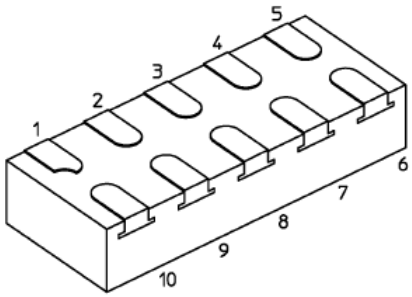
TOSHIBA Diodes for Protecting against ESD

DF10G6M4N

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.



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.)

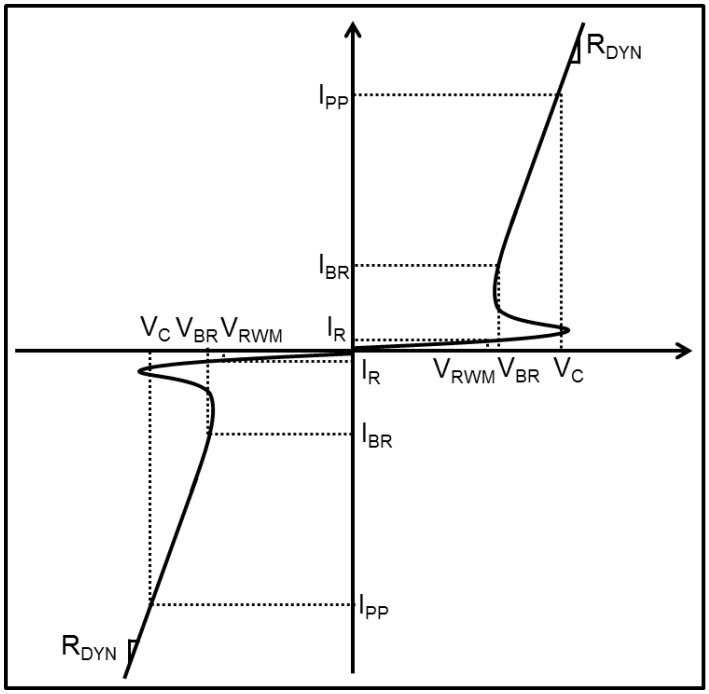
Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Electrostatic discharge voltage IEC61000-4-2(Contact) IEC61000-4-2(Air)	V_{ESD} (Note 1)	±23	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}	-55~150	°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).

Electrical Characteristics (Ta = 25°C)

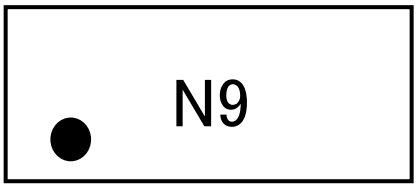
V_{RWM} : Working peak reverse voltage
V_{BR} : Reverse breakdown voltage
I_{BR} : Reverse breakdown current
I_R : Reverse Current
V_C : Clamping Voltage
I_{PP} : Peak pulse current
R_{DYN} : Dynamic resistance



Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Working peak reverse voltage	V_{RWM}	–	—	—	5.5	V
Reverse breakdown voltage	V_{BR}	I_{BR} = 1 mA	5.6	6.2	8	V
Reverse Current	I_R	V_{RWM} = 5.5 V	—	—	0.1	μA
Clamping Voltage	V_C	I_{PP}=1A (Note1)	—	8.5	—	V
	V_C	I_{PP}=2A (Note1)	—	10	15	V
Clamping Voltage	Vc	ITLP=16A (Note2)	—	18	—	V
	Vc	ITLP=30A (Note2)	—	25	—	V
Dynamic resistance	R_{DYN}	(Note:2)	—	0.5	—	Ω
Terminal capacitance	C_t	V_R = 0 V, f=1 MHz (Note.3)	—	0.2	0.3	pF

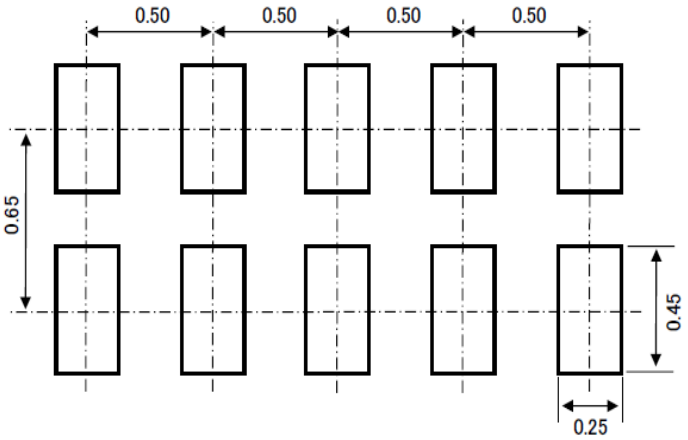
Note1：Based on IEC61000-4-5 8/20μs pulse.
Note2：TLP parameter: Z0 = 50 Ω , tp = 100ns, tr = 300ps, averaging window: t1 = 30 ns to t2 = 60 ns,
extraction of dynamic resistance using least squares fit of TLP characteristics between IPP1 = 8A and IPP2 = 16A.
Note3：Guaranteed by design.

Marking（Unit：mm）

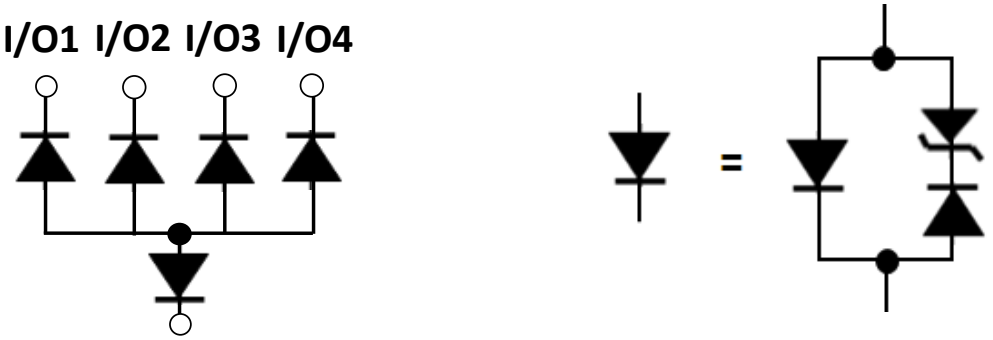


Marking Code	Part number
N9	DF10G6M4N

Land Pattern Dimensions for Reference Only

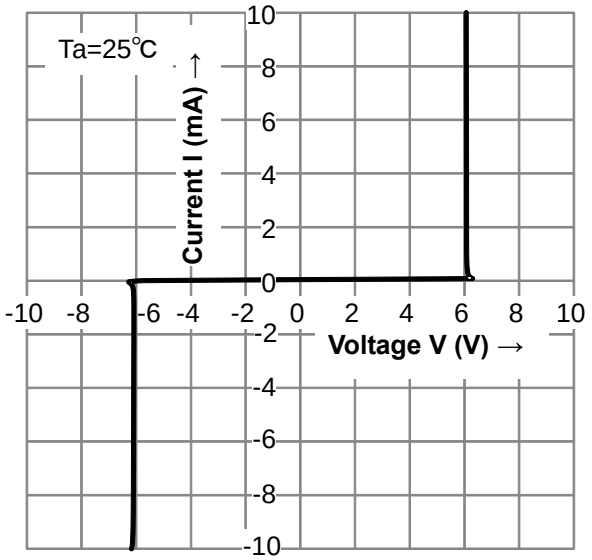


Equivalent Circuit

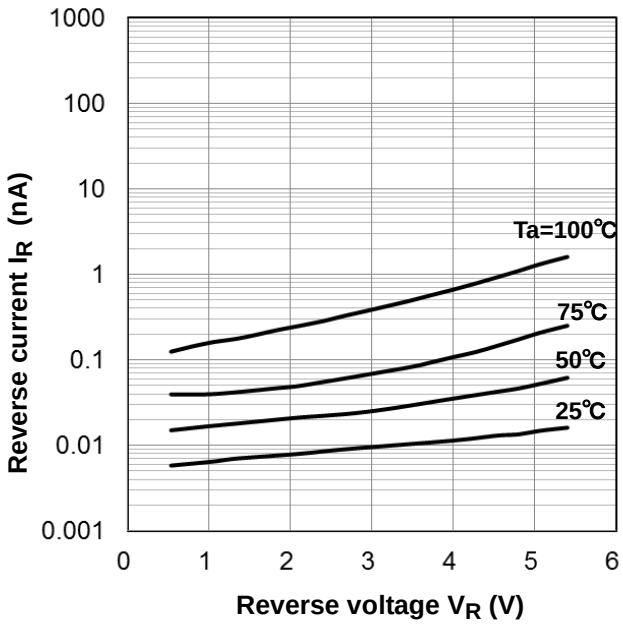


Characteristics Curves (Note)

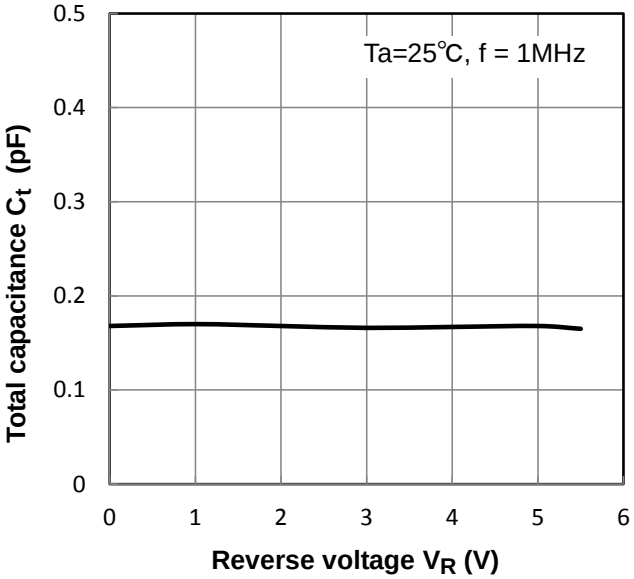
I - V



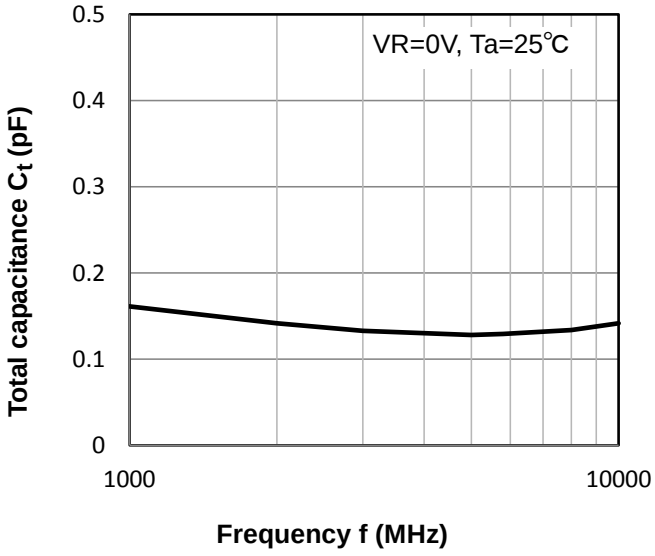
I_R - V_R



C_t - V_R

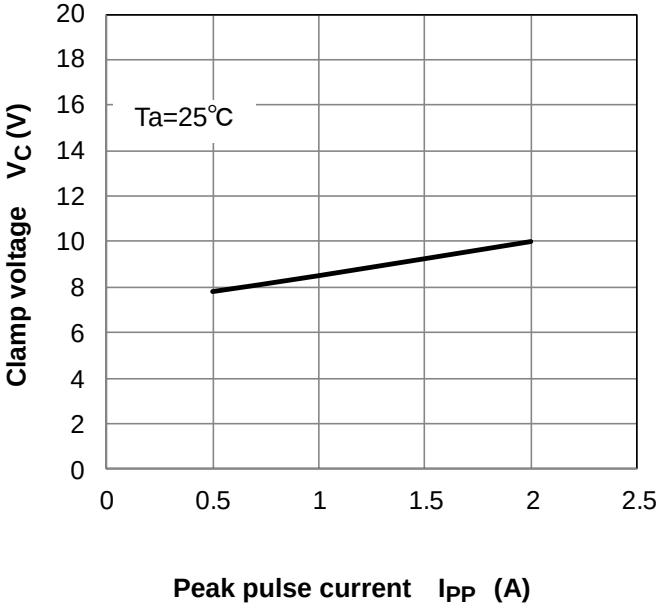


C_t - f



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

V_C - I_{PP}



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

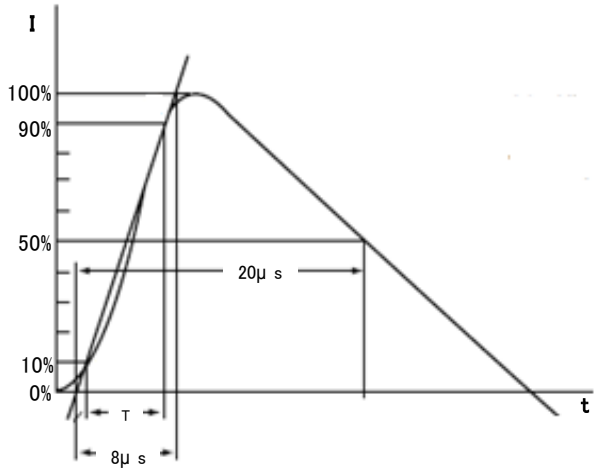
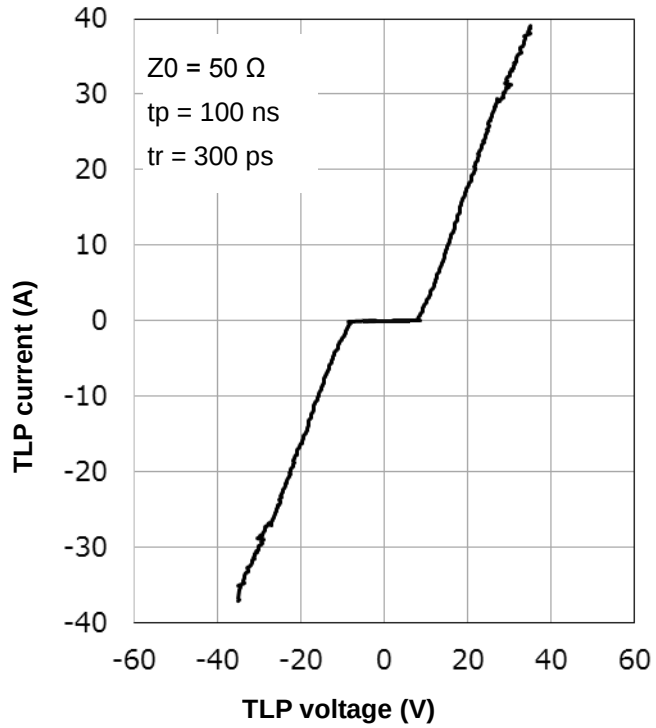


Fig Based on IEC61000-4-5 8/20 μs pulse.(Ed.2)

TLP



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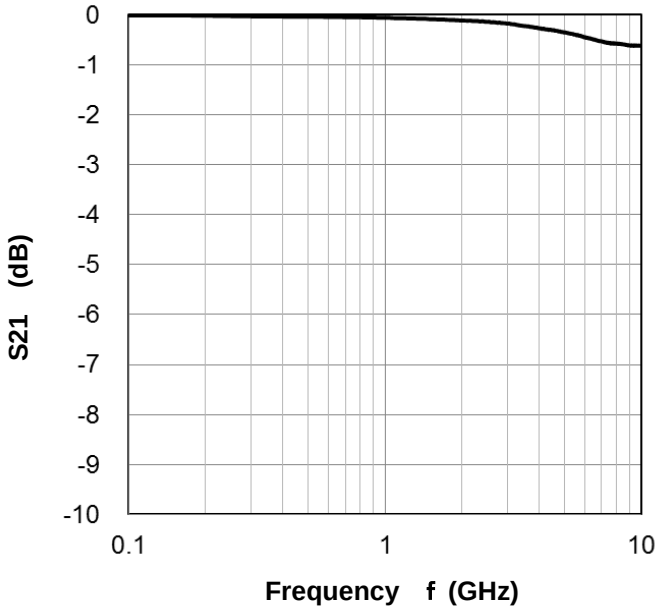
Insertion Loss (S21)
S21-f



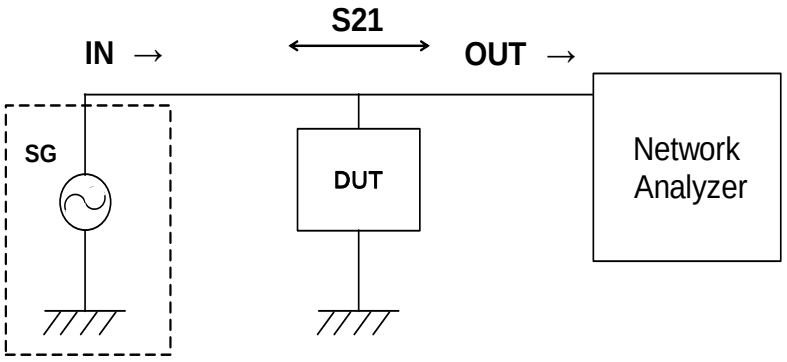


Fig. S21 measurement circuit

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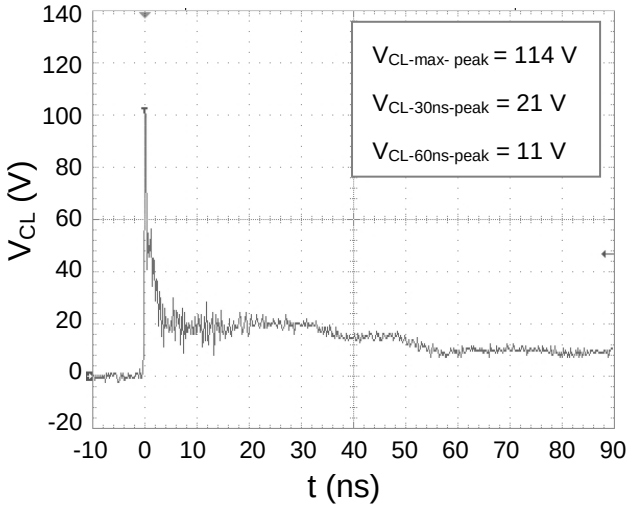
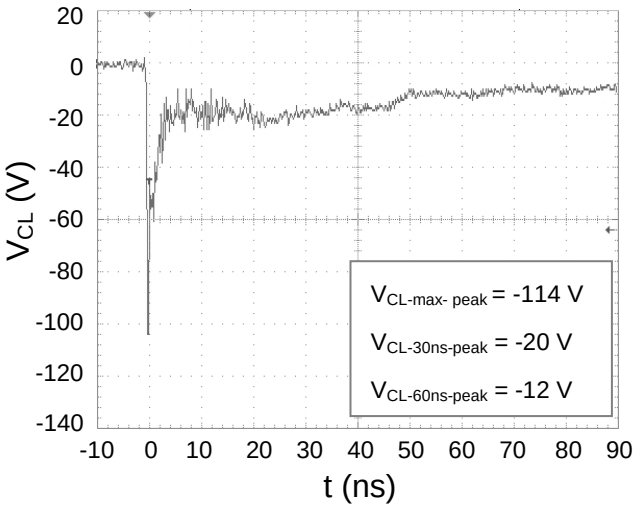
ESD Clamp Waveform (IEC61000-4-2) (Note)

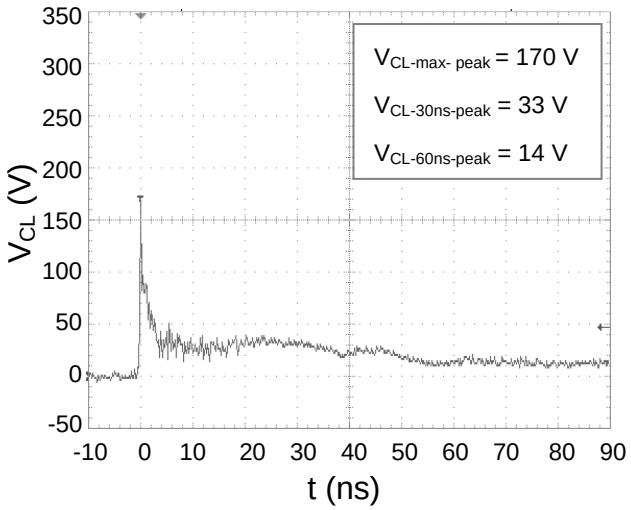
+8kV contact ESD



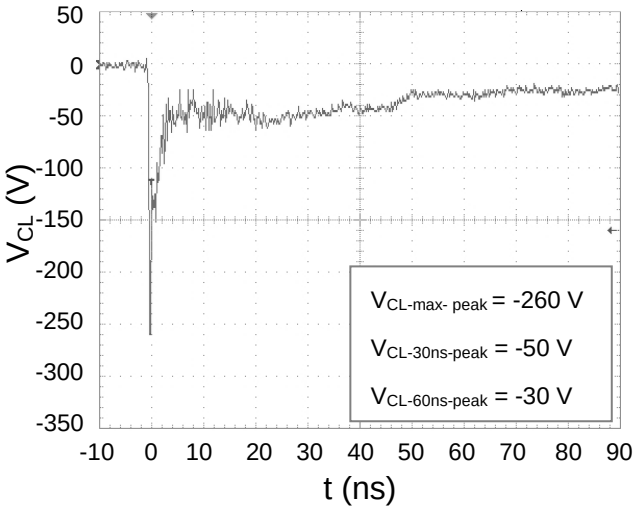
-8kV contact ESD



+15kV contact ESD



-15kV contact ESD



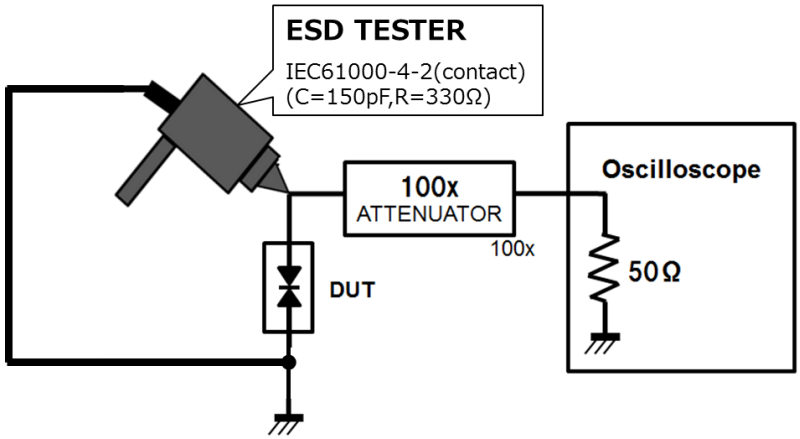


Fig. IEC61000-4-2 (Contact)

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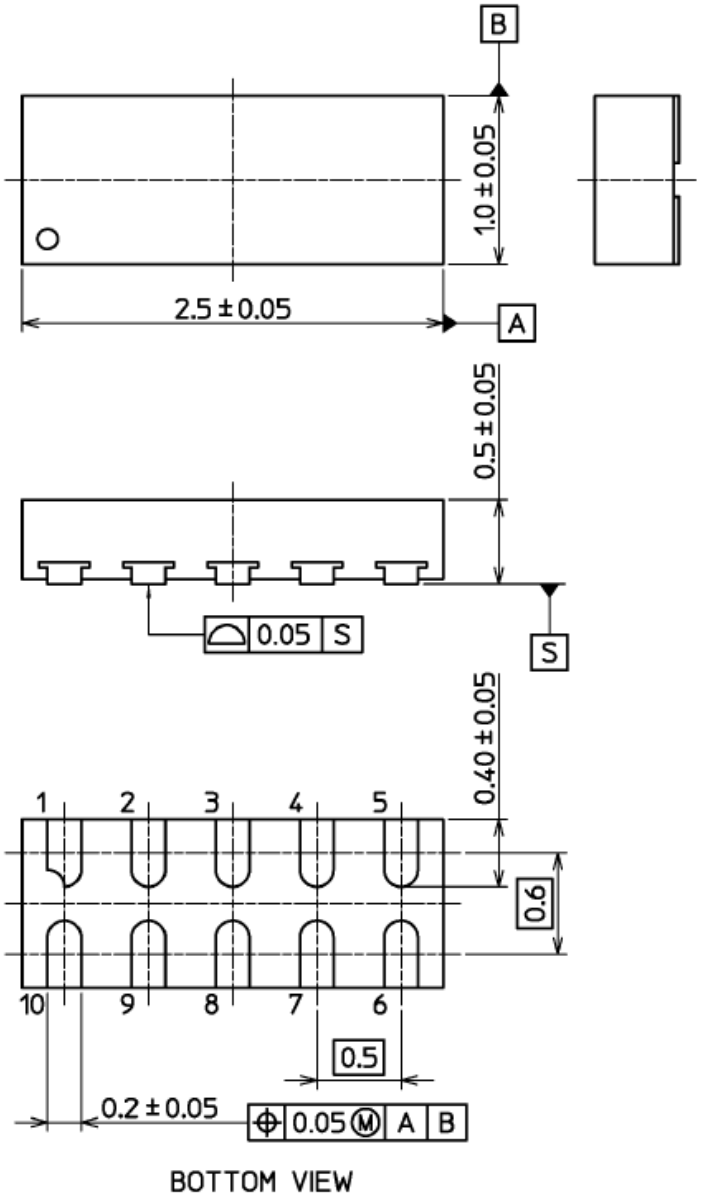
Package Dimensions（Unit：mm）



Weight: 0.0032 g (typ.)

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

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