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Ordering number:EN3025

PNP/NPN Epitaxial Planar Silicon Transistors

# 2SA1705/2SC4485

## Low-Frequency Power Amplifier Applications

## Applications

· Voltage regulators, relay drivers, lamp drivers.

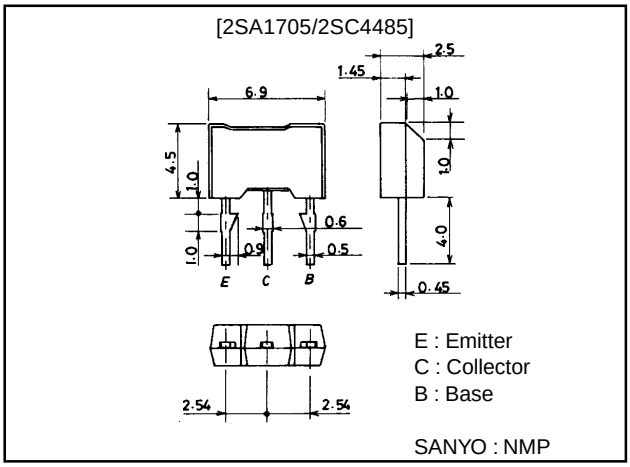
## Features

· Adoption of FBET process.
· Fast switching speed.

## Package Dimensions

unit:mm

2064




( ) : 2SA1705

## Specifications

### Absolute Maximum Ratings at Ta = 25˚C

| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---|---|---|---|
| Collector-to-Base Voltage | $V_{CBO}$ | | (–)60 | V |
| Collector-to-Emitter Voltage | $V_{CEO}$ | | (–)50 | V |
| Emitter-to-Base Voltage | $V_{EBO}$ | | (–)5 | V |
| Collector Current | $I_C$ | | (–)1 | A |
| Collector Current (Pulse) | $I_{CP}$ | | (–)2 | A |
| Collector Dissipation | $P_C$ | | 0.9 | W |
| Junction Temperature | Tj | | 150 | ˚C |
| Storage Temperature | Tstg | | –55 to +150 | ˚C |

### Electrical Characteristics at Ta = 25˚C

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Collector Cutoff Current | $I_{CBO}$ | $V_{CB}$=(–)50V, $I_E$=0 | | | (–)100 | nA |
| Emitter Cutoff Current | $I_{EBO}$ | $V_{EB}$=(–)4V, $I_C$=0 | | | (–)100 | nA |
| DC Current Gain | $h_{FE}1$ | $V_{CE}$=(–)2V, $I_C$=(–)100mA | 100* | | 400* | |
| | $h_{FE}2$ | $V_{CE}$=(–)2V, $I_C$=(–)1A | 30 | | | |
| Gain-Bandwidth Product | $f_T$ | $V_{CE}$=(–)10V, $I_C$=(–)50mA | | 150 | | MHz |



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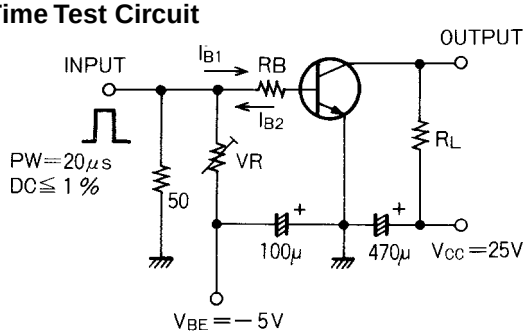
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C$=(–)500mA, $I_B$=(–)50mA | | (–180) | (–500) | mV |
| | | | | 120 | 300 | mV |
| Base-to-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C$=(–)500mA, $I_B$=(–)50mA | | (–)0.9 | (–)1.2 | V |
| Output Capacitance | $C_{ob}$ | $V_{CB}$=(–)10V, f=1MHz | | (12)8.5 | | pF |
| Collector-to-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C$=(–)10μA, $I_E$=0 | (–)60 | | | V |
| Collector-to-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C$=(–)1mA, $R_{BE}$=∞ | (–)50 | | | V |
| Emitter-to-Base Breakdown Votage | $V_{(BR)EBO}$ | $I_E$=(–)10μA, $I_C$=0 | (–)5 | | | V |
| Turn-ON TIme | $t_{ON}$ | See specified Test Circuit | | 40 | | V |
| Storage Time | $t_{stg}$ | See specified Test Circuit | | (300) | | ns |
| | | | | 350 | | ns |
| Fall Time | $t_f$ | See specified Test Circuit | | 30 | | ns |

* : The 2SA1705/2SC4485 are classified by 100mA $h_{FE}$ as follows :

| | | |
|---|---|---|
| 100 R 200 | 140 S 280 | 200 T 400 |

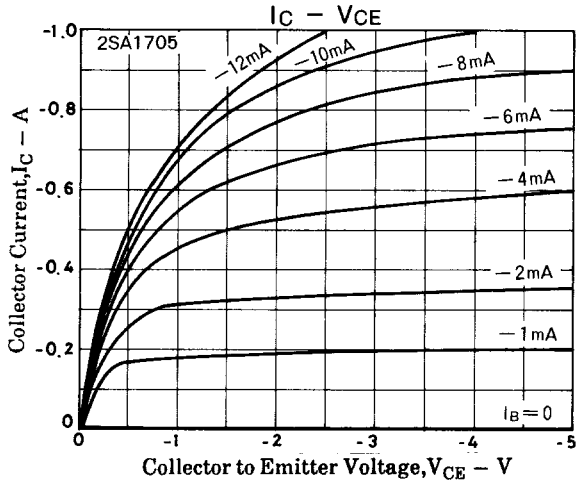
## Switching Time Test Circuit

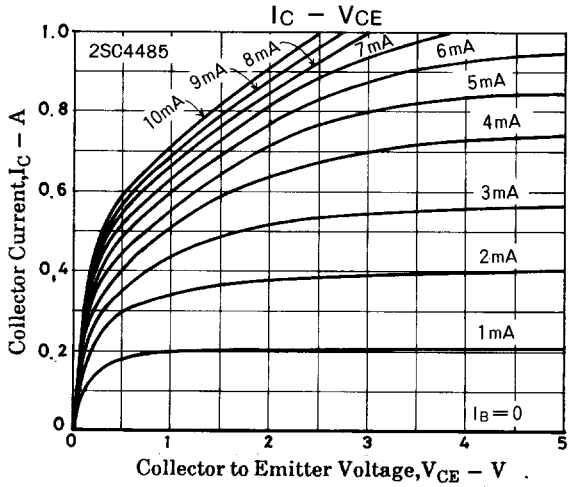


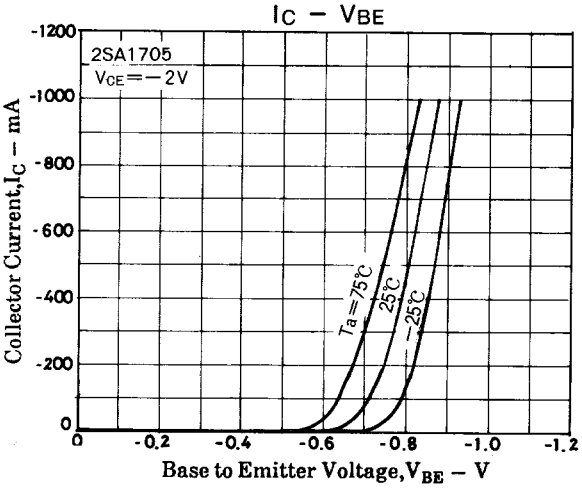

$10I_{B1}=-10I_{B2}=I_C=500mA$

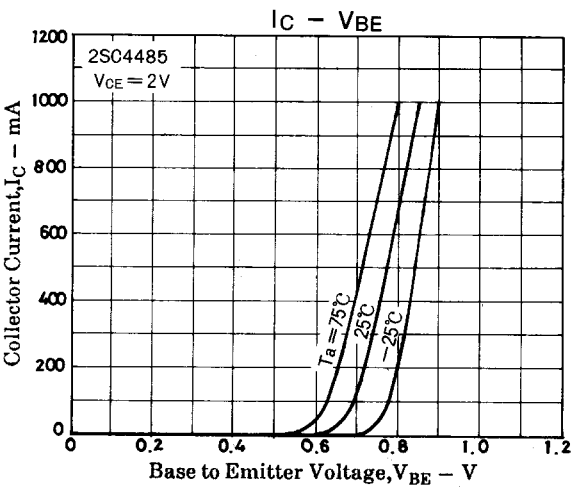
(For PNP, the polarity is reversed.)

Unit (resistance : Ω, capacitance : F)



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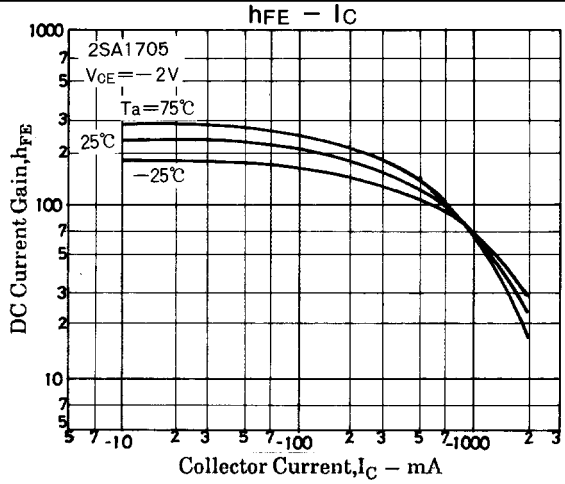
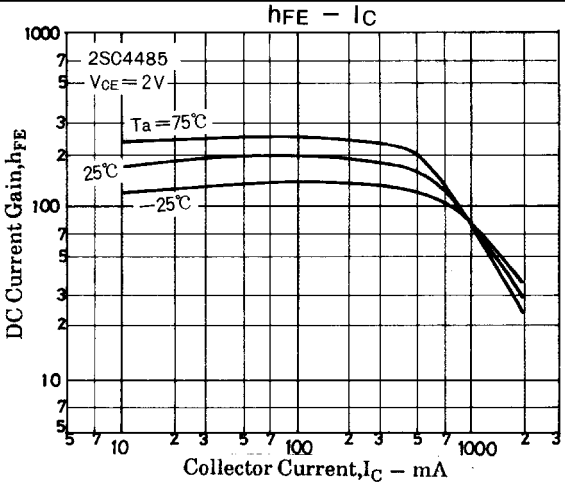
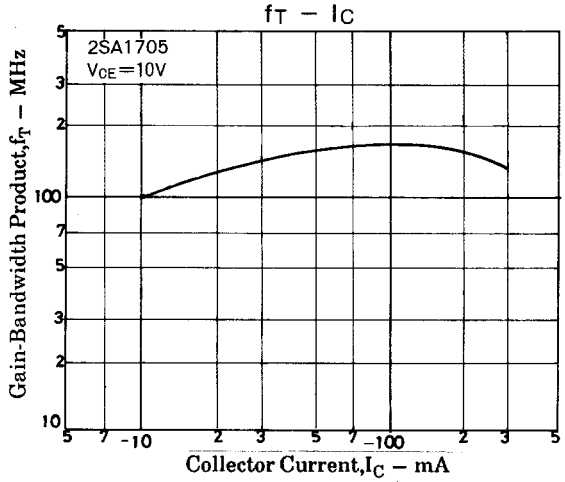
hFE – IC



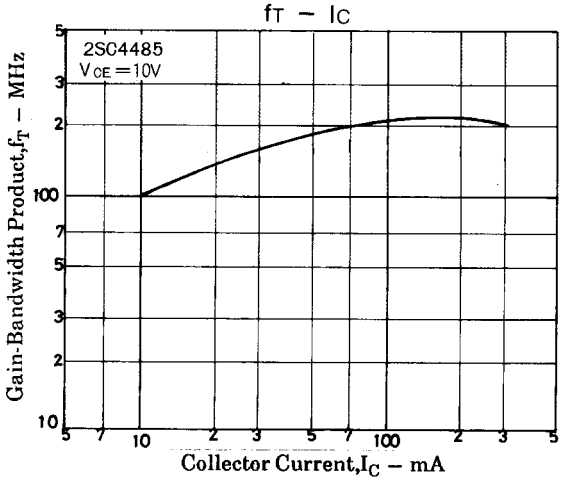

hFE – IC



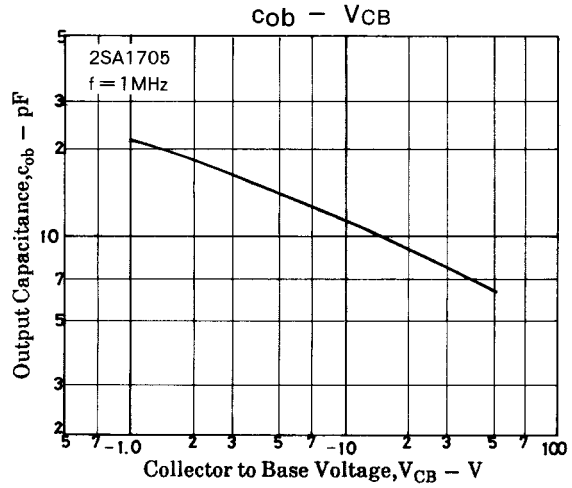

fT – IC



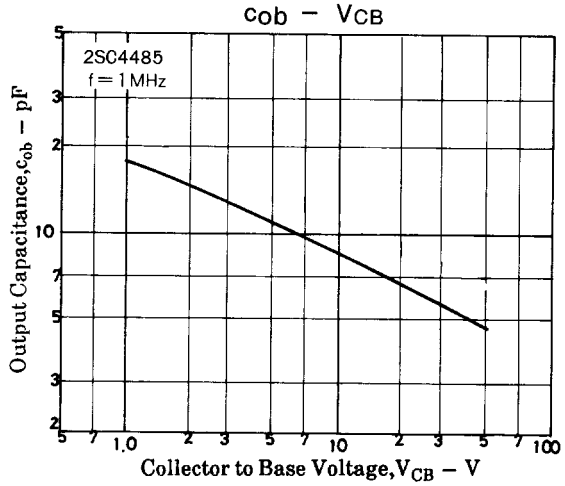

fT – IC



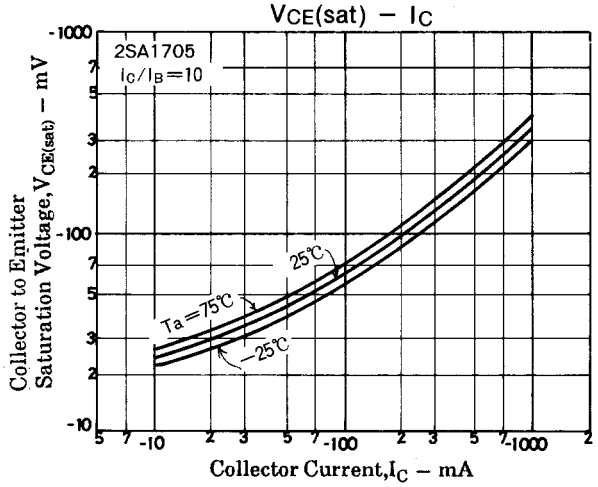

Cob – VCB



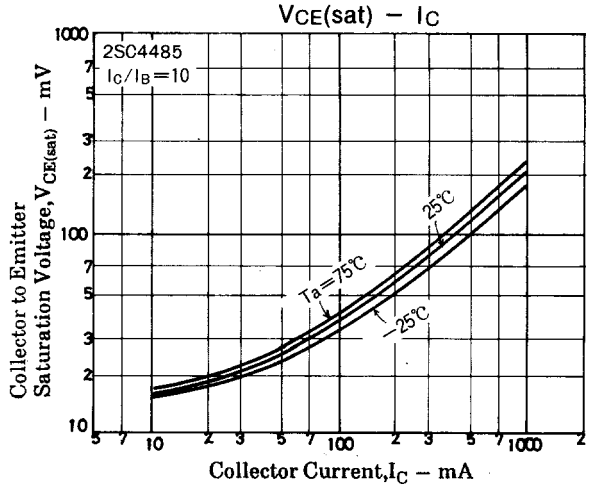

Cob – VCB




VCE(sat) – IC




VCE(sat) – IC



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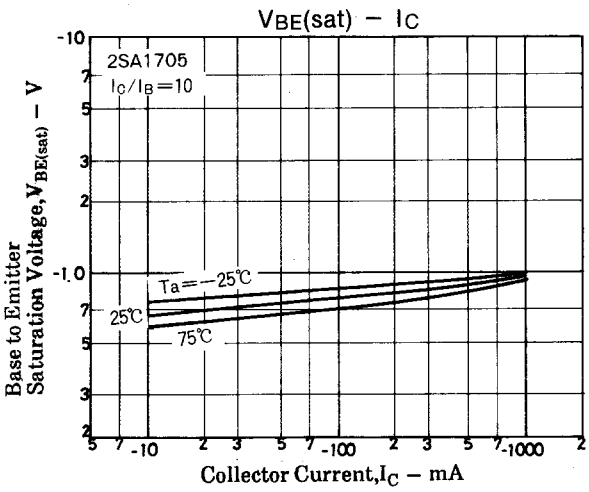


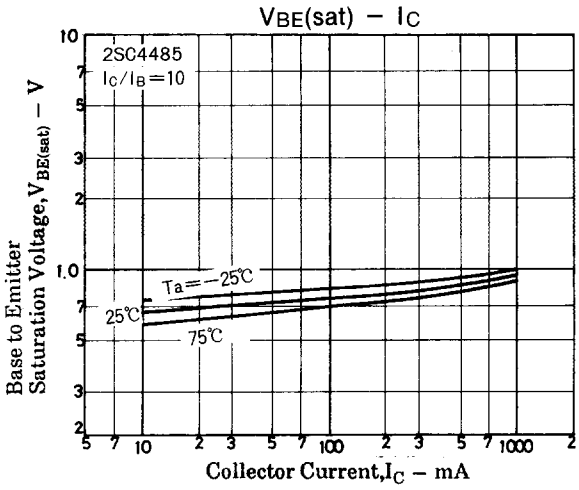


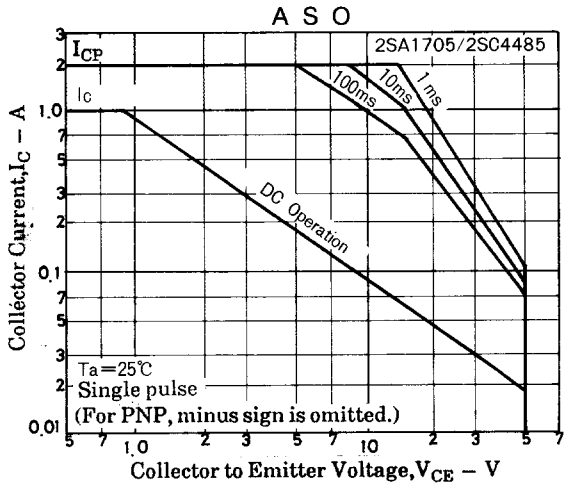


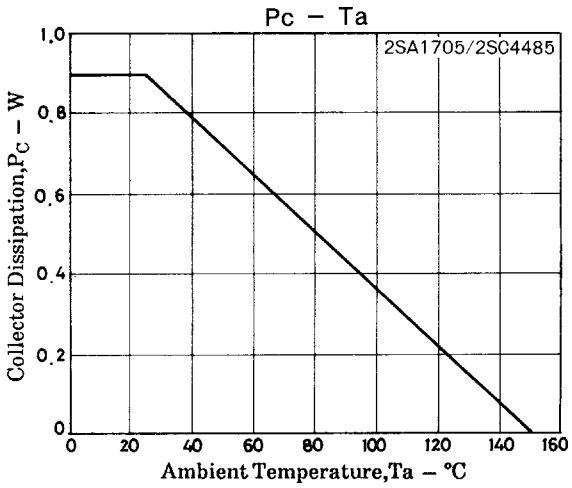






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