6-Line Ultra Low Capacitance TVS Diode Array

Features

- Ultra low capacitance : 0.3pF typical (I/O to I/O)
- Ultra low leakage : nA level
- Operating voltage : 5V
- Low clamping voltage
- Protects one power line and six 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) 4A (8/20us)
- RoHS Compliant

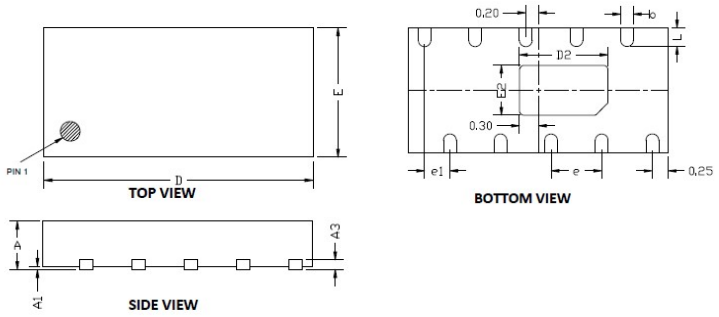
Mechanical Data

- Package : DFN4120-10 (4.1×2.0×0.55mm)
- Case Material : "Green" Molding Compound.
- Moisture Sensitivity : Level 3 per J-STD-020
- Terminal Connections : See Diagram Below
- Marking Information: See Below

Applications

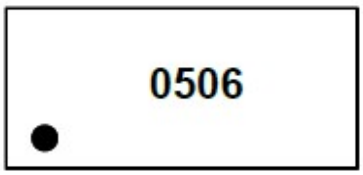
- USB 3.0
- HDMI 1.4
- High-Speed Data Lines

DFN4120-10



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.50	0.55	0.60	0.020	0.022	0.024
A1	0.00		0.05	0.000		0.002
A3	0.15 REF			0.006 REF		
D	4.05	4.10	4.15	0.162	0.164	0.166
E	1.95	2.00	2.05	0.075	0.080	0.082
D2	1.25	1.40	1.50	0.050	0.056	0.060
E2	0.65	0.80	0.90	0.026	0.032	0.036
b	0.15	0.20	0.25	0.006	0.008	0.010
L	0.20	0.30	0.40	0.008	0.012	0.016
e1	0.40 BSC			0.016 BSC		
e	0.80 BSC			0.032 BSC		

Marking Information

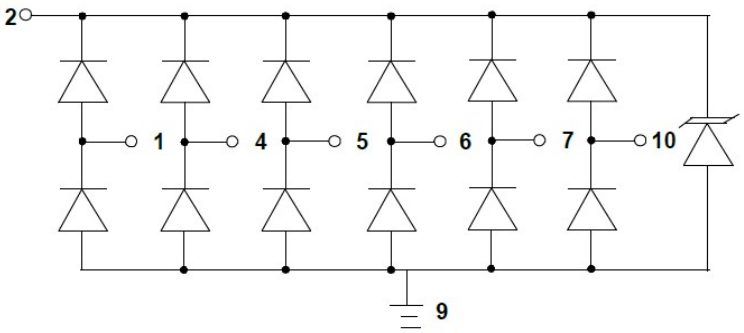


0506 = Device Marking Code
Dot denotes Pin1

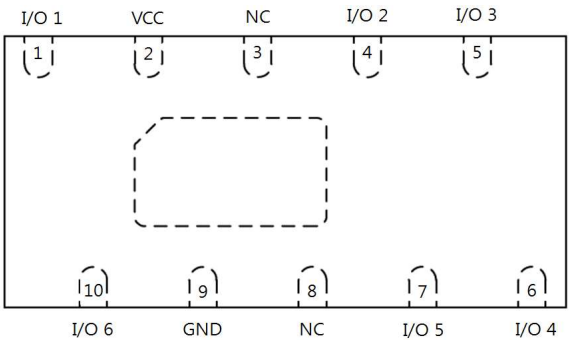
Ordering Information

Part Number	Packaging	Reel Size
AR0506PA	3000/Tape & Reel	7 inch

Circuit and Pin Confiquration



Circuit Schematic



Pin Schematic

Absolute Maximum Ratings (Ta= 25℃ unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20us)	Ppk	100	W
Peak Pulse Current (8/20us)	I_{PP}	4	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	℃
Storage Temperature Range	T_{STG}	-55 to +150	℃

Electrical Charateristics (Ta= 25℃ unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Reverse Working Voltage	V_{RWM}	-	-	5.0	V	Any I/O pin to ground
Breakdown Voltage	V_{BR}	6.0	-	-	V	I_T = 1mA, any I/O pin to ground
Reverse Leakage Current	I_R	-	-	0.5	uA	V_{RWM} = 5V, any I/O pin to ground
Clamping Voltage (8/20us pulse)	V_C	-	-	12	V	I_{PP}=1A, any I/O pin to ground
	V_C	-	-	25	V	I_{PP}=4A, any I/O pin to ground
Junction Capacitance	C_J	-	0.3	0.4	pF	f=1MHz, V_R=0V, any I/O pin to ground

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

Fig.1 Power Derating Curve

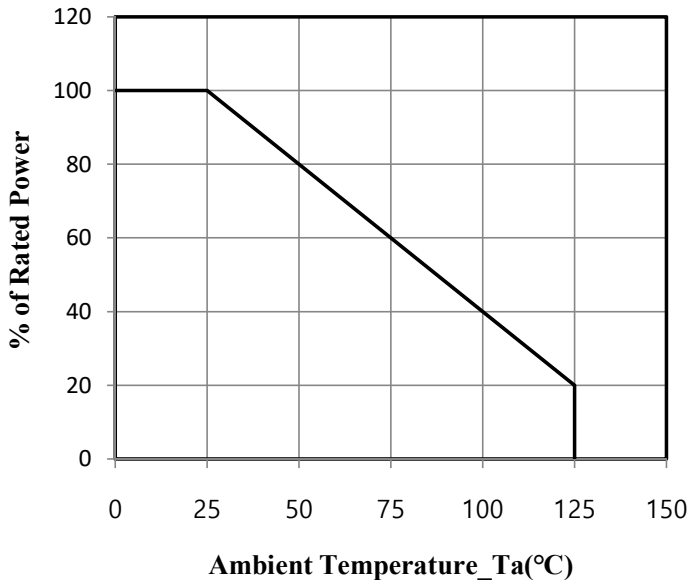


Fig.2 Peak Pulse Power vs. Pulse Time

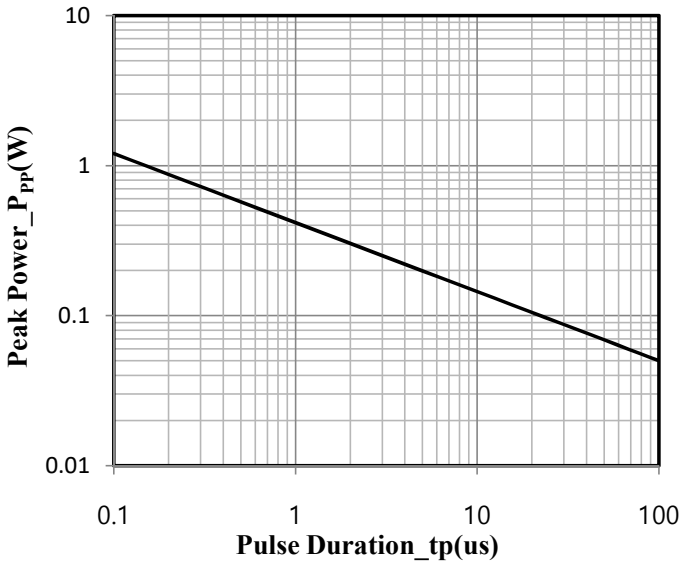


Fig.3 8 × 20us Pulse Waveform

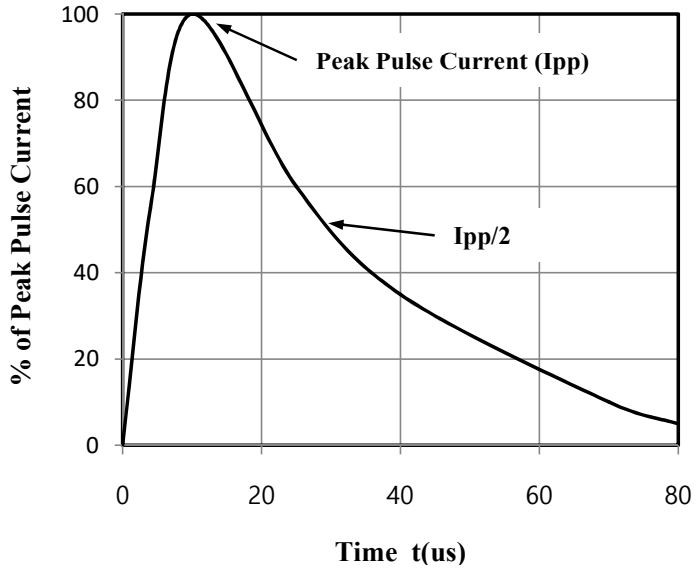


Fig.4 Junction Capacitance vs. Reverse Voltage

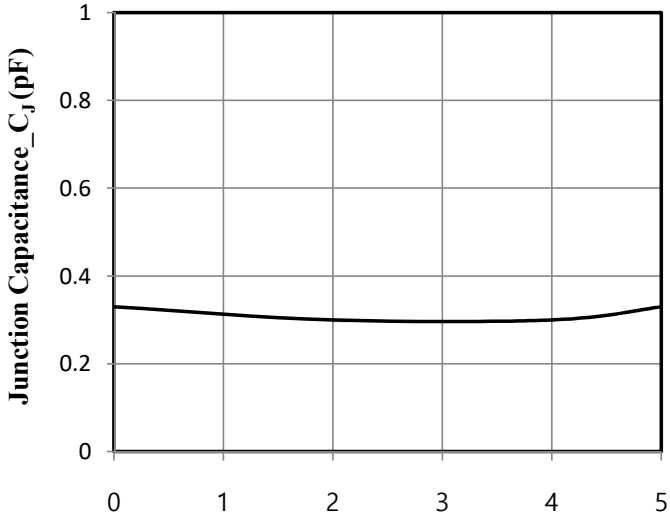


Fig.5 Clamping Voltage vs. Peak Pulse Current (tp=8/20us)

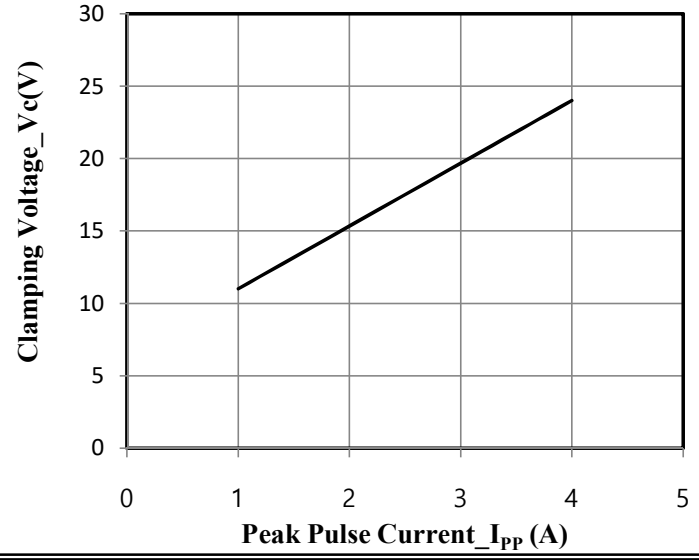
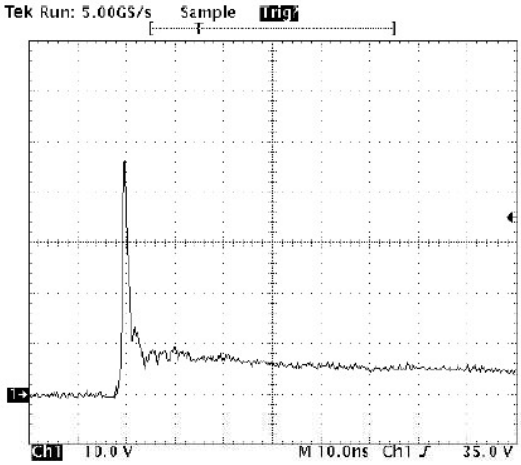


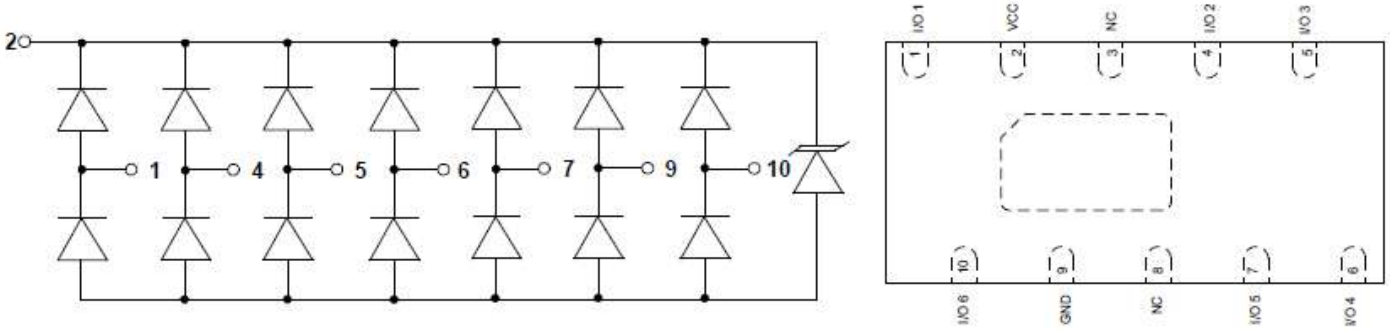
Fig. 6 ESD Clamping Voltage 8kV Contact per IEC61000-4-2



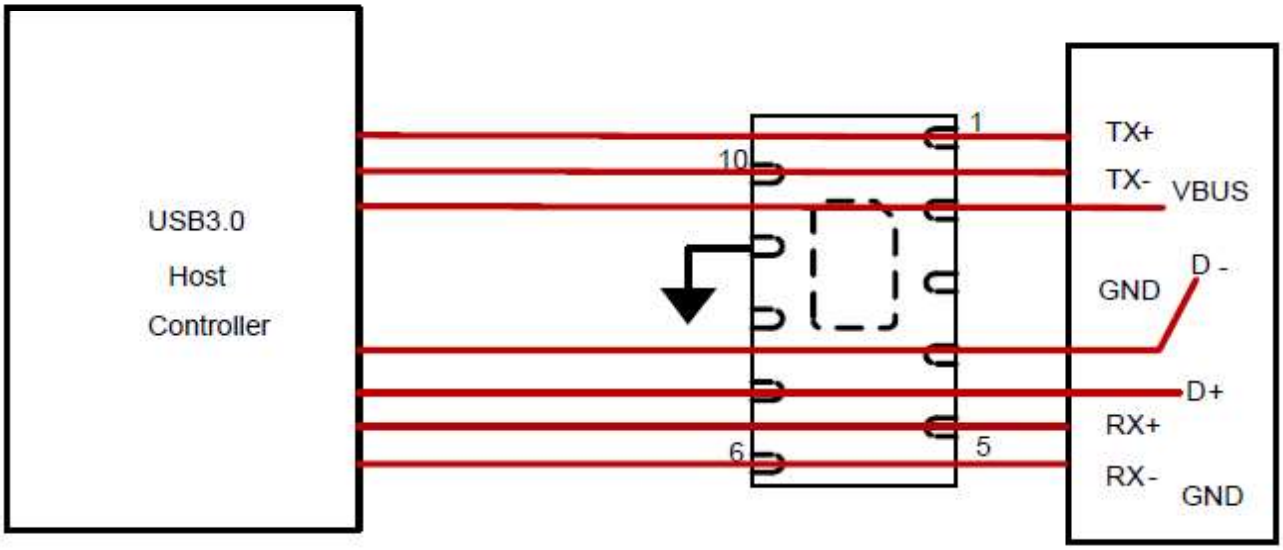
Note: Data is taken with a 10x attenuator

Typical Application

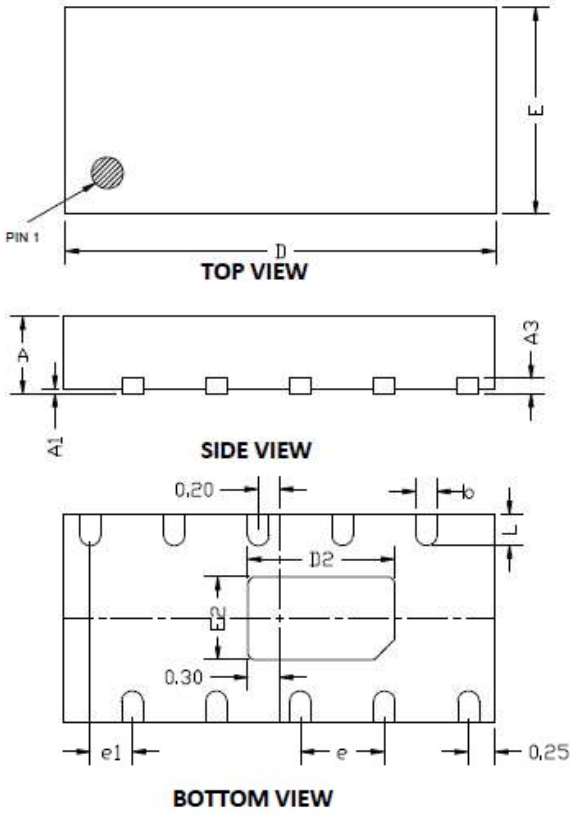
The AR0506PA is designed for easy PCB layout by allowing the traces to run straight through the device. The pro-tected data lines are normally connected at pins 1, 4, 5, 6, 7 &10, pin 9 is connected to ground. The connection to ground should be made directly to a ground plane. The path length should also be kept as short as possible to mini-mize parasitic inductance. Pin 2 can be connected to Vcc biased or left not connected depending upon the applica-tion



AR0506PA on USB3.0 Application



DFN4120-10 Package Outline Drawing



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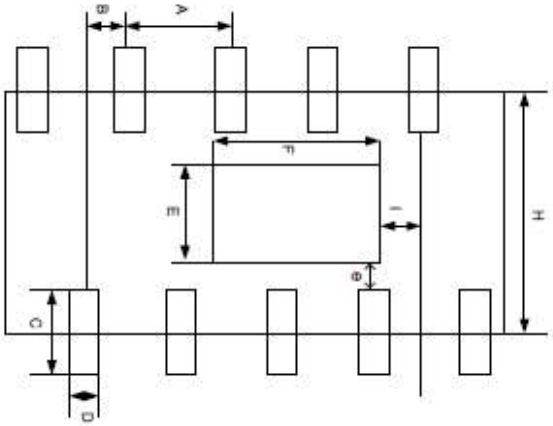
Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
A	0.800	0.032
B	0.400	0.016
C	0.600	0.024
D	0.200	0.008
E	0.800	0.032
F	1.400	0.056
H	2.000	0.080
I	0.300	0.012
e	0.200	0.008