



TPI8011N TPI12011N

Application Specific Discretes
A.S.D.™

TRIPOLAR PROTECTION FOR ISDN INTERFACES

FEATURES

- BIDIRECTIONAL TRIPLE CROWBAR PROTECTION.
- PEAK PULSE CURRENT :
 $I_{PP} = 30\text{ A}$, 10/1000 μs .
- BREAKDOWN VOLTAGE:
TPI80xxN : 80V
TPI120xxN : 120V.
- AVAILABLE IN SO-8 PACKAGES.
- LOW DYNAMIC BREAKOVER VOLTAGE :
TPI80N : 150V
TPI120 : 200V

DESCRIPTION

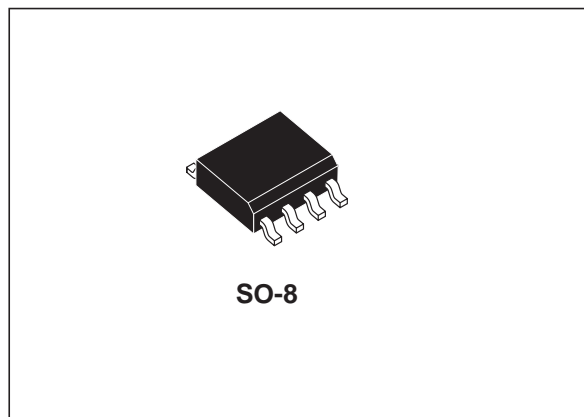
Dedicated devices for ISDN interface and high speed data telecom line protection. Equivalent to a triple TRISIL with low capacitance.

These devices provide :

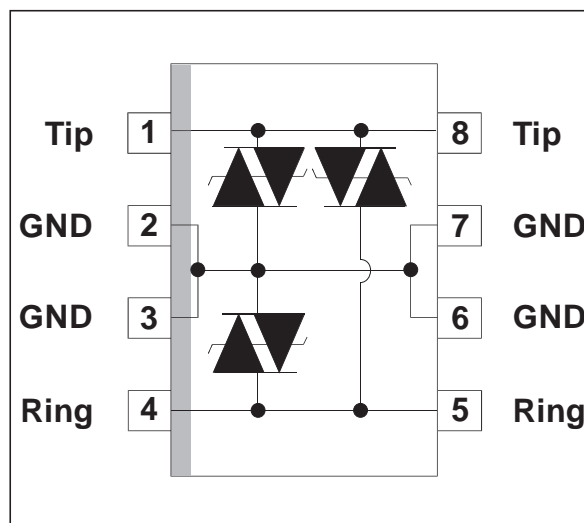
- low capacitance from lines to ground, allowing high speed transmission without signal attenuation.
- good capacitance balance between lines in order to ensure longitudinal balance.
- fixed breakdown voltage in both common and differential modes.
- the same surge current capability in both common and differential modes.
- A particular attention has been given to the internal wire bonding. The "4-point" configuration ensures a reliable protection, eliminating overvoltages introduced by the parasitic inductances of the wiring (Ldi/dt), especially for very fast transient overvoltages.

COMPLIES WITH THE FOLLOWING STANDARDS :

CCITT K17 - K20	10/700 μs	1.5 kV
	5/310 μs	38 A
VDE 0433	10/700 μs	2 kV
	5/310 μs	50 A
VDE 0878	1.2/50 μs	1.5 kV
	1/20 μs	40 A
CNET	0.5/700 μs	1.5 kV
	0.2/310 μs	38 A



SCHEMATIC DIAGRAM



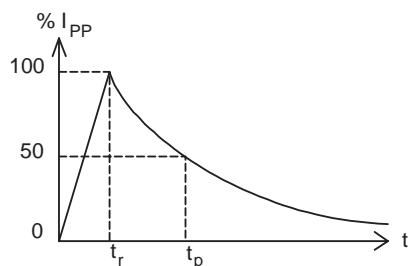
TPI8011N/TPI12011N

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

Symbol	Parameter		Value	Unit
I_{PP}	Peak pulse current (see note 1)	10/1000 μs 5/320 μs 2/10 μs	30 40 90	A
I_{TSM}	Non repetitive surge peak on-state current ($F = 50\text{ Hz}$).	$t_p = 10\text{ ms}$ $t = 1\text{ s}$	8 3.5	A
T_{stg} T_j	Storage temperature range Maximum junction temperature		- 55 to + 150 150	$^{\circ}\text{C}$
T_L	Maximum lead temperature for soldering during 10s		260	$^{\circ}\text{C}$

Note 1 : Pulse waveform :

10/1000 μs	$t_r=10\mu\text{s}$	$t_p=1000\mu\text{s}$
5/310 μs	$t_r=5\mu\text{s}$	$t_p=310\mu\text{s}$
2/10 μs	$t_r=2\mu\text{s}$	$t_p=10\mu\text{s}$

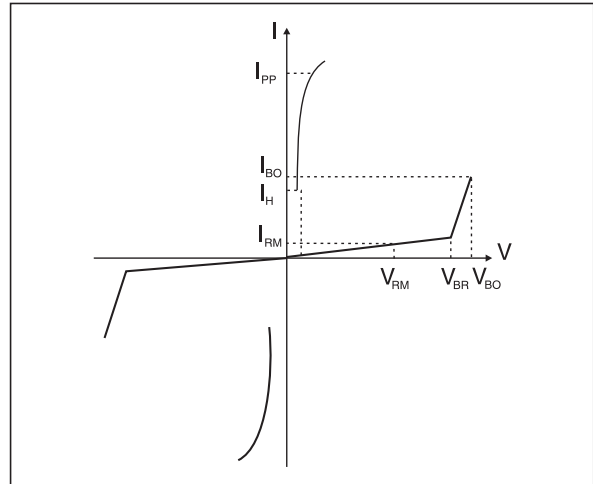


THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-a)}$	Junction to ambient	SO-8	170	$^{\circ}\text{C/W}$

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

Symbol	Parameter
V_{RM}	Stand-off voltage
I_{RM}	Leakage current
V_{BR}	Breakdown voltage
V_{BO}	Breakover voltage
I_H	Holding current
I_{BO}	Breakover current
I_{PP}	Peak pulse current
V_F	Forward Voltage Drop
C	Capacitance



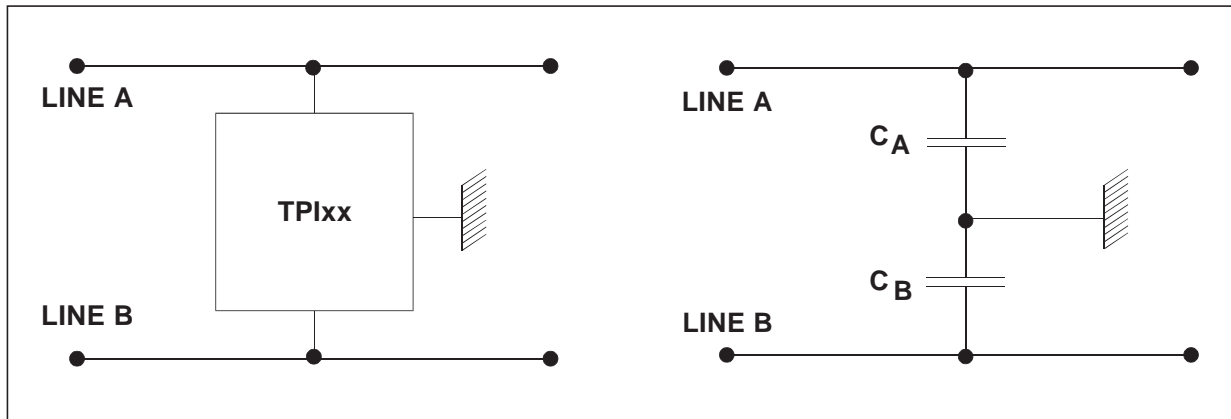
Types	$I_{RM} \text{ @ } V_{RM}$		$V_{BR} \text{ @ } I_R$		V_{BO}	$V_{BO} \text{ dyn.}$	I_{BO}	I_H
	max.		min.		max. note1	typ. note2	max. note1	min. note3
	μA	V	V	mA	V	V	mA	mA
TPI8011N	10	70	80	1	120	150	800	150
TPI12011N	10	105	120	1	180	200	800	150

Note 1 : See the reference test circuit 1.

Note 2 : Surge test according to CCITT 1.5kV, 10/700 μs between Tip or Ring and ground.

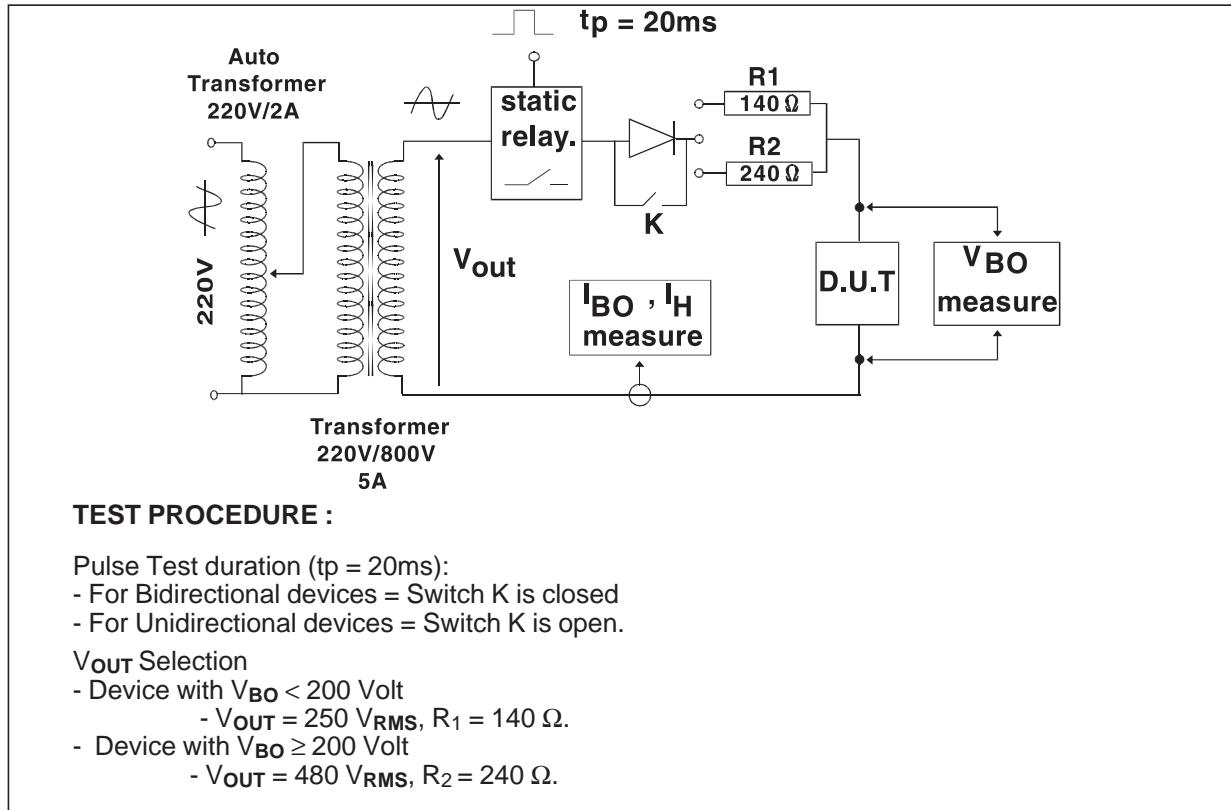
Note 3 : See functional holding current test circuit 2.

CAPACITANCES CHARACTERISTICS



CONFIGURATION	$C_A \text{ (pF)}$ max	$C_B \text{ (pF)}$ max	$C_A - C_B \text{ (pF)}$ max
$V_A = 1\text{V}$ $V_B = 56\text{V}$	70	50	30
$V_A = 56\text{V}$ $V_B = 1\text{V}$	50	70	30

REFERENCE TEST CIRCUIT 1 :



FUNCTIONAL HOLDING CURRENT (I_H) TEST CIRCUIT 2 :

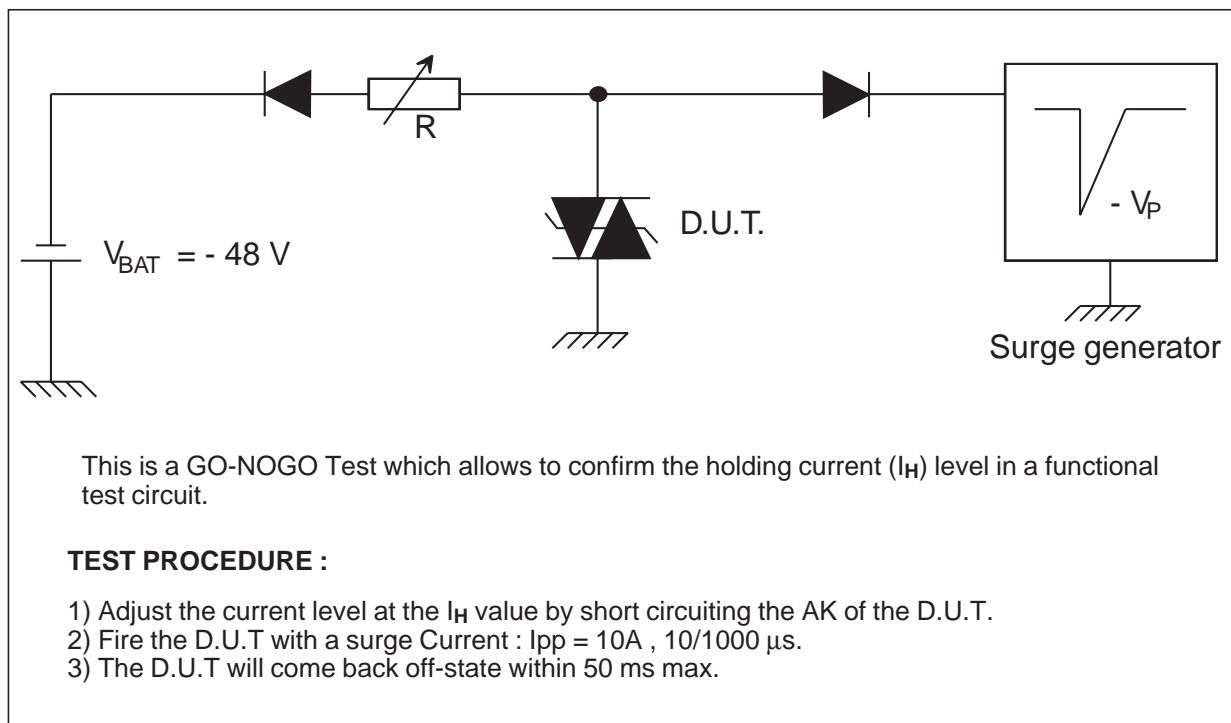
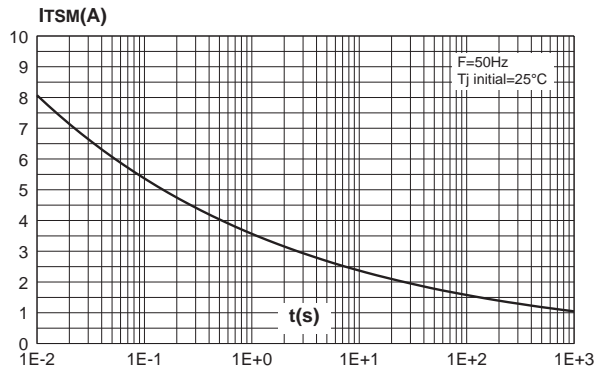
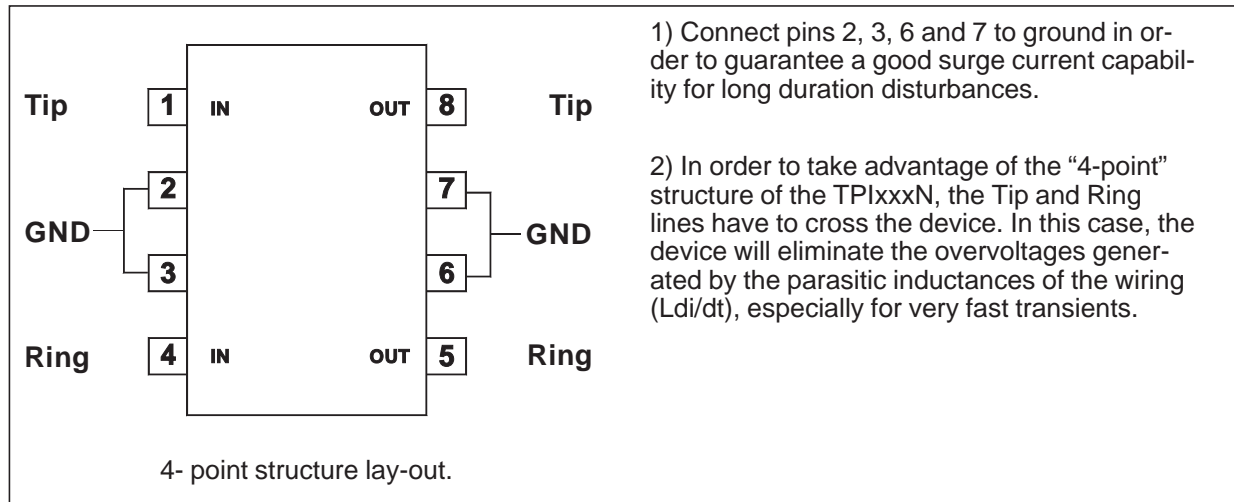


Fig. 1 : Surge peak current versus overload duration.

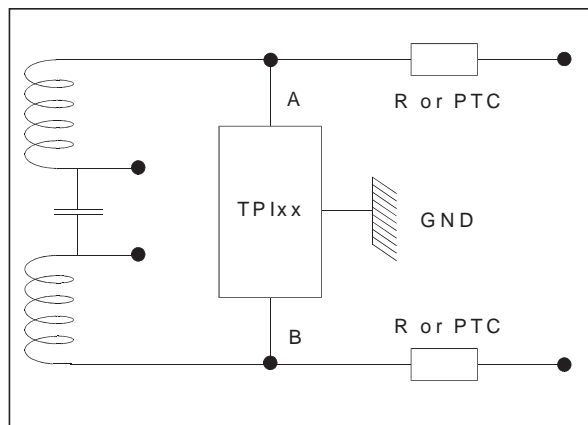


APPLICATION NOTE.

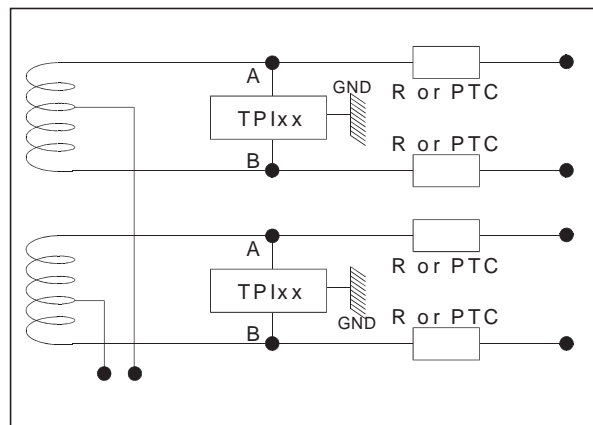


APPLICATION CIRCUITS :

1 - U INTERFACE PROTECTION



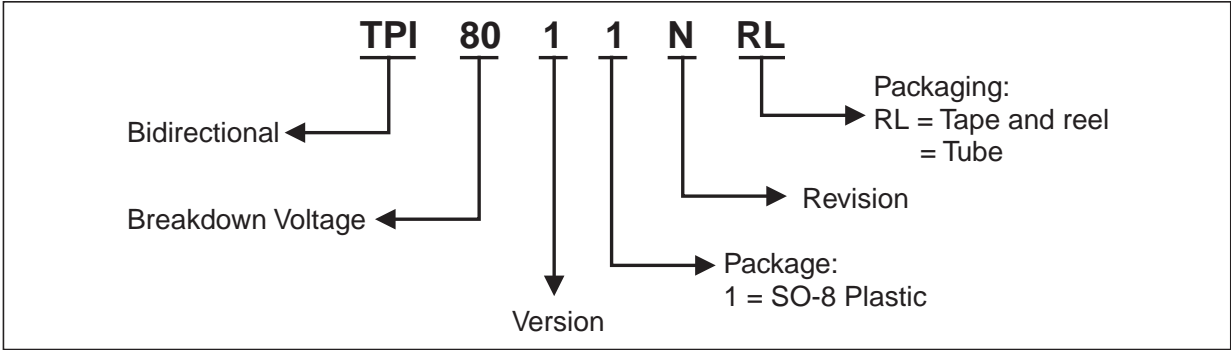
2 - S INTERFACE PROTECTION



This component uses an internal structure resulting in symmetrical characteristics with a good balanced behaviour. Its topology ensures the same breakdown voltage level for positive and negative surges in differential and common mode .

TPI8011N/TPI12011N

ORDER CODE

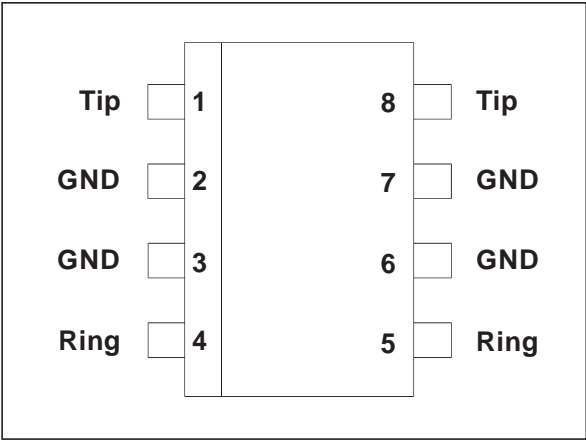


MARKING

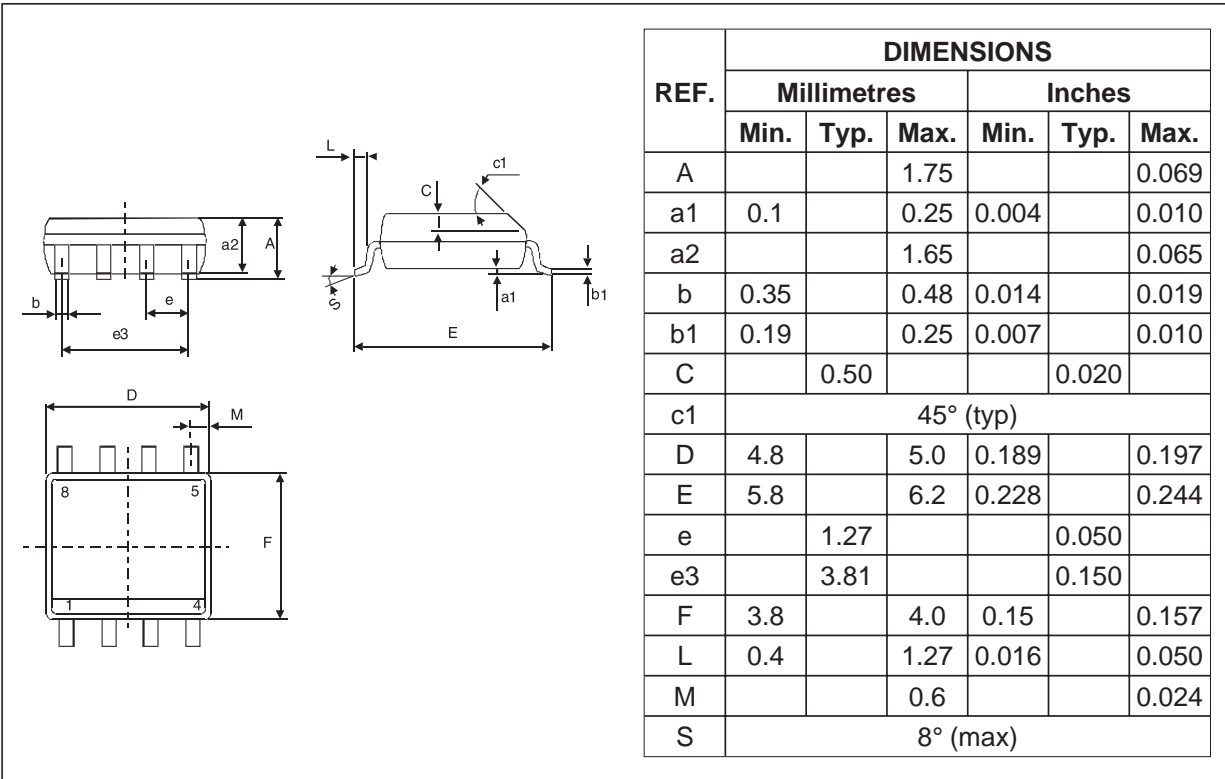
Package	Type	Marking
SO-8	TPI8011N TPI12011N	TP80N TP120N

CONNECTION DIAGRAM

SO-8 Plastic



PACKAGE MECHANICAL DATA **SO-8 Plastic**



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

Weight : 0.08g

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