SGS-THOMSON MICROELECTRONICS

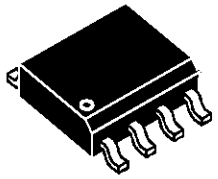
TPN3021

Application Specific Discretes
A.S.D.™

TRIPOLAR PROTECTION FOR NETWORK INTERFACES

FEATURES

- PROTECTS HIGH-SPEED LINE DRIVERS / RECEIVERS
- CROWBAR PROTECTION MODE
- VERY LOW CAPACITANCE : C = 30 pF MAXIMUM
- HIGH SURGE CURRENT CAPABILITY : I_{pp} = 150A FOR 8/20 µs SURGE



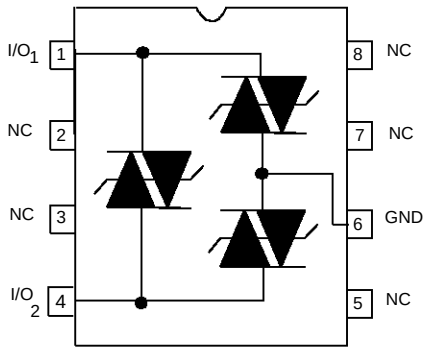
SO8
(Plastic)

DESCRIPTION

Compatible with all protection standards, the TPN3021 is designed for protecting dataline drivers and receivers against high surges.

With a stand-off voltage of 28V and a very low capacitance, this device is able to protect high-speed interfaces such as T1/E1 interface, as well as the traditional types such as RS232 and RS485.

FUNCTIONAL DIAGRAM



COMPLIES WITH THE FOLLOWING STANDARDS :

- IEC801-2	15kV	(air discharge)
- IEC801-4	40A	(repetitive 2.5kHz)
- IEC801-5	1.2/50µs	4kV
	8/20µs	150A

ABSOLUTE MAXIMUM RATINGS ($0°C \leq T_{amb} \leq 70°C$)

Symbol	Parameter		Value	Unit
I_{pp}	Peak pulse current	10/1000 µs 8/20 µs	30 150	A A
T_{stg} Tj	Storage temperature range Maximum junction temperature		- 40 to + 150 150	°C °C

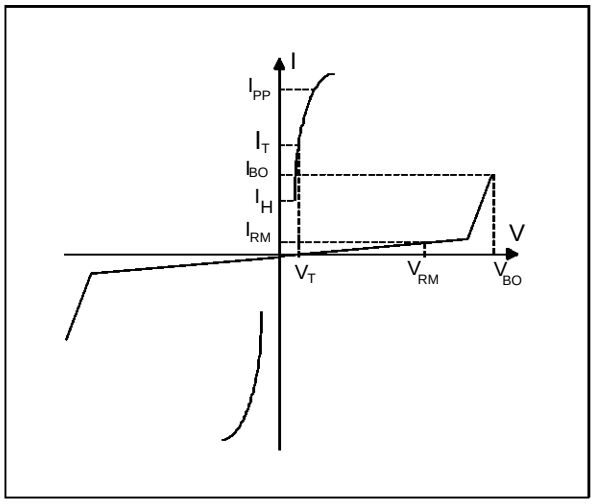
THERMAL RESISTANCE

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

ELECTRICAL CHARACTERISTICS

(T_{amb}=25°C, unless otherwise specified)

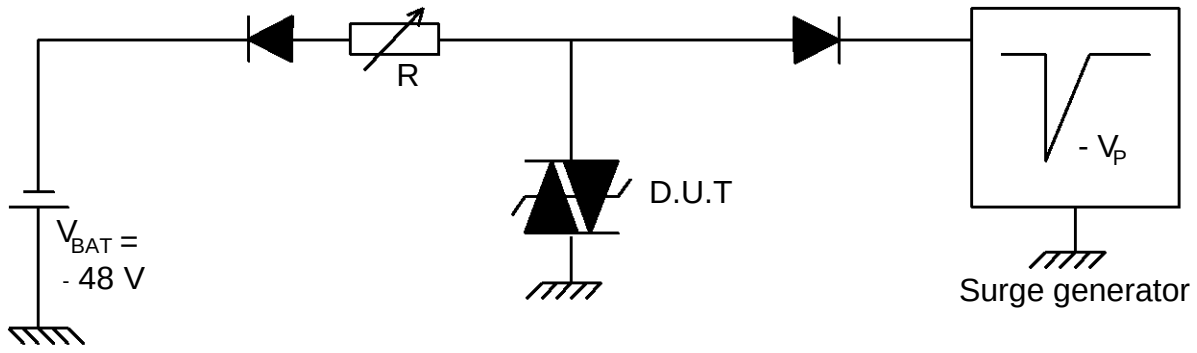
Symbol	Parameter
V_{RM}	Stand-off voltage
V_{BO}	Breakover voltage
I_H	Holding current
I_{BO}	Breakover current
I_{RM}	Leakage current at V_{RM}
I_{PP}	Peak pulse current
C	Capacitance
αT	Temperature coefficient



Type	I_{RM} @ V_{RM} max. note 1		V_{BO} @ I_{BO} max.		I_H min. note 2	V_T max. note 3	C typ. note 4	C max. note 4	αT typ. note 5
	µA	V	V	mA	mA	V	pF	pF	10^{-4}/°C
TPN3021	4	28	38	100	30	4	25	30	8

Note 1 : Between any I/O pin and Ground or between I/O_1 and I/O_2.
Note 2 : See the functional holding current (I_H) test circuit.
Note 3 : Square pulse : t_p = 500 µs, I_T = 5A.
Note 4 : Between any I/O pin and GND or between I/O_1 and I/O_2 at 0V bias, V_{RMS} = 30 mV, F = 1 MHz.
Note 5 : $\Delta V_{BO} = \alpha T \times (T_{amb} - 25) \times V_{BO}(25°C)$.

FUNCTIONAL HOLDING CURRENT (I_H) TEST CIRCUIT : GO-NO GO TEST

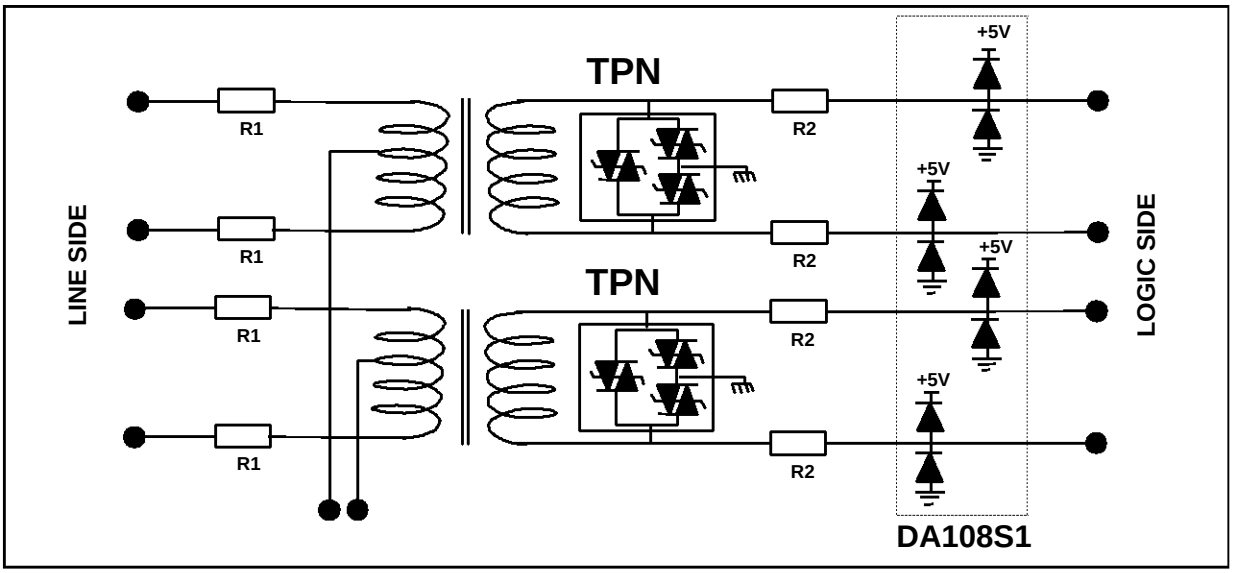


This is a GO-NO GO test which allows to confirm the holding current (I_H) level in a functional test circuit.

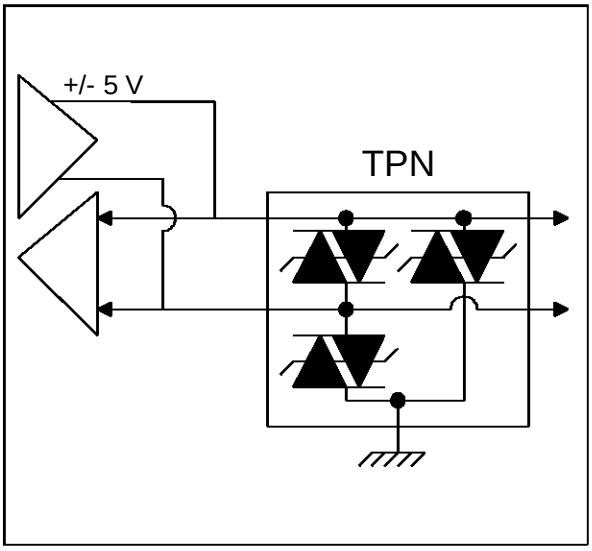
TEST PROCEDURE :

- Adjust the current level at the I_H value by short circuiting the D.U.T.
- Fire the D.U.T. with a surge current : I_{pp} = 10A, 10/1000 µs.
- The D.U.T. will come back to the OFF-state within a duration of 50 ms max.

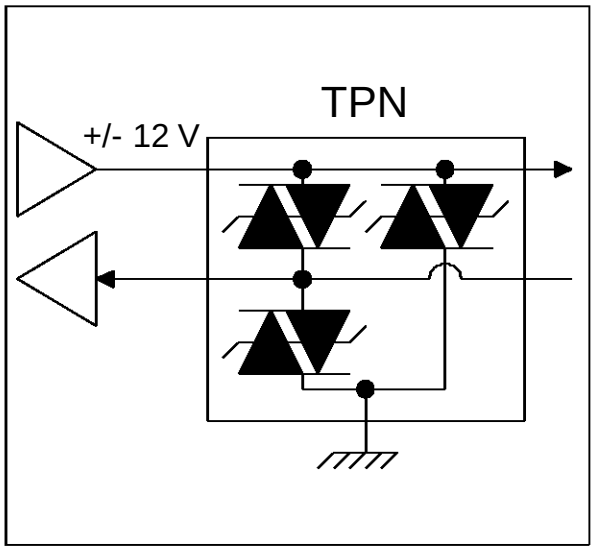
Application 1 : T1/E1 Interface Protection



Application 2 : RS485 Interface Protection



Application 3 : RS232 Interface Protection

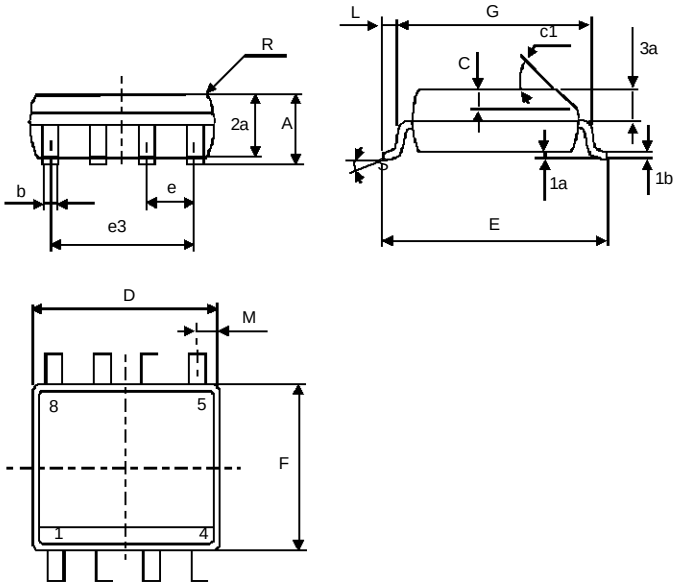


MARKING

Type	Marking
TPN3021	TPN302

PACKAGE MECHANICAL DATA

SO8 (Plastic)



REF.	DIMENSIONS					
	Millimeters			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	0.026		0.033
b	0.35		0.48	0.014		0.019
b1	0.19		0.25	0.007		0.010
C	0.25		0.5	0.010		0.020
c1	45° (typ)					

REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
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)					