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CMTLCP0201CR35BFE

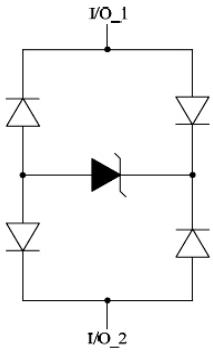
Ultra-Low Capacitance TVS Protection

◆ DESCRIPTIONS

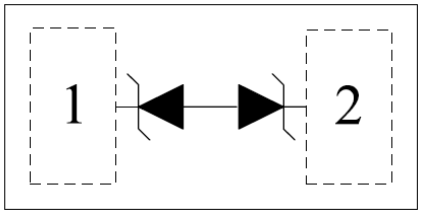
CMTLCP0201CR35BFE is an ultra-low capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 0.35pF only, CMTLCP0201CR35BFE is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4 (±15kV air, ±8kV contact discharge), IEC 61000-4-4 (electrical fast transient - EFT) (40A, 5/50 ns), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

CMTLCP0201CR35BFE uses ultra-small chip scale package. Each CMTL0201CR35BFE device can protect one high-speed data line. It offers system designers flexibility to protect single data line where space is a premium concern. The combined features of low capacitance, ultra-small size and high ESD robustness make CMTLCP0201CR35BFE ideal for high-speed data port and high-frequency line (e.g.,USB 2.0 & antenna line) applications, such as cellular phones and HD visual devices.

◆ Circuit Diagram



◆ Pin Configuration



0201 CSP
(Top View)

◆ FEATURES

1、Transient protection for high-speed data lines
IEC 61000-4-2 (ESD) ±15kV (Air)
±8kV (Contact)
IEC 61000-4-4 (EFT) 40A (5/50 ns)
Cable Discharge Event (CDE)
2、Package optimized for high-speed lines
3、Ultra-small package (0.6mm×0.3mm×0.27mm)
4、Protects one data, control or power line
5、Low capacitance: 0.35pF (Typical)
6、Low leakage current: 0.1μA @ VRWM (Typical)
7、Low clamping voltage
8、Each I/O pin can withstand over 1000 ESD strikes for ±8kV contact discharge

◆ Applications

1、Serial ATA
2、PCI Express
3、Desktops, Servers and Notebooks
4、Cellular Phones
5、MDDI Ports
6、USB2.0 Power and Data Line Protection
7、Display Ports
8、HDMI/DVI ports

◆ Mechanical Characteristics

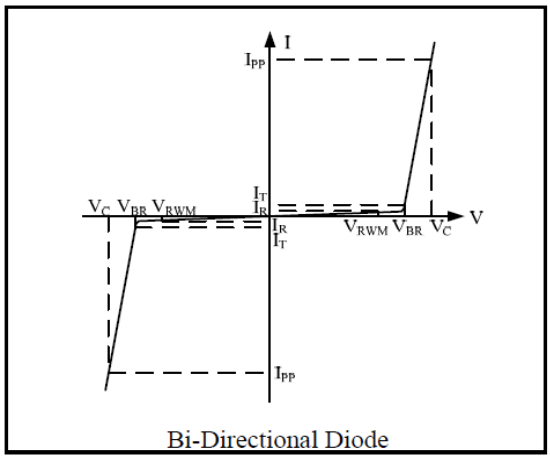
1、Chip scale package
2、Flammability Rating: UL 94V-0
3、Marking: Part number (P)
4、Packaging: Tape and Reel

◆ Absolute Maximum Rating

Symbol	Parameter	Value	Units
V_{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	±17 ±12	kV
T_{OPT}	Operating Temperature	-55/+125	℃
T_{STG}	Storage Temperature	-55/+150	℃

◆ Electrical Characteristics (T = 25℃)

Symbol	Parameter
V_{RWM}	Nominal Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Reverse Breakdown Voltage @ I_T
I_T	Test Current for Reverse Breakdown
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Peak Pulse Current
C_{ESD}	Parasitic Capacitance
V_R	Reverse Voltage
f	Small Signal Frequency

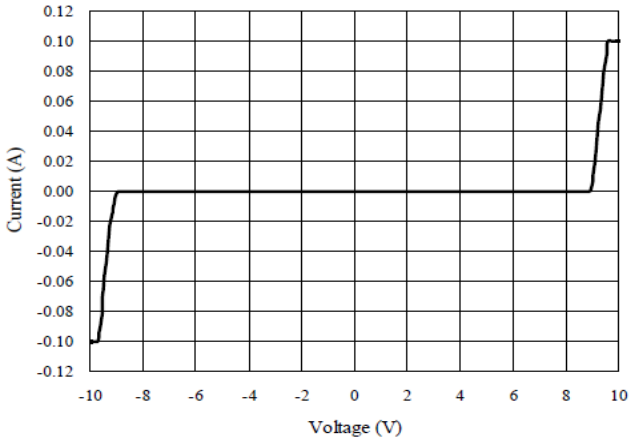


Bi-Directional Diode

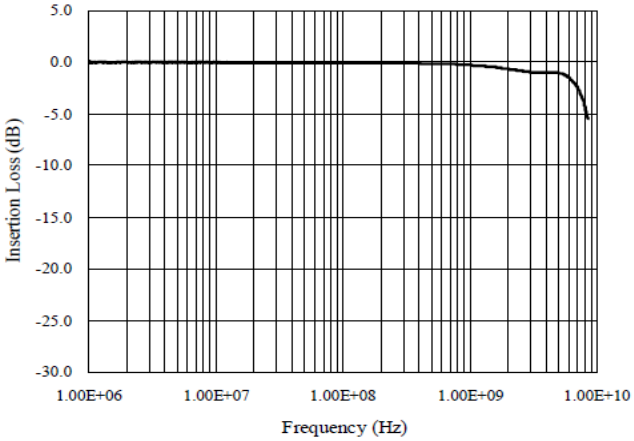
Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}				5.0	V
I_R	V_{RWM} = 5V, T = 25℃ Between I/O and I/O		0.1	1.0	μA
V_{BR}	I_T = 1mA Between I/O and I/O	7.0	8.8	11	V
V_C	I_{PP} = 1A, tp = 8/20μs Between I/O and I/O			12	V
V_C	I_{PP} = 2A, tp = 8/20μs Between I/O and I/O			14	V
C_{ESD}	V_R = 0V, f = 1MHz Between I/O and I/O		0.35	0.50	pF

◆ TYPICAL ELECTRICAL CHARACTERISTICS CURVE

Voltage Sweeping of I/O to I/O

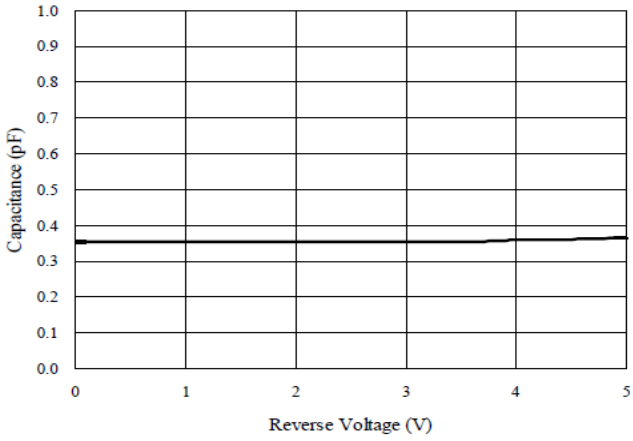


Insertion Loss S21 of I/O to I/O

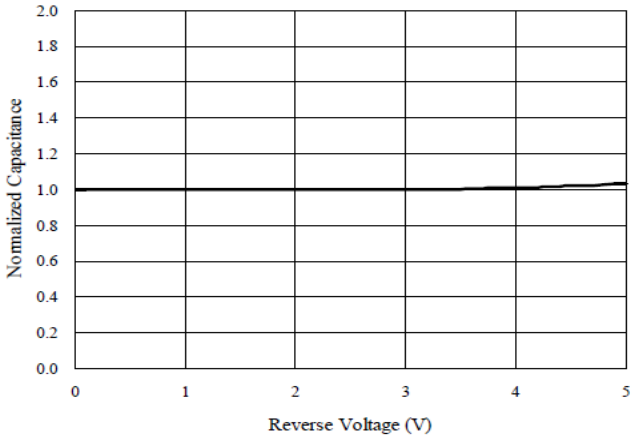


Capacitance vs. Voltage of I/O to I/O (f = 1MHz)

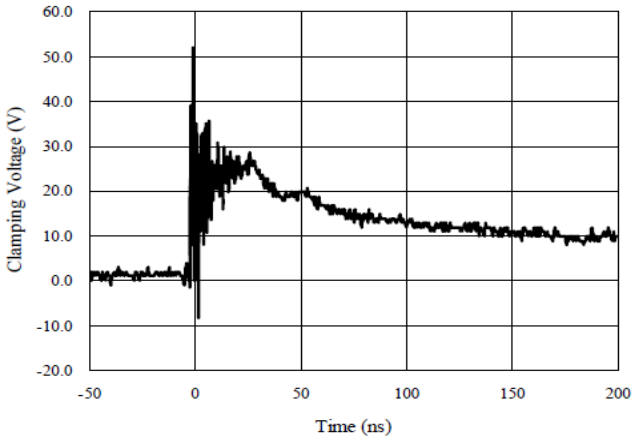
Capacitance *vs.* Reverse Voltage



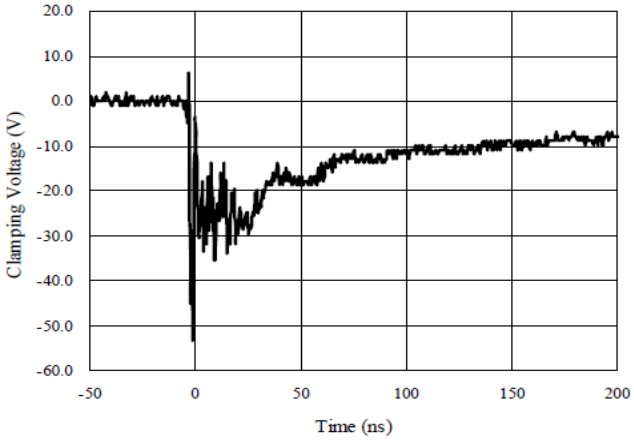
Normalized Capacitance *vs.* Reverse Voltage



ESD Clamping of I/O to I/O (+8kV Contact per IEC 61000-4-2)



ESD Clamping of I/O to I/O (-8kV Contact per IEC 61000-4-2)

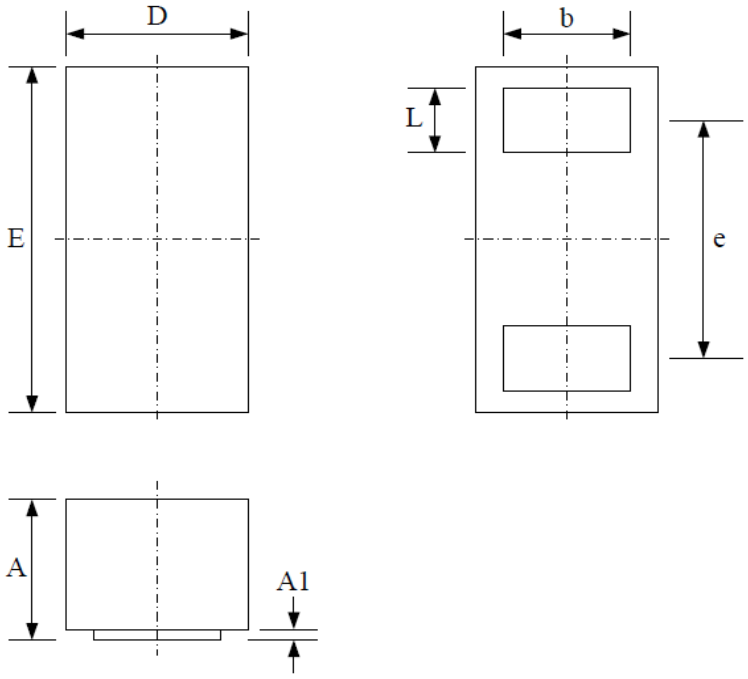


◆ PACKAGE OUTLINE

1、0201 CSP package

2、2 bumps, very small package

3、Thermally-Enhanced



Package Dimensions (Controlling dimensions are in millimeters)

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Minimum	Maximum	Minimum	Maximum
A	0.240	0.300	0.009	0.012
A1	0.000	0.010	0.000	0.001
D	0.300 BSC		0.012 BSC	
E	0.600 BSC		0.024 BSC	
b	0.190	0.230	0.007	0.009
e	0.400 BSC		0.016 BSC	
L	0.100	0.140	0.004	0.006