# 2N3107 THROUGH 2N3110

NPN SILICON AF MEDIUM POWER AMPLIFIERS & SWITCHES

THE 2N3107 THROUGH 2N3110 ARE NPN SILICON PLANAR EPITAXIAL TRANSISTORS FOR AF MEDIUM POWER DRIVERS AND OUTPUTS, AS WELL AS FOR SWITCHING APPLICATIONS UP TO 1 AMPERE. THEY ARE COMPLEMENTARY TO THE PNP 2N4032, 2N4030.

CASE TO-39

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## ABSOLUTE MAXIMUM RATINGS

| | | 2N3107 2N3108 | 2N3109 2N3110 |
|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | 100V | 80V |
| Collector-Emitter Voltage | $V_{CEO}$ | 60V | 40V |
| Emitter-Base Voltage | $V_{EBO}$ | 7V | 7V |
| Collector Current | $I_C$ | 1A | |
| Total Power Dissipation ($T_C \leq 25^oC$) | $P_{tot}$ | 5W | |
| ($T_A \leq 25^oC$) | | 800mW | |
| Operating Junction & Storage Temperature | $T_j$, $T_{stg}$ | -65 to 200°C | |

ELECTRICAL CHARACTERISTICS ($T_A=25^oC$ unless otherwise noted)

| PARAMETER | SYMBOL | MIN | MAX | UNIT | TEST CONDITIONS |
|---|---|---|---|---|---|
| Collector-Base Breakdown Voltage<br>2N3107, 2N3108<br>2N3109, 2N3110 | $BV_{CBO}$ | <br>100<br>80 | | <br>V<br>V | $I_C$=0.1mA $I_E$=0 |
| Collector-Emitter Breakdown Voltage<br>2N3107, 2N3108<br>2N3109, 2N3110 | $LV_{CEO}$ * | <br>60<br>40 | | <br>V<br>V | $I_C$=30mA $I_B$=0 |
| Emitter-Base Breakdown Voltage | $BV_{EBO}$ | 7 | | V | $I_E$=0.1mA $I_C$=0 |
| Collector Cutoff Current | $I_{CES}$ | | 10 | nA | $V_{CE}$=60V $V_{BE}$=0 |
| Collector Cutoff Current ($T_A=150^oC$) | $I_{CBO}$ | | 10 | µA | $V_{CB}$=60V $I_E$=0 |
| Emitter Cutoff Current | $I_{EBO}$ | | 10 | nA | $V_{EB}$=5V $I_C$=0 |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$* | | 0.25<br>1.0 | V<br>V | $I_C$=150mA $I_B$=15mA<br>$I_C$=1A $I_B$=0.1A |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$* | | 1.1<br>2.0 | V<br>V | $I_C$=150mA $I_B$=15mA<br>$I_C$=1A $I_B$=0.1A |
| D.C. Current Gain<br>2N3107, 2N3109 only | $H_{FE}$ * | <br>35<br>100<br>40 | <br><br>300<br> | <br><br><br> | <br>$I_C$=0.1mA $V_{CE}$=10V<br>$I_C$=150mA $V_{CE}$=1V<br>$I_C$=500mA $V_{CE}$=10V |

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| PARAMETER | SYMBOL | MIN | MAX | UNIT | TEST CONDITIONS |
|---|---|---|---|---|---|
| 2N3107, 2N3109 only | $H_{FE}$ * | 30 | | | $I_C$=150mA $V_{CE}$=10V $T_A$=-55°C |
| D.C. Current Gain | $H_{FE}$ * | 20 | | | $I_C$=0.1mA $V_{CE}$=10V |
| | | 40 | 120 | | $I_C$=150mA $V_{CE}$=1V |
| | | 25 | | | $I_C$=500mA $V_{CE}$=10V |
| 2N3108, 2N3110 only | | 15 | | | $I_C$=150mA $V_{CE}$=10V $T_A$=-55°C |
| Current Gain-Bandwidth Product | $f_T$ | | | | $I_C$=50mA $V_{CE}$=10V |
| 2N3107, 2N3109 | | 70 | | MHz | |
| 2N3108, 2N3110 | | 60 | | MHz | |
| Collector-Base Capacitance | Cob | | | | $V_{CB}$=10V $I_E$=0 f=1MHz |
| 2N3107, 2N3108 | | | 20 | pF | |
| 2N3109, 2N3110 | | | 25 | pF | |
| Emitter-Base Capacitance | Cib | | 80 | pF | $V_{EB}$=0.5V $I_C$=0 f=1MHz |
| Noise Figure (f=1KHz) | NF | | 7 | dB | $I_C$=30μA $V_{CE}$=10V $R_G$=1KΩ |
| Turn-On Time | $t_{on}$ | | 200 | nS | $I_C$=150mA $I_{B1}$=7.5mA |
| Turn-Off Time 2N3107, 2N3109 | $t_{off}$ | | 1000 | nS | $I_C$=150mA $I_{B1}$=-$I_{B2}$=7.5mA |
| 2N3108, 2N3110 | | | 600 | nS | |

* Pulse Test : Pulse Width=0.3mS, Duty Cycle=1%