Ordering number:EN3578

PNP/NPN Epitaxial Planar Silicon Transistors

2SA1770/2SC4614

High-Voltage Switching Applications

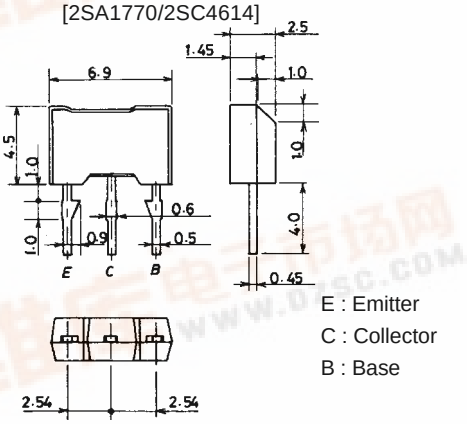
Features

- Adoption of MBIT process.
- High breakdown voltage and large current capacity.

Package Dimensions

unit:mm

2064



( ) : 2SA1770

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		(–)1.5	A
Colletor Current (Pulse)	I_{CP}		(–)2.5	A
Collector Dissipation	P_C		1	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			(–)1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=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	80			
Gain-Bandwidth Product	f_T	V_{CE}=(–)10V, I_C=(–)50mA		120		MHz
Output Capacitance	C_{ob}	V_{CB}=(–)10V, f=1MHz		(22)14		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=(–)500mA, I_B=(–)50mA		(–200)	(–500)	mV
				130	450	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=(–)500mA, I_B=(–)50mA		(–)0.85	(–)1.2	V

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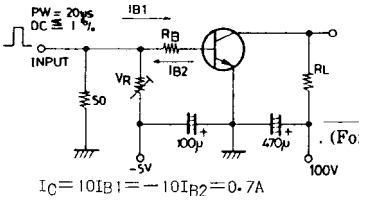
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, I_E=0	(–)180			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(–)1mA, R_{BE}=∞	(–)160			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=(–)10μA, I_C=0	(–)6			V
Turn-ON Time	t_{on}	See specified Test Circuit		(40)40		ns
Storage Time	t_{stg}	See specified Test Circuit		(0.7)		μs
				1.2		μs
Fall Time	t_f	See specified Test Circuit		(40)80		ns

* ; The 2SA1770/2SC4614 are classified by 100mA h_{FE} as follows :

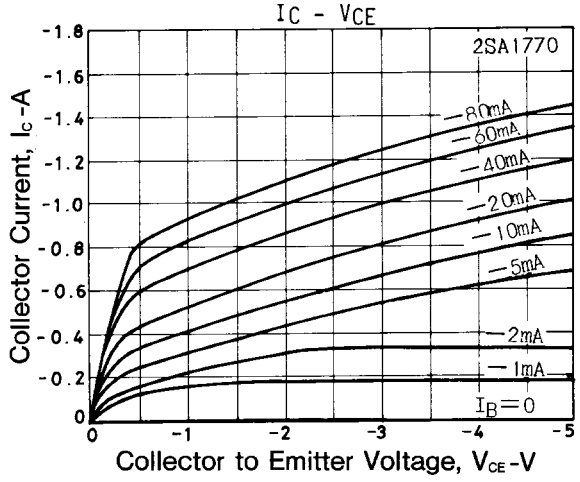
100	R	200	140	S	280	200	T	400

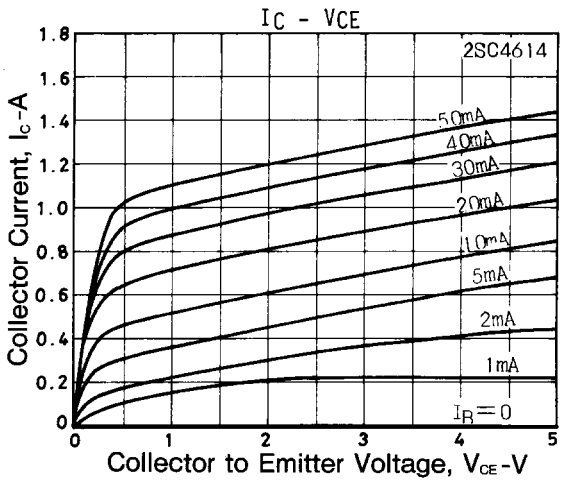
Switching Time Test Circuit

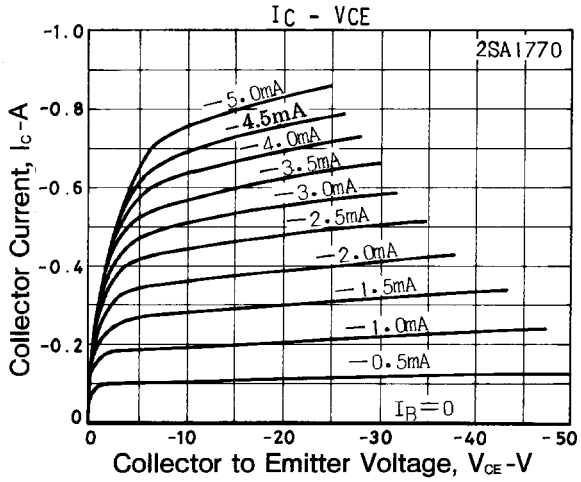


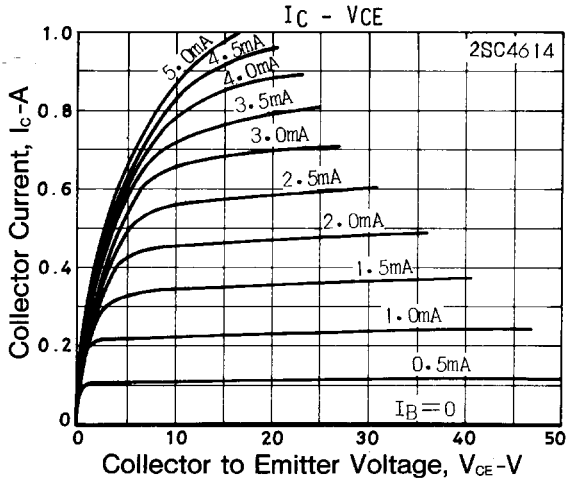
I_C= 10I_{B1}= −10I_{B2}=0.7A

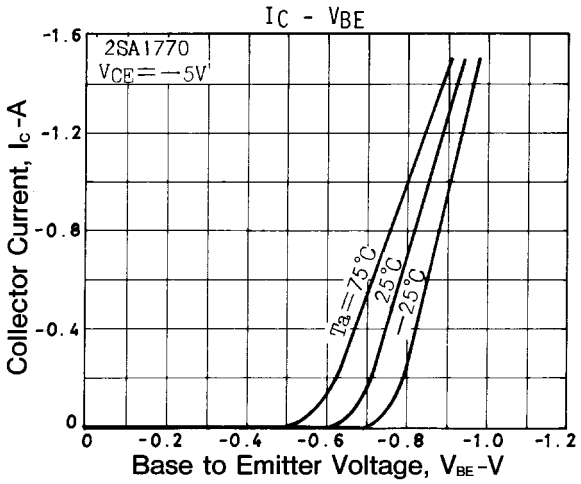
Unit (resistance : Ω, capacitance : F)

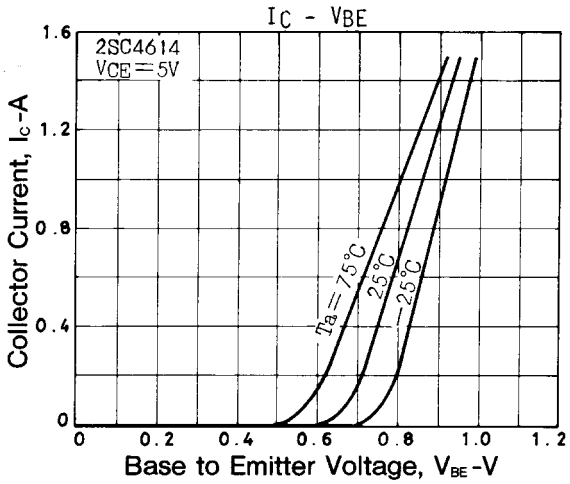


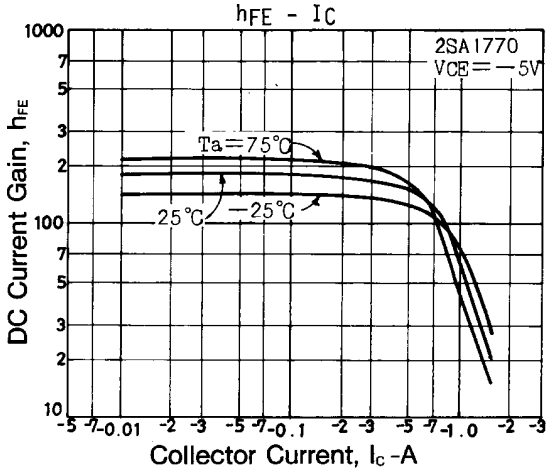


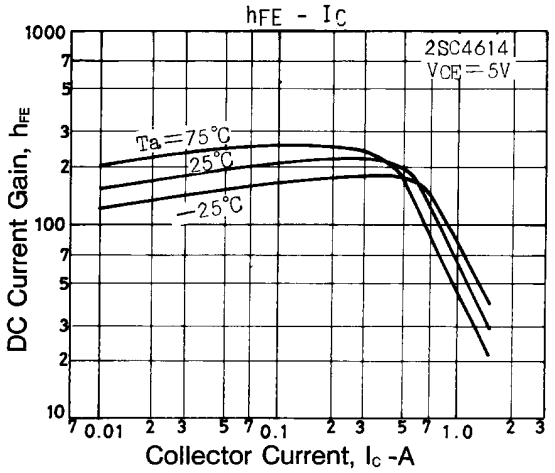


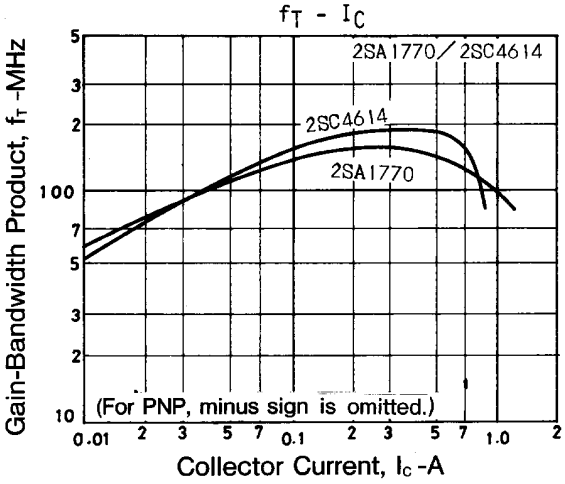


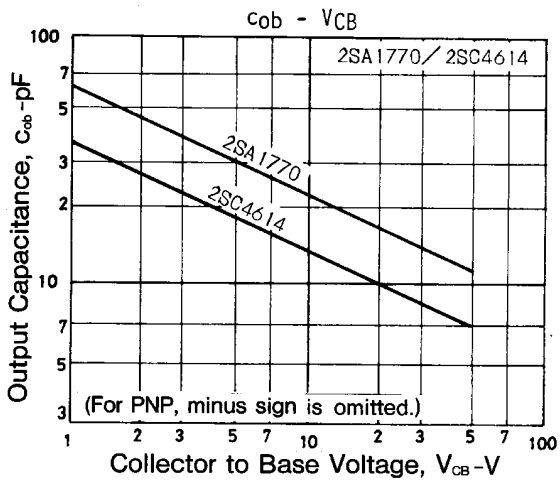

IC - VBE
2SA1770
VCE=−5V
Collector Current, IC -A
Base to Emitter Voltage, VBE -V
Ta=75°C
25°C
−25°C

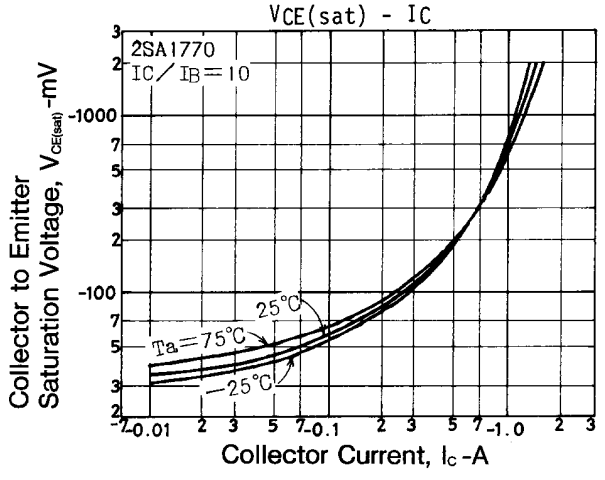

IC - VBE
2SC4614
VCE=5V
Collector Current, IC -A
Base to Emitter Voltage, VBE -V
Ta=75°C
25°C
−25°C

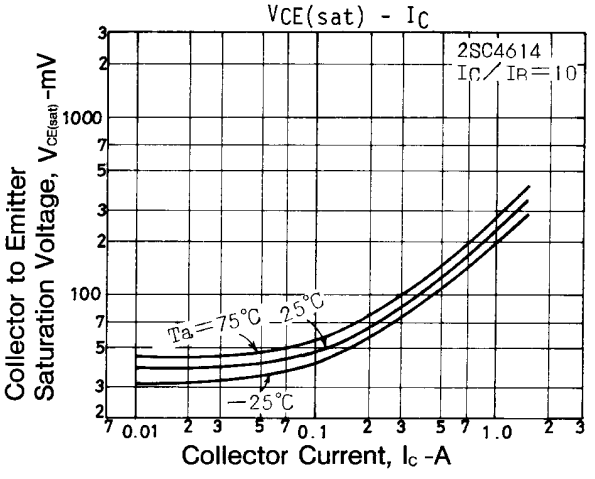

hFE - IC
2SA1770
VCE=−5V
DC Current Gain, hFE
Collector Current, IC -A
Ta=75°C
25°C
−25°C


hFE - IC
2SC4614
VCE=5V
DC Current Gain, hFE
Collector Current, IC -A
Ta=75°C
25°C
−25°C


fT - IC
2SA1770/2SC4614
2SC4614
2SA1770
(For PNP, minus sign is omitted.)
Gain-Bandwidth Product, fT -MHz
Collector Current, IC -A


Cob - VCB
2SA1770/2SC4614
2SA1770
2SC4614
(For PNP, minus sign is omitted.)
Output Capacitance, Cob -pF
Collector to Base Voltage, VCB -V


VCE(sat) - IC
2SA1770
IC/IB=10
Collector to Emitter Saturation Voltage, VCE(sat) -mV
Collector Current, IC -A
Ta=75°C
25°C
−25°C


VCE(sat) - IC
2SC4614
IC/IB=10
Collector to Emitter Saturation Voltage, VCE(sat) -mV
Collector Current, IC -A
Ta=75°C
25°C
−25°C