Ordering number:ENN1788A

PNP/NPN Epitaxial Planar Silicon Transistors

2SA1418/2SC3648

High-Voltage Switching, Predriver Applications

Applications

· Color TV audio output, inverter.

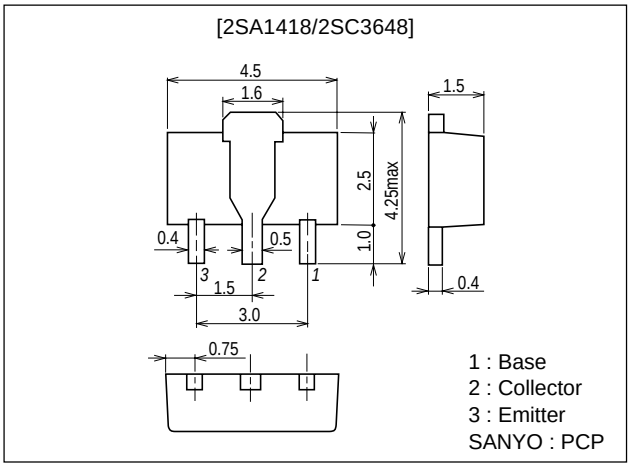
Features

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

Package Dimensions

unit:mm

2038A



( ) : 2SA1418

Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(–)180	V
Collector-to-Emitter Voltage	V_{CEO}		(–)160	V
Emitter-to-Base Voltage	V_{EBO}		(–)6	V
Collector Current	I_C		(–)0.7	A
Collector Current (Pulse)	I_{CP}		(–)1.5	A
Collector Dissipation	P_C		500	mW
		Mounted on ceramic board (250mm²×0.8mm)	1.3	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}=(–)120V, I_E=0			(–)0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0			(–)0.1	μA
DC Current Gain	$h_{FE}1$	V_{CE}=(–)5V, I_C=(–)100mA	100*		400*	
	$h_{FE}2$	V_{CE}=(–)5V, I_C=(–)10mA	90			

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

Continued on next page.

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

Marking 2SA1418 : AD
2SC3648 : CD

h_{FE} rank : R, S, T

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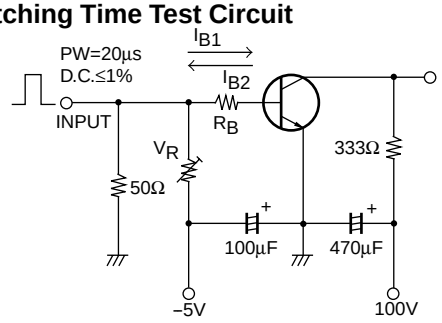
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

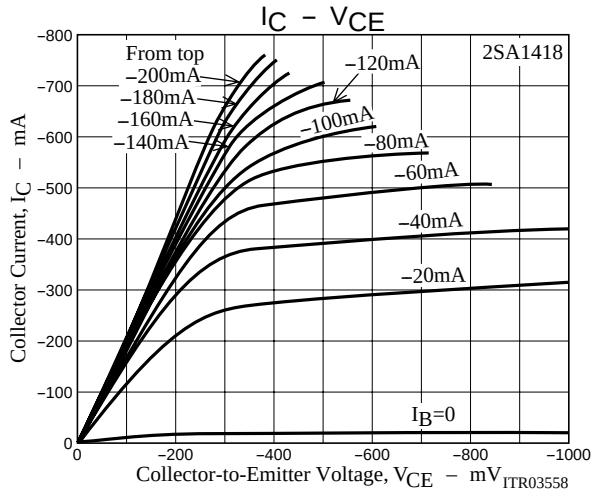
Continued from preceding page.

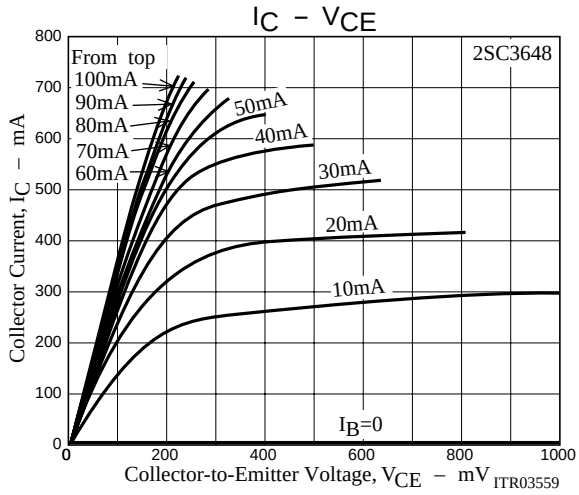
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Gain-Bandwidth Product	f_T	V_{CE}=(–)10V, I_C=(–)50mA		120		MHz
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=(–)250mA, I_B=(–)25mA		0.12	0.4	V
				(–0.2)	(–0.5)	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=(–)250mA, I_B=(–)25mA		(–)0.85	(–)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, I_E=0	(–)180			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(–)1mA, R_{BE}=∞	(–)160			V
Emitter-to-Base Breakdown Votage	$V_{(BR)EBO}$	I_E=(–)10μA, I_C=0	(–)6			V
Output Capacitance	C_{ob}	V_{CB}=(–)10V, f=1MHz		8		pF
				(11)		pF
Turn-ON Time	t_{on}	See specified Test Circuit.		50		ns
				(60)		ns
Stotage Time	t_{stg}	See specified Test Circuit.		1000		ns
				(900)		ns
Fall Time	t_f	See specified Test Circuit.		60		ns
				(60)		ns

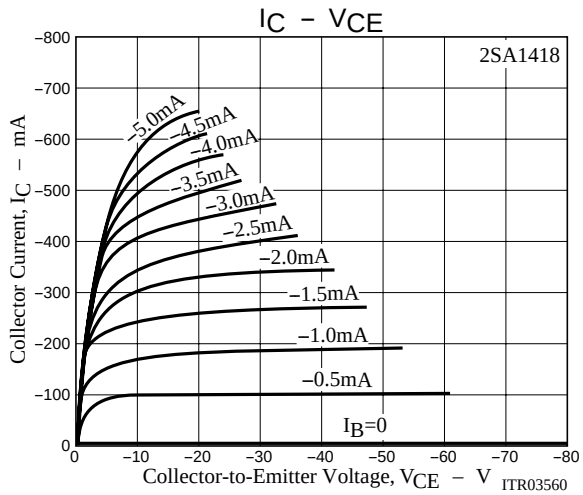
Switching Time Test Circuit

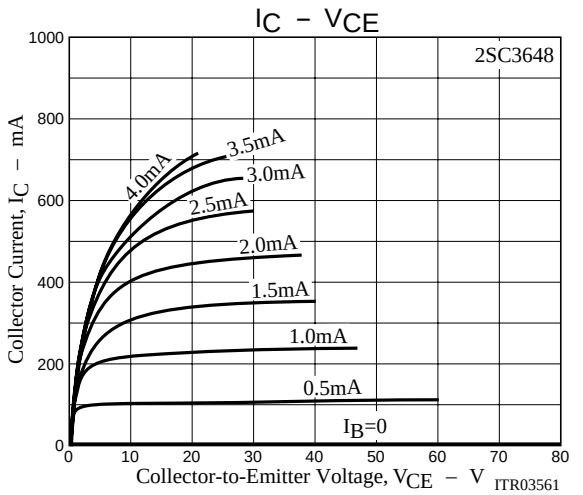


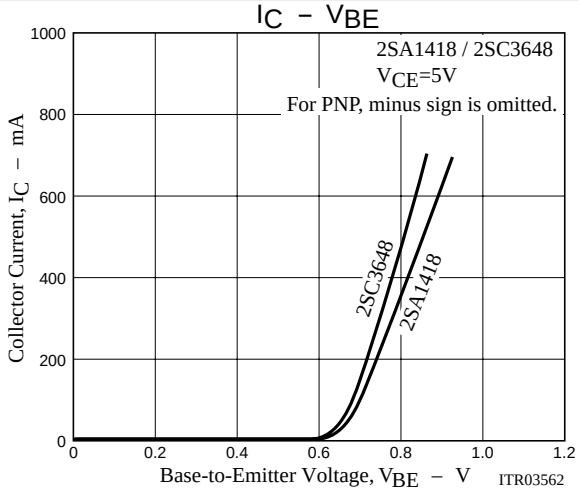
$20I_{B1}=-20I_{B2}=I_C=300mA$
(For PNP, the polarity is reversed.)

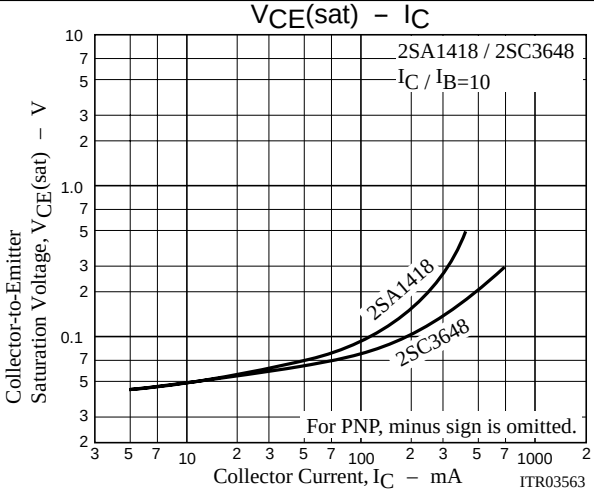


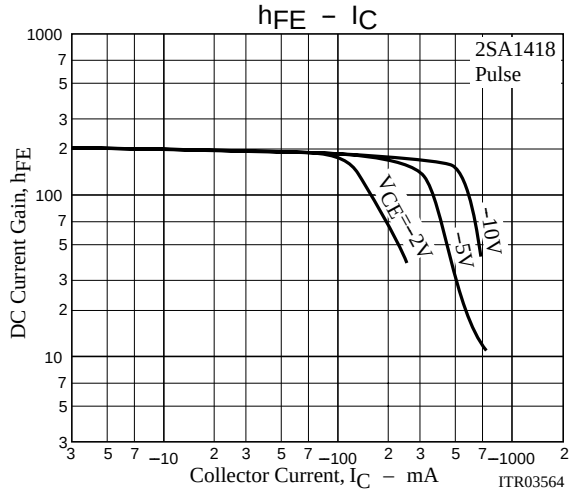


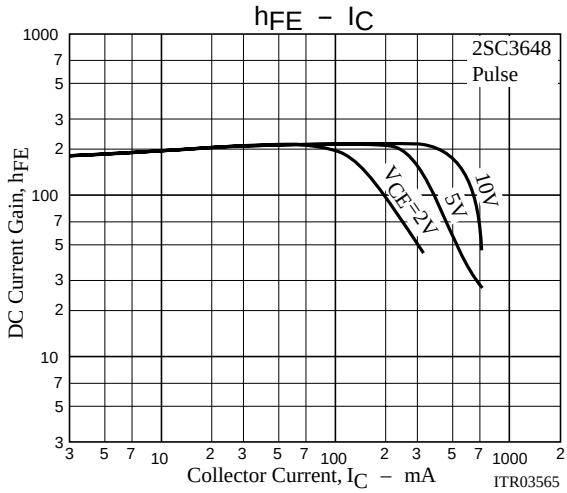


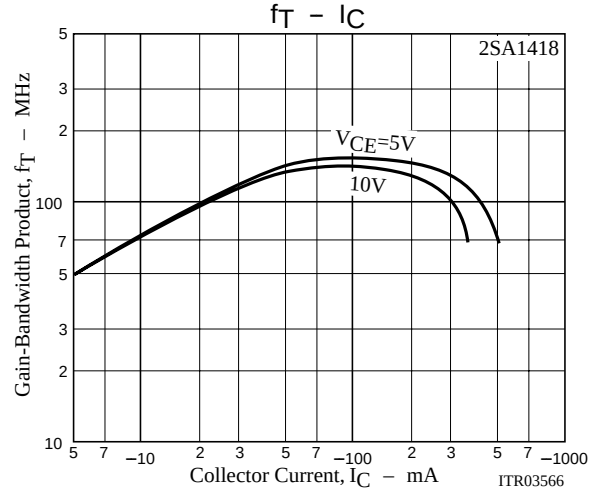


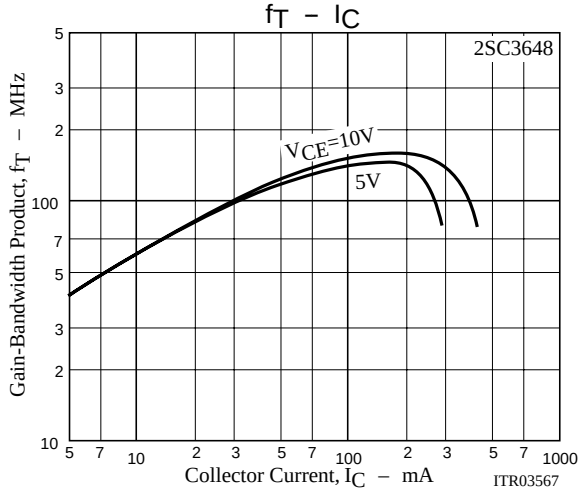

IC – VBE
2SA1418 / 2SC3648
VCE=5V
For PNP, minus sign is omitted.
2SC3648
2SA1418
Collector Current, IC – mA
Base-to-Emitter Voltage, VBE – V
ITR03562

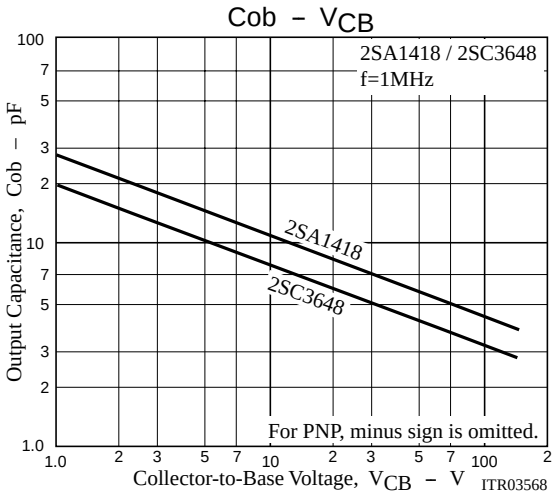

VCE(sat) – IC
2SA1418 / 2SC3648
IC / IB=10
2SA1418
2SC3648
For PNP, minus sign is omitted.
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – mA
ITR03563

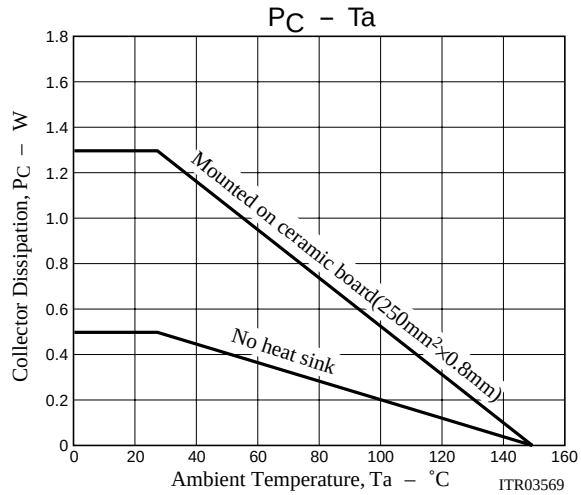

hFE – IC
2SA1418
Pulse
VCE=–2V
–5V
–10V
DC Current Gain, hFE
Collector Current, IC – mA
ITR03564


hFE – IC
2SC3648
Pulse
VCE=2V
5V
10V
DC Current Gain, hFE
Collector Current, IC – mA
ITR03565


fT – IC
2SA1418
VCE=5V
10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – mA
ITR03566


fT – IC
2SC3648
VCE=10V
5V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – mA
ITR03567


Cob – VCB
2SA1418 / 2SC3648
f=1MHz
2SA1418
2SC3648
For PNP, minus sign is omitted.
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
ITR03568


PC – Ta
Mounted on ceramic board(250mm²×0.8mm)
No heat sink
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C
ITR03569