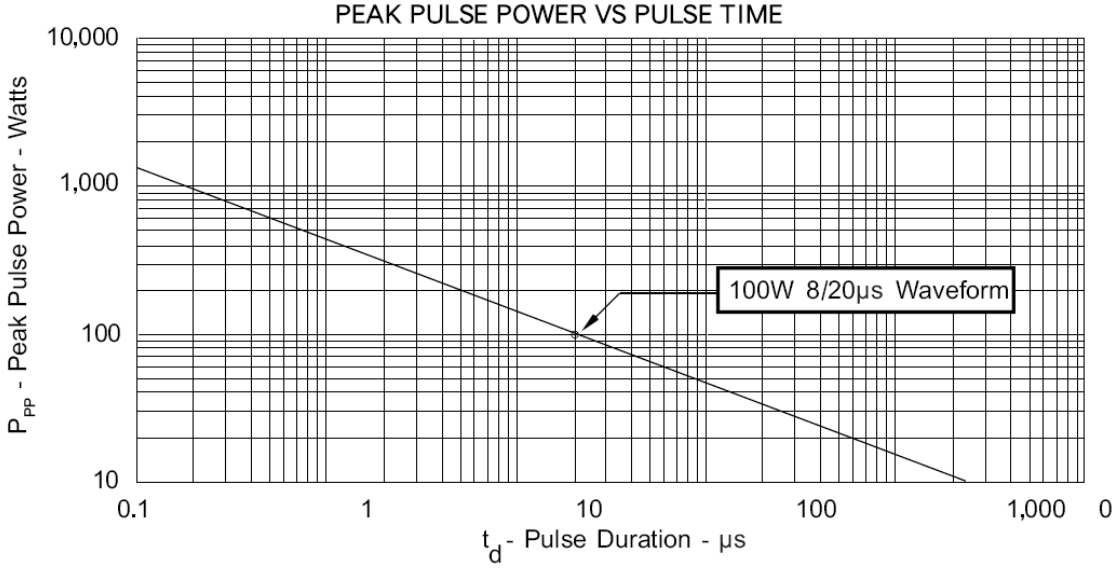



FIGURE 2
PULSE WAVE FORM

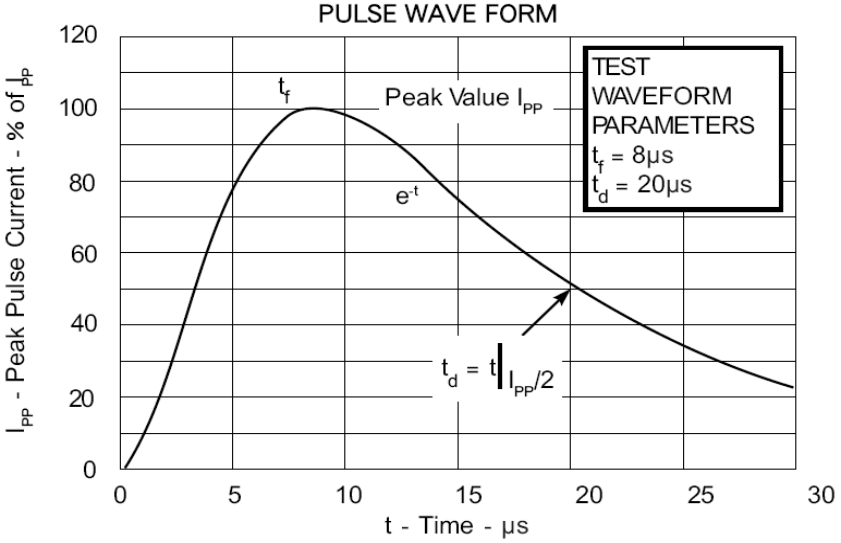
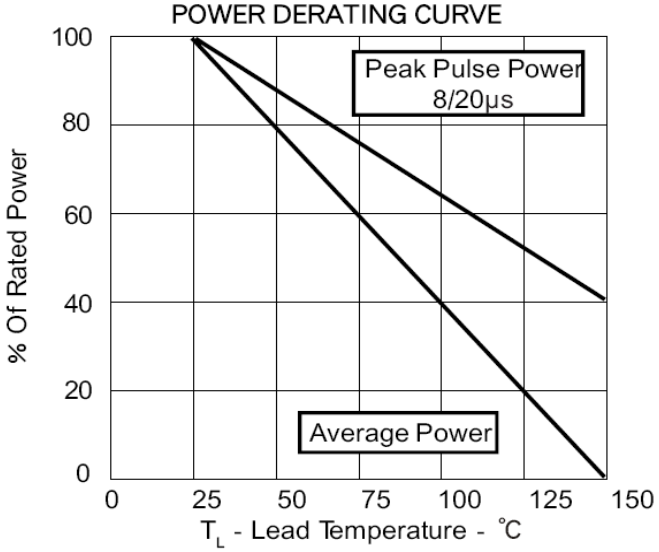
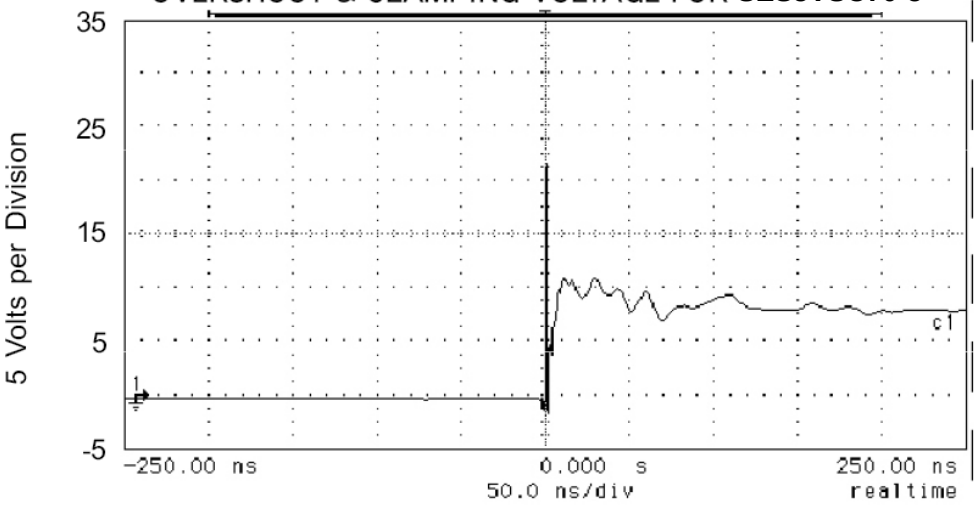


FIGURE 3
POWER DERATING CURVE



## Typical Characteristics

FIGURE 4
OVERSHOOT & CLAMPING VOLTAGE FOR **SES5VSC70-5**




ESD Test Pulse: 5 kilovolt, 1/30ns (waveform)

FIGURE 5
TYPICAL CLAMPING VOLTAGE VS PEAK PULSE CURRENT FOR **SES5VSC70-5**

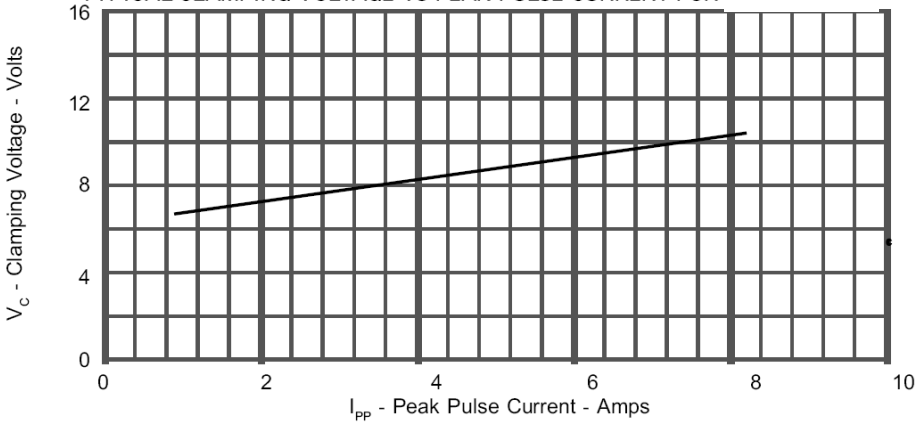
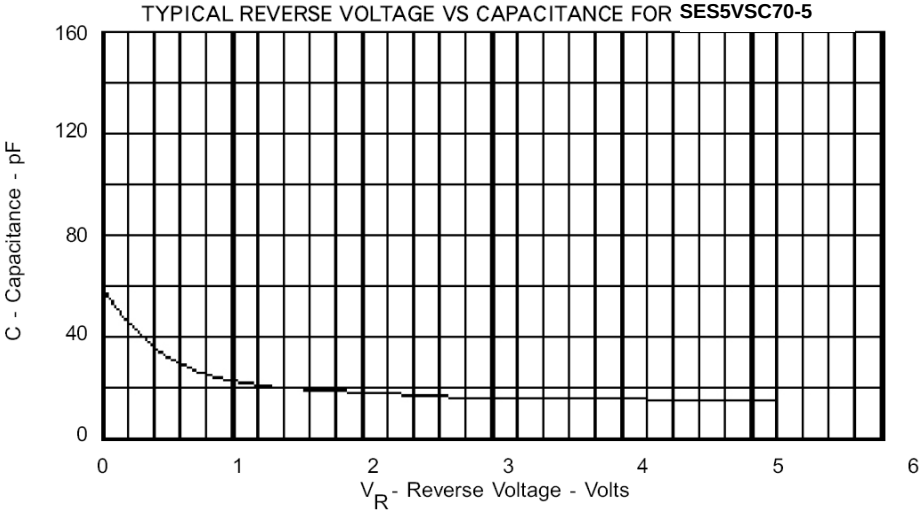
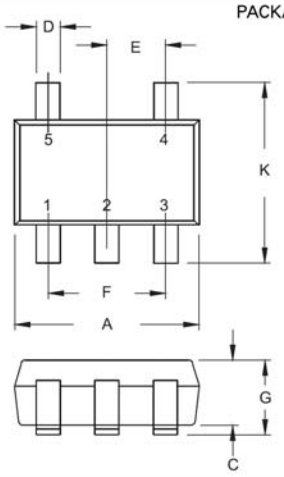


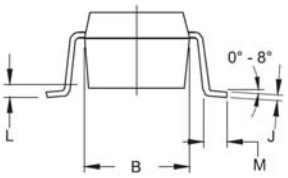

FIGURE 6
TYPICAL REVERSE VOLTAGE VS CAPACITANCE FOR **SES5VSC70-5**



## Product dimension and pad size

PACKAGE OUTLINE



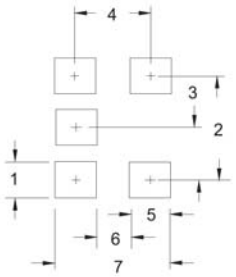

SC70-5L

PACKAGE DIMENSIONS

| DIM | MILLIMETERS MIN | MILLIMETERS MAX | INCHES MIN | INCHES MAX |
|---|---|---|---|---|
| A | 1.90 | 2.15 | 0.075 | 0.085 |
| B | 1.15 | 1.35 | 0.045 | 0.053 |
| C | 0.80 | 1.00 | 0.031 | 0.039 |
| D | 0.15 | 0.30 | 0.006 | 0.012 |
| E | 0.65 BSC | - | 0.026 BSC | - |
| F | 1.30 BSC | - | 0.051 BSC | - |
| G | 0.80 | 1.10 | 0.031 | 0.043 |
| J | 0.08 | 0.25 | 0.003 | 0.010 |
| K | 1.90 | 2.15 | 0.075 | 0.085 |
| L | 0 | 0.10 | 0 | 0.004 |
| M | 0.26 | 0.46 | 0.010 | 0.018 |

MOUNTING PAD

| TYPICAL DIM | Millimeters | Inches |
|---|---|---|
| 1 | 0.50 | 0.020 |
| 2 | 1.30 | 0.051 |
| 3 | 0.65 | 0.026 |
| 4 | 1.72 | 0.068 |
| 5 | 0.60 | 0.024 |
| 6 | 1.11 | 0.044 |
| 7 | 2.33 | 0.092 |




NOTES

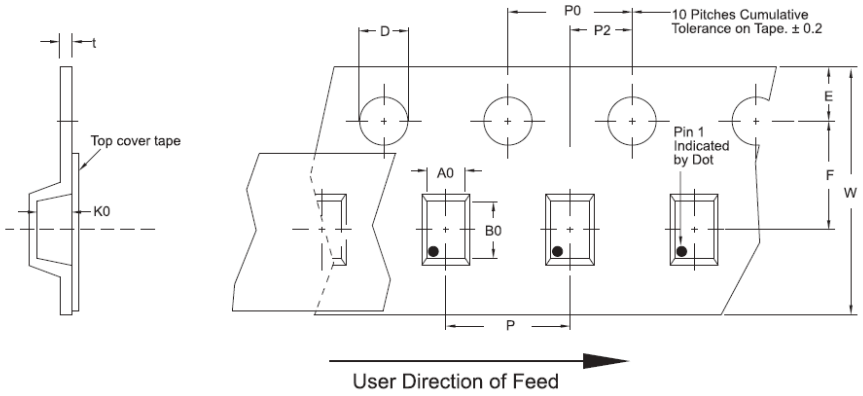
1. Dimensioning and tolerances per ANSI Y14.5M, 1985.
2. Controlling Dimension: Inches
3. Dimensions are exclusive of mold flash and metal burrs.

TAPE & REEL ORDERING NOMENCLATURE

1. Surface mount product is taped and reeled in accordance with EIA-481.
2. 7 Inch Reel - 3,000 pieces per 8mm tape.

Tape & Reel Specifications (Dimensions in millimeters)

| Reel Dia. | Tape Width | A0 | B0 | K0 | D | E | F | W | P0 | P2 | P | tmax |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 178mm (7") | 8mm | 2.25 ± 0.10 | 2.34 ± 0.10 | 1.22 ± 0.10 | 1.50 ± 0.10 | 1.75 ± 0.10 | 3.50 ± 0.05 | 8.00 ±0.30 | 4.00 ±0.10 | 2.00 ±0.05 | 4.00 ±0.10 | 0.25 |



# Application note

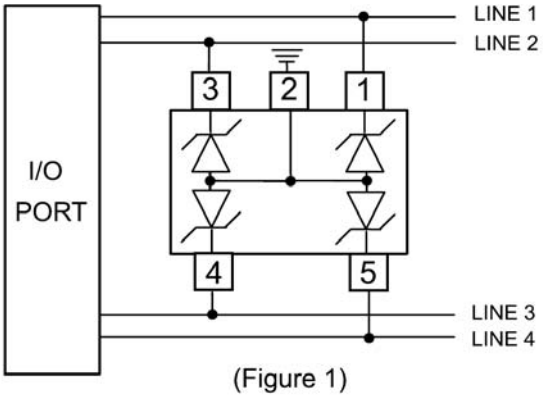
The SES5VSC70-5 Series is TVS arrays designed to protect I/O or data lines from the damaging effects of ESD or EFT. This product provides both unidirectional and bidirectional protection, with a surge capability of 100 Watts Ppp per line for an 8/20μs wave shape and ESD protection > 25 kilovolts.

COMMON-MODE UNIDIRECTIONAL CONFIGURATION (Figure 1)

The SES5VSC70-5 Series provides up to 4 lines of protection in a common-mode unidirectional configuration as depicted in Figure 1.

Circuit connectivity is as follows:

- Line 1 is connected to Pin 1.
- Line 2 is connected to Pin 3.
- Line 3 is connected to Pin 4.
- Line 4 is connected to Pin 5.
- Pin 2 is connected to ground.



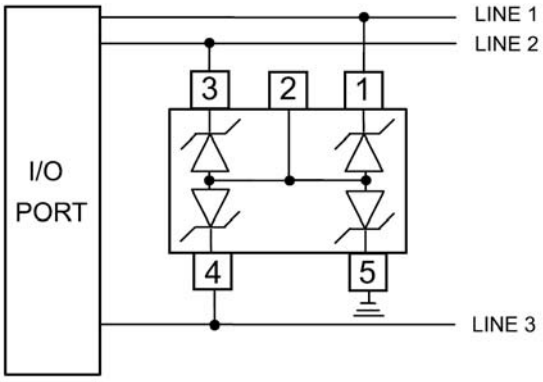

(Figure 1)

COMMON-MODE BIDIRECTIONAL CONFIGURATION (Figure 2)

The SES5VSC70-5 Series provides up to 3 lines of protection in a common-mode bidirectional configuration as depicted in Figure 2.

Circuit connectivity is as follows:

- Line 1 is connected to Pin 1.
- Line 2 is connected to Pin 3.
- Line 3 is connected to Pin 4.
- Pin 5 is connected to ground.
- Pin 2 is not connected.



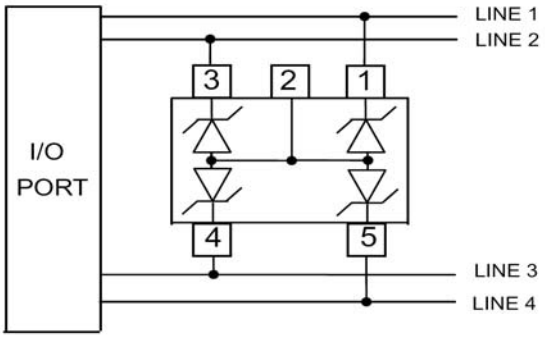

(Figure 2)

## Application note

The **SES5VSC70-5** Series provides up to 4 lines of protection in a differential-mode bidirectional configuration as depicted in Figure 3.

Circuit connectivity is as follows:

- Line 1 is connected to Pin 1.
- Line 2 is connected to Pin 3.
- Line 3 is connected to Pin 4.
- Line 4 is connected to Pin 5.
- Pin 2 is not connected.




(Figure 3)

**Circuit board layout and protection device placement:**

Circuit board layout is critical for the suppression of ESD transients.
The following guidelines are recommended:

1. Place the protection device as close to the input terminal or connector as possible.
2. The path length between the protection device and the protected line should be minimized.
3. Keep parallel signal paths to a minimum.
4. Avoid running protection conductors in parallel with unprotected conductor.
5. Minimize all printed-circuit board conductive loops including power and ground loops.
6. Minimize the length of the transient return path to ground.
7. Avoid using shared transient return paths to a common ground point.
8. Ground planes should be used whenever possible. For multilayer printed-circuit boards, use ground vias.

## Revision History

| Revision | Date | Changes |
|---|---|---|
| 1.0 | 2008-7-3 | - |