

Description- eGuard™

The eGuard0522P* is an ultra low capacitance TVS (Transient Voltage Suppressor) array designed to protect sensitive semiconductor components from electrical overstress when interfaced to high-speed data lines. The ultra low capacitance (0.35pF typical I/O to I/O) of the eGuard0522P ensures negligible signal attenuation at data rates up to 3.5GHz. The solid-state construction ensures fast clamping of electrical overstress transients resulting from ESD (electrostatic discharge), EFT (Electrical Fast Transients) or CDE (Cable Discharge Events).

In addition to ultra low capacitance, the eGuard0522P provides superior surge current capability and excellent voltage clamping performance. The surge current capability (8x20 μ s) is rated at 7A; approximately 33% higher than industry norms. Furthermore, the tight clamping ratio (V_C/V_{RWM}) of 1.9 (typical at 1A) ensures harmful transients are clamped quickly and close to the normal working voltage of the circuit. The super tight clamping ratio is 30% better than industry norms and ensures superior protection of sensitive integrated circuits.

The eGuard0522P is designed to protect up to two data lines. It is packaged in a RoHS/WEEE compliant, 6 pin DFN that has a very low package profile of 0.55mm (nominal). The combination of ultra low capacitance, high surge capability, tight clamping ratio and low package profile make the eGuard0522P the ideal choice for today's ESD sensitive, space constrained applications.

Features

- ESD protection in accordance with:
IEC 61000-4-2 (ESD) ± 17 kV (air), ± 12 kV (contact)
IEC 61000-4-5 (lightning) 7A (8/20 μ s)
IEC 61000-4-4 (EFT) 40A (5/50ns)
- Tight clamping ratio, V_C/V_{RWM} , ensures superior protection
- High reverse surge current, I_{PP} , capability
- Low idle current minimizes standby power consumption
- Low profile DFN package
- Package design optimized for high speed lines
- Flow-Through design
- Protects two I/O lines
- Low capacitance: 0.35pF typical (I/O to I/O)
- Low operating voltage: 5V
- Solid-state silicon-avalanche technology

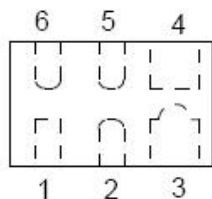
Mechanical Characteristics

- DFNWB1.6x1-6L 6-pin package(1.6x1.0x0.5mm)
- Pb-Free, Halogen Free, RoHS/WEEE Compliant
- Lead Pitch: 0.5mm
- Lead finish: NiPdAu
- Marking: Marking Code
- Packaging: Tape and Reel

Applications

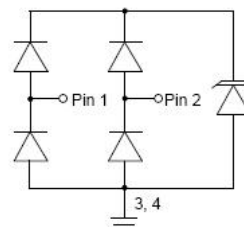
- High Definition Multi-Media Interface (HDMI)
- Digital Visual Interface (DVI)
- DisplayPort™ Interface
- MDDI(Mobile Display Digital Interface)Ports
- PCI(Peripheral Component Interconnect) Express
- eSATA(External Serial Advanced Technology Attachment)Interfaces

Pin Configuration



Pin	Identification
1, 2	Input Lines
5, 6	Output Lines (No Internal Connection)
3, 4	Ground

Circuit Diagram



* The eGuard logo is a trademark of SMC Diode Solutions - Sangdest Microelectronics (Nanjing) Co.

Ordering Information:

Device	Package	Shipping
eGuard0522P	DFNWB1.6×1-6L (Pb-Free)	3000pcs / reel

For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification.

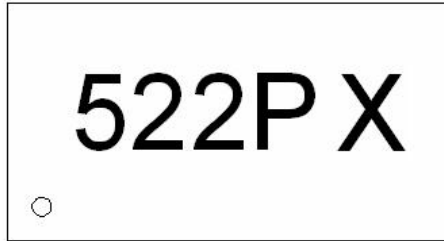
Maximum Ratings @ $T_A=25^{\circ}\text{C}$ unless otherwise specified

Parameter	Symbol	Value	Unit
Peak Pulse Current (tp=8/20μs)	I _{PP}	7	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V _{ESD}	±17 ±12	kV
Operating Junction Temperature Range	T _J	-55 to + 150	°C
Storage Temperature Range	T _{STG}	-55 to + 150	°C

Electrical Characteristics:

Characteristics	Symbol	Condition	Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	V _{RWM}	Any I/O pin to ground	-	-	5	V
Reverse Breakdown Voltage	V _{BR}	@ I _t =1mA Any I/O pin to ground	6	-	-	V
Forward Voltage Drop	V _F	@ I _F =1mA, T = 25 °C	-	-	0.9	V
Reverse Leakage Current	I _R	@V _{RWM} = 5V, T = 25 °C Any I/O pin to ground	-	0.5	1	μA
Clamping Voltage	V _C	@I _{PP} = 1A, tp=8/20μs Any I/O pin to ground	-	9.5	10.5	V
Clamping Voltage	V _C	@I _{PP} = 7A, tp=8/20μs Any I/O pin to ground	-	-	17	V
Junction Capacitance	C _j	@V _R = 0V, f _{SIG} = 1MHz Between I/O pins	-	0.35	0.4	pF
Junction Capacitance	C _j	@V _R = 0V, f _{SIG} = 1MHz Any I/O pin to ground	-	0.65	0.8	pF

Marking Diagram:

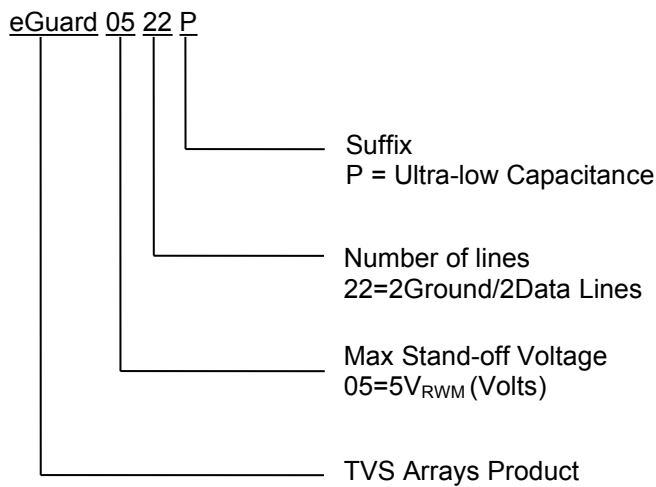


Where 522P is eGuard0522P

522P = Part name
X = Marking code for data code

Cautions: Molding resin
Epoxy resin UL:94V-0

Part Name Information



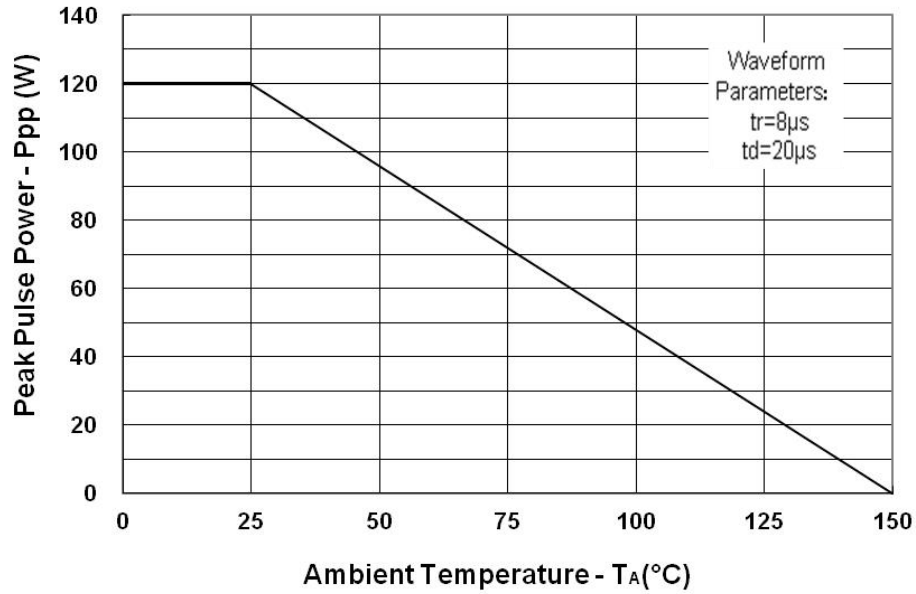


Fig.1 Power Derating Curve

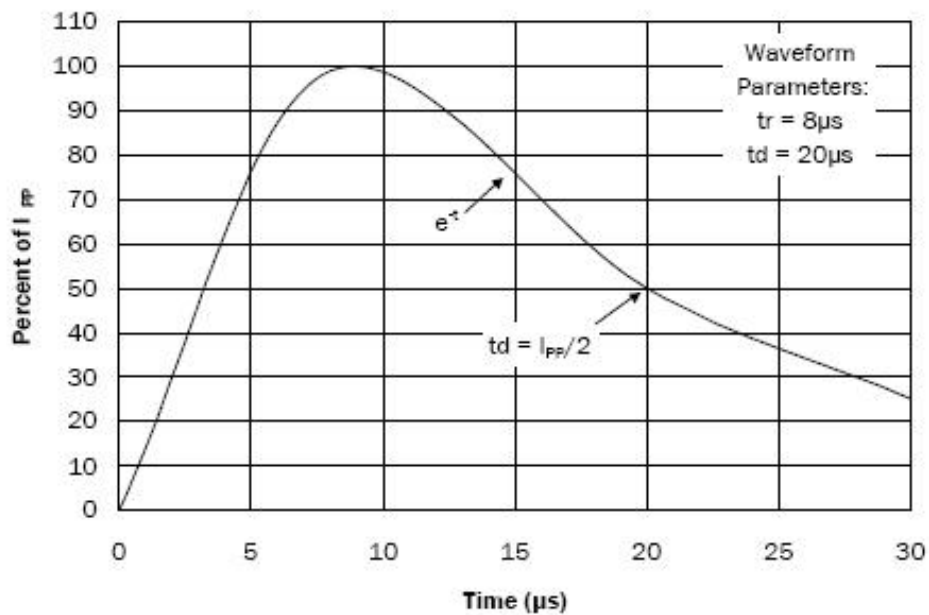


Fig.2 Pulse Waveform

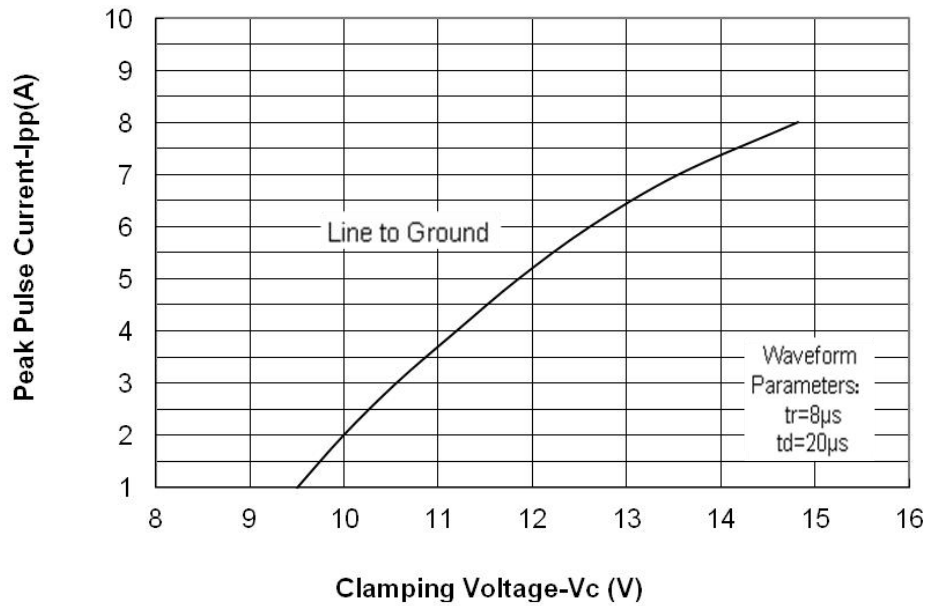


Fig.3 Clamping Voltage vs. Peak Pulse Current

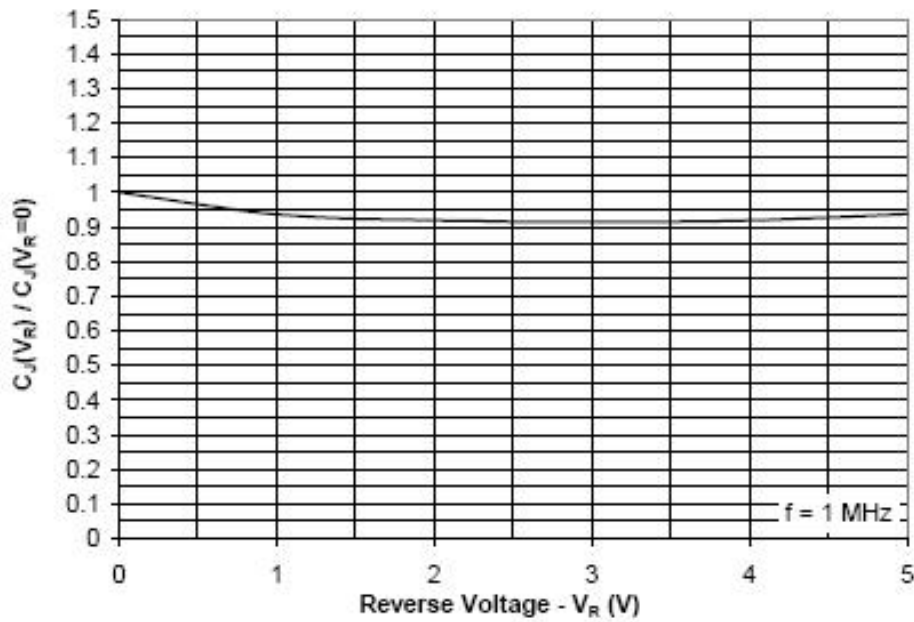


Fig. 4 Normalized Capacitance vs. Reverse Voltage

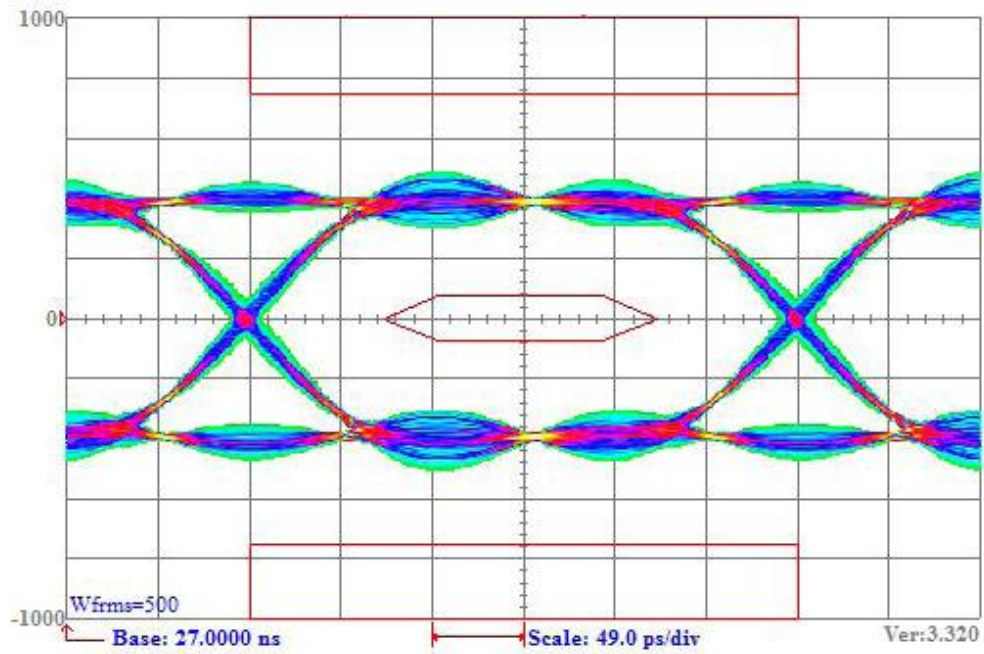


Fig. 5 HDMI 1.4 Eye Diagram

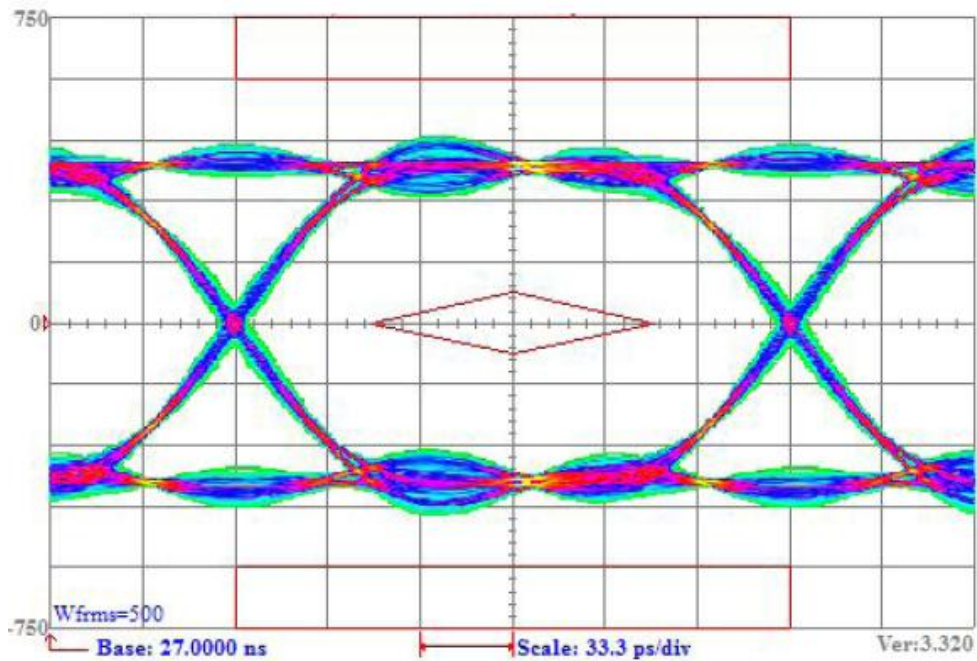
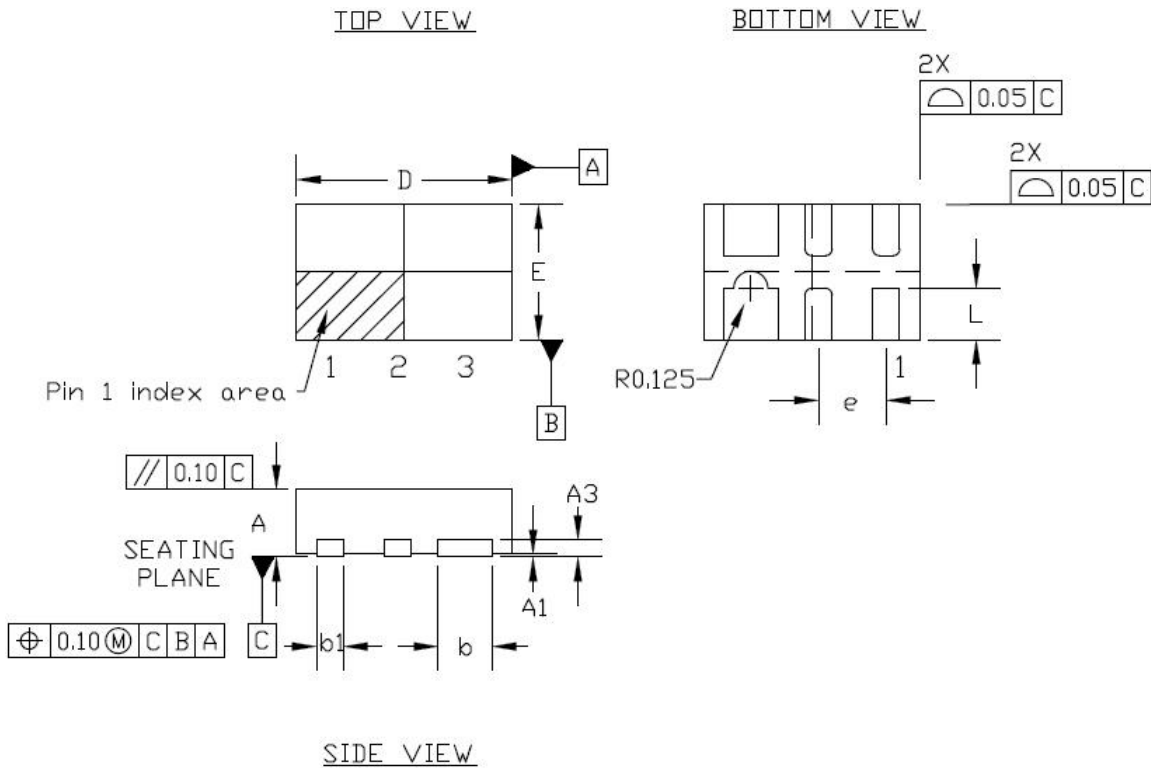


Fig. 6 USB3.0 Eye Diagram

Mechanical Dimensions:



SYMBOL	COMMON					
	DIMENSIONS MILLIMETER			DIMENSIONS INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.45	0.50	0.55	0.018	0.020	0.022
A1	0.00	0.02	0.05	0.000	0.001	0.002
A3	0.125 REF			0.005 REF		
b	0.35	0.40	0.45	0.014	0.016	0.018
b1	0.15	0.20	0.25	0.006	0.008	0.010
D	1.55	1.60	1.65	0.062	0.063	0.065
D2	-	-	-	-	-	-
E	0.95	1.00	1.05	0.038	0.040	0.042
E2	-	-	-	-	-	-
e	0.50 REF			0.020 REF		
L	0.33	0.38	0.43	0.013	0.015	0.017

DFNWB1.6×1- 6L

DISCLAIMER:

- 1- The information given herein, including the specifications and dimensions, is subject to change without prior notice to improve product characteristics. Before ordering, purchasers are advised to contact the SMC - Sangdest Microelectronics (Nanjing) Co., Ltd sales department for the latest version of the datasheet(s).
- 2- In cases where extremely high reliability is required (such as use in nuclear power control, aerospace and aviation, traffic equipment, medical equipment, and safety equipment), safety should be ensured by using semiconductor devices that feature assured safety or by means of users' fail-safe precautions or other arrangement.
- 3- In no event shall SMC - Sangdest Microelectronics (Nanjing) Co., Ltd be liable for any damages that may result from an accident or any other cause during operation of the user's units according to the datasheet(s). SMC - Sangdest Microelectronics (Nanjing) Co., Ltd assumes no responsibility for any intellectual property claims or any other problems that may result from applications of information, products or circuits described in the datasheets.
- 4- In no event shall SMC - Sangdest Microelectronics (Nanjing) Co., Ltd be liable for any failure in a semiconductor device or any secondary damage resulting from use at a value exceeding the absolute maximum rating.
- 5- No license is granted by the datasheet(s) under any patents or other rights of any third party or SMC - Sangdest Microelectronics (Nanjing) Co., Ltd.
- 6- The datasheet(s) may not be reproduced or duplicated, in any form, in whole or part, without the expressed written permission of SMC - Sangdest Microelectronics (Nanjing) Co., Ltd.
- 7- The products (technologies) described in the datasheet(s) are not to be provided to any party whose purpose in their application will hinder maintenance of international peace and safety nor are they to be applied to that purpose by their direct purchasers or any third party. When exporting these products (technologies), the necessary procedures are to be taken in accordance with related laws and regulations..