

## eGuard0524P TVS Arrays

### Description - eGuard™

The eGuard0524P\* 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 eGuard0524P 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 eGuard0524P provides superior surge current capability and excellent voltage clamping performance. The surge current capability (8x20µs) is rated at 7A; approximately 33% higher than industry norms. Furthermore, the tight clamping ratio (VC/VRWM) 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 eGuard0524P is designed to protect up to four data lines. It is packaged in a RoHS/WEEE compliant, 10 pin DFN that has a very low package profile of 0.5mm (nominal). The combination of ultra low capacitance, high surge capability, tight clamping ratio and low package profile make the eGuard0524P the ideal choice for today's ESD sensitive, space constrained applications.

### Features

- ESD protection in accordance with:  
IEC 61000-4-2 (ESD) ±17kV (air), ±12kV (contact)  
IEC 61000-4-5 (lightning) 7A (8/20µs)  
IEC 61000-4-4 (EFT) 40A (5/50ns)
- Tight clamping ratio, VC/VRWM, ensures superior protection
- High reverse surge current, IPP, capability
- Low idle current minimizes standby power consumption
- Low profile DFN package
- Package design optimized for high speed lines
- Flow-Through design
- Protects four I/O lines
- Low capacitance: 0.35pF typical (I/O to I/O)
- Low operating voltage: 5V
- Solid-state silicon-avalanche technology
- “-A” is an AEC-Q101 qualified device

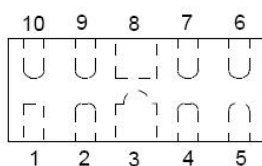
### Mechanical Characteristics

- DFNWB2.5×1-10L 10-pin package
- RoHS/WEEE Compliant
- Lead Pitch: 0.5mm
- Lead finish: Pure Sn
- Marking: Marking Code
- Packaging: Tape and Reel

### Applications

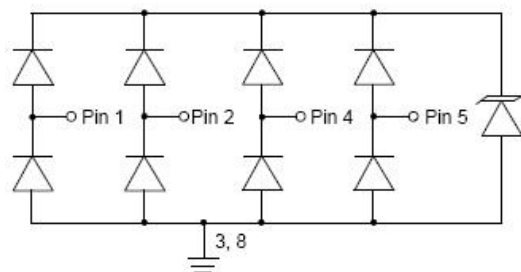
- High Definition Multi-Media Interface (HDMI)
- Digital Visual Interface (DVI)
- DisplayPort™ Interface
- MDDI (Mobile Display Digital Interface) Ports
- PCI (Peripheral Component Interconnect) Express
- eSATA (External Serial Advanced Technology Attachment) Interfaces

### Pin Configuration



Pin	Identification
1, 2, 4, 5	Input Lines
6, 7, 9, 10	Output Lines (No Internal Connection)
3, 8	Ground

### Circuit Diagram



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

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## Ordering Information

Device	Package	Shipping
eGuard0524P	DFNWB2.5×1-10L (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<sub>A</sub>=25°C unless otherwise specified

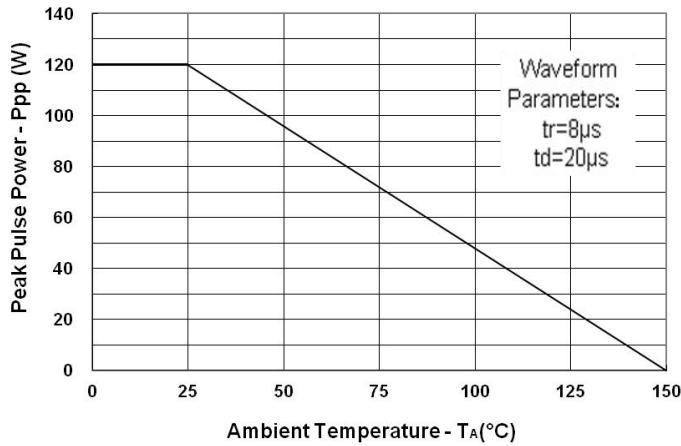
Parameter	Symbol	Value	Units
Peak Pulse Current (tp=8/20µs)	I <sub>PP</sub>	7	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V <sub>ESD</sub>	±17 ±12	kV
Operating Junction Temperature Range	T <sub>J</sub>	-55 to + 150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to + 150	°C

## Electrical Characteristics

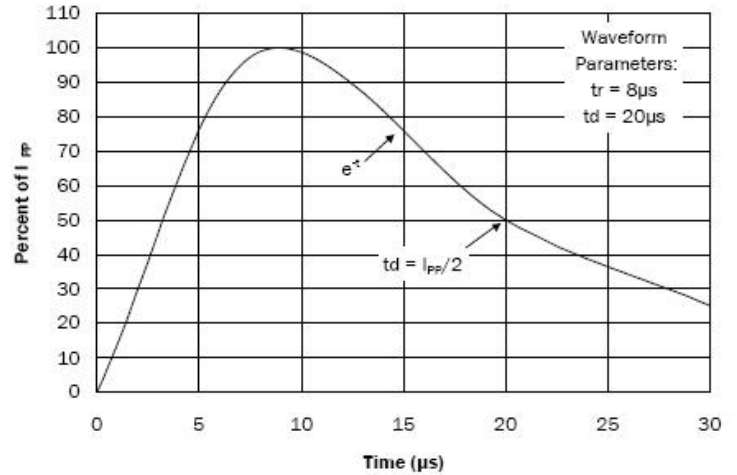
Characteristics	Symbol	Condition	Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	V <sub>RWM</sub>	Any I/O pin to ground	-	-	5	V
Reverse Breakdown Voltage	V <sub>BR</sub>	@ I <sub>F</sub> =1mA Any I/O pin to ground	6	-	-	V
Forward Voltage Drop	V <sub>F</sub>	@ I <sub>F</sub> =1mA, T = 25 °C	-	-	0.9	V
Reverse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

\* Pulse width < 300 µs, duty cycle < 2%

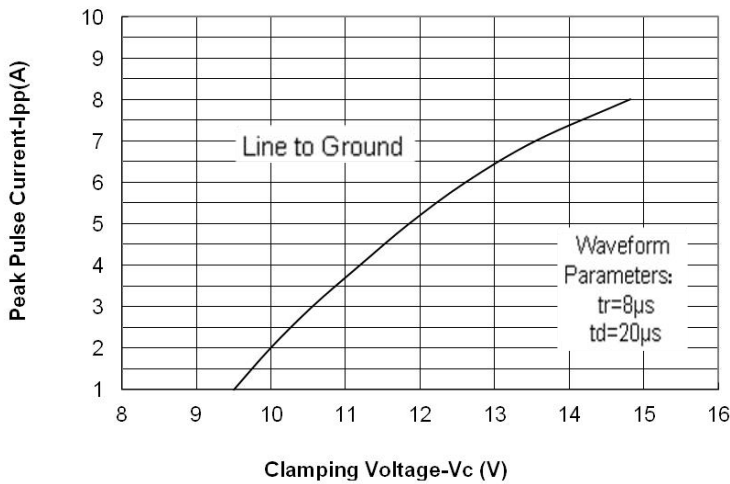
**Ratings and Characteristics Curves**



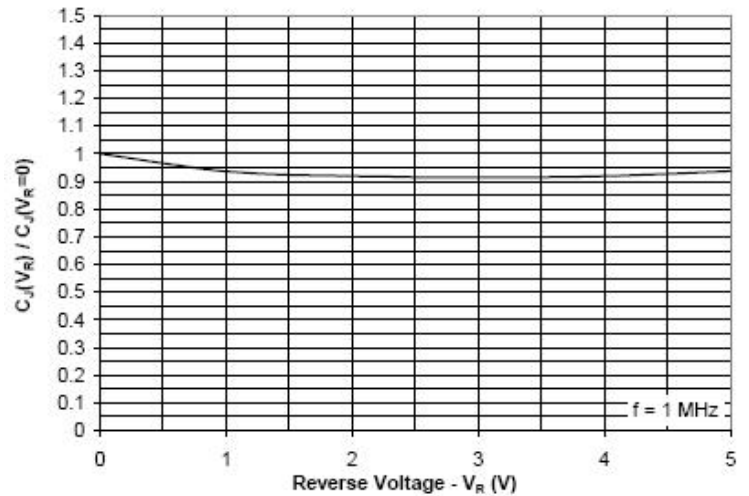
**Fig.1 Power Derating Curve**



**Fig.2 Pulse Waveform**



**Fig. 3 Clamping Voltage vs. Peak Pulse Current**



**Fig. 4 Normalized Capacitance vs. Reverse Voltage**

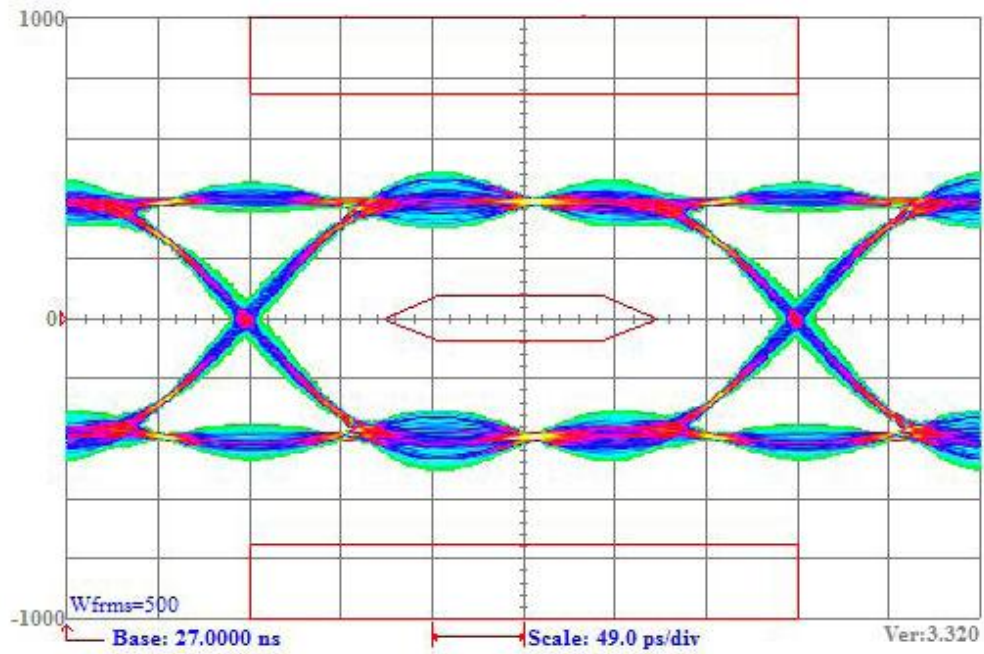


Fig. 5 HDMI 1.4 Eye Diagram

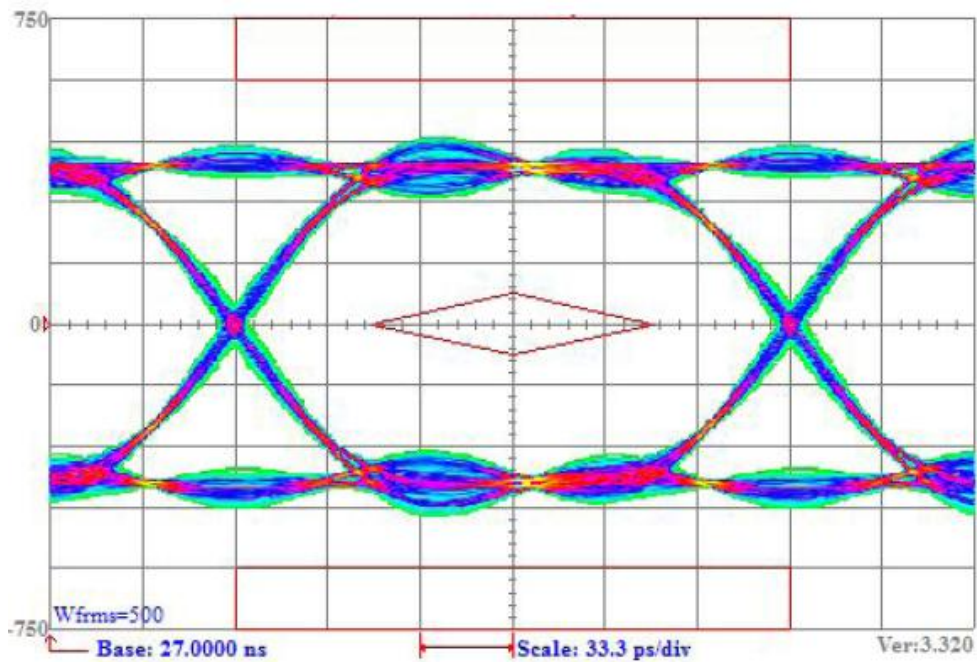
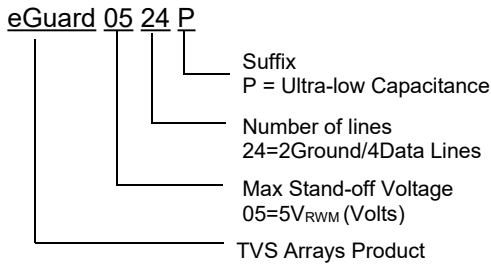
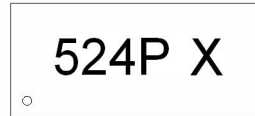


Fig. 6 USB3.0 Eye Diagram

Part Name Information



Marking Diagram

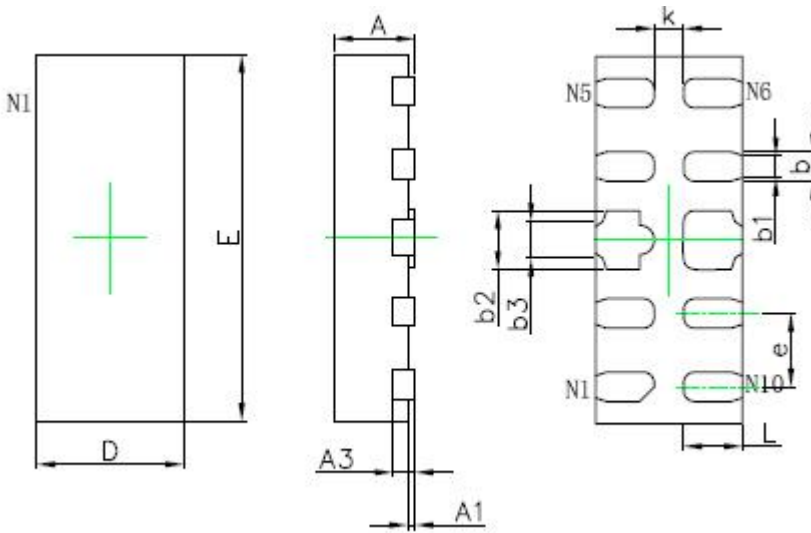


Where 524P is eGuard0524P

524P = Part name  
X = Marking code for date code

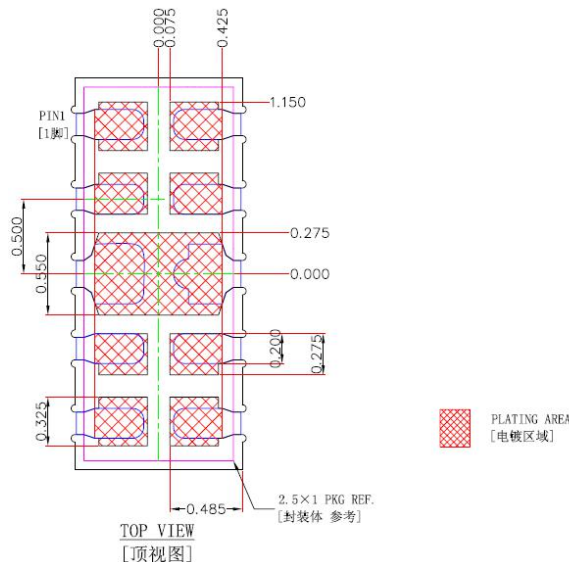
Cautions: Molding resin  
Epoxy resin UL:94V-0

Mechanical Dimensions DFNWB2.5×1-10L



SYMBOL	Millimeters		Inches	
	MIN.	MAX.	MIN.	MAX.
A	0.500	0.600	0.020	0.024
A1	0.000	0.050	0.000	0.002
A3	0.152REF.		0.006REF.	
D	0.900	1.100	0.035	0.043
E	2.400	2.600	0.094	0.102
k	0.200REF.		0.006REF.	
b	0.150	0.250	0.006	0.010
b1	0.100	0.200	0.004	0.008
b2	0.350	0.450	0.014	0.018
b3	0.130	0.230	0.005	0.009
e	0.500 TYP.		0.020 TYP.	
L	0.300	0.500	0.012	0.020

Soldering Pad Layout (Millimeters)





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