SGS-THOMSON MICROELECTRONICS

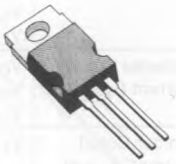
# 2N6107/09/11
# 2N6288/90/92

## GENERAL PURPOSE COMPLEMENTARY PAIRS

### DESCRIPTION

The 2N6107, 2N6109, 2N6111, 2N6288, 2N6290 and 2N6292 are epitaxial-base silicon transistors in Jedec TO-220 plastic package. They are intended for a wide variety of medium power switching and linear applications.

The PNP types are the 2N6107, 2N6109, 2N6111 and their complementary NPN types are the 2N6292, 2N6290 and 2N6288 respectively.



TO-220

### INTERNAL SCHEMATIC DIAGRAMS


### ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | PNP / NPN | 2N6107 / 2N6292 | 2N6109 / 2N6290 | 2N6111 / 2N6288 | Unit |
|---|---|---|---|---|---|---|
| $V_{CBO}$ | Collector-base Voltage ($I_E$ = 0) | | 80 | 60 | 40 | V |
| $V_{CEX}$ | Collector-emitter Voltage ($R_{BE}$ = 100 Ω) | | 80 | 60 | 40 | V |
| $V_{CEO}$ | Collector-emitter Voltage ($I_B$ = 0) | | 70 | 50 | 30 | V |
| $V_{EBO}$ | Emitter-base Voltage ($I_C$ = 0) | | 5 | | | V |
| $I_C$ | Collector Current | | 7 | | | A |
| $I_B$ | Base Current | | 3 | | | A |
| $P_{tot}$ | Total Power Dissipation at $T_{case} \leq 25$ °C | | 40 | | | W |
| $T_{stg}$ | Storage Temperature | | – 65 to 150 | | | °C |
| $T_j$ | Junction Temperature | | 150 | | | °C |

For PNP devices voltage and current values are negative.

## THERMAL DATA

| | | | | |
|---|---|---|---|---|
| $R_{th\ j\text{-}case}$ | Thermal Resistance Junction-case | Max | 3.12 | °C/W |
| $R_{th\ j\text{-}amb}$ | Thermal Resistance Junction-ambient | Max | 70 | °C/W |

## ELECTRICAL CHARACTERISTICS ($T_{case}$ = 25 °C unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_{CEX}$ | Collector Cutoff Current ($V_{BE}$ = − 1.5 V) | $V_{CE}$ = 40V for **2N6111/2N6288** | | | 0.1 | mA |
| | | $V_{CE}$ = 60V for **2N6109/2N6290** | | | 0.1 | mA |
| | | $V_{CE}$ = 80V for **2N6107/2N6292** | | | 0.1 | mA |
| | | $T_c$ = 150°C | | | | |
| | | $V_{CE}$ = 30V for **2N6111/2N6288** | | | 2 | mA |
| | | $V_{CE}$ = 50V for **2N6109/2N6290** | | | 2 | mA |
| | | $V_{CE}$ = 70V for **2N6107/2N6292** | | | 2 | mA |
| $I_{CEO}$ | Collector Cutoff Current ($I_B$ = 0) | $V_{CE}$ = 20V for **2N6111/2N6288** | | | 1 | mA |
| | | $V_{CE}$ = 40V for **2N6109/2N6290** | | | 1 | mA |
| | | $V_{CE}$ = 60V for **2N6107/2N6292** | | | 1 | mA |
| $I_{EBO}$ | Emitter Cutoff Current ($I_C$ = 0) | $V_{EB}$ = 5 V | | | 1 | mA |
| $V_{CEO(sus)}$* | Collector Emitter Sustaining Voltage | $I_C$ = 0.1 A for **2N6111/2N6288** | 30 | | | V |
| | | for **2N6109/2N6290** | 50 | | | V |
| | | for **2N6107/2N6292** | 70 | | | V |
| $V_{CER(sus)}$* | Collector Emitter Sustaining Voltage | $I_C$ = 0.1 A $R_{BE}$ = 100 ohm | | | | |
| | | for **2N6111/2N6288** | 40 | | | V |
| | | for **2N6109/2N6290** | 60 | | | V |
| | | for **2N6107/2N6292** | 80 | | | V |
| $V_{CE(sat)}$* | Collector-emitter Saturation Voltage | $I_C$ = 2 A $I_B$ = 0.2 A for **2N6111/2N6288** | | | 1 | V |
| | | $I_C$ = 2.5 A $I_B$ = 0.25 A for **2N6109/2N6290** | | | 1 | V |
| | | $I_C$ = 3 A $I_B$ = 0.3 A for **2N6107/2N6292** | | | 1 | V |
| | | $I_C$ = 7 A $I_B$ = 3 A | | | 3.5 | V |
| $V_{BE(on)}$* | Base-emitter Voltage | $I_C$ = 2 A $V_{CE}$ = 4 A for **2N6111/2N6288** | | | 1.5 | V |
| | | $I_C$ = 2.5 A $V_{CE}$ = 4 A for **2N6109/2N6290** | | | 1.5 | V |
| | | $I_C$ = 3 A $V_{CE}$ = 4 A for **2N6107/2N6292** | | | 1.5 | V |
| | | $I_C$ = 7 A $V_{CE}$ = 4 A | | | 3 | V |
| $h_{FE}$* | DC Current Gain | $I_C$ = 2 A $V_{CE}$ = 4 A for **2N6111/2N6288** | 30 | | 150 | |
| | | $I_C$ = 2.5 A $V_{CE}$ = 4 A for **2N6109/2N6290** | 30 | | 150 | |
| | | $I_C$ = 3 A $V_{CE}$ = 4 A for **2N6107/2N6292** | 30 | | 150 | |
| | | $I_C$ = 7 A $V_{CE}$ = 4 A | 2.3 | | | |
| $h_{fe}$ | Small Signal Current Gain | $I_C$ = 0.5 A $V_{CE}$ = 4 V f = 50 KHz | 20 | | | |
| $f_T$ | Transition Frequency | $I_C$ = 0.5 A $V_{CE}$ = 4 V for **NPN** Types | 10 | | | MHz |
| | | $I_C$ = 0.5 A $V_{CE}$ = 4 V for **PNP** Types | 4 | | | MHz |
| $C_{cbo}$ | Collector-base Capacitance | $V_{CB}$ = 10 V f = 1 MHz | | | 250 | pF |

* Pulsed : pulse duration = 300µs, duty cycle = 1.5 %.
For PNP types voltage and current values are negative.
For characteristic curves see the BD533 (NPN) and BD534 (PNP) series.