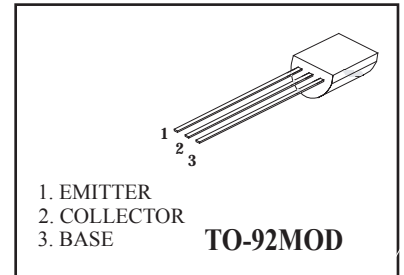
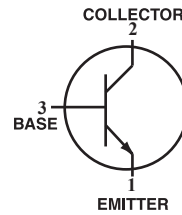


### NPN General Purpose Transistors

**(Pb)** Lead(Pb)-Free



#### MAXIMUM RATINGS

| Rating                        | Symbol                         | Value      | Unit       |
|-------------------------------|--------------------------------|------------|------------|
| Collector-Emitter Voltage     | $V_{CEO}$                      | 25<br>50   | Vdc        |
| Collector-Base Voltage        | $V_{CBO}$                      | 30<br>60   | Vdc        |
| Emitter-Base Voltage          | $V_{EBO}$                      | 5.0        | Vdc        |
| Collector Current-Continuous  | $I_C$                          | 1.0        | Adc        |
| <b>Peak Collector Current</b> | <b><math>I_{cp}(DC)</math></b> | <b>1.5</b> | <b>Adc</b> |

#### THERMAL CHARACTERISTICS

| Characteristics  | Symbol          | Max         | Unit                 |
|--|-----------------|-------------|----------------------|
| Total Device Dissipation<br>Alumina Substrate, (1) $T_A=25^\circ C$<br>Derate above $25^\circ C$ | $P_D$           | 1.0<br>8.0  | mW<br>mW/ $^\circ C$ |
| Thermal Resistance, Junction to Ambient  | $R_{\theta JA}$ | 125         | $^\circ C/W$         |
| Junction and Storage, Temperature  | $T_J, T_{stg}$  | -55 to +150 | $^\circ C$           |

#### DEVICE MARKING

2SC1383=2SC1383, 2SC1384=2SC1384

#### ELECTRICAL CHARACTERISTICS

| Characteristics | Symbol | Min | Max | Unit |
|-----------------|--------|-----|-----|------|
|-----------------|--------|-----|-----|------|

#### OFF CHARACTERISTICS

|   |                    |               |          |     |                 |
|---|--------------------|---------------|----------|-----|-----------------|
| Collector-Emitter Breakdown Voltage ( $I_C=2.0\text{mAdc}, I_B=0$ ) | 2SC1383<br>2SC1384 | $V_{(BR)CEO}$ | 25<br>50 | -   | Vdc             |
| Collector-Base Breakdown Voltage ( $I_C=10\ \mu\text{Adc}, I_E=0$ ) | 2SC1383<br>2SC1384 | $V_{(BR)CBO}$ | 30<br>60 | -   | Vdc             |
| Emitter-Base Breakdown Voltage ( $I_E=10\ \mu\text{Adc}, I_C=0$ )   |                    | $V_{(BR)EBO}$ | 5.0      | -   | Vdc             |
| Collector Cutoff Current ( $V_{CB}=20\text{Vdc}, I_E=0$ )           |                    | $I_{CBO}$     | -        | 0.1 | $\mu\text{Adc}$ |

1. Alumina=0.4 x 0.3 x 0.024 in. 99.5% alumina

**ELECTRICAL CHARACTERISTICS** ( $T_A=25^\circ\text{C}$  unless otherwise noted) (Continued)

| Characteristics | Symbol | Min | Max | Unit |
|-----------------|--------|-----|-----|------|
|-----------------|--------|-----|-----|------|

**ON CHARACTERISTICS**

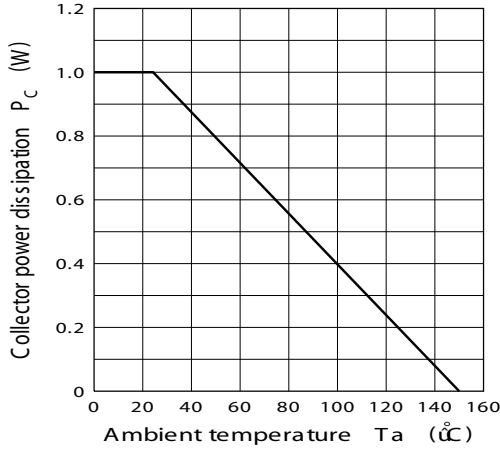
|   |                                  |          |          |        |
|---|----------------------------------|----------|----------|--------|
| DC Current Gain<br>( $I_C=500\text{ mAdc}, V_{CE}=10\text{ Vdc}$ )<br>( $I_C=1.0\text{ Adc}, V_{CE}=5.0\text{ Vdc}$ ) | $h_{FE}^{(1)}$<br>$h_{FE}^{(2)}$ | 85<br>50 | 340<br>- | -<br>- |
| Collector-Emitter Saturation Voltage<br>( $I_C=500\text{ mAdc}, I_B=50\text{ mAdc}$ )                                 | $V_{CE(sat)}$                    | -        | 0.4      | Vdc    |
| Base-Emitter Saturation Voltage<br>( $I_C=500\text{ Adc}, I_B=50\text{ mAdc}$ )                                       | $V_{BE(sat)}$                    | -        | 1.2      | Vdc    |

**SMALL-SIGNAL CHARACTERISTICS**

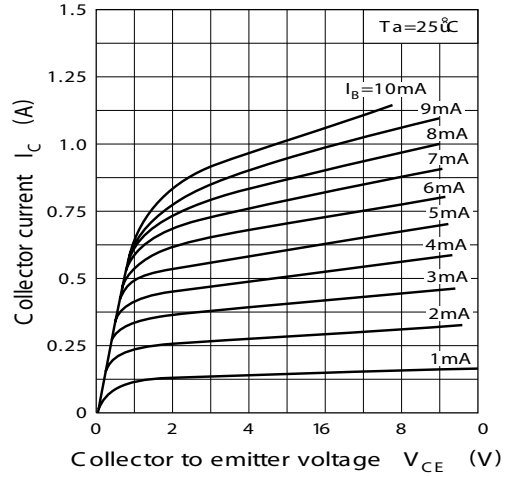
|   |       |     |   |     |
|---|-------|-----|---|-----|
| Current-Gain-Bandwidth Product<br>( $I_C=50\text{ mAdc}, V_{CE}=10\text{ Vdc}, f=30\text{ MHz}$ ) | $f_T$ | 100 | - | MHz |
|---|-------|-----|---|-----|

**CLASSIFICATION OF  $h_{FE}$** 

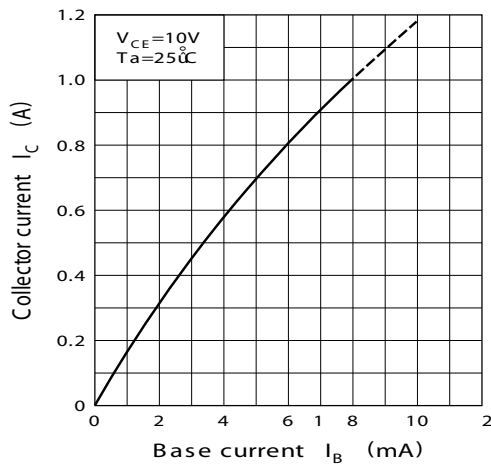
| Rank  | Q      | R       | H       |
|-------|--------|---------|---------|
| Range | 85-170 | 120-240 | 170-340 |



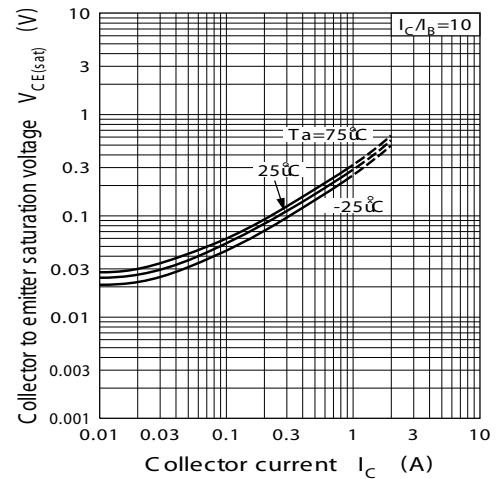
**FIG1. Total Power Dissipation Vs Ambient Temperature**



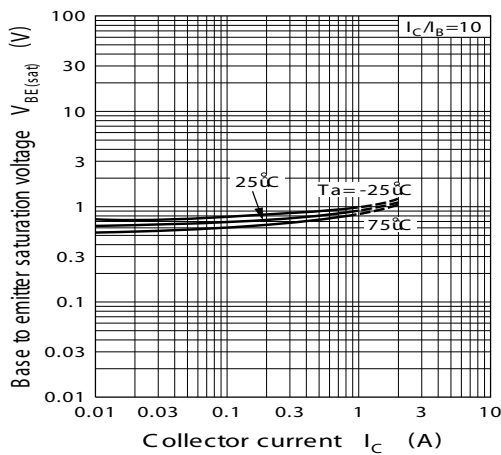
**FIG2. Static Characteristic**



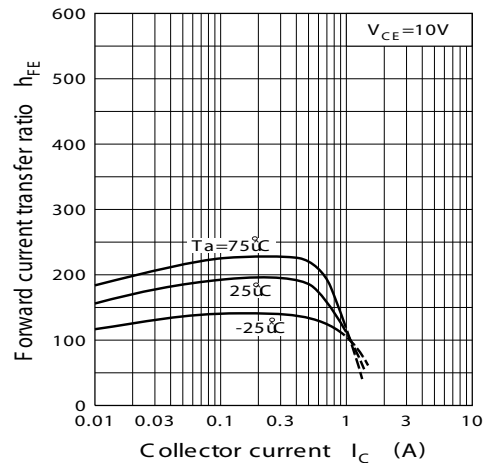
**FIG3. Collect Current Vs Base Current**



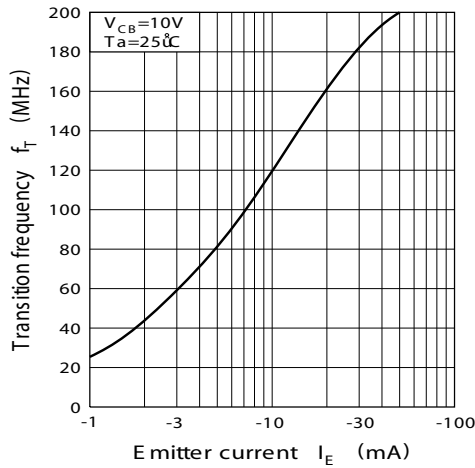
**FIG4. Collector-Emitter Saturation Voltage**



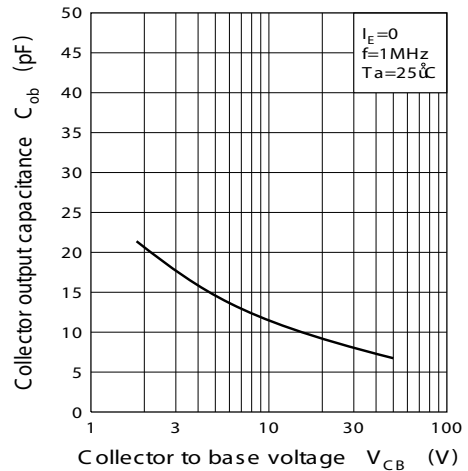
**FIG 5. Base-Emitter Saturation Voltage**



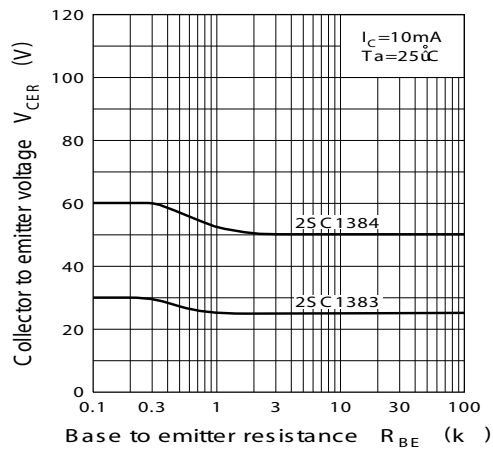
**FIG6. Current Gain Bandwidth Product**



**FIG7. Current-Gain-Bandwidth**



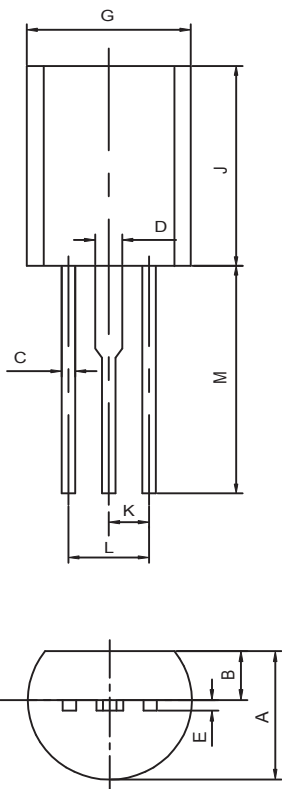
**FIG9. Capacitance**



**FIG9. V<sub>CER</sub> VS R<sub>BE</sub>**

## TO-92MOD Outline Dimensions

unit:mm



| TO-92MOD |          |        |
|----------|----------|--------|
| Dim      | Min      | Max    |
| A        | 4.700    | 5.100  |
| B        | 1.730    | 2.030  |
| C        | 0.400    | 0.600  |
| D        | 0.900    | 1.100  |
| E        | 0.400    | 0.500  |
| G        | 5.800    | 6.200  |
| J        | 8.400    | 8.800  |
| K        | 1.500TYP |        |
| L        | 2.900    | 3.100  |
| M        | 12.20    | 13.450 |