Ordering number:EN3877

PNP/NPN Epitaxial Planar Silicon Transistors

# 2SA1825/2SC4729

## 50V/8A Switching Applications

## Applications

· Relay drivers, high-speed inverters, converters, and other general high-current switching applications.

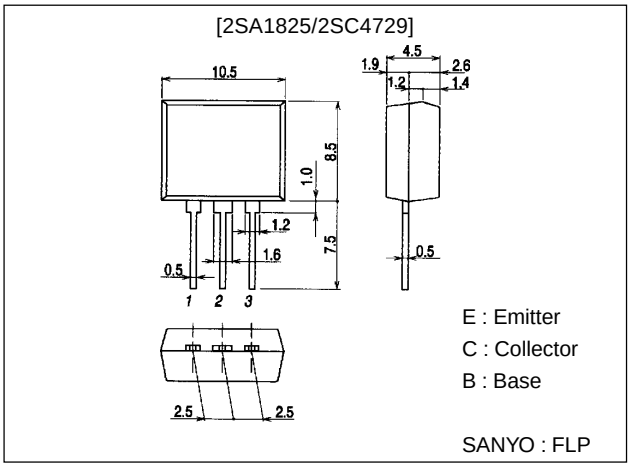
## Features

· Low collector-to-emitter saturation voltage.
· High Gain-Bandwidth Product.
· Excellent linearity of DC Current Gain.
· Fast switching speed.

## Package Dimensions

unit:mm

2084




( ) : 2SA1825

## 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 | $V_{EBO}$ | | (–)6 | V |
| Collector Current | $I_C$ | | (–)8 | A |
| Collector Current (Pulse) | $I_{CP}$ | | (–)12 | A |
| Base Current | $I_B$ | | (–)2 | A |
| Collector Dissipation | $P_C$ | | 1.5 | 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 | $I_{CBO}$ | $V_{CB}$=(–)40V, $I_E$=0 | | | (–)1 | μA |
| Emitter Cutoff Current | $I_{EBO}$ | $V_{EB}$=(–)4V, $I_C$=0 | | | (–)1 | μA |
| DC Current Gain | $h_{FE}1$ | $V_{CE}$=(–)2V, $I_C$=(–)0.5A | 100* | | 400* | |
| | $h_{FE}2$ | $V_{CE}$=(–)2V, $I_C$=(–)6A | 35 | | | |
| Gain-Bandwidth Product | $f_T$ | $V_{CE}$=(–)5V, $I_C$=(–)1A | | (130) | | MHz |
| | | | | 180 | | MHz |
| Output Capacitance | $C_{ob}$ | $V_{CB}$=(–)10V, f=1MHz | | (95)65 | | pF |

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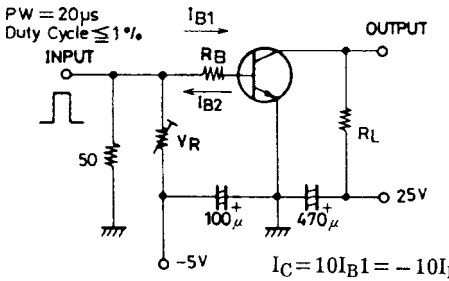
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C$=(–)4A, $I_B$=(–)0.2A | | (–250) | (–500) | mV |
| | | | | 200 | 400 | mV |
| Base-to-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C$=(–)4mA, $I_B$=(–)0.2A | | (–)0.95 | (–)1.3 | V |
| 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 Voltage | $V_{(BR)EBO}$ | $I_E$=(–)10μA, $I_C$=0 | (–)6 | | | V |
| Turn-ON Time | $t_{on}$ | See specified Test Circuit | | 50 | | ns |
| Storage Time | $t_{stg}$ | See specified Test CIrcuit | | (450) | | ns |
| | | | | 500 | | ns |
| Fall Time | $t_f$ | See specified Test Circuit | | 20 | | ns |

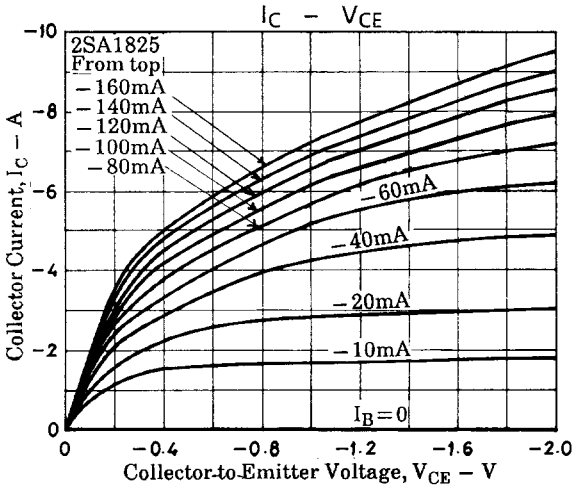
* ; 2SA1825/2SC4729 are classified by 500mA $h_{FE}$ as follows :

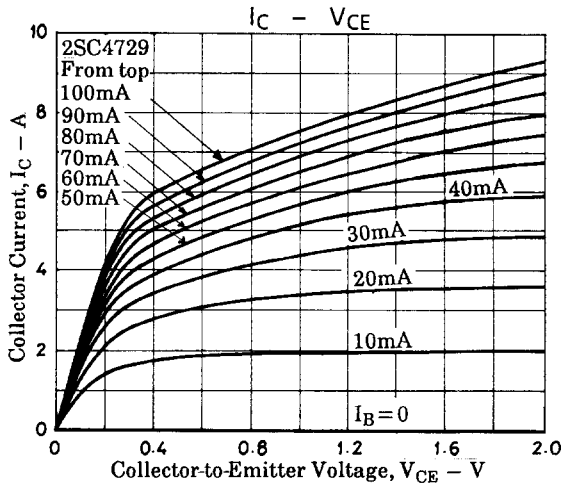
| | | |
|---|---|---|
| 100 R 200 | 140 S 280 | 200 T 400 |

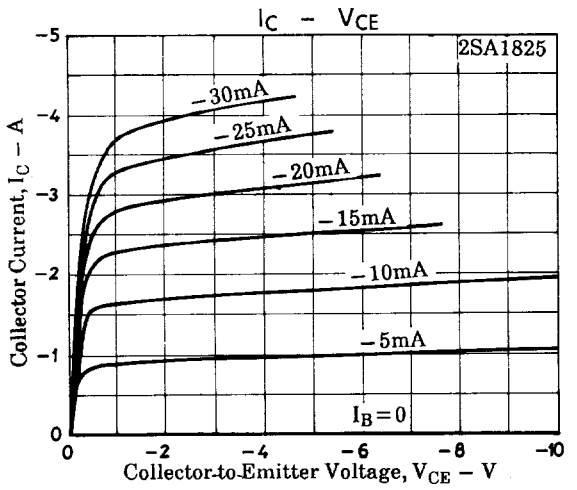
## Switching Time Test Circuit

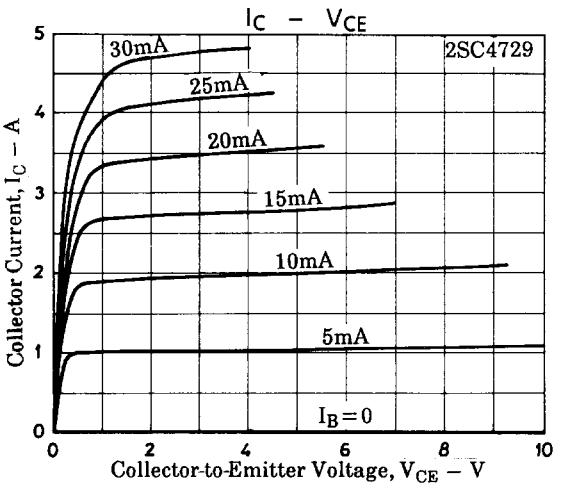


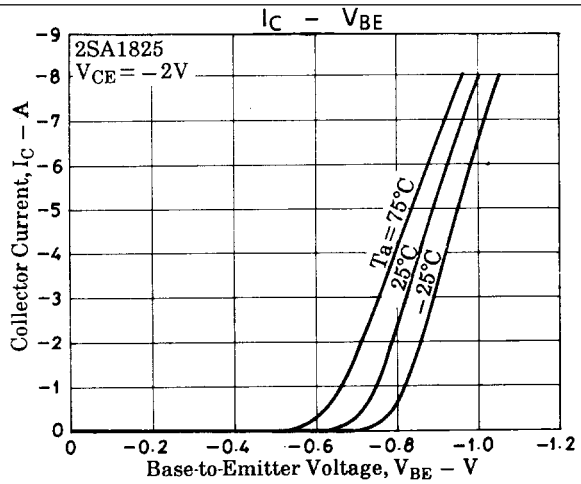

$I_C = 10I_B1 = -10I_B2 = 4A$
(For PNP, the polarity is reversed).
Unit (resistance : Ω, capacitance : F)

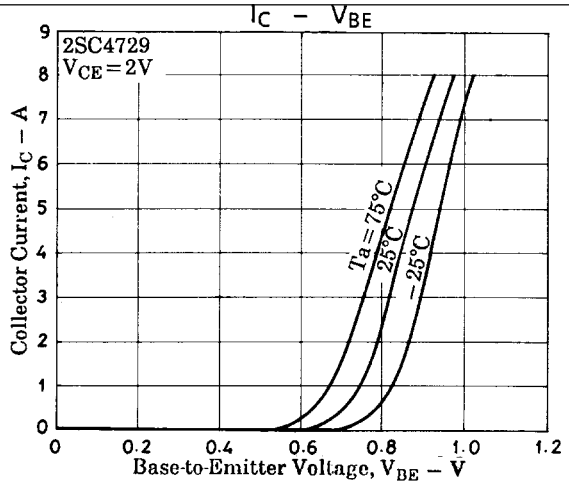


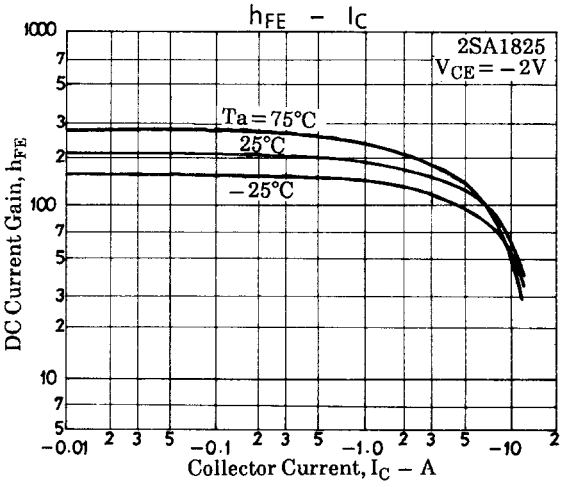



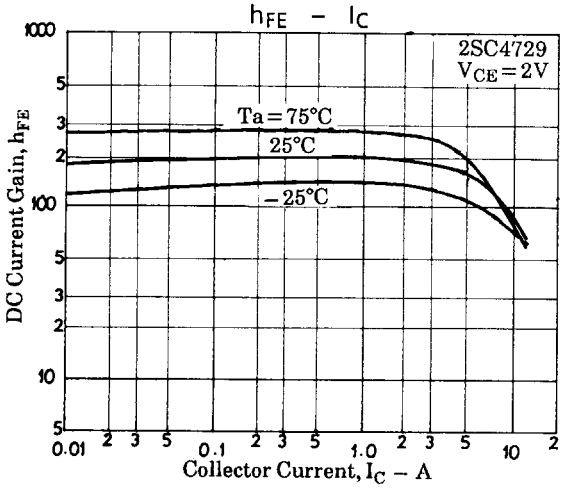



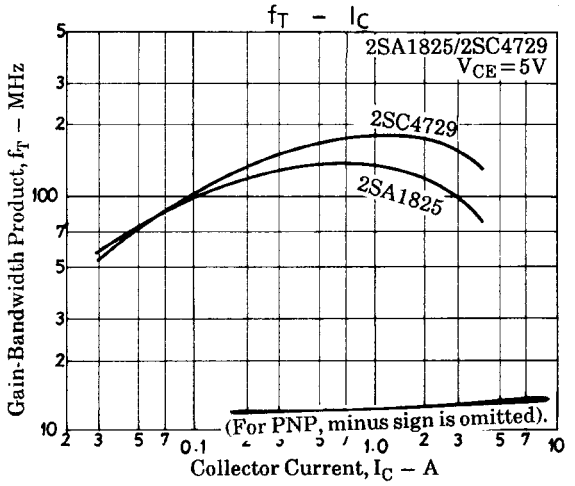



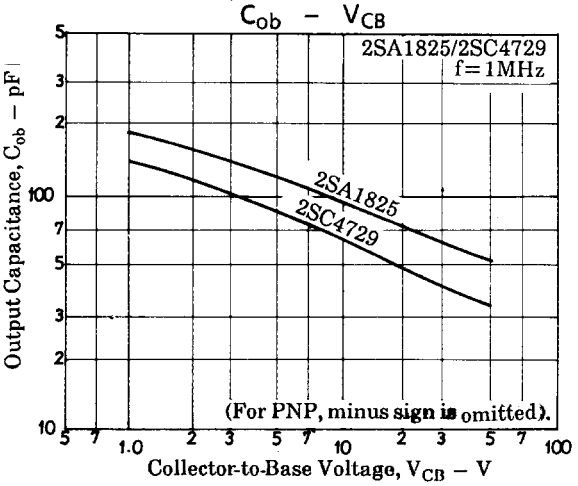

IC – VBE
2SA1825
VCE = –2V
Ta = 75°C
25°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V

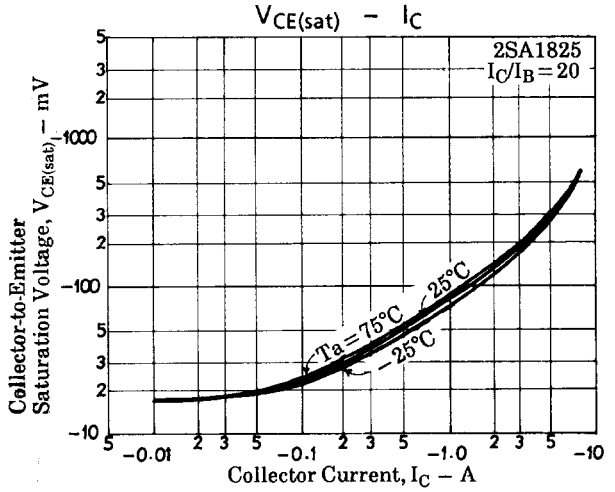

IC – VBE
2SC4729
VCE = 2V
Ta = 75°C
25°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V

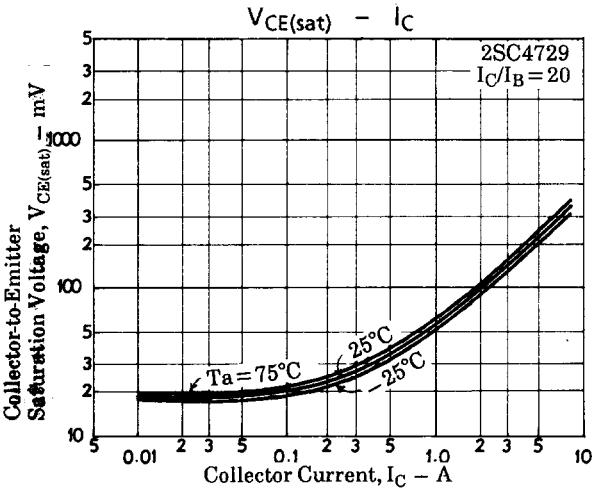

hFE – IC
2SA1825
VCE = –2V
Ta = 75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A


hFE – IC
2SC4729
VCE = 2V
Ta = 75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A


fT – IC
2SA1825/2SC4729
VCE = 5V
2SC4729
2SA1825
(For PNP, minus sign is omitted).
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A


Cob – VCB
2SA1825/2SC4729
f = 1MHz
2SA1825
2SC4729
(For PNP, minus sign is omitted).
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V


VCE(sat) – IC
2SA1825
IC/IB = 20
Ta = 75°C
25°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A


VCE(sat) – IC
2SC4729
IC/IB = 20
Ta = 75°C
25°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A