



**STF715**  
**STN715**

## NPN MEDIUM POWER TRANSISTORS

| Type   | Marking |
|--------|---------|
| STF715 | 715     |
| STN715 | N715    |

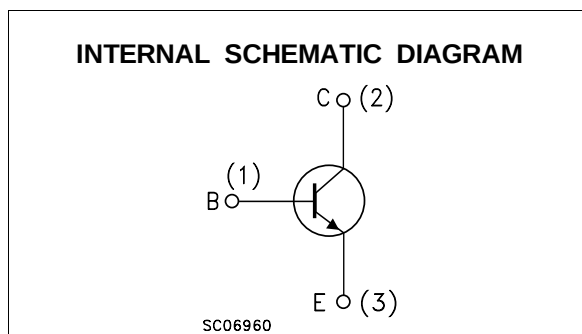
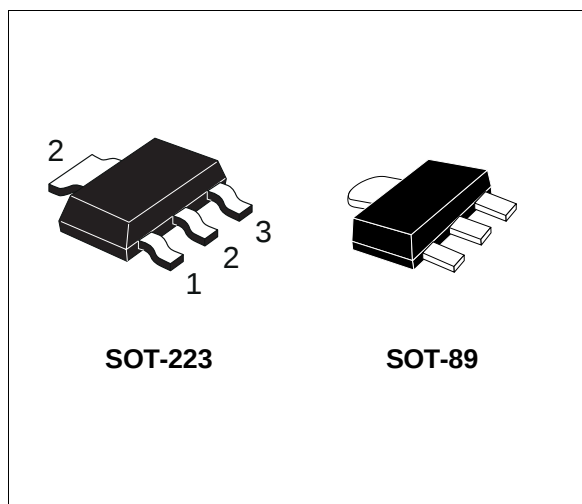
- SURFACE-MOUNTING DEVICES IN MEDIUM POWER SOT-223 AND SOT-89 PACKAGES
- AVAILABLE IN TAPE & REEL PACKING

### APPLICATIONS

- VOLTAGE REGULATION
- RELAY DRIVER
- GENERIC SWITCH

### DESCRIPTION

The STF715 and STN715 are NPN transistors manufactured using Planar Technology resulting in rugged high performance devices.



### ABSOLUTE MAXIMUM RATINGS

| Symbol           | Parameter                                      | Value      |         | Unit |        |
|------------------|------------------------------------------------|------------|---------|------|--------|
|                  |                                                | Devices    | STN715  |      | STF715 |
|                  |                                                | Packages   | SOT-223 |      | SOT-89 |
| V <sub>CBO</sub> | Collector-Base Voltage (I <sub>E</sub> = 0)    | 140        |         | V    |        |
| V <sub>CEO</sub> | Collector-Emitter Voltage (I <sub>B</sub> = 0) | 80         |         | V    |        |
| V <sub>EBO</sub> | Emitter-Base Voltage (I <sub>C</sub> = 0)      | 5          |         | V    |        |
| I <sub>C</sub>   | Collector Current                              | 1.5        |         | A    |        |
| I <sub>CM</sub>  | Collector Peak Current (t <sub>p</sub> < 5 ms) | 2          |         | A    |        |
| I <sub>B</sub>   | Base Current                                   | 0.3        |         | A    |        |
| I <sub>BM</sub>  | Base Peak Current (t <sub>p</sub> < 5 ms)      | 0.6        |         | A    |        |
| P <sub>tot</sub> | Total Dissipation at T <sub>c</sub> = 25 °C    | 1.6        | 1.4     | W    |        |
| T <sub>stg</sub> | Storage Temperature                            | -65 to 150 |         | °C   |        |
| T <sub>j</sub>   | Max. Operating Junction Temperature            | 150        |         | °C   |        |

## STF715 - STN715

### THERMAL DATA

|                 |                                     | SOT-223 | SOT-89 |      |
|-----------------|-------------------------------------|---------|--------|------|
| $R_{thj-amb}$ • | Thermal Resistance Junction-ambient | Max     | 78     | 89   |
|                 |                                     |         |        | °C/W |

• Device mounted on a PCB area of 1 cm<sup>2</sup>.

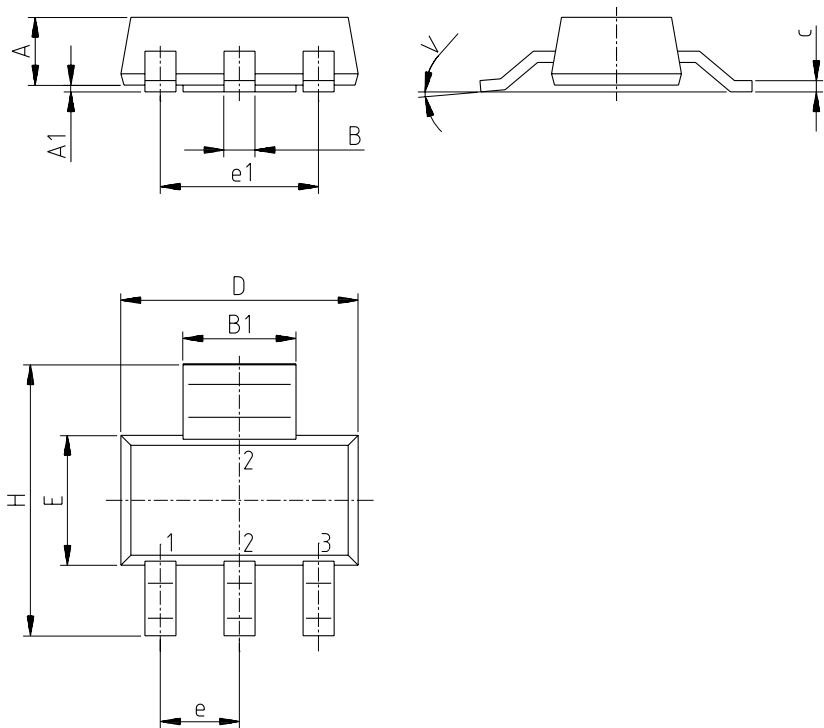
### ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

| Symbol                  | Parameter                                                 | Test Conditions                                                            |                                                                         | Min.            | Typ. | Max.        | Unit   |
|-------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------|------|-------------|--------|
| I <sub>CES</sub>        | Collector Cut-off Current (V <sub>BE</sub> = 0)           | V <sub>CE</sub> = 140 V                                                    |                                                                         |                 |      | 500         | μA     |
| I <sub>CEO</sub>        | Collector Cut-off Current (I <sub>B</sub> = 0)            | V <sub>CE</sub> = 80 V                                                     |                                                                         |                 |      | 1           | mA     |
| I <sub>EBO</sub>        | Emitter Cut-off Current (I <sub>C</sub> = 0)              | V <sub>EB</sub> = 5 V                                                      |                                                                         |                 |      | 100         | μA     |
| V <sub>CEO(sus)</sub> * | Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0) | I <sub>C</sub> = 10 mA                                                     |                                                                         | 80              |      |             | V      |
| V <sub>CE(sat)</sub> *  | Collector-Emitter Saturation Voltage                      | I <sub>C</sub> = 100 mA<br>I <sub>C</sub> = 1 A                            | I <sub>B</sub> = 10 mA<br>I <sub>B</sub> = 100 mA                       |                 |      | 0.25<br>0.5 | V<br>V |
| V <sub>BE(sat)</sub> *  | Base-Emitter Saturation Voltage                           | I <sub>C</sub> = 100 mA<br>I <sub>C</sub> = 1 A                            | I <sub>B</sub> = 10 mA<br>I <sub>B</sub> = 100 mA                       |                 |      | 1<br>1.1    | V<br>V |
| h <sub>FE</sub> *       | DC Current Gain                                           | I <sub>C</sub> = 100 mA<br>I <sub>C</sub> = 500 mA<br>I <sub>C</sub> = 1 A | V <sub>CE</sub> = 2 V<br>V <sub>CE</sub> = 2 V<br>V <sub>CE</sub> = 2 V | 140<br>80<br>40 |      |             |        |
| f <sub>T</sub>          | Transition Frequency                                      | I <sub>C</sub> = 0.1 A                                                     | V <sub>CE</sub> = 10 V                                                  |                 | 50   |             | MHz    |

\* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %

SOT-223 MECHANICAL DATA

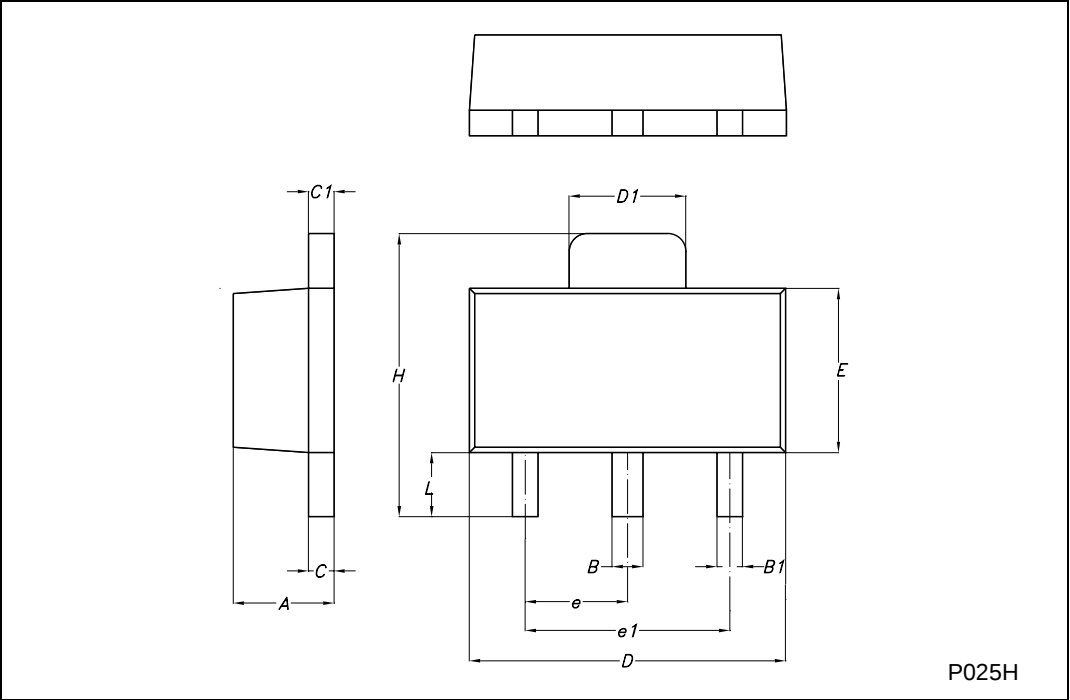
| DIM. | mm   |      |      | inch  |       |       |
|------|------|------|------|-------|-------|-------|
|      | MIN. | TYP. | MAX. | MIN.  | TYP.  | MAX.  |
| A    |      |      | 1.80 |       |       | 0.071 |
| B    | 0.60 | 0.70 | 0.80 | 0.024 | 0.027 | 0.031 |
| B1   | 2.90 | 3.00 | 3.10 | 0.114 | 0.118 | 0.122 |
| c    | 0.24 | 0.26 | 0.32 | 0.009 | 0.010 | 0.013 |
| D    | 6.30 | 6.50 | 6.70 | 0.248 | 0.256 | 0.264 |
| e    |      | 2.30 |      |       | 0.090 |       |
| e1   |      | 4.60 |      |       | 0.181 |       |
| E    | 3.30 | 3.50 | 3.70 | 0.130 | 0.138 | 0.146 |
| H    | 6.70 | 7.00 | 7.30 | 0.264 | 0.276 | 0.287 |
| V    |      |      | 10°  |       |       | 10°   |
| A1   |      | 0.02 |      |       |       |       |



P008B

SOT-89 MECHANICAL DATA

| DIM. | mm   |      |      | mils  |      |       |
|------|------|------|------|-------|------|-------|
|      | MIN. | TYP. | MAX. | MIN.  | TYP. | MAX.  |
| A    | 1.4  |      | 1.6  | 55.1  |      | 63.0  |
| B    | 0.44 |      | 0.56 | 17.3  |      | 22.0  |
| B1   | 0.36 |      | 0.48 | 14.2  |      | 18.9  |
| C    | 0.35 |      | 0.44 | 13.8  |      | 17.3  |
| C1   | 0.35 |      | 0.44 | 13.8  |      | 17.3  |
| D    | 4.4  |      | 4.6  | 173.2 |      | 181.1 |
| D1   | 1.62 |      | 1.83 | 63.8  |      | 72.0  |
| E    | 2.29 |      | 2.6  | 90.2  |      | 102.4 |
| e    | 1.42 |      | 1.57 | 55.9  |      | 61.8  |
| e1   | 2.92 |      | 3.07 | 115.0 |      | 120.9 |
| H    | 3.94 |      | 4.25 | 155.1 |      | 167.3 |
| L    | 0.89 |      | 1.2  | 35.0  |      | 47.2  |



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