

TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

2SA1933

High-Current Switching Applications

- Low collector saturation voltage: $V_{CE(sat)} = -0.4 \text{ V (max)}$ ($I_C = -2 \text{ A}$)
- High-speed switching time: $t_{stg} = 1.0 \mu\text{s}$ (typ.)
- Complementary to 2SC5175

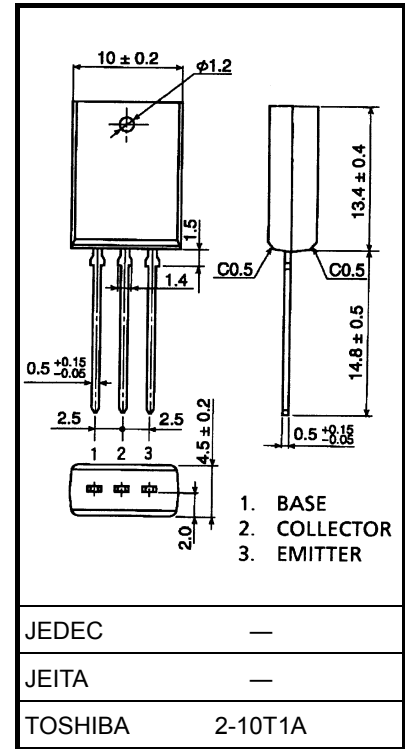
Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	-60	V
Collector-emitter voltage	V_{CEO}	-50	V
Emitter-base voltage	V_{EBO}	-7	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	$^\circ\text{C}$
Storage temperature range	T_{stg}	-55 to 150	$^\circ\text{C}$

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings. Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

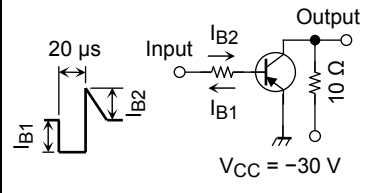
Industrial Applications

Unit: mm

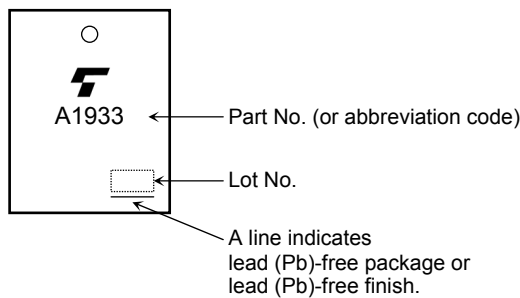


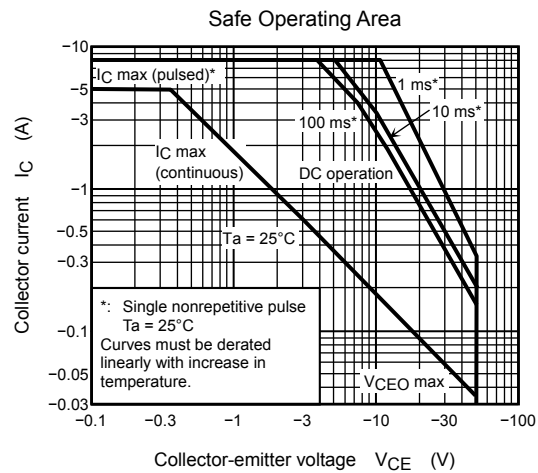
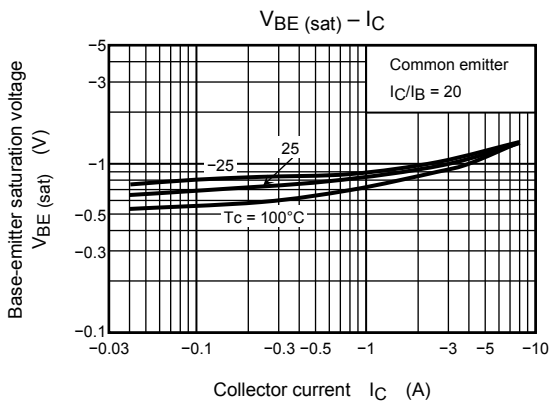
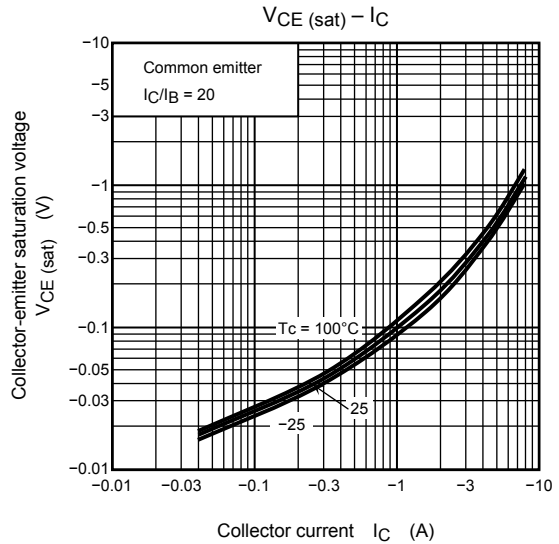
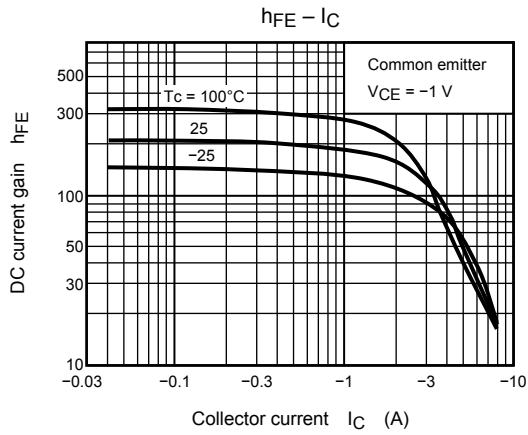
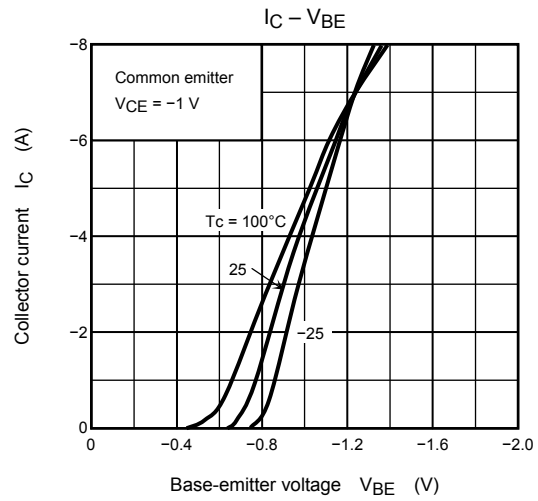
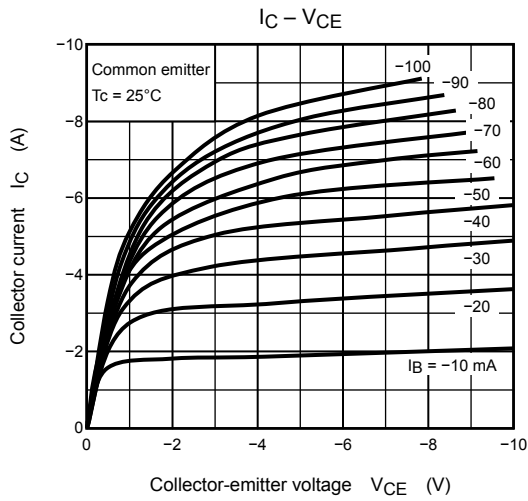
Weight: 1.5 g (typ.)

Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	$V_{CB} = -50\text{ V}, I_E = 0$	—	—	-1	μA
Emitter cut-off current		I_{EBO}	$V_{EB} = -7\text{ V}, I_C = 0$	—	—	-1	μA
Collector-emitter breakdown voltage		$V_{(BR)CEO}$	$I_C = -10\text{ mA}, I_B = 0$	-50	—	—	V
DC current gain		$h_{FE(1)}$	$V_{CE} = -1\text{ V}, I_C = -1\text{ A}$	70	—	320	
		$h_{FE(2)}$	$V_{CE} = -1\text{ V}, I_C = -3\text{ A}$	60	—	—	
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = -2\text{ A}, I_B = -0.15\text{ A}$	—	-0.2	-0.4	V
Base-emitter saturation voltage		$V_{BE(sat)}$	$I_C = -2\text{ A}, I_B = -0.15\text{ A}$	—	-0.9	-1.5	V
Transition frequency		f_T	$V_{CE} = -4\text{ V}, I_C = -1\text{ A}$	—	60	—	MHz
Collector output capacitance		C_{ob}	$V_{CB} = -10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	170	—	pF
Switching time	Turn-on time	t_{on}	 <p>$V_{CC} = -30\text{ V}$</p>	—	0.1	—	μs
	Storage time	t_{stg}		—	1.0	—	
	Fall time	t_f		—	0.1	—	
			$-I_{B1} = I_{B2} = 0.15\text{ A}, \text{duty cycle} \leq 2\%$				

Marking





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