

TOSHIBA Field Effect Transistor Silicon NPN Epitaxial Type (PCT Process) (Darlington)

2SD1784

Micro Motor Drive, Hammer Drive Applications

Switching Applications

Power Amplifier Applications

- High DC current gain: $h_{FE} = 4000$ (min) ($V_{CE} = 2\text{ V}$, $I_C = 150\text{ mA}$)
- Low saturation voltage: $V_{CE(sat)} = 1.5\text{ V}$ (max) ($I_C = 1\text{ A}$, $I_B = 1\text{ mA}$)

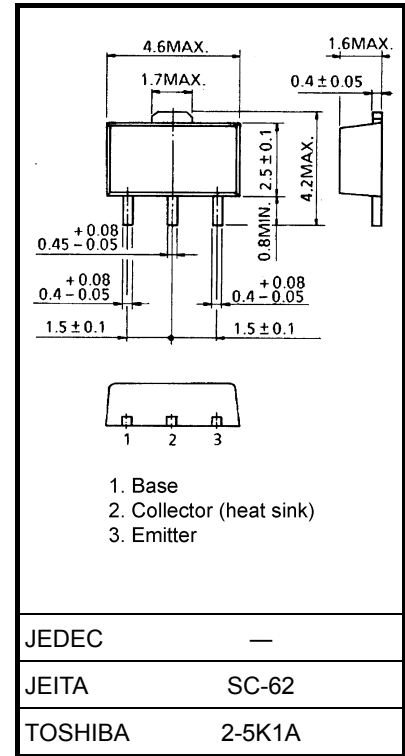
Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	30	V
Collector-emitter voltage	V_{CEO}	30	V
Emitter-base voltage	V_{EBO}	10	V
Collector current	I_C	1.5	A
Base current	I_B	50	mA
Collector power dissipation	P_C (Note 1)	1000	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	-55 to 150	°C

Note 1: 2SD1784 mounted on a ceramic substrate (250 mm² × 0.8 mm)

Note 2: 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).

Unit: mm

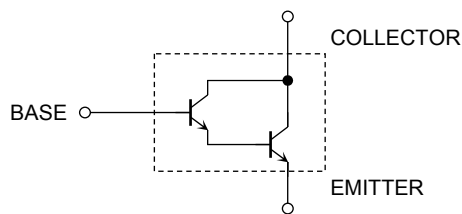


Weight: 0.05 g (typ.)

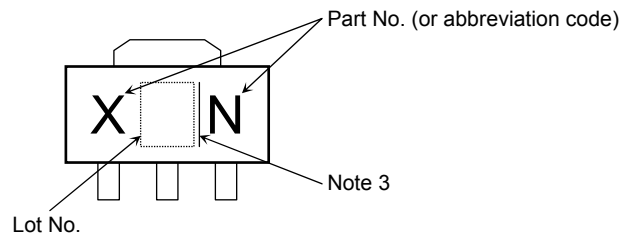
Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	$V_{CB} = 30\text{ V}, I_E = 0$	—	—	10	μA
Emitter cut-off current		I_{EBO}	$V_{EB} = 10\text{ V}, I_C = 0$	—	—	10	μA
Collector-emitter breakdown voltage		$V_{(BR)CEO}$	$I_C = 10\text{ mA}, I_B = 0$	30	—	—	V
DC current gain		h_{FE}	$V_{CE} = 2\text{ V}, I_C = 150\text{ mA}$	4000	—	—	—
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = 1\text{ A}, I_B = 1\text{ mA}$	—	—	1.5	V
Base-emitter saturation voltage		$V_{BE(sat)}$	$I_C = 1\text{ A}, I_B = 1\text{ mA}$	—	—	2.2	V
Switching time	Turn-on time	t_{on}	<p>$I_B(1) = I_B(2) = 1\text{ mA}$ $V_{CC} = 15\text{ V}$ DUTY CYCLE $\leq 1\%$</p>	—	0.20	—	μs
	Storage time	t_{stg}		—	0.6	—	
	Fall time	t_f		—	0.3	—	

Equivalent Circuit



Marking

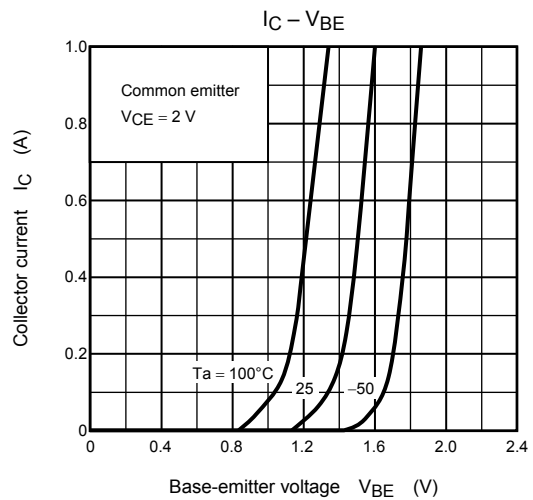
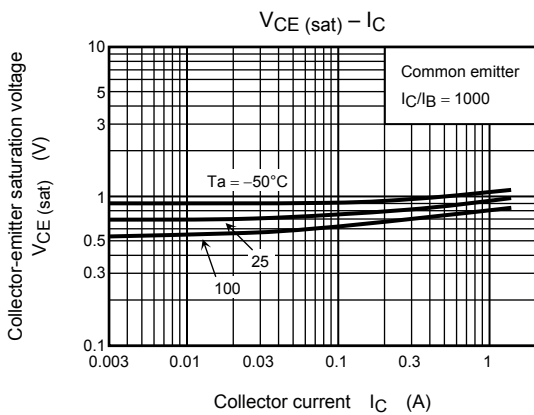
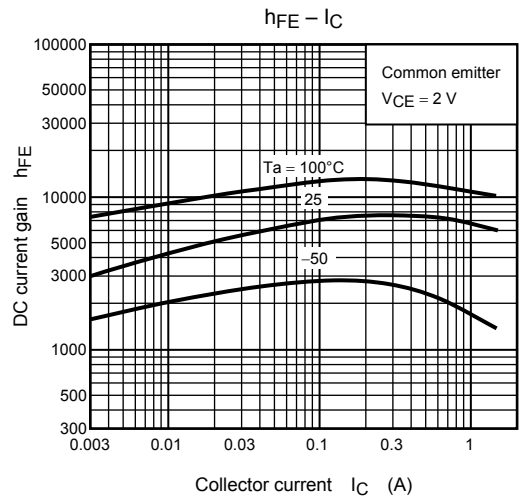
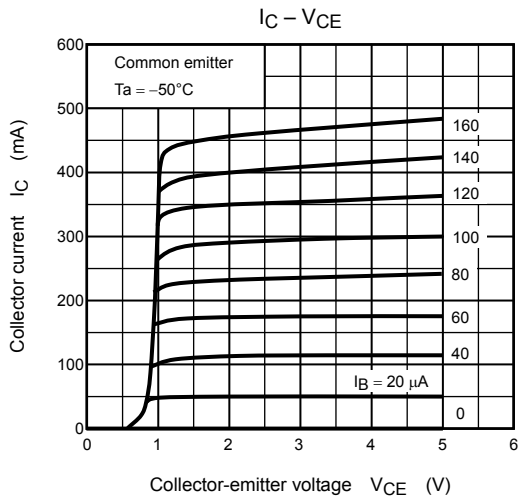
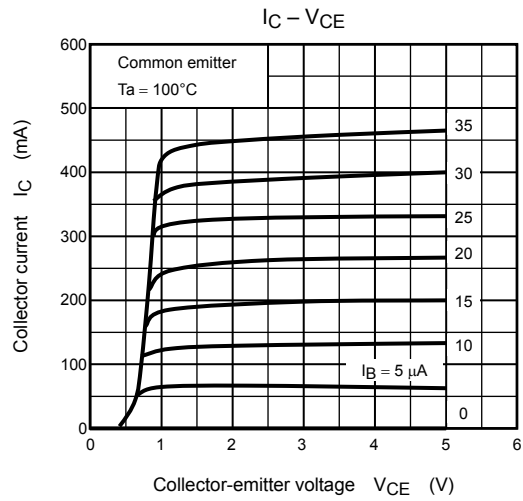
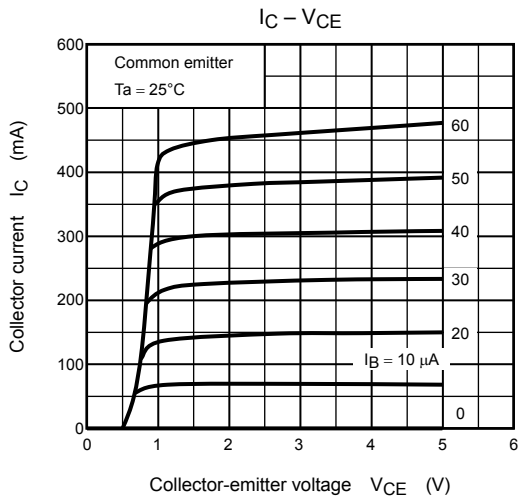


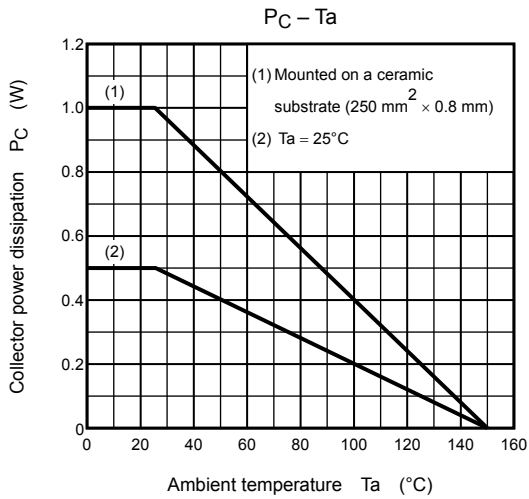
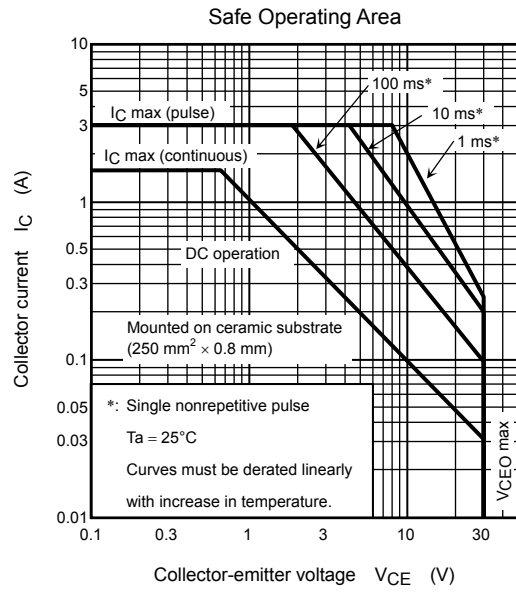
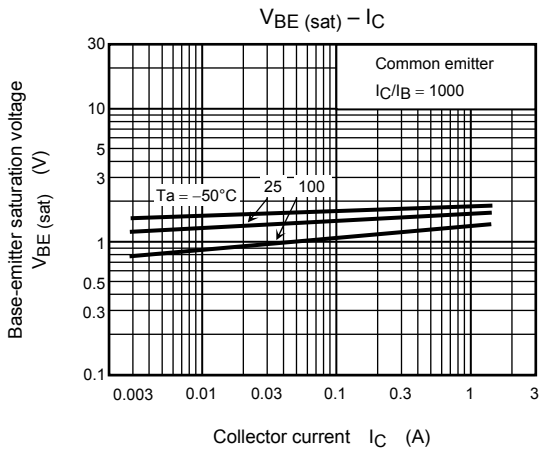
Note 3: A line beside a Lot No. identifies the indication of product Labels.

Without a line: $[[Pb]]/INCLUDES > MCV$

With a line: $[[G]]/RoHS COMPATIBLE$ or $[[G]]/RoHS [[Pb]]$

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