PNP / NPN Epitaxial Planar Silicon Transistors

2SA1469 / 2SC3746 — 60V / 5A High-Speed Switching Applications

Applications

- Various inductance lamp drivers for electrical equipment.
- Inverters, converters (flash, fluorescent lamp lighting circuit).
- Power amp (high power car stereo, motor controller).
- High-speed switching (switching regulator, driver).

Features

- Low saturation voltage.
- Excellent current dependence of h_{FE}.
- Short switching time.
- Micaless package facilitating mounting.

Specifications ( ) : 2SA1469

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(-)80	V
Collector-to-Emitter Voltage	V_{CEO}		(-)60	V
Emitter-to-Base Voltage	V_{EBO}		(-)5	V
Collector Current	I_C		(-)5	A
Collector Current (Pulse)	I_{CP}		(-)7	A
Collector Dissipation	P_C		2	W
		Tc=25°C	20	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}=(-)40V, I_E=0A			(-)0.1	mA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(-)4V, I_C=0A			(-)0.1	mA
DC Current Gain	h_{FE}	V_{CE}=(-)2V, I_C=(-)1A	100*		280*	

* : The 2SA1469/2SC3746 are classified by 1A h_{FE} as follows :

Continued on next page.

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

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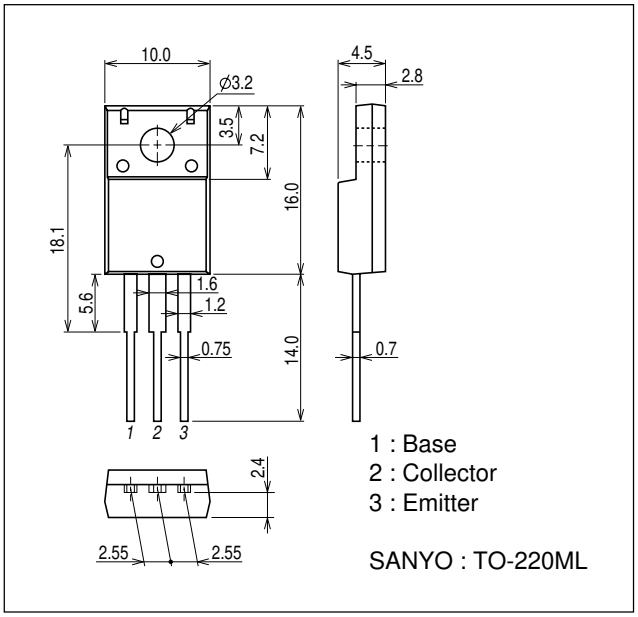
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Gain-Bandwidth Product	f_T	V_{CE}=(-)5V, I_C=(-)1A		100		MHz
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=(-)2.5A, I_B=(-)0.125A			(-)0.4	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(-)1mA, I_E=0A	(-)80			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(-)1mA, R_{BE}=∞	(-)60			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=(-)1mA, I_C=0A	(-)5			V
Turn-On Time	t_{on}	See specified Test Circuit.		0.1		µs
Storage Time	t_{stg}	See specified Test Circuit.		0.5		µs
Fall Time	t_f	See specified Test Circuit.		0.1		µs

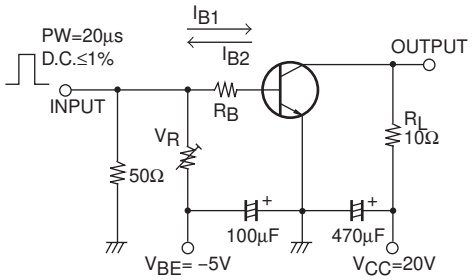
Package Dimensions

unit : mm (typ)

7508-002

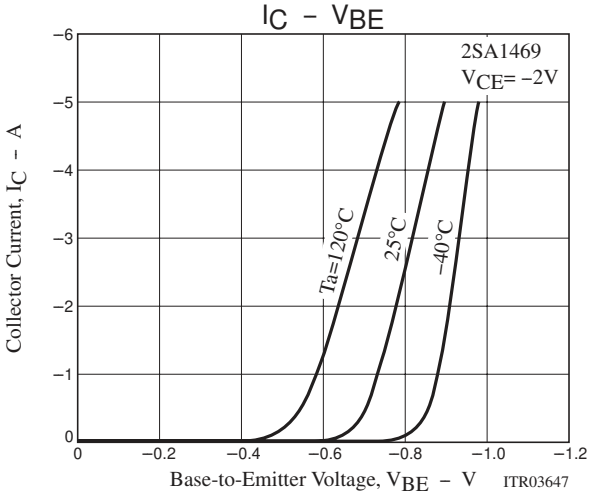


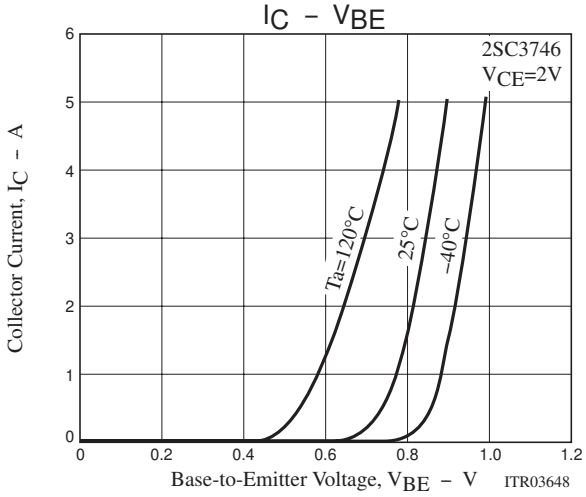
Switching Time Test Circuit

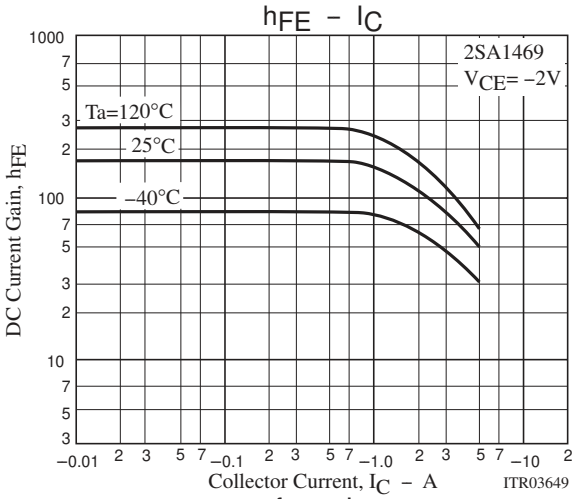


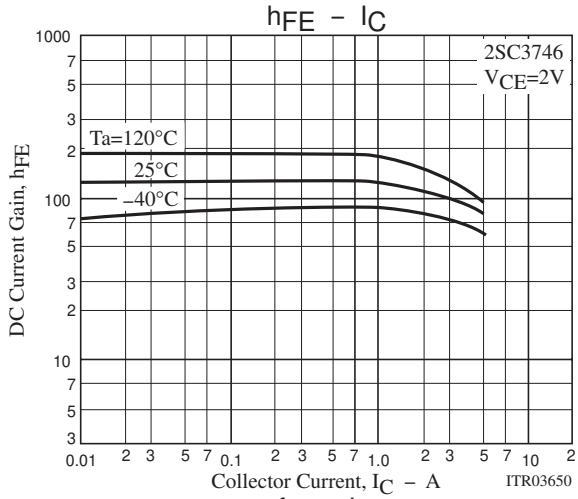
$20I_{B1}=-20I_{B2}=I_C=2A$

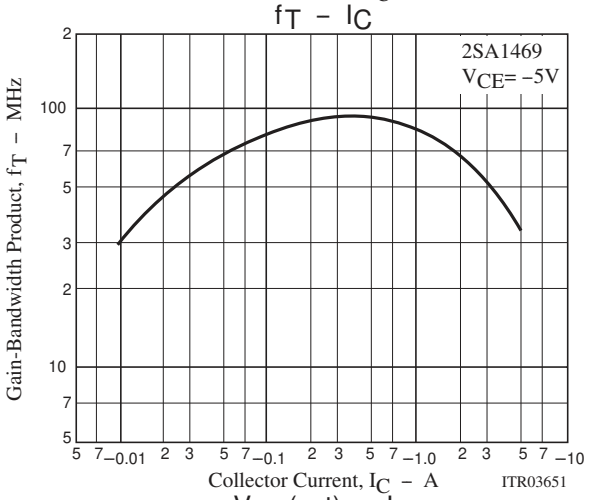
For PNP, the polarity is reversed.

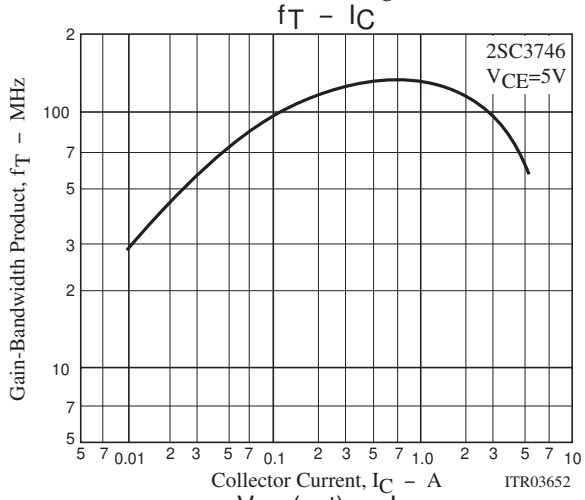


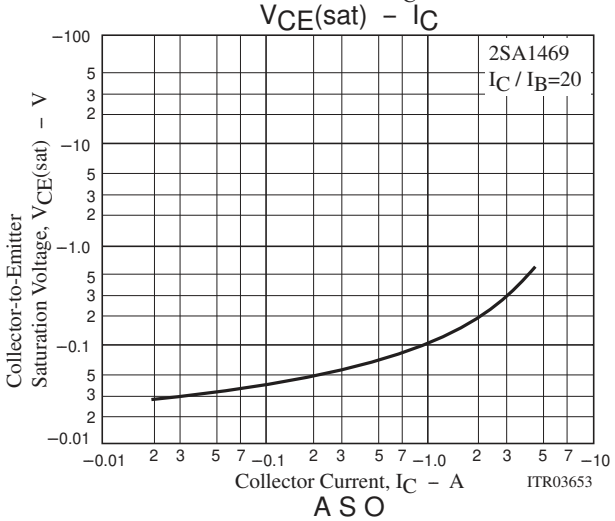


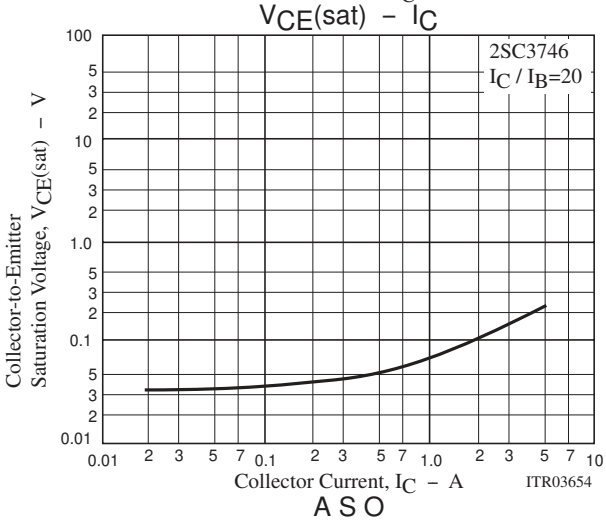

hFE – IC
2SA1469
VCE= –2V
Ta=120°C
25°C
–40°C
DC Current Gain, hFE
Collector Current, IC – A
ITR03649

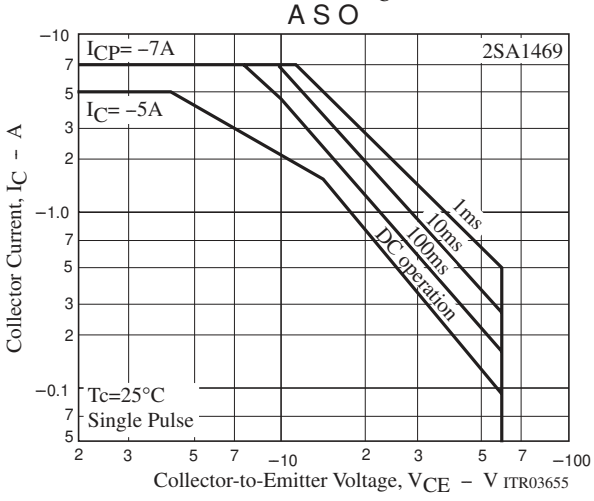

hFE – IC
2SC3746
VCE=2V
Ta=120°C
25°C
–40°C
DC Current Gain, hFE
Collector Current, IC – A
ITR03650

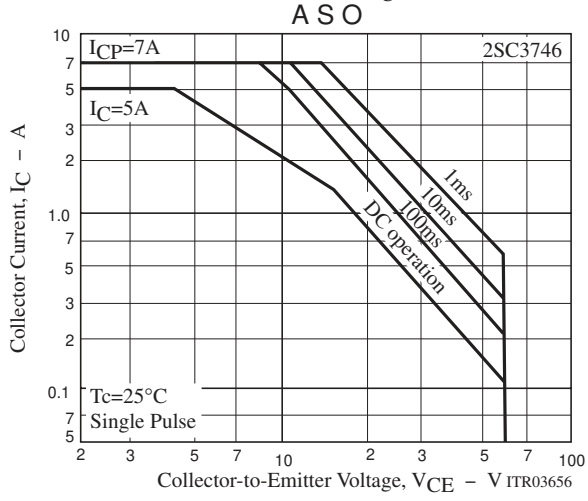

fT – IC
2SA1469
VCE= –5V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
ITR03651


fT – IC
2SC3746
VCE=5V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
ITR03652


VCE(sat) – IC
2SA1469
IC / IB=20
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
ITR03653


VCE(sat) – IC
2SC3746
IC / IB=20
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
ITR03654


A S O
2SA1469
ICP= –7A
IC= –5A
1ms
10ms
100ms
DC operation
Tc=25°C
Single Pulse
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR03655


A S O
2SC3746
ICP=7A
IC=5A
1ms
10ms
100ms
DC operation
Tc=25°C
Single Pulse
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR03656