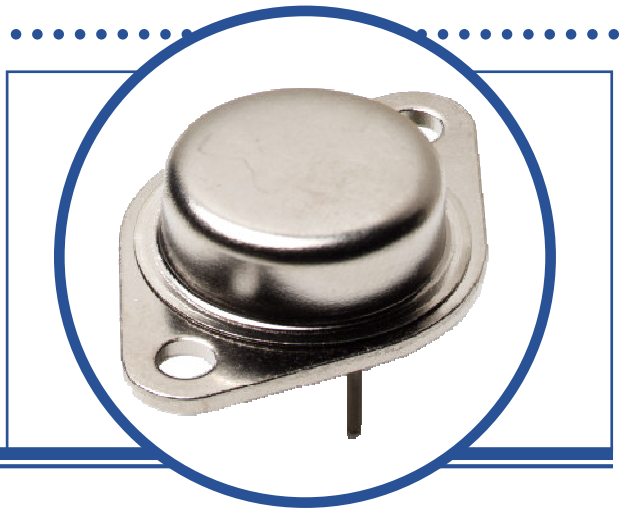
# SILICON MULTI-EPITAXIAL NPN TRANSISTOR

TT electronics
Semelab Limited

## 2N6059

- High Current Capability.
- Hermetic TO3 Metal package.
- Screening Options Available.



## ABSOLUTE MAXIMUM RATINGS ($T_C$ = 25°C unless otherwise stated)

| | | | |
|---|---|---|---|
| $V_{CBO}$ | Collector – Base Voltage | | 100V |
| $V_{CEO}$ | Collector – Emitter Voltage | | 100V |
| $V_{EBO}$ | Emitter – Base Voltage | | 5V |
| $I_C$ | Continuous Collector Current | | 12A |
| $I_B$ | Base Current | | 0.2A |
| $P_D$ | Total Power Dissipation at | $T_C$ = 25°C | 150W |
| | | Derate Above 25°C | 1.00W/°C |
| $T_J$ | Junction Temperature Range | | -55 to +175°C |
| $T_{stg}$ | Storage Temperature Range | | -55 to +175°C |

### THERMAL PROPERTIES

| Symbols | Parameters | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| $R_{\theta JC}$ | Thermal Resistance, Junction To Case | | | 1.00 | °C/W |



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## ELECTRICAL CHARACTERISTICS ($T_C$ = 25°C unless otherwise stated)

| Symbols | Parameters | Test Conditions | | Min. | Typ | Max. | Units |
|---|---|---|---|---|---|---|---|
| $I_{CEO}$ | Collector-Emitter Cut-Off Current | $V_{CE}$ = 50V | | | | 1.0 | mA |
| $I_{CEX}$ | Collector=Emitter Cut-Off Current | $V_{CE}$ = 100V | $V_{BE}$ = 1.5V | | | 10 | µA |
| | | | $T_C$ = 150°C | | | 5 | mA |
| $I_{EBO}$ | Emitter-Base Cut-Off Current | $V_{EB}$ = 5V | | | | 2 | mA |
| $V_{(BR)CEO}$ (1) | Collector-Emitter Breakdown Voltage | $I_C$ = 100mA | | 100 | | | V |
| $V_{BE}$ | Base-Emitter Voltage (nonsaturated) | $I_C$ = 6A | $V_{CE}$ = 3V | | | 2.8 | |
| $V_{BE(sat)}$ (1) | Base-Emitter Saturation Voltage | $I_C$ = 12A | $I_B$ = 120mA | | | 4 | |
| $V_{CE(sat)}$ (1) | Collector-Emitter Saturation Voltage | $I_C$ = 12A | $I_B$ = 120mA | | | 3 | |
| | | $I_C$ = 6A | $I_B$ = 24mA | | | 2 | |
| | | | $T_C$ = 150°C | | | 2 | |
| $h_{FE}$ (1) | Forward-Current Transfer Ratio | $I_C$ = 1.0A | $V_{CE}$ = 3V | 1000 | | | |
| | | $I_C$ = 6A | $V_{CE}$ = 3V | 1000 | | 18000 | |
| | | | $T_C$ = -55°C | 300 | | | |
| | | $I_C$ = 12A | $V_{CE}$ = 3V | 150 | | | |

## DYNAMIC CHARACTERISTICS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| $\|h_{fe}\|$ | Magnitude of Common-Emitter Small Signal Forward Current Transfer Ratio | $I_C$ = 5A<br>f = 1.0MHz | $V_{CE}$ = 3V | 10 | | 250 | |
| $h_{fe}$ | Small Signal Forward-Current Transfer Ratio | $I_C$ = 5A<br>f = 1.0kHz | $V_{CE}$ = 3V | 1000 | | | |
| $C_{obo}$ | Output Capacitance | f = 1.0MHz<br>$I_E$ = 0 | $V_{CB}$ = 10V | | | 300 | pF |
| $t_{on}$ | Turn-On Time | $I_C$ = 5A<br>$I_B$ = 20mA | $V_{CC}$ = 30V | | | 2 | µs |
| $t_{off}$ | Turn-Off Time | $I_C$ = 5A<br>$I_B$ = 20mA | $V_{CC}$ = 30V | | | 10 | |

**Notes**
(1) Pulse Width ≤ 300us, δ ≤ 2%

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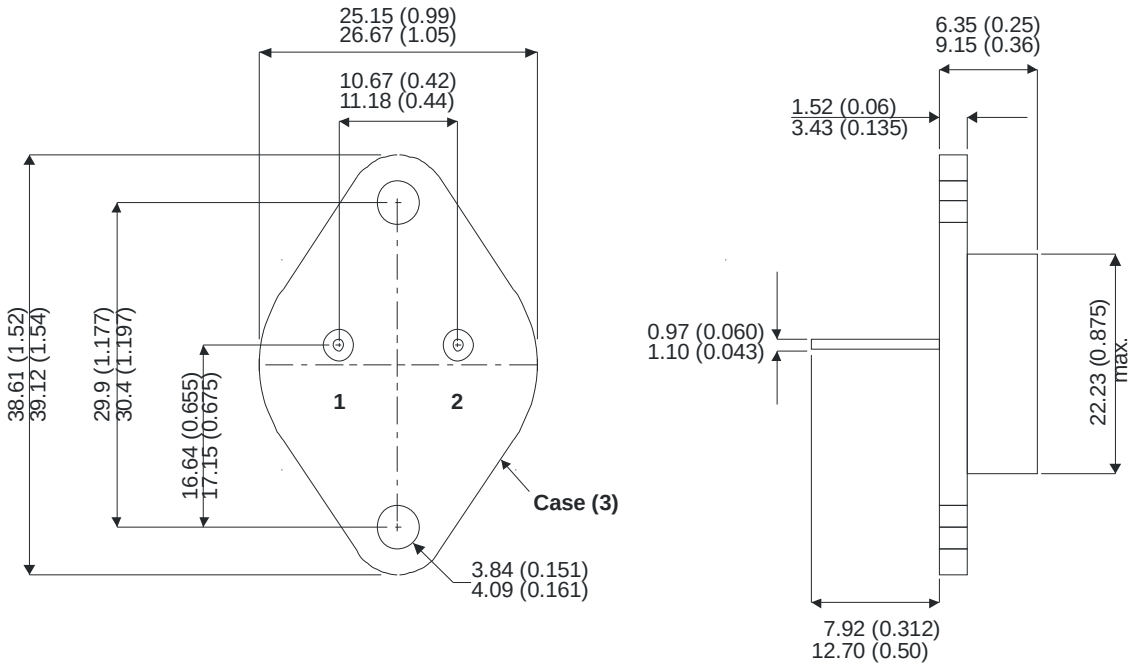
## MECHANICAL DATA

Dimensions in mm (inches)




**TO3 (TO-204AA) METAL PACKAGE**

**Underside View**

Pin 1 - Base  Pin 2 - Emitter  Case - Collector