



4-Line Ultra Low Capacitance TVS Diode Array

Features

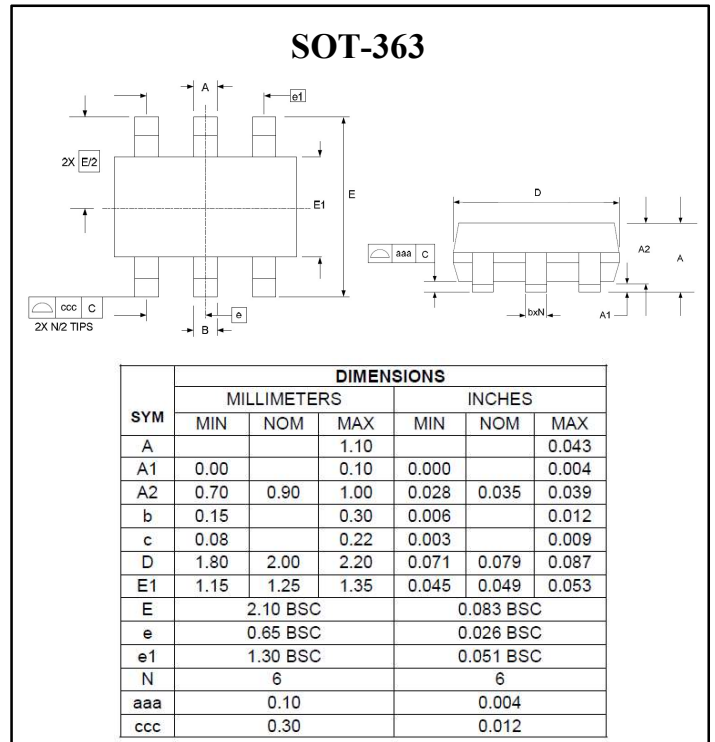
- Ultra low capacitance : 0.3pF typical (I/O to I/O)
- Ultra low leakage : nA level
- Low operating voltage : 5V
- Low clamping voltage
- Up to 4 data lines and one power line protects
- Complies with following standards :
 - IEC 61000-4-2(ESD) immunity test
Air discharge : $\pm 30\text{kV}$, Contact discharge : $\pm 25\text{kV}$
 - IEC61000-4-4 (EFT) 40A (5/50ns)
 - IEC61000-4-5 (Lightning) 5A (8/20us)
- RoHS Compliant

Mechanical Data

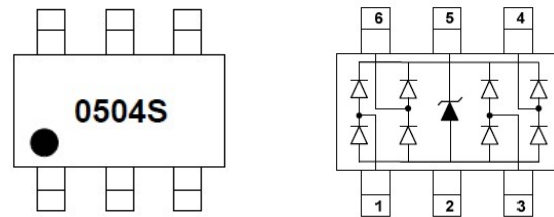
- Package : SOT-363(SC-70)
- Case Material : "Green" Molding Compound.
- Lead Finish : Matte Tin
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity : Level 3 per J-STD-020
- Terminal Connections : See Diagram Below
- Marking Information : See Below

Applications

- USB 2.0 and USB 3.0 Ports
- USB OTG
- Digital Video Interface(DVI)
- Monitor and Flat Panel Displays
- PCI Express and Sserial SATA Ports
- Gigabit Ethernet
- IEEE 1394 Firewire Ports
- Consumer products (STB, DVD, DSC, DVC....)



Marking and Pin Configuration



0504S = Device Marking Code
Dot denotes Pin 1

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)	V _{ESD}	± 30	kV
ESD per IEC 61000-4-2 (Contact)		± 25	
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 (Note 1)	V _{RWM}	-	-	5.0	V	
Breakdown Voltage (Note 1)	V _{BR}	6.0	-	-	V	I _T = 1mA
Reverse Leakage Current (Note 1)	I _R	-	-	0.5	uA	V _{RWM} = 5V
Clamping Voltage (Note 1)	V _C	-	-	15	V	I _{PP} = 1A(8×20us pulse)
Clamping Voltage (Note 1)	V _C	-	-	20	V	I _{PP} = 5A(8×20us pulse)
Junction Capacitance (Note 2)	C _J	-	0.3	0.4	pF	f=1MHz, V _R =0V
Junction Capacitance (Note 1)	C _J	-	-	0.8	pF	f=1MHz, V _R =0V

Note 1 : Any I/O pin to ground, Note 2 : Between I/O pins, (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

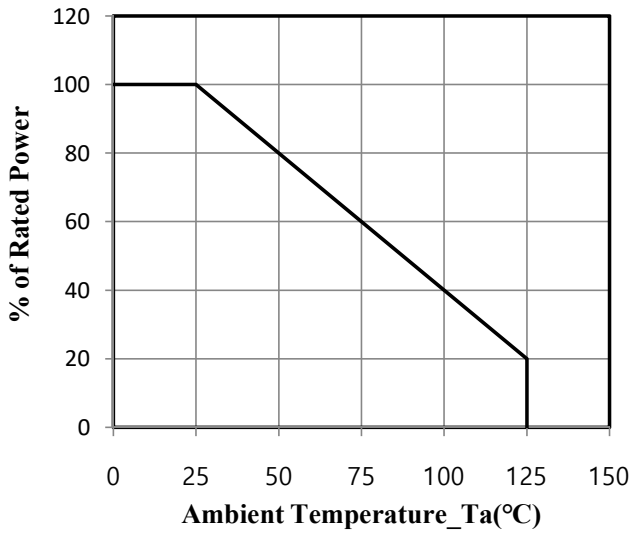


Fig.2 Peak Pulse Power vs. Pulse Time

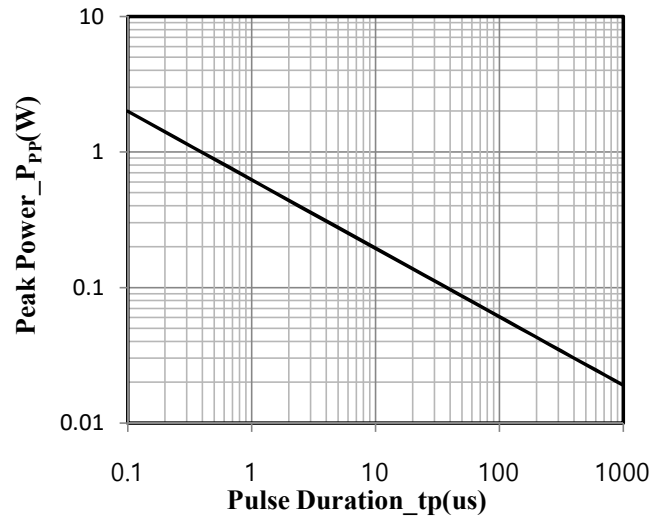


Fig.3 Clamping Voltage vs. Peak Pulse Current (tp=8/20us)

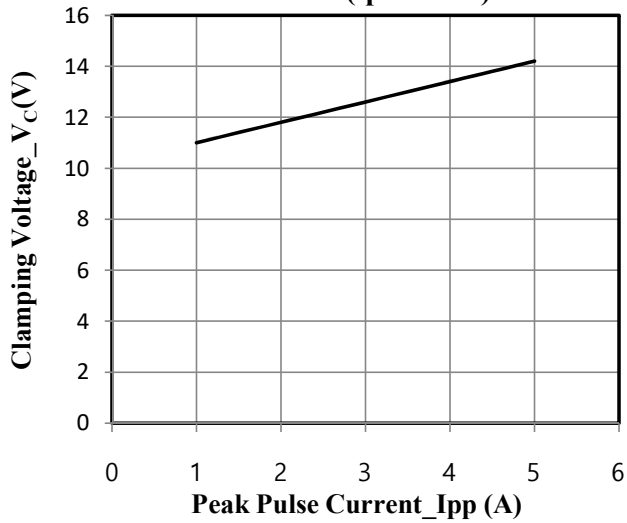


Fig.4 Junction Capacitance vs. Reverse Voltage

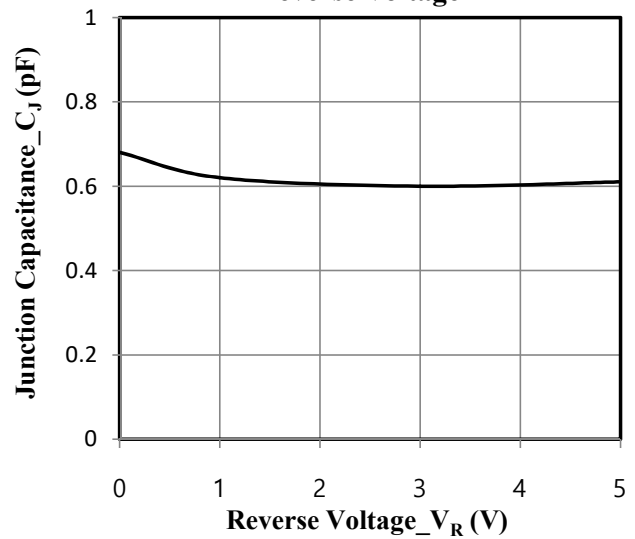


Fig.5 8 × 20us Pulse Waveform

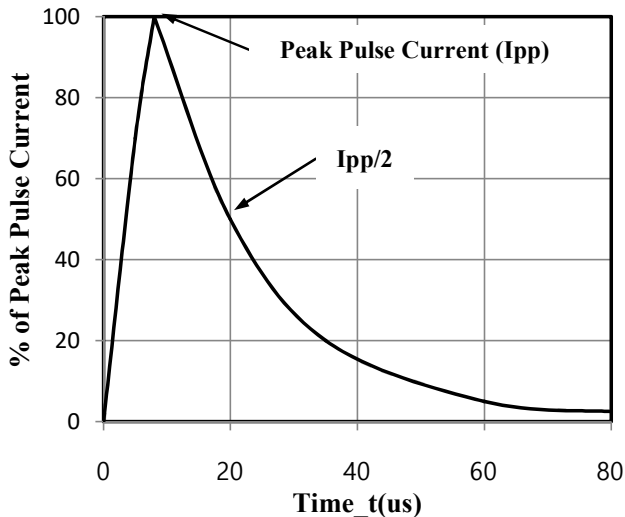
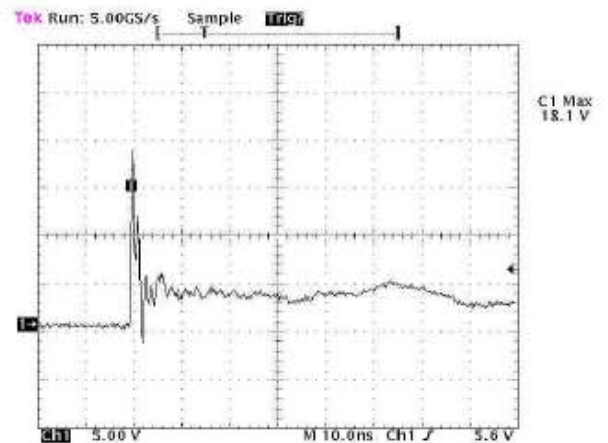
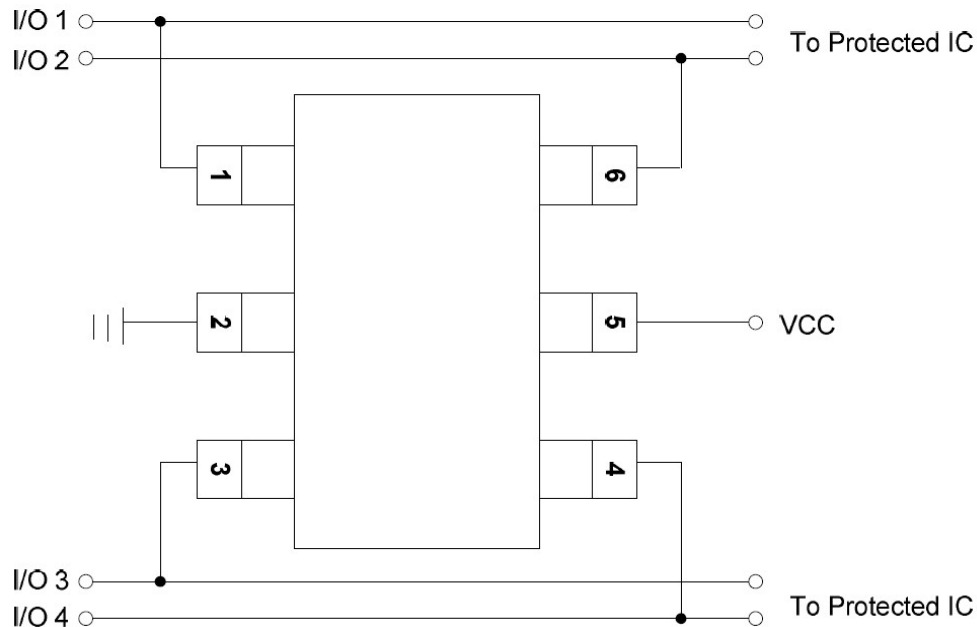


Fig. 6 ESD Clamping Voltage 8kV Contact per IEC61000-4-2

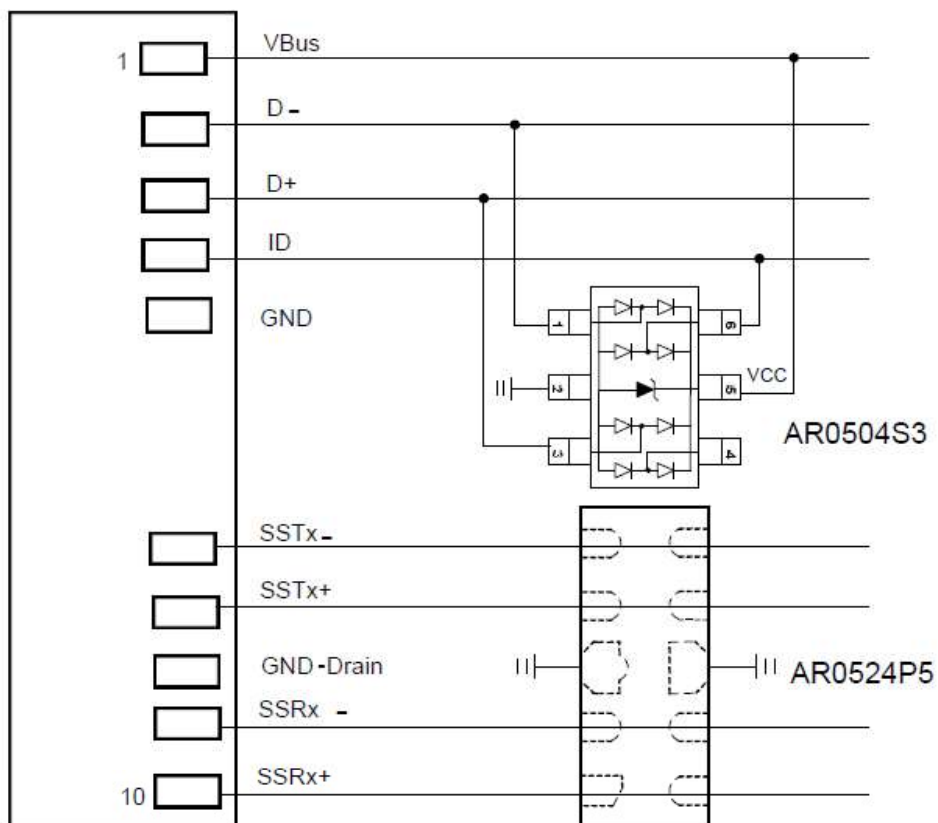


Typical Application

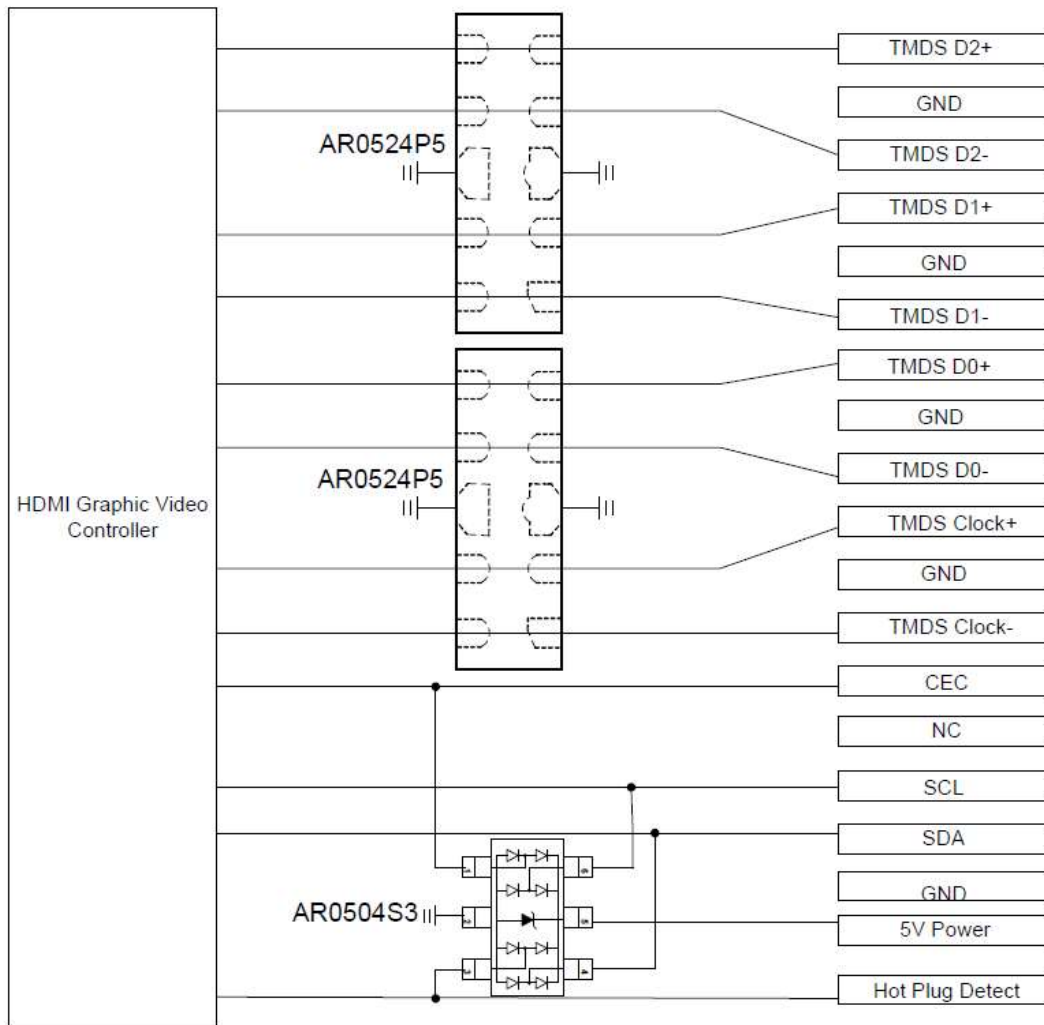
The AR0504S3 is designed to protect four data lines from transient over-voltages by clamping them to fixed reference. When the voltage on the protected line exceeds the reference voltage (plus diode VF) the steering diodes are forward biased, conducting the transient current away from the sensitive circuitry. 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.



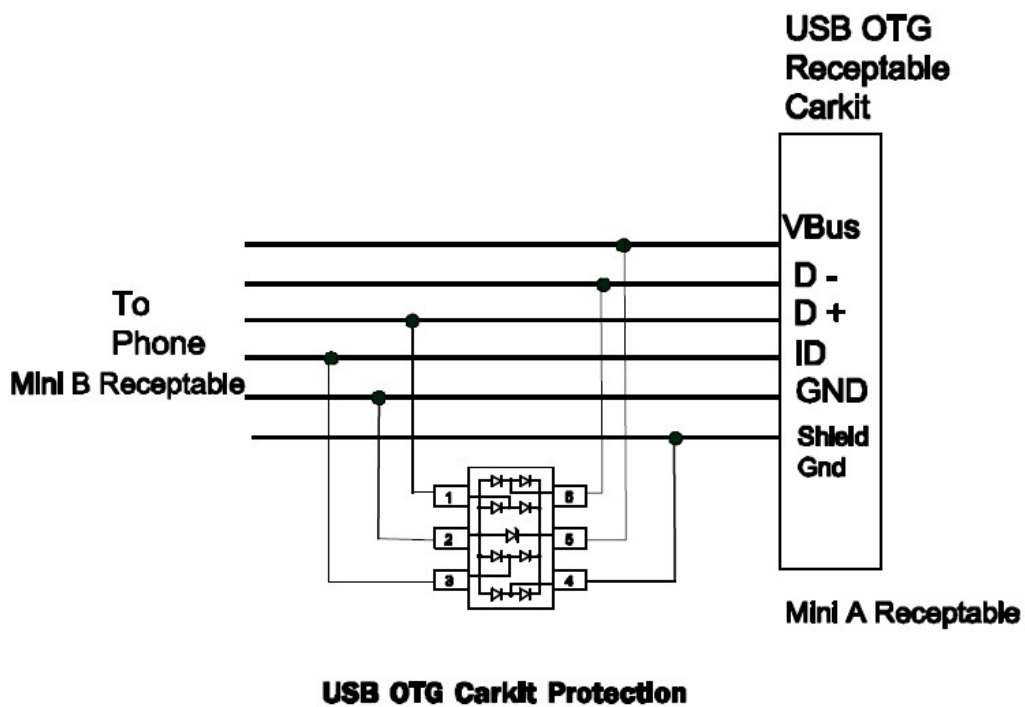
AR0504S3 on USB 3.0 Port Application



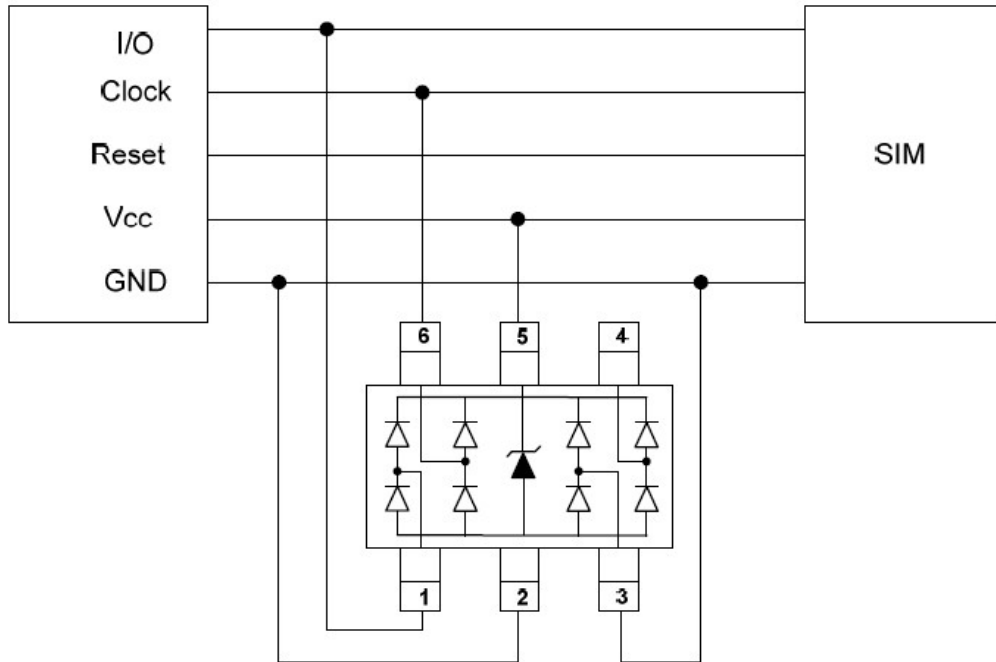
AR0504S3 on HDMI Port Application



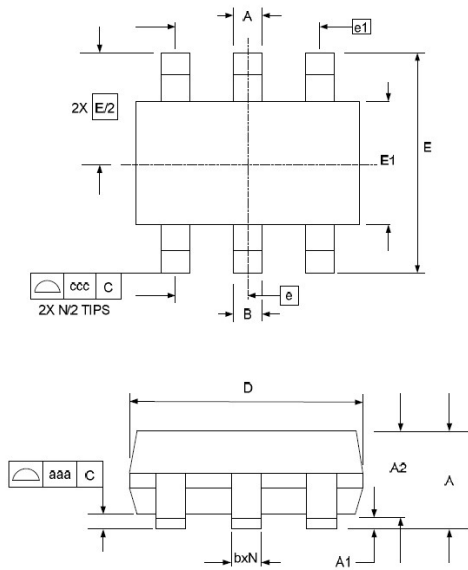
AR0504S3 on USB OTG CarKit Application



AR0504S3 on SIM Port Application

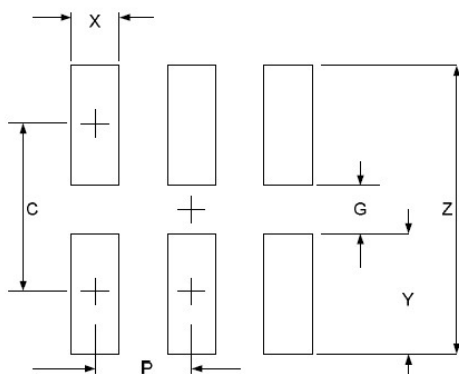


SOT-363 Package Outline Drawing



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A			1.10			0.043
A1	0.00		0.10	0.000		0.004
A2	0.70	0.90	1.00	0.028	0.035	0.039
b	0.15		0.30	0.006		0.012
c	0.08		0.22	0.003		0.009
D	1.80	2.00	2.20	0.071	0.079	0.087
E1	1.15	1.25	1.35	0.045	0.049	0.053
E	2.10 BSC			0.083 BSC		
e	0.65 BSC			0.026 BSC		
e1	1.30 BSC			0.051 BSC		
N	6			6		
aaa	0.10			0.004		
ccc	0.30			0.012		

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	1.85	0.073
G	1.00	0.039
P	0.65	0.026
X	0.40	0.016
Y	0.85	0.033
Z	2.70	0.106