Ordering number: EN3716

SANYO

No.3716

# 2SB1511/2SD2285

PNP/NPN Epitaxial Planar Silicon Transistors

## High-Current Switching Applications

**Applications**

· Relay drivers, high-speed inverters, converters.

**Features**

· Low collector-to-emitter saturation voltage : $V_{CE}(sat) = -0.5V$(PNP), 0.4V(NPN) max.
· Large current capacity.
· Micaless package facilitating easy mounting.

( ) : 2SB1511

**Absolute Maximum Ratings** at Ta = 25°C

| | | | | unit |
|---|---|---|---|---|
| Collector-to-Base Voltage | $V_{CBO}$ | | (−)60 | V |
| Collector-to-Emitter Voltage | $V_{CEO}$ | | (−)30 | V |
| Emitter-to-Base Voltage | $V_{EBO}$ | | (−)6 | V |
| Collector Current | $I_C$ | | (−)20 | A |
| Peak Collector Current | $i_{cp}$ | | (−)40 | A |
| Collector Dissipation | $P_C$ | | 3.0 | W |
| | | Tc = 25°C | 40 | W |
| Junction Temperature | Tj | | 150 | °C |
| Storage Temperature | Tstg | | −55 to +150 | °C |

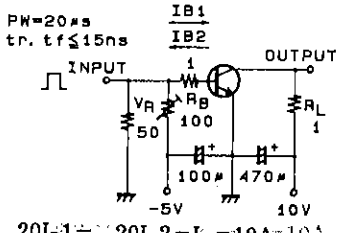
**Electrical Characteristics** at Ta = 25°C

| | | | min | typ | max | unit |
|---|---|---|---|---|---|---|
| Collector Cutoff Current | $I_{CBO}$ | $V_{CB}=(-)40V, I_E=0$ | | | (−)0.1 | mA |
| Emitter Cutoff Current | $I_{EBO}$ | $V_{EB}=(-)4V, I_C=0$ | | | (−)0.1 | mA |
| DC Current Gain | $h_{FE}(1)$ | $V_{CE}=(-)2V, I_C=(-)1A$ | 70※ | | 280※ | |
| | $h_{FE}(2)$ | $V_{CE}=(-)2V, I_C=(-)10A$ | 30 | | | |
| C-E Saturation Voltage | $V_{CE}(sat)$ | $I_C=(-)8A, I_B=(-)0.4A$ | | (−0.25) | (−0.5) | V |
| | | | | 0.2 | 0.4 | |
| Gain-Bandwidth Product | $f_T$ | $V_{CE}=(-)5V, I_C=(-)1A$ | | 120 | | MHz |
| C-B Breakdown Voltage | $V_{(BR)CBO}$ | $I_C=(-)1mA, I_E=0$ | (−)60 | | | V |
| C-E Breakdown Voltage | $V_{(BR)CEO}$ | $I_C=(-)1mA, R_{BE}=\infty$ | (−)30 | | | V |
| E-B Breakdown Voltage | $V_{(BR)EBO}$ | $I_E=(-)1mA, I_C=0$ | (−)6 | | | V |
| Turn-ON Time | $t_{on}$ | See specified Test Circuit. | | 300 | | ns |
| Storage Time | $t_{stg}$ | 〃 | | (300)600 | | ns |
| Fall Time | $t_f$ | 〃 | | 20 | | ns |

※ : The 2SB1511/2SD2285 are classified by 1A $h_{FE}$ as follows.

| | | |
|---|---|---|
| 70 Q 140 | 100 R 200 | 140 S 280 |

**Switching Time Test Circuit**



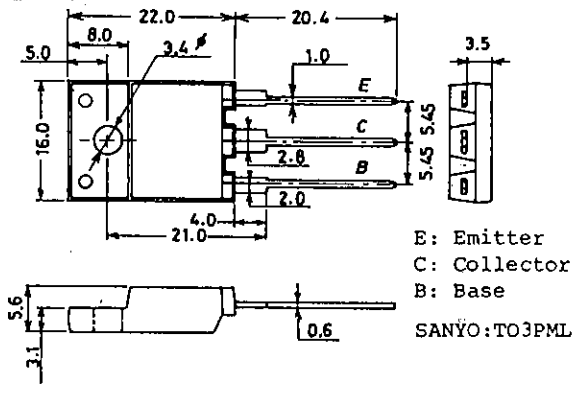

$20I_{B1} = -20I_{B2} = I_C = 10A$

(For PNP, the polarity is reversed.)

Unit (resistance : Ω, capacitance : F)

**Package Dimensions** 2039A

(unit : mm)




E: Emitter
C: Collector
B: Base

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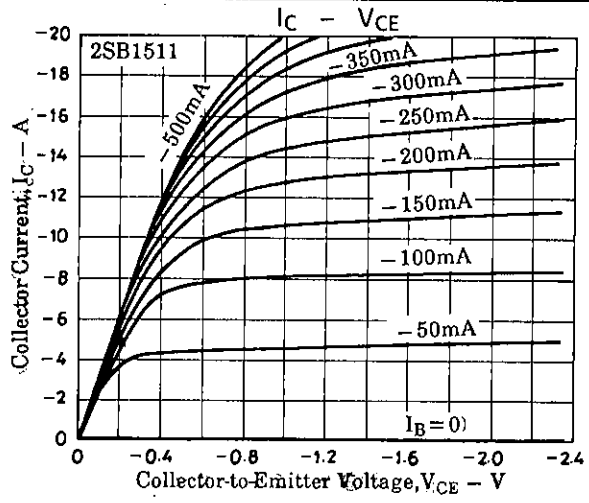
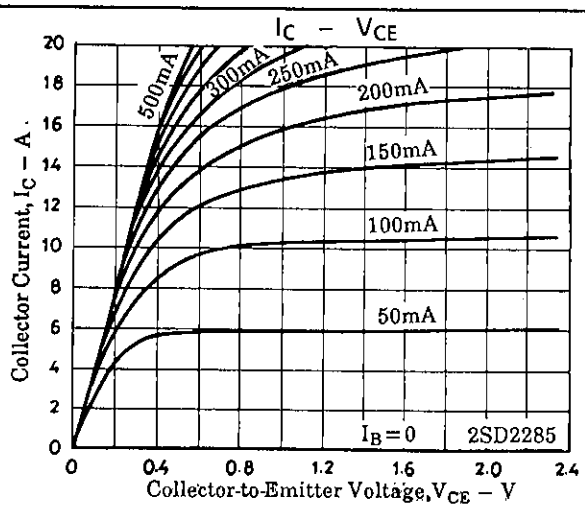
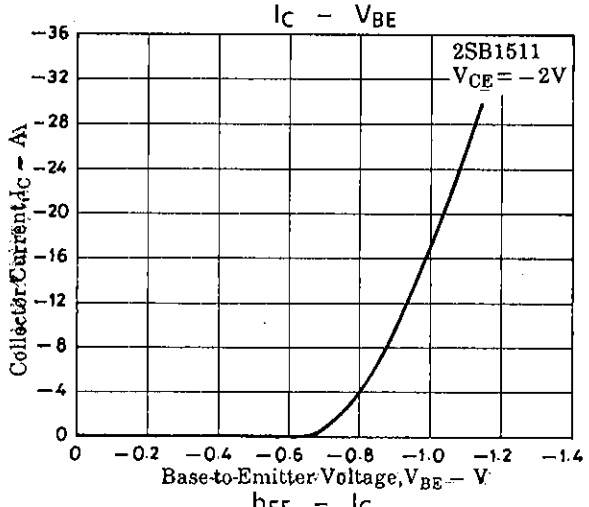
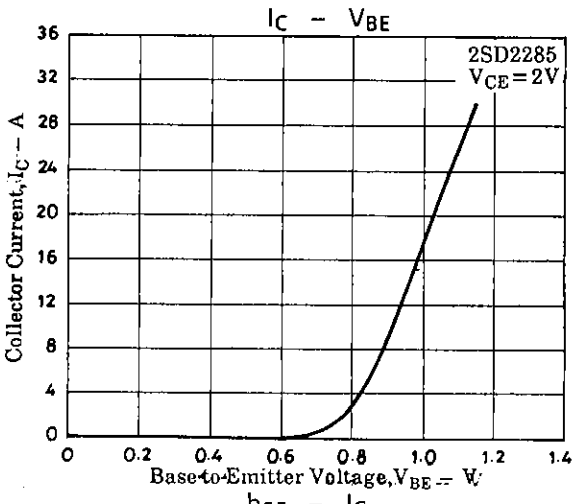
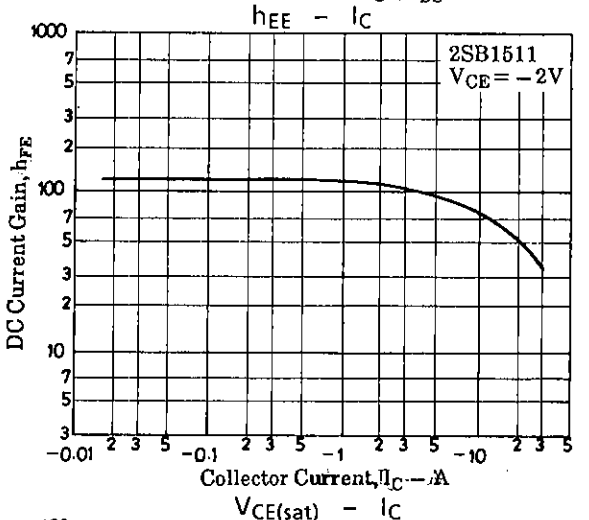
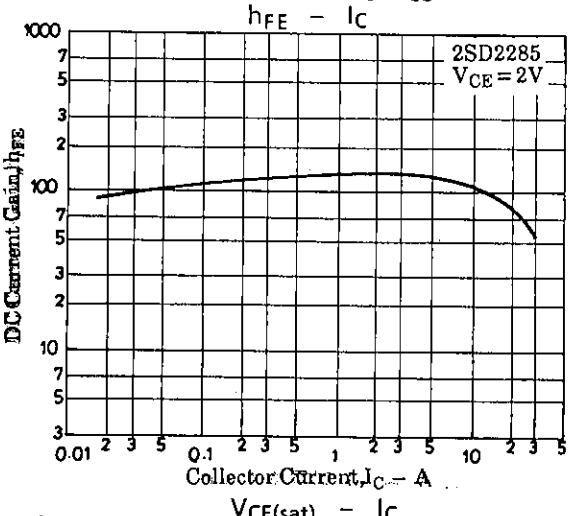

$I_C$ – $V_{CE}$
2SB1511
–350mA
–300mA
–250mA
–200mA
–150mA
–100mA
–50mA
–500mA
$I_B$=0
Collector Current, $I_C$ – A
Collector-to-Emitter Voltage, $V_{CE}$ – V

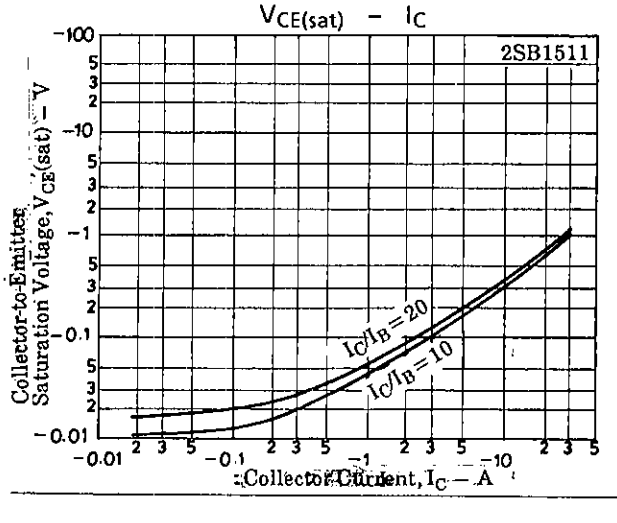

$I_C$ – $V_{CE}$
500mA
300mA
250mA
200mA
150mA
100mA
50mA
$I_B$=0
2SD2285
Collector Current, $I_C$ – A
Collector-to-Emitter Voltage, $V_{CE}$ – V

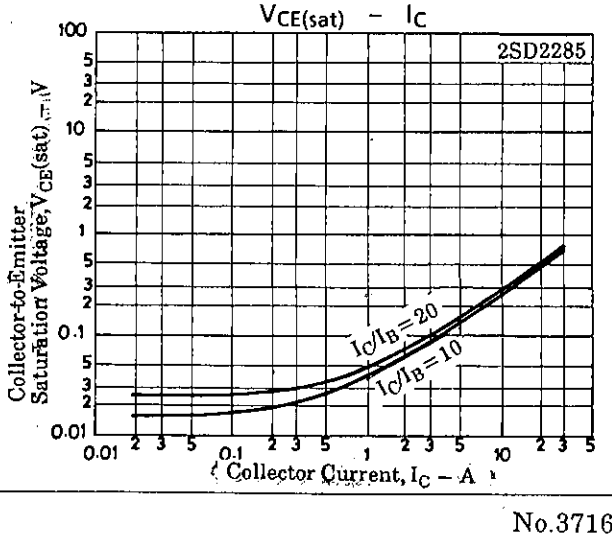

$I_C$ – $V_{BE}$
2SB1511
$V_{CE}$=–2V
Collector Current, $I_C$ – A
Base-to-Emitter Voltage, $V_{BE}$ – V


$I_C$ – $V_{BE}$
2SD2285
$V_{CE}$=2V
Collector Current, $I_C$ – A
Base-to-Emitter Voltage, $V_{BE}$ – V


$h_{EE}$ – $I_C$
2SB1511
$V_{CE}$=–2V
DC Current Gain, $h_{FE}$
Collector Current, $I_C$ – A


$h_{FE}$ – $I_C$
2SD2285
$V_{CE}$=2V
DC Current Gain, $h_{FE}$
Collector Current, $I_C$ – A


$V_{CE(sat)}$ – $I_C$
2SB1511
$I_C/I_B$=20
$I_C/I_B$=10
Collector-to-Emitter Saturation Voltage, $V_{CE(sat)}$ – V
Collector Current, $I_C$ – A


$V_{CE(sat)}$ – $I_C$
2SD2285
$I_C/I_B$=20
$I_C/I_B$=10
Collector-to-Emitter Saturation Voltage, $V_{CE(sat)}$ – V
Collector Current, $I_C$ – A