

# ITAxxB1

### Bidirectional Transil<sup>™</sup> array for data line protection

### Features

- High surge capability Transil array: I<sub>PP</sub> = 40 A (8/20 µs)
- Peak pulse power: 300 W (8/20 µs)
- Up to 5 bidirectional Transil functions
- Low clamping factor (V<sub>CL</sub> / V<sub>BR</sub>) at high current level
- Low leakage current
- ESD protection up to 15 kV

#### Complies with the following standards

- IEC 61000-4-2 level 4
  - 15 kV (air discharge)
  - 8 kV (contact discharge)
- MIL STD 883G- Method 3015-7: class 3B
  - 25 kV (human body model)

### Applications

Differential data transmission line protection, such as:

- RS-232
- RS-423
- RS-422
- RS-485

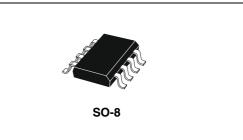
### Description

Transil diode arrays provide high overvoltage protection by clamping action. Their instantaneous response to transient overvoltages makes them particularly suited to protect voltage sensitive devices such as MOS technology and low voltage supplied IC's.

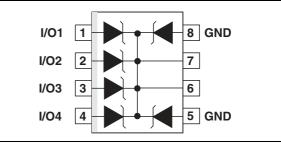
The ITA series combines high surge capability against energetic pulses with high voltage performance against ESD.

TM: Transil is a trademark of STMicroelectronics





#### Figure 1. Functional diagram



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### 1 Characteristics

Symbol	Parameter	Value	Unit
P <sub>PP</sub>	Peak pulse power (8/20 µs) <sup>(1)</sup>	300	W
I <sub>PP</sub>	Peak pulse current (8/20 µs) <sup>(1)</sup>	40	А
l <sup>2</sup> t	Wire I <sup>2</sup> t value <sup>(1)</sup>	0.6	A <sup>2</sup> s
Тj	Maximum operating junction temperature	125	°C
T <sub>stg</sub>	Storage temperature range	-55 to +150	°C
ΤL	Maximum lead temperature for soldering during 10 s at 5	260	°C

#### Table 1.Absolute ratings (T<sub>amb</sub> = 25 °C)

1. For surges greater than the specified maximum value, the I/O will first present a short-circuit and after an open circuit caused by the wire melting.

Symbol	Parameter										
V <sub>RM</sub>	Stand-off voltage										
V <sub>BR</sub>	Breakdo	Breakdown voltage									
V <sub>CL</sub>	Clampir	Clamping voltage						IRM			
I <sub>RM</sub>	Leakage current						$\square$		V	RM VCL VBR	v
I <sub>PP</sub>	Peak pulse current										
αΤ	Voltage	temperati	nperature coefficient								
С	Capacitance						ı				
		$V_{BR}$	@ I <sub>R</sub>	I <sub>RM</sub> @	V <sub>RM</sub>	V <sub>CL</sub>	@ I <sub>PP</sub>	V <sub>CL</sub>	@ I <sub>PP</sub>	αΤ	С
Order code		min. (1)		max.		(1)	8/20 µs	max. (1)	8/20 µs	max.	max. (2)
		V	mA	μA	V	V	Α	V	А	10 <sup>-4</sup> / °C	pF
ITA6V	5B1	6.5	1	10	5	10	10	12	25	4	750
ITA10	)B1	10	1	4	8	15	10	19	25	8	570
ITA18	3B1	18	1	4	15	25	10	28	25	9	350
ITA28	5B1	25	1	4	24	33	10	38	25	12	300

### Table 2.Electrical characteristics (T<sub>amb</sub> = 25 °C)

1. Betwenn I/O pin and ground.

2. Between two input pins at 0 V Bias, F = 1 MHz.

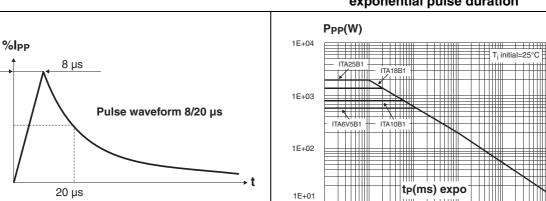
100-

50

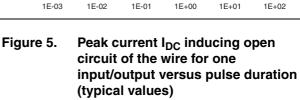
0

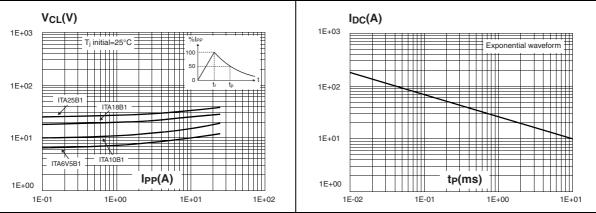
57

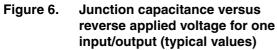
#### Figure 2. **Pulse waveform**

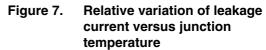


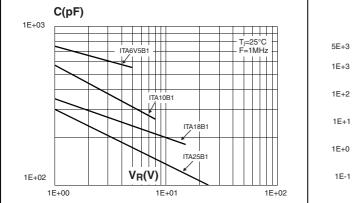
#### Clamping voltage versus peak Figure 4. pulse current (exponential waveform 8/20 µs)











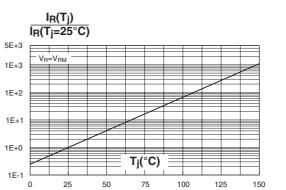
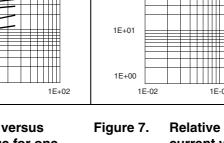


Figure 3. Typical peak pulse power versus exponential pulse duration



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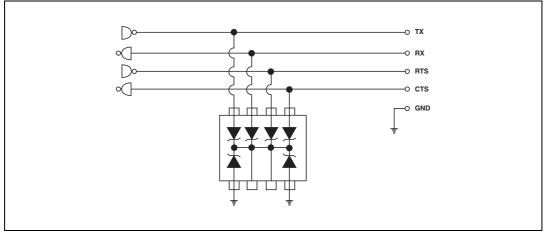
### 2 Application information

This monolithic Transil Array is based on 6 unidirectional Transils with a common cathode and can be configurated to offer up to 5 bidirectional functions. This imposes a maximum differential voltage between 2 input pins (see *Table 3*).

Table 3.Maximum differential voltages

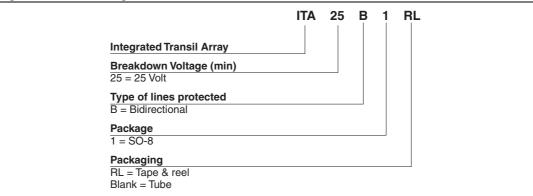
Order code	Maximum differential voltage between two input pins at 25 °C
ITA6V5B1	± 3.5 V
ITA10B1	± 5.0 V
ITA18B1	± 9.0 V
ITA25B1	± 12.5 V

#### Figure 8. RS-232 junction (typical application)



### **3** Ordering information scheme

#### Figure 9. Ordering information scheme





### 4 Package information

• Epoxy meets UL94, V0

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

Table 4. SO-8 dimensions

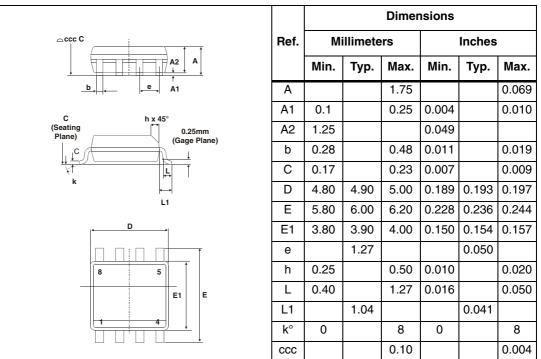
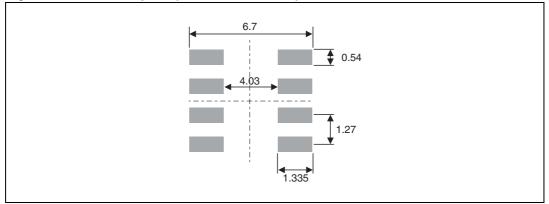


Figure 10. SO-8 footprint (dimensions in mm)



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## 5 Ordering Information

#### Table 5.Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
ITA6V5B1	6V5B1			2000	Ammopack
ITA6V5B1RL	6V5B1			2500	Tape and reel
ITA10B1	10B1			2000	Ammopack
ITA18B1	18B1	SO-8	0.08 g	2000	Ammopack
ITA18B1RL	18B1			2500	Tape and reel
ITA25B1	25B1			2000	Ammopack
ITA25B1RL	25B1			2500	Tape and reel

### 6 Revision history

#### Table 6.Document revision history

Date	Revision	Description of changes
13-Dec-2004	1	First issue.
15-Nov-2007	2	Reformatted to current standards. SO-8 package dimensions update. Updated pulse waveform parameters in <i>Figure 2</i> .

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