

Description

The AR0508PBA 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 AR0508PBA has an ultra-low capacitance with a typical value at 0.5pF, and complies with the IEC 61000-4-2 (ESD) with $\pm 25\text{kV}$ air and $\pm 20\text{kV}$ 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 AR0508PBA an ideal choice to protect HDMI 1.4, USB 3.0 and other high speed ports.

Features

- 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: $\pm 25\text{kV}$
Contact discharge: $\pm 20\text{kV}$
 - IEC61000-4-5 (Lightning) 5A (8/20 μs)
- RoHS Compliant

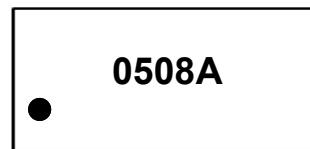
Mechanical Characteristics

- 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

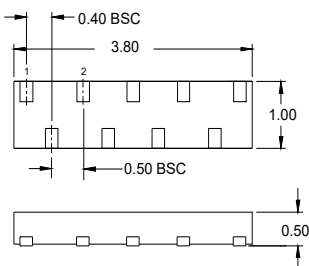


0508A = Device Marking Code
Dot denotes pin1

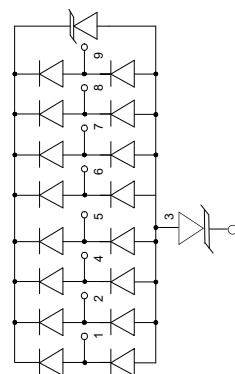
Ordering Information

Part Number	Packaging	Reel Size
AR0508PBA	3000/Tape & Reel	7 inch

Dimensions and Pin Configuration



Dimensions



Circuit Diagram

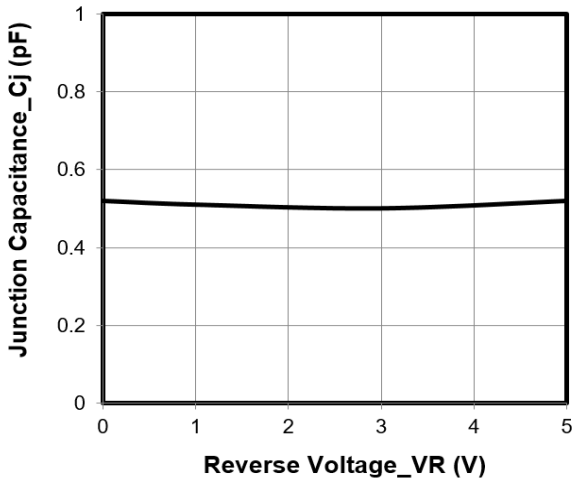
Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 μs)	Ppk	75	W
Peak Pulse Current (8/20 μs)	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	$^{\circ}\text{C}$
Storage Temperature Range	T _{stg}	-55 to +150	$^{\circ}\text{C}$

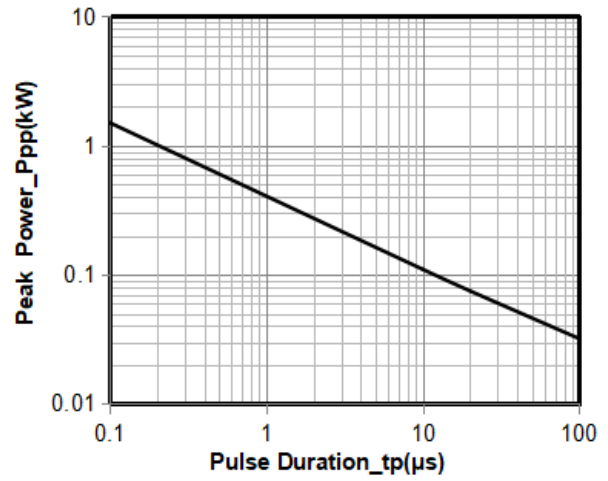
Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

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			0.2	μA	V _{RWM} = 5V, any I/O pin to ground
Clamping Voltage	V _C			12	V	I _{PP} = 1A (8 x 20 μs pulse), any I/O pin to ground
Clamping Voltage	V _C			15	V	I _{PP} = 5A (8 x 20 μs pulse), any I/O pin to ground
Junction Capacitance	C _J		0.50	0.60	pF	V _R = 0V, f = 1MHz, any I/O pin to ground
Junction Capacitance	C _J		0.25	0.40	pF	V _R = 0V, f = 1MHz, between I/O pins

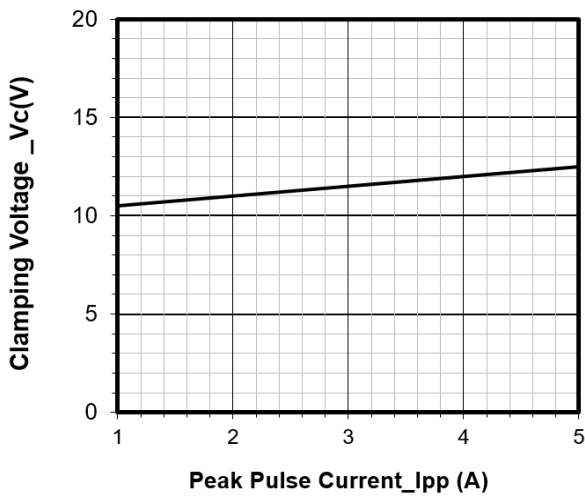
Typical Performance Characteristics (TA=25°C unless otherwise Specified)



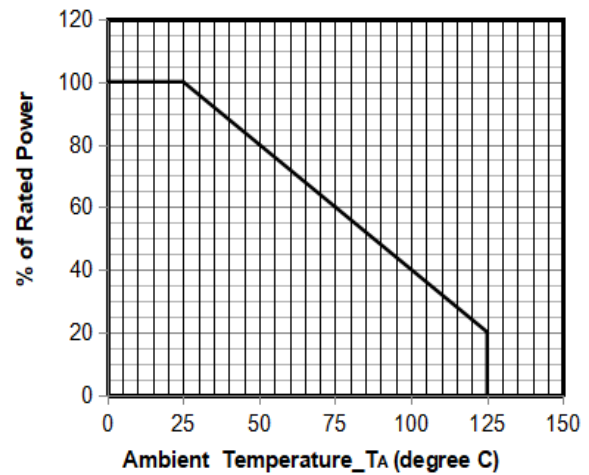
Junction Capacitance vs. Reverse Voltage



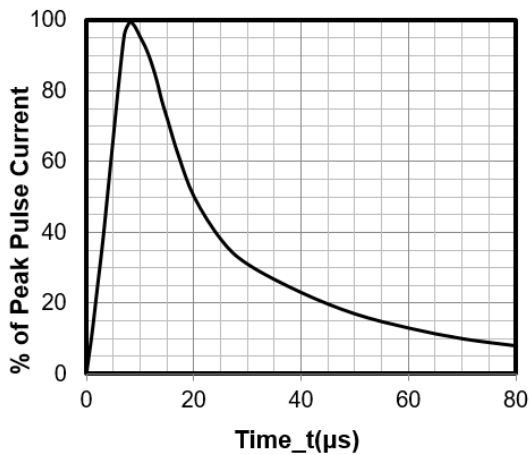
Peak Pulse Power vs. Pulse Time



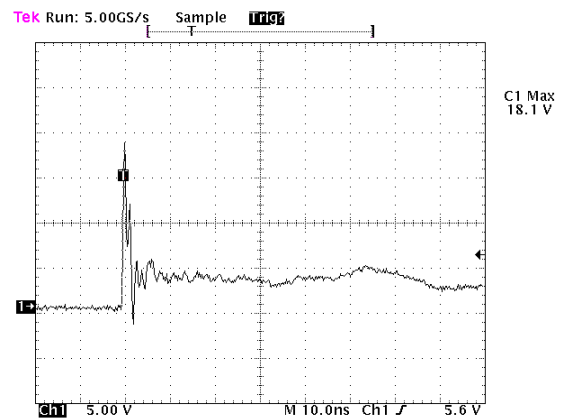
Clamping Voltage vs. Peak Pulse Current



Power Derating Curve



8 X 20μs Pulse Waveform



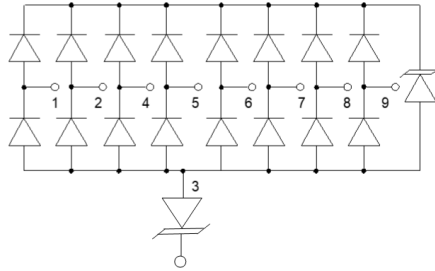
Note: Data is taken with a 10x attenuator

ESD Clamping Voltage

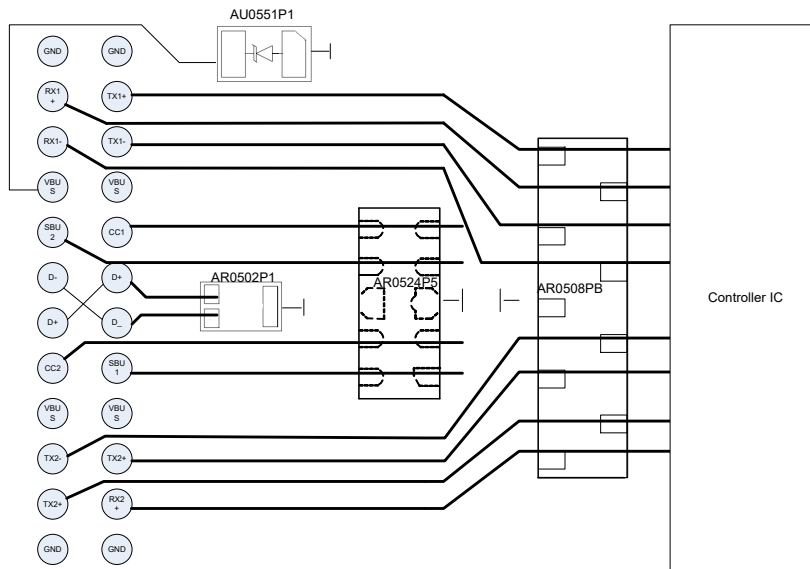
8 kV Contact per IEC61000-4-2

Typical Application

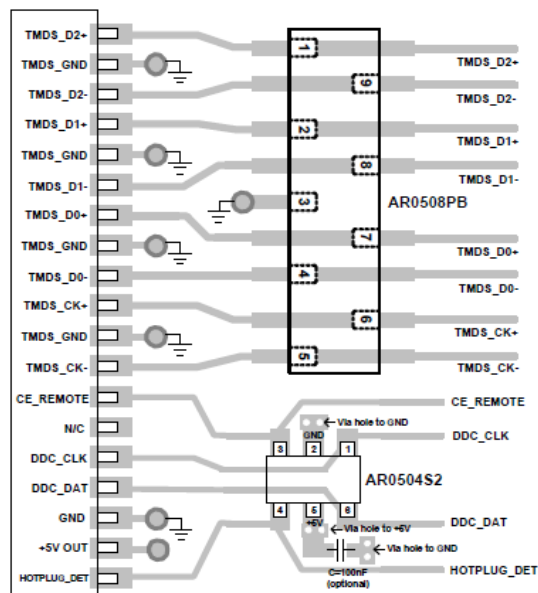
The AR0508PBA is designed for easy PCB layout by allowing the traces to run straight through the device. The protected data lines are normally connected at pins 1, 2, 4, 5, 6, 7, 8, and 9, pin 3 is connected to ground. The connection to ground should be made directly to a ground plane. The path length should also be kept as short as possible to minimize parasitic inductance.



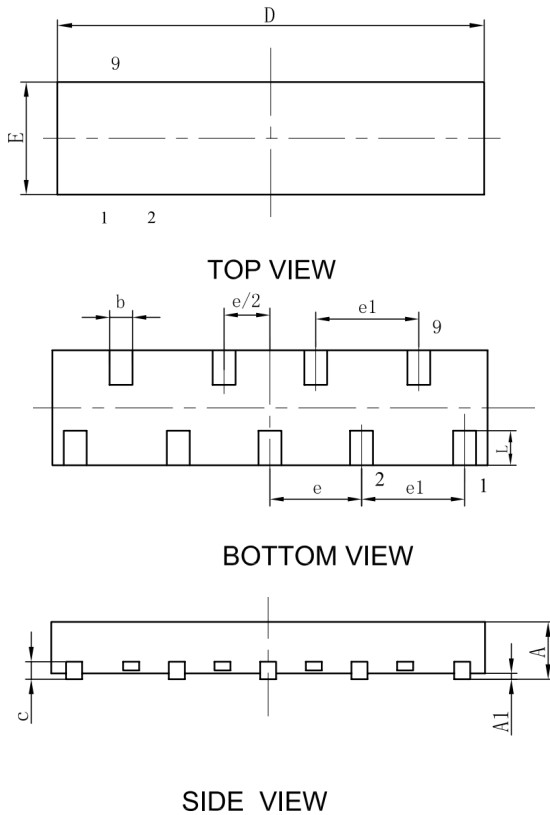
AR0508PBA on USB 3.1 Type C Application



AR0508PBA on HDMI Application

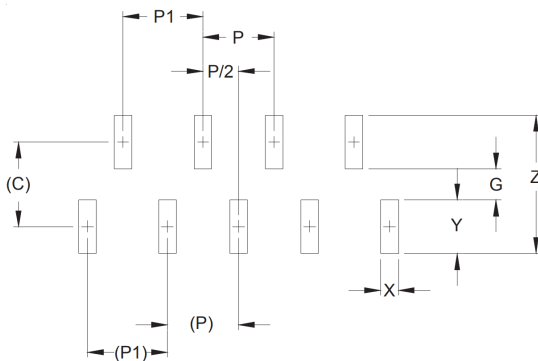


DFN3810-9 Package Outline Drawing



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

Contact Information

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