Ordering number : ENN6662

PNP / NPN Epitaxial Planar Silicon Transistors

# 2SB633P / 2SD613P

## 85V / 6A, AF 35 to 45W Output Applications

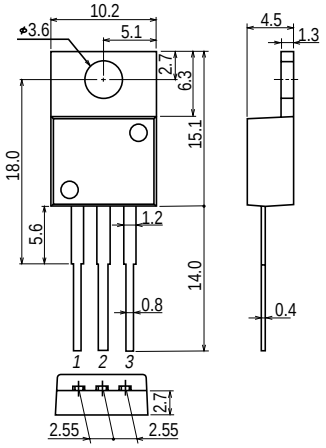
### Features

- High breakdown voltage, $V_{CEO}$ 85V, high current 6A.
- AF 35 to 45W output.

### Package Dimensions

unit : mm
2010C

[2SB633P / 2SD613P]




1 : Base
2 : Collector
3 : Emitter

SANYO : TO-220

### Specifications

( ) : 2SB633P

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

| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---|---|---|---|
| Collector-to-Base Voltage | $V_{CBO}$ | | (–)100 | V |
| Collector-to-Emitter Voltage | $V_{CEO}$ | | (–)85 | V |
| Emitter-to-Base Voltage | $V_{EBO}$ | | (–)6 | V |
| Collector Current | $I_C$ | | (–)6 | A |
| Collector Current (Pulse) | $I_{CP}$ | | (–)10 | A |
| Collector Dissipation | $P_C$ | Tc=25°C | 60 | 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 | | | (-)0.1 | mA |
| Emitter Cutoff Current | $I_{EBO}$ | $V_{EB}$=(-)4V, $I_C$=0 | | | (-)0.1 | mA |

Continued on next page.

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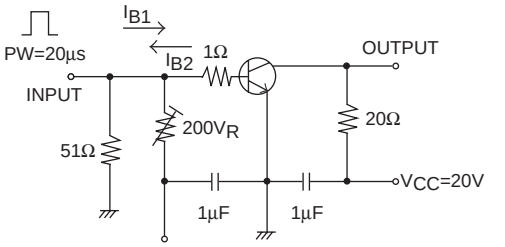
Continued from preceding page.

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| DC Current Gain | $h_{FE}1$ | $V_{CE}$=(–)5V, $I_C$=(–)1A | 40* | | 320* | |
| | $h_{FE}2$ | $V_{CE}$=(–)5V, $I_C$=(–)3A | 20 | | | |
| Gain-Bandwidth Product | $f_T$ | $V_{CE}$=(–)5V, $I_C$=(–)1A | | 15 | | MHz |
| Output Capacitance | Cob | $V_{CB}$=(–)10V, f=1MHz | | (150)110 | | pF |
| Collector-to-Emitter Saturation Voltage | $V_{CE}$(sat) | $I_C$=(–)4A, $I_B$=(–)0.4A | | | (–)2.0 | V |
| Base-to-Emitter Voltage | $V_{BE}$ | $V_{CE}$=(–)5V, $I_C$=(–)1A | | | (–)1.5 | V |
| Collector-to-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C$=(–)5mA, $I_E$=0 | (–)100 | | | V |
| Collector-to-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C$=(–)5mA, $R_{BE}$=∞ | (–)85 | | | V |
| | | $I_C$=(–)50mA, $R_{BE}$=∞ | (–)85 | | | V |
| Emitter-to-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E$=(–)5mA, $I_C$=0 | (–)6 | | | V |
| Turn-ON Time | $t_{on}$ | See specified test circuit. | | (0.16)0.28 | | μs |
| Fall Time | $t_f$ | See specified test circuit. | | (0.33)0.50 | | μs |
| Storage Time | $t_{stg}$ | See specified test circuit. | | (1.45)3.60 | | μs |

* : The 2SB633P / 2SD613P are classified by 1A $h_{FE}$ as follows :

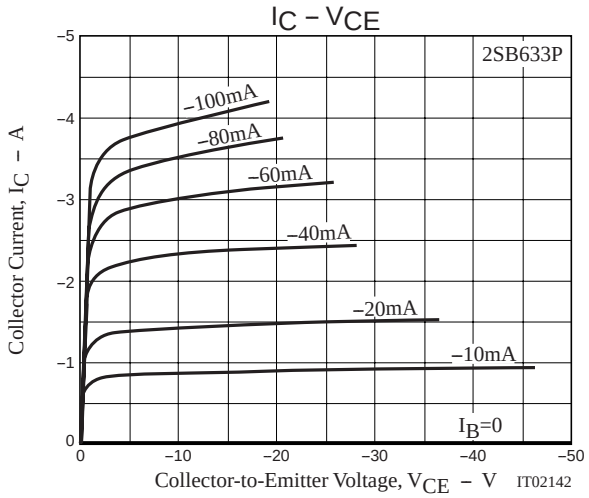
| Rank | D | E | F |
|---|---|---|---|
| $h_{FE}$ | 60 to 120 | 100 to 200 | 160 to 320 |

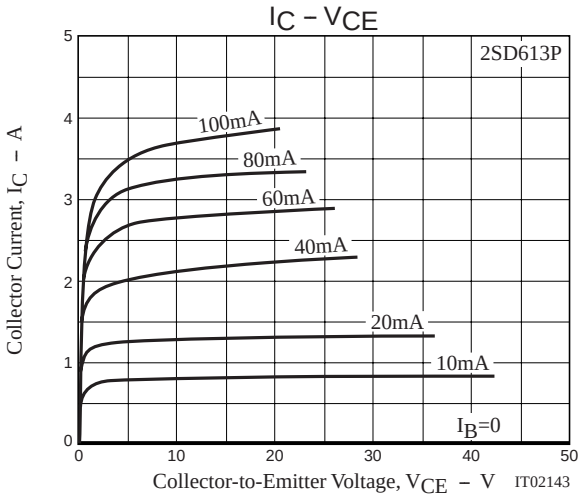
## Swicthing Time Test Circuit

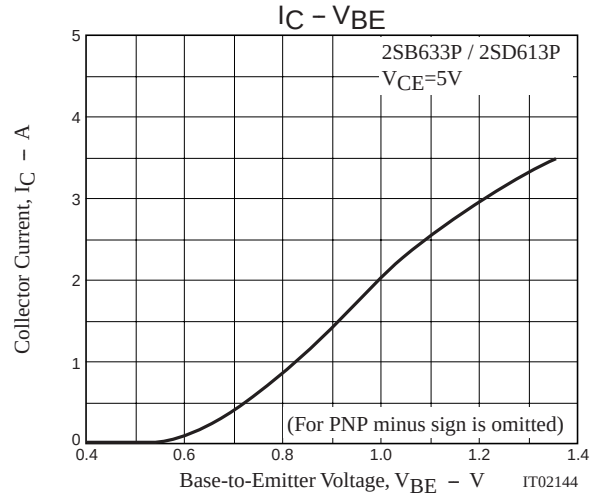


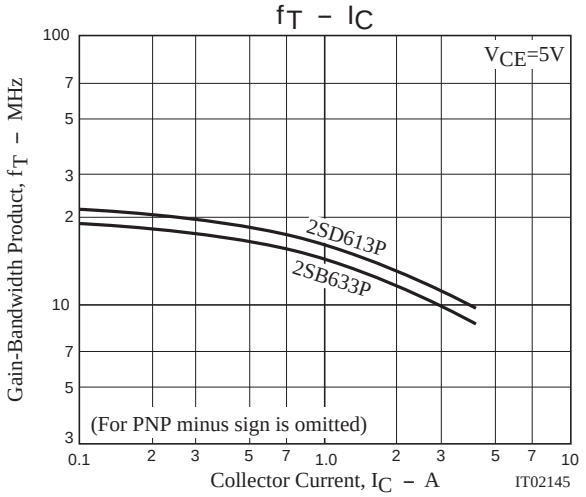

$V_{BE}$= –2V  $10I_{B1}$= –$10I_{B2}$=$I_C$=1A

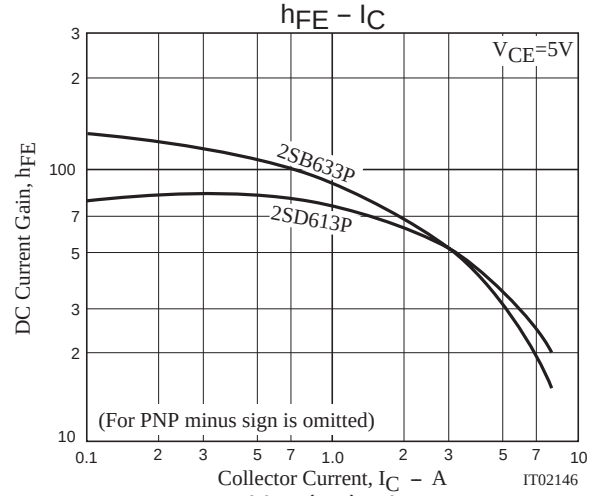
For PNP, the polarity is reversed.

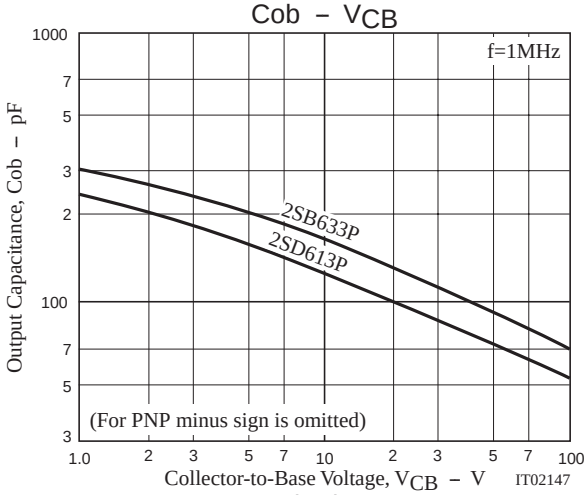


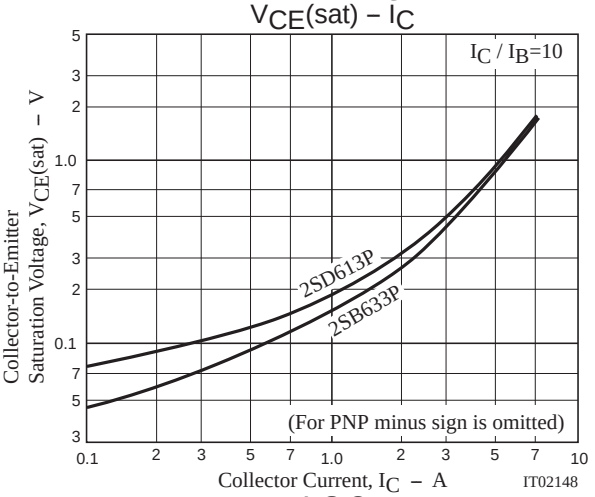



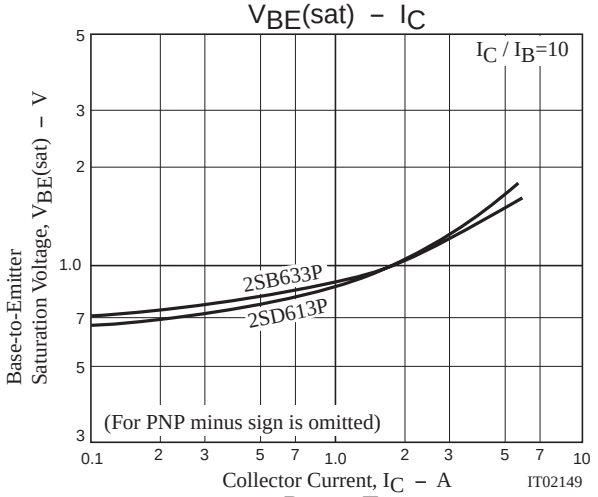

IC – VBE
2SB633P / 2SD613P
VCE=5V
(For PNP minus sign is omitted)
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT02144

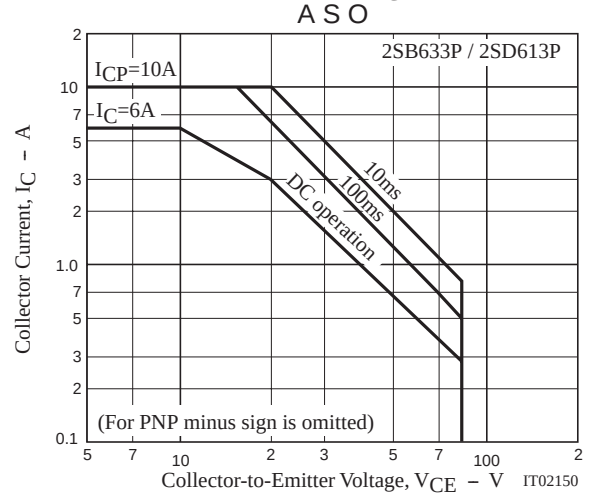

fT – IC
VCE=5V
2SD613P
2SB633P
(For PNP minus sign is omitted)
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT02145

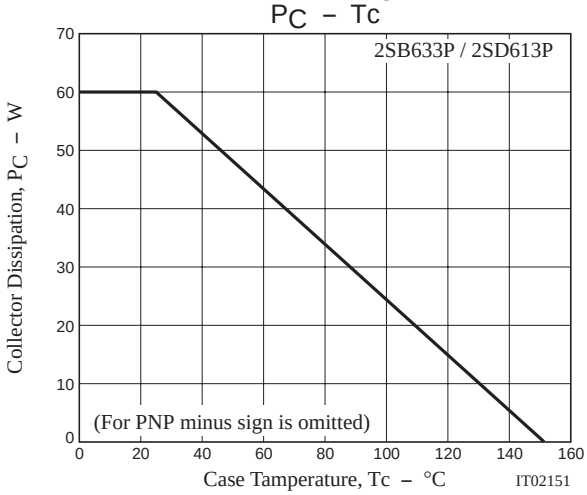

hFE – IC
VCE=5V
2SB633P
2SD613P
(For PNP minus sign is omitted)
DC Current Gain, hFE
Collector Current, IC – A
IT02146


Cob – VCB
f=1MHz
2SB633P
2SD613P
(For PNP minus sign is omitted)
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT02147


VCE(sat) – IC
IC / IB=10
2SD613P
2SB633P
(For PNP minus sign is omitted)
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT02148


VBE(sat) – IC
IC / IB=10
2SB633P
2SD613P
(For PNP minus sign is omitted)
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT02149


A S O
2SB633P / 2SD613P
ICP=10A
IC=6A
10ms
100ms
DC operation
(For PNP minus sign is omitted)
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT02150


PC – Tc
2SB633P / 2SD613P
(For PNP minus sign is omitted)
Collector Dissipation, PC – W
Case Tamperature, Tc – °C
IT02151

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