

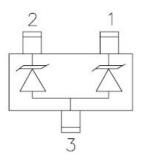




# eGuard0502B Ultra Low Capacitance TVS Diode Array



#### **Circuit Diagram**



### **Description**

The eGuard0502B is ultra low capacitance TVS arrays designed to protect high speed data interfaces. This series has been specifically designed to protect sensitive components which are connected to high-speed data and transmission lines from over voltage caused by ESD (electrostatic discharge), CDE (Cable Discharge Events), and EFT (electrical fast transients).

The eGuard0502B has a typical capacitance of only 0.50pF (pin 1 to 2). This means it can be used on circuits operating in excess of 3GHz without signal attenuation. They may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 (±15kV air, ±8kV contact discharge). Each device can be configured to protect 1 bidirectional line or two unidirectional lines.

These devices are in a small SOT-523 package. They are designed for use in applications where board space is at a premium.

### **Applications**

- High Definition Multi-Media Interface (HDMI)
- Mobile Display Digital Interface (MDDI)
- RF/Antenna Circuits
- USB 2.0 & Firewire Ports
- GaAs Photodetector Protection
- HBT Power Amp Protection
- Infiniband Transceiver Protection

### **Mechanical Characteristics**

- SOT-523 package
- RoHS/WEEE Compliant
- Molding compound flammability rating: UL 94V-0
- Packaging: Tape and Reel per EIA 481

#### **Features**

- Transient protection for high-speed data lines to IEC 61000-4-2 (ESD) ±15kV (air), ±8kV (contact)
   IEC 61000-4-4 (EFT) 40A (5/50ns)
- Designed to replace polymer TVS
- Protects up to two I/O lines
- Ultra-Low capacitance (<1pF)</li>
- No insertion loss to >3.0GHz
- Low profile (<1mm)</li>
- Low leakage current and clamping voltage
- Low operating voltage: 5.0V







## **Maximum Ratings**

Characteristics	Symbol	Max.	Units
Peak Pulse Power (tp=8/20us)	P <sub>PK</sub>	125	Watts
Peak Pulse Current (tp=8/20us)	I <sub>PP</sub>	5	А
ESD per IEC61000-4-2 (air) ESD per IEC61000-4-2 (contact)	V <sub>ESD</sub>	15 8	KV
Operating Temperature	TJ	-55 to +125	$^{\circ}$
Storage Temperature	T <sub>STG</sub>	-55 to +150	$^{\circ}$

# **Electrical Characteristics(T=25°C unless otherwise specified)**

Characteristics	Symbol	Condition	Min.	Тур.	Max.	Units
Reverse Stand-Off Voltage	V <sub>RWM</sub>	Pin 1 or Pin 2 to Pin 3 and Between Pins 1 and 2	-	-	5	V
Reverse Breakdown Voltage	$V_{BR}$	@ I <sub>t</sub> =1mA Pin 1 or Pin 2 to Pin 3 and Between Pins 1 and 2	6	-	-	V
Reverse Leakage Current	I <sub>R</sub>	@V <sub>RWM</sub> = 5V, T = 25 ℃ Pin 1 or Pin 2 to Pin 3 and Between Pins 1 and 2	-	-	1	μА
Clamping Voltage	Vc	@I <sub>PP</sub> = 1A, tp=8/20μs Pin 1 and Pin 2	-	-	15	V
Clamping Voltage	Vc	@I <sub>PP</sub> = 5A, tp=8/20µs Pin 1 or Pin 2 to Pin 3	-	-	22	V
Clamping Voltage	Vc	@I <sub>PP</sub> = 5A, tp=8/20μs Pin 1 to Pin 2	-	-	25	V
Junction Capacitance	C <sub>j</sub>	@V <sub>R</sub> = 0V, f <sub>SIG</sub> = 1MHz Pin 1 to Pin 2	-	0.6	0.9	pF
Junction Capacitance	Cj	@V <sub>R</sub> = 0V, f <sub>SIG</sub> = 1MHz Pin 1 or Pin 2 to Pin 3	- <u>-</u>	-	1.2	pF

<sup>•</sup> China - Germany - Korea - Singapore - United States •

<sup>•</sup> http://www.smc-diodes.com - sales@ smc-diodes.com •

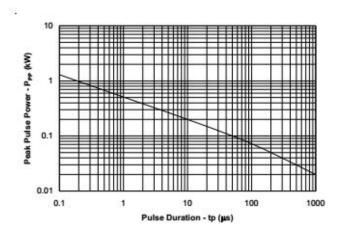




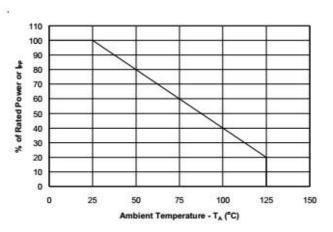


### **Ratings and Characteristics Curves**

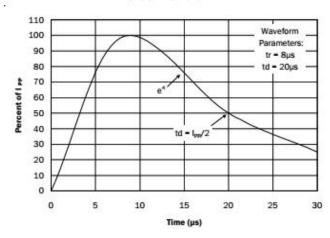
#### Non-Repetitive Peak Pulse Power vs. Pulse Time



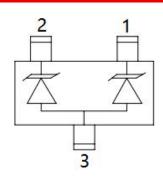
#### **Power Derating Curve**



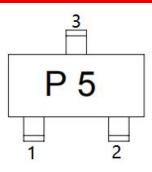
#### **Pulse Waveform**



# **Pin Configuration**



# **Marking Diagram**



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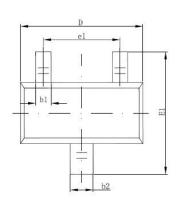


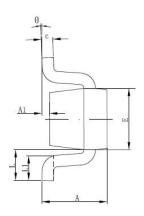
# Ordering Information

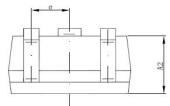
Device	Package	Shipping
eGuard0502B	SOT-523	3000 pcs/reel

For information on tape and reel specifications, including part orientation and tape sizes, please refer to our tape and reel packaging specification.

## **Mechanical Dimensions SOT-523**

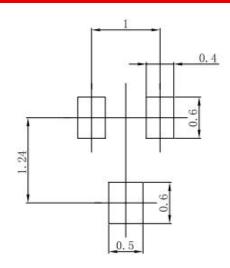






SYMBOL	Millimeters		Inc	hes
	MIN.	MAX.	MIN.	MAX.
Α	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
С	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
Е	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
е	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.400 REF.		0.016 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

# **Soldering Pad Layout (Millimeters )**



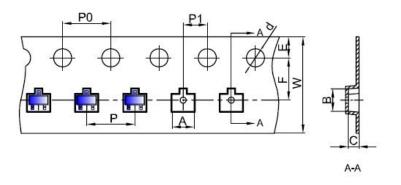
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#### Carrier Tape Specification SOT-523



SYMBOL	Millimeters		
	Min.	Max.	
Α	1.80	1.90	
В	1.80	1.90	
С	0.825	0.925	
d	1.40	1.60	
E	1.65	1.85	
F	3.40	3.60	
Р	3.90	4.10	
P0	3.90	4.10	
P1	1.90	2.10	
W	7.90	8.30	

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