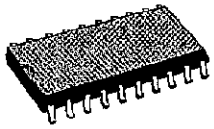
SGS-THOMSON MICROELECTRONICS

ITA6V5B3 / ITA10B3 ITA18B3 / ITA25B3

MONOLITHIC TRANSIL® ARRAY FOR DATA LINE PROTECTION

FEATURES

- HIGH SURGE CAPABILITY TRANSIL ARRAY IPP = 40 A 8/20µs
- UP TO 9 BIDIRECTIONAL TRANSIL FUNCTIONS
- BREAKDOWN VOLTAGE AND MAXIMUM DIFFERENTIAL VOLTAGE BETWEEN TWO INPUT PINS :
  ITA 6V5 = 6,5 V
  ITA10 = 10 V
  ITA18 = 18 V
  ITA25 = 25 V
- AVAILABLE IN SO 20 PACKAGES



SO 20
(Plastic)

DESCRIPTION

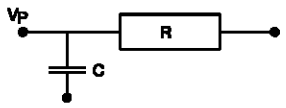
Specially developed for RS 232, RS 423 interface protection, this monolithic chip component offers a high surge capability and a low clamping voltage.

The internal wire bonding, "4 points connection", ensures a reliable protection against very fast transient overvoltages like ESD.

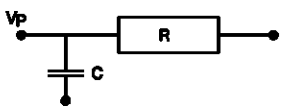
A low clamping voltage is guaranteed,eliminating all spikes due to the perturbation itself and also spikes induced by parasitic inductances created by external wiring.

IN ACCORDANCE WITH :

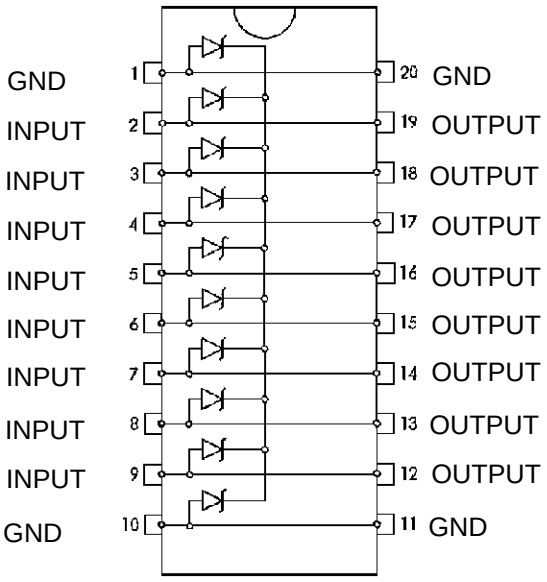
- ESD standard :
  . IEC 801-2 15kV 5ns / 50ns
  . IEC 801-4 40A 5ns / 50ns
  . IEC 801-5 1kV 1.2 / 50µs
  25A 8/20µs
  . MIL STD 883C - Methode 3015-2
  V_P = 25kV
  C = 150pF
  R = 150Ω
  5 s duration



- Human body test :
  V_P = 4kV
  C = 150pF
  R = 150Ω



FUNCTIONAL DIAGRAM

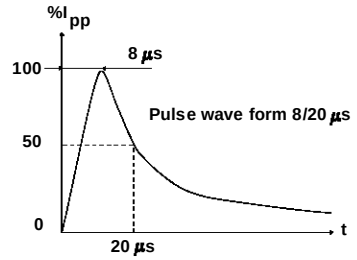


EQUIVALENT TO 8 BIDIRECTIONAL TRANSILS

ABSOLUTE RATINGS (limiting values) (0°C ≤ Tamb ≤ 70°C)

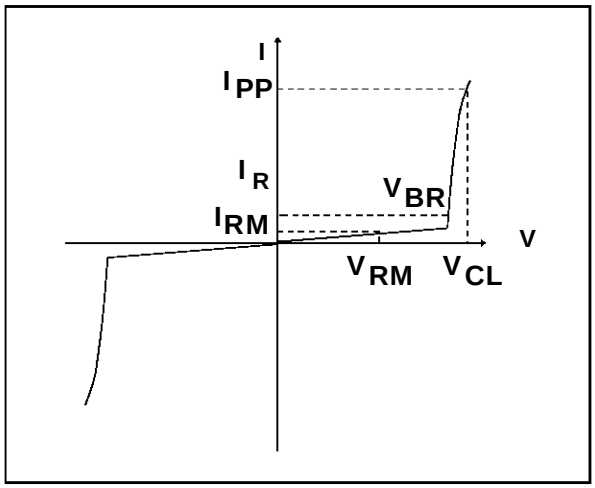
Symbol	Parameter		Value	Unit
Ipp	Peak pulse current for 8/20 µs exponential pulse	See note	40	A
I^2t	Wire I^2t value	See note	0.6	A^2s
T_{stg} T_j	Storage and Junction Temperature Range		- 55 to + 150 125	°C °C

Note : For surges greater than the maximum value specified, the input/output will present first a short circuit to the common bus line and after an open circuit caused by the wire.



ELECTRICAL CHARACTERISTICS

Symbol	Parameter
I_{RM}	Leakage Current @ V_{RM}
V_{RM}	Stand-off Voltage
V_{BR}	Breakdown Voltage
V_{CL}	Clamping Voltage
I_{PP}	Surge Current
C	Input Capacitance



Types	I_{RM} @ V_{RM} max		V_{BR} @ I_R min Note 1		V_{CL} @ I_{PP} max Note 1 8/20µs		V_{CL} max Note 1	I_{pp} 8/20µs	C1 max Note2	C2 max Note3	α_T max
	µA	V	V	mA	V	A	V	A	pf	pf	$10^{-4}/°C$
ITA6V5B3	50	5	6.5	1	9,5	10	11	25	1100	800	4
ITA10B3	10	8	10	1	13	10	17	25	800	360	8
ITA18B3	4	15	18	1	23	10	26	25	500	250	9
ITA25B3	4	24	25	1	31	10	36	25	420	140	12

All parameters tested at 25°C, except where indicated.

Note 1 : Between I/O pin and ground
Note 2 : Between two input Pins at 0 V Bias
Note 3 : Between one input Pin at 0 V and one input Pin at V_{RM}.

Figure 1 : Typical. Peak pulse power versus exponential pluse duration.

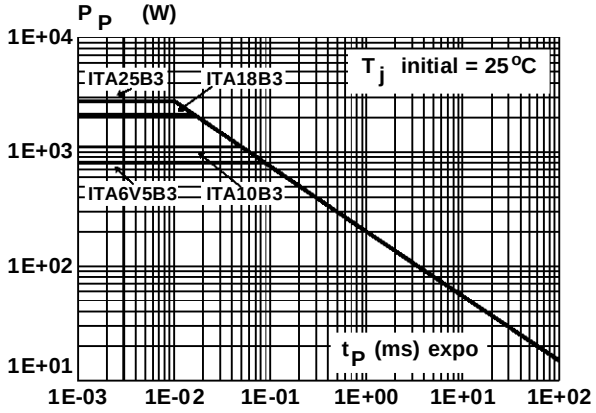


Figure 2 : Clampling voltage versus peak pulse current exponential waveform 8/20 µs.

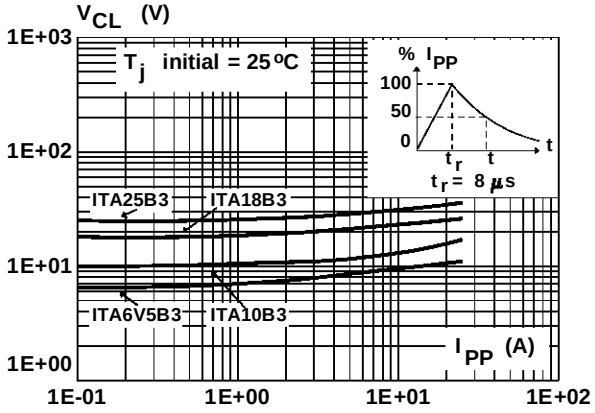


Figure 3 : Peak current I_{PC} inducing open circuit of the wire for one input/output versus pulse duration (typical values).

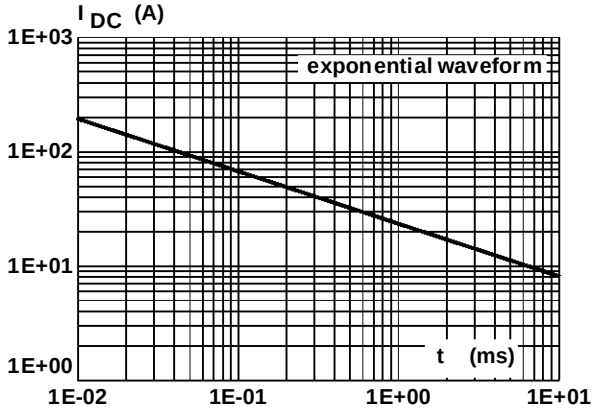
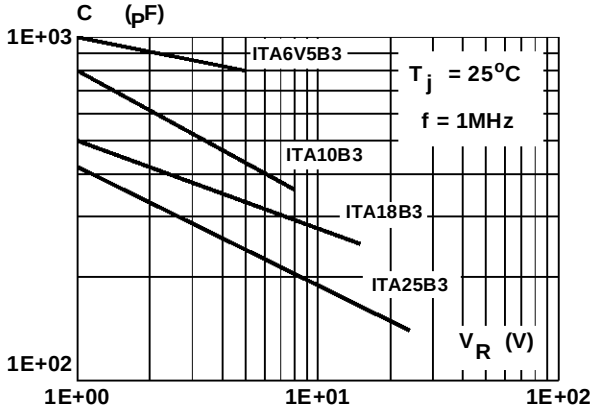


Figure 4 : Junction capacitance versus reverse applied voltage for one input/output (typical values).



Note : The curve of the figure 2 is specified for a junction temperature of 25°C before surge.

APPLICATION NOTICE

TYPES	Maximum differential voltage between two input pins at 25 °C
	V
ITA6V5B	6.5
ITA10B3	10
ITA18B3	18
ITA25B3	25

This monolithic Transil Array is based on 10 Unidirectional Transils with a common cathode and can be configured to offer 8 or 9 bidirectional functions following the customer application.

Figure 5 : Equivalent to 8 Bidirectional Transils

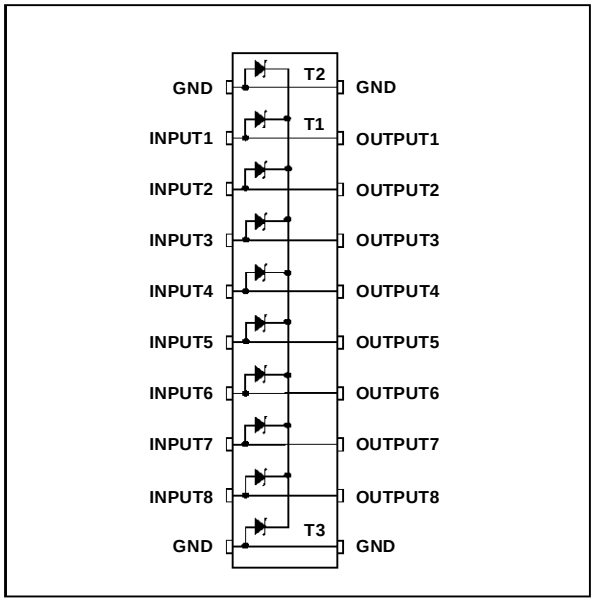
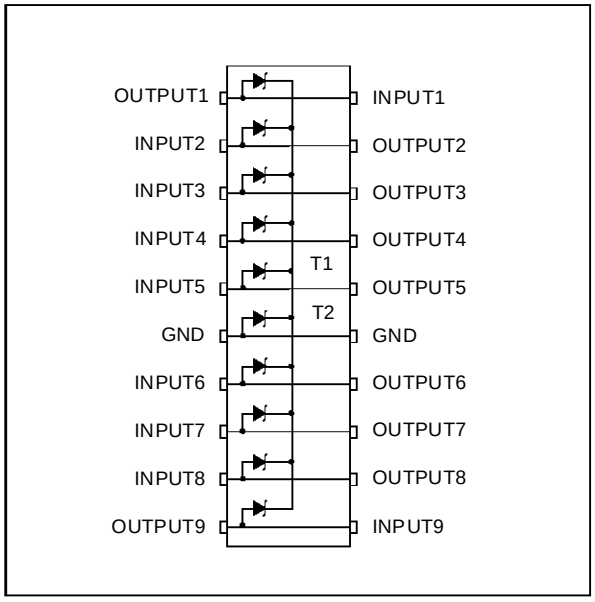


Figure 6 : Equivalent to 9 Bidirectional Transils



UTILIZATION AS OCTAL BIDIRECTIONAL TRANSIL ARRAY.

The main application of this device is to be configured as a 8 bidirectional Transil Array as per the Pin-out of Fig 6.
Pin 1 - 20 and Pin 10 - 11 are connected to ground.
INPUTS are from Pin 2 to Pin 9 and
OUTPUTS are from Pin 12 to Pin 19.

Note : INPUTS and OUTPUTS are symmetrical and can be reversed following application layout requests.
The bidirectional function is made with 2 unidirectional Transils. One (T1) is connected to the INPUT/OUTPUT, the other one (T2) is connected to the ground (see Fig 5).
Ground is connected via 2 diodes T2 and T3. This allows it to withstand 2 specified surges on 2 different lines at the same time.

UTILIZATION AS 9 BIDIRECTIONAL TRANSIL ARRAY.

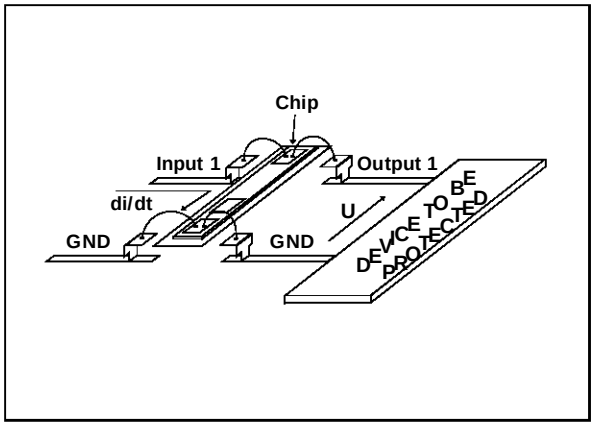
The ITAxxB can be also used as a 9 bidirectional Transil Array.
Ground can be connected to the couple Pin 1 - 20 or 2 - 19 or 3 - 18 or 4 -17 up to 10-11.
The other Pins are used as INPUTS and OUTPUTS.
The bidirectional function is made with 2 unidirectional Transil T1 and T2. One example with ground Pins 6-15 is given Fig 6.
This configuration allows to withstand only one specified surge at the same time.

APPLICATION NOTICE

Design advantage of ITAxxxB3 used with 4 - points Structure.

The ITAxxxB3 has been designed with a 4 - points structure (Isolated Input/output) in order to efficiently protect against disturbances with very high (di/dt) rates, such as ESD.
The purpose is to eliminate the overvoltage introduced by the parasitic inductances of the wiring (L.di/dt).
But efficient protection depends not only on the component itself, but also on the schematic layout.

Figure 7 : 4 Point structure layout



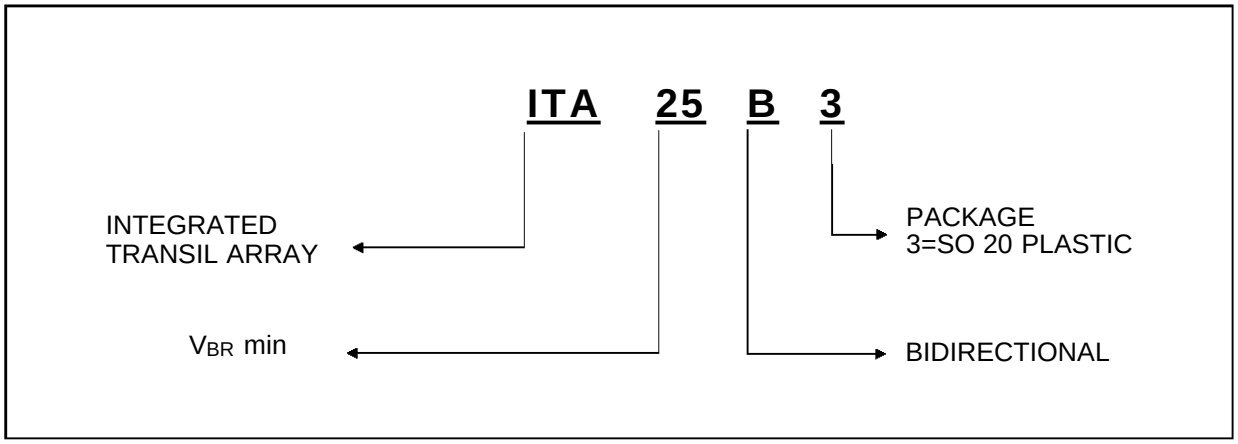
The schema given in fig. 7, shows the lay-out to be used in order to take advantage of the 4 - points structure of the ITAxxxB3.

With this lay-out, each of the lines to be protected passes through the protection device.

In this case, it works as an interface between the data line and the circuit to be protected, guaranteeing an isolation between its inputs and outputs.

The surge currrent is deviated through the input stage of the protection device.
The component to be protected is no longer exposed to any L.di/dt overvoltages.

ORDER CODE

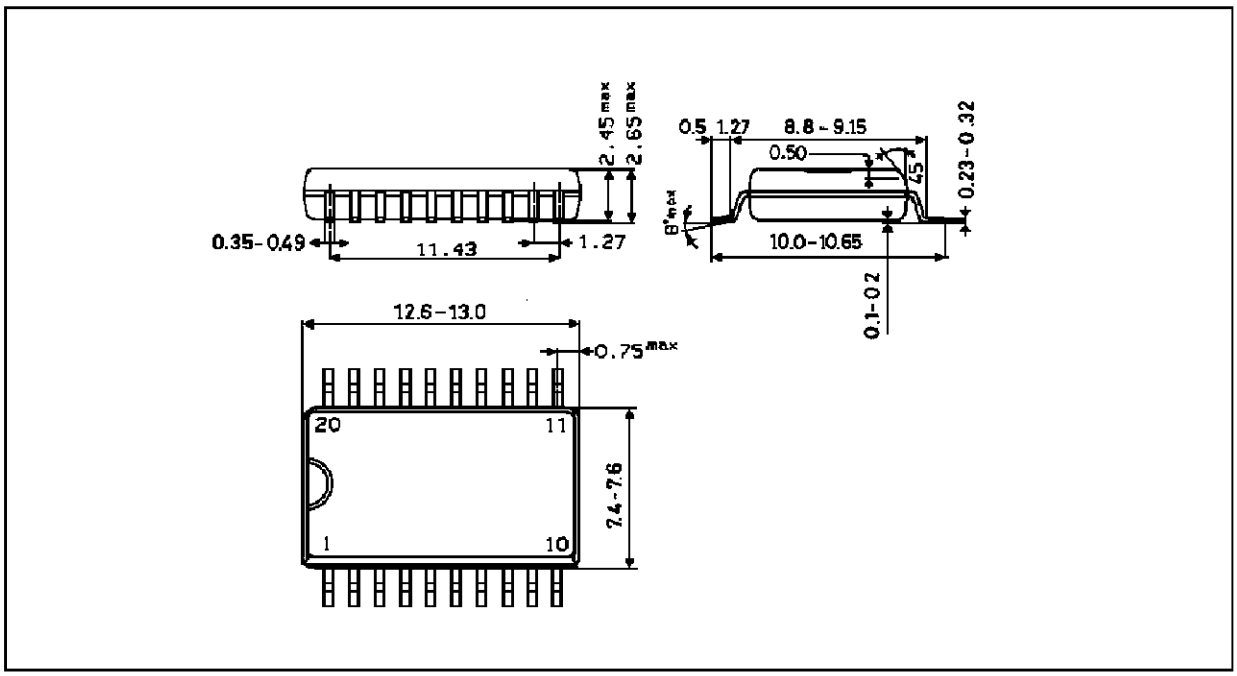


MARKING

TYPE	MARKING
ITA6V5B3	ITA6V5B3
ITA10B3	ITA10B3
ITA18B3	ITA18B3
ITA25B3	ITA25B3

PACKAGE MECHANICAL DATA (in millimeters)

SO 20 Plastic



Packaging : Products supplied in antistatic tubes.