

## ESDA6V1-5SC6

ASD™

# TRANSIL™ ARRAY FOR ESD PROTECTION

#### **MAIN APPLICATIONS**

Where transient overvoltage protection in ESD sensitive equipment is required, such as:

- Computers
- Printers
- Communication systems
- Cellular phone handsets and accessories
- Other telephone set
- Set top boxes

#### **FEATURES**

- 5 Unidirectional Transil™ Functions
- Low leakage current: I<sub>R</sub> max. < 1µA</p>
- Breakdown voltage: V<sub>BR</sub> = 6.1V min.

#### **DESCRIPTION**

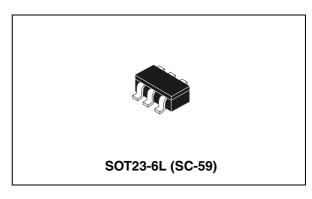
The ESDA6V1-5SC6 is a 5-bit wide monolithic suppressor which is designed to protect against ESD components connected to data and transmission lines.

### **BENEFITS**

- High integration
- Suitable for high density boards

### **COMPLIES WITH THE FOLLOWING STANDARDS:**

|   |         | Test kV | Max.<br>current |
|---|---------|---------|-----------------|
| IEC61000-4-2 level 4  | Air     | 15      | -               |
| 12001000 4 2 10001 4  | Contact | 8       | 30A             |
| MIL STD<br>883C-Method<br>3015-7 class3<br>(Human Body Model) | Contact | > 4     | > 2.67A         |



**Table 1: Order Code** 

| Part Number  | Marking |
|--------------|---------|
| ESDA6V1-5SC6 | EC62    |

Figure 1: Functional Diagram

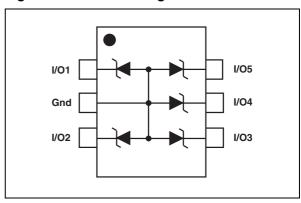
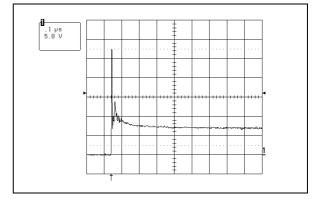


Figure 2: ESD response to IEC61000-4-2 (air discharge 16kV, positive surge)



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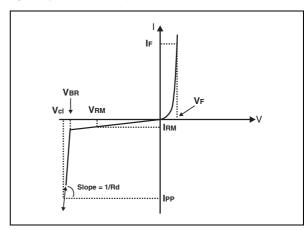
**Table 2: Absolute Maximum Ratings**  $(T_{amb} = 25^{\circ}C)$ 

| Symbol           |                            | Value  | Unit           |    |
|------------------|----------------------------|--|----------------|----|
| V <sub>PP</sub>  | ESD discharge              | MIL STD 883E - Method 3015-7<br>IEC61000-4-2 air discharge<br>IEC61000-4-2 contact discharge | 25<br>20<br>15 | kV |
| $P_{PP}$         | Peak pulse power (8/20)    | 100  | W              |    |
| Tj               | Junction temperature       | 150  | °C             |    |
| T <sub>stg</sub> | Storage temperature ran    | -55 to +150  | °C             |    |
| TL               | Maximum lead temperat case | 260  | °C             |    |
| T <sub>op</sub>  | Operating temperature ra   | -40 to +125  | °C             |    |

Note 1: The evolution of the operating parameters versus temperature is given by curves and  $\alpha T$  parameter.

**Table 3: Electrical Characteristics**  $(T_{amb} = 25^{\circ}C)$ 

| Symbol          | Parameter                       |
|-----------------|---------------------------------|
| $V_{RM}$        | Stand-off voltage               |
| V <sub>BR</sub> | Breakdown voltage               |
| V <sub>CL</sub> | Clamping voltage                |
| I <sub>RM</sub> | Leakage current                 |
| I <sub>PP</sub> | Peak pulse current              |
| αΤ              | Voltage temperature coefficient |
| V <sub>F</sub>  | Forward voltage drop            |
| С               | Capacitance                     |
| R <sub>d</sub>  | Dynamic resistance              |



|              | V    | / <sub>BR</sub> @ | I <sub>R</sub> | I <sub>RM</sub> @ | V <sub>RM</sub> | R <sub>d</sub> | $\alpha$ T           | С       | V <sub>F</sub> @ | 9 I <sub>F</sub> |
|--------------|------|-------------------|----------------|-------------------|-----------------|----------------|----------------------|---------|------------------|------------------|
| Time         | min. | max.              |                | max.              |                 | typ.           | max.                 | typ.    | max.             |                  |
| Туре         |      |                   |                |                   |                 | note 2         | note 3               | 0V bias |                  |                  |
|              | V    | V                 | mA             | μA                | V               | mΩ             | 10 <sup>-4</sup> /°C | pF      | V                | mA               |
| ESDA6V1-5SC6 | 6.1  | 7.2               | 1              | 1                 | 3               | 590            | 6                    | 50      | 1.25             | 200              |

**Note 2:** Square pulse, Ipp = 15A,  $t_p$ =2.5 $\mu$ s.

Note 3:  $\Delta$  V<sub>BR</sub> =  $\alpha$ T\* (T<sub>amb</sub> -25°C) \* V<sub>BR</sub> (25°C).

Figure 3: Peak power dissipation versus initial junction temperature

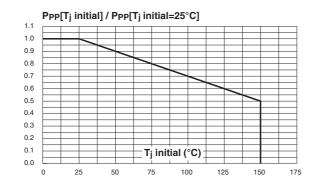
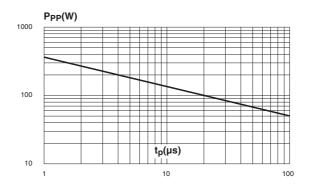


Figure 4: Peak pulse power versus exponential pulse duration ( $T_j$  initial = 25 °C)



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Figure 5: Clamping voltage versus peak pulse current ( $T_j$  initial = 25 °C). Rectangular waveform ( $t_p$  = 2.5  $\mu$ s)

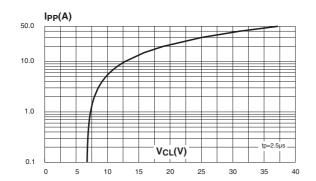


Figure 6: Capacitance versus reverse applied voltage (typical values)

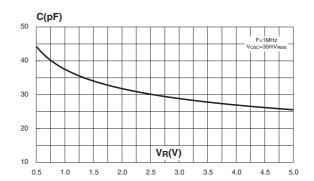
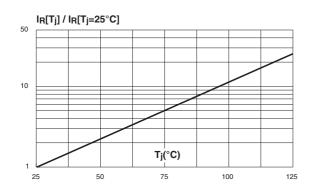


Figure 7: Relative variation of leakage current versus junction temperature (typical values)

Figure 8: Peak forward voltage drop versus peak forward current (typical values)



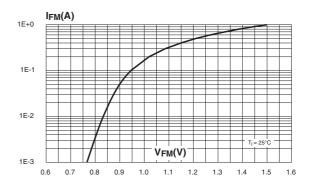
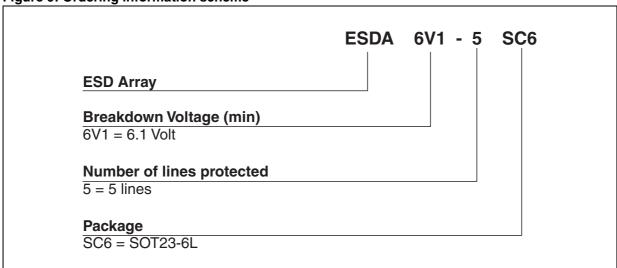
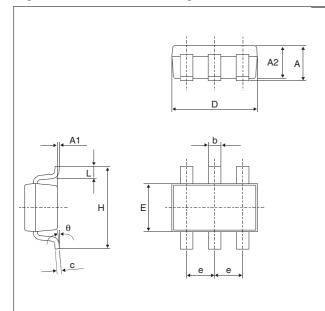


Figure 9: Ordering information scheme



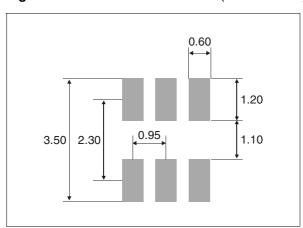
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Figure 10: SOT23-6L Package Mechanical Data



|      | DIMENSIONS |         |      |        |       |       |
|------|------------|---------|------|--------|-------|-------|
| REF. | Mi         | llimete | rs   | Inches |       |       |
|      | Min.       | Тур.    | Max. | Min.   | Тур.  | Max.  |
| Α    | 0.90       |         | 1.45 | 0.035  |       | 0.057 |
| A1   | 0          |         | 0.10 | 0      |       | 0.004 |
| A2   | 0.90       |         | 1.30 | 0.035  |       | 0.051 |
| b    | 0.35       |         | 0.50 | 0.014  |       | 0.02  |
| С    | 0.09       |         | 0.20 | 0.004  |       | 0.008 |
| D    | 2.80       |         | 3.05 | 0.110  |       | 0.120 |
| Е    | 1.50       |         | 1.75 | 0.059  |       | 0.069 |
| е    |            | 0.95    |      |        | 0.037 |       |
| Н    | 2.60       |         | 3.00 | 0.102  |       | 0.118 |
| L    | 0.10       |         | 0.60 | 0.004  |       | 0.024 |
| θ    |            |         | 10°  |        |       | 10°   |

Figure 11: Foot Print Dimensions (in millimeters)



**Table 4: Ordering Information** 

| Part Number  | Marking | Package  | Weight  | Base qty | Delivery mode |
|--------------|---------|----------|---------|----------|---------------|
| ESDA6V1-5SC6 | EC62    | SOT23-6L | 16.7 mg | 3000     | Tape & reel   |

**Table 5: Revision History** 

| Date       | Revision | Description of Changes   |
|------------|----------|--|
| Feb-2002   | 2B       | Last update.   |
| 4-Nov-2004 | 3        | SOT23-6L package dimensions change for reference "D" from 3.0 millimeters (0.118 inches) to 3.05 millimeters (0.120 inches). |

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