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**ON Semiconductor**  
**DATA SHEET**

PNP / NPN Epitaxial Planar Silicon Transistors

**2SA1418 / 2SC3648** — **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	VCBO		(-)180	V
Collector-to-Emitter Voltage	VCEO		(-)160	V
Emitter-to-Base Voltage	VEBO		(-)6	V
Collector Current	IC		(-)0.7	A
Collector Current (Pulse)	ICP		(-)1.5	A
Collector Dissipation	PC		500	mW
		Mounted on a ceramic board (250mm <sup>2</sup> ×0.8mm)	1.3	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		-55 to +150	°C

Marking 2SA1418 : AD

2SC3648 : CD

# 2SA1418 / 2SC3648

## Electrical Characteristics at Ta=25°C

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

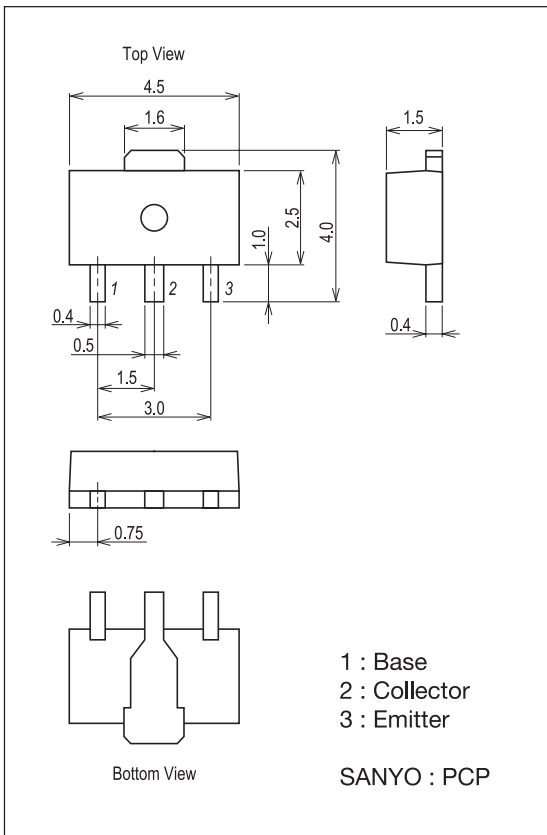
\*: The 2SA1418 / 2SC3648 are classified by 100mA  $h_{FE}$  as follows:

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

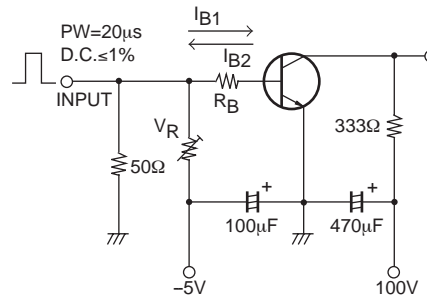
## Package Dimensions

unit : mm (typ)

7007B-004

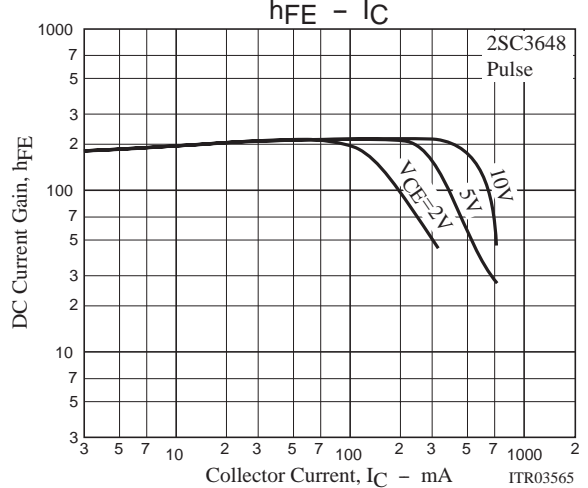
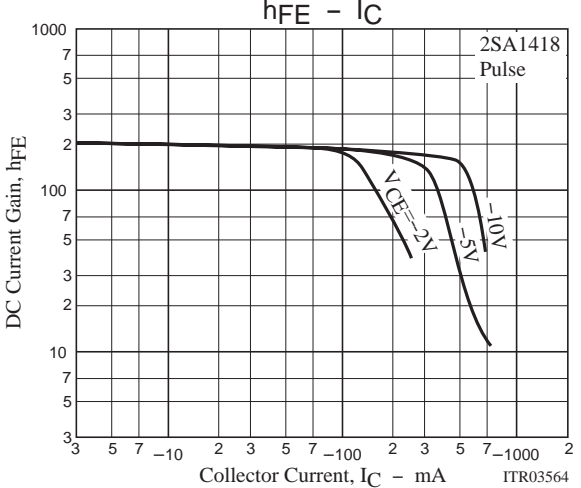
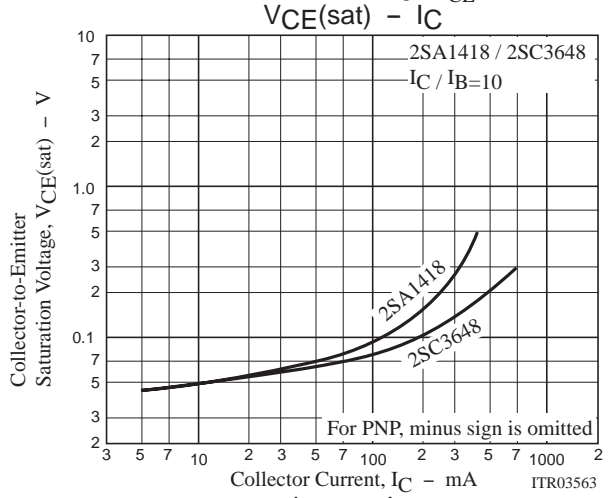
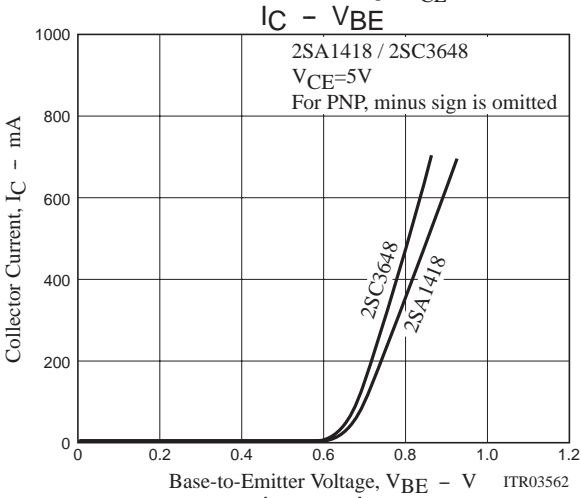
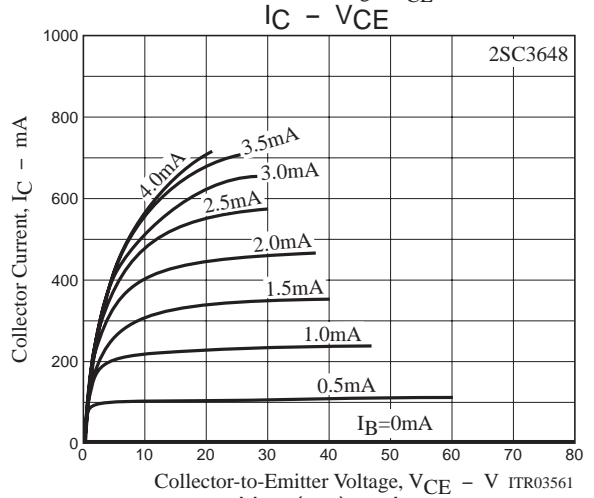
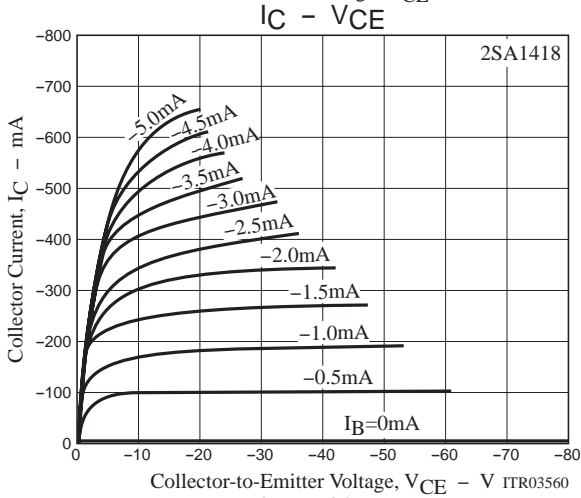
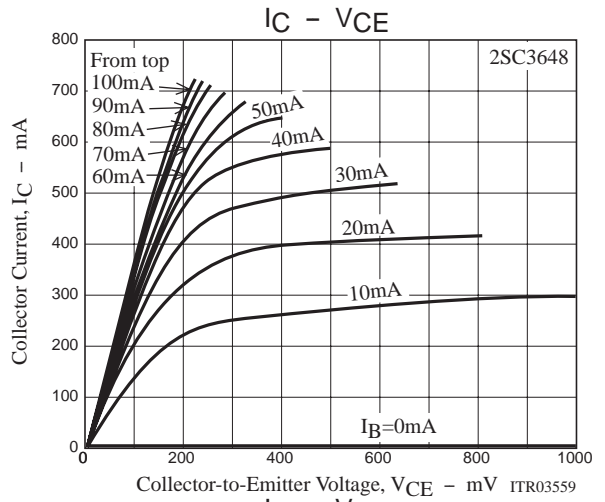
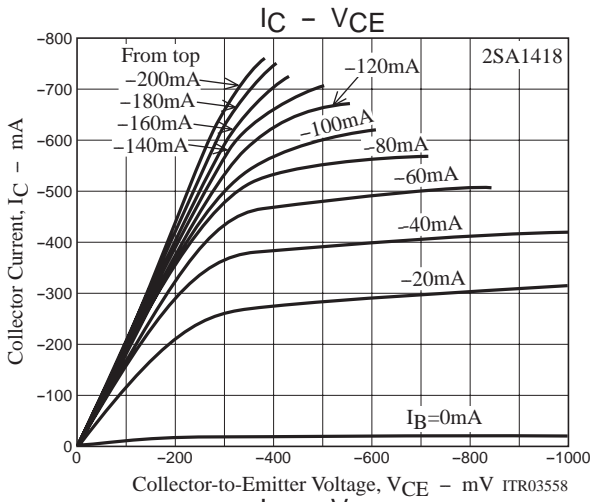


## Switching Time Test Circuit

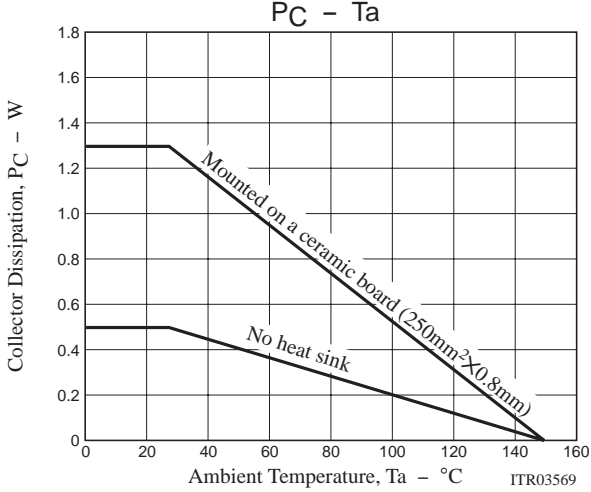
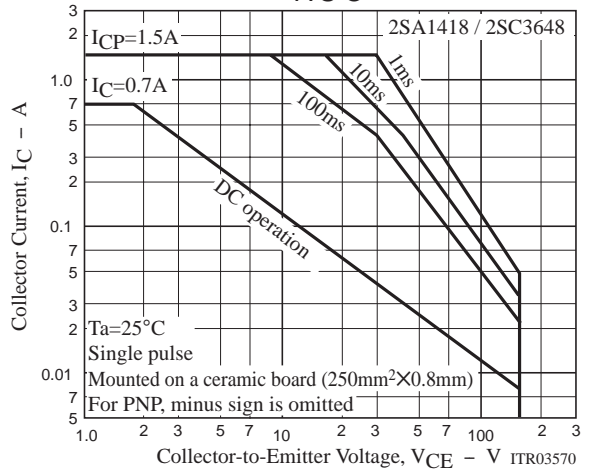
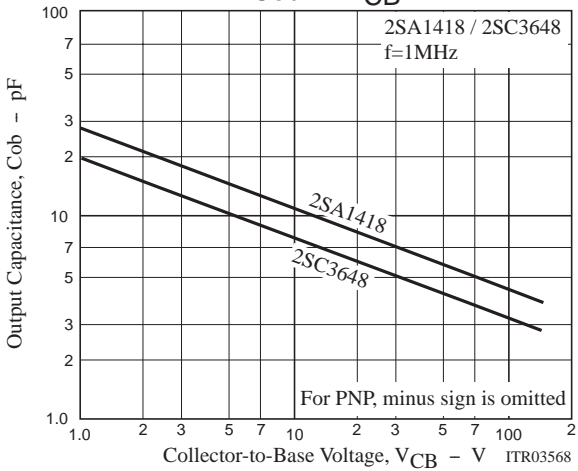
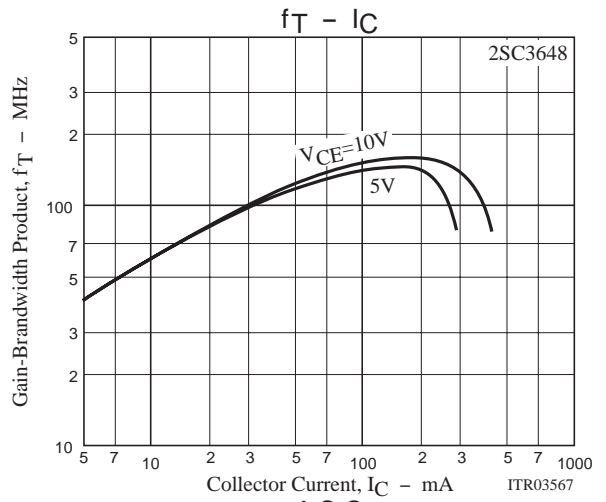
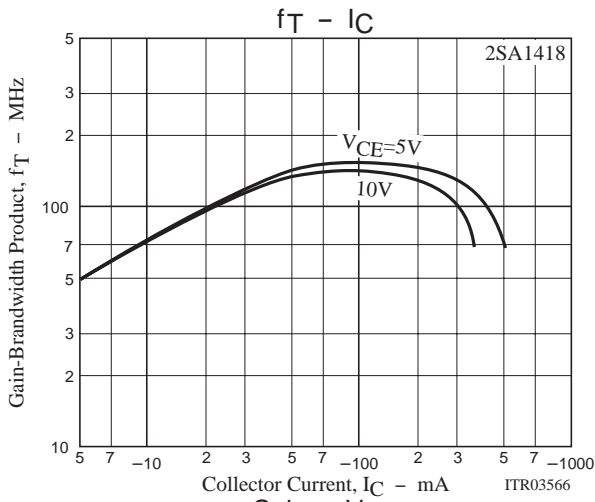


$I_C = 20I_{B1} = -20I_{B2} = 300mA$   
(For PNP, the polarity is reversed)

2SA1418 / 2SC3648



# 2SA1418 / 2SC3648



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