



TO-92 Plastic-Encapsulate Transistors

3DD13001 TRANSISTOR (NPN)

FEATURES

Power dissipation

$$P_{CM} : 1.25 \text{ W (} T_{amb}=25 \text{)}$$

Collector current

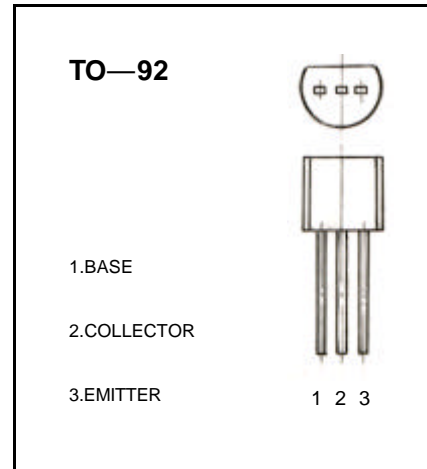
$$I_{CM} : 0.2 \text{ A}$$

Collector-base voltage

$$V_{(BR)CBO} : 600 \text{ V}$$

Operating and storage junction temperature range

$$T_J, T_{stg}: -55 \text{ to } +150$$

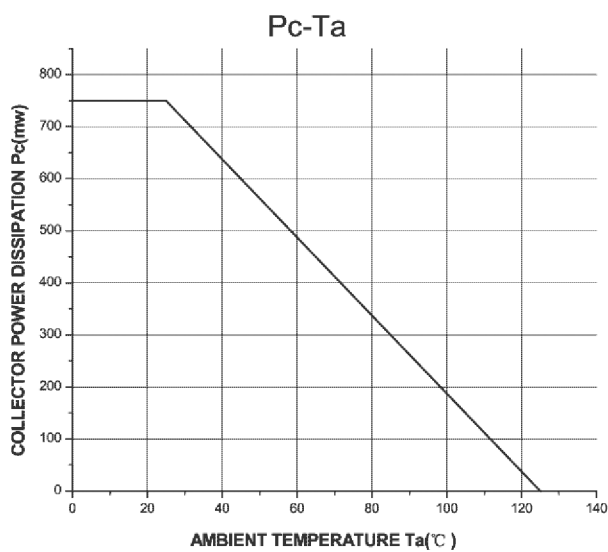
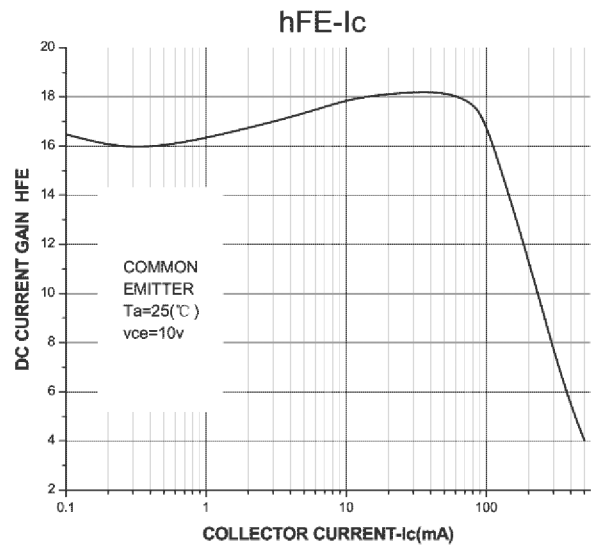
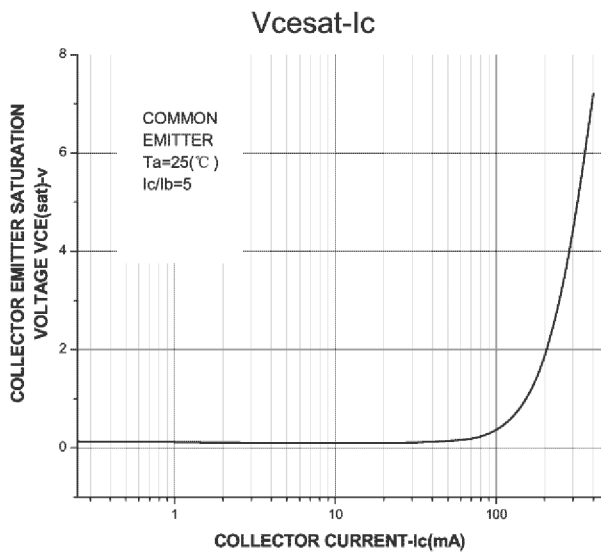
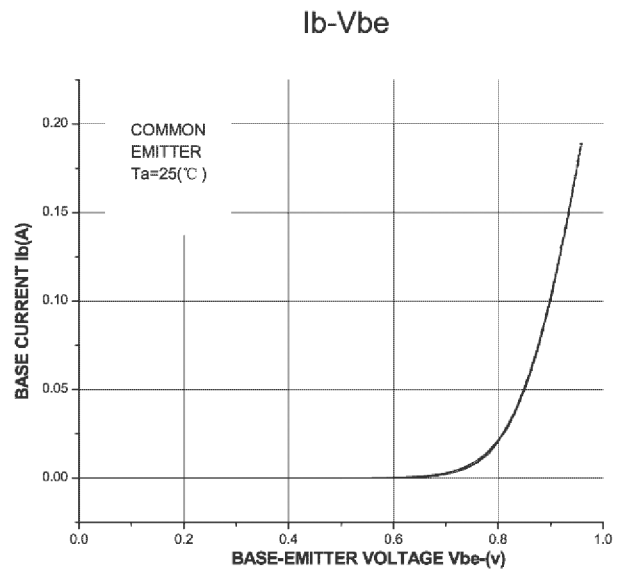
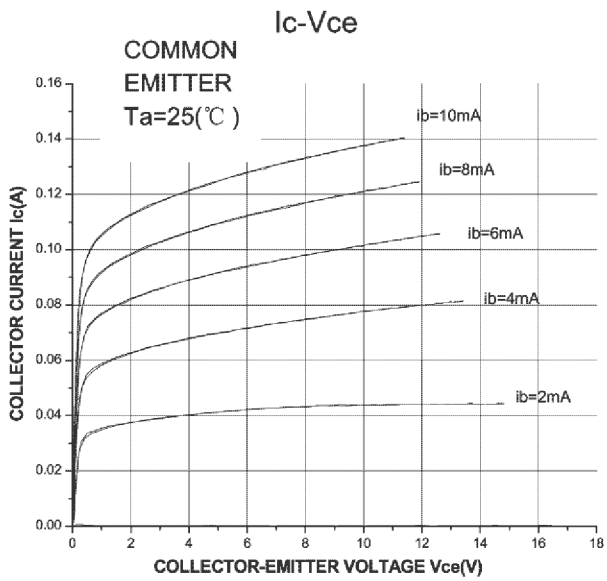


ELECTRICAL CHARACTERISTICS ($T_{amb}=25$ unless otherwise specified)

| Parameter | Symbol | Test conditions | MIN | TYP | MAX | UNIT |
|--------------------------------------|---------------|---|-----|-----|-----|---------|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | $I_C=100 \mu A, I_E=0$ | 600 | | | V |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | $I_C=1 \text{ mA}, I_B=0$ | 400 | | | V |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | $I_E=100 \mu A, I_C=0$ | 7 | | | V |
| Collector cut-off current | I_{CBO} | $V_{CB}=600 \text{ V}, I_E=0$ | | | 100 | μA |
| Collector cut-off current | I_{CEO} | $V_{CE}=400 \text{ V}, I_B=0$ | | | 200 | μA |
| Emitter cut-off current | I_{EBO} | $V_{EB}=7 \text{ V}, I_C=0$ | | | 100 | μA |
| DC current gain | $h_{FE(1)}$ | $V_{CE}=20 \text{ V}, I_C=20 \text{ mA}$ | 10 | | 70 | |
| | $h_{FE(2)}$ | $V_{CE}=10 \text{ V}, I_C=0.25 \text{ mA}$ | 5 | | | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C=50 \text{ mA}, I_B=10 \text{ mA}$ | | | 0.5 | V |
| Base-emitter saturation voltage | $V_{BE(sat)}$ | $I_C=50 \text{ mA}, I_B=10 \text{ mA}$ | | | 1.2 | V |
| Transition frequency | f_T | $V_{CE}=20 \text{ V}, I_C=20 \text{ mA}$ $f=1 \text{ MHz}$ | 8 | | | MHz |
| Fall time | t_f | $I_C=50 \text{ mA}, I_{B1}=-I_{B2}=5 \text{ mA}$ | | | 0.3 | μs |
| Storage time | t_s | $V_{CC}=45 \text{ V}$ | | | 1.5 | μs |

CLASSIFICATION OF $h_{FE(1)}$

| Range | 10-15 | 15-20 | 20-25 | 25-30 | 30-35 | 35-40 | 40-45 | 45-50 | 50-55 | 55-60 | 60-65 | 65-70 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|



TO-92 PACKAGE OUTLINE DIMENSIONS



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------------|---------------------------|--------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 3.300 | 3.700 | 0.130 | 0.146 |
| A1 | 1.100 | 1.400 | 0.043 | 0.055 |
| b | 0.380 | 0.550 | 0.015 | 0.022 |
| c | 0.360 | 0.510 | 0.014 | 0.020 |
| D | 4.400 | 4.700 | 0.173 | 0.185 |
| D1 | 3.430 | | 0.135 | |
| E | 4.300 | 4.700 | 0.169 | 0.185 |
| e | 1.270TYP | | 0.050TYP | |
| e1 | 2.440 | 2.640 | 0.096 | 0.104 |
| L | 14.100 | 14.500 | 0.555 | 0.571 |
| Ö | | 1.600 | | 0.063 |
| \downarrow | 0.000 | 0.380 | 0.000 | 0.015 |