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.

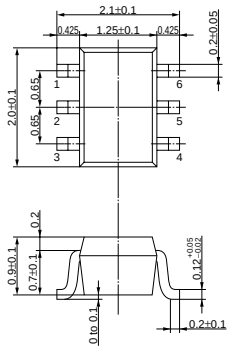
Basic Part Number of Element

- 2SC3757+2SA1738

Absolute Maximum Ratings (Ta=25˚C)

Parameter		Symbol	Ratings	Unit
Tr1	Collector to base voltage	V_{CBO}	40	V
	Collector to emitter voltage	V_{CES}	40	V
	Emitter to base voltage	V_{EBO}	5	V
	Collector current	I_C	100	mA
	Peak collector current	I_{CP}	300	mA
Tr2	Collector to base voltage	V_{CBO}	–15	V
	Collector to emitter voltage	V_{CES}	–15	V
	Emitter to base voltage	V_{EBO}	–4	V
	Collector current	I_C	–50	mA
	Peak collector current	I_{CP}	–100	mA
Overall	Total power dissipation	P_T	150	mW
	Junction temperature	T_j	150	˚C
	Storage temperature	T_{stg}	–55 to +150	˚C

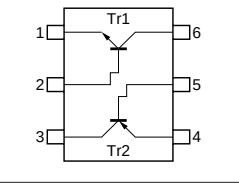
Unit: mm



1 : Emitter (Tr1)
2 : Base (Tr1)
3 : Collector (Tr2)
4 : Emitter (Tr2)
5 : Base (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

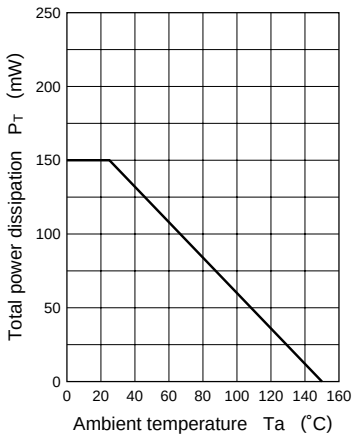
Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	I_{CBO}	V_{CB} = –8V, I_E = 0			– 0.1	µA
Emitter cutoff current	I_{EBO}	V_{EB} = –3V, I_C = 0			– 0.1	µA
Forward current transfer ratio	h_{FE1}	V_{CE} = –1V, I_C = –10mA	50		150	
	h_{FE2}	V_{CE} = –1V, I_C = –1mA	30			
Collector to 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

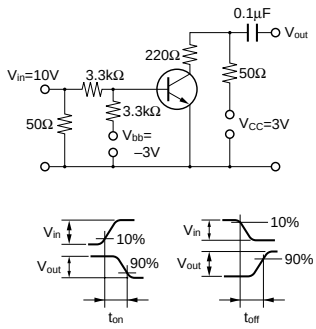
P_T — Ta



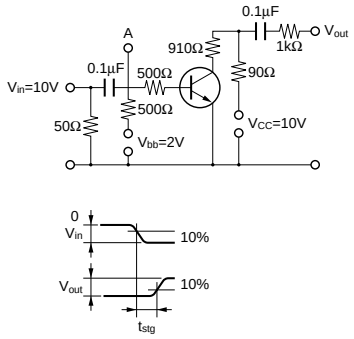
Characteristics charts of Tr1

Switching time measuring circuit

t_{on}, t_{off} Test Circuit

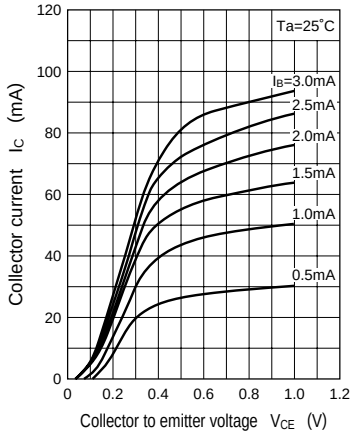


t_{stg} Test Circuit

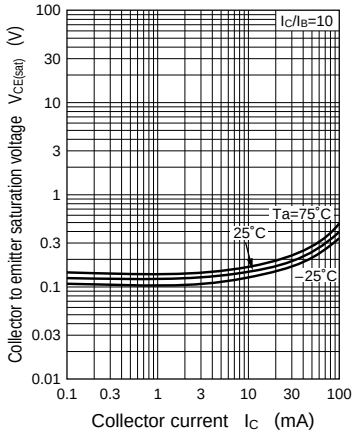


(Wave form at A)

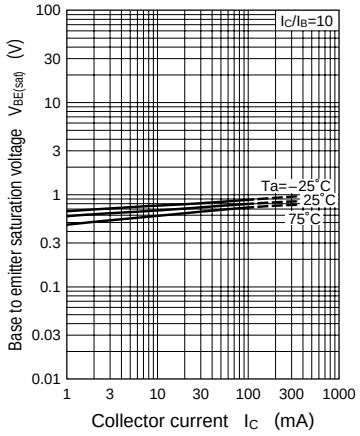
I_C — V_{CE}



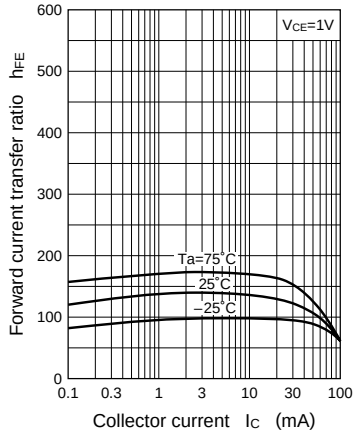
$V_{CE(sat)}$ — I_C



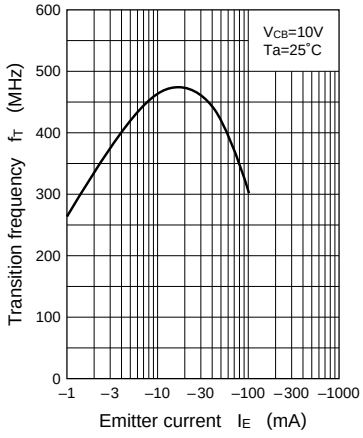
$V_{BE(sat)}$ — I_C



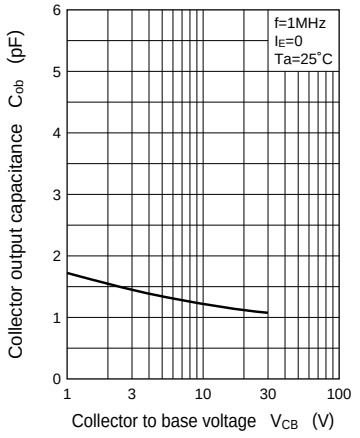
h_{FE} — I_C



f_T — I_E



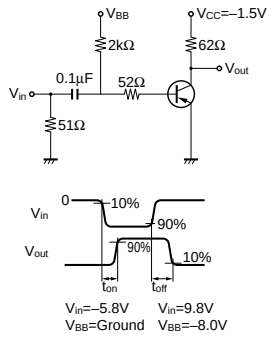
C_{ob} — V_{CB}



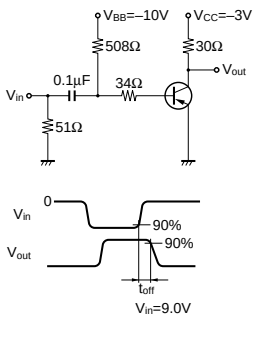
Characteristics charts of Tr2

Switching time measuring circuit

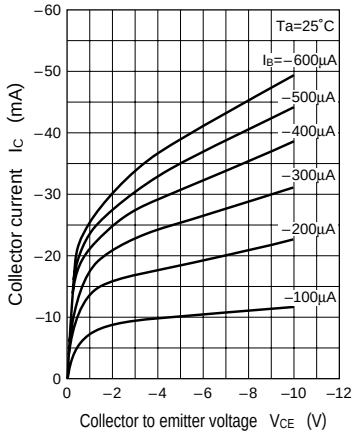
t_{on}, t_{off} Test Circuit



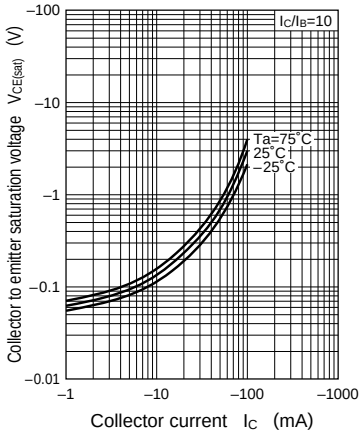
t_{stg} Test Circuit



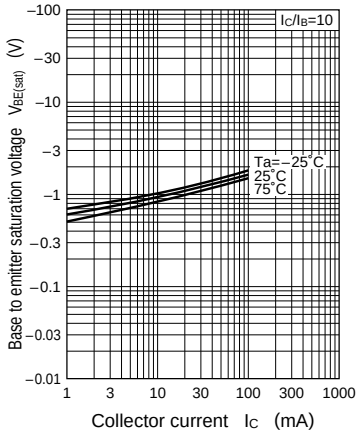
I_C — V_{CE}



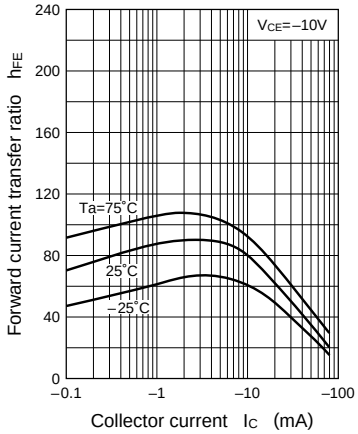
$V_{CE(sat)}$ — I_C



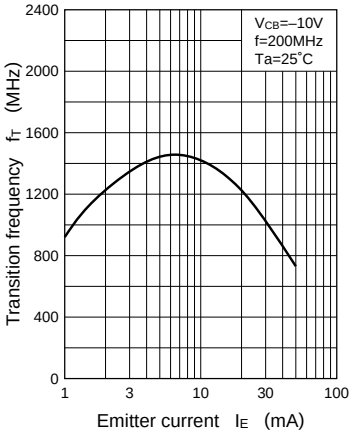
$V_{BE(sat)}$ — I_C



h_{FE} — I_C



f_T — I_E



C_{ob} — V_{CB}