

7-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 7 data lines
- 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

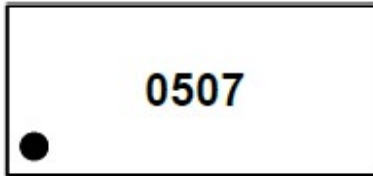
Mechanical Data

- Package : DFN4120-10 (4.1 \times 2.0 \times 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

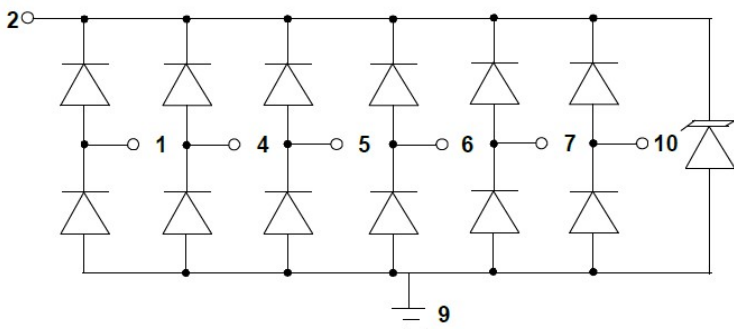
- USB 3.0/ MicroUSB 3.0
- HDMI 1.4/2.0
- High-Speed Data Lines

Marking Information

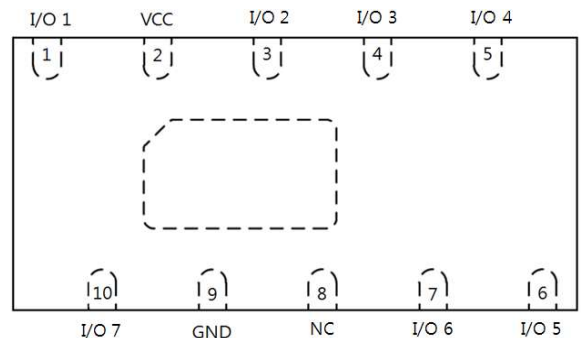


0507 = Device Marking Code
Dot denotes Pin1

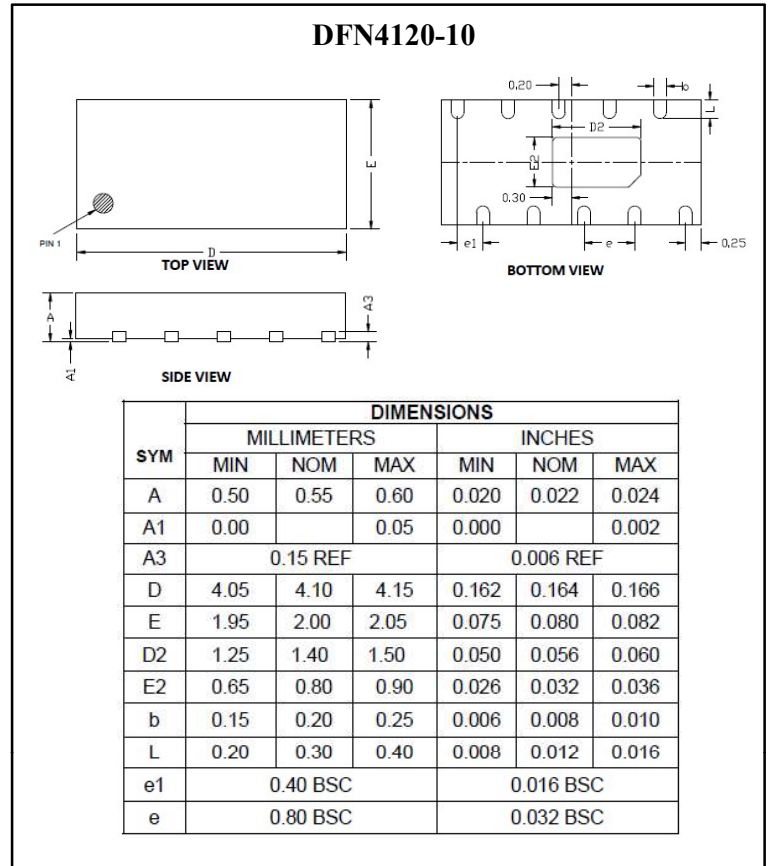
Circuit and Pin Configuration



Circuit Schematic



Pin Schematic



Ordering Information

Part Number	Packaging	Reel Size
AR0507PA	3000/Tape & Reel	7 inch



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

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20us)	P _{pk}	75	W
Peak Pulse Current (8/20us)	I _{pp}	5.0	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}	-	-	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	-	-	10	V	I _{pp} =1A, any I/O pin to ground
	V _C	-	-	15	V	I _{pp} =5A, any I/O pin to ground
Junction Capacitance	C _J	-	0.6	0.8	pF	f=1MHz, V _R =0V, any I/O pin to ground

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

Fig.1 Power Derating Curve

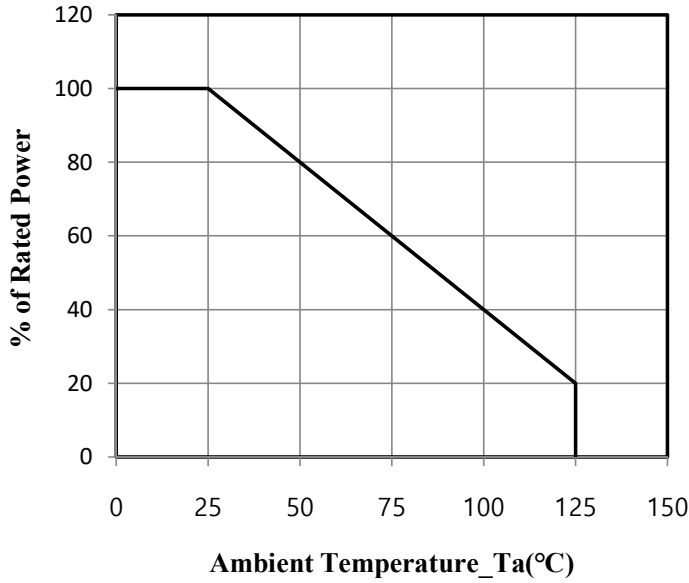


Fig.2 Peak Pulse Power vs. Pulse Time

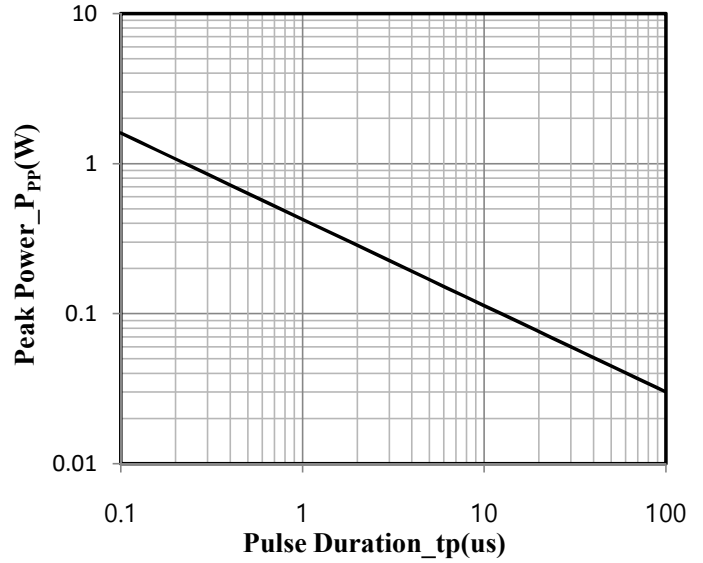


Fig.3 8 × 20us Pulse Waveform

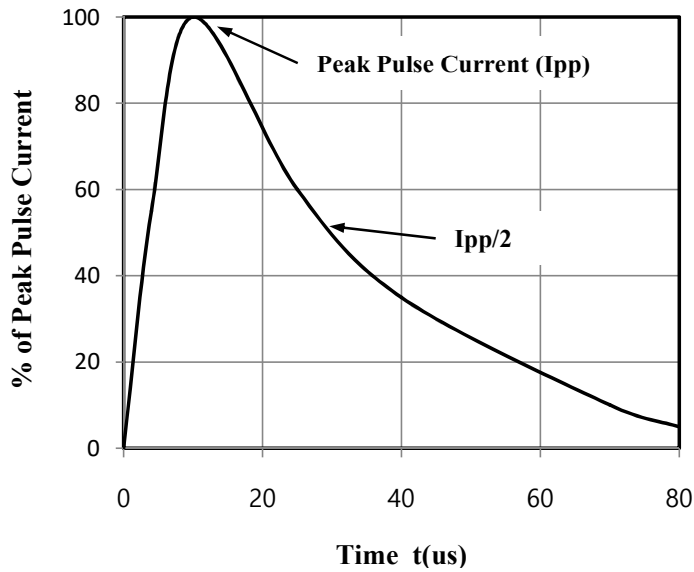


Fig.4 Junction Capacitance vs. Reverse Voltage

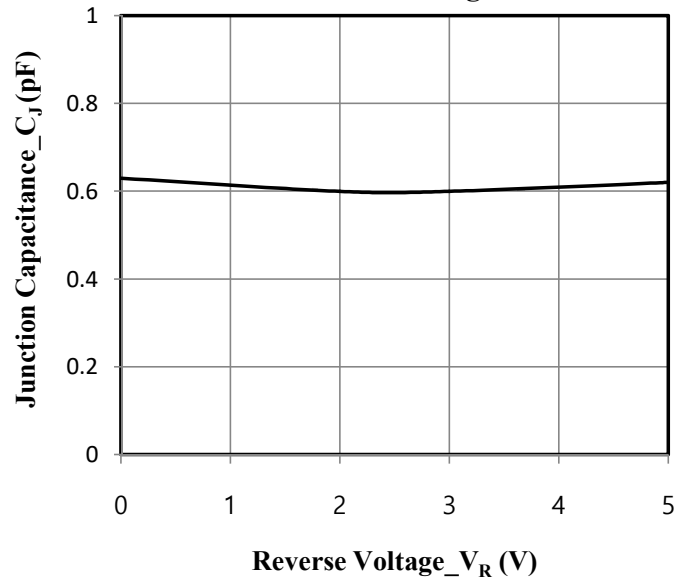


Fig.5 Clamping Voltage vs. Peak Pulse Current (tp=8/20us)

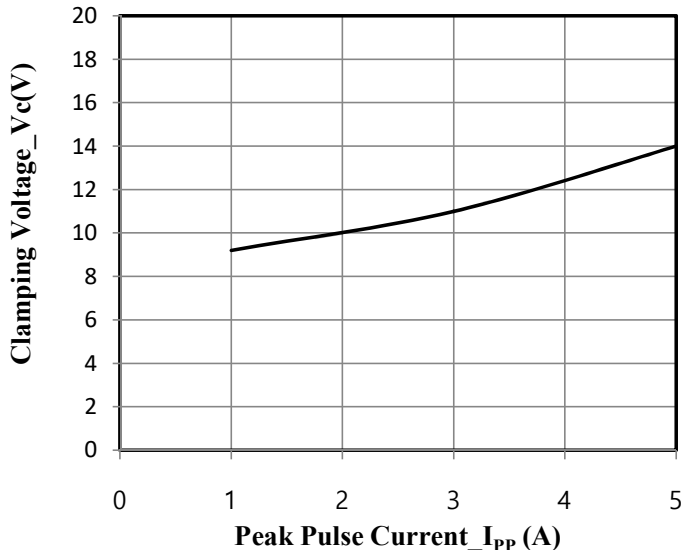
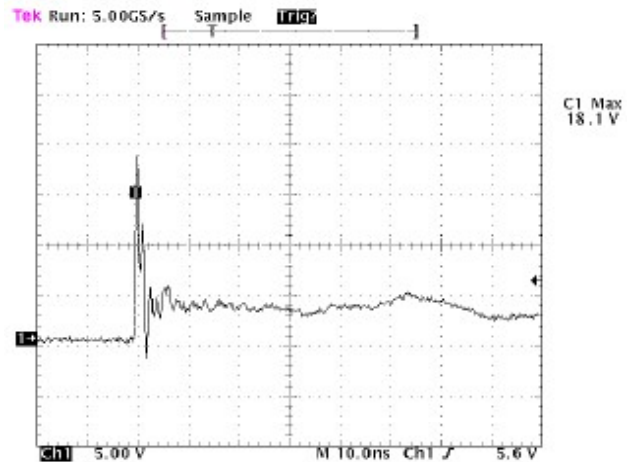


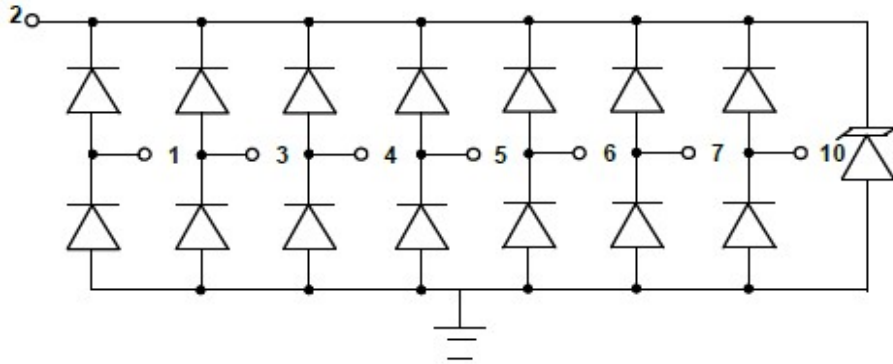
Fig. 6 ESD Clamping Voltage 8kV Contact per IEC61000-4-2



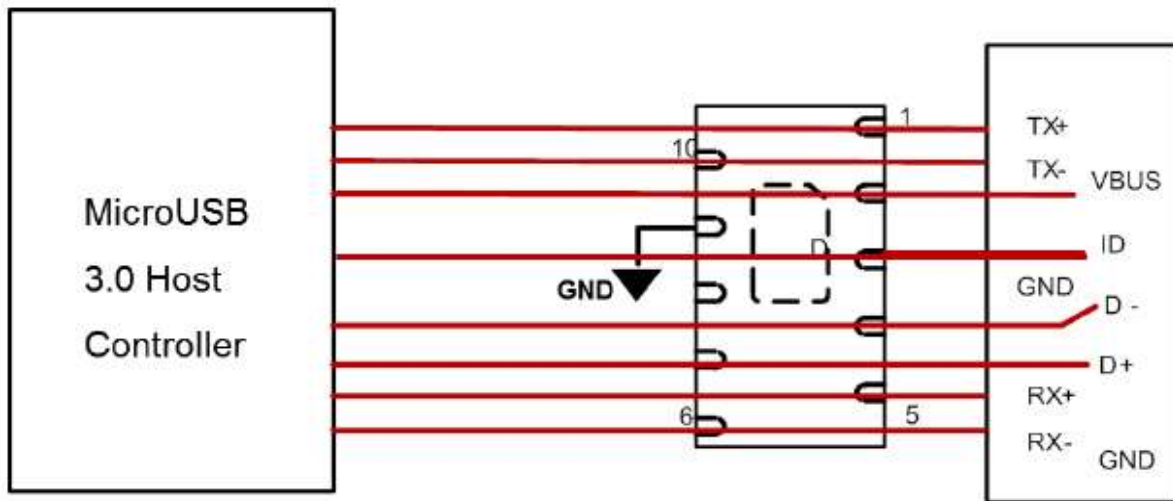
Note: Data is taken with a 10x attenuator

Typical Application

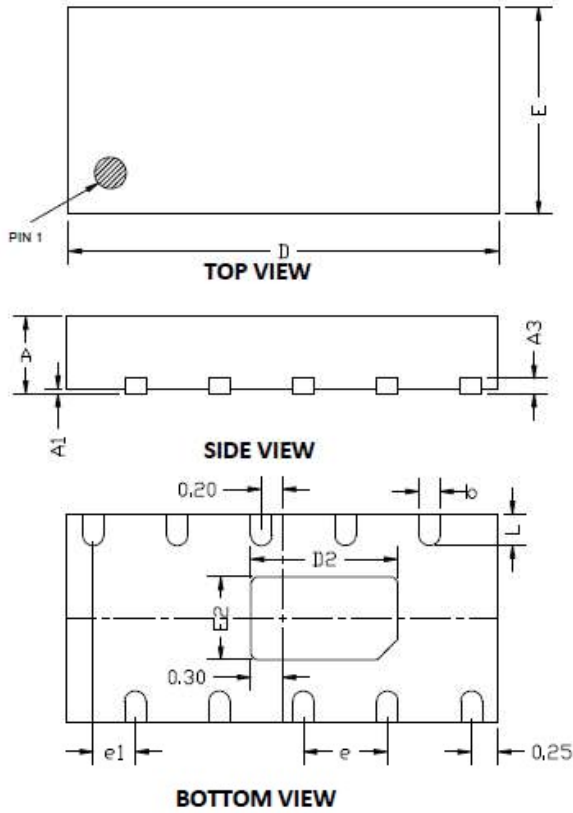
The AR0507PA is designed for easy PCB layout by allowing the traces to run straight through the device. The protected data lines are normally connected at pins 1, 3, 4, 5, 6, 7 & 10, pin 9 is connected to ground. The connection to ground should be made directly to a ground plane. The path length should also be kept as short as possible to minimize parasitic inductance. Pin 2 can be connected to Vcc biased or left not connected depending upon the application.



AR0507PA on USB3.0 Micro-AB/A Application

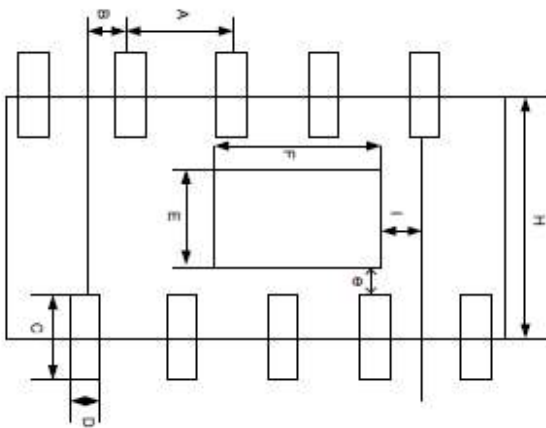


DFN4120-10 Package Outline Drawing



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		

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