TOSHIBA Transistor Silicon NPN Triple Diffused Type (PCT Process) (Darlington Power Transistor)

# 2SD1140

Micro Motor Drive, Hammer Drive Applications Switching Applications Power Amplifier Applications

- High DC current gain:  $h_{FE} = 4000$  (min) ( $V_{CE} = 2$  V,  $I_{C} = 150$  mA)
- Low saturation voltage: V<sub>CE</sub> (sat) = 1.5 V (max) (I<sub>C</sub> = 1 A, I<sub>B</sub> = 1 mA)

## Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	30	V
Collector-emitter voltage	V <sub>CEO</sub>	30	V
Emitter-base voltage	V <sub>EBO</sub>	10	V
Collector current	IC	1.5	Α
Base current	ΙΒ	50	mA
Collector power dissipation	PC	900	mW
Junction temperature	Tj	150	°C
Storage temperature range	T <sub>stg</sub>	-55 to 150	°C

Note1: 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

1. EMITTER
2. COLLECTOR
3. BASE

Unit: mm

1. 2 3
2.54
2.54
3. BASE

Unit: mm

TOSHIBA

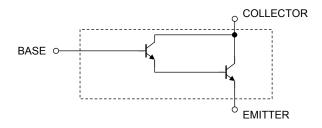
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Weight: 0.36 g (typ.)

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).

# **Equivalent Circuit**

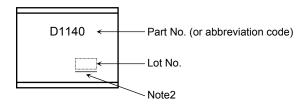




# **Electrical Characteristics (Ta = 25°C)**

Chara	cteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Collector cut-off co	urrent	I <sub>CBO</sub>	V <sub>CB</sub> = 30 V, I <sub>E</sub> = 0	_	_	10	μΑ
Emitter cut-off cur	rent	I <sub>EBO</sub>	V <sub>EB</sub> = 10 V, I <sub>C</sub> = 0	-	_	10	μΑ
Collector-emitter b	oreakdown voltage	V (BR) CEO	I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0	30	_	_	V
DC current gain		h <sub>FE</sub>	V <sub>CE</sub> = 2 V, I <sub>C</sub> = 150 mA	4000	_	_	
Collector-emitter s	saturation voltage	V <sub>CE</sub> (sat)	I <sub>C</sub> = 1 A, I <sub>B</sub> = 1 mA	_	_	1.5	V
Base-emitter saturation voltage		V <sub>BE (sat)</sub>	I <sub>C</sub> = 1 A, I <sub>B</sub> = 1 mA	_	_	2.2	V
Switching time Storage	Turn-on time	t <sub>on</sub>	20 μs Input Output		0.2	_	
	Storage time	t <sub>stg</sub>		_	0.6	_	μs
	Fall time	t <sub>f</sub>	$V_{CC}$ = 15 V $I_{B1}$ = 1 mA, $I_{B2}$ = 1 mA duty cycle ≤ 1%	_	0.3	_	

### Marking



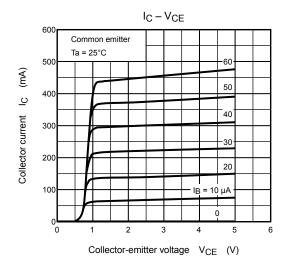
Note2: A line under a Lot No. identifies the indication of product Labels.

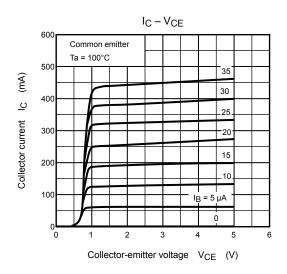
Not underlined: [[Pb]]/INCLUDES > MCV

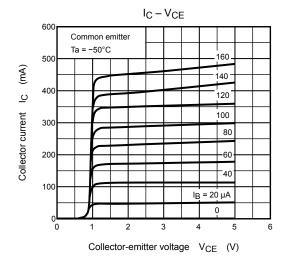
Underlined: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

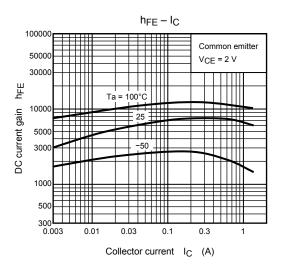
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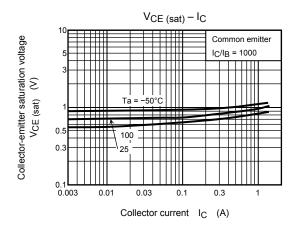
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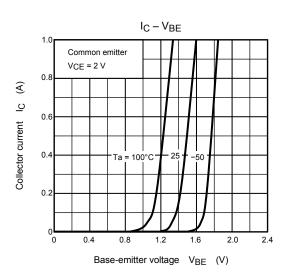


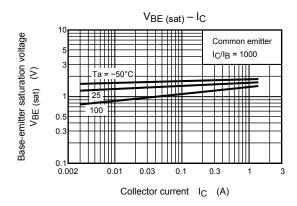


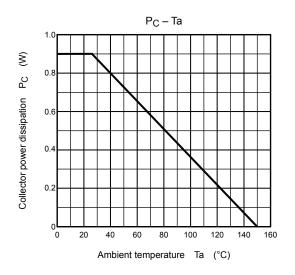


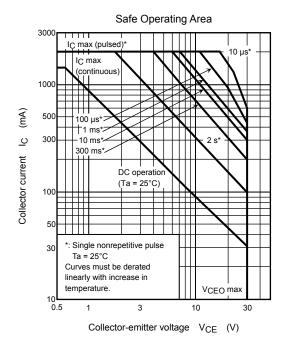












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