Elektronische Bauelemente

# 2SD2045

**NPN - PNP**

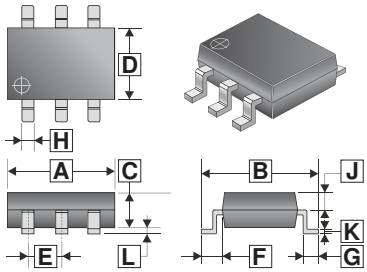
**Plastic-Encapsulate Transistors**

RoHS Compliant Product
A suffix of “-C” specifies halogen and lead free

## FEATURE

- 40V complementary device
- Mounting cost and area can be cut in half
- High hFE

**SOT-26**

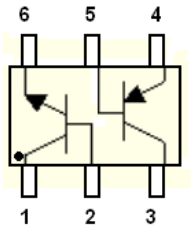



## MARKING

**2045**

## PACKAGING DIMENSION

| Package | MPQ | Leader Size |
|---|---|---|
| SOT-26 | 3K | 7 inch |




| REF. | Millimeter | | REF. | Millimeter | |
|---|---|---|---|---|---|
| | Min. | Max. | | Min. | Max. |
| A | 2.70 | 3.10 | G | 0.37 REF. | |
| B | 2.60 | 3.00 | H | 0.30 | 0.55 |
| C | 1.20 REF. | | J | - | - |
| D | 1.40 | 1.80 | K | 0.12 REF. | |
| E | 0.95 REF. | | L | - | 0.10 |
| F | 0.60 REF. | | | | |

## ABSOLUTE MAXIMUM RATINGS OF TR1 and TR2 @Ta = 25°C

| Parameter | Symbol | Value | | Unit |
|---|---|---|---|---|
| | | $T_R1$ (NPN) | $T_R2$ (PNP) | |
| Collector to Base Voltage | $V_{CBO}$ | 40 | -40 | V |
| Collector to Emitter Voltage | $V_{CEX}$ | 40 | -40 | V |
| Collector to Emitter Voltage | $V_{CEO}$ | 30 | -30 | V |
| Emitter to Base Voltage | $V_{EBO}$ | 7 | -7 | V |
| Collector Currrent – Continuous | $I_C$ | 1.5 | -1.5 | A |
| Collector Current- Peak | $I_{CM}$ | 5 | -5 | A |
| Collector Power Dissipation | $P_C$ | 350 | 350 | mW |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 357 | 357 | ℃ / W |
| Junction Temperature | $T_J$ | 150 | | ℃ |
| Storage Temperature | $T_{STG}$ | -55 ~ +150 | | ℃ |

## ELECTRICAL CHARACTERISTICS OF TR1 (NPN Transistor) @Ta = 25°C

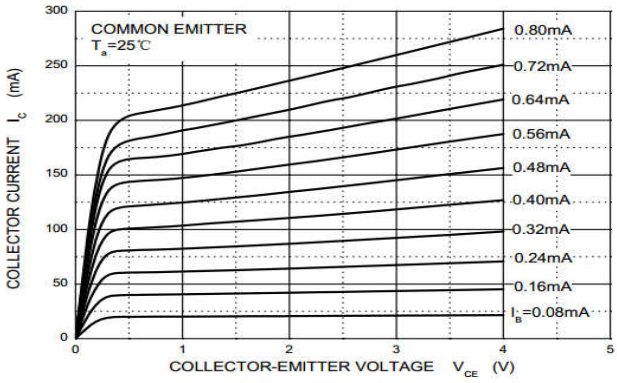
| Parameter | Test Condition | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Collector-Base Breakdown Voltage | $I_C$=100μA, $I_E$=0 | $V_{(BR)CBO}$ | 40 | - | - | V |
| Collector-Emitter Breakdown Voltage | $I_C$ =10mA, $I_B$=0 | $V_{(BR)CEO}$ | 30 | - | - | V |
| Collector-Emitter Breakdown Voltage | $I_C$ =1μA, $V_{BE(OFF)}$= -0.5V | $V_{(BR)CEX}$ | 40 | - | - | V |
| Emitter-Base Breakdown Voltage | $I_E$=100μA, $I_C$=0 | $V_{(BR)EBO}$ | 7 | - | - | V |
| Collector Cutoff Current | $V_{CB}$=32V, $I_E$=0 | $I_{CBO}$ | - | - | 20 | nA |
| Collector cut-off current | $V_{CE}$=16V, R≦1KΩ | $I_{CER}$ | - | - | 20 | nA |
| Emitter Cutoff Current | $V_{EB}$=6V, $I_C$=0 | $I_{EBO}$ | - | - | 20 | nA |
| DC Current Gain | $V_{CE}$=2V, $I_C$=100mA | $h_{FE}$ | 180 | - | 500 | |
| Collector-emitter Saturation Voltage | $I_C$=750mA, $I_B$=15mA | $V_{CE(sat)}$ | - | - | 0.375 | V |
| Base-Emitter Saturation Voltage | $I_C$=750mA, $I_B$=15mA | $V_{BE(sat)}$ | - | - | 1.2 | V |

## ELECTRICAL CHARACTERISTICS OF TR2 (PNP Transistor) @Ta = 25°C

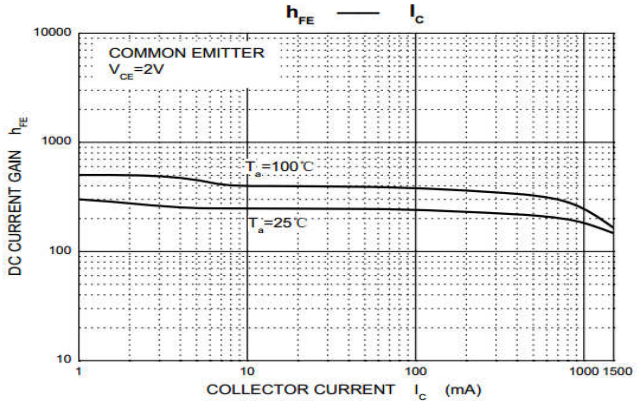
| Parameter | Test Condition | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Collector-Base Breakdown Voltage | $I_C$= -100μA, $I_E$=0 | $V_{(BR)CBO}$ | -40 | - | - | V |
| Collector-Emitter Breakdown Voltage | $I_C$ = -10mA, $I_B$=0 | $V_{(BR)CEO}$ | -30 | - | - | V |
| Collector-Emitter Breakdown Voltage | $I_C$ = -1μA, $V_{BE(OFF)}$=0.5V | $V_{(BR)CEX}$ | -40 | - | - | V |
| Emitter-Base Breakdown Voltage | $I_E$= -100μA, $I_C$=0 | $V_{(BR)EBO}$ | -7 | - | - | V |
| Collector Cutoff Current | $V_{CB}$= -32V, $I_E$=0 | $I_{CBO}$ | - | - | -20 | nA |
| Collector cut-off current | $V_{CE}$= -16V, R≦1KΩ | $I_{CER}$ | - | - | -20 | nA |
| Emitter Cutoff Current | $V_{EB}$= -6V, $I_C$=0 | $I_{EBO}$ | - | - | -20 | nA |
| DC Current Gain | $V_{CE}$= -2V, $I_C$= -100mA | $h_{FE}$ | 180 | - | 500 | |
| Collector-emitter Saturation Voltage | $I_C$= -750mA, $I_B$= -15mA | $V_{CE(sat)}$ | - | - | -0.375 | V |
| Base-Emitter Saturation Voltage | $I_C$= -750mA, $I_B$= -15mA | $V_{BE(sat)}$ | - | - | -1.2 | V |

## CHARACTERISTIC CURVES (TR1 NPN)

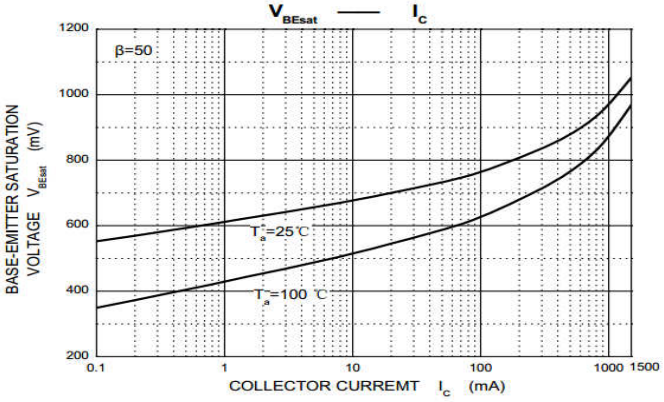
Static Characteristic



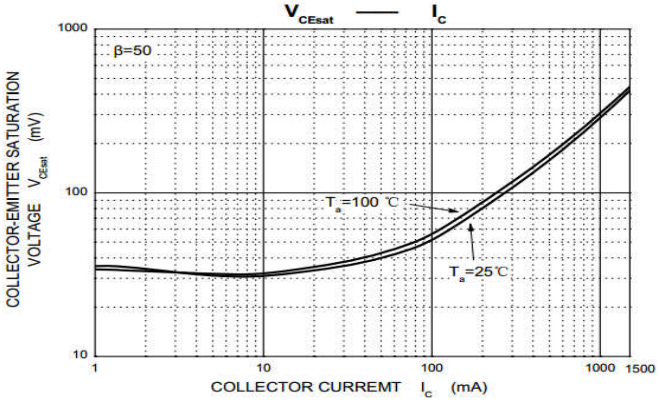

$h_{FE}$ —— $I_C$



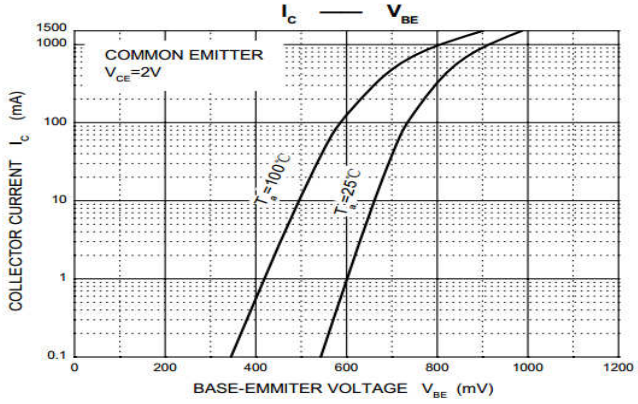

$V_{BEsat}$ —— $I_C$



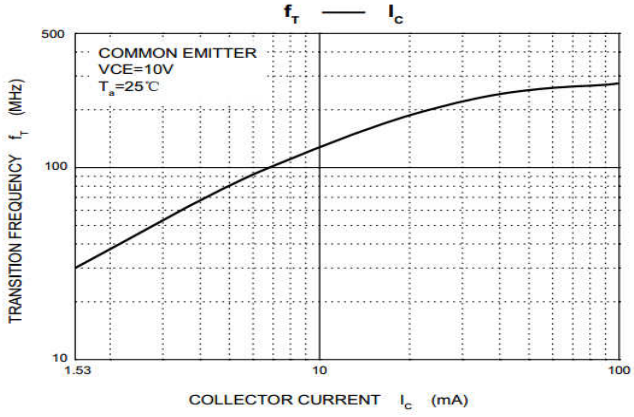

$V_{CEsat}$ —— $I_C$



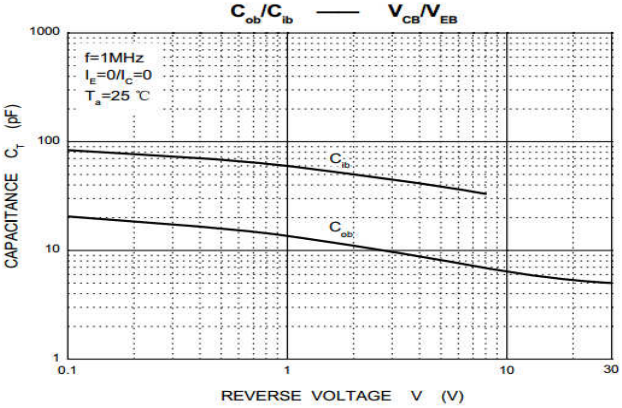

$I_C$ —— $V_{BE}$



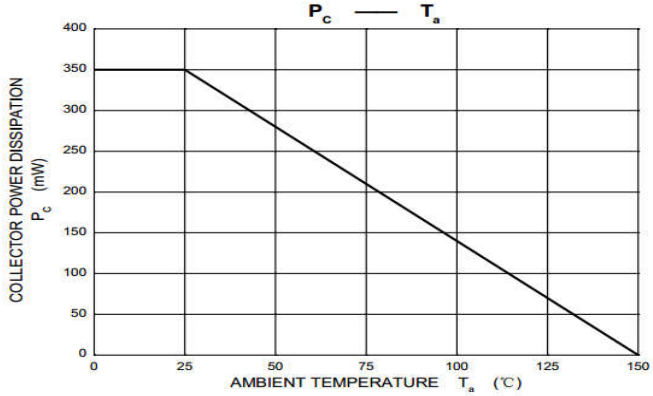

$f_T$ —— $I_C$




$C_{ob}/C_{ib}$ —— $V_{CB}/V_{EB}$

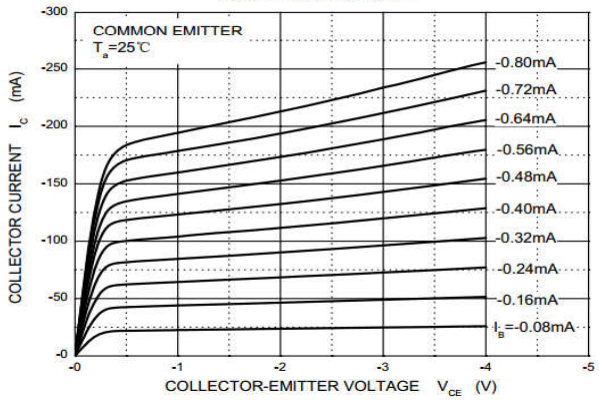



$P_C$ —— $T_a$

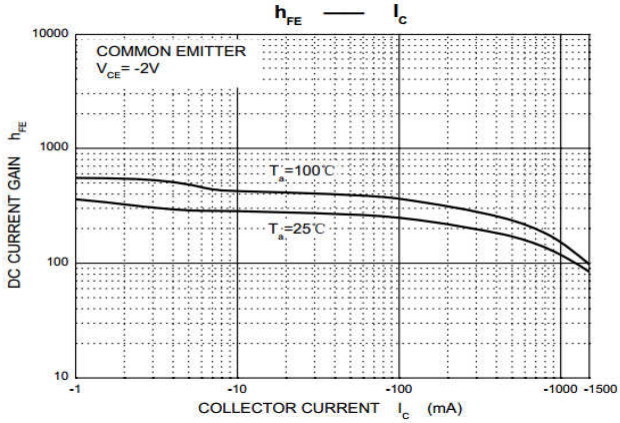


## CHARACTERISTIC CURVES (TR2 PNP)

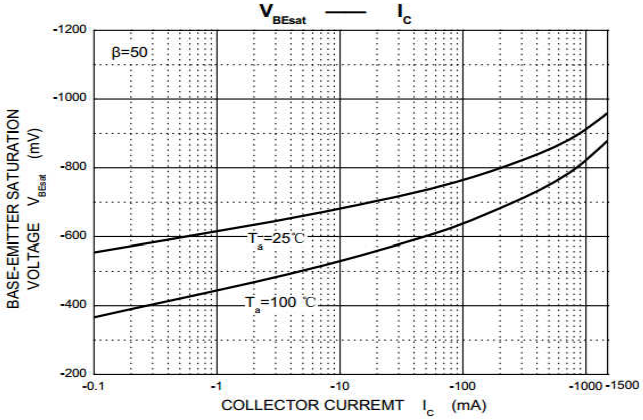
Static Characteristic



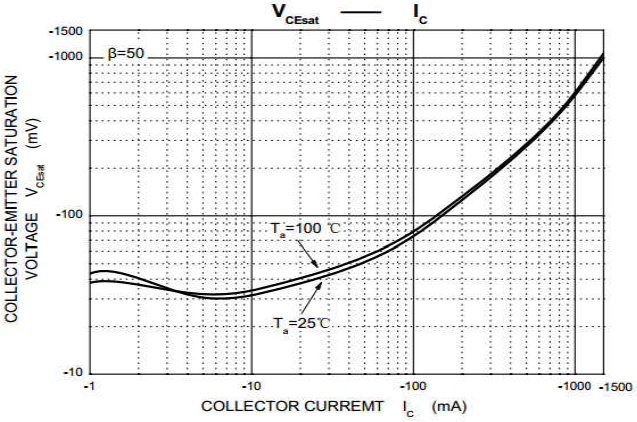

$h_{FE}$ —— $I_C$



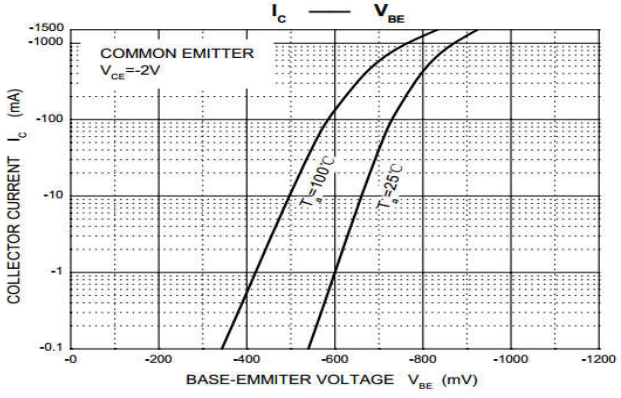

$V_{BEsat}$ —— $I_C$



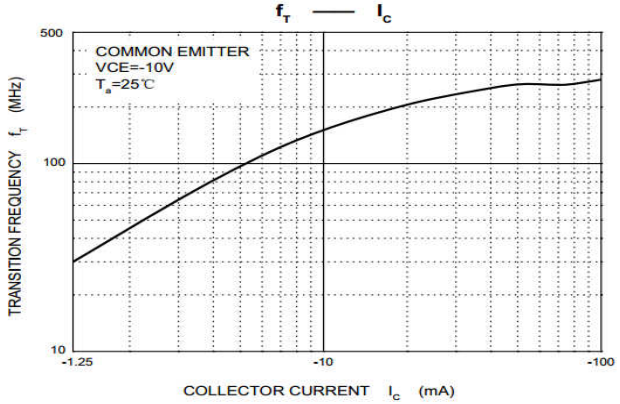

$V_{CEsat}$ —— $I_C$



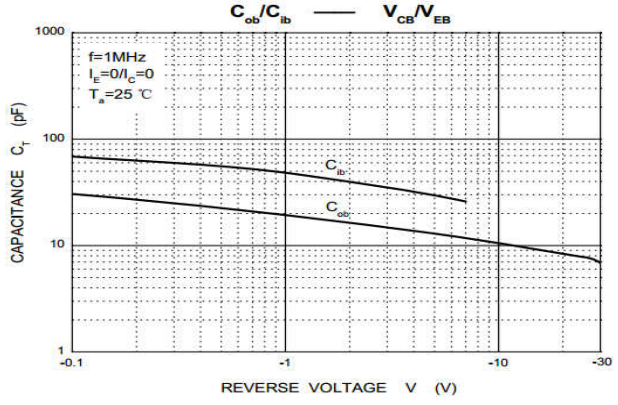

$I_C$ —— $V_{BE}$




$f_T$ —— $I_C$




$C_{ob}/C_{ib}$ —— $V_{CB}/V_{EB}$




$P_C$ —— $T_a$