

## FEATURES

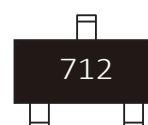
- | 400W Peak Pulse Power per Line ( $t_p=8/20\mu s$ )
- | Protects two +12V to -7V lines
- | Low clamping voltage
- | Moisture sensitivity level: Level 1
- | Weight 8 Milligrams (Approximate)

## APPLICATIONS

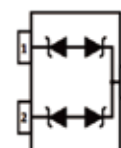
- | Protection of RS-485 transceivers with extended common-mode range
- | Security systems
- | Automatic Teller Machines
- | HFC systems
- | Networks



SOT-23



Marking



Schematic Symbol

## IEC COMPATIBILITY

- | IEC61000-4-2 (ESD)  $\pm 25kV$  (air),  $\pm 25kV$  (contact)
- | IEC61000-4-4 (EFT) 40A (5/50ns)

## APPROVALS

|             |                                    |
|-------------|------------------------------------|
| <b>RoHS</b> | Compliance with 2011/65/EU         |
| <b>HF</b>   | Compliance with IEC61249-2-21:2003 |

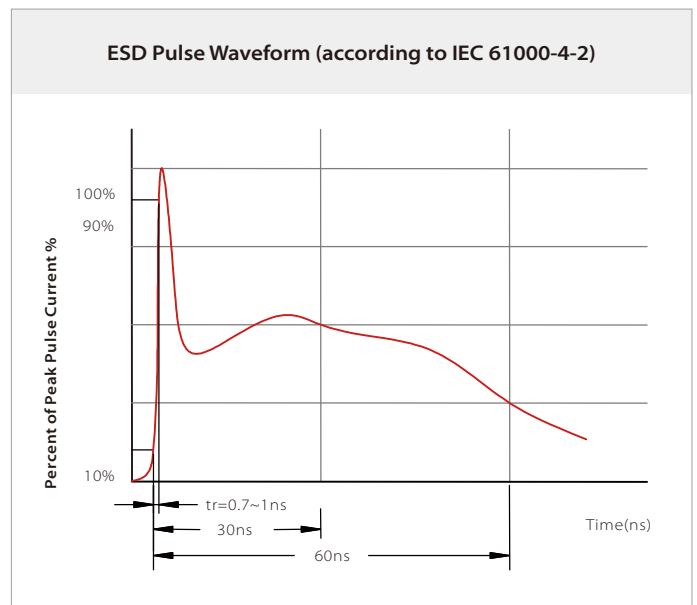
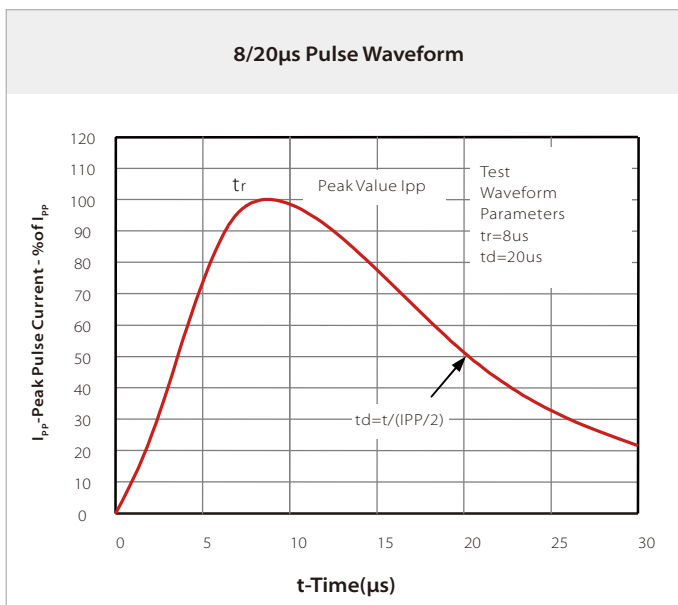
## THERMAL CONSIDERATIONS

| Symbol    | Parameter                                    | Value        | Unit        |
|-----------|----------------------------------------------|--------------|-------------|
| $P_{pp}$  | Peak Pulse Power ( $t_p=8/20\mu s$ waveform) | 400          | Watts       |
| $T_J$     | Operating Temperature Range                  | -55 to +150  | $^{\circ}C$ |
| $T_{STG}$ | Storage Temperature Range                    | -55 to +150  | $^{\circ}C$ |
| $T_L$     | Lead Soldering Temperature                   | 260(10 sec.) | $^{\circ}C$ |

## ELECTRICAL CHARACTERISTICS

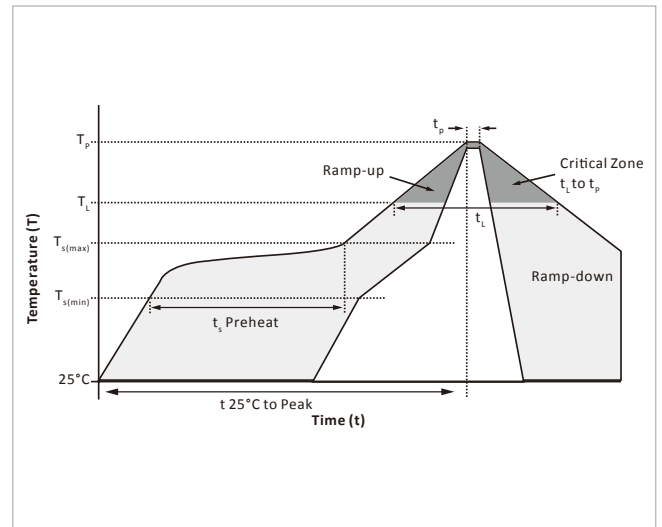
| Symbol    | Parameter                              | Condition         | Min.                        | Typ. | Max. | Unit    |
|-----------|----------------------------------------|-------------------|-----------------------------|------|------|---------|
| $V_{RWM}$ | Reverse Stand-off Voltage              | Pin 3-1 & Pin 3-2 |                             |      | 7    | V       |
|           |                                        | Pin 1-3 & Pin 2-3 |                             |      | 12   |         |
| $V_{BR}$  | Reverse Breakdown Voltage              | Pin 3-1 & Pin 3-2 | $I_T=1mA$                   | 7.5  |      | V       |
|           |                                        | Pin 1-3 & Pin 2-3 |                             | 13.3 |      |         |
| $I_R$     | Reverse Leakage Current                | Pin 3-1 & Pin 3-2 | $V_{RWM}=7V$                |      | 10   | $\mu A$ |
|           |                                        | Pin 1-3 & Pin 2-3 | $V_{RWM}=12V$               |      | 1    |         |
| $V_C$     | Clamping Voltage ( $T_p=8/20\mu s$ )   | Pin 3-1 & Pin 3-2 | $I_{pp}=5A, t_p=8/20\mu s$  |      | 10   | V       |
|           |                                        | Pin 1-3 & Pin 2-3 |                             |      | 20   |         |
| $V_C$     | Clamping Voltage ( $T_p=8/20\mu s$ )   | Pin 3-1 & Pin 3-2 | $I_{pp}=17A, t_p=8/20\mu s$ |      | 12   | V       |
|           |                                        | Pin 1-3 & Pin 2-3 |                             |      | 26   |         |
| $I_{pp}$  | Peak Pulse Current ( $T_p=8/20\mu s$ ) | Pin 3-1 & Pin 3-2 | $t_p=8/20\mu s$             |      | 17   | A       |
|           |                                        | Pin 1-3 & Pin 2-3 |                             |      |      |         |
| $C_J$     | Off State Junction Capacitance         | Pin 3-1 & Pin 3-2 | $V_R=0V, f=1MHz$            | 55   |      | pF      |
|           |                                        | Pin 1-3 & Pin 2-3 |                             |      |      |         |

## CHARACTERISTIC CURVES

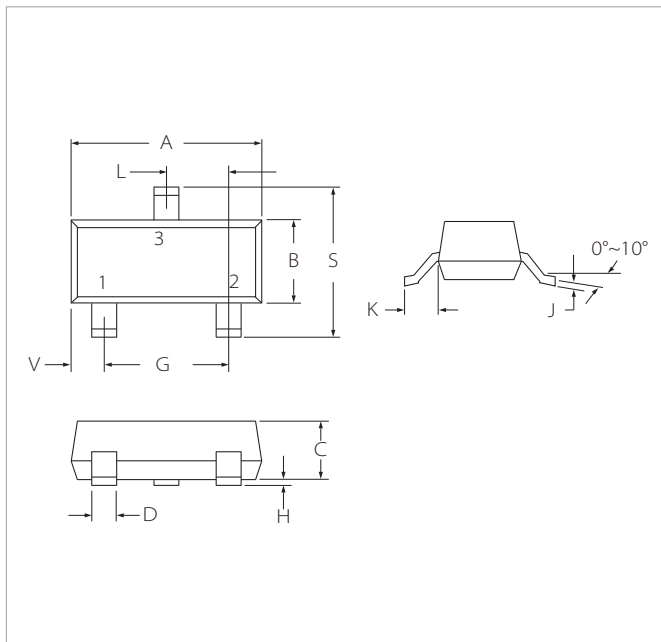


## SOLDERING PARAMETERS

| Reflow Condition                                      |                                  | Lead-free assembly |
|-------------------------------------------------------|----------------------------------|--------------------|
| Pre Heat                                              | Temperature Max ( $T_{s(min)}$ ) | 150°C              |
|                                                       | Temperature Max ( $T_{s(max)}$ ) | 200°C              |
|                                                       | Time (min to max) ( $t_p$ )      | 60 – 180 secs      |
| Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak |                                  | 3°C/second max     |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                  |                                  | 3°C/second max     |
| Reflow                                                | Temperature ( $T_L$ ) (Liquidus) | 217°C              |
|                                                       | Time (min to max) ( $t_L$ )      | 60 – 150 seconds   |
| Peak Temperature ( $T_p$ )                            |                                  | 260°C              |
| Time within 5°C of actual peak Temperature ( $t_p$ )  |                                  | 20 – 40 seconds    |
| Ramp-down Rate                                        |                                  | 6°C/second max     |
| Time 25°C to peak Temperature ( $T_p$ )               |                                  | 8 minutes max.     |
| Do not exceed                                         |                                  | 260°C              |

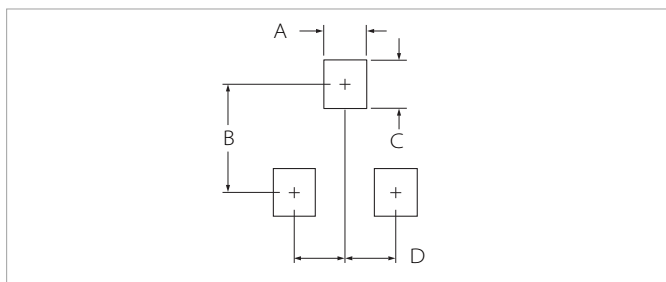


## SOT-23 PACKAGE INFORMATION



| Ref. | Millimeters |      | Inches |       |
|------|-------------|------|--------|-------|
|      | Min.        | Max. | Min.   | Max.  |
| A    | 2.80        | 3.04 | 0.110  | 0.120 |
| B    | 1.20        | 1.40 | 0.047  | 0.055 |
| C    | 0.89        | 1.11 | 0.035  | 0.044 |
| D    | 0.37        | 0.50 | 0.015  | 0.020 |
| G    | 1.78        | 2.04 | 0.070  | 0.081 |
| H    | 0.01        | 0.10 | 0.001  | 0.004 |
| J    | 0.08        | 0.18 | 0.003  | 0.007 |
| K    | 0.35        | 0.69 | 0.014  | 0.029 |
| L    | 0.89        | 1.02 | 0.035  | 0.040 |
| S    | 2.10        | 2.64 | 0.083  | 0.104 |
| V    | 0.45        | 0.60 | 0.018  | 0.024 |

## RECOMMENDED PAD LAYOUT DIMENSIONS



| Ref. | Millimeters |      | Inches |       |
|------|-------------|------|--------|-------|
|      | Min.        | Max. | Min.   | Max.  |
| A    | 0.71        | 0.97 | 0.028  | 0.038 |
| B    | 1.88        | 2.13 | 0.074  | 0.084 |
| C    | 0.71        | 0.97 | 0.028  | 0.038 |
| D    | 0.81        | 1.07 | 0.032  | 0.042 |

## ORDERING INFORMATION

| Part Number | Component Package | QTY/Reel | Reel Size |
|-------------|-------------------|----------|-----------|
| SM712       | SOT-23            | 3000PCS  | 7"        |

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