

## FAST-SWITCH HOLLOW-EMITTER NPN TRANSISTOR

- VERY HIGH SWITCHING SPEED
- NPN TRANSISTOR
- LOW BASE-DRIVE REQUIREMENTS

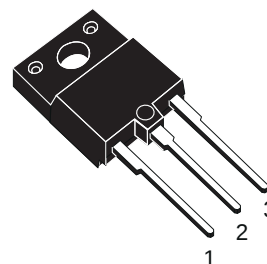
### APPLICATIONS:

- SWITCH MODE POWER SUPPLIES

### DESCRIPTION

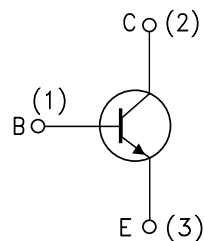
The SGSIF461 is manufactured using Multi-epitaxial Mesa technology for cost-effective high performance and uses a Hollow Emitter structure to enhance switching speeds.

The SGSIF series is designed for high speed switching applications such as power supplies and horizontal deflection circuits in TVs and monitors.



ISOWATT218

### INTERNAL SCHEMATIC DIAGRAM



SC06960

### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Parameter                                  | Value      | Unit |
|-----------|--------------------------------------------|------------|------|
| $V_{CES}$ | Collector-Emitter Voltage ( $V_{BE} = 0$ ) | 850        | V    |
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ )    | 400        | V    |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )         | 7          | V    |
| $I_C$     | Collector Current                          | 15         | A    |
| $I_{CM}$  | Collector Peak Current ( $t_p < 5$ ms)     | 25         | A    |
| $I_B$     | Base Current                               | 8          | A    |
| $I_{BM}$  | Base Peak Current ( $t_p < 5$ ms)          | 15         | A    |
| $P_{tot}$ | Total Dissipation at $T_c = 25$ °C         | 55         | W    |
| $T_{stg}$ | Storage Temperature                        | -65 to 150 | °C   |
| $T_j$     | Max. Operating Junction Temperature        | 150        | °C   |

## THERMAL DATA

|                |                                  | ISOWATT218 |      |
|----------------|----------------------------------|------------|------|
| $R_{thj-case}$ | Thermal Resistance Junction-Case | Max        | 2.2  |
|                |                                  |            | °C/W |

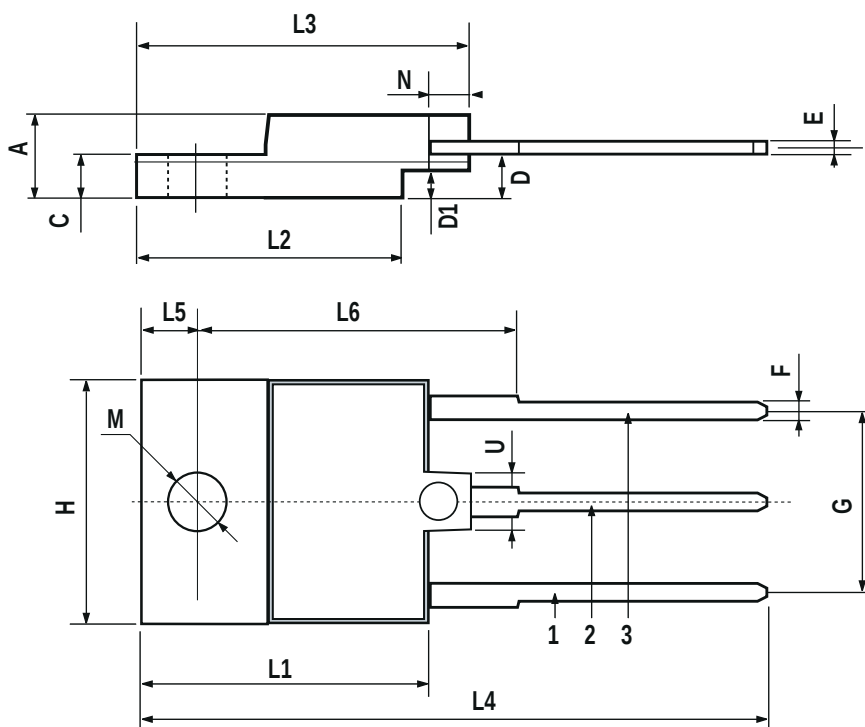
ELECTRICAL CHARACTERISTICS ( $T_{case} = 25^{\circ}C$  unless otherwise specified)

| Symbol                     | Parameter                                  | Test Conditions                                                                                                                                                                               | Min. | Typ.             | Max.              | Unit                          |
|----------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------|-------------------|-------------------------------|
| $I_{CES}$                  | Collector Cut-off Current ( $V_{BE} = 0$ ) | $V_{CE} = 700\text{ V}$                                                                                                                                                                       |      |                  | 200               | $\mu A$                       |
| $I_{CEO}$                  | Collector Cut-off Current ( $I_B = 0$ )    | $V_{EC} = 380\text{ V}$<br>$V_{EC} = 400\text{ V}$                                                                                                                                            |      |                  | 200<br>2          | $\mu A$<br>mA                 |
| $I_{EBO}$                  | Emitter Cut-off Current ( $I_C = 0$ )      | $V_{BE} = 7\text{ V}$                                                                                                                                                                         |      |                  | 1                 | mA                            |
| $V_{CEO(sus)}^*$           | Collector-Emitter Sustaining Voltage       | $I_C = 100\text{ mA}$                                                                                                                                                                         | 400  |                  |                   | V                             |
| $V_{CE(sat)}^*$            | Collector-Emitter Saturation Voltage       | $I_C = 10\text{ A}$ $I_B = 2\text{ A}$<br>$I_C = 5.5\text{ A}$ $I_B = 0.8\text{ A}$                                                                                                           |      |                  | 1.5<br>1.5        | V<br>V                        |
| $V_{BE(sat)}^*$            | Base-Emitter Saturation Voltage            | $I_C = 10\text{ A}$ $I_B = 2\text{ A}$<br>$I_C = 5.5\text{ A}$ $I_B = 0.8\text{ A}$                                                                                                           |      |                  | 1.5<br>1.5        | V<br>V                        |
| $t_{ON}$<br>$t_s$<br>$t_f$ | Turn-on Time<br>Storage Time<br>Fall Time  | RESISTIVE LOAD<br>$V_{CC} = 250\text{ V}$ $I_C = 10\text{ A}$<br>$I_{B1} = 2\text{ A}$ $I_{B2} = -2I_{B1}$                                                                                    |      | 1<br>1.4<br>0.25 | 1.7<br>2.3<br>0.5 | $\mu s$<br>$\mu s$<br>$\mu s$ |
| $t_{ON}$<br>$t_s$<br>$t_f$ | Turn-on Time<br>Storage Time<br>Fall Time  | RESISTIVE LOAD<br>$V_{CC} = 250\text{ V}$ $I_C = 10\text{ A}$<br>$I_{B1} = 2\text{ A}$ $I_{B2} = -2I_{B1}$<br>With Antisaturation Network                                                     |      | 1<br>1<br>0.15   |                   | $\mu s$<br>$\mu s$<br>$\mu s$ |
| $t_{ON}$<br>$t_s$<br>$t_f$ | Turn-on Time<br>Storage Time<br>Fall Time  | RESISTIVE LOAD<br>$V_{CC} = 250\text{ V}$ $I_C = 10\text{ A}$<br>$I_{B1} = 2\text{ A}$ $V_{BE(off)} = -5\text{ V}$                                                                            |      | 1<br>1<br>0.06   |                   | $\mu s$<br>$\mu s$<br>$\mu s$ |
| $t_s$<br>$t_f$             | Storage Time<br>Fall Time                  | INDUCTIVE LOAD<br>$I_C = 10\text{ A}$ $h_{FE} = 5$<br>$V_{CL} = 350\text{ V}$ $V_{BE(off)} = -5\text{ V}$<br>$L = 300\text{ }\mu H$ $R_{BE(off)} = 1.2\text{ }\Omega$                         |      | 1.4<br>0.1       | 2.8<br>0.2        | $\mu s$<br>$\mu s$            |
| $t_s$<br>$t_f$             | Storage Time<br>Fall Time                  | INDUCTIVE LOAD<br>$I_C = 10\text{ A}$ $h_{FE} = 5$<br>$V_{CL} = 350\text{ V}$ $V_{BE(off)} = -5\text{ V}$<br>$L = 300\text{ }\mu H$ $R_{BE(off)} = 1.2\text{ }\Omega$<br>$T_c = 100^{\circ}C$ |      |                  | 4<br>0.3          | $\mu s$<br>$\mu s$            |

\* Pulsed: Pulse duration = 300  $\mu s$ , duty cycle 1.5 %

## ISOWATT218 MECHANICAL DATA

| DIM. | mm    |      |       | inch  |       |       |
|------|-------|------|-------|-------|-------|-------|
|      | MIN.  | TYP. | MAX.  | MIN.  | TYP.  | MAX.  |
| A    | 5.35  |      | 5.65  | 0.210 |       | 0.222 |
| C    | 3.3   |      | 3.8   | 0.130 |       | 0.149 |
| D    | 2.9   |      | 3.1   | 0.114 |       | 0.122 |
| D1   | 1.88  |      | 2.08  | 0.074 |       | 0.081 |
| E    | 0.75  |      | 1     | 0.029 |       | 0.039 |
| F    | 1.05  |      | 1.25  | 0.041 |       | 0.049 |
| G    | 10.8  |      | 11.2  | 0.425 |       | 0.441 |
| H    | 15.8  |      | 16.2  | 0.622 |       | 0.637 |
| L1   | 20.8  |      | 21.2  | 0.818 |       | 0.834 |
| L2   | 19.1  |      | 19.9  | 0.752 |       | 0.783 |
| L3   | 22.8  |      | 23.6  | 0.897 |       | 0.929 |
| L4   | 40.5  |      | 42.5  | 1.594 |       | 1.673 |
| L5   | 4.85  |      | 5.25  | 0.190 |       | 0.206 |
| L6   | 20.25 |      | 20.75 | 0.797 |       | 0.817 |
| M    | 3.5   |      | 3.7   | 0.137 |       | 0.145 |
| N    | 2.1   |      | 2.3   | 0.082 |       | 0.090 |
| U    |       | 4.6  |       |       | 0.181 |       |



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