AR0508PB
8-Line Ultra Low Capacitance TVS Diode Array

Description

The AR0508PB is an ultra low capacitance TVS array, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The AR0508PB has an ultra-low capacitance with a typical value at 0.29pF, and complies with the IEC 61000-4-2 (ESD) with ±25kV air and ±20kV contact discharge. It is assembled into a 9-pin lead-free DFN package. The flow through style package allows for easy PCB layout and matched trace lengths necessary to maintain consistent impedance between high speed differential lines. The small size, ultra-low capacitance and high ESD surge protection make AR0508PB an ideal choice to protect HDMI 1.4, USB 3.0 and other high speed ports.

Features

- Ultra low capacitance: 0.29pF typical
- Ultra low leakage: nA level
- Low operating voltage: 5V
- Low clamping voltage
- Protects eight data lines
- Leadless flow-through package
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge: ±25kV
    - Contact discharge: ±20kV
  - IEC61000-4-5 (Lightning) 5A (8/20μs)
- RoHS Compliant

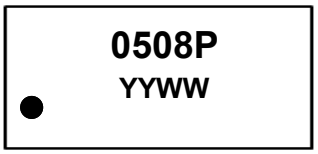
Mechanical Characteristics

- Package: DFN3810-9
- Case Material: “Green” Molding Compound.
- Terminal Connections: See Diagram Below
- Marking Information: See Below

Applications

- USB 3.0, 3.1 and type C
- HDMI 1.4
- High-Speed Data Lines

Marking Information

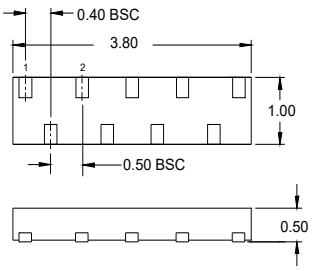


0508P = Device Marking Code
YYWW = Date Code
Dot denotes pin1

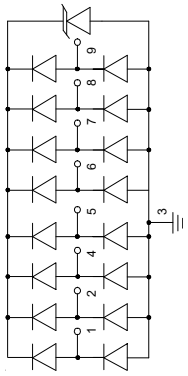
Ordering Information

Part Number	Packaging	Reel Size
AR0508PB	3000/Tape & Reel	7 inch

Dimensions and Pin Configuration



Dimensions



Circuit Diagram

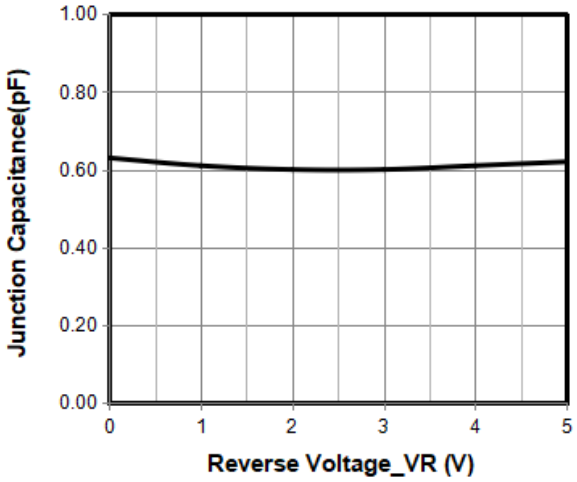
Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	Ppk	75	W
Peak Pulse Current (8/20μs)	I_{PP}	5	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	V_{ESD}	±25 ±20	kV
Operating Temperature Range	T_J	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

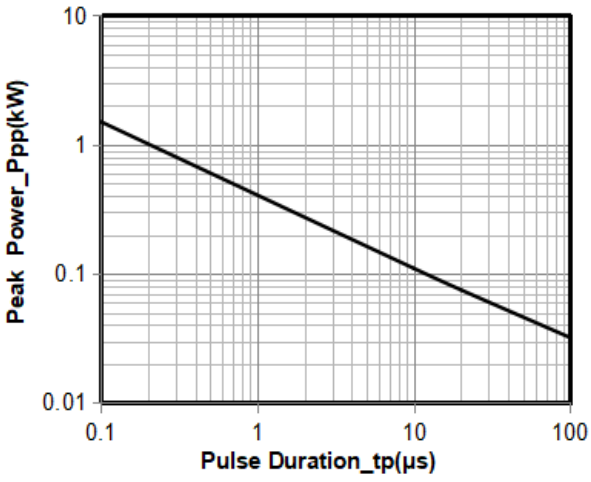
Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			5	V	Any I/O pin to ground
Breakdown Voltage	V_{BR}	6			V	I_T = 1mA, any I/O pin to ground
Reverse Leakage Current	I_R			0.5	μA	V_{RWM} = 5V, any I/O pin to ground
Clamping Voltage	V_C			10	V	I_{PP} = 1A (8 x 20μs pulse), any I/O pin to ground
Clamping Voltage	V_C			15	V	I_{PP} = 5A (8 x 20μs pulse), any I/O pin to ground
Junction Capacitance	C_J			0.8	pF	VR = 0V, f = 1MHz, any I/O pin to ground
Line Capacitance Difference	ΔC_{Line}			0.4	pF	VR = 0V, f = 1MHz, any I/O pin to pin variation

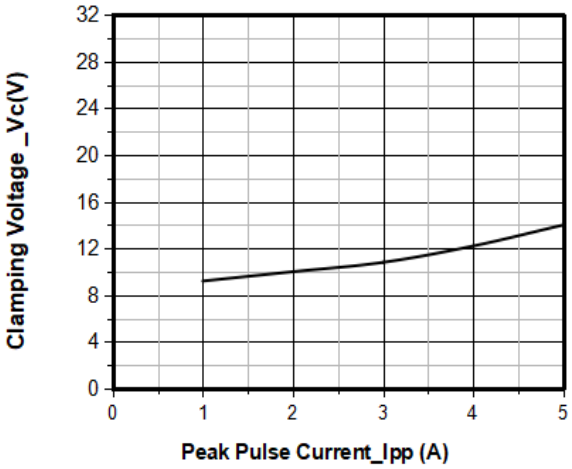
Typical Performance Characteristics (TA=25°C unless otherwise Specified)



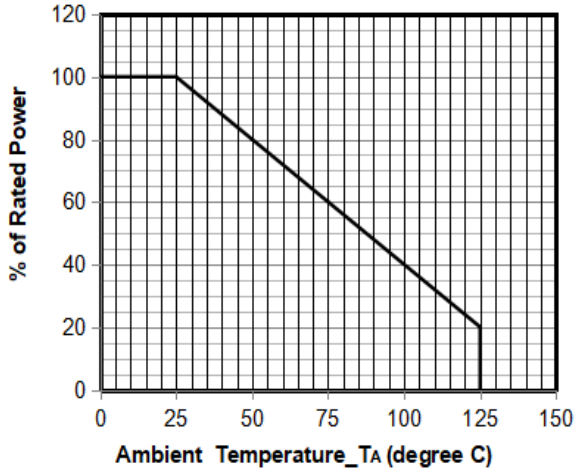
Junction Capacitance vs. Reverse Voltage



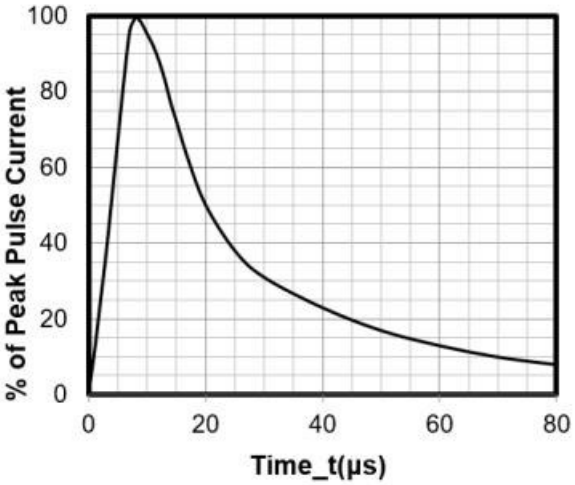
Peak Pulse Power vs. Pulse Time



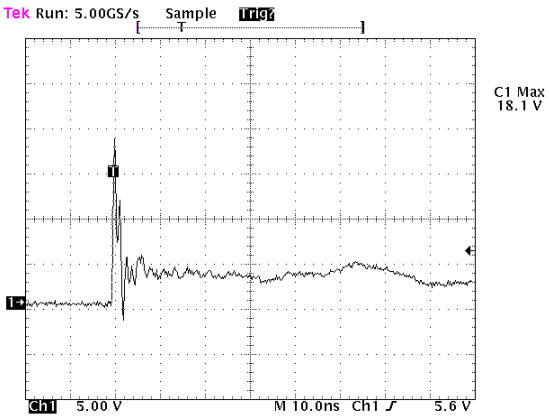
Clamping Voltage vs. Peak Pulse Current



Power Derating Curve



8 X 20μs Pulse Waveform



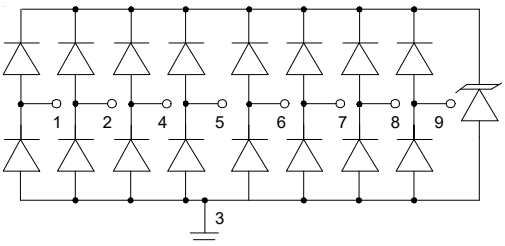
Note：Data is taken with a 10x attenuator

ESD Clamping Voltage

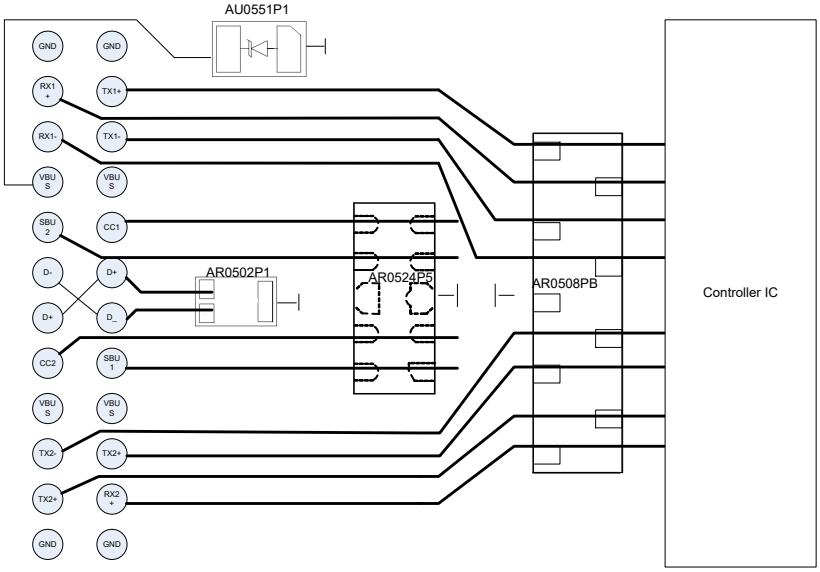
8 kV Contact per IEC61000−4−2

Typical Application

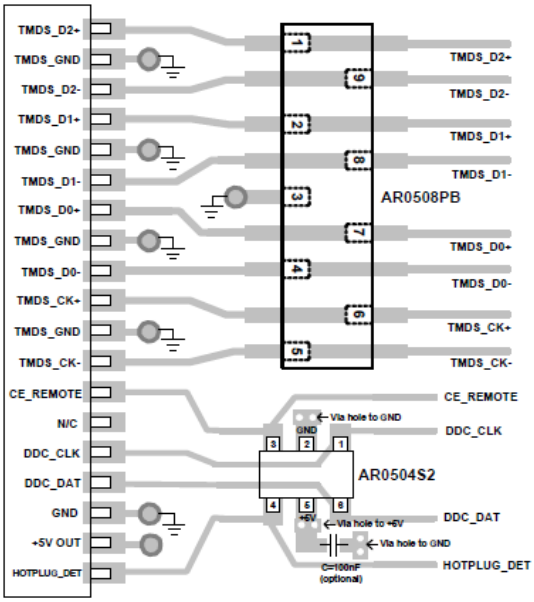
The AR0508PB is designed for easy PCB layout by allowing the traces to run straight through the device. The protected data lines are normally connected at pins 1, 2, 4, 5, 6, 7, 8, and 9, pin 3 is connected to ground. The connection to ground should be made directly to a ground plane. The path length should also be kept as short as possible to minimize parasitic inductance.



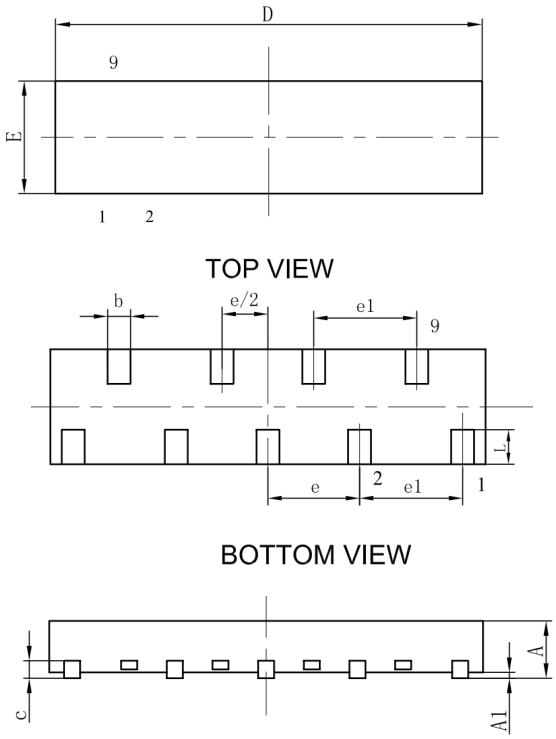
AR0508PB on USB 3.1 Type C Application



AR0508PB on HDMI Application

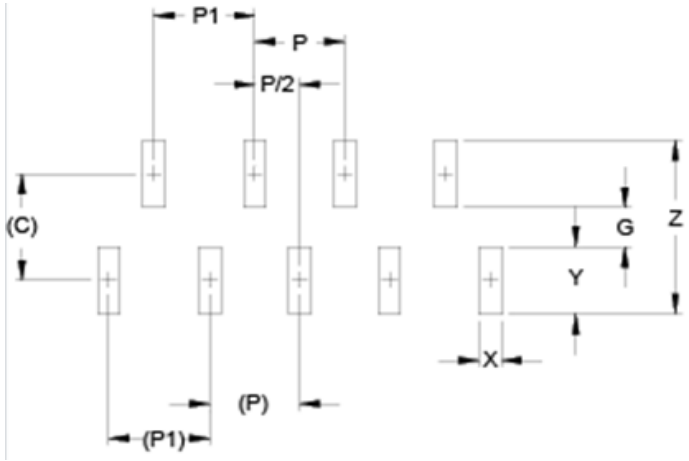


DFN3810-9 Package Outline Drawing



SYM	MILLIMETERS		
	MIN	NOM	MAX
A	0.45	0.50	0.55
A1	—	0.02	0.05
b	0.15	0.20	0.25
c	0.10	0.15	0.20
D	3.70	3.80	3.90
e	0.80BSC		
e1	0.90BSC		
E	0.90	1.00	1.10
L	0.20	0.30	0.40

Suggested Land Pattern



DIMENSIONS	
DIM	MILLIMETERS
C	(0.95)
G	0.35
P	0.80
P1	0.90
X	0.20
Y	0.60
Z	1.55

Con-tact Information

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