TOSHIBA TRANSISTOR SILICON PNP EPITAXIAL TYPE (PCT PROCESS)

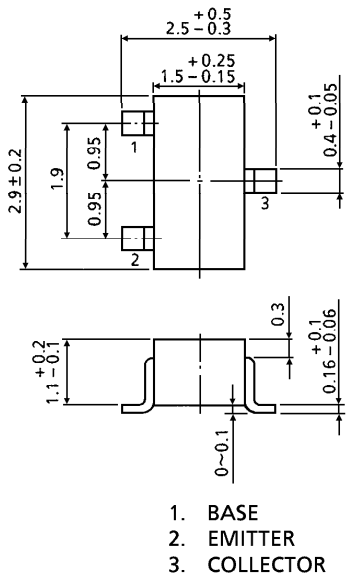
2SA1953

GENERAL PURPOSE AMPLIFIER APPLICATIONS

SWITCHING AND MUTING SWITCH APPLICATION

- Low Saturation Voltage : $V_{CE\ (sat)}$ (1) = −15mV (Typ.) @ I_C = −10mA / I_B = −0.5mA
- Large Collector Current : I_C = −500mA (Max.)

Unit in mm



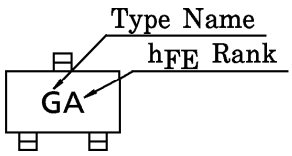
1. BASE
2. EMITTER
3. COLLECTOR

JEDEC	TO-236 MOD
EIAJ	SC-59
TOSHIBA	2-3F1A

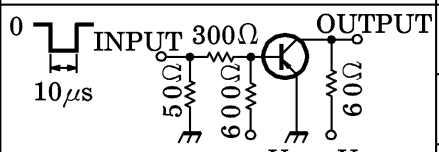
MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	−15	V
Collector-Emitter Voltage	V_{CEO}	−12	V
Emitter-Base Voltage	V_{EBO}	−5	V
Collector Current	I_C	−500	mA
Base Current	I_B	−50	mA
Collector Power Dissipation	P_C	150	mW
Junction Temperature	T_j	125	°C
Storage Temperature Range	T_{stg}	−55~125	°C

MARKING

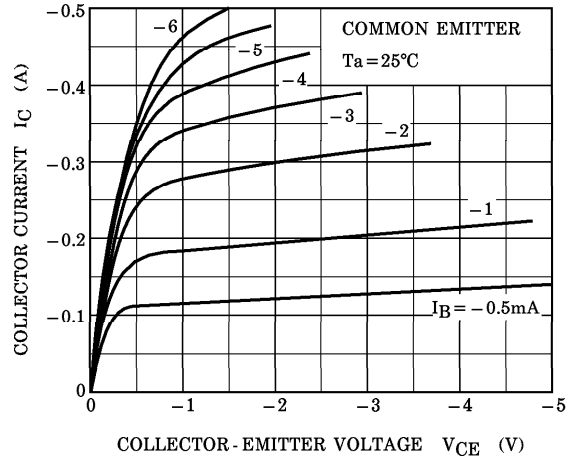


ELECTRICAL CHARACTERISTICS (Ta = 25°C)

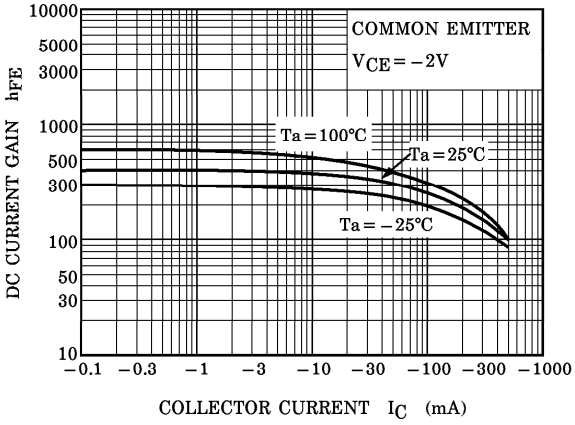
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		I_{CBO}	$V_{CB} = -15V$, $I_E = 0$	—	—	−0.1	μA
Emitter Cut-off Current		I_{EBO}	$V_{EB} = -5V$, $I_C = 0$	—	—	−0.1	μA
DC Current Gain		h_{FE} (Note)	$V_{CE} = -2V$, $I_C = -10mA$	300	—	1000	
Collector-Emitter Saturation Voltage		$V_{CE\ (sat)}$ (1)	$I_C = -10mA$, $I_B = -0.5mA$	—	−15	−30	mV
		$V_{CE\ (sat)}$ (2)	$I_C = -200mA$, $I_B = -10mA$	—	−110	−250	
Base-Emitter Saturation Voltage		$V_{BE\ (sat)}$	$I_C = -200mA$, $I_B = -10mA$	—	−0.87	−1.2	V
Transition Frequency		f_T	$V_{CE} = -2V$, $I_C = -10mA$	80	130	—	MHz
Collector Output Capacitance		C_{ob}	$V_{CB} = -10V$, $I_E = 0$, f = 1MHz	—	4.2	—	pF
Collector-Emitter On Resistance		R_{on}	$I_B = -1mA$, $V_{in} = -1V_{rms}$, f = 1kHz	—	0.9	—	Ω
Switching Time	Turn-on Time	t_{on}		—	40	—	ns
	Storage Time	t_{stg}		—	280	—	
	Fall Time	t_f	$I_{B1} = -I_{B2} = -5mA$	—	45	—	

(Note) h_{FE} Classification A : 300~600, B : 500~1000

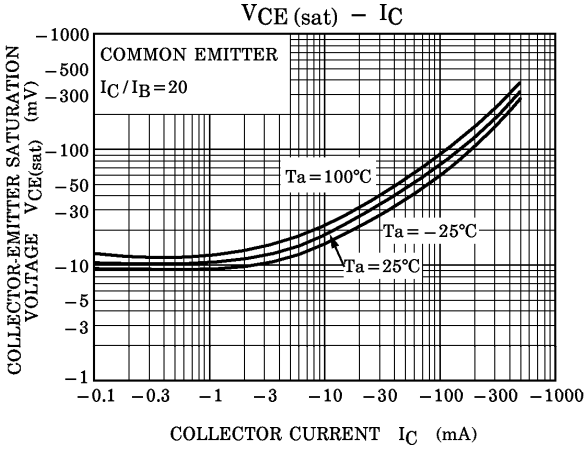
$I_C - V_{CE}$



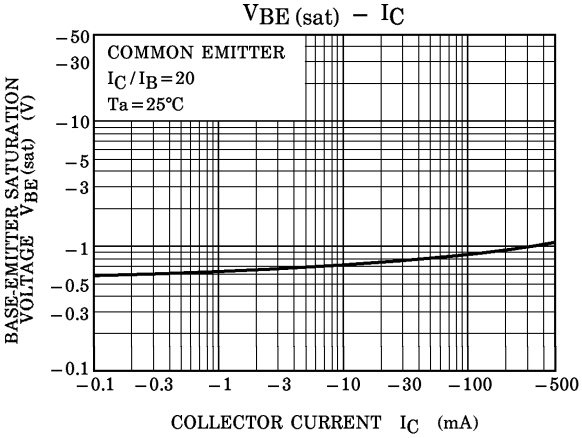
$h_{FE} - I_C$



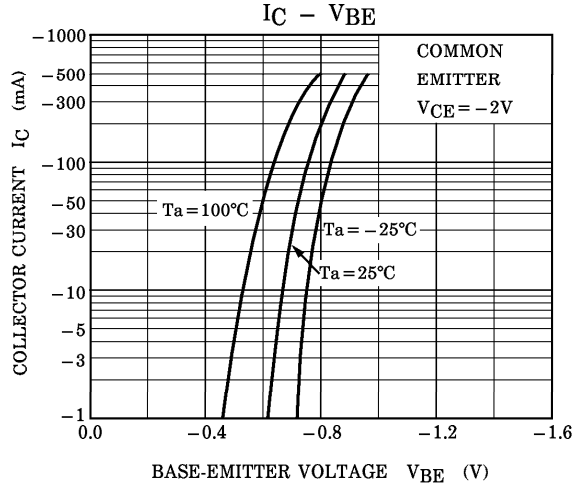
$V_{CE\,(sat)} - I_C$



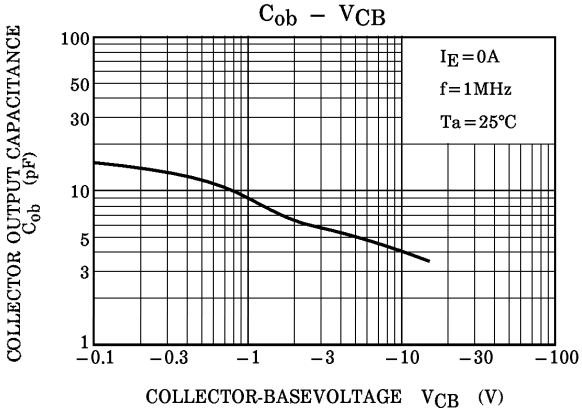
$V_{BE\,(sat)} - I_C$

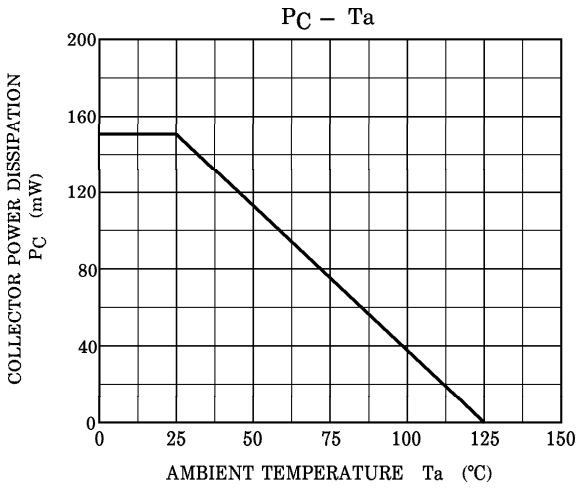


$I_C - V_{BE}$



$C_{ob} - V_{CB}$




P_C – Ta
COLLECTOR POWER DISSIPATION P_C (mW)
200
160
120
80
40
0
0
25
50
75
100
125
150
AMBIENT TEMPERATURE Ta (°C)

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000707EAA

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