



## NPN 2N3227

### SILICON ANNULAR TRANSISTORS

The 2N3227 are silicon NPN silicon annular transistors for low-current, high-speed switching applications.

They are mounted in Jedec TO-18 metal.

Compliance to RoHS

#### ABSOLUTE MAXIMUM RATINGS

| Symbol        | Ratings                                         |                    | Value       | Unit  |
|---------------|-------------------------------------------------|--------------------|-------------|-------|
| $V_{CBO}$     | Collector-Base Voltage                          |                    | 40          | V     |
| $V_{CEO}$     | Collector-Emitter Voltage                       |                    | 20          | V     |
| $V_{EBO}$     | Emitter-Base Voltage                            |                    | 6           | V     |
| $V_{CES}$     | Collector-Emitter Voltage                       |                    | 40          | V     |
| $I_{C(peak)}$ | Collector Current                               |                    | 500         | mA    |
| $P_D$         | Total Device Dissipation<br>Ambient Temperature | @ $T_C = 25^\circ$ | 0.36        | Watts |
|               | Derating Factor Above                           |                    | 2.06        | mW/°C |
| $P_D$         | Total Device Dissipation<br>Case Temperature    | @ $T_C = 25^\circ$ | 1.2         | Watts |
|               | Derating Factor Above                           |                    | 6.85        | mW/°C |
| $T_J$         | Junction Temperature                            |                    | +200        | °C    |
| $T_{Stg}$     | Storage Temperature range                       |                    | -65 to +200 |       |

## NPN 2N3227

### ELECTRICAL CHARACTERISTICS

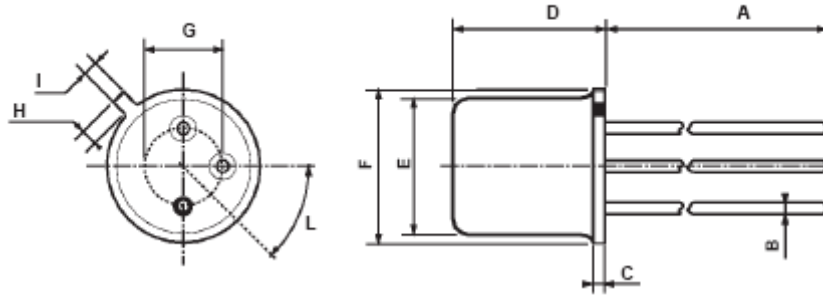
TC=25°C unless otherwise noted

| Symbol        | Ratings                              | Test Condition(s)                                                     | Min | Typ | Max  | Unit    |
|---------------|--------------------------------------|-----------------------------------------------------------------------|-----|-----|------|---------|
| $I_{CBO}$     | Collector cut-off current            | $I_E = 0 ; V_{CB} = 20V$                                              | -   | -   | 0.2  | $\mu A$ |
|               |                                      | $I_E = 0 ; V_{CB} = 20V$<br>$T_A = 150^\circ C$                       | -   | -   | 50   |         |
|               |                                      | $V_{CE} = 20V ; V_{EB(off)} = 3V$                                     | -   | -   | 0.2  |         |
| $I_{CEX}$     | Collector cut-off curren             | $V_{CE} = 20V ; V_{EB(off)} = 3V$                                     | -   | -   | 0.2  |         |
| $I_{BL}$      | Base cut-off curren                  | $V_{CE} = 20V ; V_{EB(off)} = 3V$                                     | -   | -   | 0.5  |         |
| $BV_{CBO}$    | Collector-Base Breakdown voltage     | $I_C = 10 \mu A ; I_B = 0$                                            | 40  | -   | -    | V       |
| $BV_{EBO}$    | Emitter-Base Breakdown voltage       | $I_E = 10 \mu A ; I_C = 0$                                            | 6   | -   | -    | V       |
| $BV_{CEO}$    | Collector-Emitter Breakdown voltage  | $I_C = 10 mA$                                                         | 20  | -   | -    | V       |
| $BV_{CES}$    | Collector-Emitter voltage            | $I_C = 10 \mu A ; I_B = 0$                                            | 40  | -   | -    | V       |
| $V_{CE(SAT)}$ | Collector-Emitter saturation Voltage | $I_C = 10 mA, I_B = 1.0 mA$                                           | -   | -   | 0.25 | V       |
|               |                                      | $I_C = 100 mA, I_B = 10 mA$                                           | -   | -   | 0.45 |         |
| $V_{BE(SAT)}$ | Base-Emitter saturation Voltage      | $I_C = 10 mA, I_B = 1.0 mA$                                           | -   | -   | 0.85 | V       |
|               |                                      | $I_C = 100 mA, I_B = 10 mA$                                           | -   | -   | 1.4  |         |
| $h_{FE}$      | DC Current Gain                      | $V_{CE} = 1.0 V, I_C = 10 mA$                                         | 100 | -   | 300  | -       |
|               |                                      | $V_{CE} = 1.0 V, I_C = 10 mA$<br>$T_A = -55^\circ C$                  | 40  | -   | -    |         |
|               |                                      | $V_{CE} = 1.0 V, I_C = 100 mA$                                        | 30  | -   | -    |         |
| $h_{fe}$      | Small Signal Current Gain            | $V_{CE} = 10 V, I_C = 10 mA$<br>$f = 100 MHz$                         | 5   | -   | -    | -       |
| $t_s$         | Storage time                         | $I_C = I_{B1} = I_{B2} = 10 mA$                                       | -   | -   | 13   | Ns      |
| $T_{off}$     | Turn-off time                        | $I_C = 10 A ; I_{B1} = 3 mA ;$<br>$I_{B2} = 1.5 mA ; V_{CC} = 3.0 V$  | -   | -   | 18   |         |
| $t_{on}$      | Turn-on time                         | $I_C = 10 A ; I_{B1} = 3 mA$<br>$V_{CC} = 3.0 V, V_{EB(off)} = 1.5 V$ | -   | -   | 12   |         |
| $C_{ob}$      | Output Capacitance                   | $V_{CB} = 5 V ; I_E = 0$ ,<br>$f = 140 kHz$                           | -   | -   | 4.0  | pF      |
| $C_{ib}$      | Input Capacitance                    | $V_{BE} = 1 V ; I_C = 0$ ,<br>$f = 140 kHz$                           | -   | -   | 4.0  | pF      |

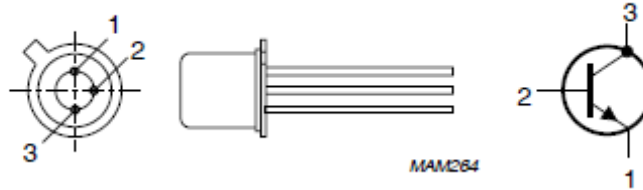
## NPN 2N3227

### MECHANICAL DATA CASE TO-18

| DIMENSIONS (mm) |      |      |
|-----------------|------|------|
|                 | min  | max  |
| A               | 12.7 | -    |
| B               | -    | 0.49 |
| C               | 0.9  | -    |
| D               | -    | 5.3  |
| E               | -    | 4.9  |
| F               | -    | 5.8  |
| G               | 2.54 | -    |
| H               | -    | 1.2  |
| I               | -    | 1.16 |
| L               | 45°  | -    |



|         |           |
|---------|-----------|
| Pin 1 : | emitter   |
| Pin 2 : | base      |
| Pin 3 : | Collector |
| Case :  | Collector |



Revised September 2012

Information furnished is believed to be accurate and reliable. However, Comset Semiconductors assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. Data are subject to change without notice. Comset Semiconductors makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Comset Semiconductors assume any liability arising out of the application or use of any product and specifically disclaims any and all liability, including without limitation consequential or incidental damages. Comset Semiconductors' products are not authorized for use as critical components in life support devices or systems.