

eGuard0502A Ultra Low Capacitance TVS Diode Array



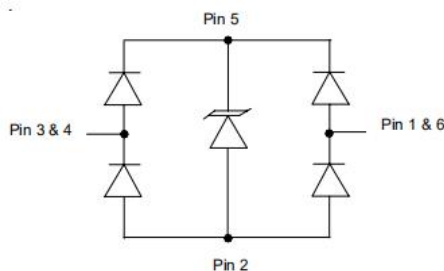
Description

The eGuard0502A consists of 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 overvoltage caused by ESD (electrostatic discharge), CDE (Cable Discharge Events), and EFT (electrical fast transients). They are designed for use in applications where board less than 2.9mm² of space is at a premium. Each device requires less than of PCB area and will protect two high speed data lines.

The monolithic design incorporates surge rated, low capacitance steering diodes and a TVS diode in a single package. Each line has a typical capacitance of 0.9pF to ground and 0.3pF between lines. The capacitance of each line is well matched for constant signal balance. Signal integrity is further preserved with the flow through design. A connection to the TVS is provided for protection of external voltage busses, such as those found in USB applications. This device is optimized for ESD protection of portable electronics. They may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 (±15kV air, ±8kV contact discharge).

The eGuard0502A is in a 6-pin, RoHS/WEEE compliant, SOT-563 package. It measures 1.6 x 1.2 x 0.55mm. The leads are finished with lead-free matte tin. The small package makes it ideal for use in portable electronics such as cell phones, laptops, and digital still cameras.

Circuit Diagram



Applications

- USB 2.0 High Speed
- 10/100/1000 Ethernet Ports
- High-Definition Multimedia Interface (HDMI)
- Digital Visual Interface (DVI)
- Monitors and Flat Panel Displays
- Video Graphics Cards
- IEEE 1394 Firewire Ports High Speed

Mechanical Characteristics

- SOT-563 package
- RoHS/WEEE Compliant
- Lead Finish: matte tin
- Molding compound flammability rating: UL 94V-0
- Marking: 5A

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)
- Flow through design for ease of layout for high speed data line application
- Protects up to two I/O lines & power line
- Low capacitance (<0.9pF) for high-speed interfaces
- Ultra-small package requires less than 2.9mm² of PCB area
- Low leakage current and clamping voltage
- Low operating voltage: 5.0V
- Solid-state silicon-avalanche technology

Maximum Ratings

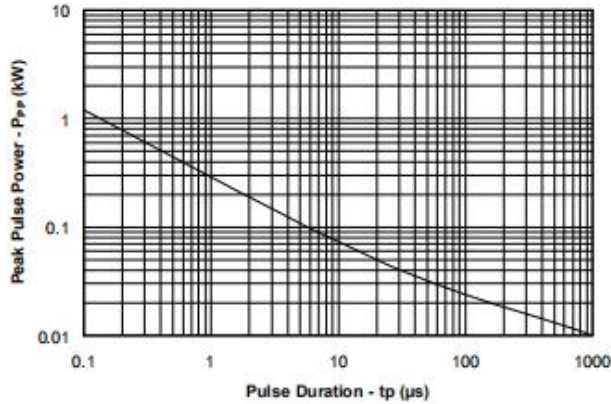
Characteristics	Symbol	Max.	Units
Peak Pulse Power (tp=8/20us)	P _{PK}	50	Watts
Peak Pulse Current (tp=8/20us)	I _{PP}	3	A
ESD per IEC61000-4-2 (air)	V _{ESD}	20	KV
ESD per IEC61000-4-2 (contact)		15	
Operating Temperature	T _J	-55 to +125	°C
Storage Temperature	T _{STG}	-55 to +150	°C

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

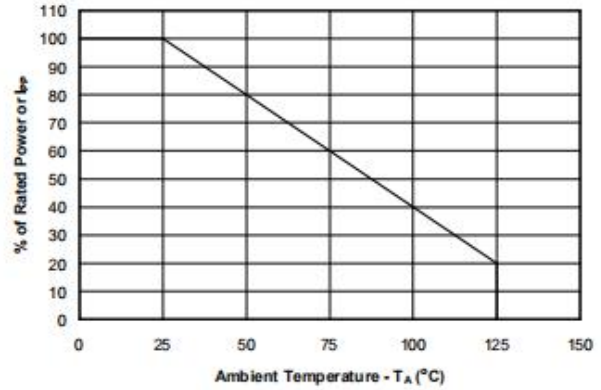
Characteristics	Symbol	Condition	Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	VRWM	Between I/O lines to Gnd or I/O to I/O	-	-	5	V
Reverse Breakdown Voltage	V _{BR}	@ I _t =1mA Between I/O lines to Gnd	6	-	-	V
Reverse Leakage Current	I _R	@V _{RWM} = 5V, T = 25 °C Between I/O lines to Gnd or I/O to I/O	-	-	1	µA
Clamping Voltage	V _C	@I _{PP} = 1A, tp=8/20µs Between I/O lines to Gnd	-	-	14	V
Clamping Voltage	V _C	@I _{PP} = 3A, tp=8/20µs Between I/O lines to Gnd	-	-	16	V
Clamping Voltage	V _C	@I _{PP} = 3A, tp=8/20µs Between I/O to I/O	-	-	18	V
Junction Capacitance	C _j	@V _R = 0V, f _{SIG} = 1MHz Between I/O lines to Gnd	-	-	0.9	pF
Junction Capacitance	C _j	@V _R = 0V, f _{SIG} = 1MHz Between I/O to I/O	-	0.3	0.7	pF

Ratings and Characteristics Curves

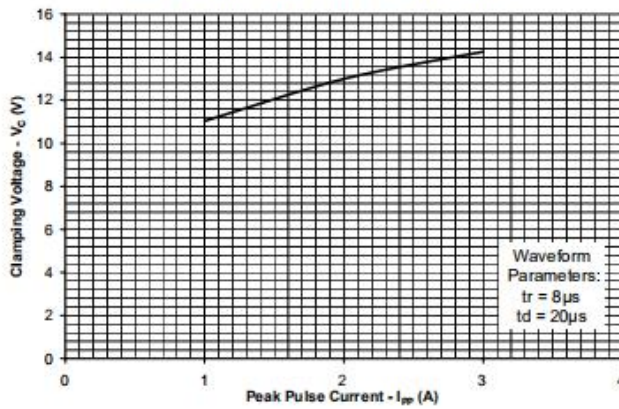
Non-Repetitive Peak Pulse Power vs. Pulse Time



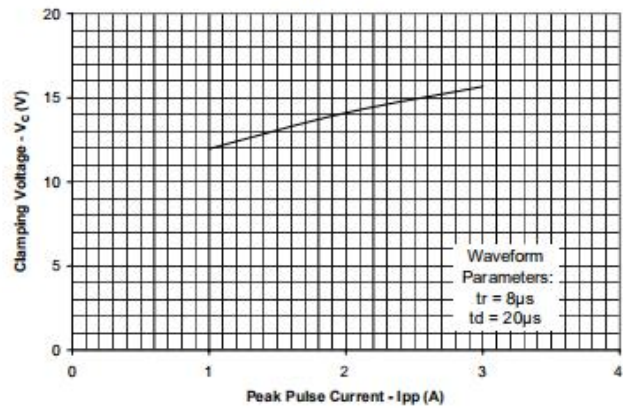
Power Derating Curve



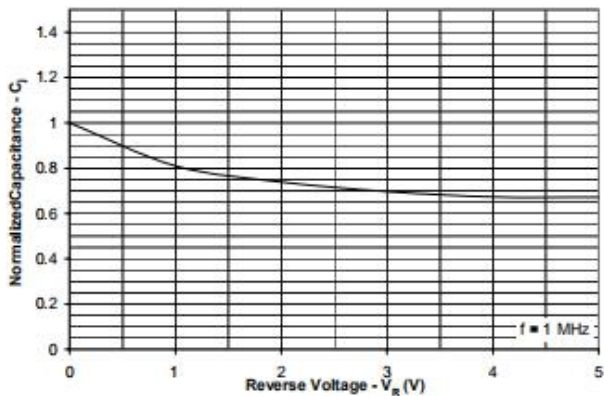
**Clamping Voltage vs. Peak Pulse Current
I/O to Gnd - Pin 1, 3, 4, 6 to Pin 2**



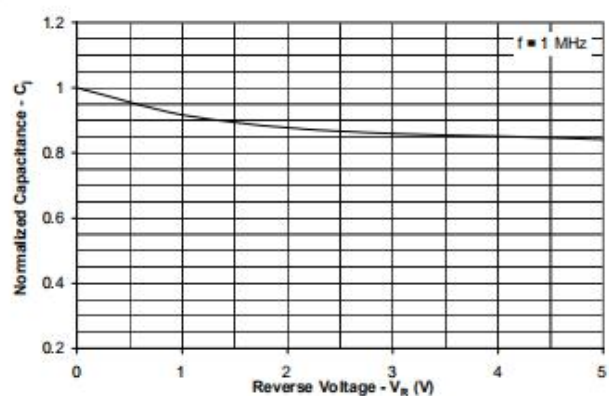
**Clamping Voltage vs. Peak Pulse Current
I/O to I/O**



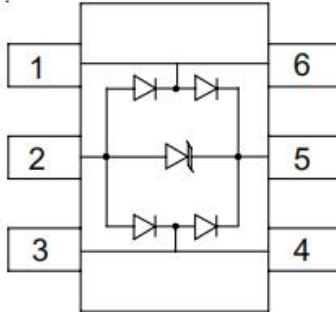
**Normalized Capacitance vs. Reverse Voltage
I/O to Gnd - Pin 1, 3, 4, or 6 to Pin 2**



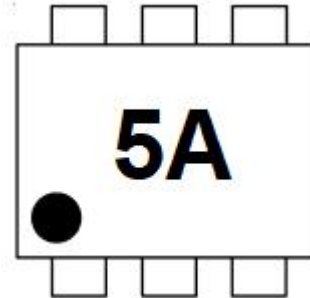
**Normalized Capacitance vs. Reverse Voltage
I/O to I/O**



Pin Configuration



Marking Diagram

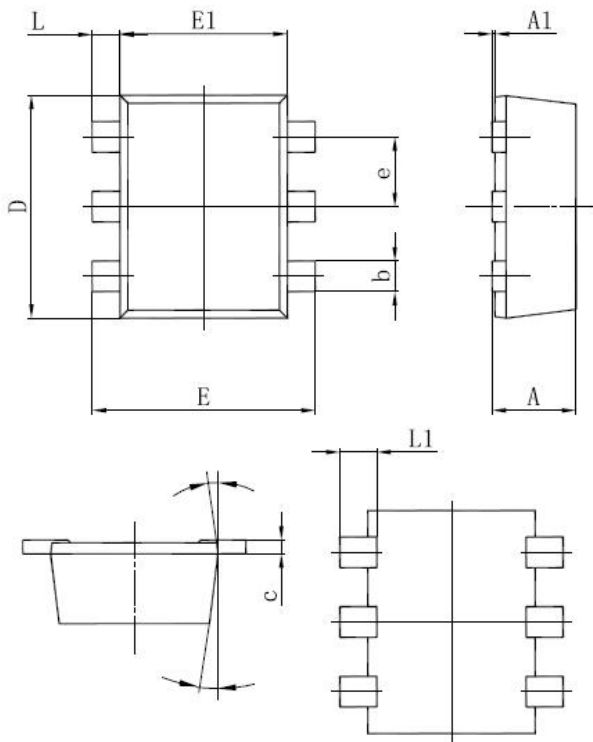


Ordering Information

Device	Package	Shipping
eGuard0502A	SOT-563	3000 pcs/reel

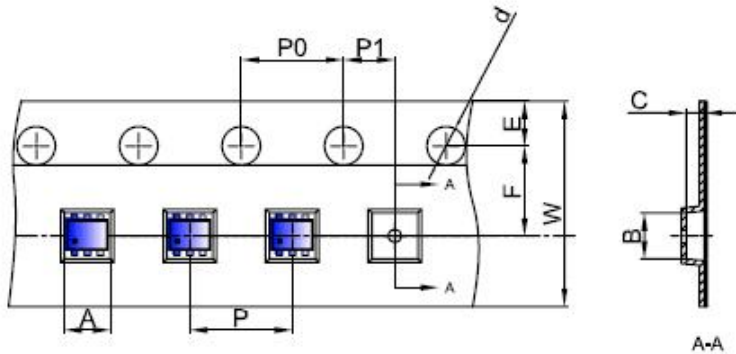
For information on tape and reel specifications, including part orientation and tape sizes, please refer to our tape and reel packaging specification.

Mechanical Dimensions SOT-563



SYMBOL	Millimeters		Inches	
	MIN.	MAX.	MIN.	MAX.
A	0.525	0.600	0.021	0.024
A1	0.000	0.050	0.000	0.002
e	0.450	0.550	0.018	0.022
c	0.090	0.160	0.004	0.006
D	1.500	1.700	0.059	0.067
b	0.170	0.270	0.007	0.011
E1	1.100	1.300	0.043	0.051
E	1.500	1.700	0.059	0.067
L	0.100	0.300	0.004	0.012
L1	0.200	0.400	0.008	0.016
θ	7° REF.		7° REF.	

Carrier Tape Specification SOT-563



SYMBOL	Millimeters	
	Min.	Max.
A	1.68	1.88
B	1.68	1.88
C	0.59	0.79
d	1.40	1.60
E	1.65	1.85
F	3.40	3.60
P	3.90	4.10
P0	3.90	4.10
P1	1.90	2.10
W	7.90	8.10

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