# 1 Characteristics

**Table 1. Absolute ratings ($T_{amb}$ = 25 °C)**

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $P_{PP}$ | Peak pulse power (8/20 µs)(1) | $T_j$ initial = $T_{amb}$ | 300 | W |
| $I_{PP}$ | Peak pulse current (8/20 µs)(1) | $T_j$ initial = $T_{amb}$ | 40 | A |
| $I^2t$ | Wire $I^2t$ value(1) | | 0.6 | $A^2s$ |
| $T_j$ | Maximum operating junction temperature | | 125 | °C |
| $T_{stg}$ | Storage temperature range | | -55 to +150 | °C |
| $T_L$ | Maximum lead temperature for soldering during 10 s | | 260 | °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.

**Table 2. Electrical characteristics (definitions, $T_{amb}$ = 25 °C)**

| Symbol | Parameter |
|---|---|
| $V_{RM}$ | Stand-off voltage |
| $V_{BR}$ | Breakdown voltage |
| $V_{CL}$ | Clamping voltage |
| $I_{RM}$ | Leakage current |
| $I_{PP}$ | Peak pulse current |
| $\alpha T$ | Voltage temperature coefficient |
| $V_F$ | Forward voltage drop |
| C | Capacitance |

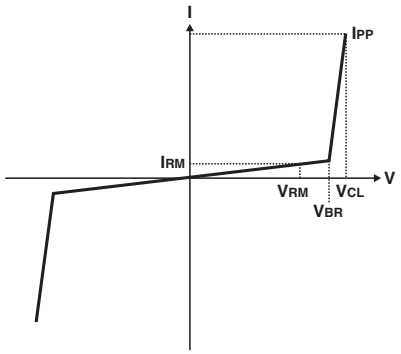



**Table 3. Electrical characteristics (values, $T_{amb}$ = 25 °C)**

| Order code | $V_{BR}$(1) @ $I_R$ min. | | $I_{RM}$ @ $V_{RM}$ max. | | $V_{CL}$(1) @ $I_{PP}$ max. 8/20 µs | | $V_{CL}$(1) @ $I_{PP}$ max. 8/20 µs | | $\alpha T$ max. | C(2) max. |
|---|---|---|---|---|---|---|---|---|---|---|
| | V | mA | µA | V | V | A | V | A | $10^{-4}$/°C | pF |
| ITA6V5B3 | 6.5 | 1 | 10 | 5 | 9.5 | 10 | 12.1 | 25 | 4 | 1100 |
| ITA18B3 | 18 | 1 | 4 | 15 | 21 | 10 | 26 | 25 | 9 | 500 |
| ITA25B3 | 25 | 1 | 4 | 24 | 31 | 10 | 36 | 25 | 12 | 420 |

1. Between I/O pin and ground.
2. Between two input pins at 0 V Bias, F = 1 MHz.

**Figure 2. Pulse waveform**

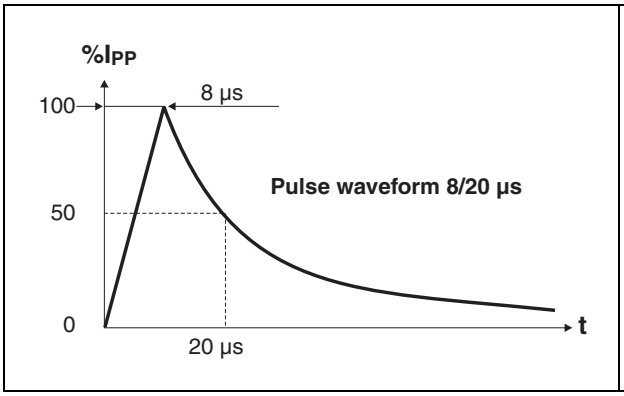



**Figure 3. Typical peak pulse power versus exponential pulse duration**

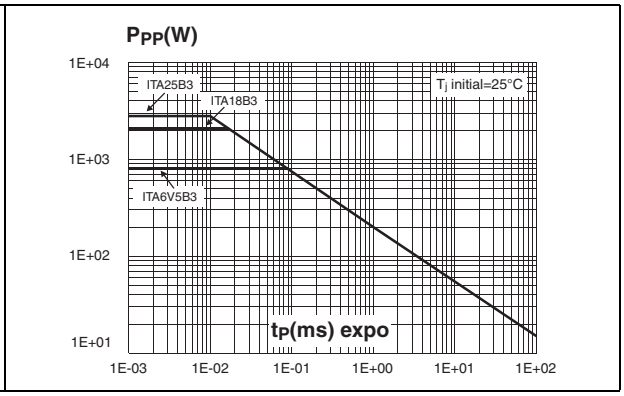



**Figure 4. Clamping voltage versus peak pulse current (exponential waveform 8/20 µs)**

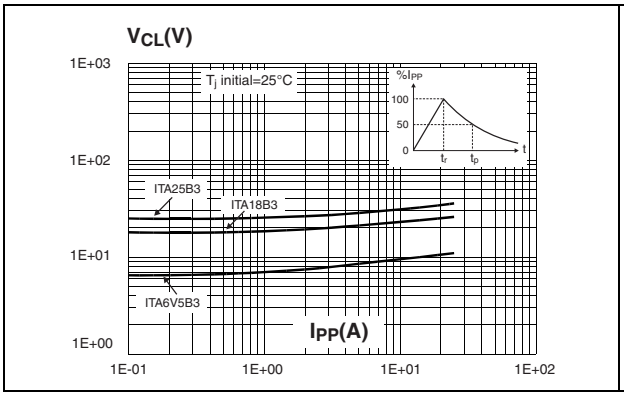



**Figure 5. Peak current $I_{DC}$ inducing open circuit of the wire for one input/output versus pulse duration**

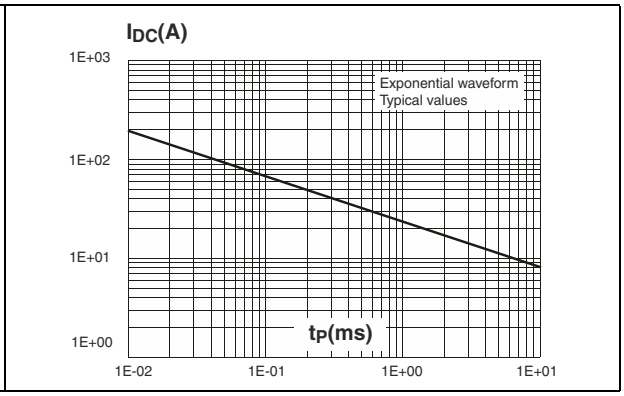



**Figure 6. Junction capacitance versus reverse applied voltage for one input/output (typical values)**

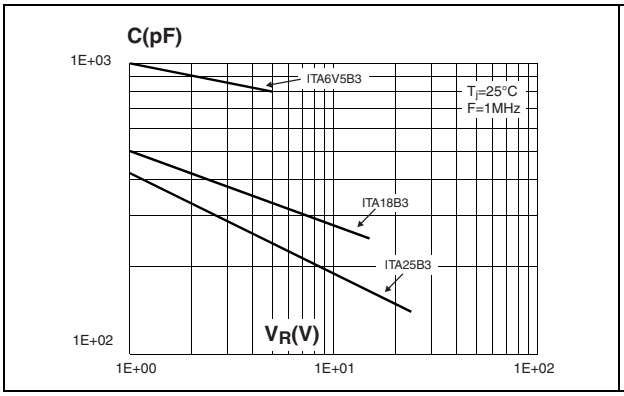
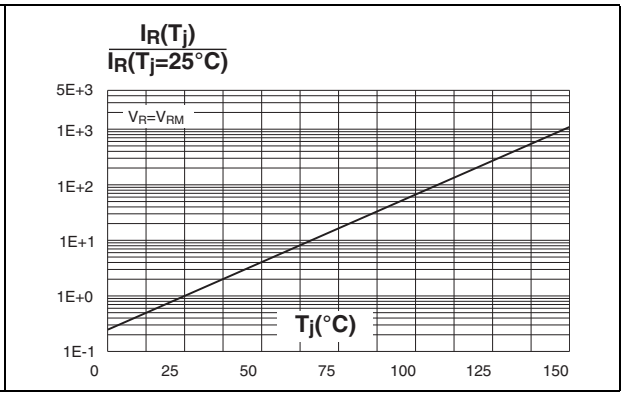



**Figure 7. Relative variation of leakage current versus junction temperature**



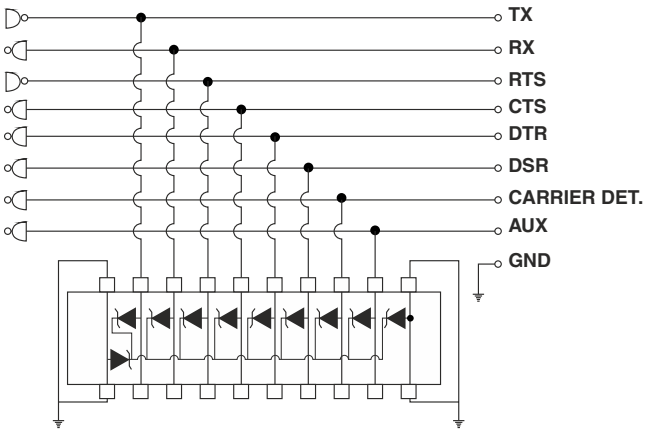
# 2 Application information

This monolithic Transil array is based on 10 unidirectional Transils with a common cathode and can be configured to offer up to 9 bidirectional functions. This imposes a maximum differential voltage between 2 input pins (see *Table 4*).

**Table 4. Maximum differential voltages**

| Order code | Maximum differential voltage between two input pins at 25°C |
|---|---|
| ITA6V5B3 | ± 3.5 v |
| ITA18B3 | ± 9.0 v |
| ITA25B3 | ± 12.5 v |

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



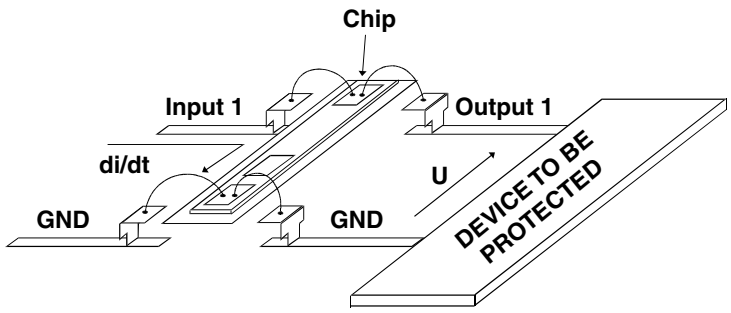
## 2.1 Design advantage of ITAxxB3 used with 4-point structure

The ITAxxxB3 has been designed with a 4-point structure (separated Input/output) to efficiently protect against disturbances with very high di/dt rates, such as ESD. The purpose of this 4-point structure is to eliminate the overvoltage introduced by the parasitic inductances of the wiring (Ldi/dt).

Efficient protection depends not only on the component itself, but also on the circuit layout. *Figure 9* shows the layout to be used to take advantage of the 4-point structure of the ITAxxxB3.

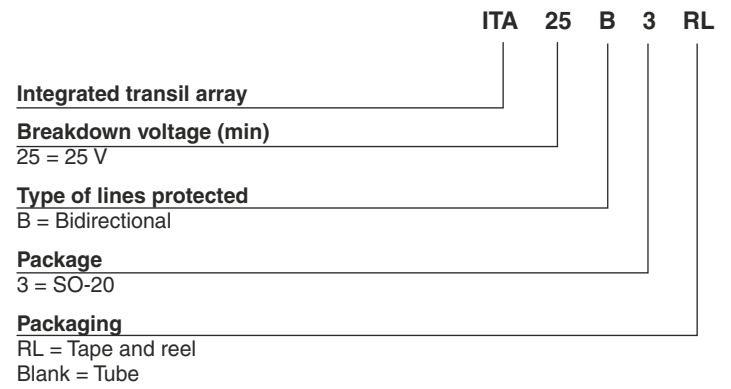
With this layout, each line to be protected passes through the protection device. This approach provides a highly effective interface between the data line and the circuit to be protected, guaranteeing an isolation between its inputs and outputs.

**Figure 9. The 4 point structure**




# 3 Ordering information scheme

**Figure 10. Ordering information scheme**

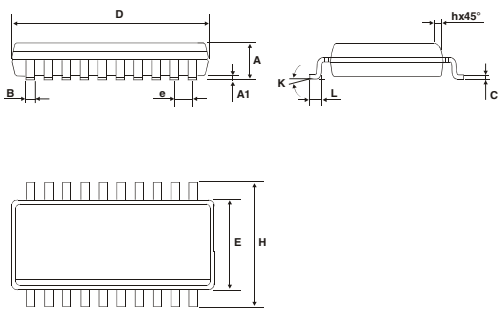


# 4 Package information

- Epoxy meets UL94, V0
- Lead-free package

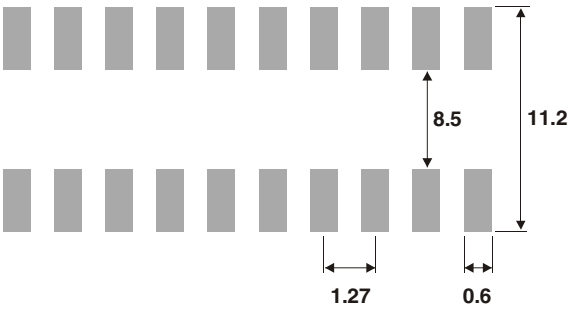
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: *www.st.com.* ECOPACK® is an ST trademark.

**Table 5. SO-20 dimensions**




| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 2.35 | | 2.65 | 0.092 | | 0.104 |
| A1 | 0.10 | | 0.30 | 0.004 | | 0.008 |
| B | 0.33 | | 0.51 | 0.013 | | 0.020 |
| C | 0.23 | | 0.32 | 0.009 | | 0.013 |
| D | 12.6 | | 13.0 | 0.484 | | 0.512 |
| E | 7.40 | | 7.60 | 0.291 | | 0.299 |
| e | | 1.27 | | | 0.050 | |
| H | 10.0 | | 10.65 | 0.394 | | 0.419 |
| h | 0.25 | | 0.75 | 0.010 | | 0.029 |
| L | 0.40 | | 1.27 | 0.016 | | 0.050 |
| K | 8° (max) | | | | | |

**Figure 11. SO-20 footprint (dimensions in mm)**



# 5 Ordering Information

**Table 6. Ordering information**

| Order code | Marking | Package | Weight | Base qty | Delivery mode |
|---|---|---|---|---|---|
| ITA6V5B3 | ITA6V5B3 | SO-20 | 0.55 g | 1000 | Tube |
| ITA18B3 | ITA18B3 | | | 1000 | Tube |
| ITA18B3RL | ITA18B3 | | | 1000 | Tape and reel |
| ITA25B3 | ITA25B3 | | | 1000 | Tube |
| ITA25B3RL | ITA25B3 | | | 1000 | Tape and reel |

# 6 Revision history

**Table 7. Document revision history**

| Date | Revision | Changes |
|---|---|---|
| 13-Dec-2004 | 1 | Initial release. |
| 07-Nov-2007 | 2 | Reformatted to current standards. Updated leakage current values in *Table 2* Updated pulse waveform parameters in *Figure 2*. |
| 09-Oct-2012 | 3 | Updated *Table 3* and resized text in *Figure 8* for readability. |

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