

## DESCRIPTION

The JCA0510D1 is a bi-directional TVS diode, 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 JCA0510D1 has an ultra-low capacitance with a typical value at 0.4pF, and complies with the IEC 61000-4-2 (ESD) standard with  $\pm 15\text{kV}$  air and  $\pm 8\text{kV}$  contact discharge. It is assembled into an ultra-small 0.6x0.3x0.3mm lead-free DFN package. The small size, ultra-low capacitance and high ESD surge protection make JCA0510D1 an ideal choice to protect cell phone, digital video interfaces and other high speed ports.

## APPLICATIONS

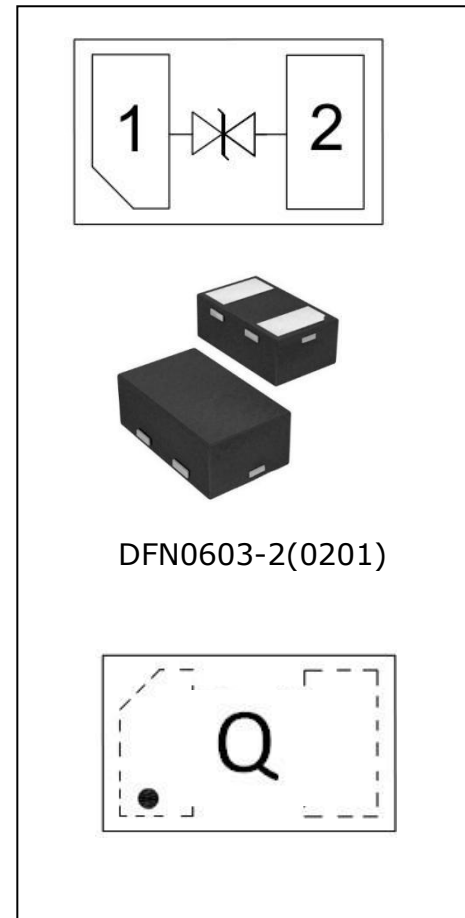
- ✧ Smart phones.
- ✧ Display Ports.
- ✧ MDDI Ports.
- ✧ USB Ports.
- ✧ Digital Video Interface (DVI).
- ✧ PCI Express and Serial SATA Ports.

## FEATURES

- ✧ Ultra small package: 0.6x0.3x0.3mm.
- ✧ Ultra low capacitance: 0.35pF typical.
- ✧ Ultra low leakage: nA level.
- ✧ Low operating voltage: 5V.
- ✧ Low clamping voltage.
- ✧ 2-pin leadless package.
- ✧ Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test Air discharge:  $\pm 20\text{kV}$
  - Contact discharge:  $\pm 15\text{kV}$
  - IEC61000-4-5 (Lightning) 4A (8/20 $\mu\text{s}$ ).
- ✧ RoHS Compliant.
- ✧ Lead Finish: NiPdAu.

## MECHANICAL CHARACTERISTICS

- ✧ DFN0603-2(0201) Package.
- ✧ Tape & Reel : 10,000pcs.
- ✧ Reel Size : 7 inch.



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

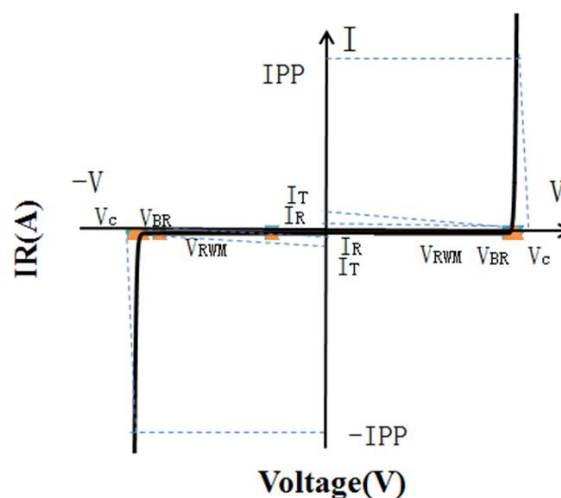
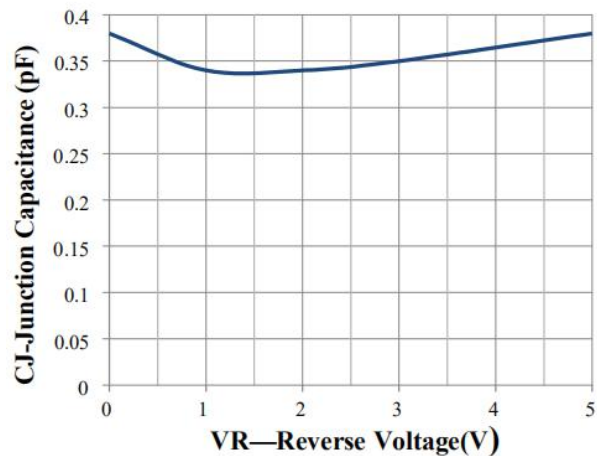
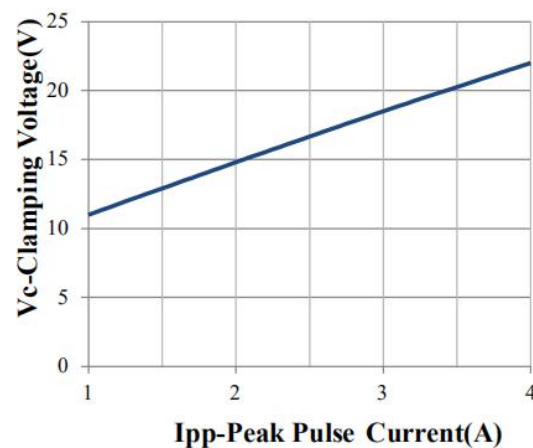
Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 $\mu\text{s}$ )	Ppk	80	W
Peak Pulse Current (8/20 $\mu\text{s}$ )	IPP	4	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	VESD	$\pm 20$ $\pm 15$	kV
Operating Temperature Range	TJ	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	Tstg	-55 to +150	$^{\circ}\text{C}$

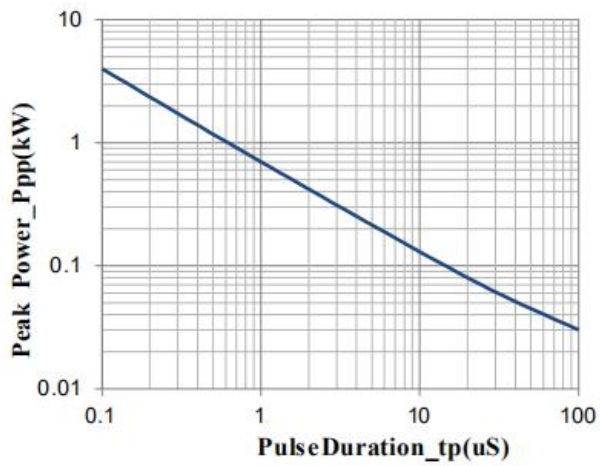
**ELECTRICAL CHARACTERISTICS( $T_A=25^{\circ}\text{C}$  unless otherwise specified)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Reverse Working Voltage	$V_{\text{RWM}}$				5.0	V
Breakdown Voltage	$V_{\text{BR}}$	$I_{\text{T}} = 1\text{mA}$	6.0	7.5	8.5	V
Reverse Leakage Current	$I_{\text{R}}$	$V_{\text{RWM}} = 5.0\text{V}$			0.5	$\mu\text{A}$
Clamping Voltage	$V_{\text{C}}$	$I_{\text{PP}} = 1\text{A}$ (8 x 20 $\mu\text{s}$ pulse)			12	V
Clamping Voltage	$V_{\text{C}}$	$I_{\text{PP}} = 4\text{A}$ (8 x 20 $\mu\text{s}$ pulse)			20	V
Junction Capacitance	$C_{\text{J}}$	$V_{\text{R}} = 0\text{V}$ , $f = 1\text{MHz}$		0.35	0.4	pF

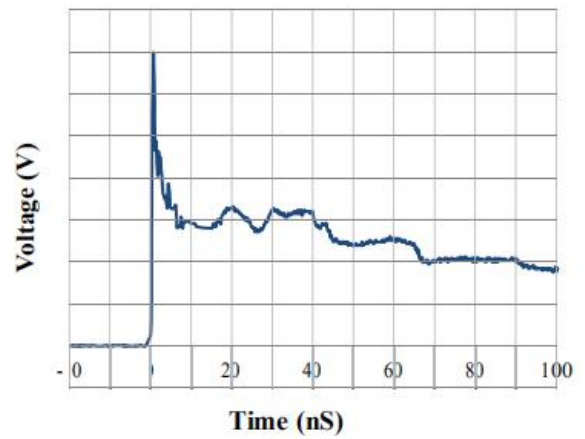
**ELECTRICAL PARAMETER**

Symbol	Parameter
$V_{RWM}$	Peak Reverse Working Voltage
$I_R$	Reverse Leakage Current @ $V_{RWM}$
$V_{BR}$	Breakdown Voltage @ $I_T$
$I_T$	Test Current
$I_{PP}$	Maximum Reverse Peak Pulse Current
$V_C$	Clamping Voltage @ $I_{PP}$

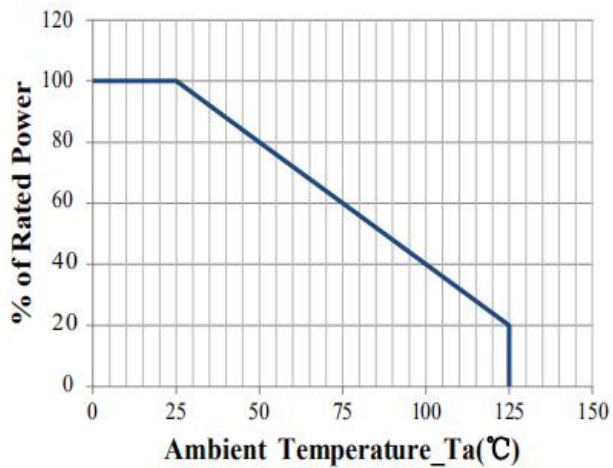

**TYPICAL CHARACTERISTICS**( $T_A=25^{\circ}\text{C}$  unless otherwise Specified)

**Junction Capacitance vs. Reverse Voltage**

**Clamping Voltage vs. Peak Pulse Current**



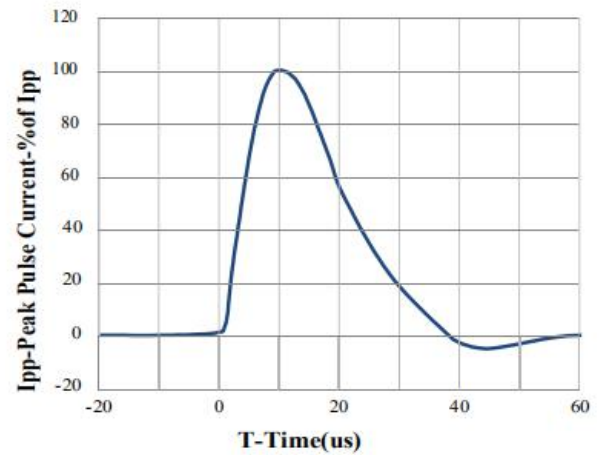
**Peak Pulse Power vs. Pulse Time**



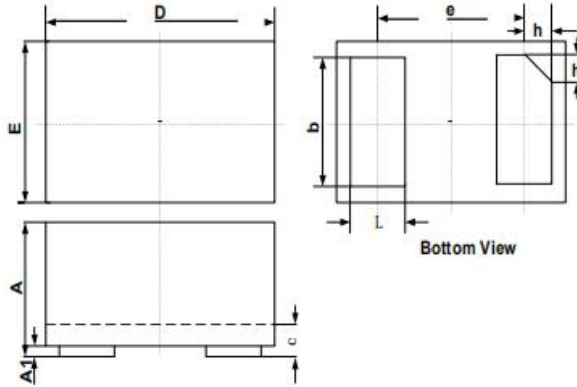
**IEC61000-4-2 Pulse Waveform**



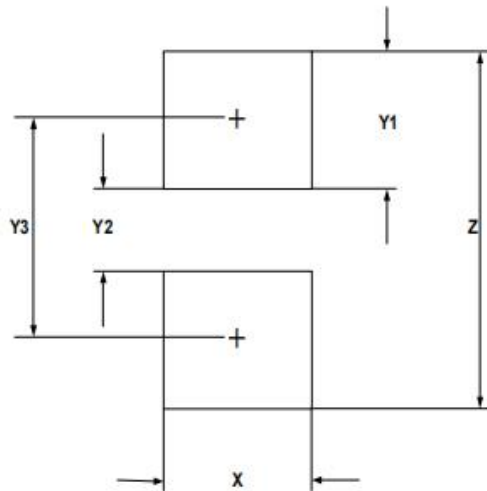
**Power Derating Curve**



**8 X 20us Pulse Waveform**

**DFN0603-2(0201) PACKAGE OUTLINE & DIMENSIONS**


SYM	DIMENSIONS		
	MILLIMETERS		
	MIN	NOM	MAX
A	0.230		0.330
A1	0.000	0.020	0.050
b	0.215	0.245	0.275
c	0.120	0.150	0.180
D	0.550	0.600	0.650
e	0.355 BSC		
E	0.250	0.300	0.350
L	0.160	0.190	0.220
h	0.079 BSC		

**SUGGESTED LAND PATTERN**


SYM	DIMENSIONS	
	MILLIMETERS	INCHES
X	0.30	0.012
Y1	0.25	0.010
Y2	0.15	0.006
Y3	0.40	0.016
Z	0.65	0.026

Website: <http://www.jksemi.com>

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