

TOSHIBA TRANSISTOR SILICON PNP EPITAXIAL TYPE (PCT PROCESS)

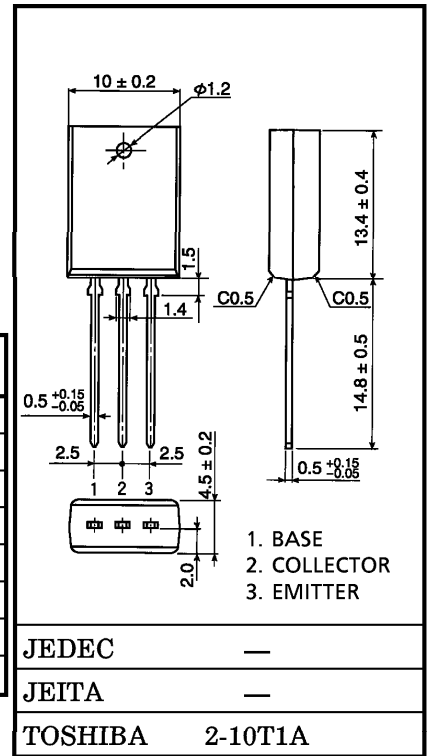
# 2SA1933

HIGH CURRENT SWITCHING APPLICATIONS

- Low Saturation Voltage  
:  $V_{CE(sat)} = -0.4V$  (Max.) at  $I_C = -2 A$
- High Speed Switching Time :  $t_{stg} = 1.0 \mu s$  (Typ.)
- Complementary to 2SC5175

INDUSTRIAL APPLICATIONS

Unit in mm



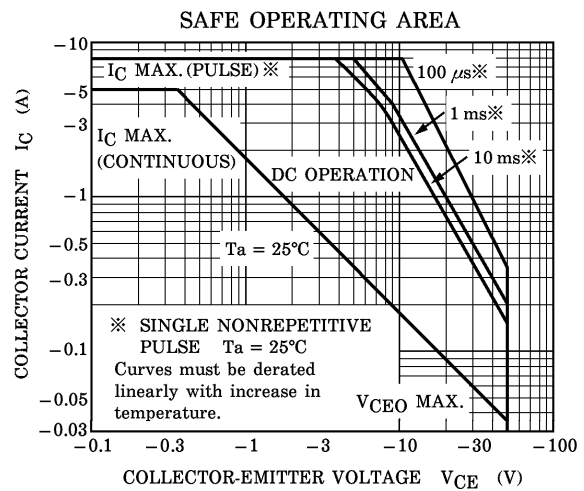
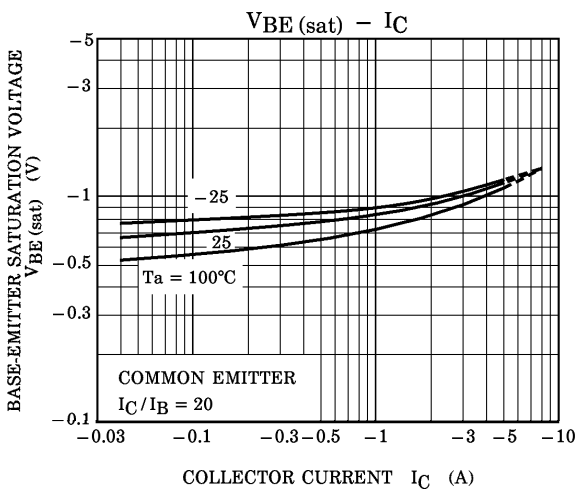
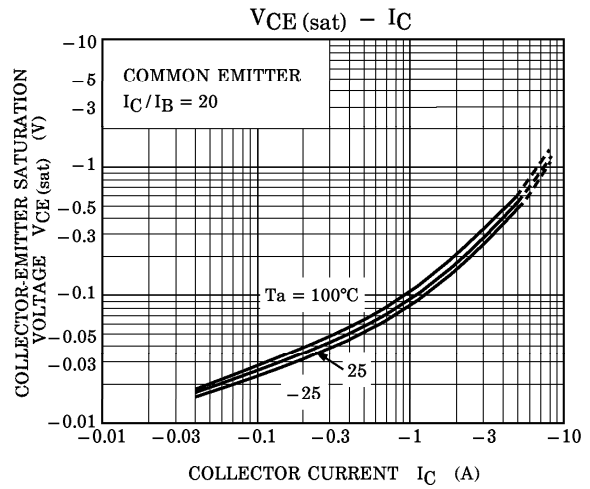
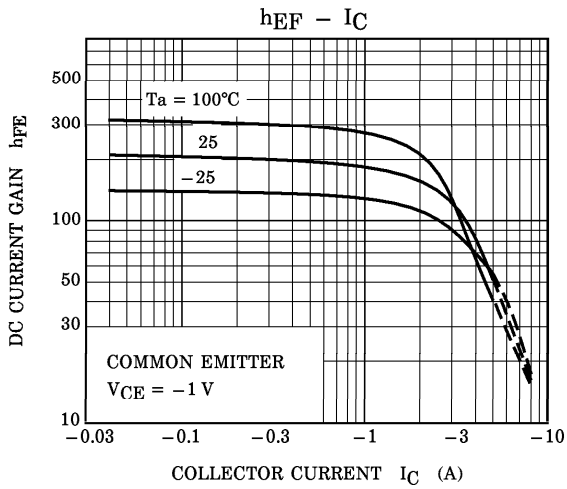
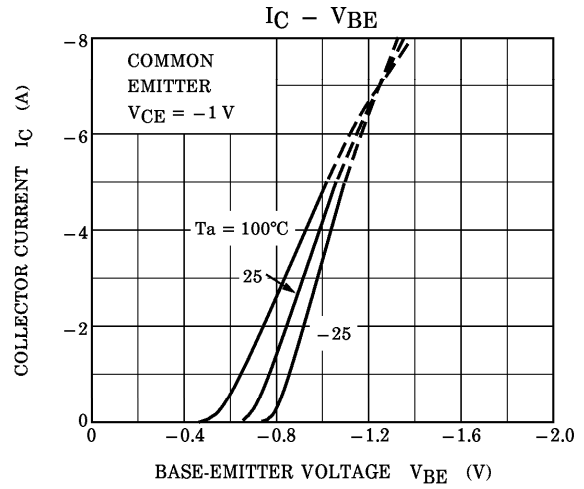
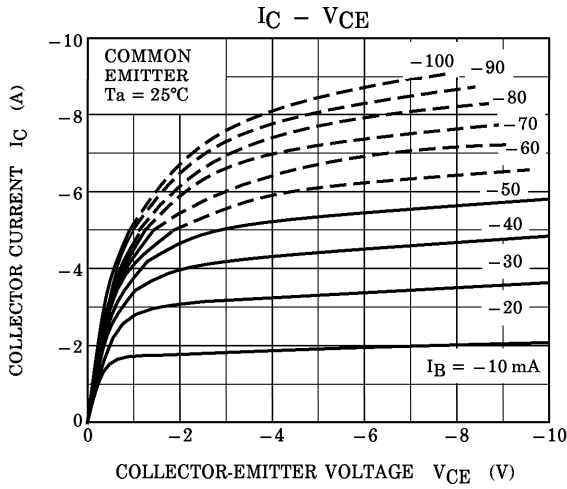
Weight : 1.5 g (Typ.)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	$V_{CBO}$	-60	V
Collector-Emitter Voltage	$V_{CEO}$	-50	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Collector Current	$I_C$	-5	A
Base Current	$I_B$	-1	A
Collector Power Dissipation	$P_C$	1.8	W
Junction Temperature	$T_j$	150	°C
Storage Temperature Range	$T_{stg}$	-55~150	°C

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		$I_{CBO}$	$V_{CB} = -50 V, I_E = 0$	—	—	-1	$\mu A$
Emitter Cut-off Current		$I_{EBO}$	$V_{EB} = -5 V, I_C = 0$	—	—	-1	$\mu A$
Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$	$I_C = -10 mA, I_B = 0$	-50	—	—	V
DC Current Gain		$h_{FE(1)}$	$V_{CE} = -1 V, I_C = -1 A$	100	—	320	
		$h_{FE(2)}$	$V_{CE} = -1 V, I_C = -3 A$	60	—	—	
Saturation Voltage	Collector-Emitter	$V_{CE(sat)}$	$I_C = -2 A, I_B = -0.15 A$	—	-0.2	-0.4	V
	Base-Emitter	$V_{BE(sat)}$	$I_C = -3 A, I_B = -0.15 A$	—	-0.9	-1.5	
Transition Frequency		$f_T$	$V_{CE} = -4 V, I_C = -1 A$	—	60	—	MHz
Collector Output Capacitance		$C_{ob}$	$V_{CB} = -10 V, I_E = 0, f = 1 MHz$	—	170	—	pF
Switching Time	Turn-on Time	$t_{on}$	<p>INPUT <math>I_{B2}</math> OUTPUT  <math>I_{B1}</math> <math>I_{B1}</math>  <math>20 \mu s</math>  <math>-I_{B1} = I_{B2} = 0.15 A</math>  DUTY CYCLE <math>\leq 1\%</math>  <math>V_{CC} = -30 V</math></p>	—	0.1	—	$\mu s$
	Storage Time	$t_{stg}$		—	1.0	—	
	Fall Time	$t_f$		—	0.1	—	



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