Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!


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Microsemi LAWRENCE

**TECHNICAL DATA**

# NPN DARLINGTON POWER SILICON TRANSISTOR

***Qualified per MIL-PRF-19500/502***

| *Devices* | | *Qualified Level* |
|---|---|---|
| **2N6058** | **2N6059** | **JANTX<br>JANTXV** |

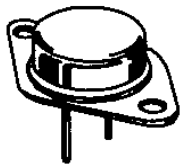
**MAXIMUM RATINGS**

| Ratings | Symbol | 2N6058 | 2N6059 | Units |
|---|---|---|---|---|
| Collector-Emitter Voltage | $V_{CEO}$ | 80 | 100 | Vdc |
| Collector-Base Voltage | $V_{CBO}$ | 80 | 100 | Vdc |
| Emitter-Base Voltage | $V_{EBO}$ | 5.0 | | Vdc |
| Base Current | $I_B$ | 0.2 | | Adc |
| Collector Current | $I_C$ | 12 | | Adc |
| Total Power Dissipation[1] @ $T_C = +25^0C$<br>@ $T_C = +100^0C$ | $P_T$ | 150<br>75 | | W<br>W |
| Operating & Storage Junction Temperature Range | $T_J$, $T_{stg}$ | -55 to +175 | | $^0C$ |

**THERMAL CHARACTERISTICS**

| Characteristics | Symbol | Max. | Unit |
|---|---|---|---|
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 1.0 | $^0C/W$ |

1) Derate linearly at 1.0 W/$^0$C above $T_C > +25^0C$



TO-3*
(TO-204AA)

*See appendix A for package outline

**ELECTRICAL CHARACTERISTICS ($T_C = 25^0C$ unless otherwise noted)**

| Characteristics | | Symbol | Min. | Max. | Unit |
|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | |
| Collector-Emitter Breakdown Voltage<br>$I_C$ = 100 mAdc | 2N6058<br>2N6059 | $V_{(BR)CEO}$ | 80<br>100 | | Vdc |
| Collector-Emitter Cutoff Current<br>$V_{CE}$ = 40 Vdc<br>$V_{CE}$ = 50 Vdc | <br>2N6058<br>2N6059 | $I_{CEO}$ | | 1.0<br>1.0 | mAdc |
| Collector-Emitter Cutoff Current<br>$V_{CE}$ = 80 Vdc, $V_{BE}$ = 1.5 Vdc<br>$V_{CE}$ = 100 Vdc, $V_{BE}$ = 1.5 Vdc | <br>2N6058<br>2N6059 | $I_{CEX}$ | | 0.5<br>0.5 | mAdc |
| Emitter-Base Cutoff Current<br>$V_{EB}$ = 5.0 Vdc | | $I_{EBO}$ | | 2.0 | mAdc |

**ELECTRICAL CHARACTERISTICS (con't)**

| Characteristics | Symbol | Min. | Max. | Unit |
|---|---|---|---|---|
| **ON CHARACTERISTICS** [2] | | | | |
| Forward-Current Transfer Ratio | | | | |
| $I_C$ = 1.0 Adc, $V_{CE}$ = 3.0 Vdc | $h_{FE}$ | 1,000 | 18,000 | |
| $I_C$ = 6.0 Adc, $V_{CE}$ = 3.0 Vdc | | 1,000 | | |
| $I_C$ = 12 Adc, $V_{CE}$ = 3.0 Vdc | | 150 | | |
| Collector-Emitter Saturation Voltage | | | | |
| $I_C$ = 12 Adc, $I_B$ = 120 mAdc | $V_{CE(sat)}$ | | 3.0 | Vdc |
| $I_C$ = 6.0 Adc, $I_B$ = 24 mAdc | | | 2.0 | |
| Base-Emitter Saturation Voltage | | | | |
| $I_C$ = 12 Adc, $I_B$ = 120 mAdc | $V_{BE(sat)}$ | | 4.0 | Vdc |
| Base-Emitter Voltage | | | | |
| $I_C$ = 6.0 Adc, $V_{CE}$ = 3.0 Vdc | $V_{BE}$ | | 2.8 | Vdc |
| **DYNAMIC CHARACTERISTICS** | | | | |
| Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio | | | | |
| $I_C$ = 5.0Adc, $V_{CE}$ = 3.0 Vdc, f = 1.0 MHz | $\lvert h_{fe} \rvert$ | 10 | 250 | |
| Small-Signal Short-Circuit Forward Current Transfer Ratio | | | | |
| $I_C$ = 5.0 Adc, $V_{CE}$ = 3.0 Vdc, f = 1.0 kHz | $h_{fe}$ | 1,000 | | |
| Output Capacitance | | | | |
| $V_{CB}$ = 10 Vdc, $I_E$ = 0, 100 kHz ≤ f ≤ 1.0 MHz | $C_{obo}$ | | 300 | pF |
| **SWITCHING CHARACTERISTICS** | | | | |
| Turn-On Time | | | | |
| $V_{CC}$ = 30 Vdc; $I_C$ = 5.0 Adc; $I_B$ = 20 mAdc | $t_{on}$ | | 2.0 | µs |
| Turn-Off Time | | | | |
| $V_{CC}$ = 30 Vdc; $I_C$ = 5.0 Adc; $I_{B1}$ = $I_{B2}$ = 20 mAdc | $t_{off}$ | | 10 | µs |

**SAFE OPERATING AREA**

**DC Tests**

$T_C$ = +25°C + 10°C, -0°, 1 Cycle, t ≥ 1.0 s

**Test 1**

$V_{CE}$ = 12.5 Vdc, $I_C$ = 12 Adc

**Test 2**

$V_{CE}$ = 30 Vdc, $I_C$ = 5.0 Adc

**Test 3**

$V_{CE}$ = 70 Vdc, $I_C$ = 200 mAdc 2N6058

**Test 4**

$V_{CE}$ = 90 Vdc, $I_C$ = 155 mAdc 2N6059

(2) Pulse Test: Pulse Width = 300µs, Duty Cycle ≤ 2.0%.