

### DESCRIPTION

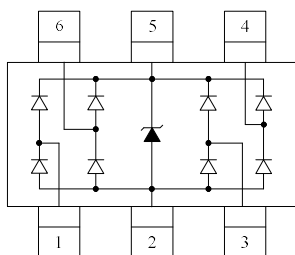
KESDU5V0H4 is an ultra-low capacitance Transient Voltage Suppressor (TVS) designed to protection for high-speed data interfaces. With typical capacitance of 0.20pF (I/O to I/O) only, KESDU5V0H4 is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4(±15KV air, ±8KV contact discharge), IEC61000-4-4 (electrical fast transient-EFT) (40A, 5/50ns), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

KESDU5V0H4 uses small SOT-163 package. Each KESDU5V0H4 device can protect four high-speed data lines one Vcc line. The combined features of ultra-low capacitance, small size and high ESD robustness make KESDU5V0H4 ideal for high-speed data ports and high-frequency lines (e.g., HDMI & DVI) applications. The low clamping voltage of the KESDU5V0H4 guarantees a minimum stress on the protected IC.

### ORDERING INFORMATION

- ✧ Device: KESDU5V0H4
- ✧ Package: SOT-163
- ✧ Marking: V05
- ✧ Material: Halogen free
- ✧ Packing: Tape & Reel
- ✧ Quantity per reel: 3,000pcs

### PIN CONFIGURATION



### FEATURES

- ✧ Transient protection for high-speed data lines  
IEC 61000-4-2(ESD) ±20KV(Contact)  
±25KV(Air)  
IEC 61000-4-4(EFT) 40A(5/50ns)
- ✧ Package optimized for high-speed lines
- ✧ Small package(2.9mm\*2.8mm\*1.1mm)
- ✧ Protects four data lines and one Vcc line
- ✧ Low capacitance: 0.20pF (I/O to I/O)
- ✧ Low leakage current
- ✧ Low clamping voltage
- ✧ Each I/O pin can withstand over 1000 ESD strikes for ±8KV contact discharge

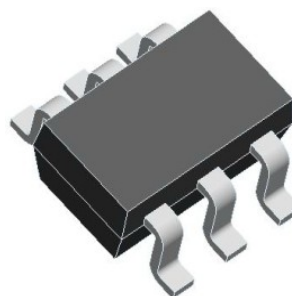
### MACHANICAL DATA

- ✧ SOT-163 package
- ✧ Flammability Rating: UL 94V-0
- ✧ Terminal: Matte tin plated.
- ✧ High temperature soldering guaranteed:  
260°C/10s
- ✧ Packaging: Tape and Reel
- ✧ Reel size: 7 inch

### APPLICATIONS

- ✧ Serial ATA
- ✧ MDDI Ports
- ✧ USB 2.0/3.0 Power and Data Line Protection
- ✧ Display Ports
- ✧ High Definition Multi-Media Interface (HDMI)
- ✧ Digital Visual Interface (DVI)

### PACKAGE OUTLINE



### ABSOLUTE MAXIMUM RATING

| Symbol    | Parameter                                                      | Value                | Units |
|-----------|----------------------------------------------------------------|----------------------|-------|
| $P_{PP}$  | Peak Pulse Power (8/20 $\mu$ s)                                | 60                   | W     |
| $V_{ESD}$ | ESD per IEC 61000-4-2 (Contact)<br>ESD per IEC 61000-4-2 (Air) | $\pm 20$<br>$\pm 25$ | kV    |
| $T_{OPT}$ | Operating Temperature                                          | -55/+125             | °C    |
| $T_{STG}$ | Storage Temperature                                            | -55/+150             | °C    |

### ELECTRICAL CHARACTERISTICS ( $T_{amb}=25^{\circ}C$ )

| Symbol    | Parameter                 | Test Condition                                       | Min | Typ  | Max  | Units   |
|-----------|---------------------------|------------------------------------------------------|-----|------|------|---------|
| $V_{RWM}$ | Reverse Working Voltage   | Any I/O pin to GND                                   |     |      | 5.0  | V       |
| $V_{BR}$  | Reverse Breakdown Voltage | $I_T = 1mA$<br>Any I/O pin to GND                    | 6.0 |      | 9.0  | V       |
| $I_R$     | Reverse Leakage Current   | $V_{RWM} = 5V$<br>Any I/O pin to GND                 |     |      | 1.0  | $\mu A$ |
| $V_C$     | Clamping Voltage          | $I_{PP} = 1A, t_p = 8/20\mu s$<br>Any I/O pin to GND |     |      | 10   | V       |
|           |                           | $I_{PP} = 4A, t_p = 8/20\mu s$<br>Any I/O pin to GND |     |      | 15   | V       |
|           |                           | $I_{PP} = 8A, t_p = 8/20\mu s$<br>Vcc pin to GND     |     |      | 15   | V       |
| $C_{ESD}$ | Parasitic Capacitance     | $V_R = 0V, f = 1MHz$<br>Between I/O and I/O          |     | 0.20 | 0.30 | pF      |
|           |                           | $V_R = 0V, f = 1MHz$<br>Between I/O and GND          |     | 0.45 | 0.50 | pF      |
|           |                           | $V_R = 0V, f = 1MHz$<br>Between Vcc and GND          |     | 0.80 |      | pF      |

Note: I/O Pins are pin 1,3,4,6. Pin 5 is Vcc. Pin 2 is GND.

### ELECTRICAL CHARACTERISTICS CURVE

Fig 1 Power Derating Curve

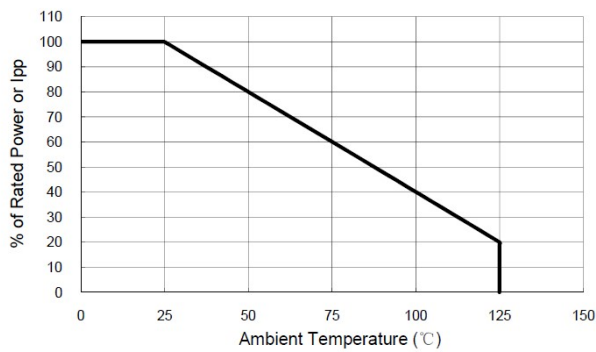


Fig 2 Clamping Voltage vs Peak Pulse Current

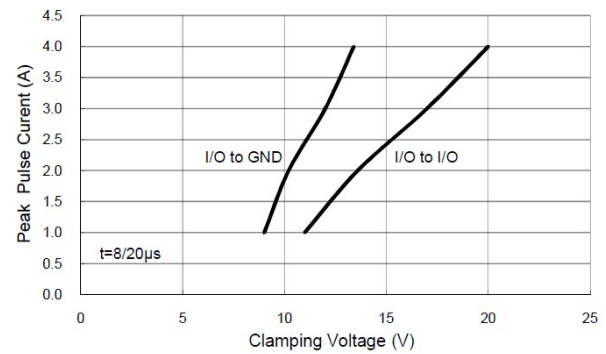


Fig 3 Voltage Sweeping of I/O to I/O

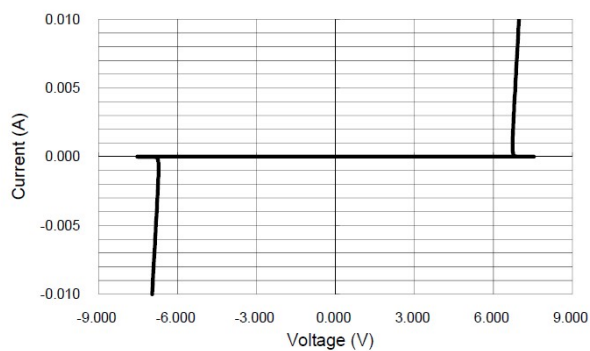


Fig 4 Voltage vs Capacitance

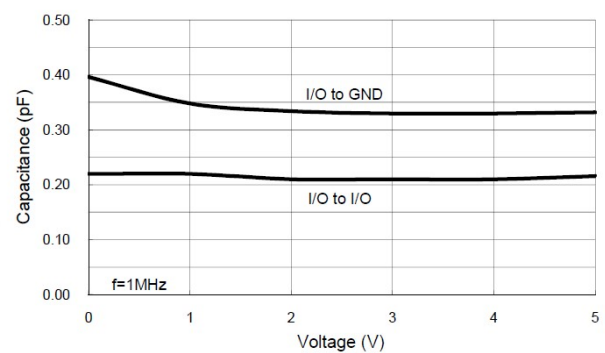


Fig 5 ESD Clamping of I/O to GND  
(+8kV Contact per IEC 61000-4-2)

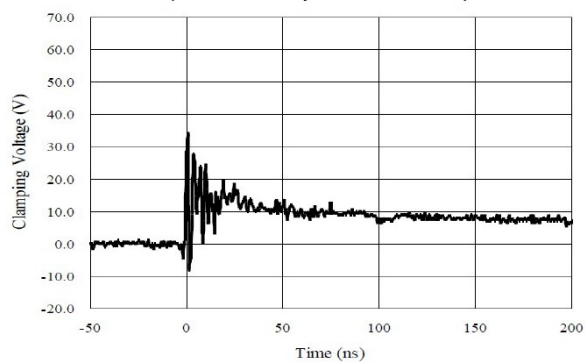
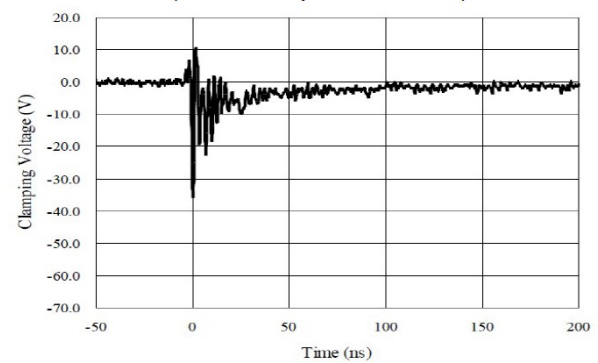
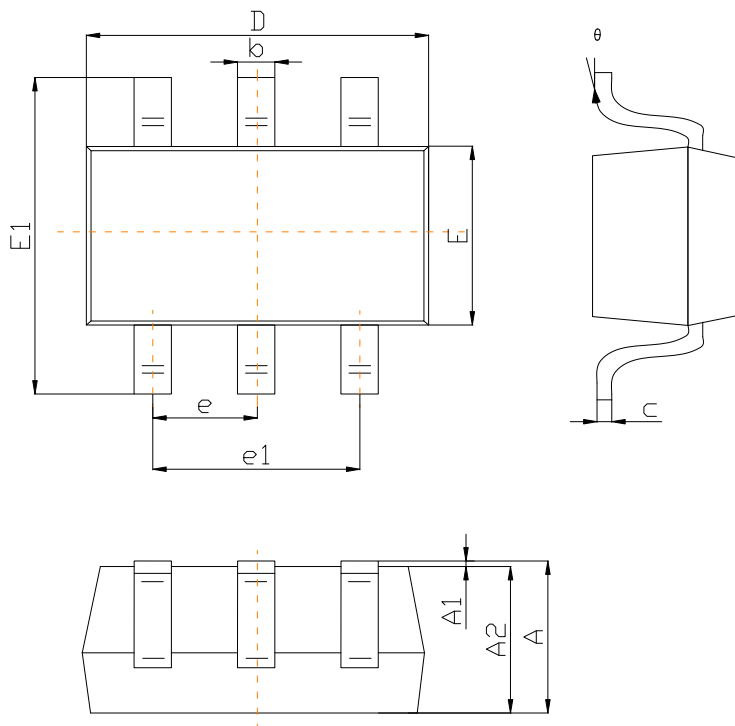


Fig 6 ESD Clamping of I/O to GND  
(-8kV Contact per IEC 61000-4-2)



#### SOT-163 PACKAGE OUTLINE DIMENSIONS



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 1.050                     | 1.250 | 0.041                | 0.049 |
| A1     | 0.000                     | 0.100 |                      | 0.004 |
| A2     | 1.050                     | 1.150 | 0.041                | 0.045 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.100                     | 0.200 | 0.004                | 0.008 |
| D      | 2.820                     | 3.020 | 0.111                | 0.119 |
| E      | 1.500                     | 1.700 | 0.059                | 0.067 |
| E1     | 2.650                     | 2.950 | 0.104                | 0.116 |
| e      | 0.950(BSC)                |       | 0.037(BSC)           |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.300                     | 0.600 | 0.012                | 0.024 |
|        | 0°                        | 8°    | 0°                   | 8°    |