

Product Summary

V_{BR} (min)	I_{PP} (max)	C_T (typ)
6V	4.7A	0.55pF

Description

The DT1446-04SO is a high performance device suitable for protecting four high speed I/Os and one V_{CC}. These devices are assembled in SOT26 package. They have high ESD surge capability and low capacitance.

Applications

- Typically Used for High Speed Ports such as USB 2.0, IEEE1394, HDMI, Laptop and Personal Computers, Flat Panel Displays, Video Graphics Displays, SIM Ports



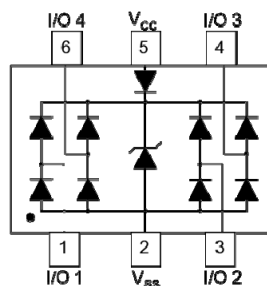
Top View

Features

- IEC 61000-4-2 (ESD): Air – ±19kV, Contact – ±16kV
- Low Channel Input Capacitance of 0.55pF Max
- ESD Protection for four I/Os and one V_{CC}
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. “Green” Device (Note 3)**

Mechanical Data

- Case: SOT26
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020 (Lead Free Plating). Solderable per MIL-STD-202, Method 208 **e3**
- Weight: 0.016 grams (approximate)



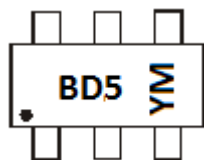
Device Schematic

Ordering Information (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DT1446-04SO-7	Standard	BD5	7	8	3,000/Tape & Reel

- Notes:
- EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 - See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 - For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



BD5 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: A = 2013)
 M = Month (ex: 9 = September)

Date Code Key

Year	2013	2014	2015	2016	2017	2018
Code	A	B	C	D	E	F

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Current ,per IEC 61000-4-5	I _{PP_I/O}	4.7	A	I/O to V _{SS} , 8/20μs
Operating Voltage (DC)	V _{DC}	6	V	V _{CC} to V _{SS}
ESD Protection – Contact Discharge	V _{ESD_I/O}	±16	kV	I/O to V _{SS} , per IEC 61000-4-2
	V _{ESD_VCC}	±30	kV	V _{CC} to V _{SS} , per IEC 61000-4-2
ESD Protection – Air Discharge, per IEC 61000-4-2	V _{ESD_I/O}	±19	kV	I/O to V _{SS} , per IEC 61000-4-2
	V _{ESD_VCC}	±30	kV	V _{CC} to V _{SS} , per IEC 61000-4-2

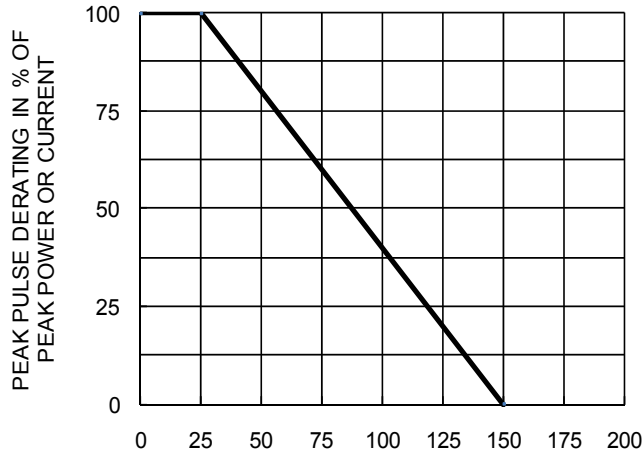
Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation Typical (Note 5)	P _D	300	mW
Thermal Resistance, Junction to Ambient Typical (Note 5)	R _{θJA}	417	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

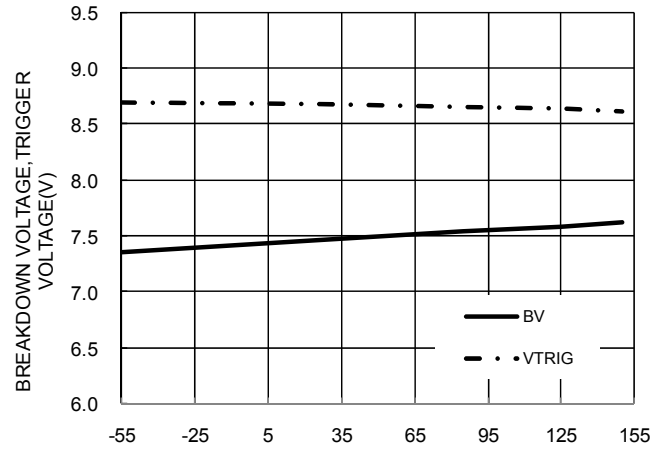
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Working Voltage	V _{RWM}	—	—	5.0	V	V _{CC} to V _{SS}
Reverse Current (Note 6)	I _R (V _{CC} to V _{SS})	—	—	5.0	μA	V _R = V _{RWM} = 5V, V _{CC} to V _{SS}
Reverse Current (Note 6)	I _R (I/O to V _{SS})	—	—	1.0	μA	V _R = V _{RWM} = 5V, any I/O to V _{SS}
Reverse Breakdown Voltage	V _{BR}	6.0	—	9.0	V	I _R = 1mA, V _{CC} to V _{SS}
Forward Clamping Voltage	V _F	—	0.8	1.0	V	I _F = 15mA, V _{SS} to V _{CC}
Reverse Clamping Voltage (Note 7)	V _{C_I/O}	—	8.5	—	V	I _{PP} = 4.7A, I/O to V _{SS} , 8/20μS
ESD Clamping Voltage	V _{ESD_VCC}	—	10	—	V	TLP, 20A, tp = 100 ns, V _{CC} to V _{SS}
	V _{ESD_I/O}	—	12	—	V	TLP, 20A, tp = 100 ns, I/O to V _{SS}
Dynamic Resistance	R _{DIF_VCC}	—	0.14	—	Ω	TLP, 20A, tp = 100 ns, V _{CC} to V _{SS}
	R _{DIF_I/O}	—	0.3	—	Ω	TLP, 20A, tp = 100 ns, I/O to V _{SS}
Channel Input Capacitance	C _{I/O} to V _{SS}	—	0.55	0.65	pF	V _R = 2.5V, V _{CC} = 5V, f = 1MHz
Channel Input Capacitance	C _{I/O} to V _{SS}	—	0.65	—	pF	V _R = 2.5V, V _{CC} = floating, f = 1MHz
Variation of Channel Input Capacitance	C _{I/OMAX} -C _{I/OMIN}	—	0.03	—	pF	V _{CC} = 5V, V _{SS} = 0V, I/O = 2.5V, f = 1MHz, T = +25°C, C _{I/OMAX} -C _{I/OMIN}
Variation of Channel Input Capacitance	C _{I/OMAX} -C _{I/OMIN}	—	0.05	—	pF	V _{CC} = floating, V _{SS} = 0V, I/O = 2.5V, f = 1MHz, T = +25°C, C _{I/OMAX} -C _{I/OMIN}

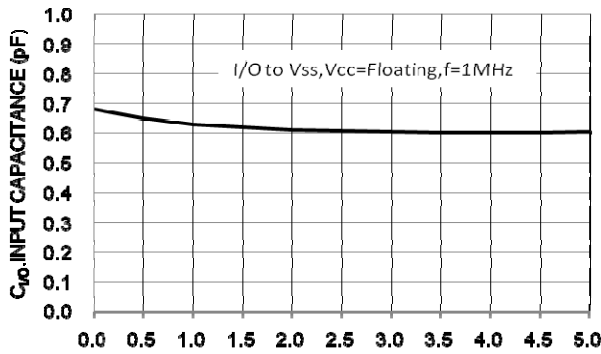
- Notes:
- Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes, Inc. suggested pad layout AP02001, which can be found on our website at <http://www.diodes.com>.
 - Short duration pulse test used to minimize self-heating effect.
 - Clamping voltage value is based on an 8x20μs peak pulse current (I_{pp}) waveform.



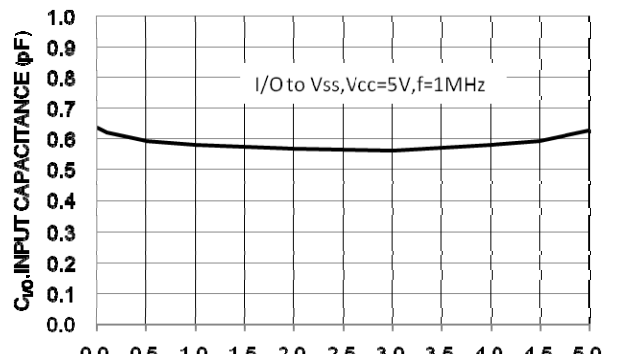
TA, AMBIENT TEMPERATURE (°C)
Figure 1. Pulse Derating Curve



TA, AMBIENT TEMPERATURE (°C)
Figure 2. BV, Trigger Voltage vs. Ambient Temperature



Vio, INPUT VOLTAGE (V)
Figure 3. Input Capacitance vs. Input Voltage



Vio, INPUT VOLTAGE (V)
Figure 4. Input Capacitance vs. Input Voltage

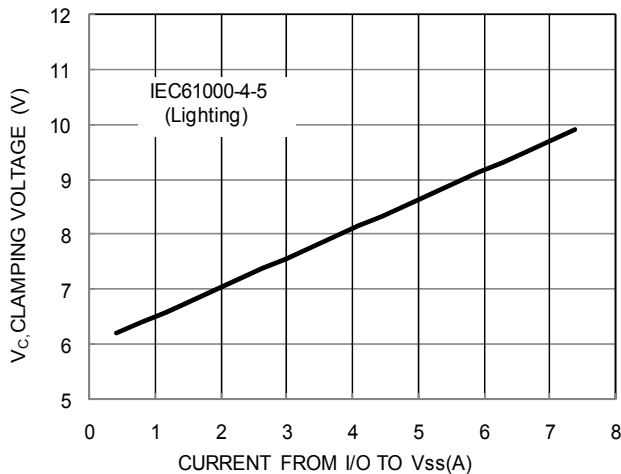


Figure 5. Clamping Voltage Characteristic

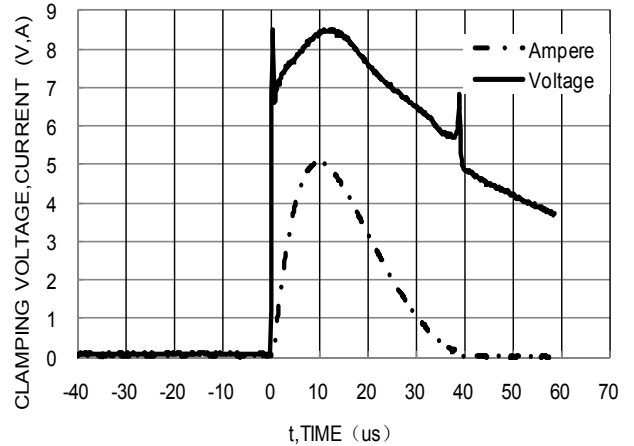


Figure 6. Waveform of Clamping Voltage, Current vs. Time(8/20us, I/O to Vss)

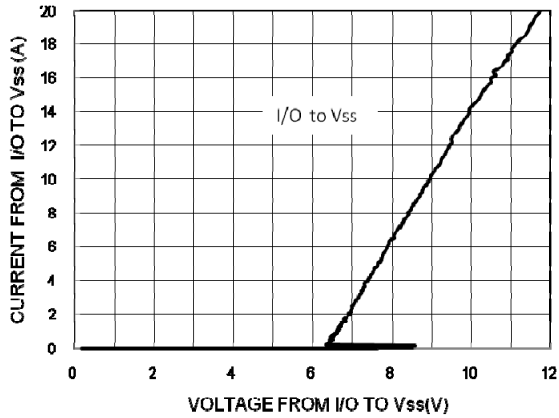


Figure 7. Transmission Line Pulsing (TLP) Measurement Current vs. Voltage

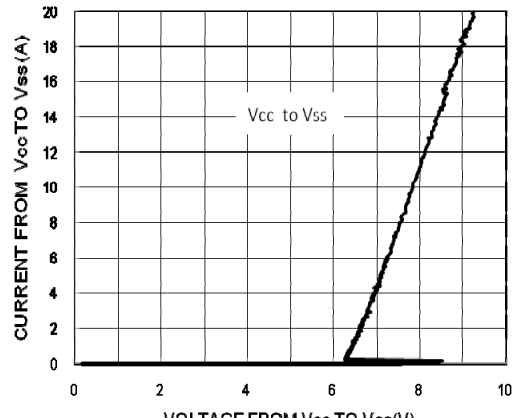
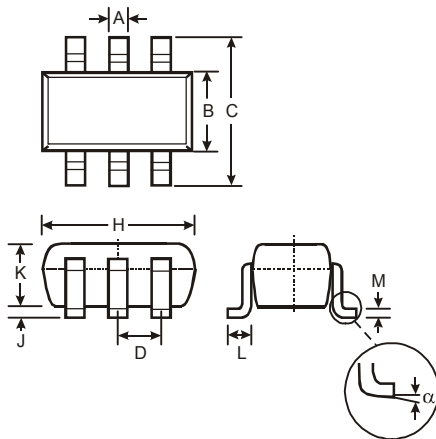


Figure 8. Transmission Line Pulsing (TLP) Measurement Current vs. Voltage

Package Outline Dimensions

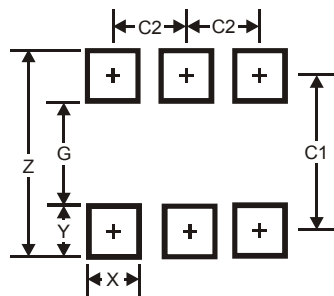
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT26			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	—	—	0.95
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
α	0°	8°	—
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
Z	3.20
G	1.60
X	0.55
Y	0.80
C1	2.40
C2	0.95

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