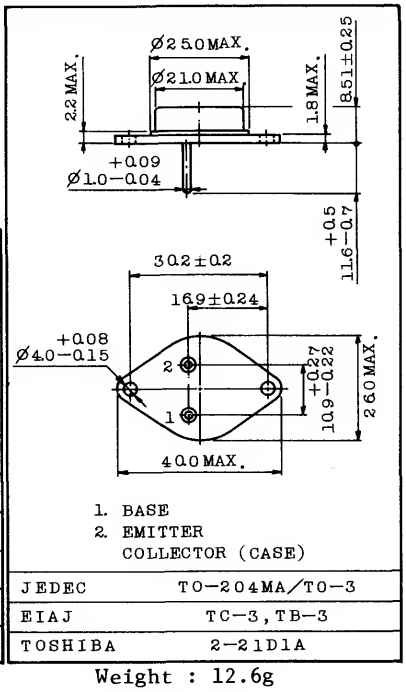
SILICON NPN TRIPLE DIFFUSED TYPE

# 2N5039

DC-DC CONVERTER, SWITCHING REGULATOR AND
HIGH POWER AMPLIFIER APPLICATIONS.

FEATURES:
. Excellent Switching Times
: $t_r < 0.5\mu s$, $t_f < 0.5\mu s$ @ $I_C$=10A, $I_B$=1A
. Low Saturation Voltage
: $V_{CE(sat)} < 2.5V$ @ $I_C$=20A, $I_B$=5A

Unit in mm




1. BASE
2. EMITTER
COLLECTOR (CASE)

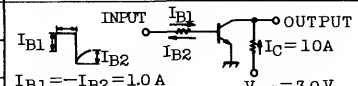
| | |
|---|---|
| JEDEC | TO−204MA/TO−3 |
| EIAJ | TC−3, TB−3 |
| TOSHIBA | 2−21D1A |

Weight : 12.6g

MAXIMUM RATINGS (Ta=25°C)

| | CHARACTERISTIC | | SYMBOL | RATING | UNIT |
|---|---|---|---|---|---|
| * | Collector-Base Voltage | | $V_{CBO}$ | 120 | V |
| | Collector-Emitter Sustaining Voltage ($V_{BE}$=-1.5V, $R_{BE}$=100Ω) | | $V_{CEX(SUS)}$ | 120 | V |
| * | Emitter-Base Voltage | | $V_{EBO}$ | 7 | V |
| * | Collector Current | DC | $I_C$ | 20 | A |
| | | Peak | $I_{CM}$ | 30 | A |
| * | Base Current | | $I_B$ | 5 | A |
| * | Collector Power Dissipation (Tc=25°C) | | $P_C$ | 140 | W |
| | Derate Linearly 25°C | | | 0.8 | W/°C |
| * | Junction Temperature | | $T_j$ | 200 | °C |
| * | Storage Temperature Range | | $T_{stg}$ | -65 ~ 200 | °C |

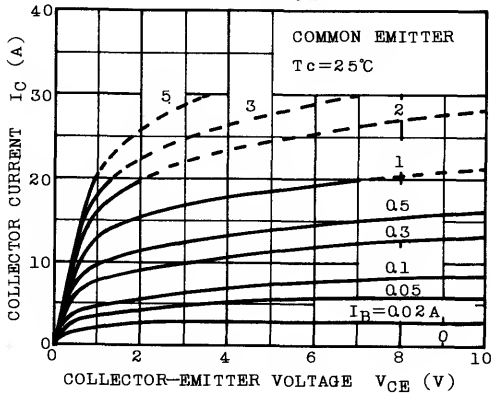
ELECTRICAL CHARACTERISTICS (Ta=25°C)

| | CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|---|
| * | Collector Cut-off Current | | $I_{CEX}$ | $V_{CE}$=110V, $V_{BE}$=-1.5V | - | - | 50 | mA |
| * | Collector Cut-off Current | | $I_{CEX}$ | $V_{CE}$=85V, $V_{BE}$=-1.5V, Tc=150°C | - | - | 10 | mA |
| * | Emitter Cut-off Current | | $I_{EBO}$ | $V_{EB}$=5V, $I_C$=0 | - | - | 15 | mA |
| | | | | $V_{EB}$=7V, $I_C$=0 | - | - | 50 | mA |
| * | Collector-Emitter Sustaining Voltage | | $V_{CEO(SUS)}$ ** | $I_C$=0.2A, $I_B$=0 | 75 | - | - | V |
| * | DC Current Gain | | $h_{FE}$ | $V_{CE}$=5V, $I_C$=2A | 30 | - | 250 | |
| | | | | $V_{CE}$=5V, $I_C$=10A | 20 | - | 100 | |
| * | Saturation Voltage | Collector-Emitter | $V_{CE(sat)}$ | $I_C$=20A, $I_B$=5A | - | - | 2.5 | V |
| | | Base-Emitter | $V_{BE(sat)}$ | $I_C$=20A, $I_B$=5A | - | - | 3.3 | V |
| * | Small Signal Forward Current Transfer Ratio | | $\|h_{fe}\|$ | $V_{CE}$=10V, $I_C$=2A, f=5MHz | 12 | - | - | |
| * | Switching Time | Rise Time | $t_r$ |  | - | - | 0.5 | μs |
| | | Storage Time | $t_{stg}$ | | - | - | 1.5 | μs |
| | | Fall Time | $t_f$ | | - | - | 0.5 | μs |

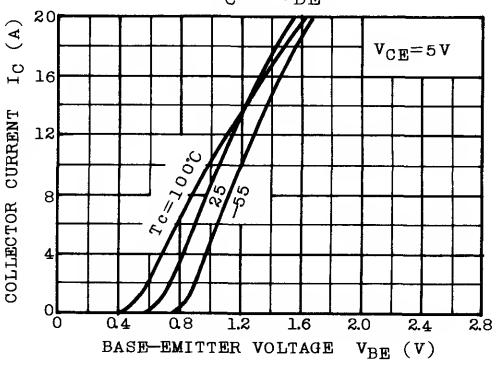


* In accordance with JEDEC registration data.
** The sustaining voltage $V_{CEO(SUS)}$ MUST NOT be measured on a curve tracer.

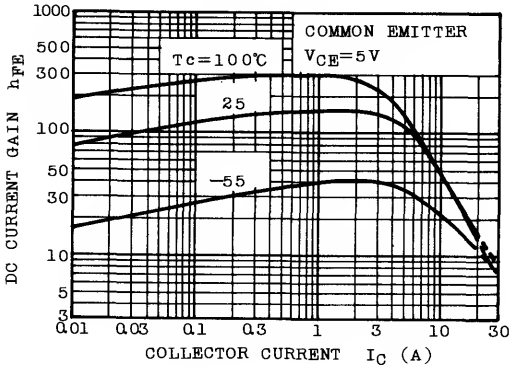
$I_C - V_{CE}$



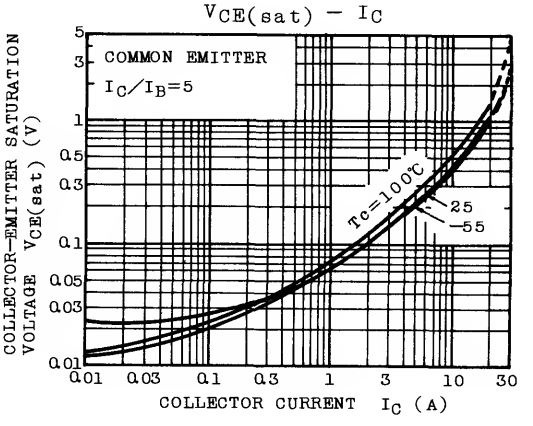

$I_C - V_{BE}$



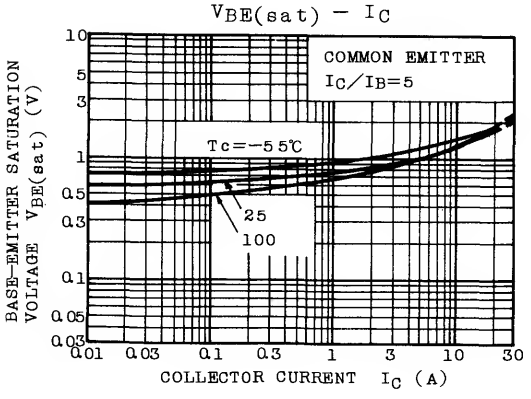

$h_{FE} - I_C$




$V_{CE(sat)} - I_C$




$V_{BE(sat)} - I_C$




$P_C - T_C$