Ordering number:EN1057B

PNP/NPN Epitaxial Planar Silicon Transistors

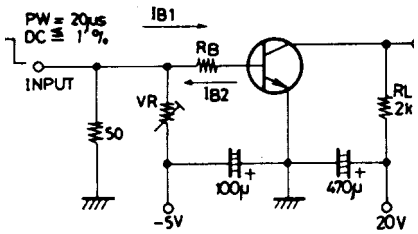
2SA1257/2SC3143

High-Voltage Switching, AF Power Amp, 100W Output Predriver Applications

Features

- Very small-sized package permitting the 2SA1257/ 2SC3143-applied sets to be made small and slim.
- High breakdown voltage (V_{CEO}≥160V).
- Small output capacitance.

Switching Time Test Circuit



I_C=10I_{B1}=–10I_{B2}=10mA
(For PNP, the polarity is reversed)
Unit (resistance : Ω, capacitance : F)

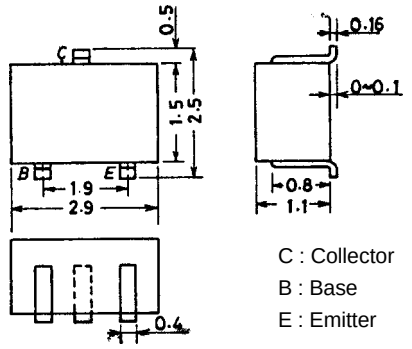
( ) : 2SA1257

Package Dimensions

unit:mm

2018A

[2SA1257/2SC3143]



C : Collector
B : Base
E : Emitter

SANYO : CP

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}		(–)5	V
Collector Current	I_C		(–)80	mA
Collector Current Pulse	I_{CP}		(–)150	mA
Collector Dissipation	P_C		200	mW
Junction Temperature	Tj		125	˚C
Storage Temperature	Tstg		–55 to +125	˚C

Electrical Characteristics at Ta = 25˚C

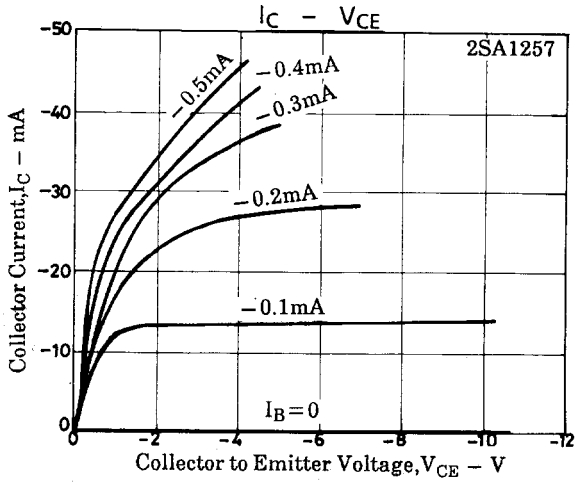
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=(–)120V, I_E=0			(–)0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0			(–)0.1	μA
DC Current Gain	h_{FE}	V_{CE}=(–)5V, I_C=(–)10mA	60*		270*	
Gain-Bandwidth Product	f_T	V_{CE}=(–)10V, I_C=(–)10mA		(130) 150		MHz
Output Capacitance	Cob	V_{CB}=(–)10V, f=1MHz		(2.4) 2.0	(3.2) 2.8	pF
Base-to-Emitter Voltage	V_{BE}	V_{CE}=(–)5V, I_C=(–)10mA			(–)1.5	V
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=(–)30mA, I_B=(–)3mA			(–)0.7	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 Voltage	$V_{(BR)EBO}$	I_E=(–)10μA, I_C=0	(–)5			V
Turn-ON Time	t_{on}	See specified Test Circuit		(0.15) 0.18		μs
Storage Time	t_{stg}	See specified Test Circuit		(0.95) 1.00		μs
Fall Time	t_f	See specified Test Circuit		(0.15) 0.20		μs

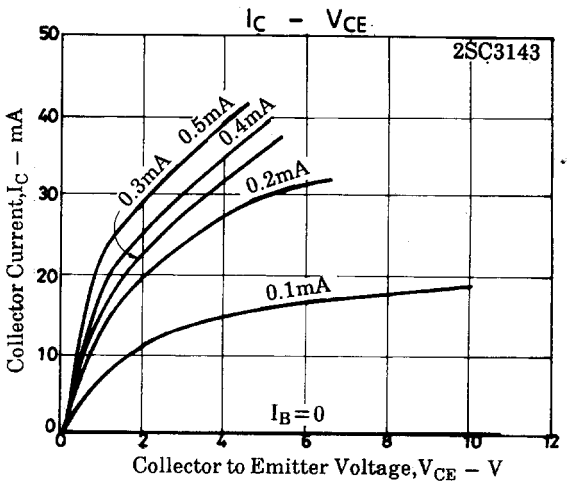
* : The 2SA1257/2SC3143 are classified by 10mA h_{FE} as follows :

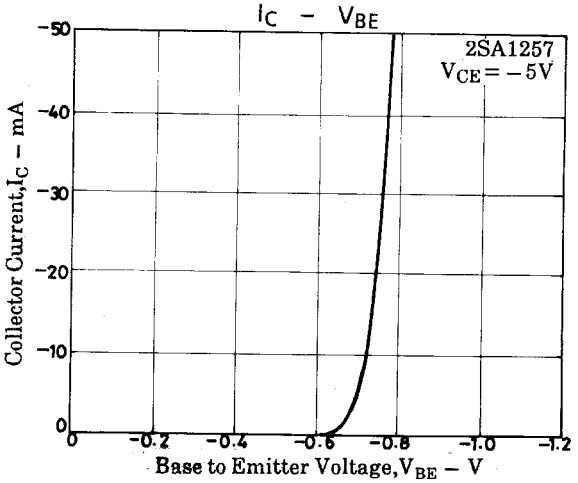
60	G3	120	90	G4	180	135	G5	270

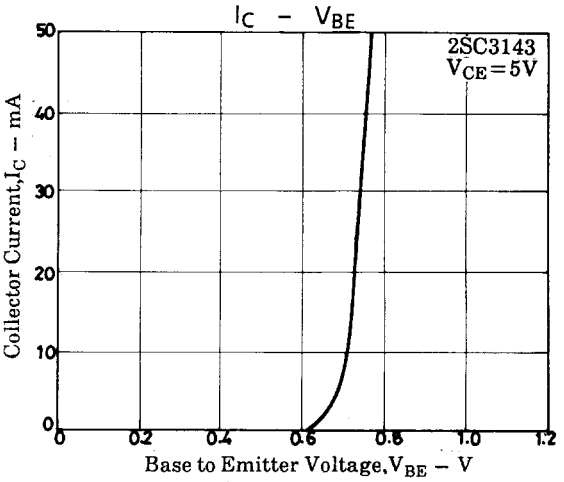
Marking 2SA1257 : G, 2SC3143 : K, h_{FE} rank : 3, 4, 5

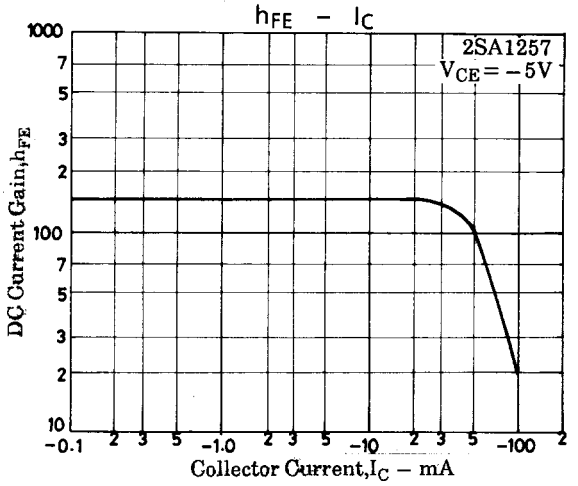
SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

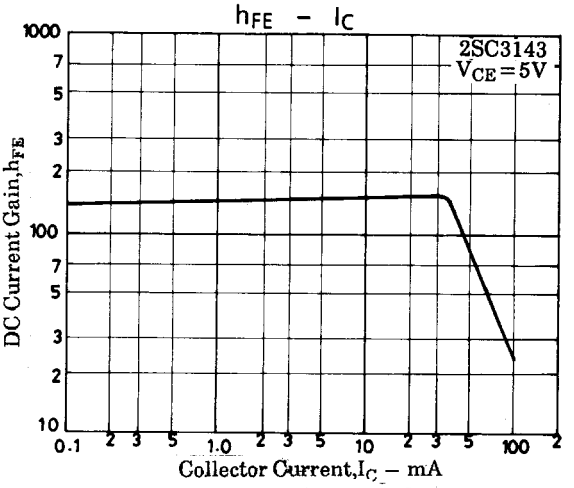

I_C – V_{CE}
2SA1257
−0.5mA
−0.4mA
−0.3mA
−0.2mA
−0.1mA
I_B=0
Collector Current, I_C – mA
Collector to Emitter Voltage, V_{CE} – V

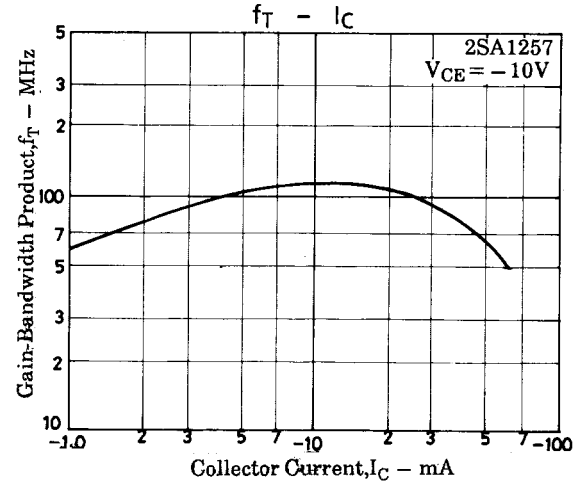

I_C – V_{CE}
2SC3143
0.5mA
0.4mA
0.3mA
0.2mA
0.1mA
I_B=0
Collector Current, I_C – mA
Collector to Emitter Voltage, V_{CE} – V

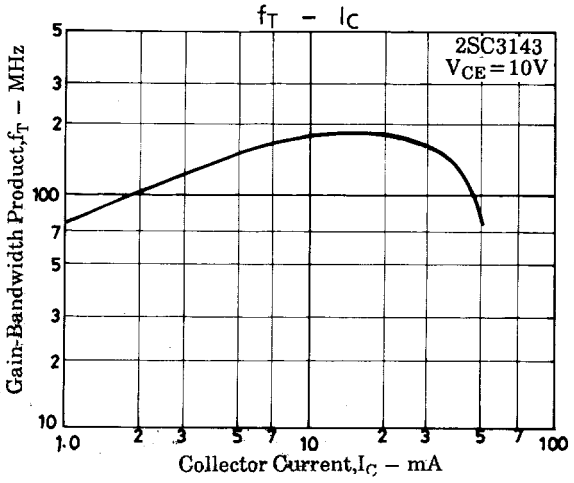

I_C – V_{BE}
2SA1257
V_{CE} = −5V
Collector Current, I_C – mA
Base to Emitter Voltage, V_{BE} – V

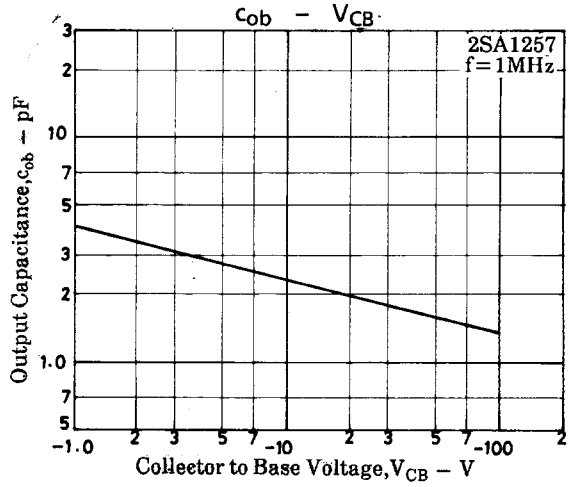

I_C – V_{BE}
2SC3143
V_{CE} = 5V
Collector Current, I_C – mA
Base to Emitter Voltage, V_{BE} – V

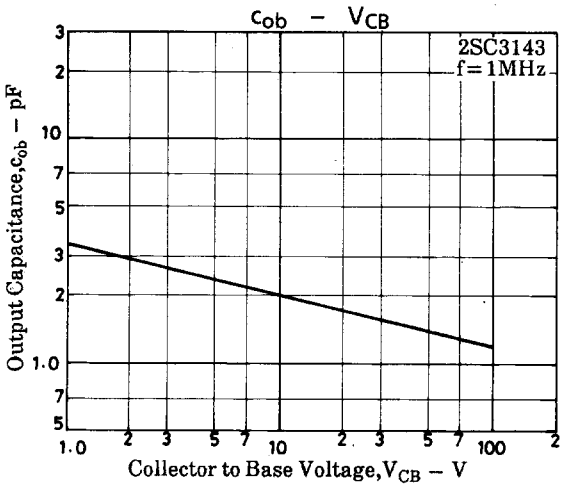

h_{FE} – I_C
2SA1257
V_{CE} = −5V
DC Current Gain, h_{FE}
Collector Current, I_C – mA

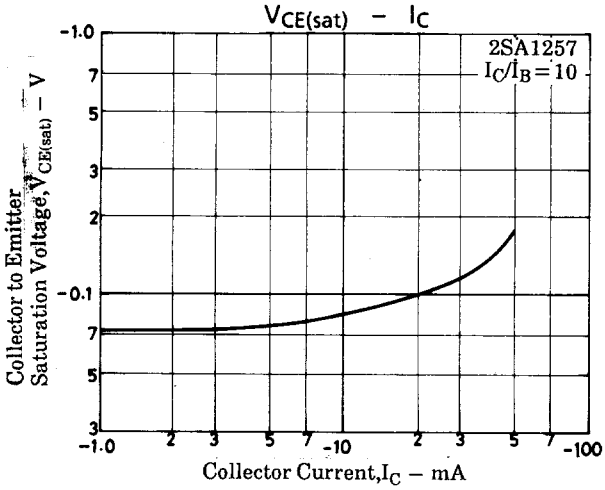

h_{FE} – I_C
2SC3143
V_{CE} = 5V
DC Current Gain, h_{FE}
Collector Current, I_C – mA

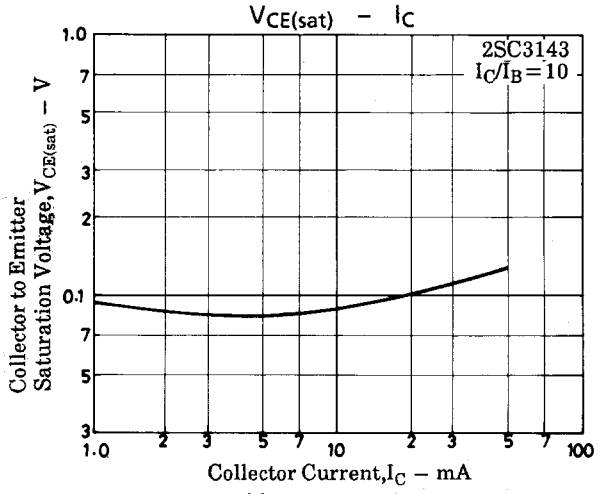

f_T – I_C
2SA1257
V_{CE} = −10V
Gain-Bandwidth Product, f_T – MHz
Collector Current, I_C – mA

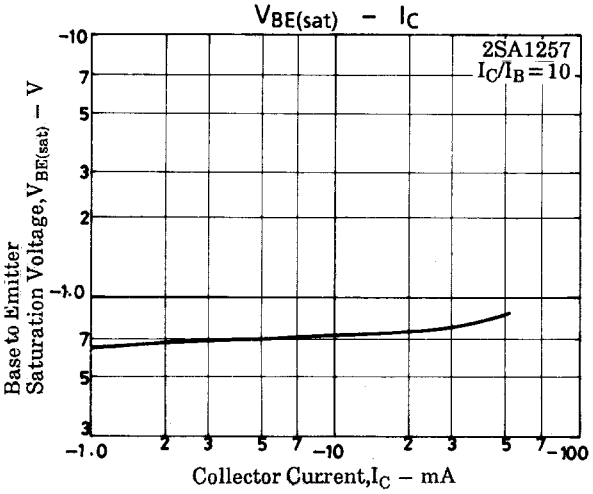

f_T – I_C
2SC3143
V_{CE} = 10V
Gain-Bandwidth Product, f_T – MHz
Collector Current, I_C – mA

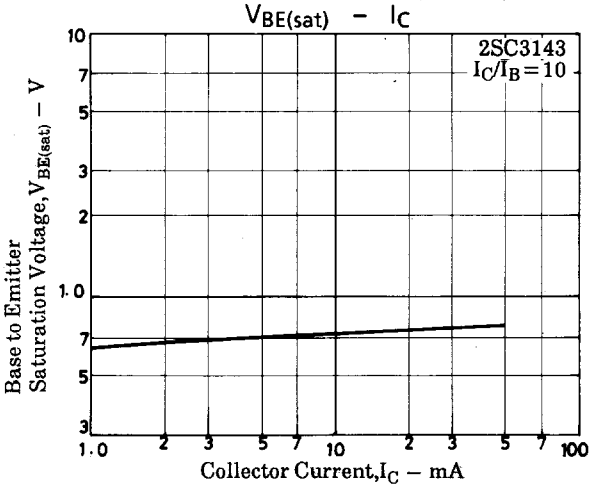

Cob – VCB
2SA1257
f=1MHz
Output Capacitance,Cob – pF
Collector to Base Voltage,VCB – V

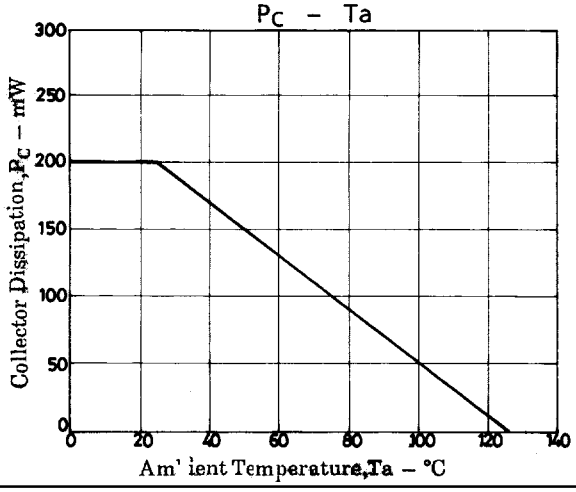

Cob – VCB
2SC3143
f=1MHz
Output Capacitance,Cob – pF
Collector to Base Voltage,VCB – V


VCE(sat) – IC
2SA1257
IC/IB=10
Collector to Emitter Saturation Voltage,VCE(sat) – V
Collector Current,IC – mA


VCE(sat) – IC
2SC3143
IC/IB=10
Collector to Emitter Saturation Voltage,VCE(sat) – V
Collector Current,IC – mA


VBE(sat) – IC
2SA1257
IC/IB=10
Base to Emitter Saturation Voltage,VBE(sat) – V
Collector Current,IC – mA


VBE(sat) – IC
2SC3143
IC/IB=10
Base to Emitter Saturation Voltage,VBE(sat) – V
Collector Current,IC – mA


PC – Ta
Collector Dissipation,PC – mW
Ambient Temperature,Ta – °C