

Product Summary

V _F (Typ)	V _P (Typ)	C _{OUT} (Typ)
0.8V	5V	1.5pF

Description

DM1231-02SO is a high-performance device suitable for protecting two high-speed channels. This product is assembled in SOT26 package. It has high ESD surge capability and low capacitance.

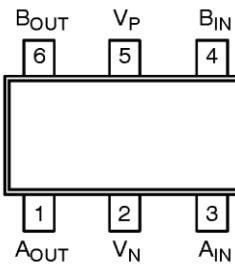
Applications

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



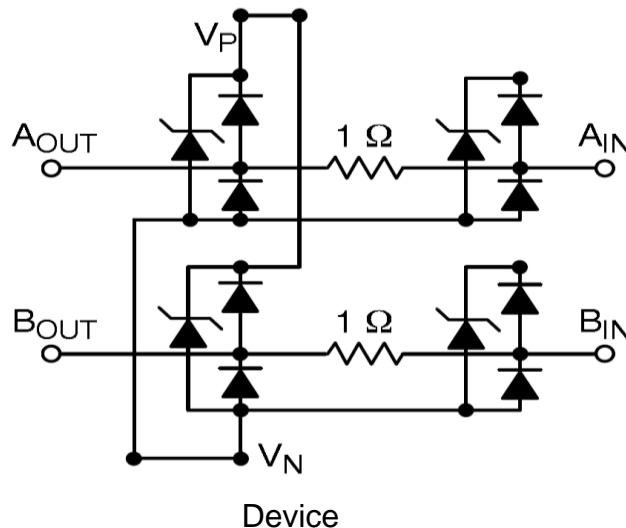
PINOUT Diagrams

Features

- Contact discharge per IEC61000-4-2 standard: ± 12 kV (OUT Pins), ± 4 kV(IN Pins)
- Withstands over 1000 ESD Strikes
- 1.5pF Typical Capacitance from OUT to V_N
- Two channels of ESD Protection
- **Totally Lead-Free & Fully 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
- Weight: 0.016 grams (Approximate)



Device

Ordering Information (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DM1231-02SO-7	Standard	BF4	7	8	3,000/Tape & Reel

Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. 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.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



BF4= Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: D = 2016)
 M = Month (ex: 9 = September)
 Note: “—” represents internal code

Date Code Key

Year	2015	2016	2017	2018	2019	2020						
Code	C	D	E	F	G	H						
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 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Value	Unit
Operating Supply Voltage (V_P)	6	V
Diode Forward Current(A_{OUT}/B_{OUT} Side)	8	mA
Continuous Current through Signal Pins (IN to OUT) 1,000 hours	125	mA
ESD Protection – Contact Discharge (Note5)	± 12 ± 4	kV

Thermal Characteristics

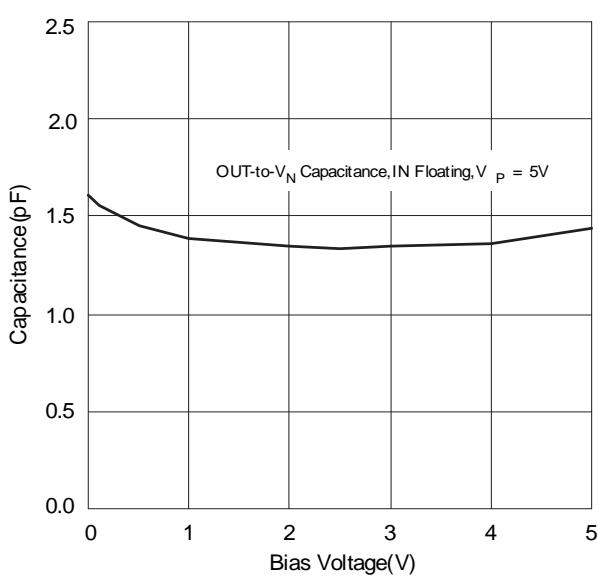
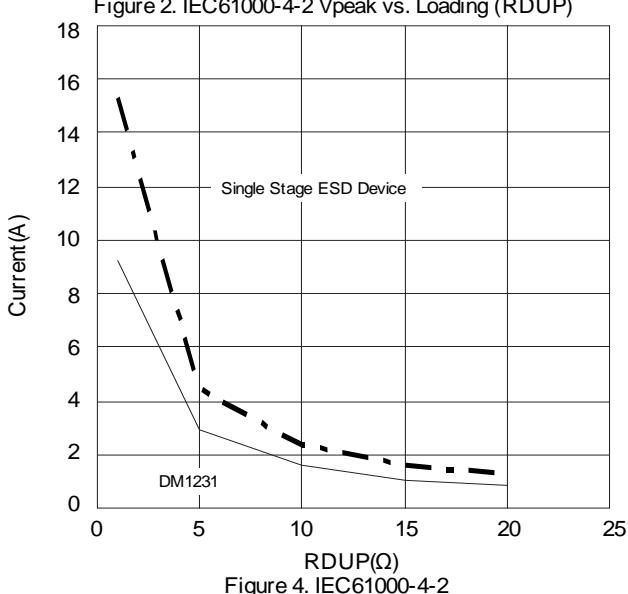
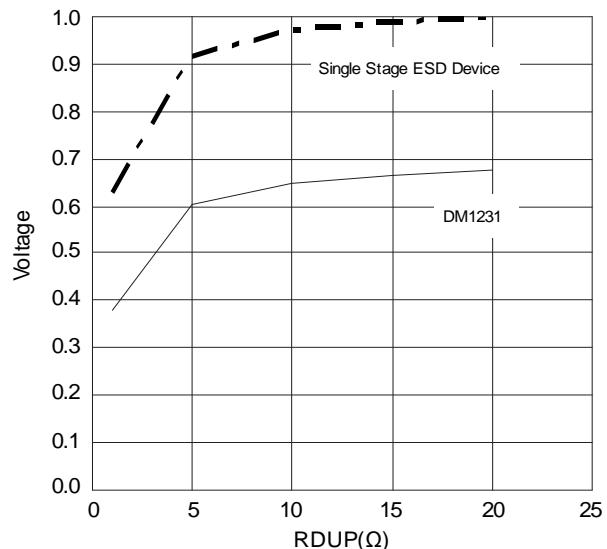
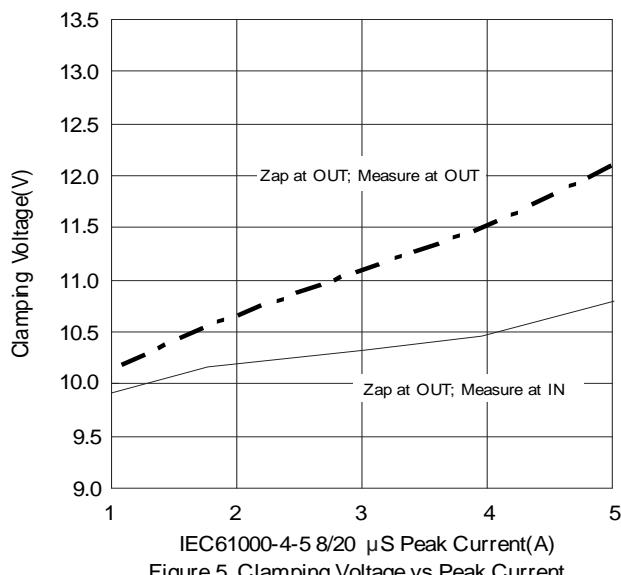
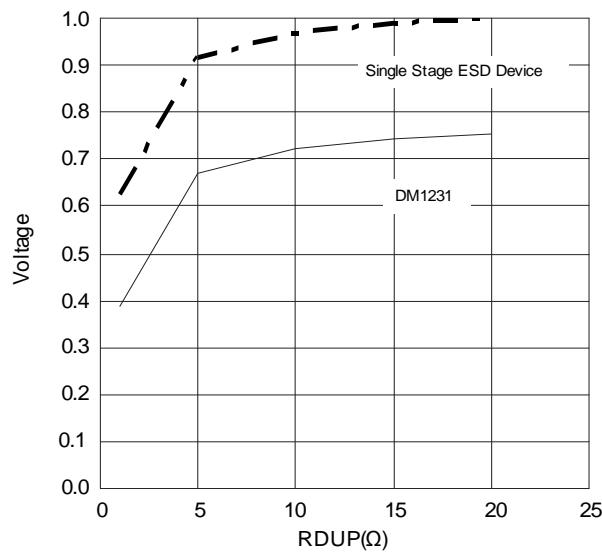
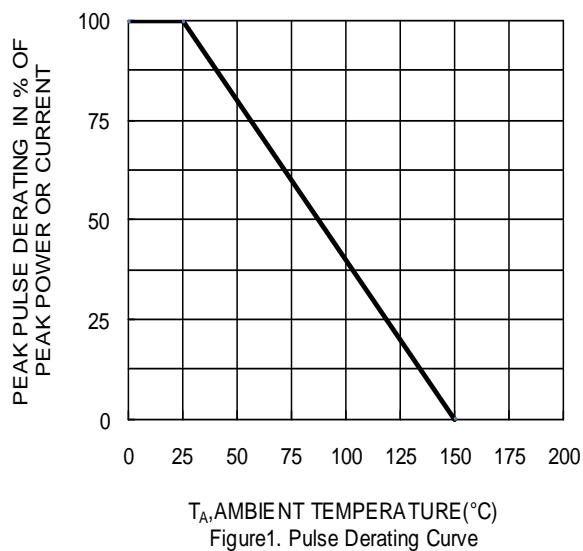
Characteristic	Symbol	Value	Unit
Power Dissipation Typical (Note 6)	P_D	300	mW
Thermal Resistance, Junction to Ambient Typical (Note 6)	$R_{\theta JA}$	417	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Operating Supply Voltage	V_P	—	5	5.5	V	—
Reverse Current (Note 7)	I_R	—	—	1	µA	$V_P = 5\text{V}$, V_P to V_N
Diode Forward Voltage	V_F	0.6	0.8	0.95	V	$I_F = 8\text{mA}$, Top Diode
Diode Forward Voltage	V_F	0.6	0.8	0.95	V	$I_F = 8\text{mA}$, Bottom Diode
Residual ESD Peak Current on RDUP(Resistance of Device Under Protection)	I_{RES}	—	2.3	—	A	IEC 61000-4-2 contact mode 8kV, RDUP = 5Ω
Channel Clamping Voltage (Note 8)	$V_{CL_Positive}$	—	+9	—	V	$I_{PP} = 1\text{A}$, $t_p = 8/20\mu\text{s}$
	$V_{CL_Negative}$	—	-1.4	—	V	Zap at OUT, Measure at IN
Dynamic Resistance	$R_{DYN_Positive}$	—	0.4	—	Ω	$I_{PP} = 1\text{A}$, $t_p = 8/20\mu\text{s}$
	$R_{DYN_Negative}$	—	0.3	—	Ω	Zap at OUT, Measure at IN
Channel Input Capacitance(Note 9)	C_{OUT}	—	1.5	—	pF	$f = 1\text{MHz}$, $V_P = 5\text{V}$, $V_{osc} = 2.5\text{V}$, $V_{osc} = 30\text{mV}$
Channel to Channel Capacitance Match	ΔC_{OUT}	—	0.02	—	pF	$f = 1\text{MHz}$, $V_P = 5\text{V}$, $V_{osc} = 2.5\text{V}$, $V_{osc} = 30\text{mV}$
Series Resistance	R_s	—	1	—	Ω	—
Channel to Channel Resistance Match	ΔR_s	—	± 10	± 30	mΩ	—

Notes:

- Standard test condition is IEC61000-4-2 level 4 test circuit with each (AOUT/BOUT) pin subjected to $\pm 12\text{kV}$ contact discharge for 1000 pulses. **Discharges are timed at 1 second intervals and all 1000 strikes are completed in one continuous test run.**
- Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes, Inc. suggested pad layout, which can be found on our website at <http://www.diodes.com/package-outlines.html>.
- Short duration pulse test used to minimize self-heating effect.
- Clamping voltage value is based on an $8\times 20\mu\text{s}$ peak pulse current (I_{PP}) waveform.
- Capacitance measured from V_{OUT} to V_N with V_{IN} floating.



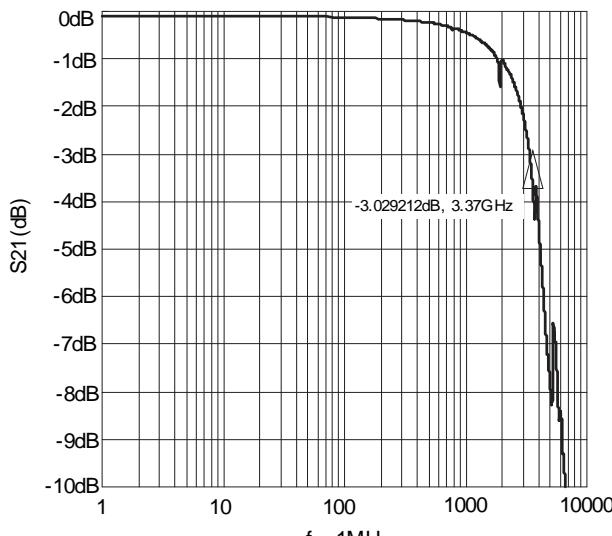
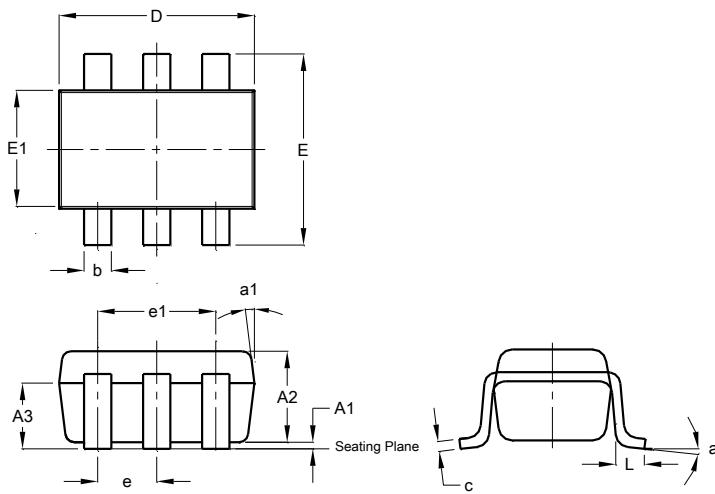


Figure 7, Typical Single-Ended S21 plot (1dB/div, 1MHz to 10GHz)

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

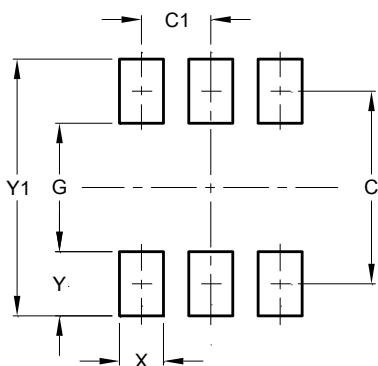


SOT26			
Dim	Min	Max	Typ
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°

All Dimensions in mm

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.



Dimensions	Value (in mm)
C	2.40
C1	0.95
G	1.60
X	0.55
Y	0.80
Y1	3.20

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