Low Capacitance Bidirectional ESD Protection Diode in SOT143

Features

- 1-line ESD protection silicon diode
- ESD Immunity ± 30 kV (acc. IEC 61000-4-2)
- Very low capacitance < 2 pF
- Bidirectional, Symmetrical clamping behaviour **(BiSy)**
- Working Voltage ± 15 V
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

3D Top View

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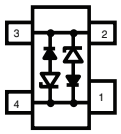
Pinning-Schematic



3D Bottom View

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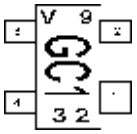
Marking



GC1 = Type code
V 9 = date code year
32 = date code week

Ordering Information

Device Name	Ordering Code	Taped Units per Reel	Reels per Carton Box
GCDA15C-1	GCDA15C-1-GS08	3000 (per 7" reel (8 mm tape))	5

Package Data

Name	Molding Compound Flammability Rating	Soldering Conditions	Weight	Marking Code
SOT143	UL 94 V-0	260 °C/10 s at terminals	8 mg	GC1

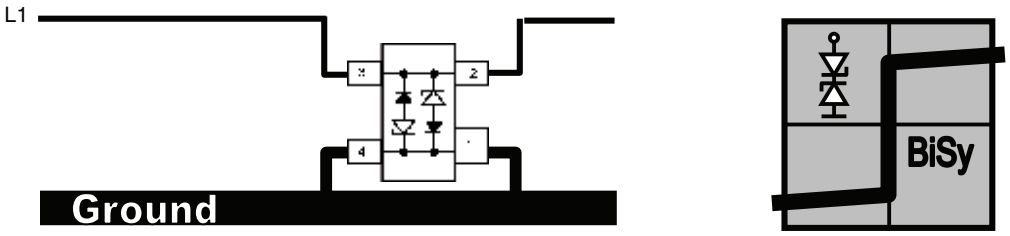
Absolute Maximum Ratings

Ratings at 25 °C, ambient temperature unless otherwise specified

Parameter	Test Conditions	Symbol	Value	Unit
Peak Pulse Current	acc. IEC 61000-4-5, 8/20 µs / single shot	I_{PP}	10	A
Peak Pulse Power	acc. IEC 61000-4-5, 8/20 µs / single shot	P_{PP}	300	W
ESD Voltage Immunity	acc. IEC 61000-4-2 / 10 pulses	V_{ESD}	± 30	kV
Operating Temperature	Junction Temperature	T_j	- 40 to + 125	°C
Storage Temperature		T_{STG}	- 55 to + 150	°C

BiSy-mode (1-line **Bi**directional **Sy**mmetrical protection mode)

The **GCDA15C-1** is a 1-line **Bi**directional, **Sy**mmetrical (**BiSy**) protection device. Two avalanche diodes each in series with a PN-Diode providing a very low capacitance. Due to its symmetry the electrical performance is also symmetrical. For an optimal ESD-protection the line inductance of the protection path (current path from the data line (L1) through the protection device to ground) has to be minimized. For this the data line which has to be protected should be led trough the **GCDA15C-1** - one pin (e.g. Pin 3) “in” and the other pin (e.g. Pin 2) “out”. The Ground pins (e.g.Pin 1 and 4) should be connected to ground on the shortest and broadest way to keep the inductance as low as possible!



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Electrical Characteristics

BiSy mode (between Pin 2 + 3 and 1 + 4)

Ratings at 25 °C, ambient temperature unless otherwise specified

Parameter	Test Conditions	Symbol	Min	Typ.	Max	Unit
Reverse Working Voltage	at I_R = 0.1 µA	V_{RWM}	15	16.5		V
Reverse Current	at $V_R = V_{RWM}$ = 15 V	I_R		< 0.001	0.1	µA
Reverse Clamping Voltage	at I_{PP} = 1 A	V_C		18.5	21	V
Reverse Clamping Voltage	at $I_{PP} = I_{PPM}$ = 10 A	V_C		26	30	V
Reverse Break down Voltage	at I_R = 1 mA	V_R	16	17		V
Capacitance	at V_R = 0 V, f = 1 MHz	C_D		1.5	2	pF
Capacitance	at V_R = 15 V, f = 1 MHz	C_D		1.3		pF
ESD-Clamping voltage peak	at ± 8 kV ESD-pulse acc. IEC 61000-4-2	V_{CESD}		130		V
Protection paths	number of lines which can be protected	N_{lines}		1		lines

Typical Characteristics

Ratings at 25 °C, ambient temperature unless otherwise specified

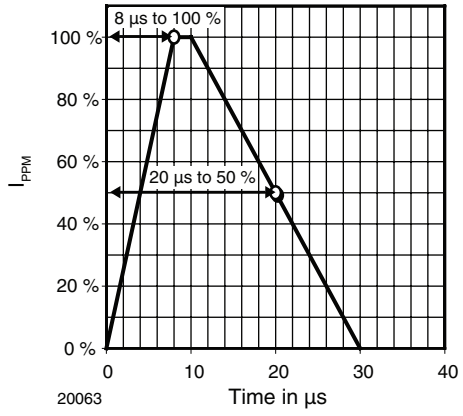

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Figure 1. 8/20 µs Peak Pulse Current wave form acc. IEC 61000-4-5

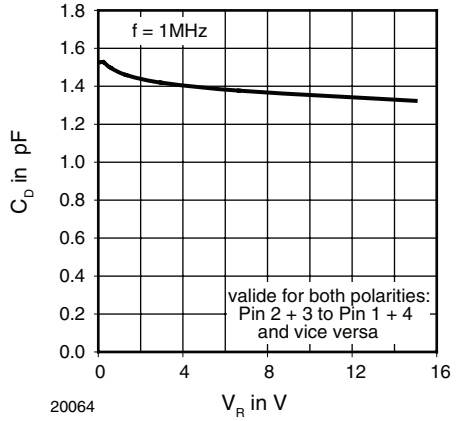

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Figure 2. Typical Capacitance C_D vs. Reverse Voltage V_R

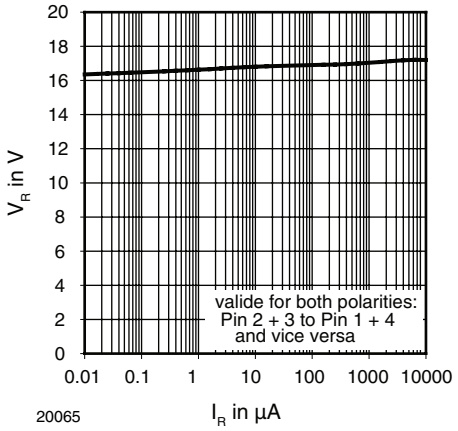


Figure 3. Typical Reverse Voltage V_R vs. Reverse Current I_R

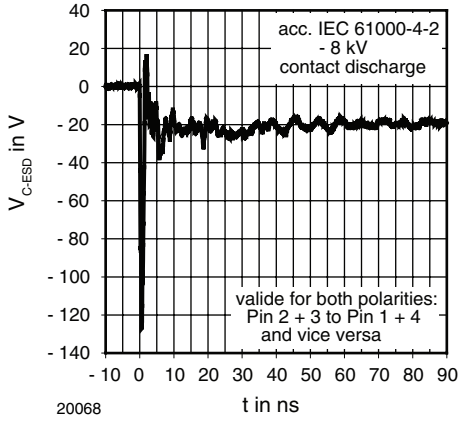


Figure 6. Typical Clamping performance at 8 kV contact discharge (acc. IEC 61000-4-2)

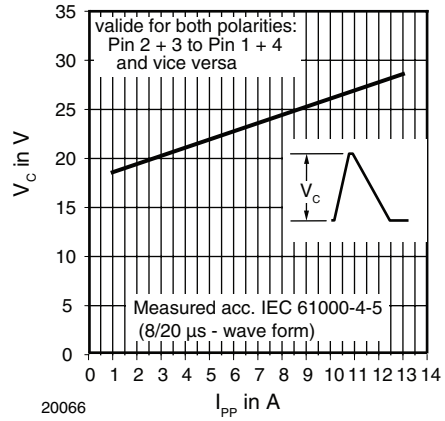


Figure 4. Typical peak clamping voltage V_C vs. peak pulse current I_{PP}

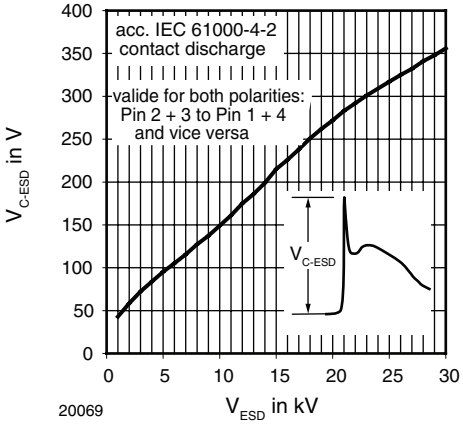


Figure 7. Typical peak clamping voltage at ESD contact discharge (acc. IEC 61000-4-2)

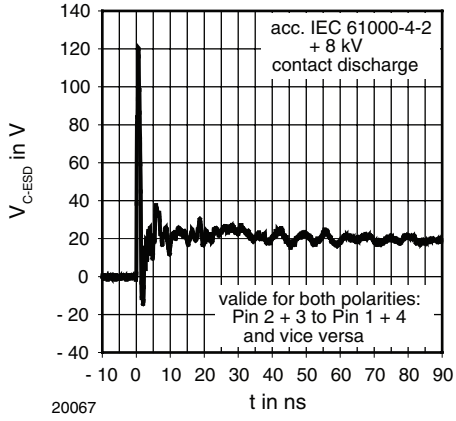
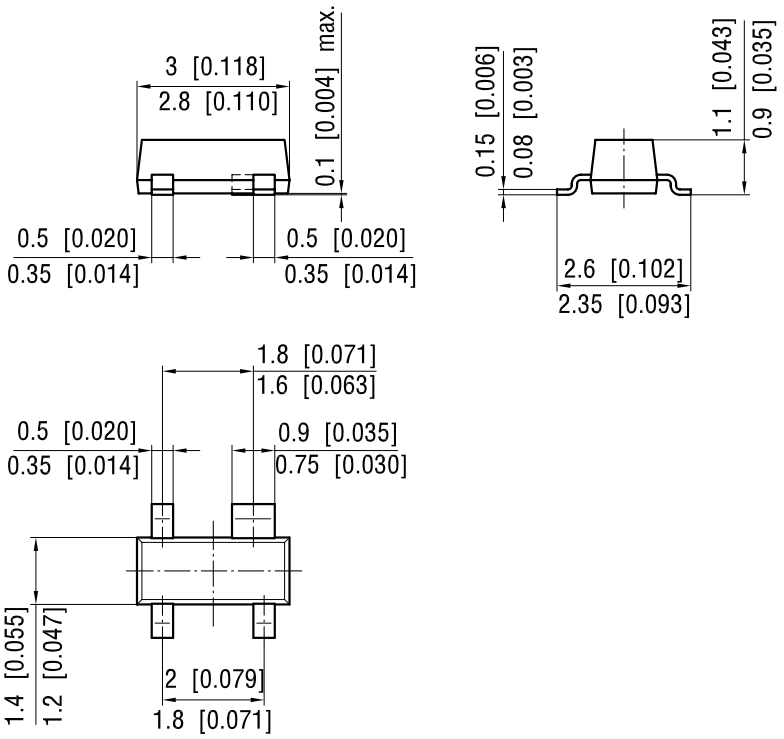
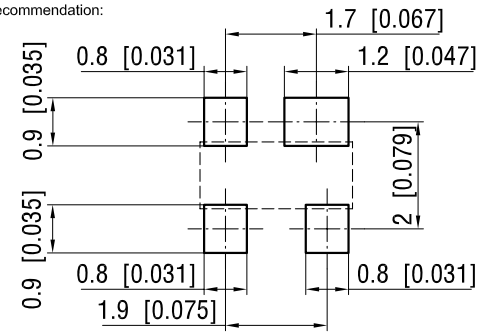


Figure 5. Typical Clamping performance at 8 kV contact discharge (acc. IEC 61000-4-2)

Package Dimensions in mm (Inches) SOT143



foot print recommendation:



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Ozone Depleting Substances Policy Statement

It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany

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