

XP04654 (XP4654)

Silicon NPN epitaxial planer transistor (Tr1)
Silicon PNP epitaxial planer transistor (Tr2)

For high speed switching

■ Features

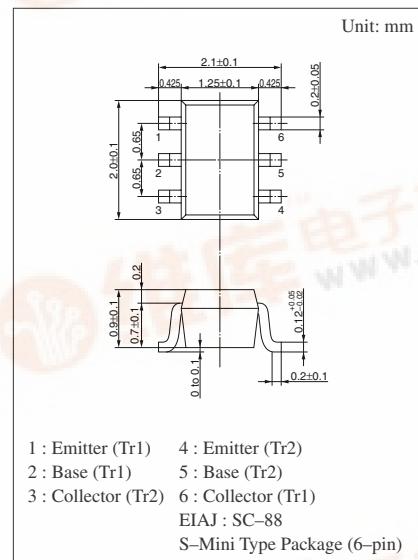
- Two elements incorporated into one package.
- Reduction of the mounting area and assembly cost by one half.

■ Basic Part Number of Element

- 2SC3757 + 2SA1738

■ Absolute Maximum Ratings (Ta=25°C)

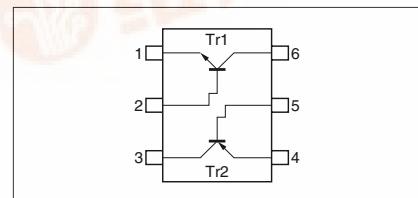
Parameter	Symbol	Ratings	Unit
Tr1	Collector to base voltage	V _{CBO}	40
	Collector to emitter voltage	V _{CES}	40
	Emitter to base voltage	V _{EBO}	5
	Collector current	I _C	mA
	Peak collector current	I _{CP}	mA
Tr2	Collector to base voltage	V _{CBO}	-15
	Collector to emitter voltage	V _{CES}	-15
	Emitter to base voltage	V _{EBO}	-4
	Collector current	I _C	mA
	Peak collector current	I _{CP}	-100
Overall	Total power dissipation	P _T	mW
	Junction temperature	T _j	°C
	Storage temperature	T _{stg}	°C



1 : Emitter (Tr1) 4 : Emitter (Tr2)
2 : Base (Tr1) 5 : Base (Tr2)
3 : Collector (Tr2) 6 : Collector (Tr1)
EIAJ : SC-88
S-Mini Type Package (6-pin)

Marking Symbol: ED

Internal Connection



■ Electrical Characteristics (Ta=25°C)

● Tr1

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = 40V, I_E = 0$			0.1	μA
Emitter cutoff current	I_{EBO}	$V_{EB} = 4V, I_C = 0$			0.1	μA
Forward current transfer ratio	h_{FE}	$V_{CE} = 1V, I_C = 10mA$	60		320	
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_C = 10mA, I_B = 1mA$		0.17	0.25	V
Base to emitter saturation voltage	$V_{BE(sat)}$	$I_C = 10mA, I_B = 1mA$			1.0	V
Transition frequency	f_T	$V_{CB} = 10V, I_E = -10mA, f = 200MHz$	450			MHz
Collector output capacitance	C_{ob}	$V_{CB} = 10V, I_E = 0, f = 1MHz$	2	6		pF
Turn-on time	t_{on}	*1		17		ns
Turn-off time	t_{off}			17		ns
Storage time	t_{stg}			10		ns

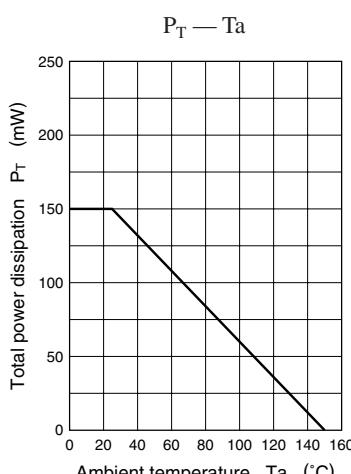
● Tr2

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = -8V, I_E = 0$			-0.1	μA
Emitter cutoff current	I_{EBO}	$V_{EB} = -3V, I_C = 0$			-0.1	μA
Forward current transfer ratio	h_{FE1}	$V_{CE} = -1V, I_C = -10mA$	50		150	
	h_{FE2}	$V_{CE} = -1V, I_C = -1mA$	30			
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_C = -10mA, I_B = -1mA$		-0.1	-0.2	V
Transition frequency	f_T	$V_{CB} = -10V, I_E = 10mA, f = 200MHz$	800	1500		MHz
Collector output capacitance	C_{ob}	$V_{CB} = -5V, I_E = 0, f = 1MHz$	1			pF
Turn-on time	t_{on}	*2		12		ns
Turn-off time	t_{off}			20		ns
Storage time	t_{stg}			19		ns

*1 Refer to the test circuit (page 459)

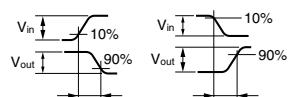
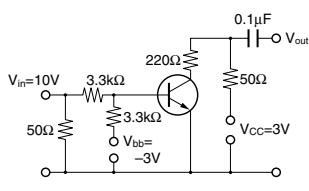
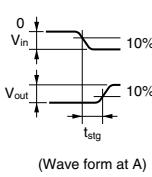
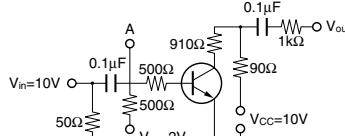
*2 Refer to the test circuit (page 460)

Common characteristics chart

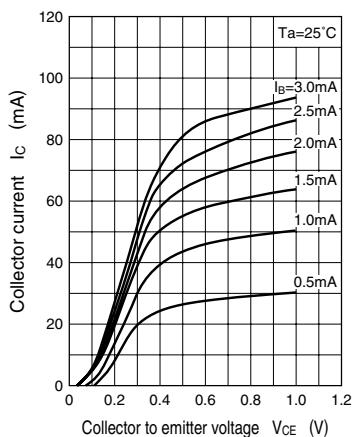
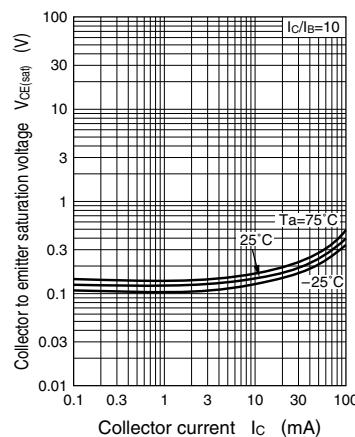
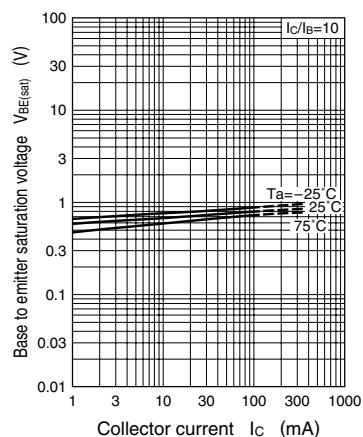
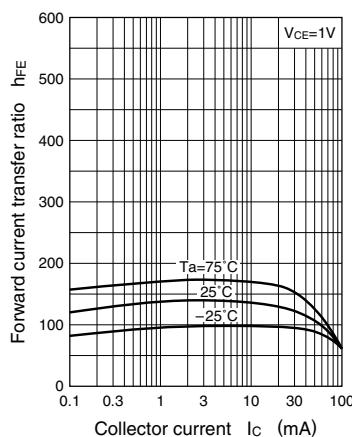
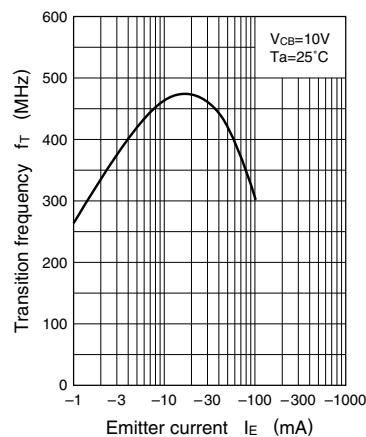
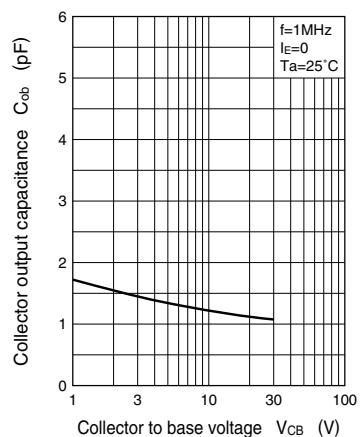


Characteristics charts of Tr1

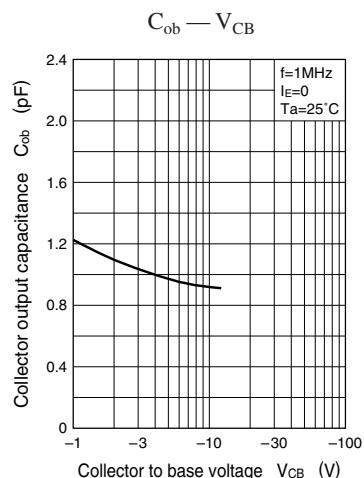
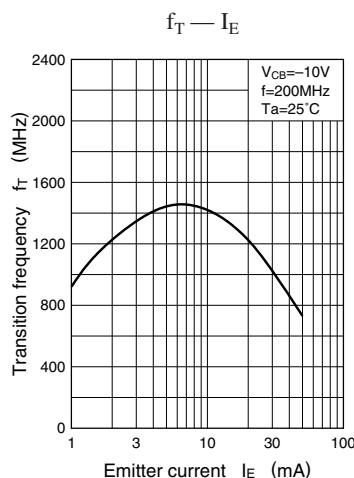
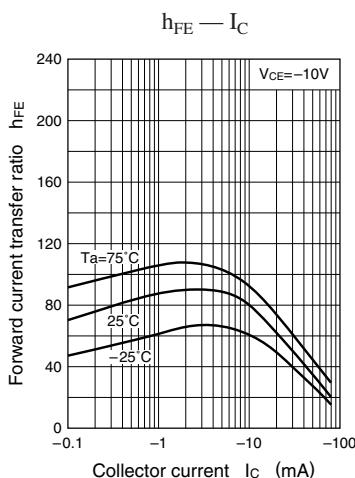
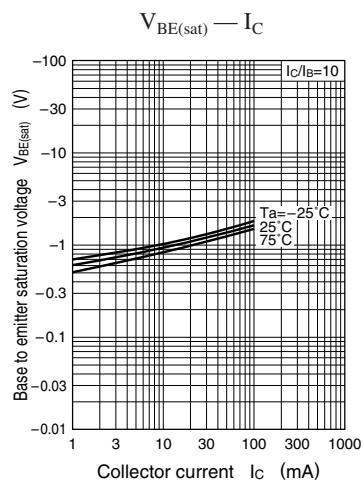
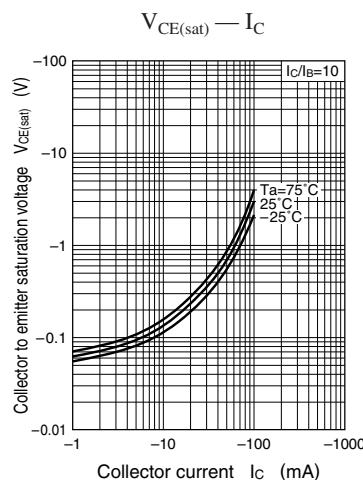
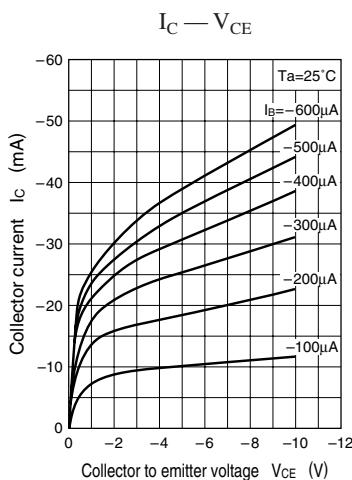
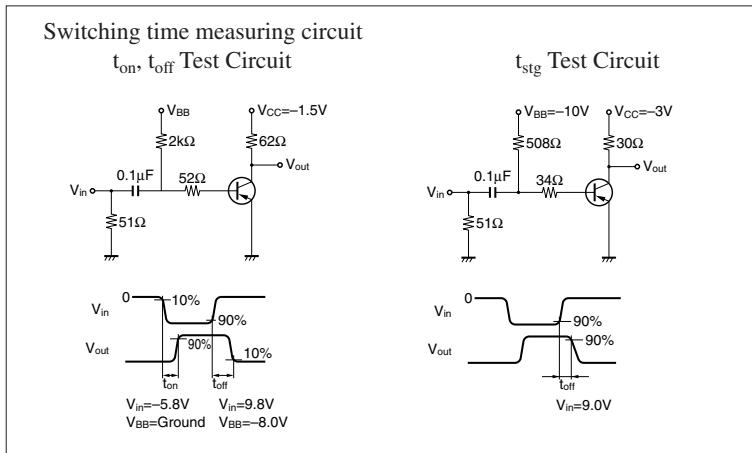
Switching time measuring circuit

 t_{on} , t_{off} Test Circuit t_{stg} Test Circuit

(Wave form at A)

 $I_C - V_{CE}$  $V_{CE(sat)} - I_C$  $V_{BE(sat)} - I_C$  $h_{FE} - I_C$  $f_T - I_E$  $C_{ob} - V_{CB}$ 

Characteristics charts of Tr2



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