



THBT7011D

Application Specific Discretes
A.S.D.TM

DUAL OVERVOLTAGE
PROTECTION FOR TELECOM LINE

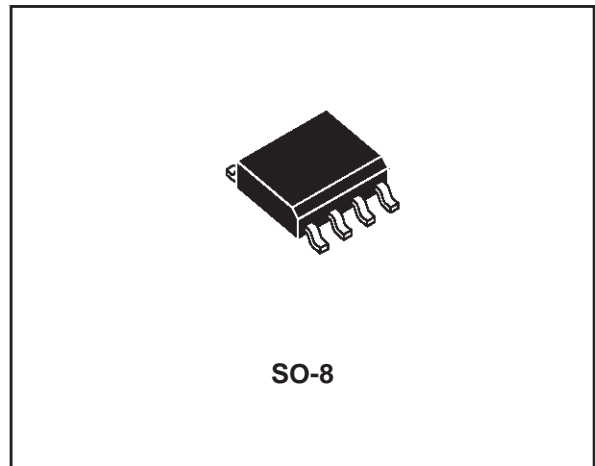
FEATURES

- BIDIRECTIONAL CROWBAR PROTECTION.
- PEAK PULSE CURRENT :
 $I_{PP} = 30A$ for 10/1000 μs surge.
- HOLDING CURRENT :
 $I_H = 150mA$.
- BREAKDOWN VOLTAGE: 70V Min.
- LOW DYNAMIC BREAKOVER VOLTAGE.

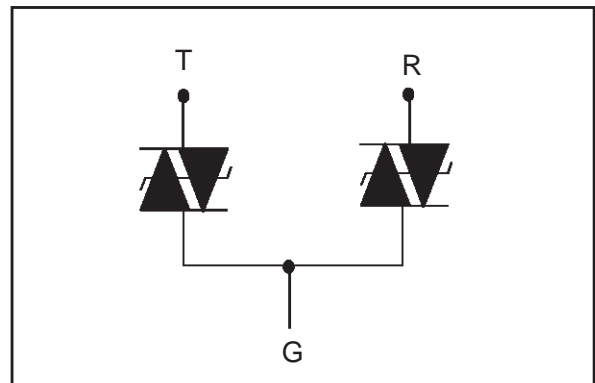
DESCRIPTION

Dedicated to telecommunication equipment protection, this device provides a dual bidirectional protection function.

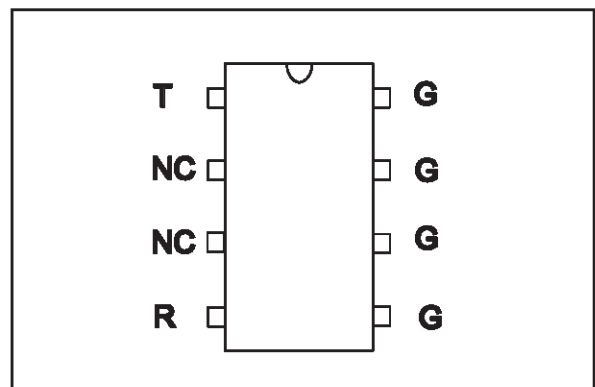
Dynamic characteristics have been defined for several types of surges, in order to meet the SLIC maximum ratings.



FUNCTIONAL DIAGRAM



PINOUT CONFIGURATION



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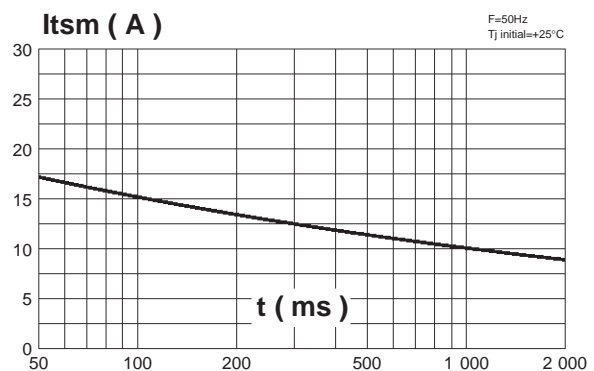
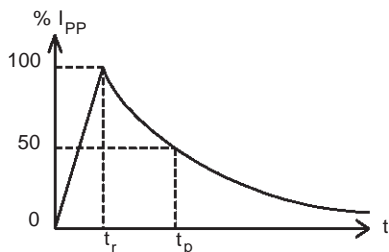
COMPLIES WITH THE FOLLOWING STANDARDS:	Peak Surge Voltage (V)	Voltage Waveform (μ s)	Current Waveform (μ s)	Admissible Ipp (A)	Necessary Resistor (Ω)
CCITT K20	4000	10/700	5/310	25	-
VDE0433	4000	10/700	5/310	40	10
VDE0878	4000	1.2/50	1/20	50	-
IEC-1000-4-5	level 4 level 4	10/700 1.2/50	5/310 8/20	25 50	- -
FCC Part 68, lightning surge type A	1500 800	10/160 10/560	10/160 10/560	47 35	25 15.5
FCC Part 68, lightning surge type B	100	9/720	5/320	25	-
BELLCORE TR-NWT-001089 First level	2500 1000	2/10 10/1000	2/10 10/1000	90 30	23 24
BELLCORE TR-NWT-001089 Second level	5000	2/10	2/10	90	50
CNET I31-24	4000	0.5/700	0.8/310	25	-

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25^{\circ}\text{C}$)

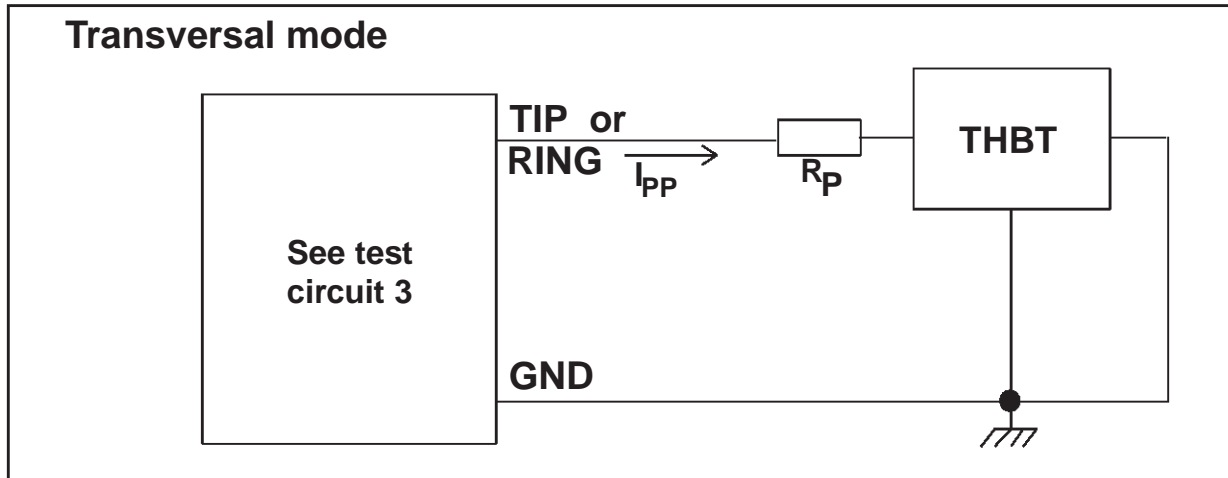
Symbol	Parameter	Value	Unit
I_{PP}	Peak pulse current (see note 1)	10/1000 μ s	A
I_{TSM}	Non repetitive surge peak on-state current (F=50Hz)	$t_p = 100$ ms $t = 1$ s	15.5 9 A
T_{stg} T_j	Storage temperature range Maximum operating junction temperature	- 40 to + 150 + 150	$^{\circ}\text{C}$ $^{\circ}\text{C}$
T_L	Maximum lead temperature for soldering during 10s	260	$^{\circ}\text{C}$

Note 1 : Pulse waveform :

10/1000 μ s $t_r=10\mu$ s $t_p=1000\mu$ s



TEST CIRCUITS FOR I_{PP}

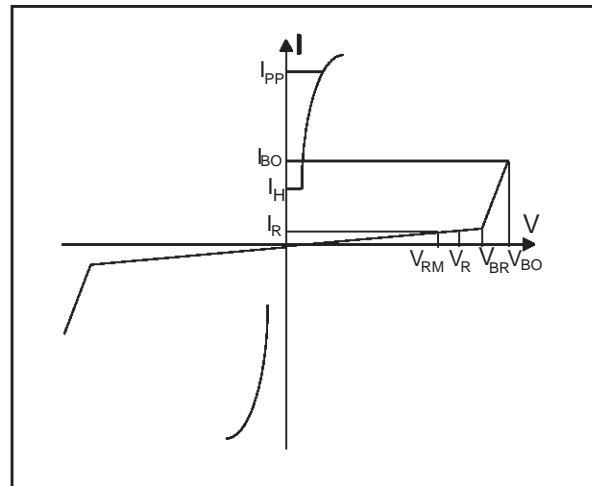


THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction to ambient	170	$^{\circ}C/W$

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}C$)

Symbol	Parameter
V_{RM}	Stand-off voltage
I_{RM}	Leakage current at stand-off voltage
V_R	Continuous Reverse voltage
V_{BR}	Breakdown voltage
V_{BO}	Breakover voltage
I_H	Holding current
I_{BO}	Breakover current
I_{PP}	Peak pulse current
C	Capacitance



STATIC PARAMETERS BETWEEN TIP AND GND, RING AND GND

Type	$I_{RM} @ V_{RM}$		$I_R @ V_R$		$V_{BO} @ I_{BO}$			I_H	C
	max. μA	V	max. note 1 μA	V	max. note 2 V	min. mA	max. mA	min note 3 mA	max note 4 pF
THBT7011D	5	66	50	70	89	50	400	150	80

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STATIC PARAMETERS BETWEEN TIP AND RING

Type	I_{RM} @ V_{RM}		I_R @ V_R		C max note 4 pF
	max. μA	note 6 V	max. μA	note 6 V	
THBT7011D	5	132	50	140	40

Note 1: I_R measured at V_R guarantees $V_{BR} > V_R$

Note 2: Measured at 50 Hz (1 cycle) test circuit 1.

Note 3: See the reference test circuit 2.

Note 4: $V_R = 1V$, $F = 1MHz$.

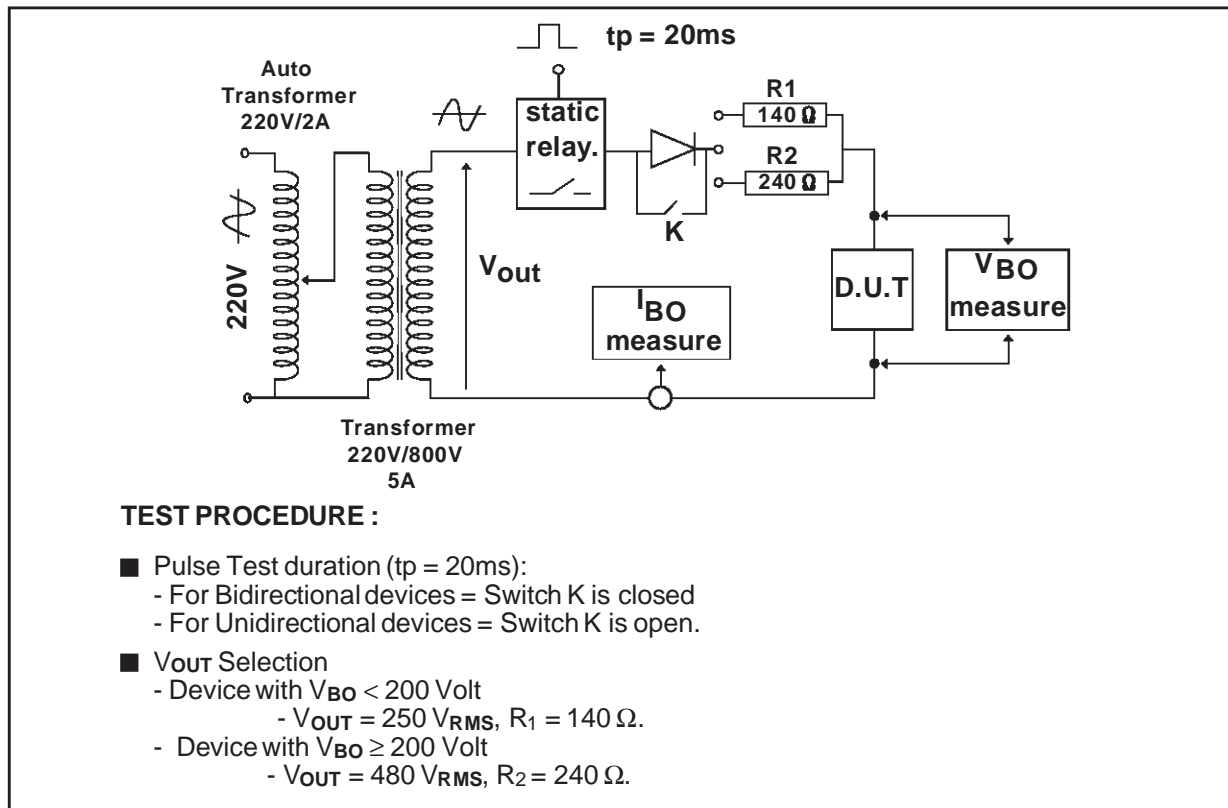
Note 5: See test circuit 3 for V_{BO} dynamic parameters; R_p is the protection resistor located on the line card.

Note 6: Ground not connected or $|V_{TIP}| = |V_{RING}|$ versus Ground

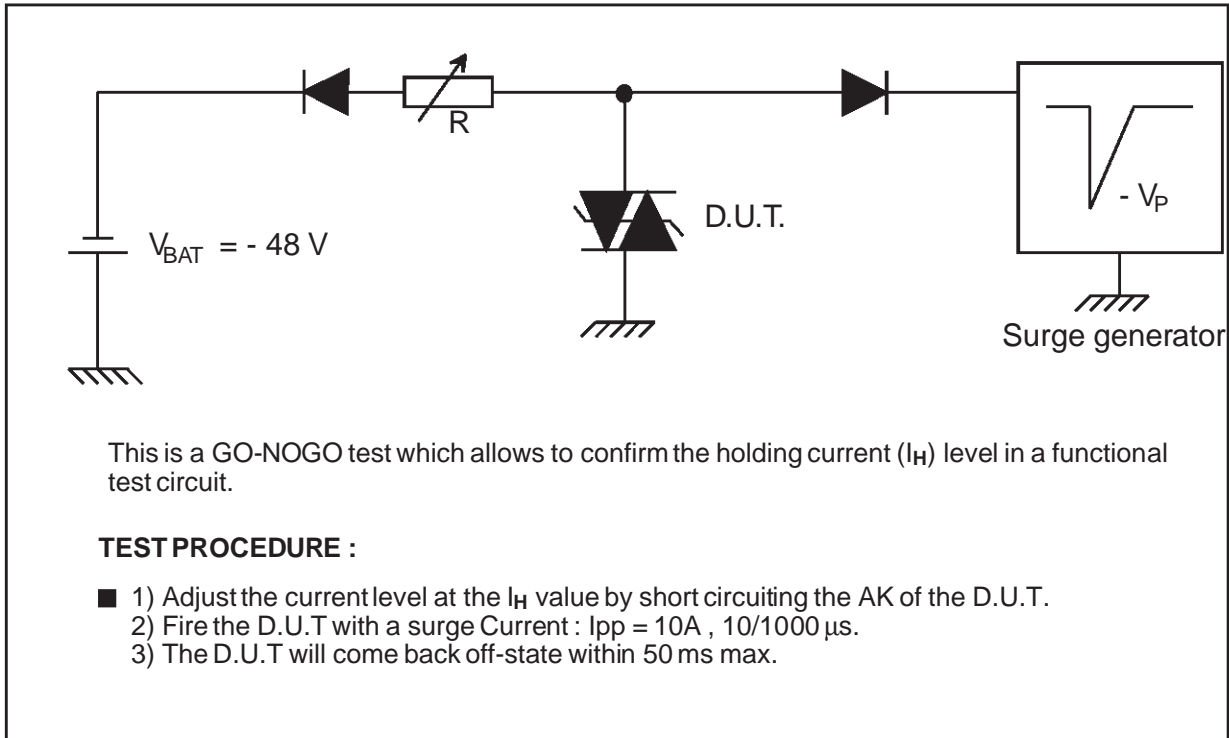
DYNAMIC BREAKOVER VOLTAGES (Transversal mode)

Type	Symbol	Test conditions (see note 5)				Maximum	Unit
THBT7011D	V_{BO}	10/700 μs	1.5kV	$R_p=10\Omega$	$I_{PP}=30A$	90	V
		1.2/50 μs	1.5kV	$R_p=10\Omega$	$I_{PP}=30A$	95	
		2/10 μs	2.5kV	$R_p=62\Omega$	$I_{PP}=38A$	150	

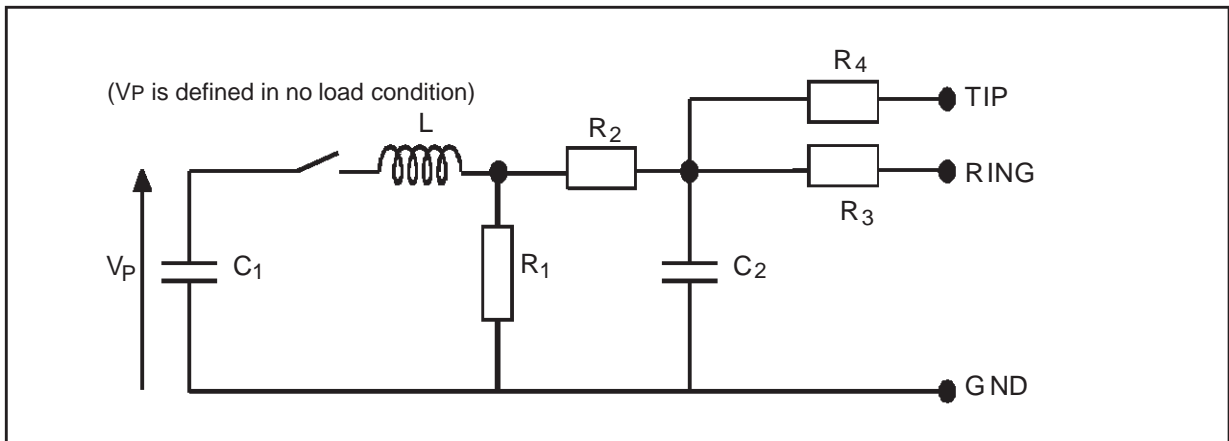
TEST CIRCUIT 1 for I_{BO} and V_{BO} parameters:



TEST CIRCUIT 2 for I_H parameter.



TEST CIRCUIT 3 for I_{PP} and V_{BO} parameters :

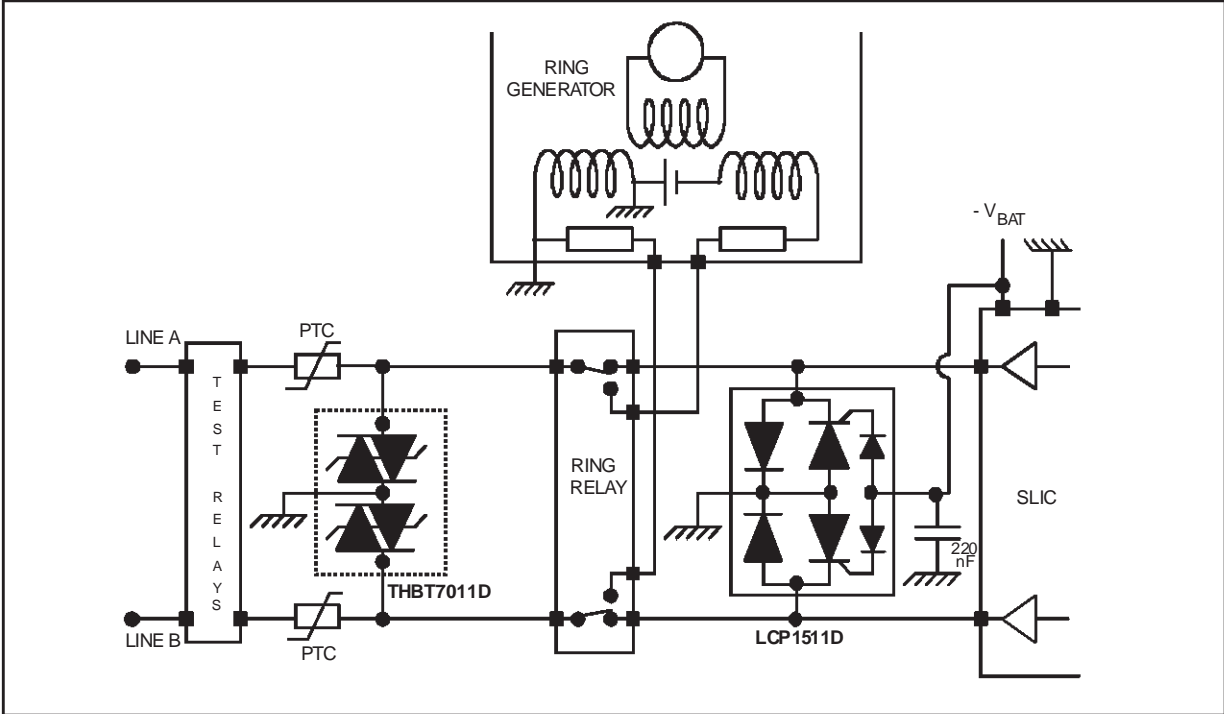


Pulse (μs)		V_p (V)	C_1 (μF)	C_2 (nF)	L (μH)	R_1 (Ω)	R_2 (Ω)	R_3 (Ω)	R_4 (Ω)	I_{PP} (A)	R_p (Ω)
t_r	t_p										
10	700	1500	20	200	0	50	15	25	25	30	10
1.2	50	1500	1	33	0	76	13	25	25	30	10
2	10	2500	10	0	1.1	1.3	0	3	3	38	62

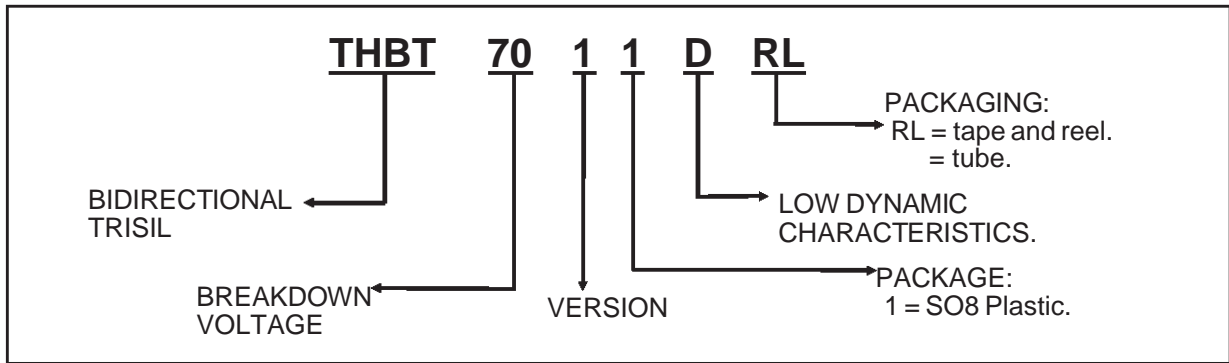
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APPLICATION CIRCUIT :

1 - Line card protection



ORDER CODE

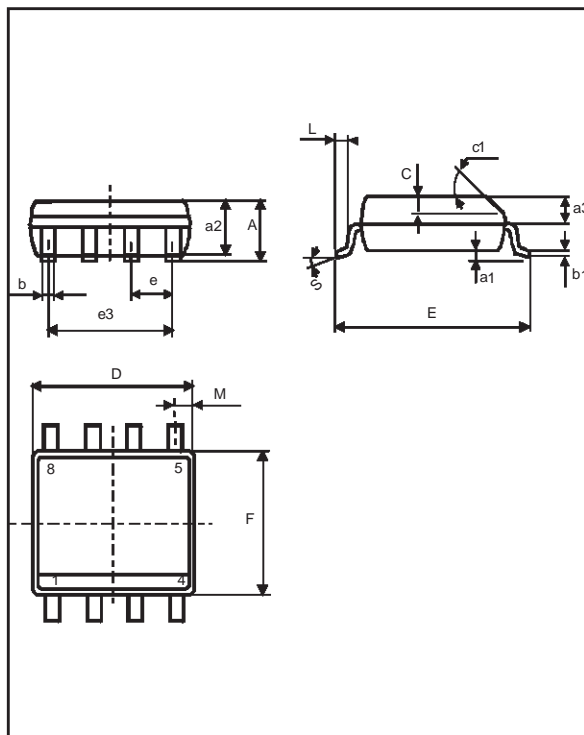


MARKING

Types	Package	Marking
THBT7011D	SO-8	BT701D

PACKAGE MECHANICAL DATA.
SO-8 Plastic

MARKING : Logo, Date Code, Part Number.



Packaging : Products supplied in antistatic tubes or tape and reel.

Weight : 0.08g



REF.	DIMENSIONS					
	Millimetres			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.75			0.069
a1	0.1		0.25	0.004		0.010
a2			1.65			0.065
a3	0.65		0.85	0.025		0.033
b	0.35		0.48	0.014		0.019
b1	0.19		0.25	0.007		0.010
C	0.25	0.50	0.50	0.010		0.020
c1	45° (typ)					
D	4.8		5.0	0.189		0.197
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F	3.8		4.0	0.15		0.157
L	0.4		1.27	0.016		0.050
M			0.6			0.024
S	8° (max)					

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