TOSHIBA Diodes for Protecting against ESD

DF10G5M4N

Application

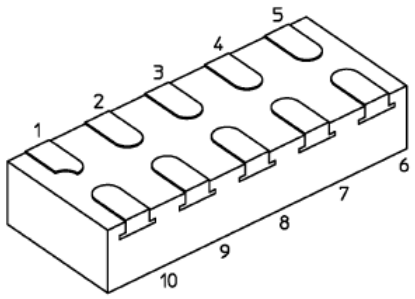
- ESD Protection

Note: This product is designed for protection against electrostatic discharge (ESD) and is not intended for any other purpose, including, but not limited to, voltage regulation.

Abusolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Electrostatic discharge voltage IEC61000-4-2(Contact) IEC61000-4-2(Air)	V_{ESD} (Note 1)	± 23 ± 25	kV
Peak pulse power (tp = 8 / 20 s)	P_{PK}	30	W
Maximum peak pulse current (tp = 8 / 20 s)	I_{PP} (Note 2)	2	A
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	−55 to 150	°C

Note1 : according to IEC61000-4-2
Note2 : according to IEC61000-4-5
Note3:Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/ “Derating Concept and Methods”) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).



1:I/O 6:NC
2:I/O 7:NC
3:GND 8:NC
4:I/O 9:NC
5:I/O 10:NC

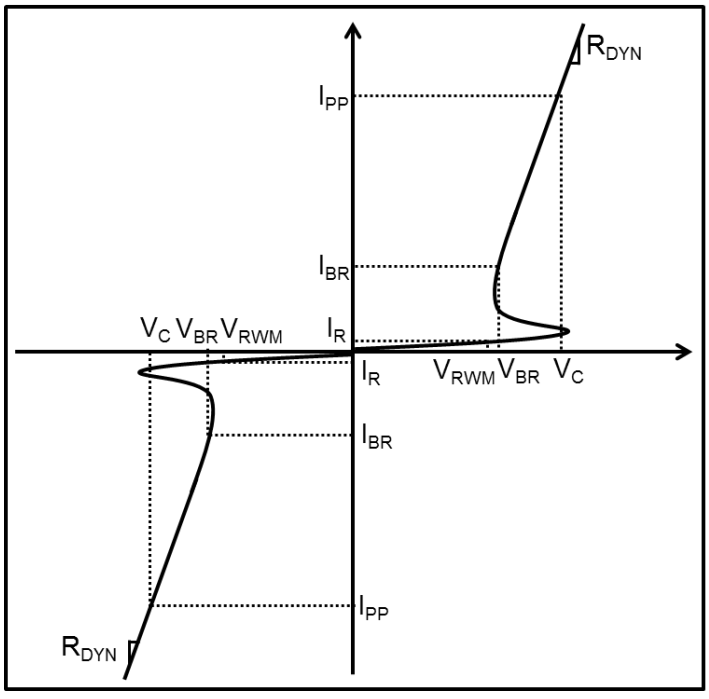
DFN10

JEDEC	—
JEITA	—
TOSHIBA	—

Weight: 3.2mg (typ.)

Electrical Characteristics (Ta = 25°C)

V_{RWM} : Working peak reverse voltage
V_{BR} : Reverse breakdown voltage
I_{BR} : Reverse breakdown current
I_R : Reverse Current
V_C : Clamping Voltage
I_{PP} : Peak pulse current
R_{DYN} : Dynamic resistance



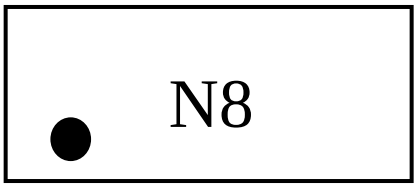
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Reverse stand-off voltage	V_{RWM}	—	—	—	3.6	V
Reverse breakdown voltage	V_{BR}	I_{BR} = 1 mA	4.0	5.0	6.0	V
Reverse current	I_R	V_{RWM} = 5.5 V	—	—	0.1	μA
Clamping Voltage	Vc	I_{PP}=1A (Note1)	—	7.5	—	V
	Vc	I_{PP}=2A (Note1)	—	10	15	V
Clamping Voltage	Vc	ITLP=16A (Note2)	—	17	—	V
	Vc	ITLP=30A (Note2)	—	24	—	V
Dynamic resistance	R_{DYN}	(Note2)	—	0.5	—	Ω
Total capacitance	C_t	V_R = 0 V, f = 1 MHz (Note3)	—	0.2	0.3	pF

Note1：Based on IEC61000-4-5 8/20μs pulse.

Note2：TLP parameter: Z0 = 50 Ω , tp = 100ns, tr = 300ps, averaging window: t1 = 30 ns to t2 = 60 ns, extraction of dynamic resistance using least squares fit of TLP characteristics between IPP1 = 8A and IPP2 = 16A.

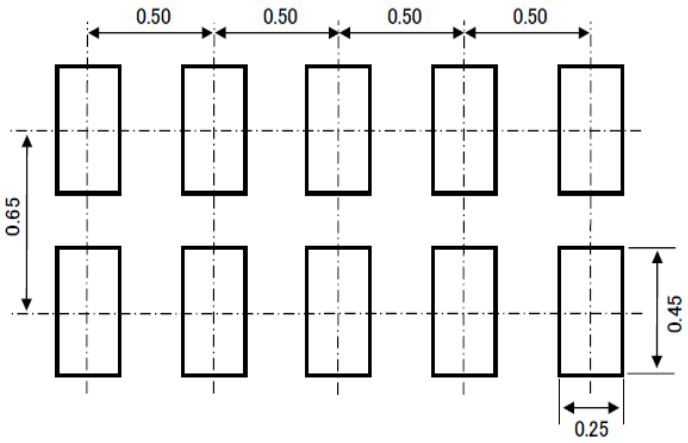
Note3：Guaranteed by design.

Marking（Unit：mm）

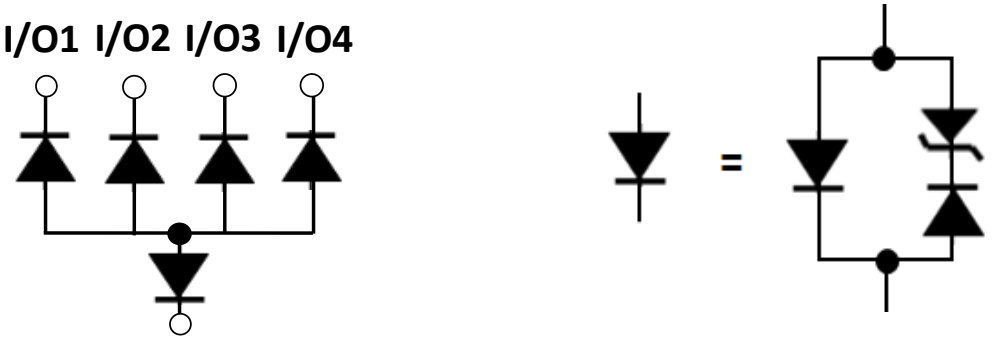


Marking Code	Part number
N8	DF10G5M4N

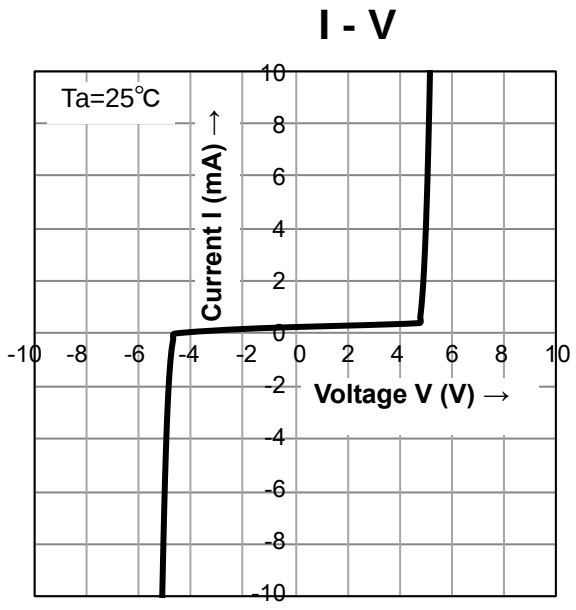
Land Pattern Dimensions for Reference Only

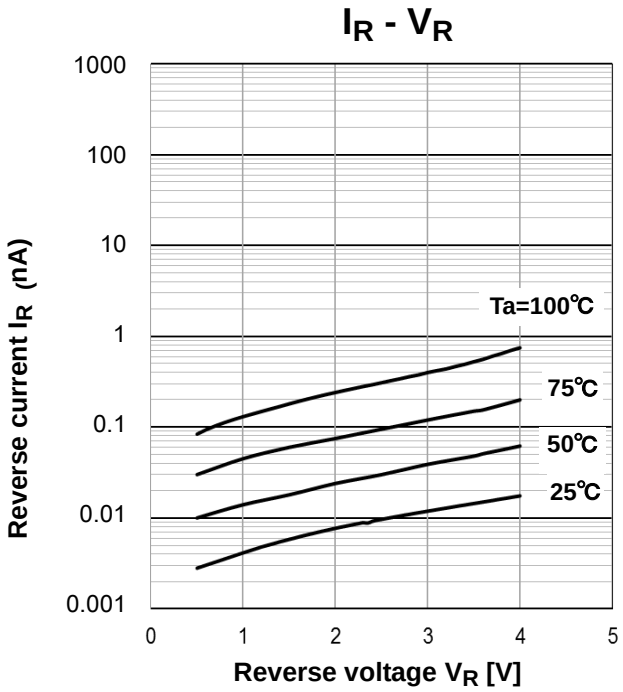


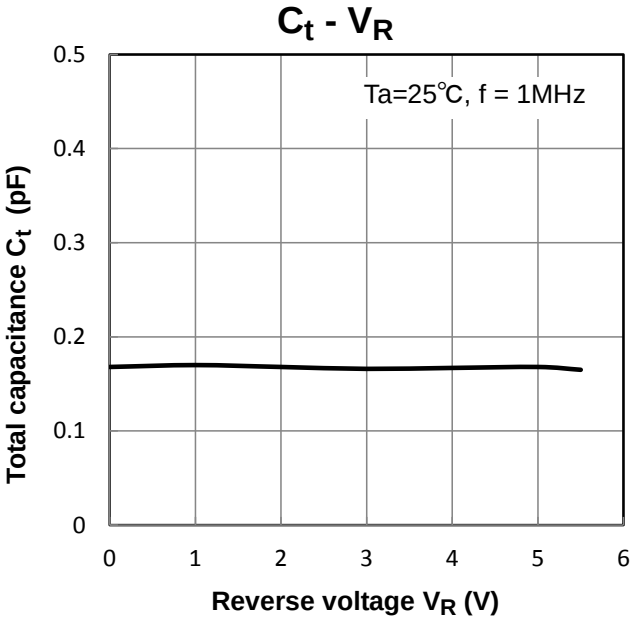
Equivalent Circuit

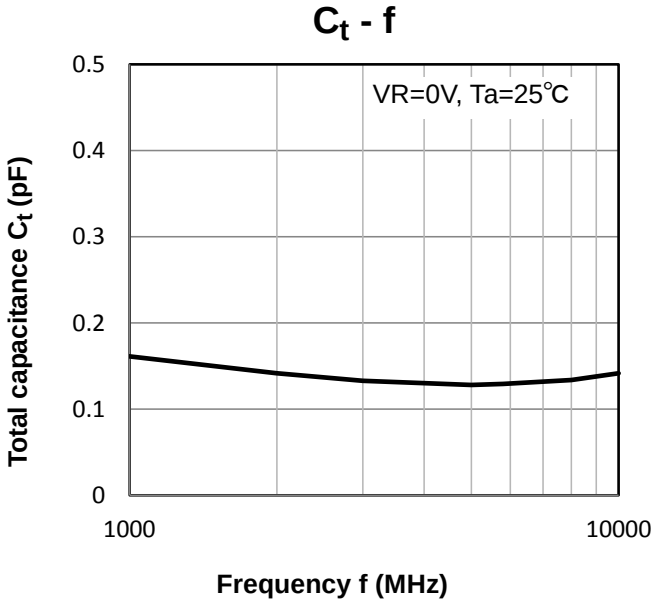


Characteristics Curves (Note)



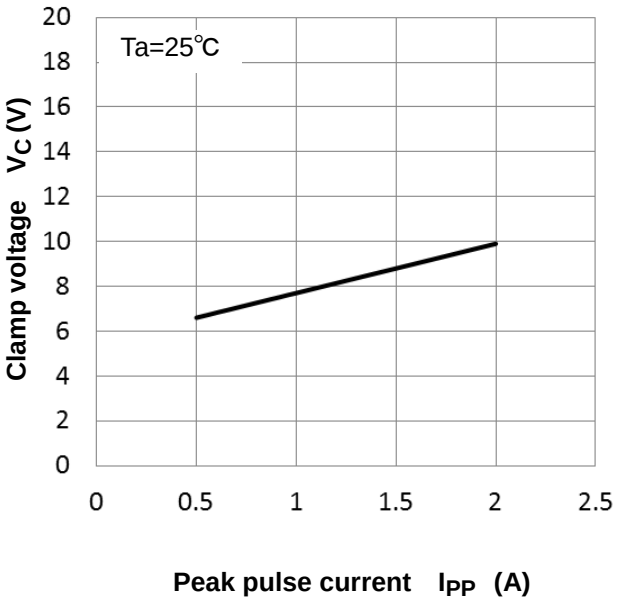






Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

Vc - I_{PP}



Based on IEC61000-4-5 8/20 μ s pulse.(Ed2)

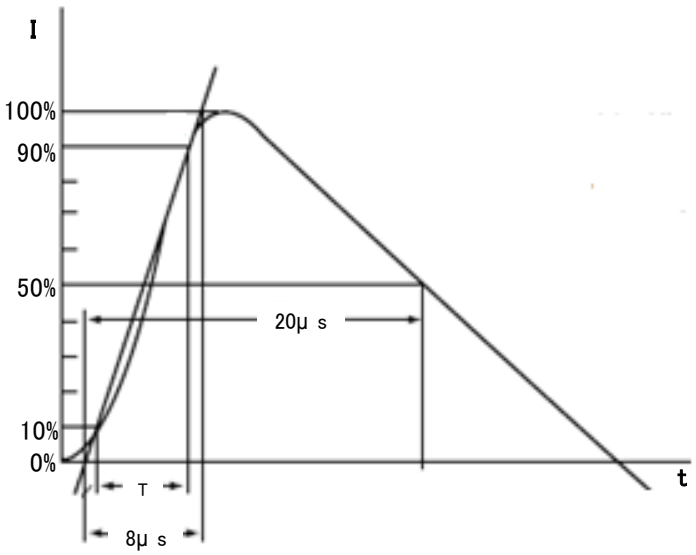
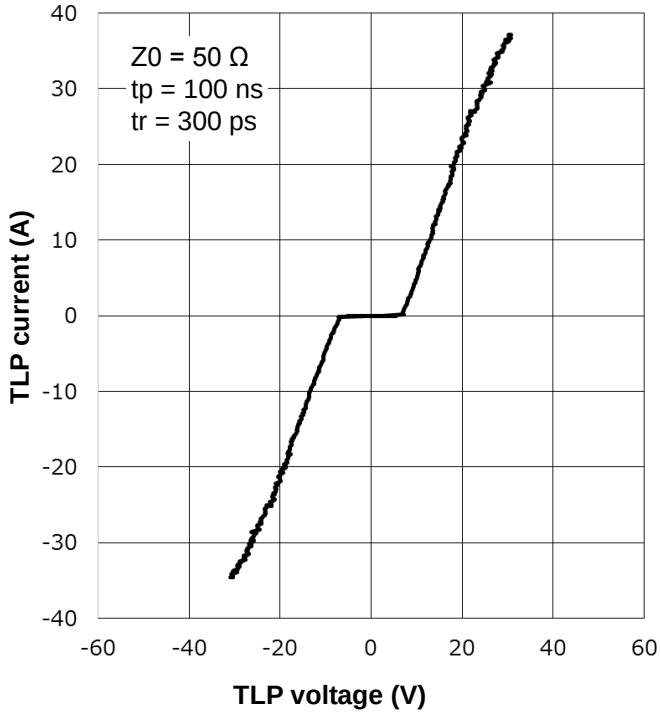


Fig Based on IEC61000-4-5 8/20 μs pulse.(Ed.2)

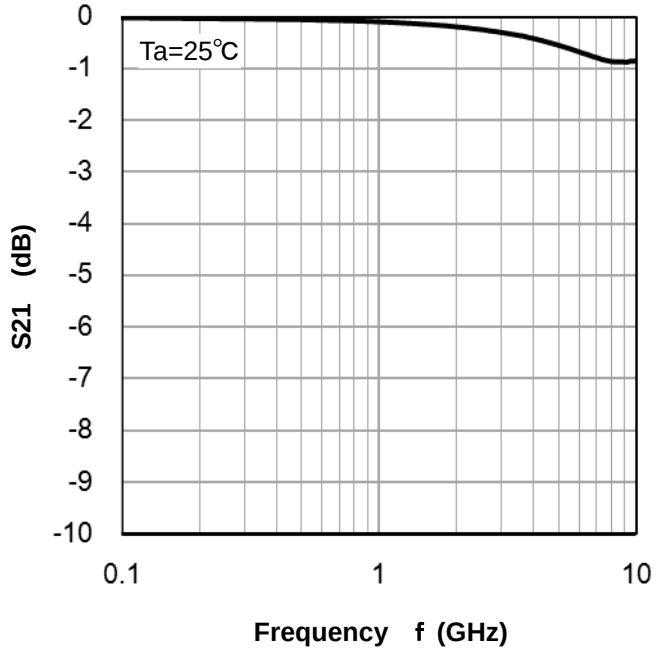
TLP



Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

Insertion Loss (S21)

S21-f



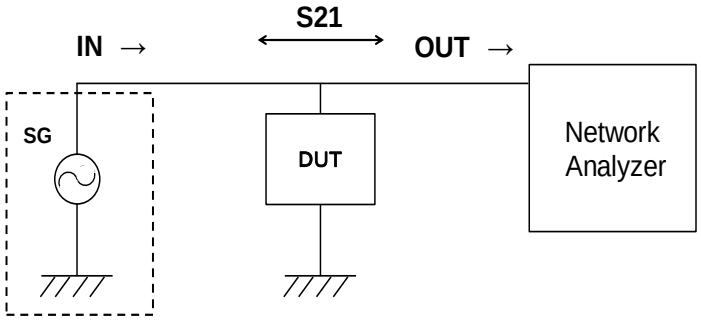
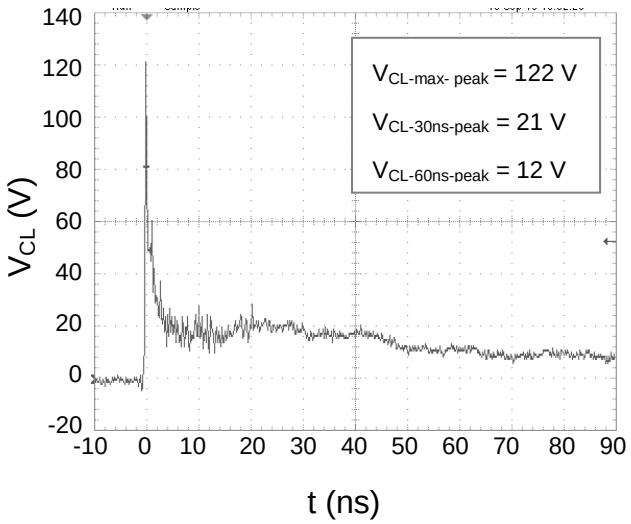


Fig. S21 measurement circuit

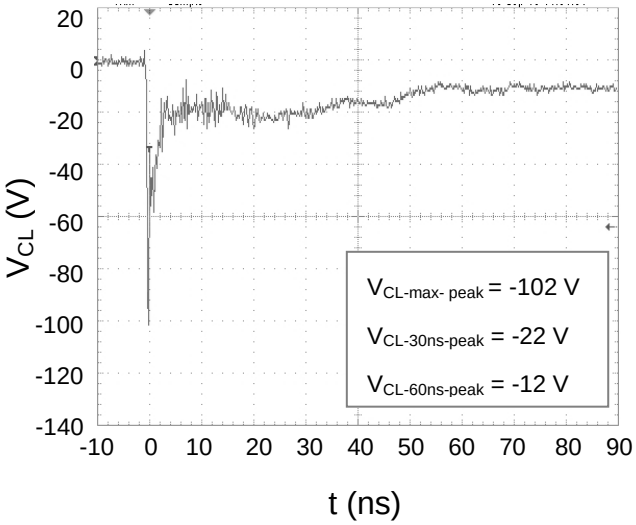
Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

ESD Clamp Waveform (IEC61000-4-2) (Note)

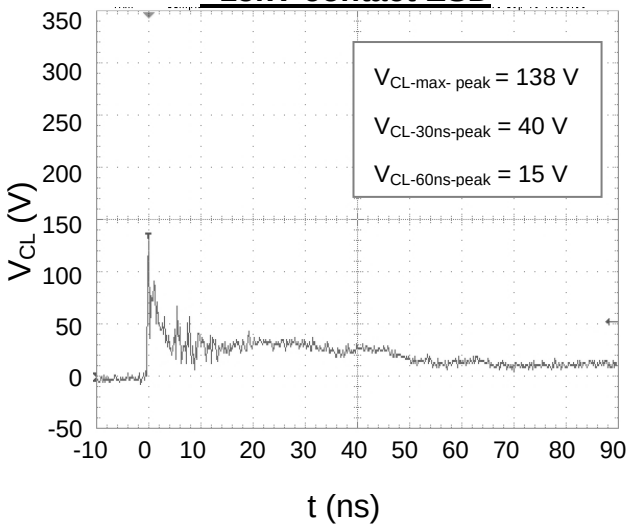
+8kV contact ESD



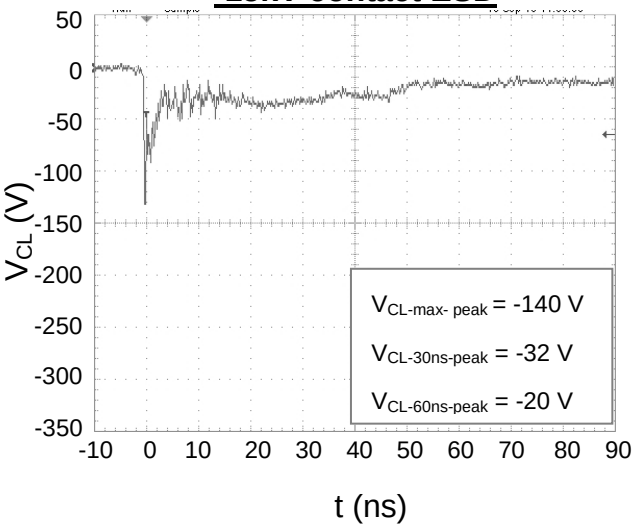
-8kV contact ESD



+15kV contact ESD



-15kV contact ESD



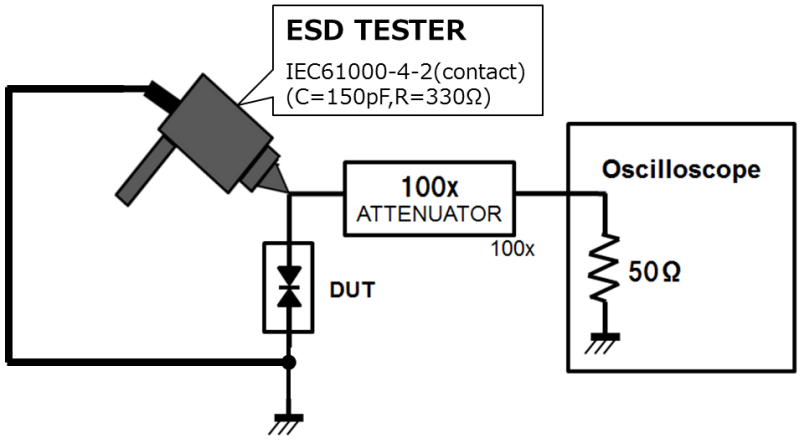
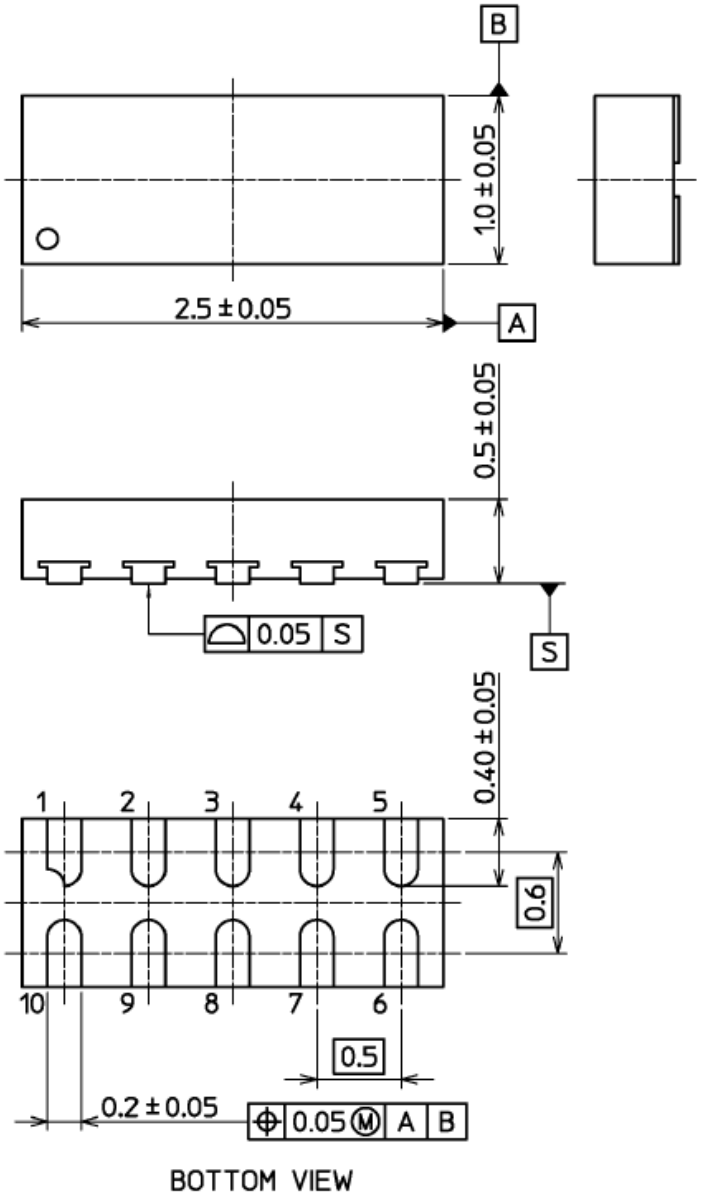


Fig. IEC61000-4-2 (Contact)

Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

Package Dimensions （**Unit：mm**）



Weight: 0.0032 g (typ.)

Package Name(s)
TOSHIBA: 1-3V1A
Nickname: DFN10

RESTRICTIONS ON PRODUCT USE

- Toshiba Corporation, and its subsidiaries and affiliates (collectively "TOSHIBA"), reserve the right to make changes to the information in this document, and related hardware, software and systems (collectively "Product") without notice.
- This document and any information herein may not be reproduced without prior written permission from TOSHIBA. Even with TOSHIBA's written permission, reproduction is permissible only if reproduction is without alteration/omission.
- Though TOSHIBA works continually to improve Product's quality and reliability, Product can malfunction or fail. Customers are responsible for complying with safety standards and for providing adequate designs and safeguards for their hardware, software and systems which minimize risk and avoid situations in which a malfunction or failure of Product could cause loss of human life, bodily injury or damage to property, including data loss or corruption. Before customers use the Product, create designs including the Product, or incorporate the Product into their own applications, customers must also refer to and comply with (a) the latest versions of all relevant TOSHIBA information, including without limitation, this document, the specifications, the data sheets and application notes for Product and the precautions and conditions set forth in the "TOSHIBA Semiconductor Reliability Handbook" and (b) the instructions for the application with which the Product will be used with or for. Customers are solely responsible for all aspects of their own product design or applications, including but not limited to (a) determining the appropriateness of the use of this Product in such design or applications; (b) evaluating and determining the applicability of any information contained in this document, or in charts, diagrams, programs, algorithms, sample application circuits, or any other referenced documents; and (c) validating all operating parameters for such designs and applications. **TOSHIBA ASSUMES NO LIABILITY FOR CUSTOMERS' PRODUCT DESIGN OR APPLICATIONS.**
- **PRODUCT IS NEITHER INTENDED NOR WARRANTED FOR USE IN EQUIPMENTS OR SYSTEMS THAT REQUIRE EXTRAORDINARILY HIGH LEVELS OF QUALITY AND/OR RELIABILITY, AND/OR A MALFUNCTION OR FAILURE OF WHICH MAY CAUSE LOSS OF HUMAN LIFE, BODILY INJURY, SERIOUS PROPERTY DAMAGE AND/OR SERIOUS PUBLIC IMPACT ("UNINTENDED USE"). ** Except for specific applications as expressly stated in this document, Unintended Use includes, without limitation, equipment used in nuclear facilities, equipment used in the aerospace industry, medical equipment, equipment used for automobiles, trains, ships and other transportation, traffic signaling equipment, equipment used to control combustions or explosions, safety devices, elevators and escalators, devices related to electric power, and equipment used in finance-related fields. **IF YOU USE PRODUCT FOR UNINTENDED USE, TOSHIBA ASSUMES NO LIABILITY FOR PRODUCT.** For details, please contact your TOSHIBA sales representative.
- Do not disassemble, analyze, reverse-engineer, alter, modify, translate or copy Product, whether in whole or in part.
- Product shall not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable laws or regulations.
- The information contained herein is presented only as guidance for Product use. No responsibility is assumed by TOSHIBA for any infringement of patents or any other intellectual property rights of third parties that may result from the use of Product. No license to any intellectual property right is granted by this document, whether express or implied, by estoppel or otherwise.
- **ABSENT A WRITTEN SIGNED AGREEMENT, EXCEPT AS PROVIDED IN THE RELEVANT TERMS AND CONDITIONS OF SALE FOR PRODUCT, AND TO THE MAXIMUM EXTENT ALLOWABLE BY LAW, TOSHIBA (1) ASSUMES NO LIABILITY WHATSOEVER, INCLUDING WITHOUT LIMITATION, INDIRECT, CONSEQUENTIAL, SPECIAL, OR INCIDENTAL DAMAGES OR LOSS, INCLUDING WITHOUT LIMITATION, LOSS OF PROFITS, LOSS OF OPPORTUNITIES, BUSINESS INTERRUPTION AND LOSS OF DATA, AND (2) DISCLAIMS ANY AND ALL EXPRESS OR IMPLIED WARRANTIES AND CONDITIONS RELATED TO SALE, USE OF PRODUCT, OR INFORMATION, INCLUDING WARRANTIES OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, ACCURACY OF INFORMATION, OR NONINFRINGEMENT.**
- Do not use or otherwise make available Product or related software or technology for any military purposes, including without limitation, for the design, development, use, stockpiling or manufacturing of nuclear, chemical, or biological weapons or missile technology products (mass destruction weapons). Product and related software and technology may be controlled under the applicable export laws and regulations including, without limitation, the Japanese Foreign Exchange and Foreign Trade Law and the U.S. Export Administration Regulations. Export and re-export of Product or related software or technology are strictly prohibited except in compliance with all applicable export laws and regulations.
- Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product. Please use Product in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. **TOSHIBA ASSUMES NO LIABILITY FOR DAMAGES OR LOSSES OCCURRING AS A RESULT OF NONCOMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS.**

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001
Адрес: 105318, г.Москва, ул.Щербаковская д.3, офис 1107

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

http://moschip.ru/get-element

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:
moschip.ru
moschip.ru_4
moschip.ru_6
moschip.ru_9