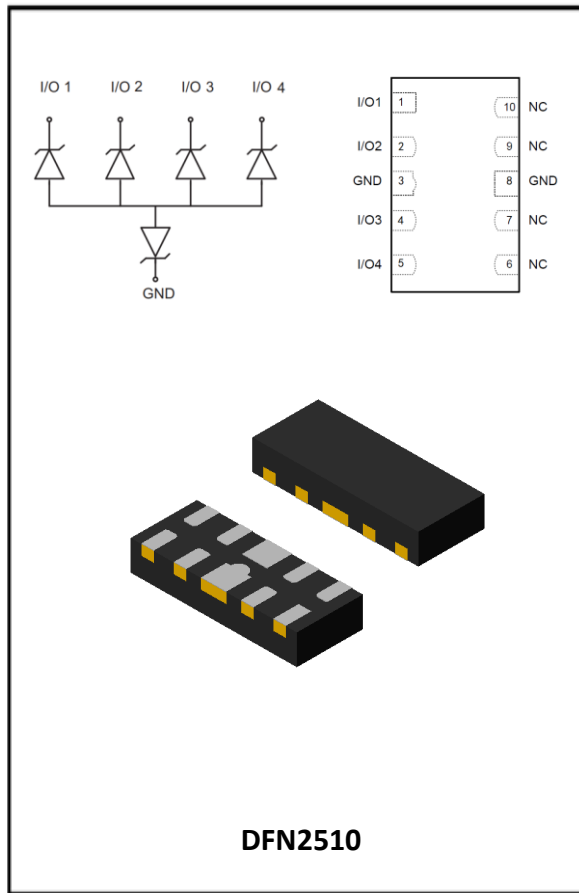


## 4-Line, Bi-directional, Ultra-low Capacitance, Transient Voltage Suppressor



### Features

- Stand-off voltage: 3.3V Max
- Transient protection for each line according to IEC61000-4-2(ESD):  $\pm 15\text{kV}$  (contact)  
IEC61000-4-5(surge): 7A (8/20 $\mu\text{s}$ )
- Ultra-low capacitance:  $C_j = 0.22\text{ pF typ}$
- Low leakage current
- Low clamping voltage
- Up to 4 lines protects
- RoHS Compliant

### Applications

- HDMI 2.0/2.1, USB 3.0/3.1 Type C
- Monitors and flat panel displays
- Set-top box and Digital TV
- MDDI ports
- Video graphics cards
- Digital Video Interface (DVI)
- Notebook Computers
- PCI Express and Serial SATA Ports

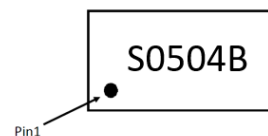
#### Caution:

*This Device is designed for signal line protection only.*

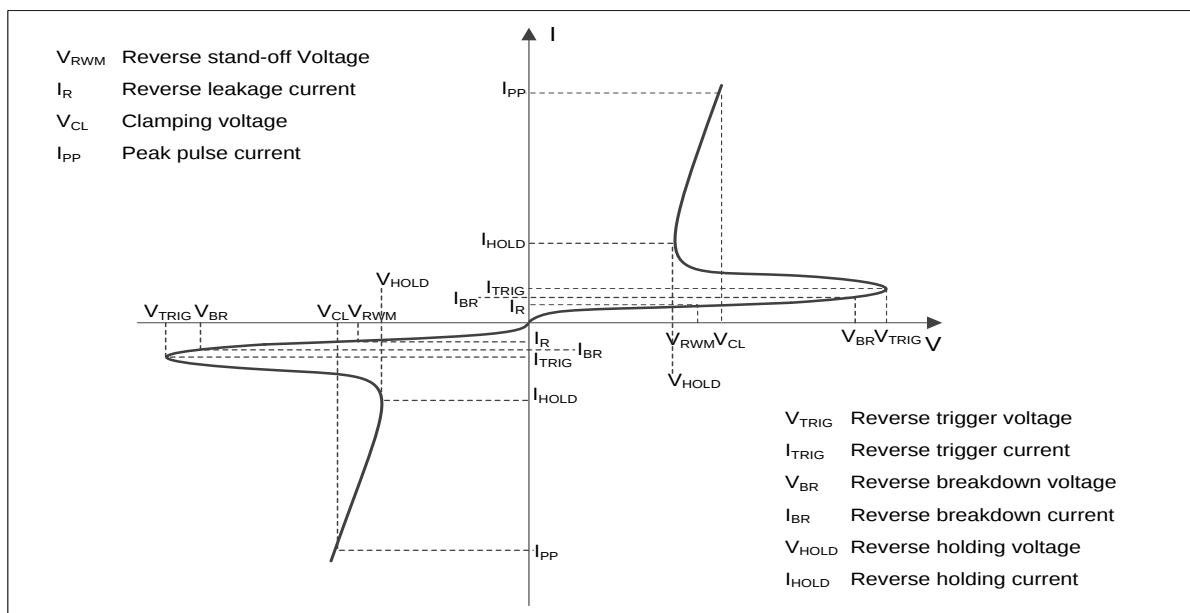
*Do not operate under electrical bias or connect to a power line.*

### Mechanical Data

- Lead Finish: Matte Tin
- Case Material: "Green" Molding Compound.
- Moisture Sensitivity: Level 3 per J-STD-020
- Marking Information: See Below



### ■Definitions of electrical characteristics





# SESDULC3304P5B

## ■Maximum Ratings

| PARAMETER                                       | SYMBOL    | LIMITS   | UNIT        |
|-------------------------------------------------|-----------|----------|-------------|
| Peak pulse power ( $t_p = 8/20\mu s$ )          | $P_{pk}$  | 56       | W           |
| Peak pulse current ( $t_p = 8/20\mu s$ )        | $I_{PP}$  | 7        | A           |
| ESD according to IEC61000-4-2 air discharge     | $V_{ESD}$ | $\pm 15$ | KV          |
| ESD according to IEC61000-4-2 contact discharge |           | $\pm 15$ |             |
| Junction temperature                            | $T_J$     | -55~125  | $^{\circ}C$ |
| Storage temperature                             | $T_{STG}$ | -55~150  | $^{\circ}C$ |

## ■Electrical Characteristics ( $T_a=25^{\circ}C$ Unless otherwise specified)

| PARAMETER                       | Symbol     | UNIT | Conditions                                      | Min | Typ  | Max  |
|---------------------------------|------------|------|-------------------------------------------------|-----|------|------|
| Reverse maximum working voltage | $V_{RWM}$  | V    | Any I/O pin to ground                           |     |      | 3.3  |
| Reverse leakage current         | $I_R$      | nA   | $V_{RWM} = 3.3V$ ,<br>any I/O pin to ground     |     |      | 200  |
| Reverse breakdown voltage       | $V_{(BR)}$ | V    | $I_T = 1mA$ ,<br>any I/O pin to ground          | 6.0 | 7.6  | 10.0 |
| Reverse holding voltage         | $V_{HOLD}$ | V    | $I_{HOLD} = 50mA$ ,<br>any I/O pin to ground    | 2   |      |      |
| Clamping voltage <sup>1)</sup>  | $V_{CL}$   | V    | $I_{PP} = 16A$ , $t_p = 100ns$                  |     | 6.5  |      |
| Clamping voltage <sup>2)</sup>  | $V_{CL}$   | V    | $I_{PP} = 1A$ , $t_p = 8/20\mu s$               |     | 3    | 5    |
|                                 |            | V    | $I_{PP} = 7A$ , $t_p = 8/20\mu s$               |     | 6.5  | 8    |
| Junction capacitance            | CJ         | pF   | $V_R = 0V$ , $f = 1MHz$<br>Any I/O pin to GND   |     | 0.22 | 0.28 |
|                                 |            |      | $V_R = 1.5V$ , $f = 1MHz$<br>Any I/O pin to GND |     | 0.2  | 0.26 |

Notes:

- 1) TLP parameter:  $Z_0 = 50\Omega$ ,  $t_p = 100ns$ ,  $t_r = 2ns$ , averaging window from 60ns to 80ns.
- 2) Non-repetitive current pulse, according to IEC61000-4-5.

## ■Ordering Information (Example)

| PREFERED P/N   | PACKING CODE | UNIT WEIGHT(mg)  | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|----------------|--------------|------------------|----------------------|-------------------------|----------------------------|---------------|
| SESDULC3304P5B | F1           | Approximate 3.48 | 3000                 | 30000                   | 120000                     | 7 reel        |



## ■ Characteristics (Typical)

Fig.1 8/20 $\mu$ s waveform per IEC61000-4-5

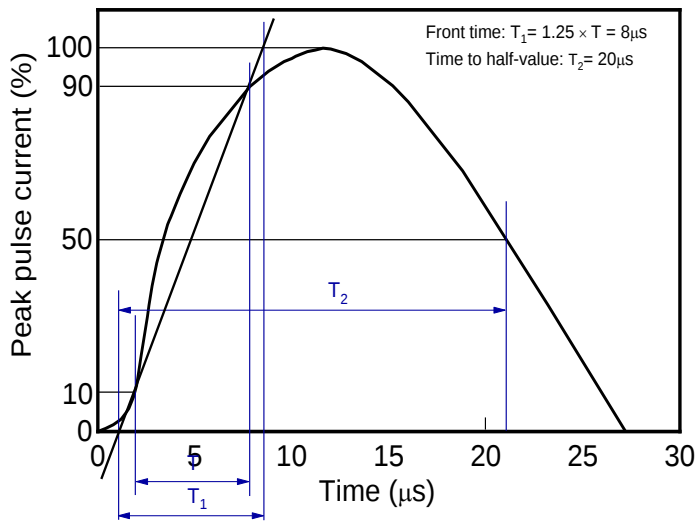


Fig.2 Contact discharge current waveform per IEC61000-4-2

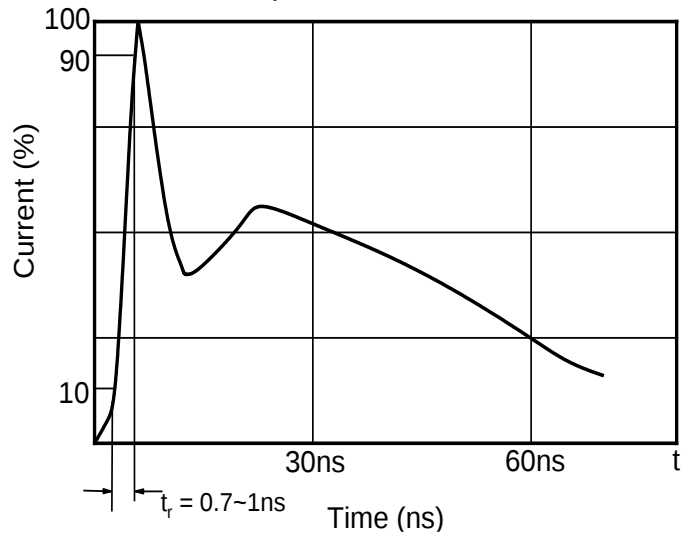


Fig.3 Clamping voltage vs. Peak pulse current

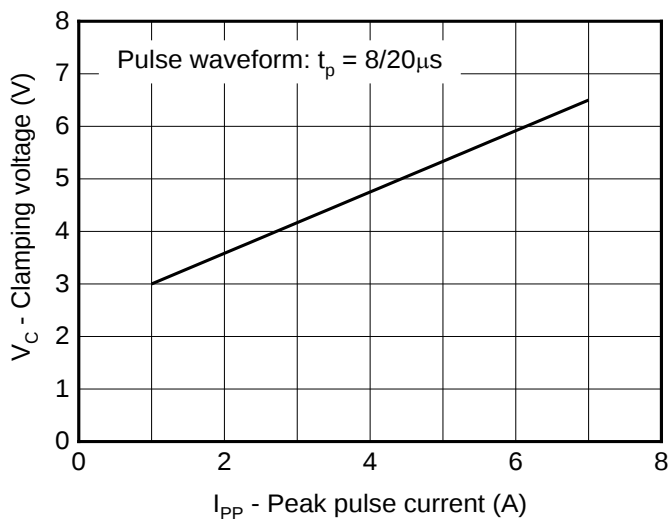


Fig.4 Capacitance vs. Reverse voltage

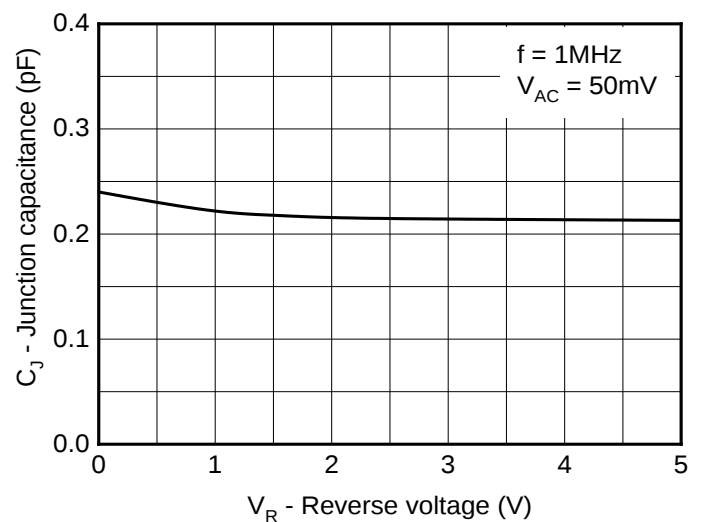


Fig.5 Non-repetitive peak pulse power vs. Pulse time

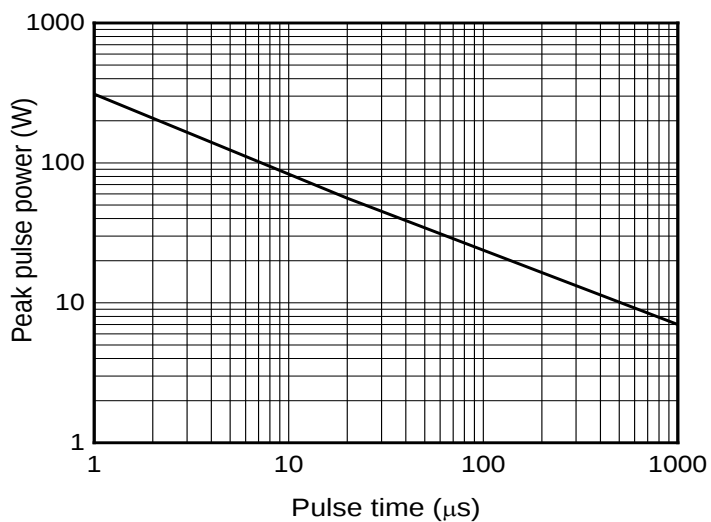


Fig.6 Power derating vs. Ambient temperature

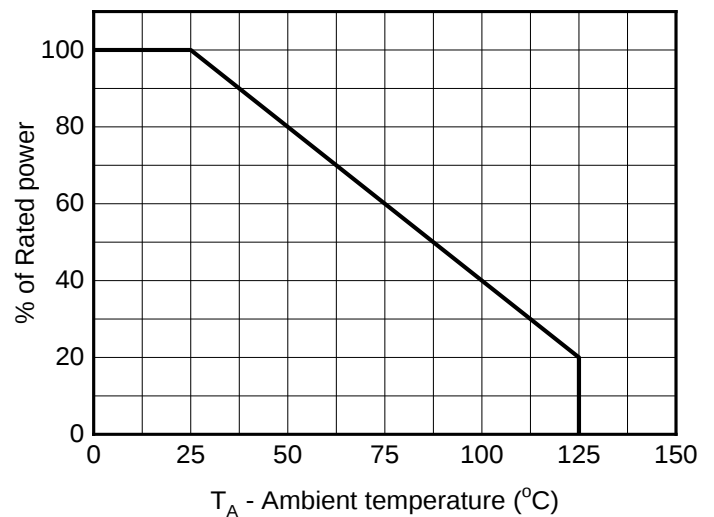
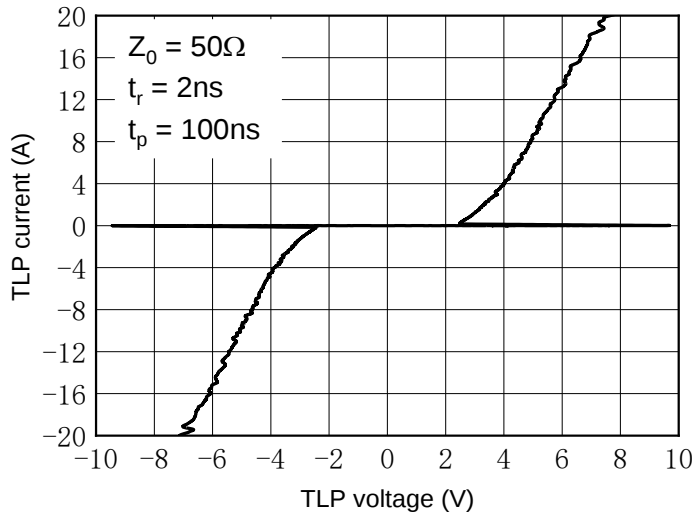
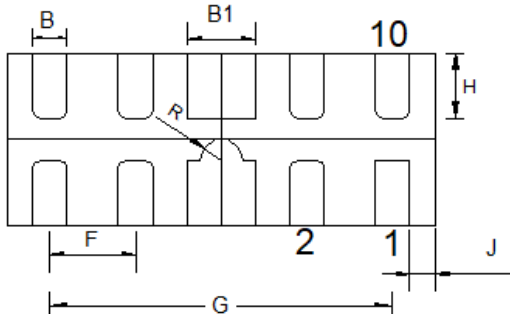
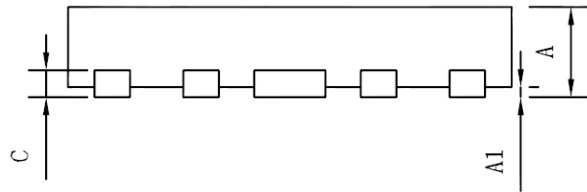
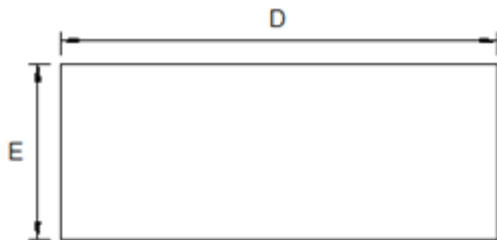


Fig.7 TLP Measurement

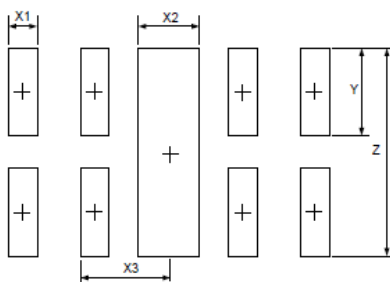


## Outline Dimensions



| SYMBOL | MILLIMETER |      |      |
|--------|------------|------|------|
|        | MIN        | NOM  | MAX  |
| A      | 0.40       | 0.45 | 0.50 |
| A1     | —          | 0.02 | 0.05 |
| B      | 0.15       | 0.20 | 0.25 |
| B1     | 0.35       | 0.40 | 0.45 |
| C      | 0.10       | 0.15 | 0.20 |
| D      | 2.45       | 2.50 | 2.55 |
| E      | 0.95       | 1.00 | 1.05 |
| F      | 0.50 BSC   |      |      |
| G      | 2.00 BSC   |      |      |
| H      | 0.30       | 0.38 | 0.46 |
| R      | 0.125 BSC  |      |      |
| J      | 0.10       | 0.15 | 0.20 |

## Soldering Footprint



| SYM | DIMENSIONS  |        |
|-----|-------------|--------|
|     | MILLIMETERS | INCHES |
| X1  | 0.200       | 0.008  |
| X2  | 0.400       | 0.016  |
| X3  | 0.600       | 0.024  |
| Y   | 0.600       | 0.024  |
| Z   | 1.400       | 0.056  |

### Notes:

This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met.



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