Ordering number:EN1058D

PNP/NPN Epitaxial Planar Silicon Darlington Transistors

# 2SA1258/2SC3144

## 60V/3A for High-Speed Drivers Applications

## Features

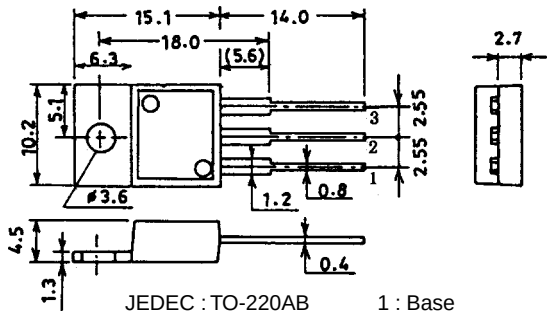
- High $f_T$.
- High switching speed.
- Wide ASO.

## Package Dimensions

unit:mm

2010C

[2SA1258/2SC3144]




JEDEC : TO-220AB
EIAJ : SC-46

1 : Base
2 : Collector
3 : Emitter

( ) : 2SA1258

## Specifications

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

| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---|---|---|---|
| Collector-to-Base Voltage | $V_{CBO}$ | | (–)70 | V |
| Collector-to-Emitter Voltage | $V_{CEO}$ | | (–)60 | V |
| Emitter-to-Base Voltage | $V_{EBO}$ | | (–)5 | V |
| Collector Current | $I_C$ | | (–)3 | A |
| Collector Current (Pulse) | $I_{CP}$ | | (–)5 | A |
| Collector Dissipation | $P_C$ | | 1.75 | W |
| | | Tc=25˚C | 20 | W |
| Junction Temperature | Tj | | 125 | ˚C |
| Storage Temperature | Tstg | | –55 to +125 | ˚C |

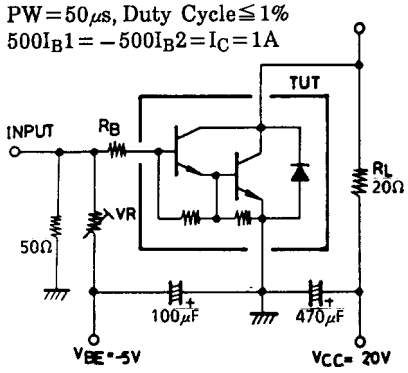
### Electrical Characteristics at Ta = 25˚C

| 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 | $I_{EBO}$ | $V_{EB}$=(–)5V, $I_C$=0 | | | (–)3 | mA |
| DC Current Gain | $h_{FE}$ | $V_{CE}$=(–)2V, $I_C$=(–)1.5A | 2000 | 5000 | | |
| Gain-Bandwidth Product | $f_T$ | $V_{CE}$=(–)5V, $I_C$=(–)1.5A | | 200 | | MHz |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C$=(–)1.5A, $I_B$=(–)3mA | | (–1.0) 0.9 | (–)1.5 | V |
| Base-to-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C$=(–)1.5A, $I_B$=(–)3mA | | | (–)2.0 | V |
| Collector-to-Base Saturation Voltage | $V_{(BR)CBO}$ | $I_C$=(–)5mA, $I_E$=0 | (–)70 | | | V |
| Collector-to-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C$=(–)50mA, $R_{BE}$=∞ | (–)60 | | | V |
| Rise Time | $t_{on}$ | See specified Test Circuit | | 0.3 | | µs |
| Storage Time | $t_{stg}$ | See specified Test Circuit | | (1.3) 1.2 | | µs |
| Fall Time | $t_f$ | See specified Test Circuit | | 0.2 | | µs |

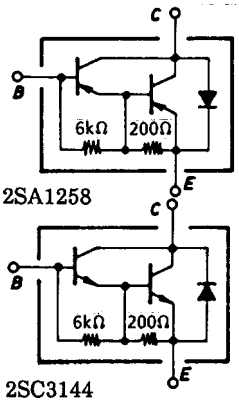

SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

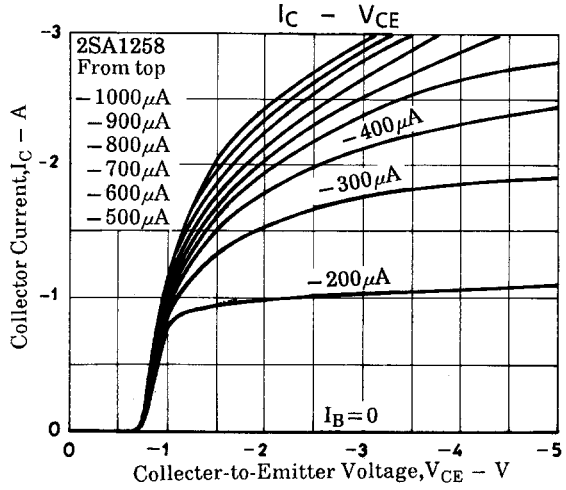
**Specified Test Circuit** (for PNP, the polarity is reversed)

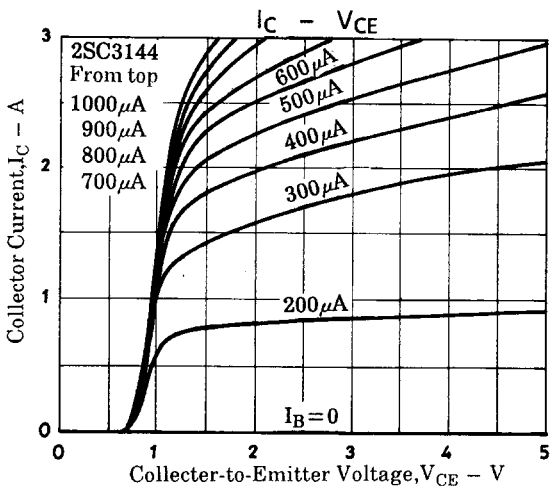
PW=50μs, Duty Cycle≦1%
500$I_B1$ = −500$I_B2$ = $I_C$ = 1A

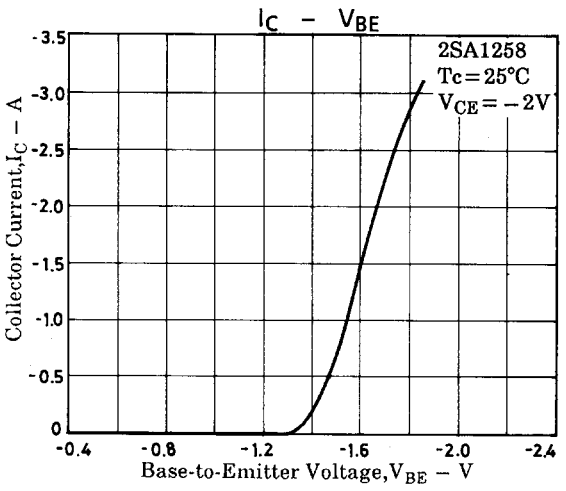


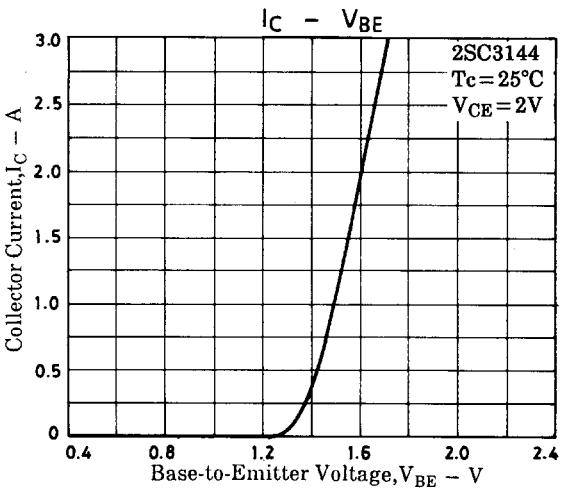

**Electrical Connection**

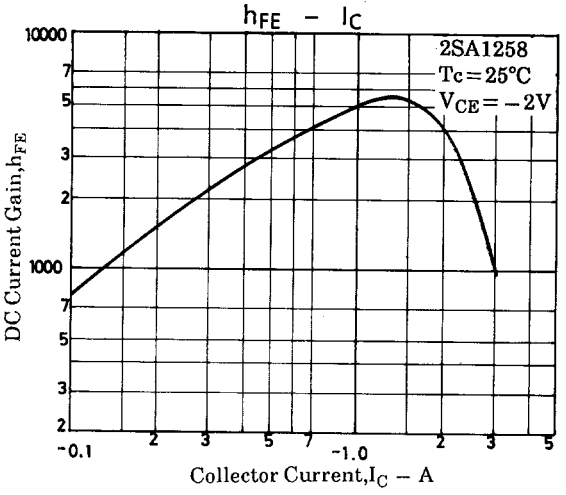


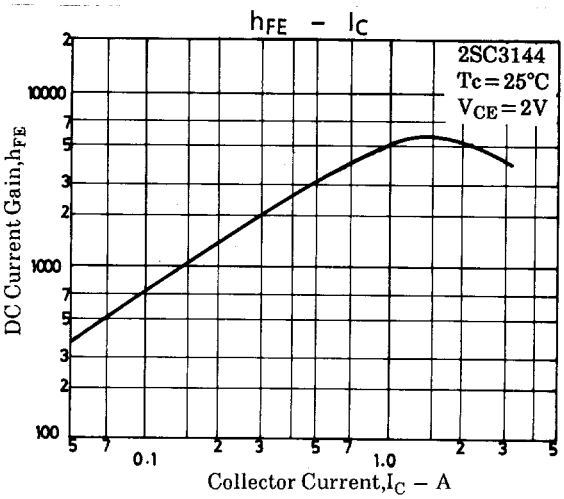



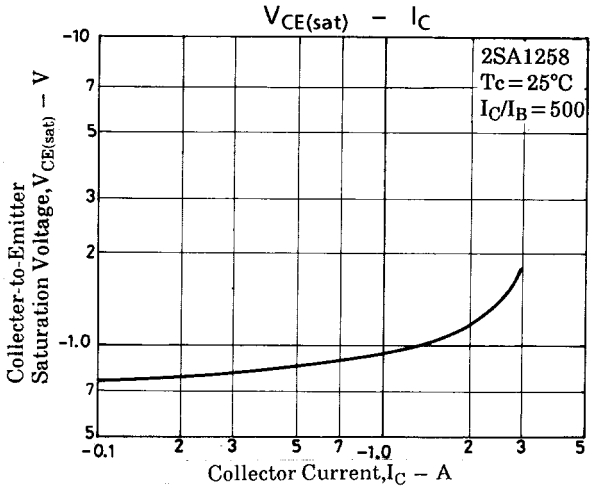



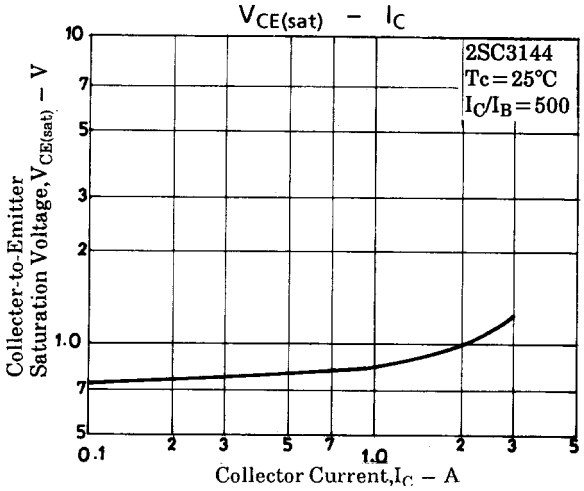



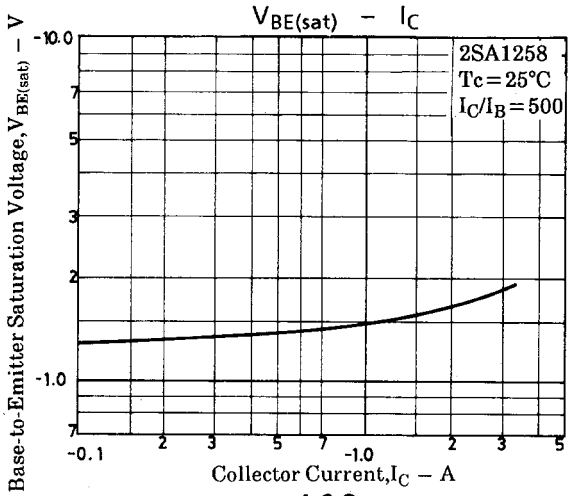



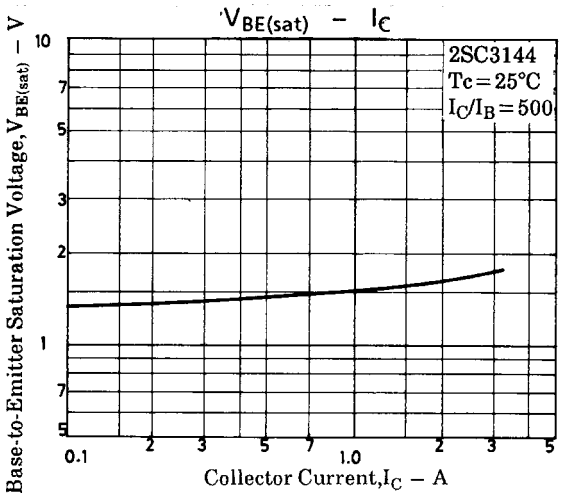



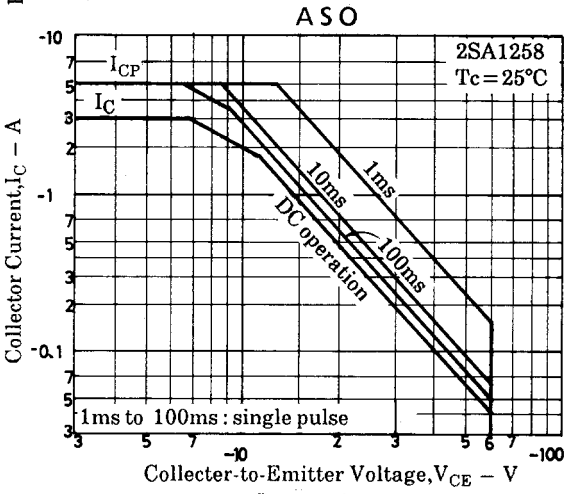



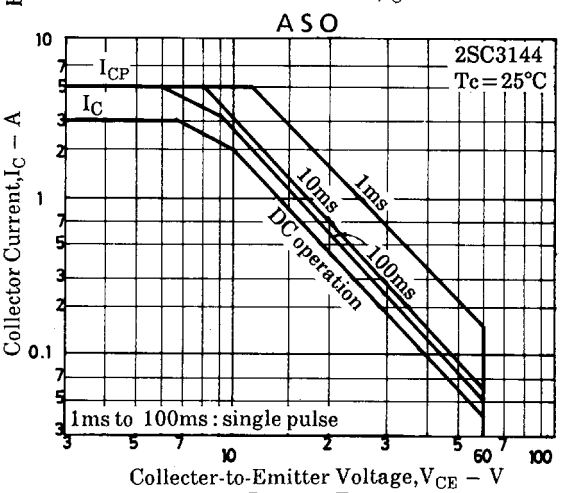

$V_{CE(sat)}$ – $I_C$
2SA1258
Tc=25°C
$I_C/I_B$=500
Collecter-to-Emitter Saturation Voltage, $V_{CE(sat)}$ – V
Collector Current, $I_C$ – A

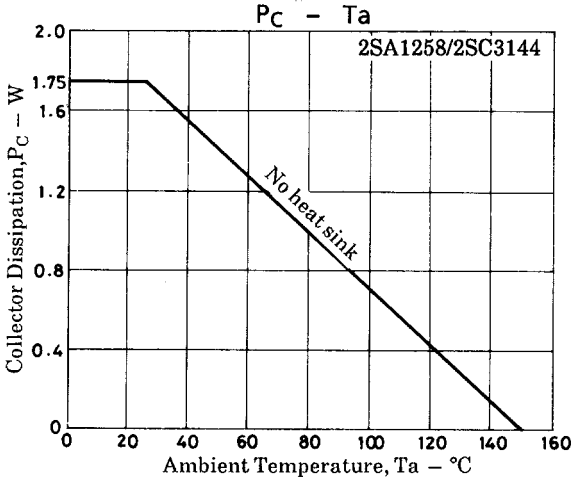

$V_{CE(sat)}$ – $I_C$
2SC3144
Tc=25°C
$I_C/I_B$=500
Collecter-to-Emitter Saturation Voltage, $V_{CE(sat)}$ – V
Collector Current, $I_C$ – A


$V_{BE(sat)}$ – $I_C$
2SA1258
Tc=25°C
$I_C/I_B$=500
Base-to-Emitter Saturation Voltage, $V_{BE(sat)}$ – V
Collector Current, $I_C$ – A


$V_{BE(sat)}$ – $I_C$
2SC3144
Tc=25°C
$I_C/I_B$=500
Base-to-Emitter Saturation Voltage, $V_{BE(sat)}$ – V
Collector Current, $I_C$ – A


ASO
2SA1258
Tc=25°C
$I_{CP}$
$I_C$
1ms
10ms
100ms
DC operation
1ms to 100ms : single pulse
Collector Current, $I_C$ – A
Collecter-to-Emitter Voltage, $V_{CE}$ – V


ASO
2SC3144
Tc=25°C
$I_{CP}$
$I_C$
1ms
10ms
100ms
DC operation
1ms to 100ms : single pulse
Collector Current, $I_C$ – A
Collecter-to-Emitter Voltage, $V_{CE}$ – V


$P_C$ – Ta
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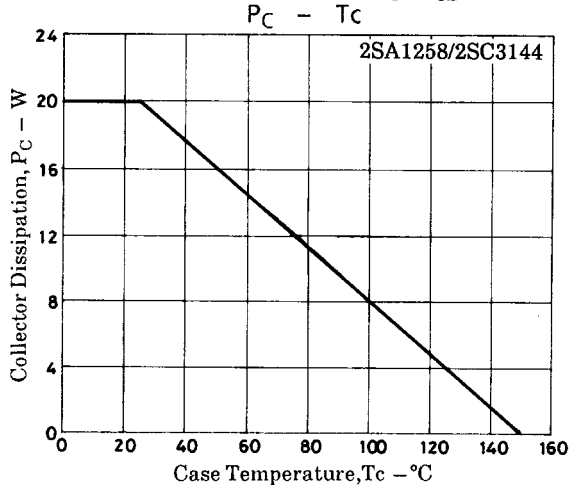
No heat sink
Collector Dissipation, $P_C$ – W
Ambient Temperature, Ta – °C


$P_C$ – Tc
2SA1258/2SC3144
Collector Dissipation, $P_C$ – W
Case Temperature, Tc – °C