



4-Line Ultra Low Capacitance TVS Array

Features

- Ultra low capacitance : 0.3pF typical (I/O to I/O)
- Ultra low leakage: nA level
- Low operating voltage : 3.3V
- Low clamping voltage
- Up to 4 data lines and one power line protects
- JEDEC SOT-23 6L package
- Complies with following standards :
 - IEC 61000-4-2(ESD) immunity test
Air discharge : $\pm 25\text{kV}$, Contact discharge : $\pm 20\text{kV}$
 - IEC61000-4-5 (Lightning) 5A (8/20us)
- RoHS Compliant



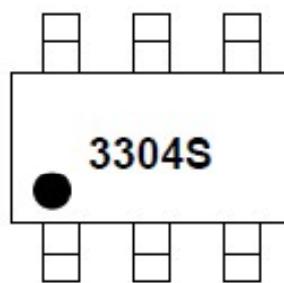
Mechanical Data

- Package : SOT-23-6L
- Case Material : "Green" Molding Compound.
- Lead Finish : Matte Tin
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity : Level 3 per J-STD-020
- Terminal Connections : See Diagram Below
- Marking Information : See Below

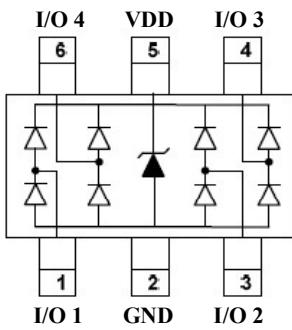
Applications

- LAN Applications
- Fingerprint
- Video Lines Protection
- Handheld Electronics
- 3.3V Operating Systems
- Analog Input Lines Protection
- Data and I/O Lines Protection

Marking



3304S = Device Marking Code
Dot denotes Pin1



Circuit and Pin Schematic

Absolute Maximum Ratings (Ta= 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20us)	Ppk	100	W
Peak Pulse Current (8/20us)	Ipp	5	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V _{ESD}	± 25 ± 20	kV
Operating Junction Temperature Range	T _J	-55 to +125	°C
Storage Temperature Range	T _{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Reverse Working Voltage	V _{RWM}	-	-	3.3	V	Any I/O pin to ground
Punch-Through Voltage	V _{PT}	3.5	-	-	V	I _T = 2uA, any I/O pin to ground
Snap-Back Voltage	V _{SB}	2.8	-	-	V	I _T = 50mA, any I/O pin to ground
Reverse Leakage Current	I _R	-	-	0.2	uA	V _{RWM} = 3.3V, any I/O pin to ground
Clamping Voltage (8×20us pulse)	V _C	-	-	10	V	I _{PP} =1A, any I/O pin to ground
	V _C	-	-	20	V	I _{PP} =5A, any I/O pin to ground
Junction Capacitance	C _J	-	0.3	0.4	pF	f=1MHZ, V _R =0V, between I/O pins
	C _J	-	0.6	0.8	pF	f=1MHZ, V _R =0V, any I/O pin to ground

* Note 1 : I/O pins are Pin 1, 3, 4 and 6



Ratings and Characteristics Curves (Ta=25°C unless otherwise noted)

Fig.1 Power Derating Curve

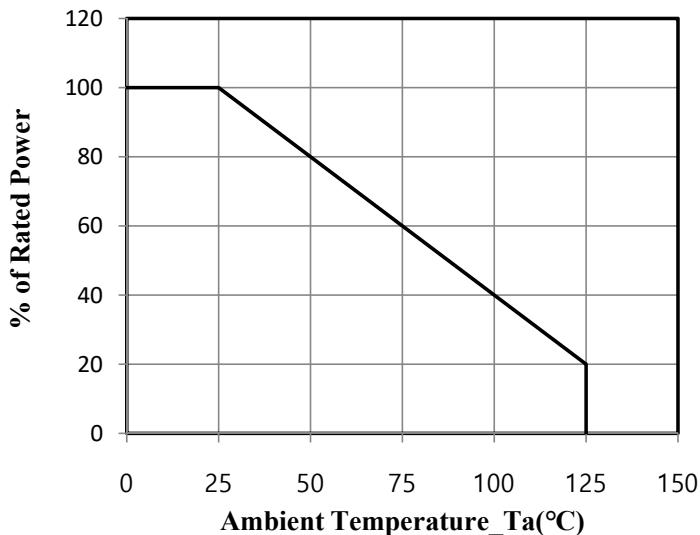


Fig.2 Peak Pulse Power vs. Pulse Time

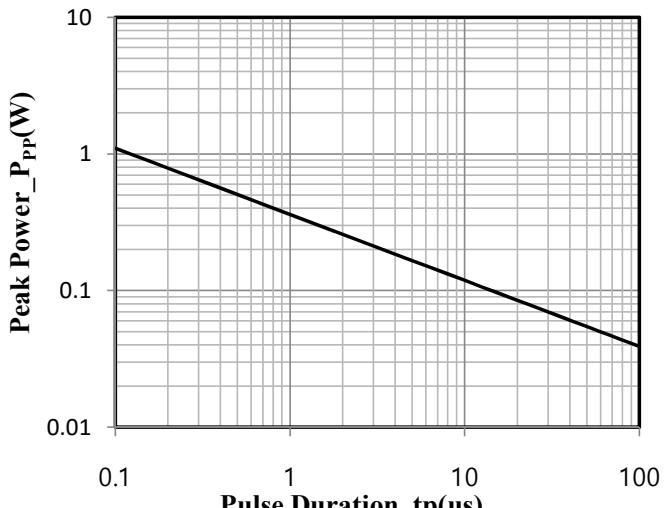


Fig.3 Clamping Voltage vs. Peak Pulse Current (tp=8/20us)

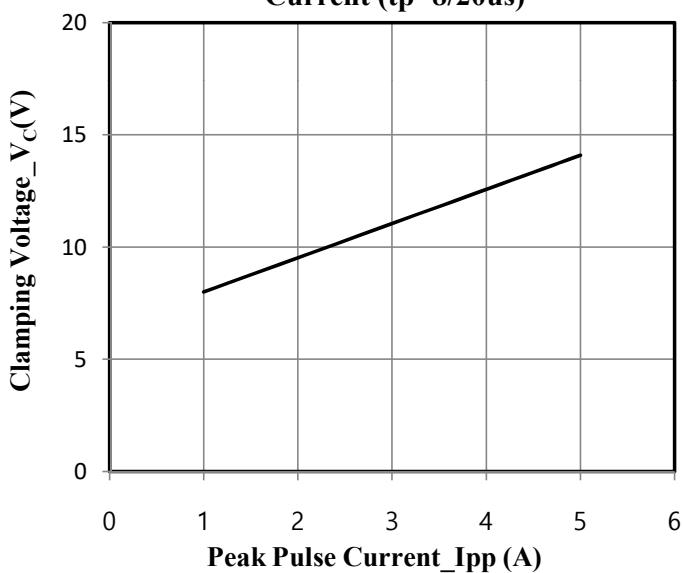


Fig.4 Junction Capacitance vs. Reverse Voltage

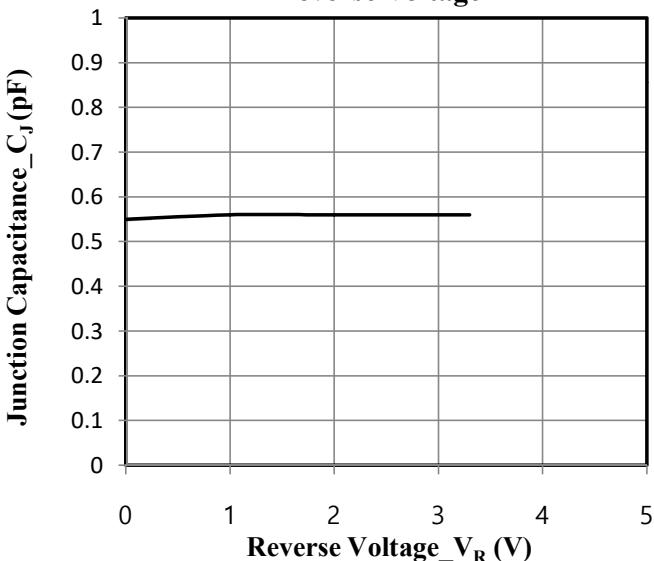


Fig.5 8 × 20us Pulse Waveform

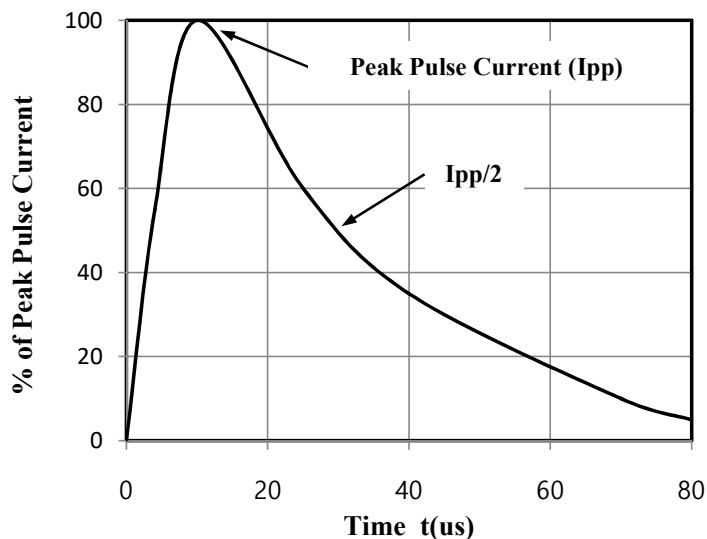
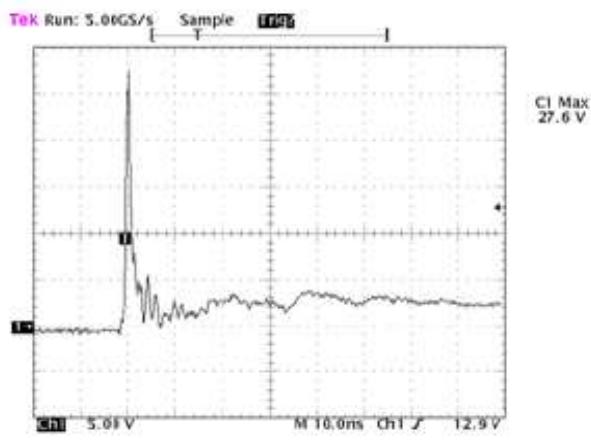


Fig. 6 ESD Clamping Voltage 8kV Contact per IEC61000-4-2

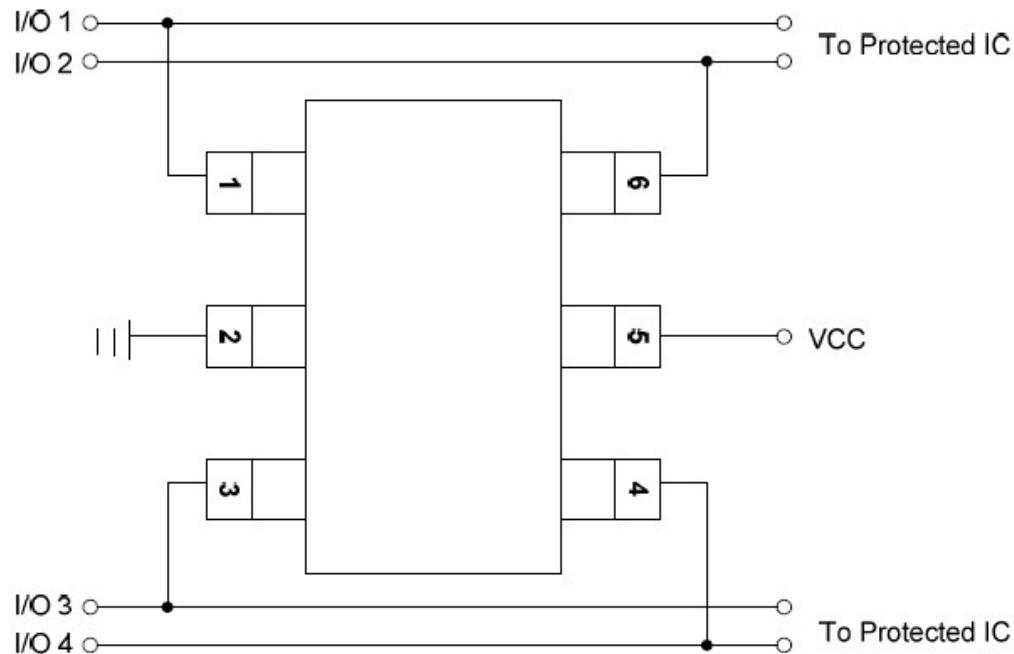


Note: Data is taken with a 10x attenuator

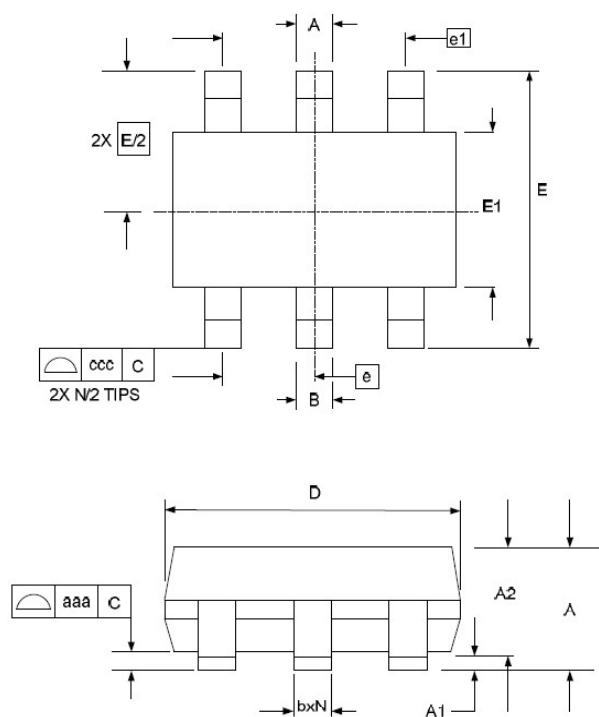


Typical Application

The AR3304S2 is designed to protect four data lines from transient over-voltages by clamping them to fixed reference. When the voltage on the protected line exceeds the reference voltage (plus diode VF) the steering diodes are forward biased, conducting the transient current away from the sensitive circuitry. Data lines are connected at pins 1, 3, 4 and 6. The negative reference (REF1) is connected at pin 2. This pin should be connected directly to a ground plane on the board for best results. The path length is kept as short as possible to minimize parasitic inductance. The positive reference (REF2) is connected at pin 5.

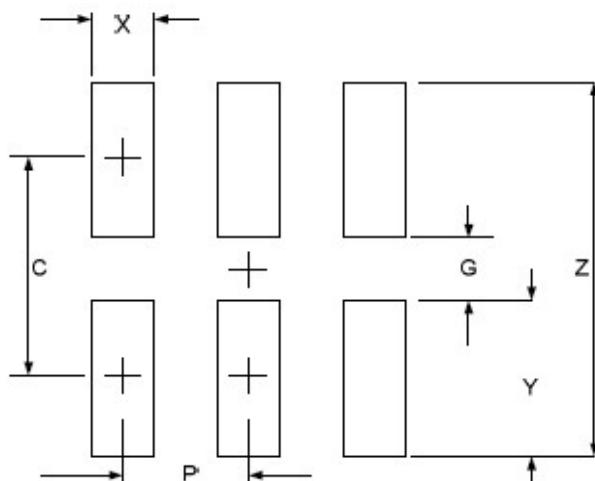


SOT23-6 Package Outline Drawing



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90		1.45	0.035		0.057
A1	0.00		0.15	0.000		0.006
A2	0.90	1.15	1.30	0.035	0.045	0.051
b	0.25		0.50	0.010		0.020
c	0.08		0.22	0.003		0.009
D	2.80	2.90	3.10	0.110	0.114	0.122
E1	1.50	1.60	1.75	0.060	0.063	0.069
E	2.80 BSC			0.110 BSC		
e	0.95 BSC			0.037 BSC		
e1	1.90 BSC			0.075 BSC		
N	6			6		
aaa	0.10			0.004		
ccc	0.20			0.008		

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	2.50	0.098
G	1.40	0.055
P	0.95	0.037
X	0.60	0.024
Y	1.10	0.043
Z	3.60	0.141