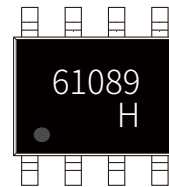


## FEATURES

- | Dual programmable transient suppressor.
- | Wide negative firing voltage range:  $V_{GKRM} = -16V$  max.
- | Low dynamic switching voltage:  $V_{FRM}$  and  $V_{GK(BD)}$
- | Low gate triggering current:  $I_{GT} = 5mA$  max.
- | Peak pulse current:  $I_{PP} = 100A$  for 10/1000 $\mu s$  surge.
- | Holding current:  $I_H = 150mA$  min.



SOP-8



Marking

## APPLICATIONS

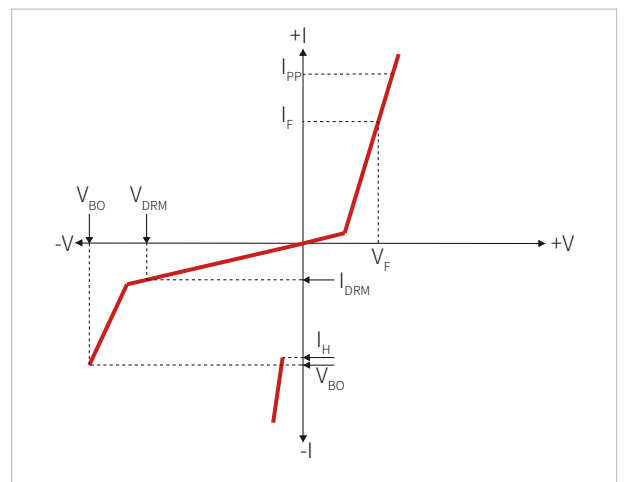
- | Switch Line Card
- | Access Network Line Card
- | PBX
- | VoIP

## APPROVALS

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

## ELECTERICAL CAHRACTERISTIC

| Symbol       | Parameters                              |
|--------------|-----------------------------------------|
| $I_{DRM}$    | Off-state current                       |
| $I_H$        | Holding current                         |
| $V_{BO}$     | Break-over voltage                      |
| $V_F$        | Forward voltage                         |
| $V_{FRM}$    | Peak forward recovery voltage           |
| $V_{GK(BD)}$ | Gate-cathode impulse break-over voltage |
| $I_{GKS}$    | Gate reverse current                    |
| $I_{GT}$     | Gate trigger current                    |
| $V_{GT}$     | Gate-cathode trigger voltage            |
| $C_{KA}$     | Cathode-anode off-state capacitance     |



## ABSOLUTE MAXIMUM RATINGS ( $T_A=25^{\circ}\text{C}$ )

| Symbol                                     | Parameter                                                             |           | Value       | Unit |
|--------------------------------------------|-----------------------------------------------------------------------|-----------|-------------|------|
| T <sub>STG</sub>                           | Storage temperature range                                             |           | -40 to +150 | °C   |
| T <sub>J</sub>                             | Junction temperature                                                  |           |             |      |
| T <sub>A</sub>                             | Operating free-air temperature range                                  |           | -40 to +85  |      |
| Non-repetitive peak on-state pulse current |                                                                       |           |             |      |
| I <sub>TSP</sub>                           | (Telcordia (Bellcore) GR-1089-CORE,Issue 2, February)                 | 10/1000μs | 100         | A    |
|                                            | (ITU-T K.20/21& K.45/44 open-circuit voltage 10/700μs)                | 5/310μs   | 150         |      |
|                                            | (Telcordia (Bellcore) GR-1089-CORE, Issue 2, February )               | 1.2/50μs  | 500         |      |
| V <sub>PP</sub>                            | Non-repetitive peak pulse voltage(10/700μs)                           |           | 6000        | V    |
| I <sub>TSM</sub>                           | Non repetitive surge peak on-state current (sinusoidal) 60Hz (Note 2) | 900s      | 2.6         | A    |
| V <sub>DRM</sub>                           | Maximum voltage Line/Ground                                           |           | -170        | V    |
| V <sub>GKRM</sub>                          | Maximum voltage Gate/Line                                             |           | -167        |      |

Note1: 5/310 $\mu\text{s}$  means current wave, and its rise time is 5 $\mu\text{s}$ , fall time is 310 $\mu\text{s}$ .  
 10/700 $\mu\text{s}$  means voltage wave, and its rise time is 10 $\mu\text{s}$ , fall time is 700 $\mu\text{s}$ .

Note2: Initially the protector must be in thermal equilibrium with  $T_J = 25^{\circ}\text{C}$ . EIA/JESD51-2 environment and EIA/JESD51-7 high effective thermal conductivity test board (multi-layer) connected with 0.6 mm printed wiring track widths

## TESTING STANDARDS

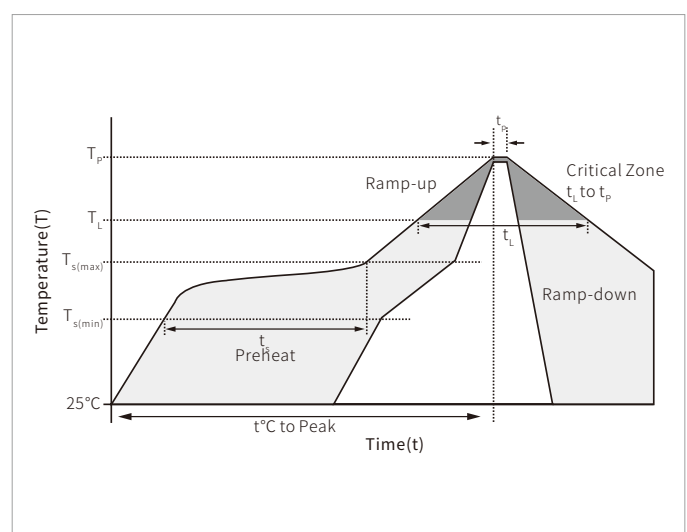
| Type                   | Wave Sharp |                      | $V_{\text{PP}}/I_{\text{PP}}$ |
|------------------------|------------|----------------------|-------------------------------|
| ITU-T K.20/21 and K.45 | Voltage    | 10/700 $\mu\text{s}$ | 6000V                         |
|                        | Current    | 5/310 $\mu\text{s}$  | 150A                          |

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C)

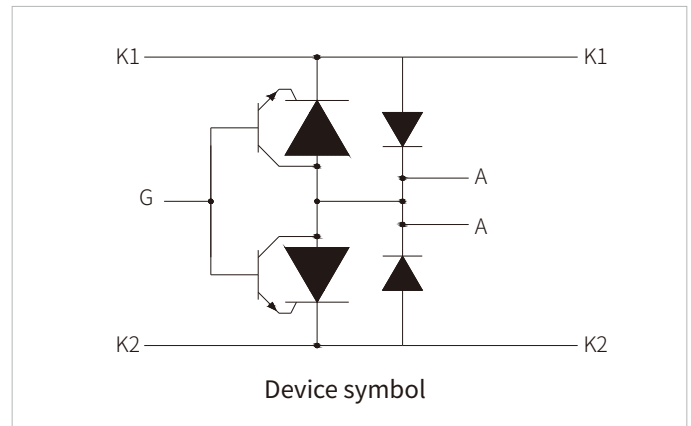
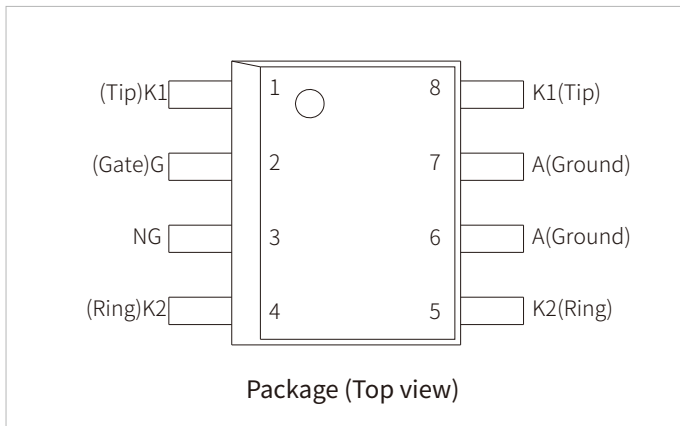
| Symbol                                         | Parameter                           | Test conditions                                                                   | Value |      |      | Unit |
|------------------------------------------------|-------------------------------------|-----------------------------------------------------------------------------------|-------|------|------|------|
|                                                |                                     |                                                                                   | Min.  | Typ. | Max. |      |
| Parameters related to the diode                |                                     |                                                                                   |       |      |      |      |
| V <sub>F</sub>                                 | Forward voltage                     | I <sub>F</sub> =5A, t <sub>W</sub> =200μs                                         | -     | -    | 3    | V    |
| V <sub>FRM</sub>                               | Peak forward recovery voltage       | 2/10μs,I <sub>F</sub> =200A,V <sub>GG</sub> =-100V                                | -     | -    | 10   |      |
| Parameters related to the protection thyristor |                                     |                                                                                   |       |      |      |      |
| I <sub>DRM</sub>                               | Off-state current                   | V <sub>DRM</sub> =-170V, V <sub>GK</sub> =0V                                      | -     | -    | -5   | μA   |
| V <sub>BO</sub>                                | Break-over voltage                  | 2/10μs,I <sub>F</sub> =200A,V <sub>GG</sub> =-100V                                | -     | -    | -112 | V    |
| I <sub>H</sub>                                 | Holding current                     | I <sub>T</sub> =-1A, di/dt=1A/ms, V <sub>GG</sub> =-100V                          | -150  | -    | -    | mA   |
| I <sub>GKS</sub>                               | Gate reverse current                | V <sub>GG</sub> =V <sub>GK</sub> =-167V, V <sub>KA</sub> =0, T <sub>J</sub> =25°C | -     | -    | -5   | μA   |
| I <sub>GT</sub>                                | Gate trigger current                | I <sub>T</sub> =-3A, t <sub>p</sub> (g)≥20μs, V <sub>GG</sub> =-100V              | -     | -    | 5    | mA   |
| V <sub>GT</sub>                                | Gate trigger voltage                |                                                                                   | -     | -    | 2.5  | V    |
| C <sub>AK</sub>                                | Anode-cathode off-state capacitance | f=1MHz, V <sub>D</sub> =1V, I <sub>G</sub> =0A, V <sub>D</sub> =-3V               | -     | -    | 170  | pF   |

## REFLOW PROFILE

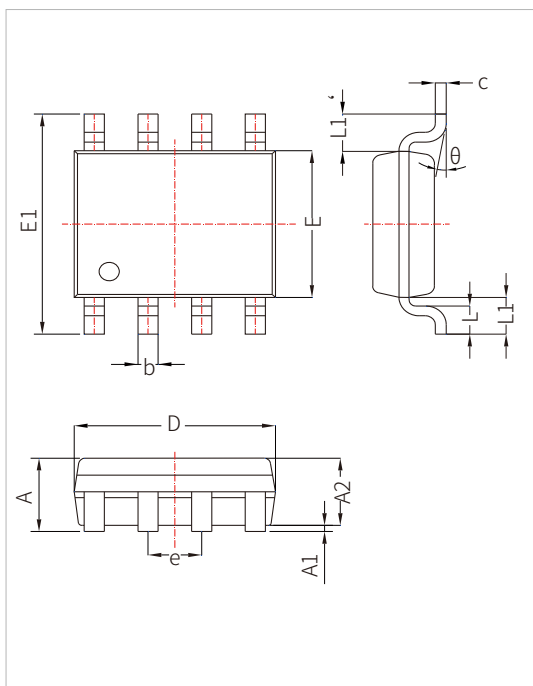
| Reflow Condition                                                                                                     |                                          | Lead-free assembly |
|----------------------------------------------------------------------------------------------------------------------|------------------------------------------|--------------------|
| Pre Heat                                                                                                             | Temperature Min                          | 150°C              |
|                                                                                                                      | Temperature Max                          | 200°C              |
|                                                                                                                      | Time(min to max)                         | 60~180 secs        |
| Average ramp up rate (Liquidus) Temp (T <sub>L</sub> ) to peak T <sub>s</sub> (max) to T <sub>L</sub> - Ramp-up Rate |                                          | 3°C/second max     |
| Reflow                                                                                                               | Temperature (T <sub>L</sub> ) (Liquidus) | 217°C              |
|                                                                                                                      | Time(min to max)(t <sub>s</sub> )        | 60~150 seconds     |
| Peak Temperature (T <sub>p</sub> )                                                                                   |                                          | 260 °C             |
| Time within 5°C of actual peak Temperature (tp)                                                                      |                                          | 20~40 seconds      |
| Ramp-down Rate                                                                                                       |                                          | 6°C/second max     |
| Time 25°C to peak Temperature (T <sub>p</sub> )                                                                      |                                          | 8 minutes max.     |
| Do not exceed                                                                                                        |                                          | 260°C              |



## SOP PACKAGE TOP VIEW AND DEVICE SYMBOL



## SOP-8 PACKAGE MECHANICAL DATA



| Ref.   | Dimensions  |      |      |        |       |       |
|--------|-------------|------|------|--------|-------|-------|
|        | Millimeters |      |      | Inches |       |       |
|        | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A      | 1.40        |      | 1.70 | 0.055  |       | 0.067 |
| A1     | 0.05        |      | 0.15 | 0.002  |       | 0.006 |
| A2     | 1.35        |      | 1.55 | 0.053  |       | 0.061 |
| b      | 0.31        |      | 0.51 | 0.012  |       | 0.020 |
| c      | 0.17        |      | 0.25 | 0.007  |       | 0.010 |
| D      | 4.70        |      | 5.30 | 0.185  |       | 0.209 |
| E      | 3.80        |      | 4.20 | 0.150  |       | 0.165 |
| E1     | 5.80        |      | 6.20 | 0.228  |       | 0.244 |
| e      | 1.14        | 1.27 | 1.40 | 0.045  | 0.050 | 0.055 |
| L      | 0.62        |      | 0.77 | 0.024  |       | 0.030 |
| L1     | 1.00        | 1.02 | 1.04 | 0.039  | 0.040 | 0.041 |
| L1-L1' |             |      | 0.12 |        |       | 0.005 |
| θ      | 0°          |      | 8°   | 0°     |       | 8°    |

## ORDERING INFORMATION

| Part Number | Component Package | QTY/Reel | Reel |
|-------------|-------------------|----------|------|
| STP61089H   | SOP-8             | 4000PCS  | 13'' |

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