



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

## 2SA1418 / 2SC3648 — PNP / NPN Epitaxial Planar Silicon Transistors

### High-Voltage Switching, Preriver Applications

#### Applications

- Color TV audio output, inverter.

#### Features

- Adoption of FBET, MBIT processes.
- High breakdown voltage and large current capacity.
- Fast switching speed.
- Ultrasmall size making it easy to provide high-density, small-sized hybrid IC's.

#### Specifications ( ) : 2SA1418

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V <sub>CB0</sub>		(-)180	V
Collector-to-Emitter Voltage	V <sub>CEO</sub>		(-)160	V
Emitter-to-Base Voltage	V <sub>EB0</sub>		(-)6	V
Collector Current	I <sub>C</sub>		(-)0.7	A
Collector Current (Pulse)	I <sub>CP</sub>		(-)1.5	A
Collector Dissipation	P <sub>C</sub>		500	mW
		Mounted on a ceramic board (250mm <sup>2</sup> ×0.8mm)	1.3	W
Junction Temperature	T <sub>j</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

Marking 2SA1418 : AD

2SC3648 : CD

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## 2SA1418 / 2SC3648

### Electrical Characteristics at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=(-)120\text{V}, I_E=0\text{A}$			$(-)0.1$	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=(-)4\text{V}, I_C=0\text{A}$			$(-)0.1$	$\mu\text{A}$
DC Current Gain	$h_{FE1}$	$V_{CE}=(-)5\text{V}, I_C=(-)100\text{mA}$	100*		400*	
	$h_{FE2}$	$V_{CE}=(-)5\text{V}, I_C=(-)10\text{mA}$	90			
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)10\text{V}, I_C=(-)50\text{mA}$		120		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=(-)10\text{V}, f=1\text{MHz}$		(11)8		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)250\text{mA}, I_B=(-)25\text{mA}$		$(-0.2)0.12$	$(-0.5)0.4$	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)250\text{mA}, I_B=(-)25\text{mA}$		$(-)0.85$	$(-)1.2$	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu\text{A}, I_E=0\text{A}$	$(-)180$			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1\text{mA}, R_{BE}=\infty$	$(-)160$			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)10\mu\text{A}, I_C=0\text{A}$	$(-)6$			V
Turn-ON Time	$t_{on}$	See specified Test Circuit.		(60)50		ns
Storage Time	$t_{stg}$	See specified Test Circuit.		(900)1000		ns
Fall Time	$t_f$	See specified Test Circuit.		(60)60		ns

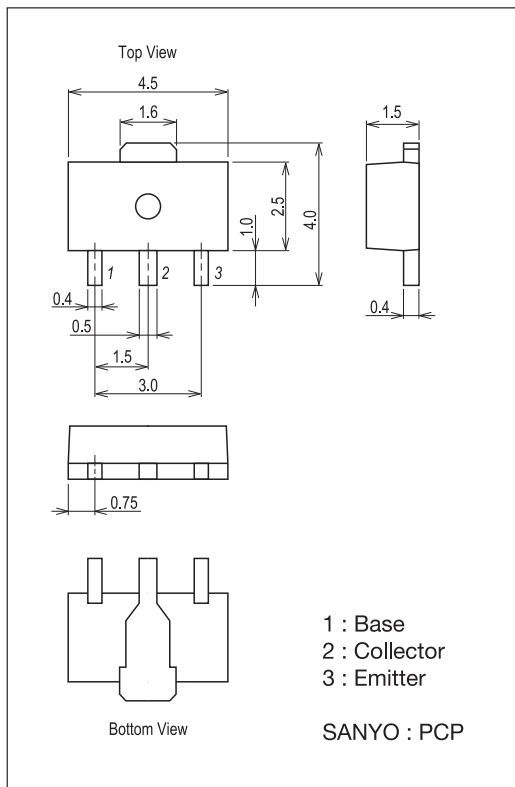
\*: The 2SA1418 / 2SC3648 are classified by 100mA  $h_{FE}$  as follows:

Rank	R	S	T
$h_{FE}$	100 to 200	140 to 280	200 to 400

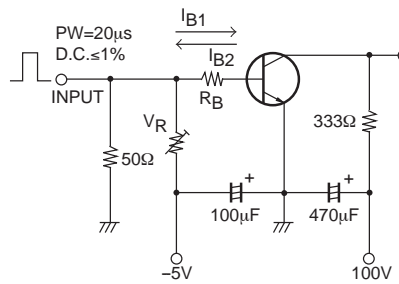
### Package Dimensions

unit : mm (typ)

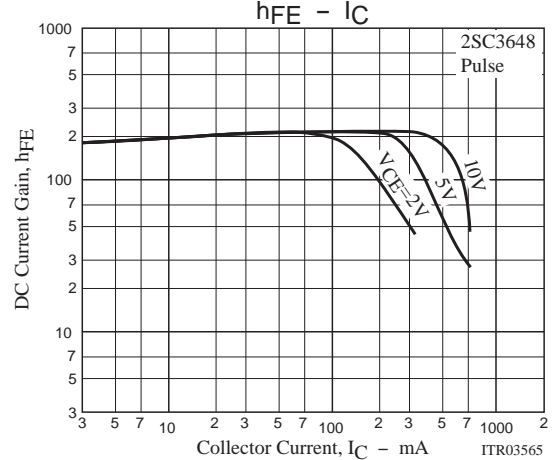
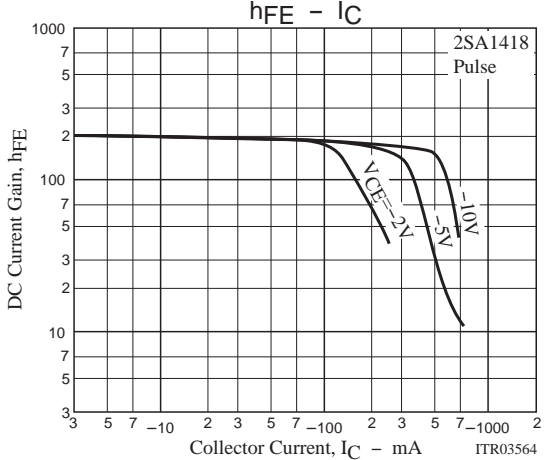
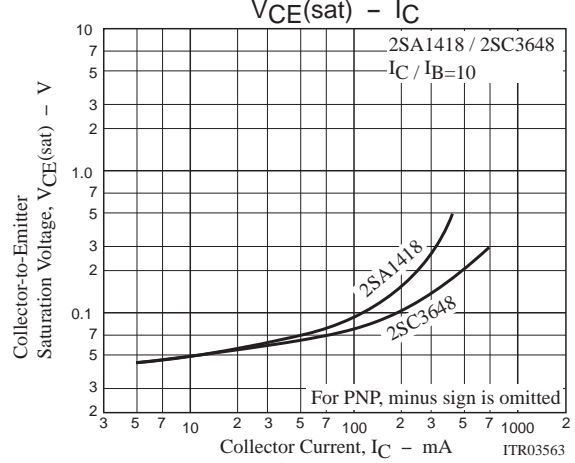
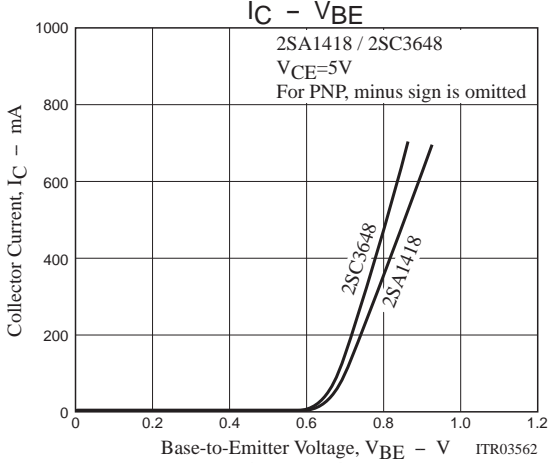
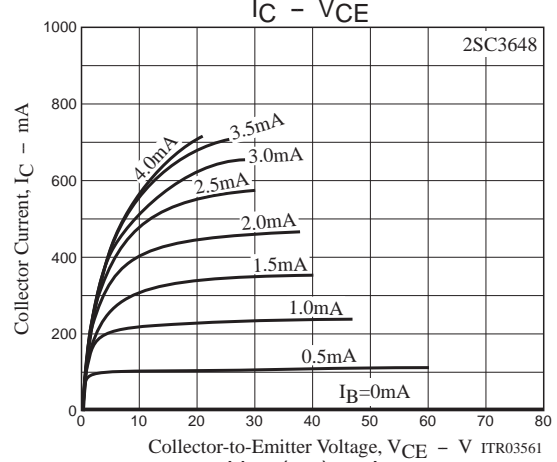
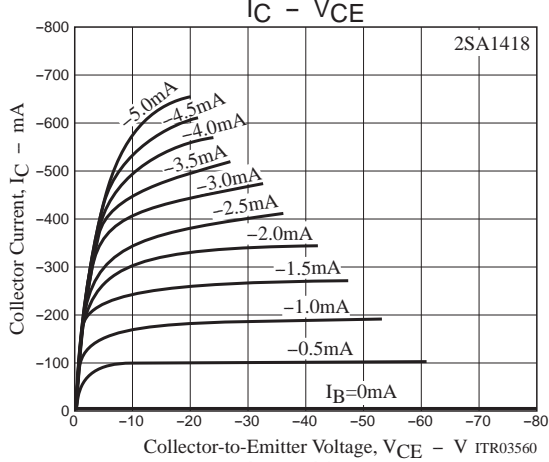
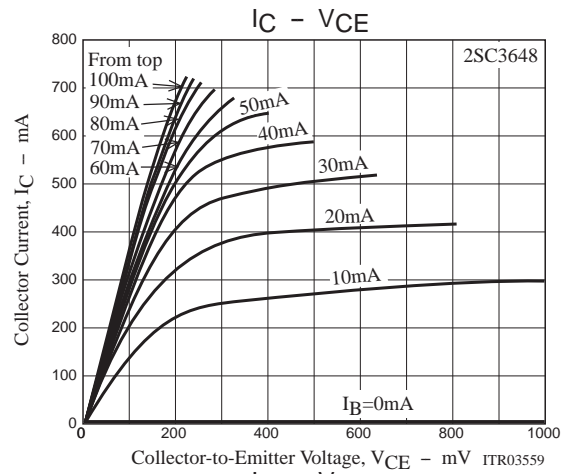
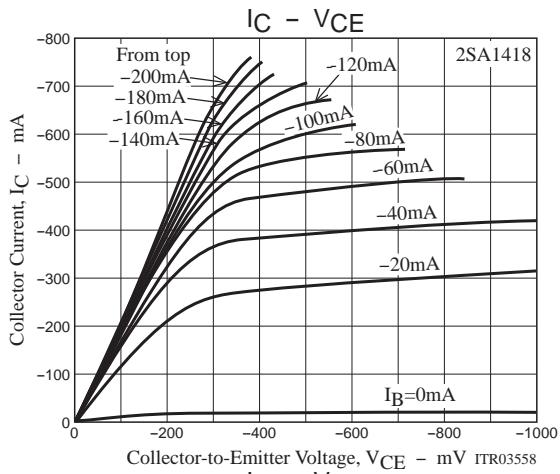
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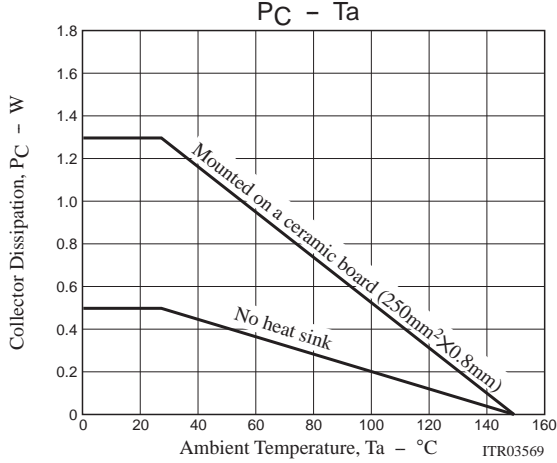
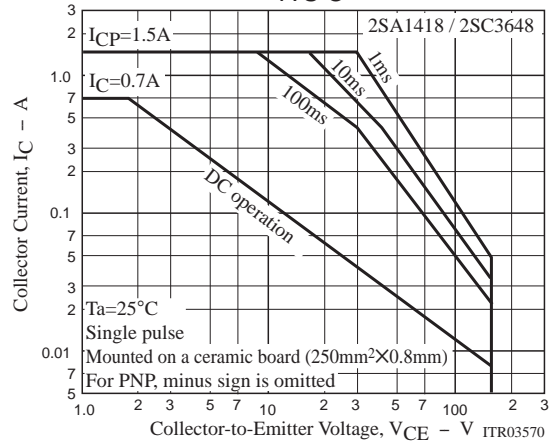
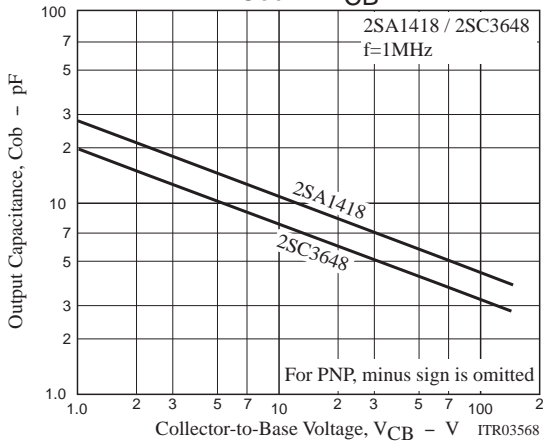
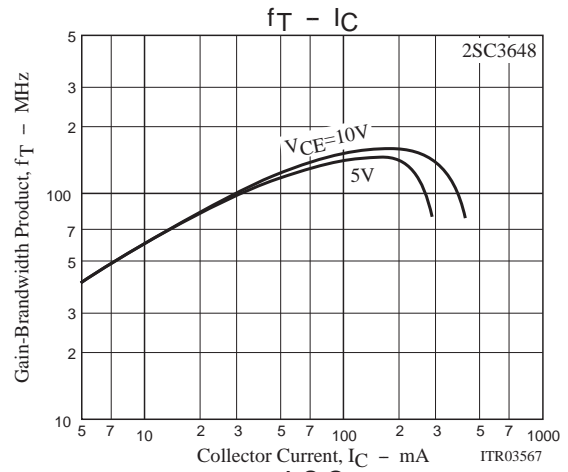
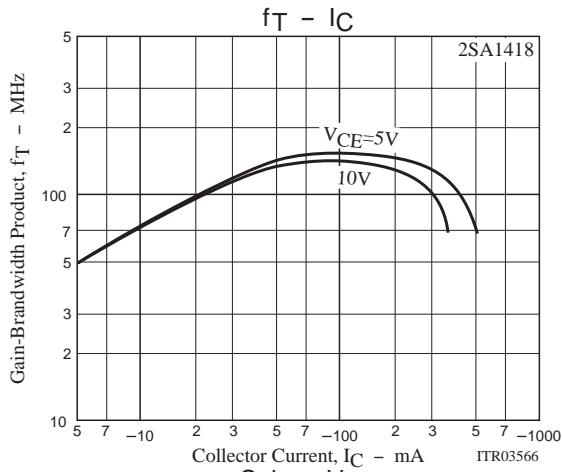
### Switching Time Test Circuit



$I_C=20I_{B1}=-20I_{B2}=300\text{mA}$   
(For PNP, the polarity is reversed)



# 2SA1418 / 2SC3648



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