Ordering number:ENN1763B

PNP/NPN Epitaxial Planar Silicon Transistors

# 2SA1404/2SC3598

## Ultrahigh-Definition CRT Display Video Output Applications

## Applictions

- Ultrahigh-definition CRT display.
- Video output.
- Color TV chroma output.
- Wide-band amp.

## Features

- High $f_T$ : $f_T$ typ=500MHz.
- High breakdown voltage : $V_{CEO}$≥120V.
- Small reverse transfer capacitance and excellent high-frequency characteristic
  : Cre=1.6pF (NPN), 2.1pF (PNP).
- Complementary pair with the 2SA1404/2SC3598.
- Adoption of FBET process.

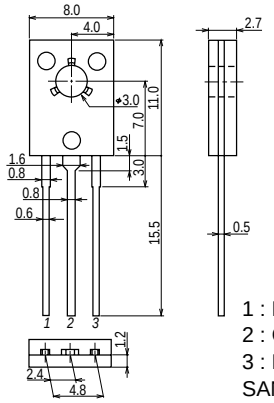
( ) : 2SA1404

## Package Dimensions

unit:mm

2009B

[2SA1404/2SC3598]




1 : Emitter
2 : Collector
3 : Base
SANYO : TO-126

## Specifications

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

| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---|---|---|---|
| Collector-to-Base Voltage | $V_{CBO}$ | | (–)120 | V |
| Collector-to-Emitter Voltage | $V_{CEO}$ | | (–)120 | V |
| Emitter-to-Base Voltage | $V_{EBO}$ | | (–)4 | V |
| Collector Current | $I_C$ | | (–)200 | mA |
| Collector Current (Pulse) | $I_{CP}$ | | (–)400 | mA |
| Collector Dissipation | $P_C$ | | 1.2 | W |
| | | Tc=25˚C | 8 | 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 | $I_{CBO}$ | $V_{CB}$=(–)80V, $I_E$=0 | | | (–)0.1 | μA |
| Emitter Cutoff Current | $I_{EBO}$ | $V_{EB}$=(–)2V, $I_C$=0 | | | (–)0.1 | μA |
| DC Current Gain | $h_{FE}1$ | $V_{CE}$=(–)10V, $I_C$=(–)10mA | 40* | | 320* | |
| | $h_{FE}2$ | $V_{CE}$=(–)10V, $I_C$=(–)150mA | 20 | | | |
| Gain-Bandwidth Product | $f_T$ | $V_{CE}$=(–)10V, $I_C$=(–)50mA | | 500 | | MHz |

* : The 2SA1404/2SC3598 are classified by 10mA $h_{FE}$ as follows :

Continued on next page.

| Rank | C | D | E | F |
|---|---|---|---|---|
| $h_{FE}$ | 40 to 80 | 60 to 120 | 100 to 200 | 160 to 320 |



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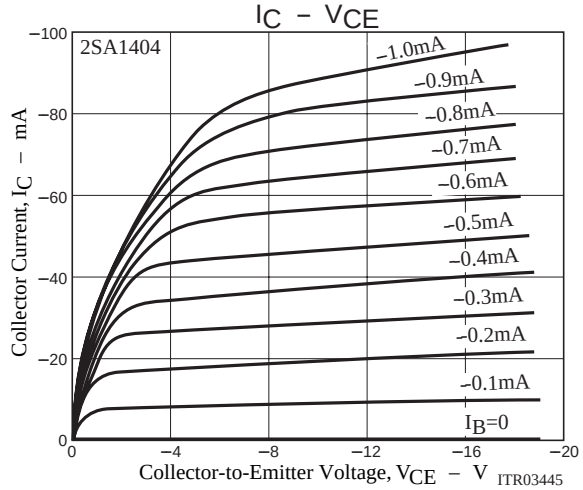
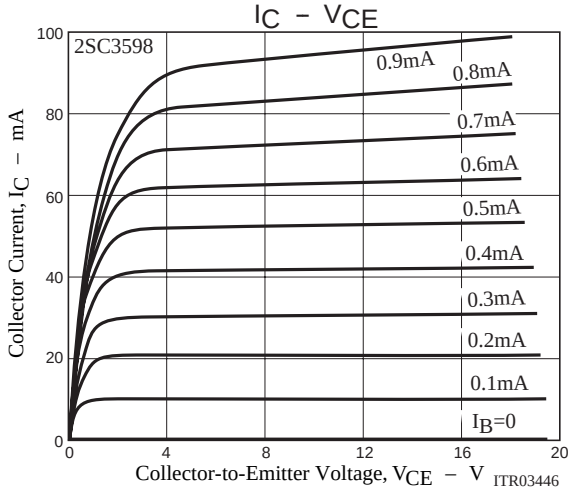
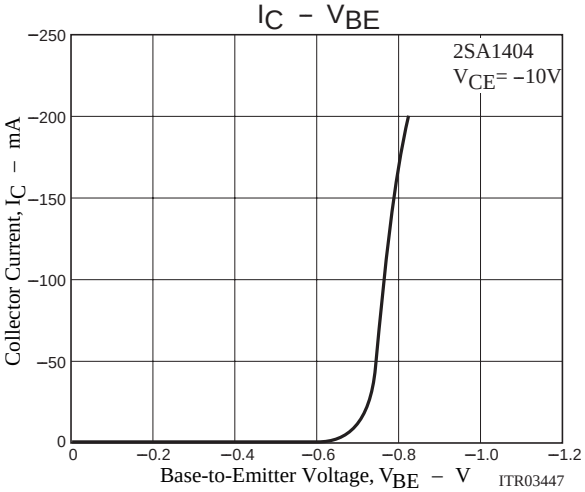
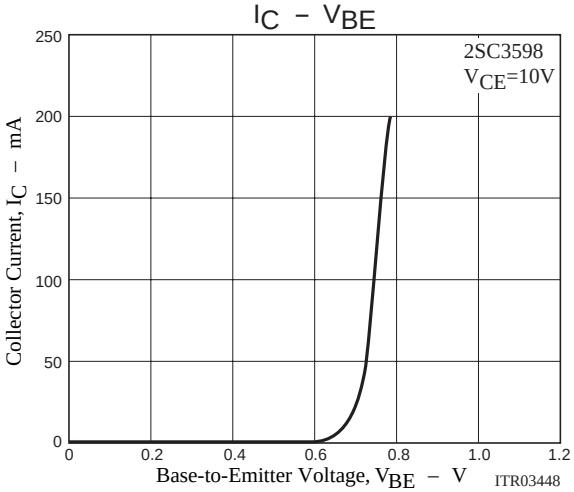
Continued from preceding page.

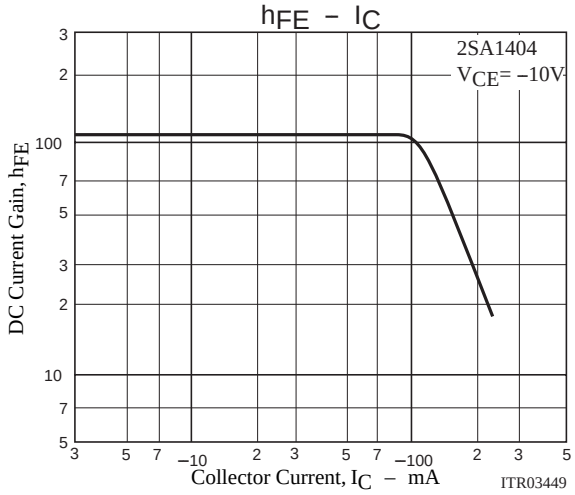
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C$=(–)50mA, $I_B$=(–)5mA | | | 0.6 | V |
| | | | | | (–0.8) | V |
| Base-to-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C$=(–)50mA, $I_B$=(–)5mA | | | (–)1.0 | V |
| Collector-to-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C$=(–)10μA, $I_E$=0 | (–)120 | | | V |
| Collector-to-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C$=(–)1mA, $R_{BE}$=∞ | (–)120 | | | V |
| Emitter-to-Base Breakdown Votage | $V_{(BR)EBO}$ | $I_E$=(–)100μA, $I_C$=0 | (–)4 | | | V |
| Output Capacitance | $C_{ob}$ | $V_{CB}$=(–)30V, f=1MHz | | 2.0 | | pF |
| | | | | (2.7) | | pF |
| Reverse Transfer Capacitance | $C_{re}$ | $V_{CB}$=(–)30V, f=1MHz | | 1.6 | | pF |
| | | | | (2.1) | | pF |

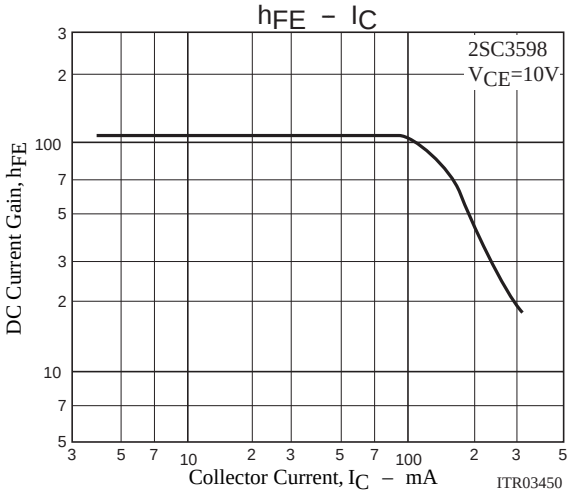


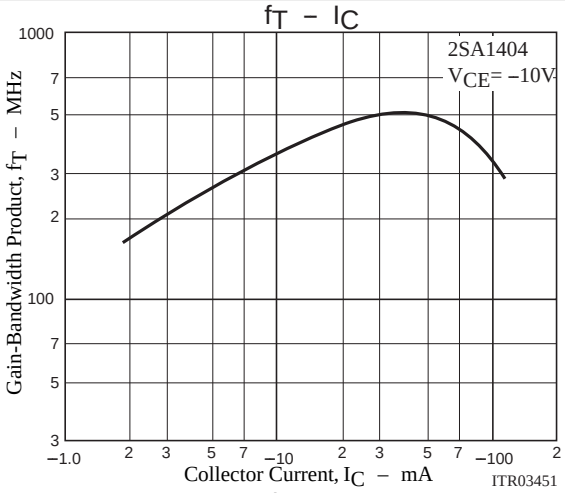



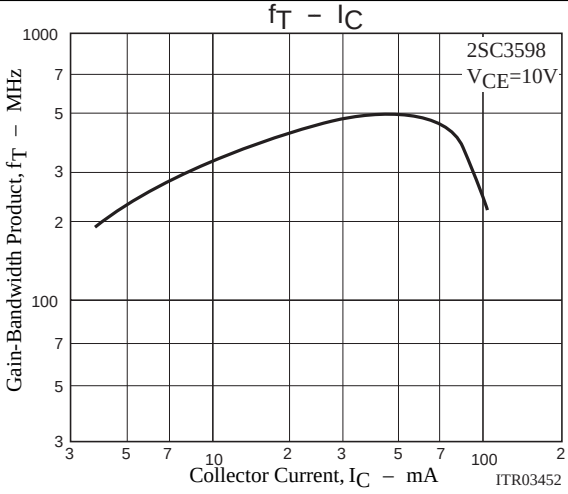



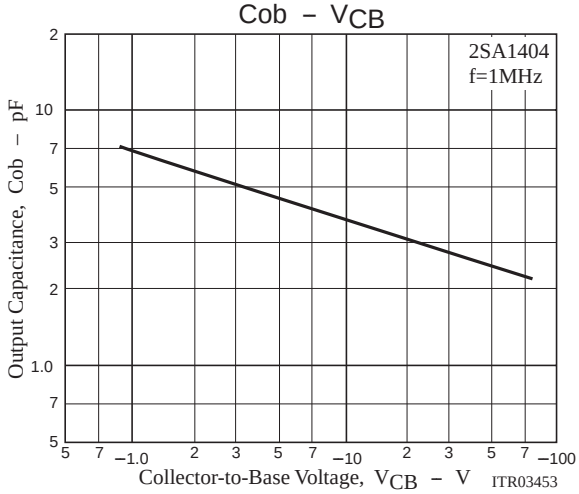



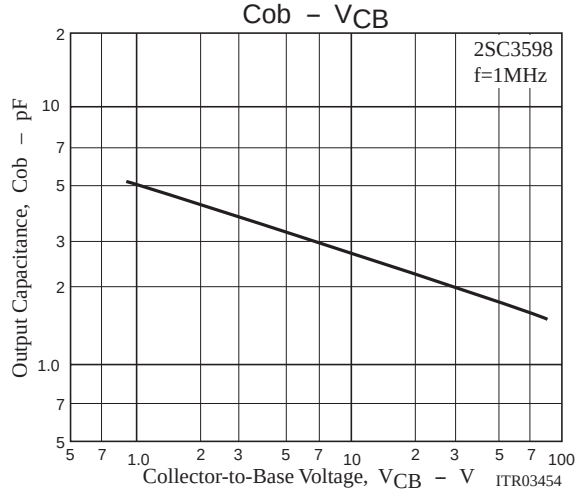



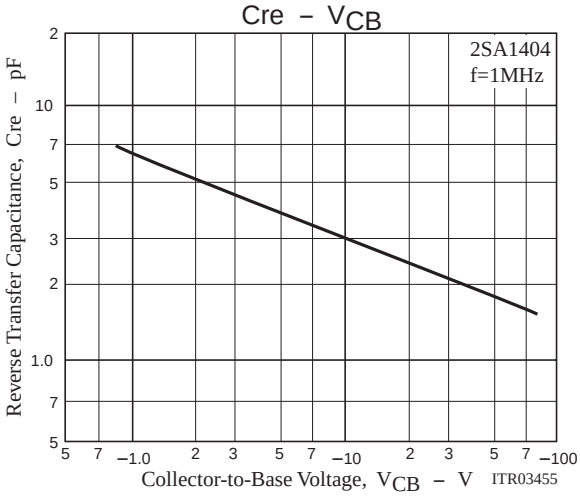



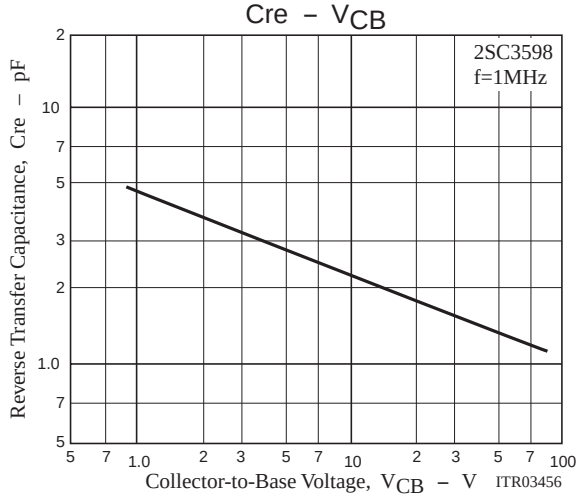

fT – IC
2SA1404
VCE= –10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – mA
ITR03451

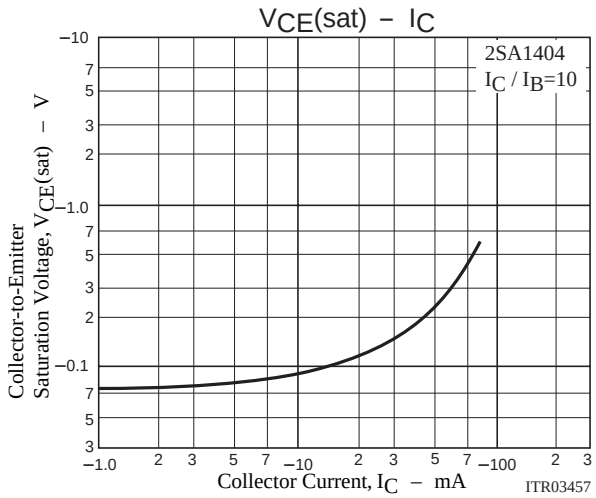

fT – IC
2SC3598
VCE=10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – mA
ITR03452

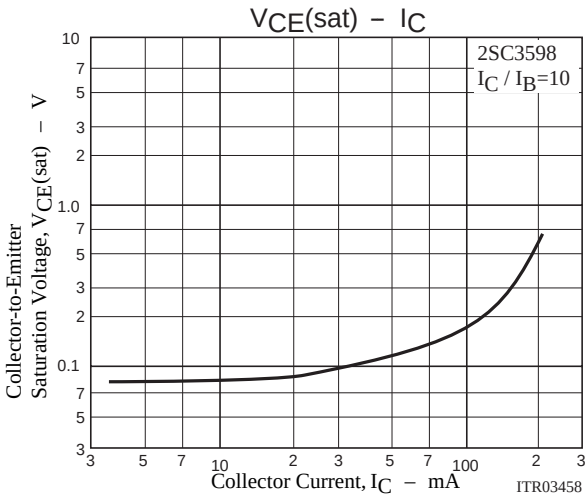

Cob – VCB
2SA1404
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
ITR03453


Cob – VCB
2SC3598
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
ITR03454


Cre – VCB
2SA1404
f=1MHz
Reverse Transfer Capacitance, Cre – pF
Collector-to-Base Voltage, VCB – V
ITR03455


Cre – VCB
2SC3598
f=1MHz
Reverse Transfer Capacitance, Cre – pF
Collector-to-Base Voltage, VCB – V
ITR03456


VCE(sat) – IC
2SA1404
IC / IB=10
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – mA
ITR03457


VCE(sat) – IC
2SC3598
IC / IB=10
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – mA
ITR03458