Unit: mm

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process) (Darlington power transistor)

# 2SD1140

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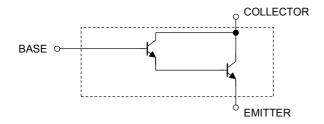
Micro Motor Drive, Hammer Drive Applications Switching Applications Power Amplifier Applications

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

### **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	Ι <sub>Β</sub>	50	mA
Collector power dissipation	P <sub>C</sub>	900	mW
Junction temperature	Tj	150	°C
Storage temperature range	T <sub>stg</sub>	-55 to 150	°C

### **Equivalent Circuit**



0.75MAX. 1.0MAX. 0.8MAX. 0.6MAX. 1.27

2. COLLECTOR3. BASE

1. EMITTER

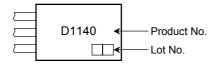
JEDEC	TO-92MOD		
JEITA	_		
TOSHIRA	2-5 Ι1Δ		

Weight: 0.36 g (typ.)

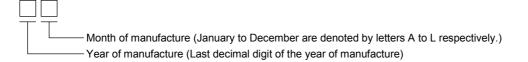
## Electrical Characteristics (Ta = 25°C)

Chara	acteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Collector cut-off c	urrent	I <sub>CBO</sub>	V <sub>CB</sub> = 30 V, I <sub>E</sub> = 0	_	_	10	μΑ
Emitter cut-off cur	rrent	I <sub>EBO</sub>	V <sub>EB</sub> = 10 V, I <sub>C</sub> = 0	_	_	10	μΑ
Collector-emitter	breakdown 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	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 S	Turn-on time	t <sub>on</sub>	20 μs Input Output  Compared to the second	_	0.2	_	
	Storage time	t <sub>stg</sub>		_	0.6	_	μs
	Fall time	t <sub>f</sub>	$V_{CC}$ = 15 V $I_{B1}$ = $-I_{B2}$ = 1 mA, duty cycle $\leq$ 1%	Ι	0.3	-	

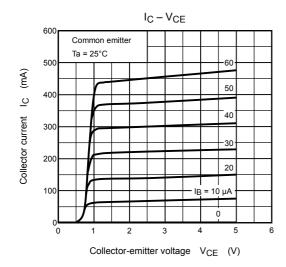
### Marking

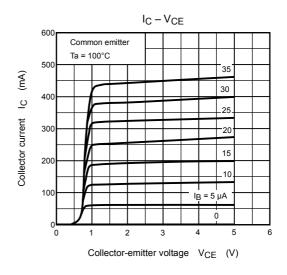


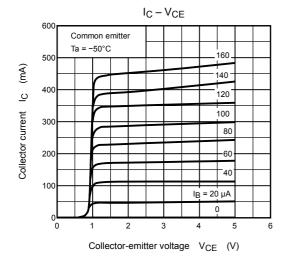
### **Explanation of Lot No.**

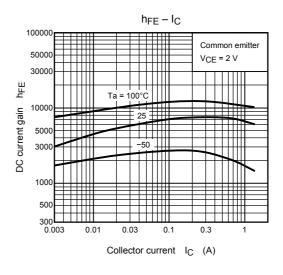


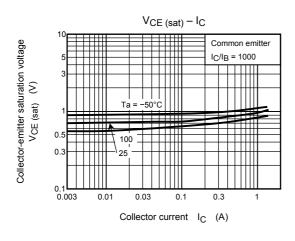
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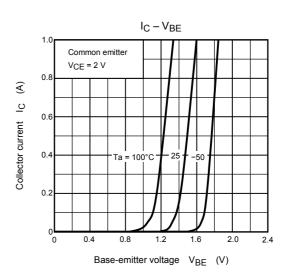


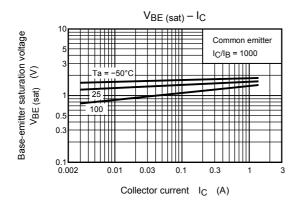


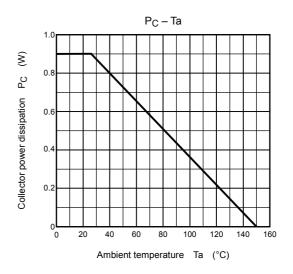


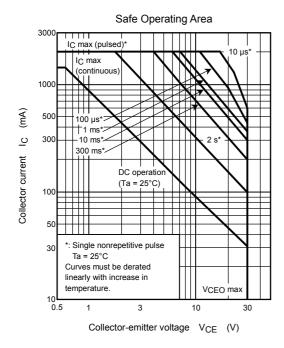












4

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5

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