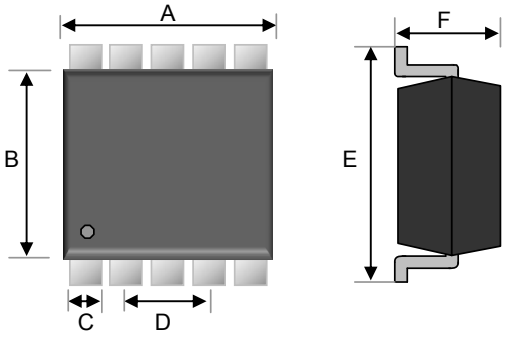
TAIWAN SEMICONDUCTOR

TESDO5V0A
Ultra Low Capacitance ESD Protection Array

Small Signal Diode

MSOP-10



Features

- ✧Meet IEC61000-4-2 (ESD) ±15kV (air), ±8kV (contact)
- ✧Meet IEC61000-4-4 (EFT) rating. 40A (5/50ήs)
- ✧Meet IEC61000-4-5 (Lightning) rating. 5A (8/20μs)
- ✧Protects four high speed I/O lines
- ✧Low working Voltage : 5V
- ✧Pb free version, RoHS compliant, and Halogen free

Mechanical Data

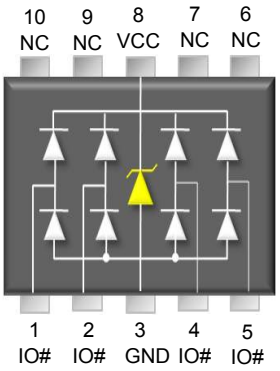
- ✧Case : MSOP-10 small outline plastic package
- ✧Terminal: Matte tin plated, lead free, solderable per MIL-STD-202, Method 208 guaranteed
- ✧High temperature soldering guaranteed: 260°C/10s
- ✧Polarity : Indicated by cathode band
- ✧Weight : 12mg (Appro.)
- ✧Marking Code : R0544

Dimensions	Unit (mm)		Unit (inch)	
	Min	Max	Min	Max
A	2.90	3.10	0.114	0.122
B	2.90	3.10	0.114	0.122
C	0.17	0.27	0.007	0.011
D	0.50_{REF}		0.020_{REF}	
E	4.9_{REF}		0.193_{REF}	
F	-	1.11	-	0.044

Ordering Information

Part No.	Package	Packing	Packing Code	Marking
TESDO5V0A	MSOP-10	3K / 7" Reel	ROG	R0544

Pin Configuration



Maximum Ratings and Electrical Characteristics

Rating at 25°C ambient temperature unless otherwise specified.

Maximum Ratings

Type Number	Symbol	Value	Units
Peak Pulse Power (tp=8/20μs waveform)	P_{PP}	125	W
Peak Pulse Current (tp = 8/20μs)	I_{PP}	5	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V_{ESD}	±15 ± 8	KV
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to + 150	°C

Electrical Characteristics

Type Number		Symbol	Min	Max	Units
Reverse Stand-Off Voltage		V_{RWM}	-	5	V
Reverse Breakdown Volta	I_R= 1mA	$V_{(BR)}$	6	-	V
Reverse Leakage Current	V_R= 5V	I_R	-	1	uA
Clamping Voltage	I_{PP}= 1A	Vc	-	15	V
	I_{PP}= 5A		-	20	
Junction Capacitance	V_R=0V, f=1.0MHz	C_J	1(Typ.)		pF

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Rating and Characteristic Curves

FIG 1 Non-Repetitive Peak Pulse Power vs. Pulse Time

FIG 2 Pulse Waveform

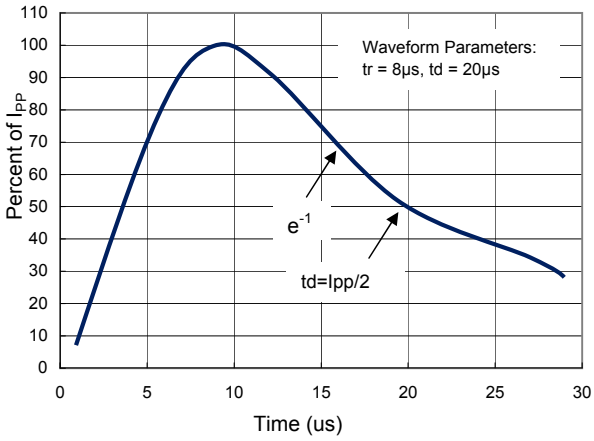


FIG 3 Admissible Power Dissipation Curve

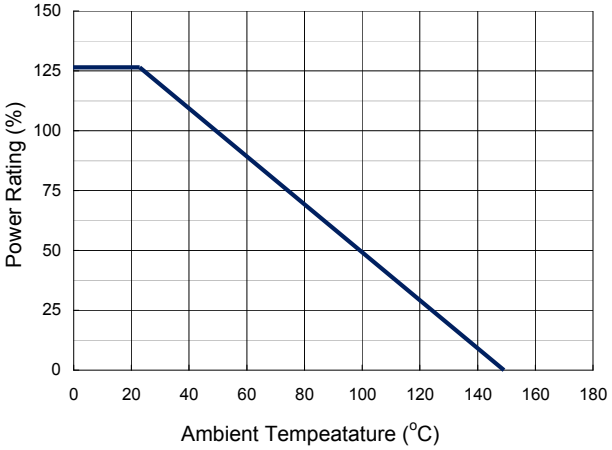


FIG 4 Typical Junction Capacitance

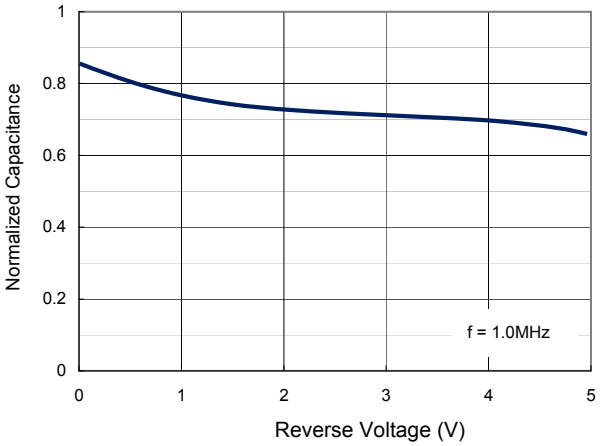
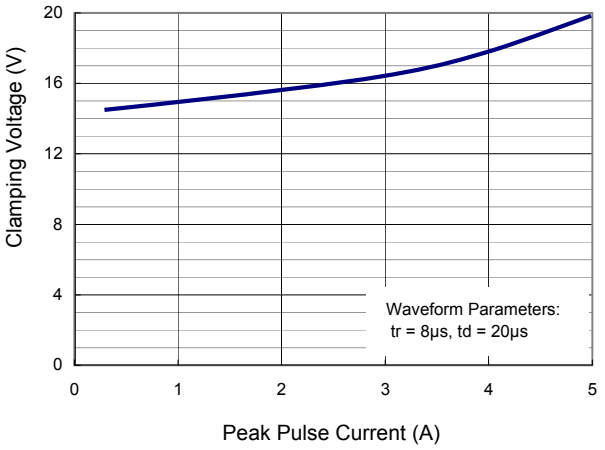


FIG 5 Clamping Voltage vs. Peak Pulse Current



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Applications Information

✧Designed for protection of high-speed interfaces such as HDMI

✧Ultra low capacitance between the pairs while being rated to handle >±8kV ESD contact discharges and >±15kV air discharge

✧Each device is in a leadless package that is less than 1.1mm wide

✧Designed such that the traces flow straight through the device, The narrow package and flow-through design reduces discontinuities and minimizes impact on signal integrity

✧TESDO5V0A is ultra low capacitance ESD protection array designed to protect high speed data interfaces

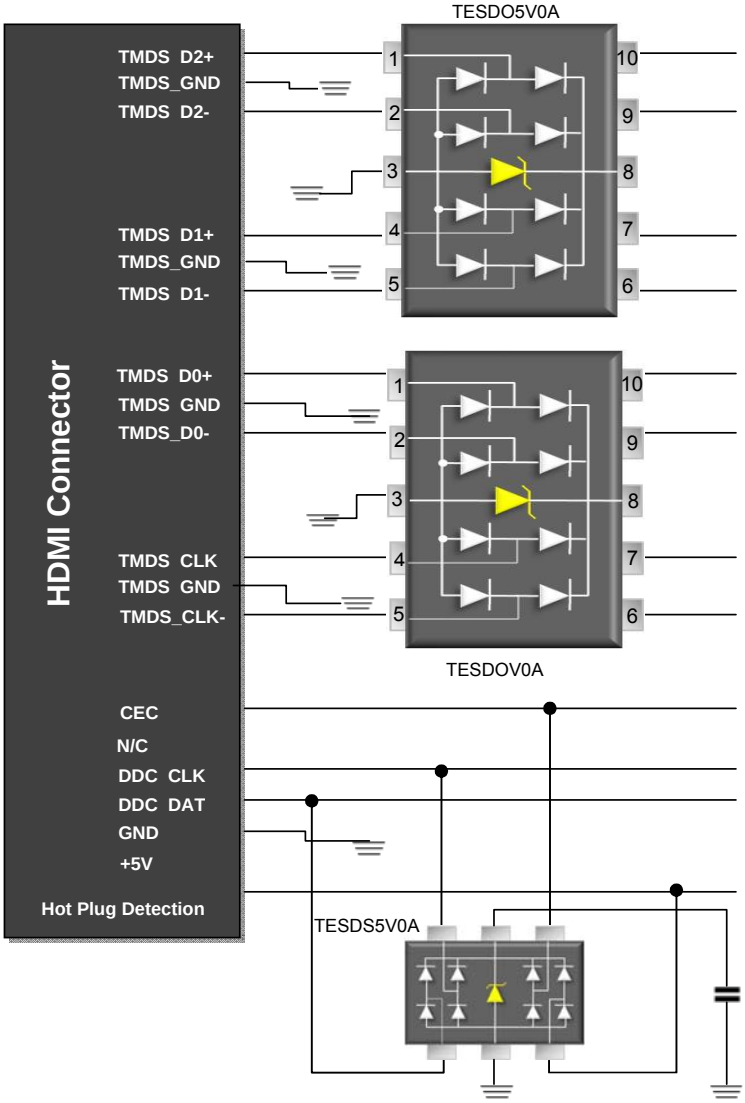
✧The combination of small size, low capacitance, and high level of ESD protection makes them a flexible solution for applications of high speed interface, ex HDMI, DisplayPortTM, MDDI, and eSATA interfaces.

Circuit Board Layout Recommendations for HDMI application

✧The PCB traces are used to connect the pin pairs for each line (pin 1 to pin 10, pin 2 to pin 9, pin 4 to pin 7, pin 5 to pin 6)

✧Signal line enters at pin 1 and exits at Pin 10 and the PCB trace connects pin 1 and 10 together. Ground is connected at pins 3 and 8.

✧One large ground pad should be used in lieu of two separate pads



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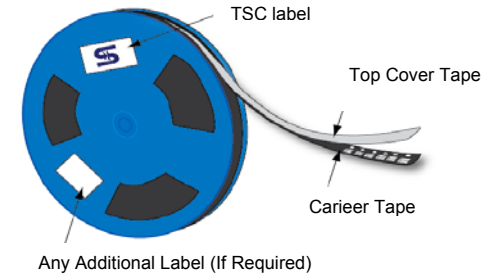
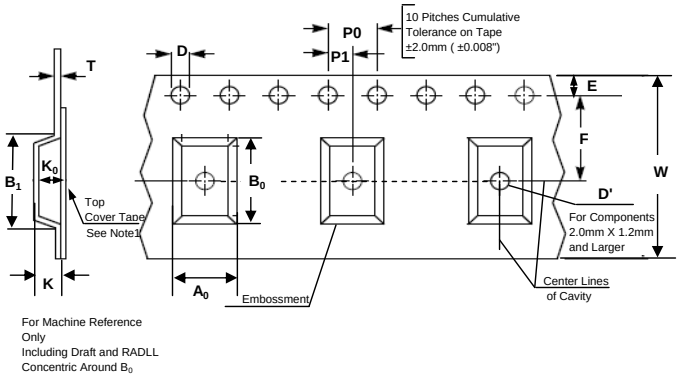
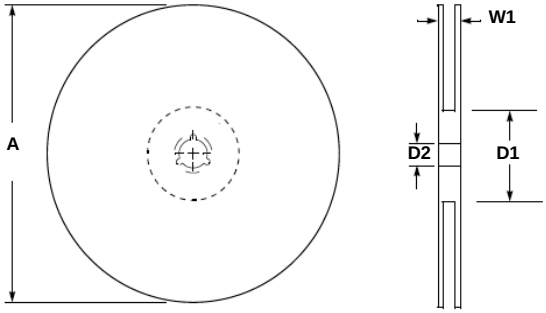
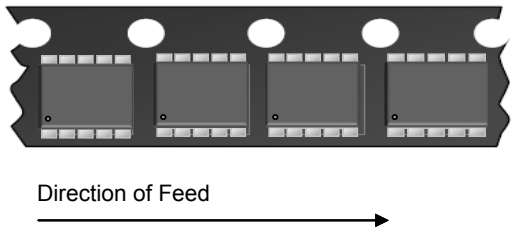
Tape & Reel specification



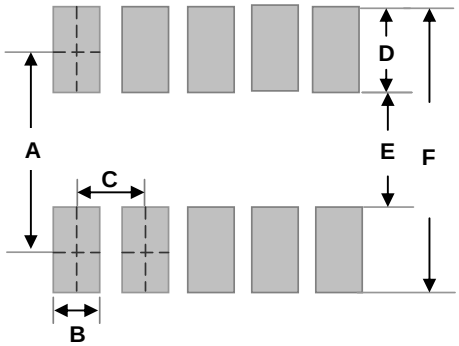


Item	Symbol	Dimension (mm)
Carrier depth	K	1.22 Max.
Sprocket hole	D	1.50 +0.10
Reel outside diameter	A	180 ± 1
Reel inner diameter	D1	50 Min.
Feed hole width	D2	13.0 ± 0.5
Sprocke hole position	E	1.75 ±0.10
Sprocke hole pitch	P0	4.00 ±0.10
Embossment center	P1	2.00 ±0.10
Overall tape thickness	T	0.6 Max.
Tape width	W	8.30 Max.
Reel width	W1	14.4 Max.





Suggested PAD Layout



Dimensions	Unit (inch)	Unit (mm)
A	0.161	4.10
B	0.012	0.30
C	0.020	0.50
D	0.063	1.60
E	0.098	2.50
F	0.224	5.70

Note 1: A_0, B_0, and K_0 are determined by component size. The clearance between the components and the cavity must be within 0.05 mm min. to 0.5 mm max. The component cannot rote more than 10^o within the determined cavity.

Note 2: If B_1 exceeds 4.2 mm(0.165") for 8 mm embossed tape, the tape may not feed through all tape feeders.

Note 3: The suggested land pattern dimensions have been provided for reference only, as actual pad layouts may vary despending on application.