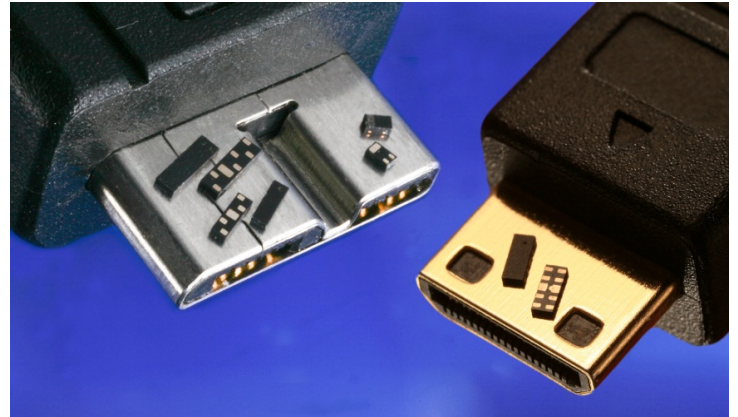


## Multi-Channel Silicon ESD Protector Overvoltage Protection Device

### Specification Status: RELEASED

#### BENEFITS

- Industry-leading lowest capacitance; provides lowest insertion loss for high speed data signals
- Industry's smallest footprint and lowest profile multi-channel ESD array helps to optimize board space
- Flow-through and single connection design helps routing PCB matched impedance high speed data lines
- Helps protect electronic circuits against damage from Electrostatic Discharge (ESD), surge and cable discharge events
- Assists equipment to pass IEC61000-4-2, level 4 testing



#### FEATURES

- Low capacitance: 0.20 pF (200fF) (typ)
- Low leakage current: 25nA @ 5V (typ)
- Low clamping voltage: +9.20 / -0.80V (typ) @ (tp=8x20µs, Ipp=2A)
- ESD maximum rating per IEC61000-4-2 standard:
  - 20kV contact discharge
  - 20kV air discharge
- Surge: 2A (max) @ (tp=8x20µs) per IEC61000-4-5
- Small size and low profile: XDFN array packages 0.38mm height (typ)

#### APPLICATIONS

- Consumer, mobile and portable electronics
- Tablet PC and external storage with high speed interfaces
- Ultra-high speed data lines
- USB 3.0/2.0, HDMI 1.3/1.4, DisplayPort, Thunderbolt (Light Peak), V-by-One HS, and LVDS interfaces
- Applications requiring high ESD performance in small DFN packages

#### AEC-Q101 QUALIFIED

#### MATERIALS INFORMATION

RoHS Compliant ELV Compliant Halogen Free \* Lead Free

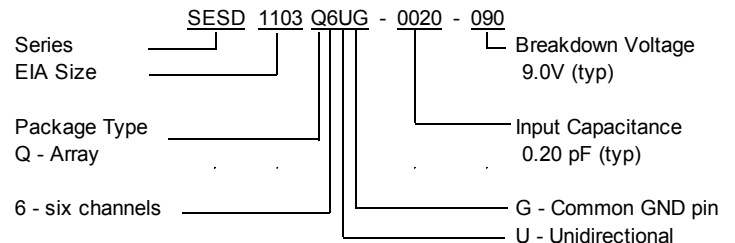
Directive 2000/53/EC Compliant

Directive 2002/95/EC Compliant

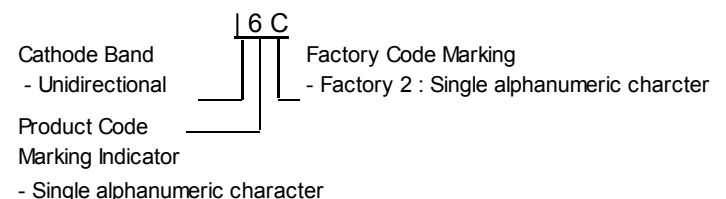


\* Halogen Free refers to: Br≤900ppm, Cl≤900ppm, Br+Cl≤1500ppm  
SESD devices meet MSL-1 Requirements  
DFN case epoxy meets UL 94 V-0

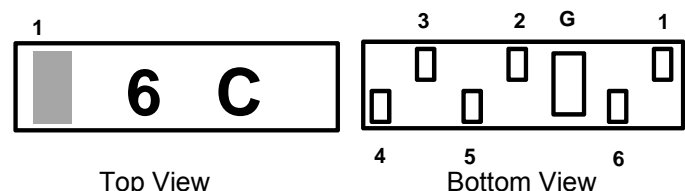
#### PART NUMBERING



#### PART MARKING



#### PIN CONFIGURATION AND SCHEMATIC



\* Drawing not to scale

308 Constitution Drive  
Menlo Park, CA USA  
www.circuitprotection.com

## Multi-Channel Silicon ESD Protector Overvoltage Protection Device

DOCUMENT: SCD28428  
REV LETTER: B  
REV DATE: MAY 15, 2013  
PAGE NO.: PAGE 2 OF 6

### DEVICE MAXIMUM RATING

ESD Withstand <sup>(1)</sup> (IEC 61000-4-2, level 4)		Temperature		Peak Current (tp=8x20μs)
Contact (kV)	Air (kV)	Operating (°C)	Storage (°C)	I <sub>pp</sub> (A)
20	20	-55 to +125	-55 to +150	2.0

<sup>(1)</sup> 20kV @ 1 pulse; 10kV @ 100 pulses; 8kV @ 1,000 pulses (under IEC6100-4-2)

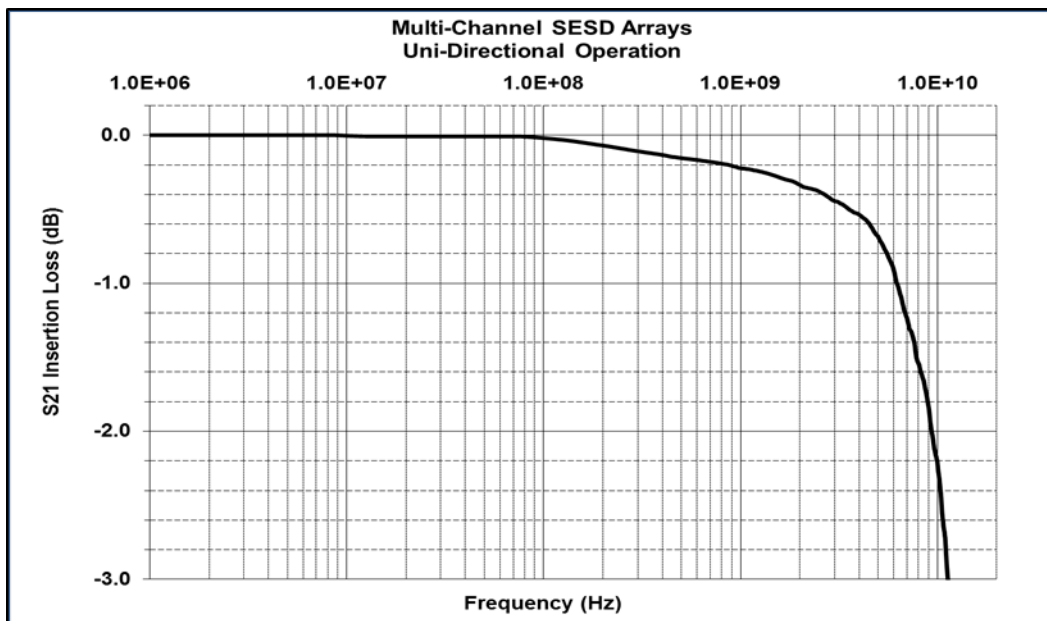
- Maximum leakage current post 15kV & 20kV pulses is less than 1 μA
- Device maximum rating @ T = 25°C, unless otherwise specified
- Caution: Stress exceeding Device Maximum Ratings may damage the device  
Prolonged exposure to stresses above the Recommended Operating Conditions may affect device reliability

### DEVICE ELECTRICAL CHARACTERISTICS

Input Capacitance @ V <sub>R</sub> = 0V, f = 3GHz, I/O to GND (pF)		Breakdown Voltage V <sub>BR</sub> @ I <sub>T</sub> =1mA (V)	Reverse Working Voltage (V)		Reverse Leakage Current I <sub>L</sub> @ V <sub>RWM</sub> =5.0V (nA)		Clamping Voltage V <sub>CL</sub> @ I <sub>pp</sub> =2.0A (V)
Typ	Maximum	Typ	Min	Max	Typ	Max	Typ
0.20	0.25	+9.00 / -0.80	0	+7.00	25.0	50.0	+9.20 / -0.80

- All device electrical characteristics @ T = 25°C, unless otherwise specified

### FIGURE 1. INSERTION LOSS DIAGRAM

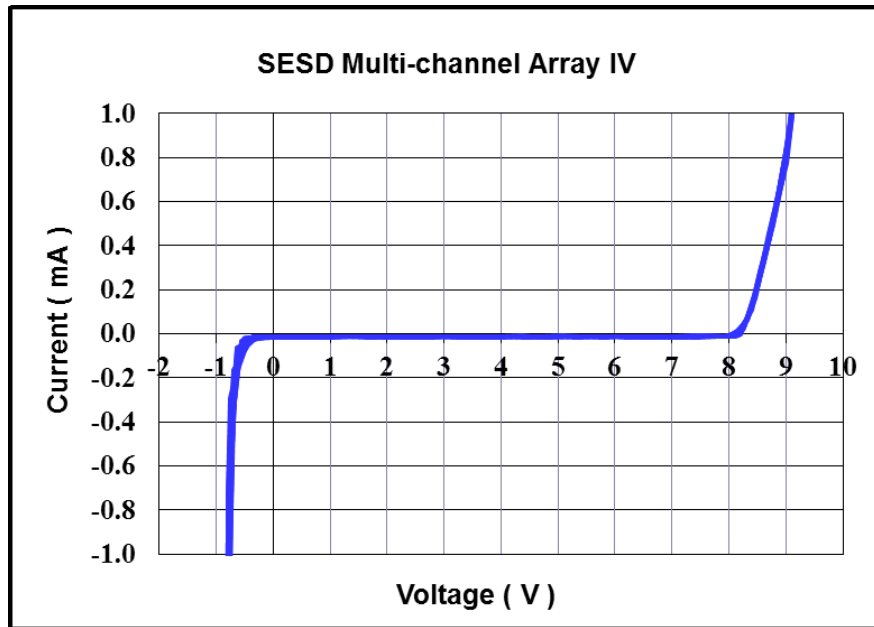


Application	Bit Rate (Gbps)	@Freq (GHz)	Ins. Loss (dB)
HDMI 1.4 (1080P)	2.25	1.13	-0.23
DisplayPort	2.70	1.35	-0.26
HDMI 1.4 (4K / QuadHD)*	3.40	1.70	-0.30
USB3.0	5.00	2.50	-0.38
eSATA	6.00	3.00	-0.44
Thunderbolt	10.0	5.00	-0.69

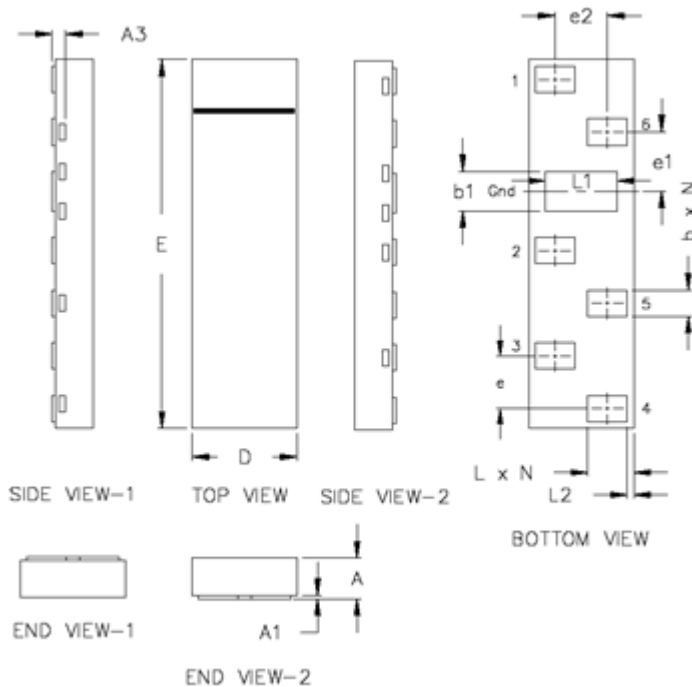
\*HDMI 4K / QuadHD resolutions (4096 x 2160) ready

## Multi-Channel Silicon ESD Protector Overvoltage Protection Device

**FIGURE 2. DEVICE IV CURVE**



## DEVICE DIMENSIONS



Dim	SESD1103Q6UG-0020-090			SESD1103Q6UG-0020-090		
	Millimeters			Inches		
Dim	Min	Nom	Max	Min	Nom	Max
A	0.33	0.38	0.43	0.013	0.015	0.017
A1	0	0.02	0.05	0	--	0.002
A3	0.127 ref.			0.005 ref.		
D	0.70	0.80	0.90	0.027	0.031	0.035
E	2.70	2.80	2.90	0.106	0.110	0.114
b	0.15	0.20	0.25	0.006	0.008	0.010
b1	0.25	0.30	0.35	0.010	0.012	0.014
L	0.30	0.35	0.40	0.012	0.014	0.016
L1	0.50	0.55	0.60	0.019	0.021	0.024
L2	0.05 BSC			0.002 BSC		
e	0.40 BSC			0.016 BSC		
e1	0.45 BSC			0.018 BSC		
e2	0.40 BSC			0.016 BSC		
N	6			6		

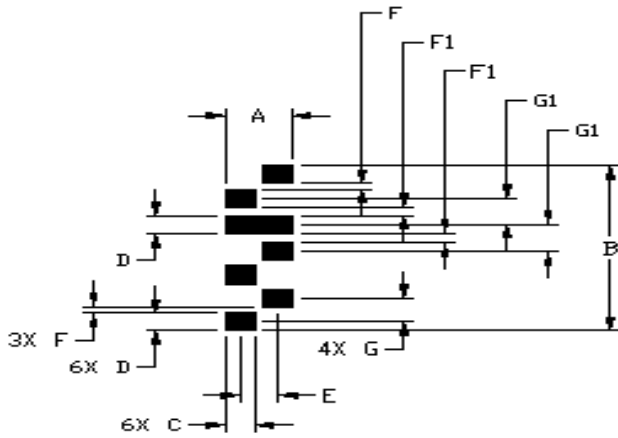
BSC – Basic Spacing between Centers

## Multi-Channel Silicon ESD Protector Overvoltage Protection Device

DOCUMENT: SCD28428  
REV LETTER: B  
REV DATE: MAY 15, 2013  
PAGE NO.: PAGE 4 OF 6

308 Constitution Drive  
Menlo Park, CA USA  
www.circuitprotection.com

### RECOMMENDED LANDING PATTERN:



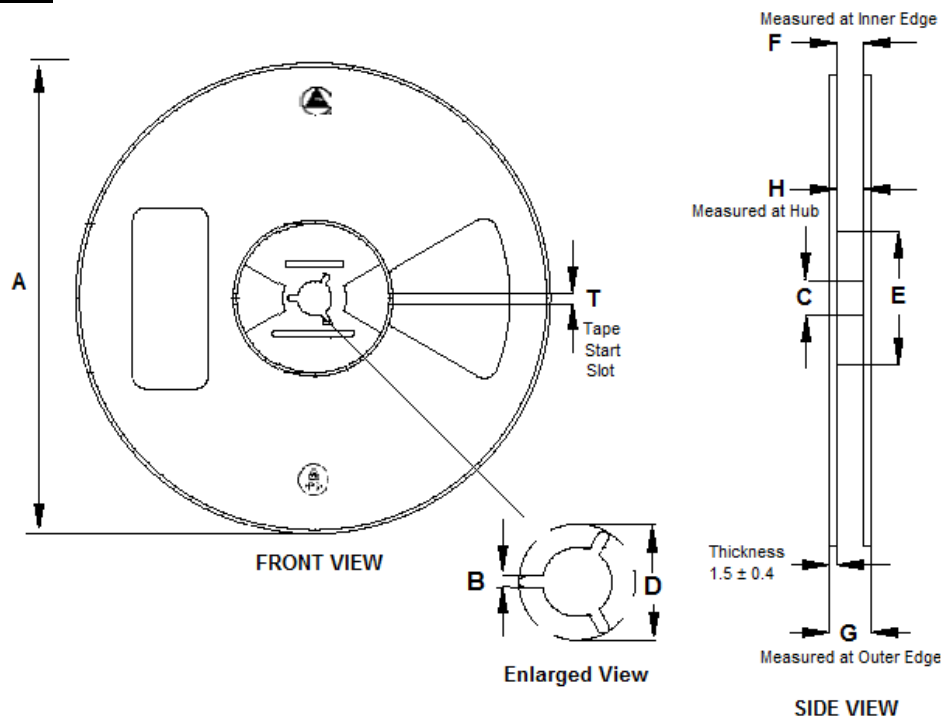
PAD LAYOUT

SESD Landing Pad Layout 7 Pin 6-ch Miniature FT Array		
Symbol	Millimeters	Inches
A	0.80	0.031
B	2.80	0.110
C	0.35	0.014
D	0.30	0.012
E	0.45	0.018
F	0.10	0.004
F1	0.15	0.006
G	0.40 BSC	0.016 BSC
G1	0.45 BSC	0.018 BSC

### PACKAGING

Packaging	Tape & Reel	Standard Box
SESD1103Q6UG-0020-090	5,000	25,000

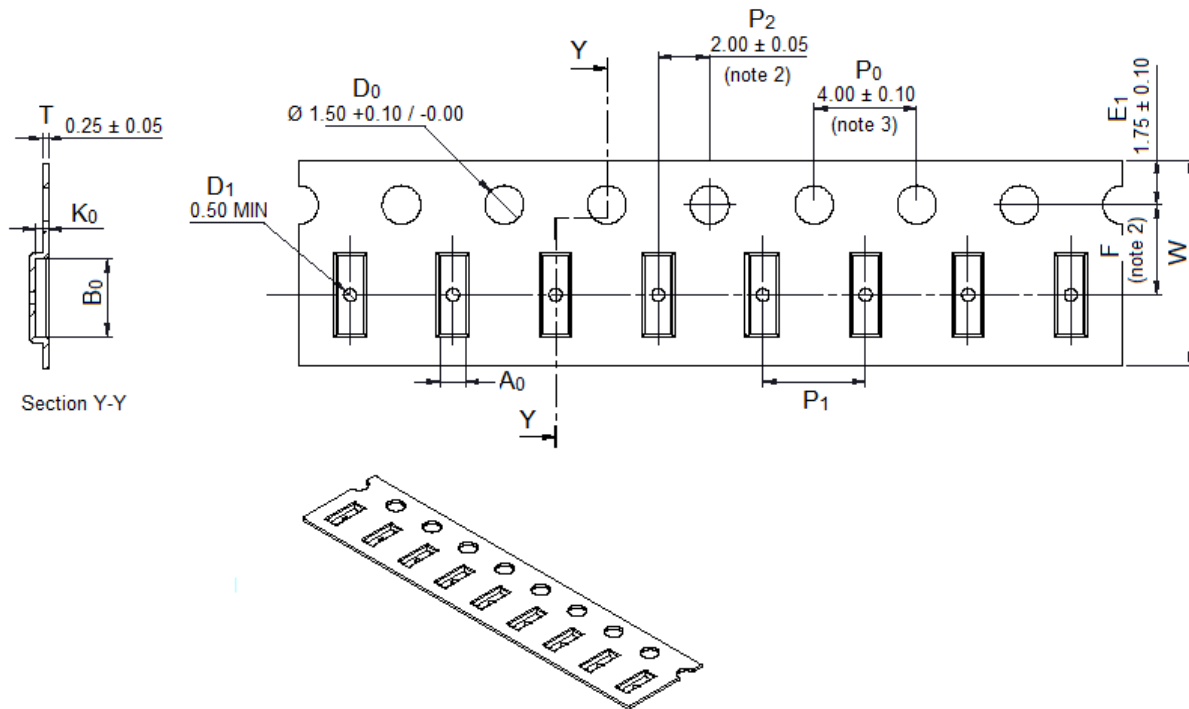
### REEL DIMENSIONS



Dimensions	A	B	C	D	E	F	G	H
(mm)	180 ± 2.00	1.50 (min)	13.10 ± 0.20	20.20 (min)	60 ± 1.00	8.75 ± 1.00	11.6 ± 1.00	9.4 (max)

**Multi-Channel  
Silicon ESD Protector  
Overvoltage Protection Device**

**CARRIER TAPE DIMENSIONS**



A <sub>0</sub>	1.00 ± 0.05
B <sub>0</sub>	3.00 ± 0.05
K <sub>0</sub>	0.51 ± 0.05
F	3.50 ± 0.05
P <sub>1</sub>	4.00 ± 0.10
W	8.00 + 0.30 / - 0.10

Note 1. All dimensions in mm

Note 2. Measured from centerline of pocket to centerline of sprocket

Note 3. Cumulative tolerance of 10 sprocket holes is ± 0.20

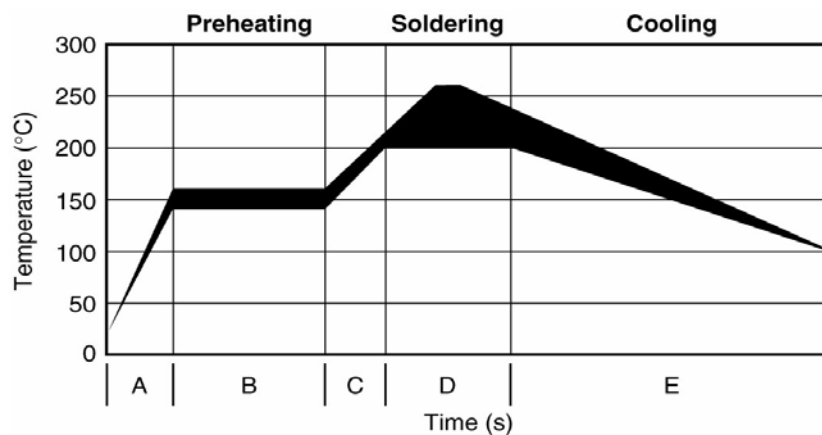
Note 4. Tolerances unless noted ± 0.20

## Multi-Channel Silicon ESD Protector Overvoltage Protection Device

### SOLDER REFLOW RECOMMENDATION

A	Temperature ramp up 1	From ambient to Preheating temperature	30s to 60s
B	Preheating	140°C - 160°C	60s to 120s
C	Temperature ramp up 2	From Preheating to Main heating temperature	20s to 40s
D	Main heating	at 200°C at 220°C at 240°C at 260°C	60s ~ 70s 50s ~ 60s 30s ~ 40s 5s ~ 10s
E	Cooling	From main heating temperature to 100°C	4°C/s (max)

**FIGURE 3. REFLOW PROFILE**



All information, including illustrations, is believed to be accurate and reliable. Users, however, should independently evaluate the suitability of and test each product selected for their application. Tyco Electronics Corporation and/or its Affiliates in the TE Connectivity Ltd. family of companies ("TE") makes no warranties as to the accuracy or completeness of the information, and disclaims any liability regarding its use. TE's only obligations are those in the TE Standard Terms and Conditions of Sale and in no case will TE be liable for any incidental, indirect, or consequential damages arising from the sale, resale, use, or misuse of its products. Specifications are subject to change without notice. In addition, TE reserves the right to make changes to materials or processing that do not affect compliance with any applicable specification without notification to Buyer. Without expressed written consent by an officer of TE, TE does not authorize the use of any of its products as components in nuclear facility applications, aerospace, or in critical life support devices or systems.

**TE Connectivity, TE Connectivity (logo), and TE (logo)** are trademarks.

Other logos, products and /or company names might be trademarks of their respective owners.