

## SuperESD - CDSOT23-SM712-ES

### 1. Description

The CDSOT23-SM712-ES protects sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD) and other voltage induced transient events. They feature large cross-sectional area junctions for conducting high transient currents, offer desirable electrical characteristics for board level protection, such as fast response time, low operating voltage. It gives designer the flexibility to protect one bi-directional line in applications where arrays are not practical.

### 2. Features

- IEC 61000-4-2 Level 4 ESD Protection
  - ±30kV Contact Discharge
  - ±30kV Air Discharge
- IEC 61000-4-4 EFT Protection
  - 35A (5/50ns)
- 400W Peak pulse Power (8/20us)
- RoHS compliance
- Bidirectional configuration
- IO Capacitance: 34pF (Typical)
- Low clamping voltage
- SOT-23 package

### 3. Applications

- RS-485
- Security systems
- Automatic teller machines
- HFC systems

### 4. Ordering Information

| Part Number      | Package | Marking | Material     | Packing     | Quantity per reel | Flammability Rating | Reel Size   |
|------------------|---------|---------|--------------|-------------|-------------------|---------------------|-------------|
| CDSOT23-SM712-ES | SOT-23  | 712     | Halogen free | Tape & Reel | 3,000<br>PCS      | UL 94V-0            | 7<br>inches |

Table-1 Ordering information

## 5. Pin Configuration and Functions

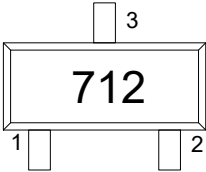
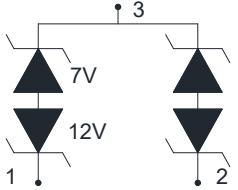
| Pin | Name | Description    | Outline   | Circuit Diagram   |
|-----|------|----------------|---|---|
| 1   | IO   | Connect to IO  |  |  |
| 2   | IO   | Connect to IO  |   |   |
| 3   | GND  | Connect to GND |   |   |

Table-2 Pin configuration

## 6. Specification

### 6.1. Absolute Maximum rating

Over operating free-air temperature range (unless otherwise noted)

| Parameters                                 | Symbol    | Min.        | Max. | Unit |   |
|--|-----------|-------------|------|------|---|
| Peak pulse power (tp=8/20us)@25°C          | $P_{pk}$  | -           | 400  | W    |   |
| Peak pulse current (tp=8/20us)@25°C        | $I_{PP}$  | Pin1,2-Pin3 | -    | 17   | A |
|  |           | Pin3-Pin1,2 | -    | 22   |   |
| ESD (IEC61000-4-2 air discharge) @25°C     | $V_{ESD}$ | -           | ±30  | kV   |   |
| ESD (IEC61000-4-2 contact discharge) @25°C | $V_{ESD}$ | -           | ±30  | kV   |   |
| Junction temperature                       | $T_J$     | -           | 150  | °C   |   |
| Operating temperature                      | $T_{OP}$  | -40         | 125  | °C   |   |
| Storage temperature                        | $T_{STG}$ | -55         | 150  | °C   |   |
| Lead temperature                           | $T_L$     | -           | 260  | °C   |   |

Table-3 Absolute Maximum rating

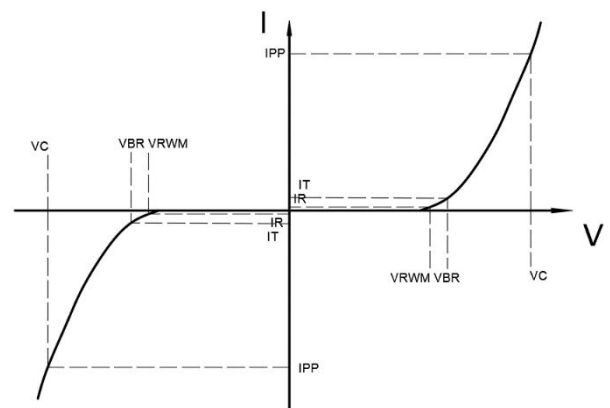
## 6.2. Electrical Characteristics

At TA = 25°C unless otherwise noted

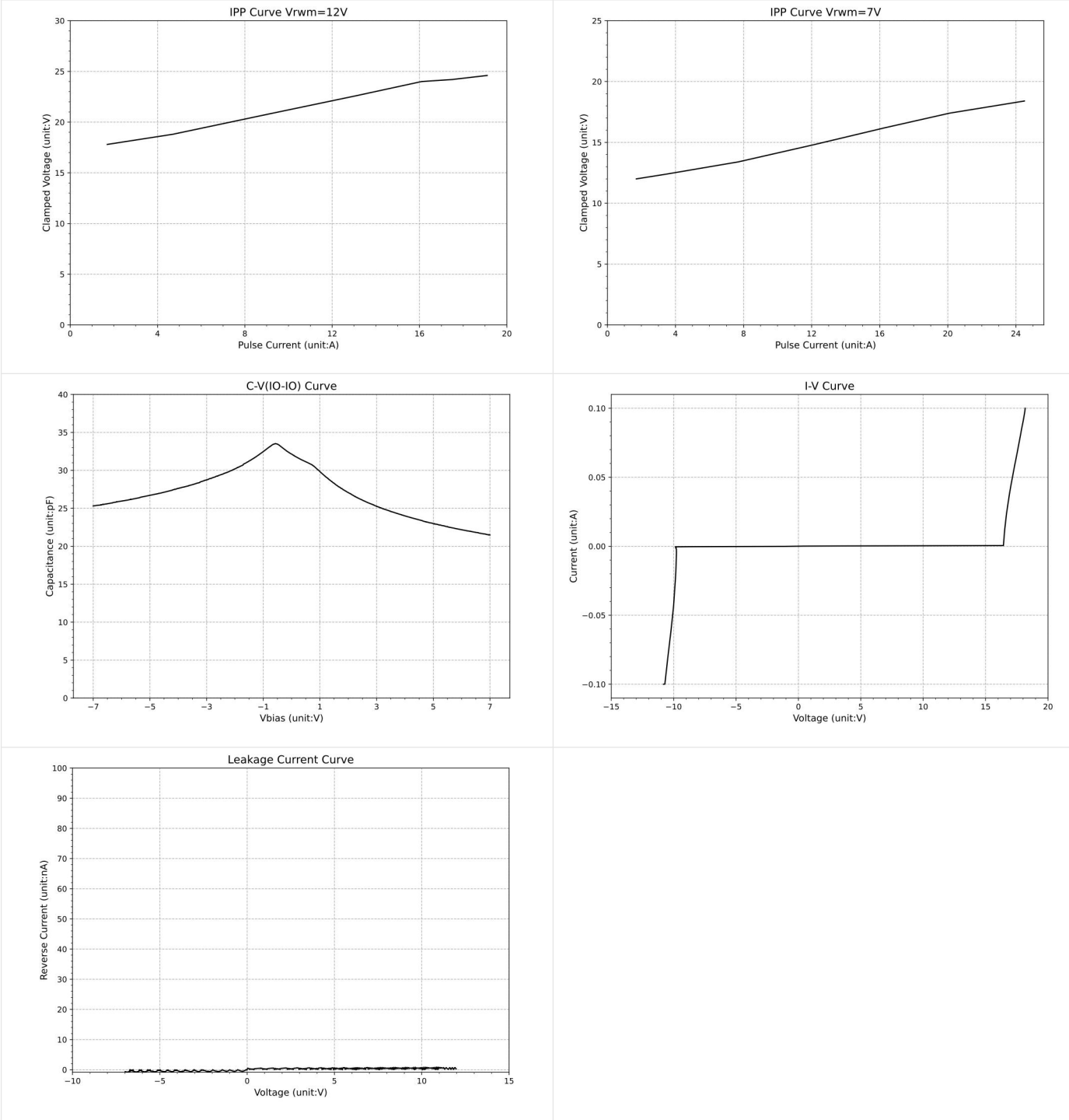
| Parameters                | Symbol    | conditions                                   | Min. | Typ. | Max. | Unit |
|---------------------------|-----------|--|------|------|------|------|
| Reverse stand-off voltage | $V_{RWM}$ | Pin1 or Pin2 to Pin3                         |      |      | 12.0 | V    |
|                           |           | Pin3 to Pin1 or Pin2                         |      |      | 7.0  |      |
| Reverse Breakdown Voltage | $V_{BR}$  | Pin1 or Pin2 to Pin3; $I_R=1\text{mA}$       | 13.3 | 16.3 |      | V    |
|                           |           | Pin3 to Pin 1or Pin2; $I_R=1\text{mA}$       | 7.5  | 9.8  |      |      |
| Reverse Leakage Current   | $I_R$     | Pin1 or Pin2 to Pin3; $V_{RWM}=12\text{V}$   |      |      | 1.0  | uA   |
|                           |           | Pin3 to Pin1or Pin2; $V_{RWM}=7\text{V}$     |      |      | 1.0  |      |
| Clamping Voltage          | $V_{CL}$  | Pin1 or Pin2 to Pin3; $I_{PP}=17\text{A}$    |      | 24.0 |      | V    |
|                           |           | Pin3 to Pin1 or Pin2; $I_{PP}=22\text{A}$    |      | 18.0 |      |      |
| Junction capacitance      | $C_O$     | I/O-GDN, $V_R=0\text{V}$ ; $f = 1\text{MHz}$ |      | 34   |      | pF   |

Table-4 Electrical Characteristics

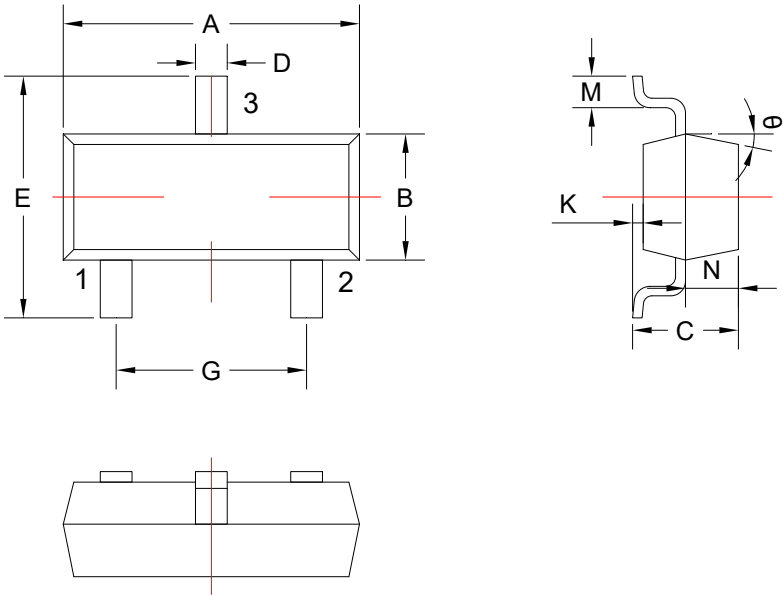
| Symbol    | Parameters                          |
|-----------|-------------------------------------|
| $V_{RWM}$ | Peak Reverse Working Voltage        |
| $I_R$     | Reverse Leakage Current @ $V_{RWM}$ |
| $V_{BR}$  | Breakdown Voltage @ $I_T$           |
| $I_T$     | Test Current                        |
| $I_{PP}$  | Maximum Reverse Peak Pulse Current  |
| $V_C$     | Clamping Voltage @ $I_{PP}$         |



7. Typical Characteristic



8. Dimension (SOT-23)



| COMMON DIMENSIONS CUNITS MEASURE=MILLIMETER |      |      |        |      |      |
|---|------|------|--------|------|------|
| SYMBOL                                      | MIN  | MAX  | SYMBOL | MIN  | MAX  |
| A   | 2.85 | 3.04 | G      | 1.80 | 2.00 |
| B   | 1.20 | 1.40 | K      | 0    | 0.10 |
| C   | 0.90 | 1.10 | M      | 0.20 | -    |
| D   | 0.40 | 0.50 | N      | 0.50 | 0.70 |
| E   | 2.25 | 2.55 | θ      | 5°   | 9°   |

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