

TOSHIBA Transistor Silicon NPN Epitaxial Type (Darlington power transistor)

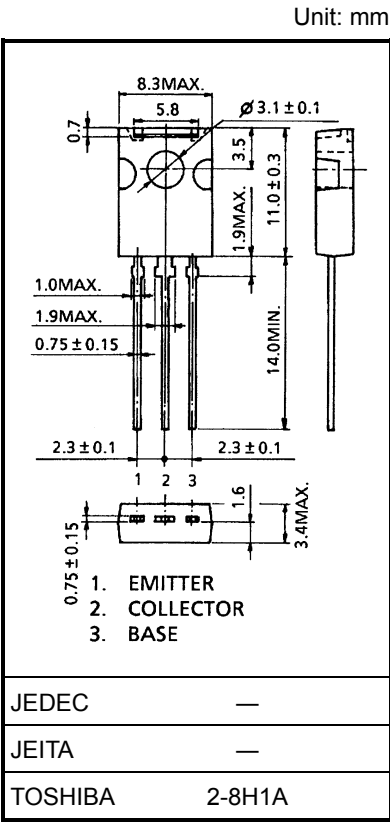
2SD1658

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

- High DC current gain: $h_{FE} = 2000$ (min) ($V_{CE} = 2\text{ V}$, $I_C = 1\text{ A}$)
- Low saturation voltage: $V_{CE}(\text{sat}) = 1.5\text{ V}$ (max) ($I_C = 1\text{ A}$, $I_B = 1\text{ mA}$)
- Zener diode included between collector and base.

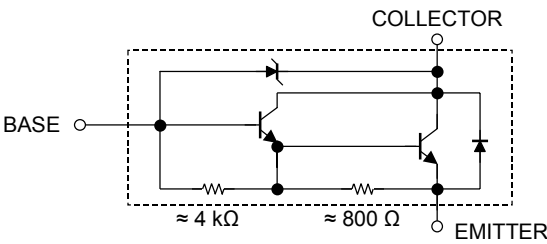
Maximum Ratings ($T_a = 25^\circ\text{C}$)

Characteristics		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	60 ± 10	V
Collector-emitter voltage		V_{CEO}	60 ± 10	V
Emitter-base voltage		V_{EBO}	8	V
Collector current		I_C	2	A
Base current		I_B	0.5	A
Collector power dissipation	$T_a = 25^\circ\text{C}$	P_C	1.5	W
	$T_c = 25^\circ\text{C}$		10	
Junction temperature		T_j	150	$^\circ\text{C}$
Storage temperature range		T_{stg}	-55 to 150	$^\circ\text{C}$

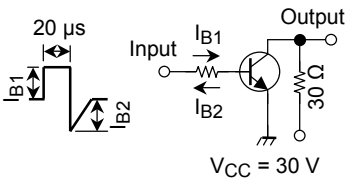


Weight: 0.82 g (typ.)

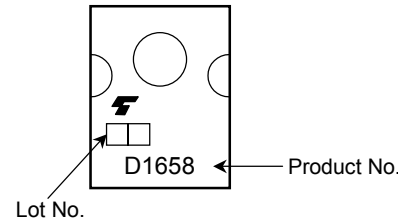
Equivalent Circuit



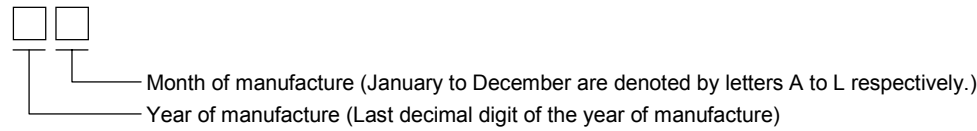
Electrical Characteristics (Ta = 25°C)

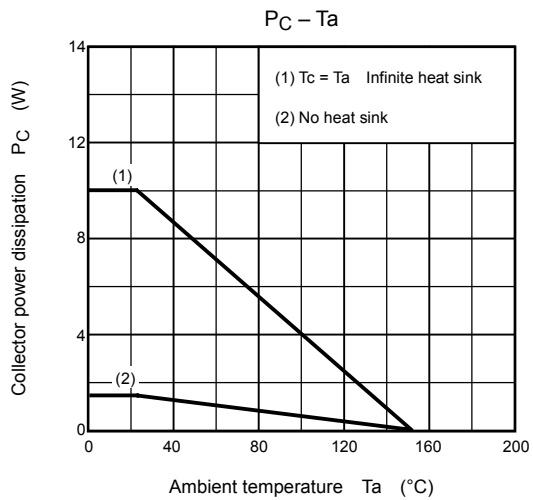
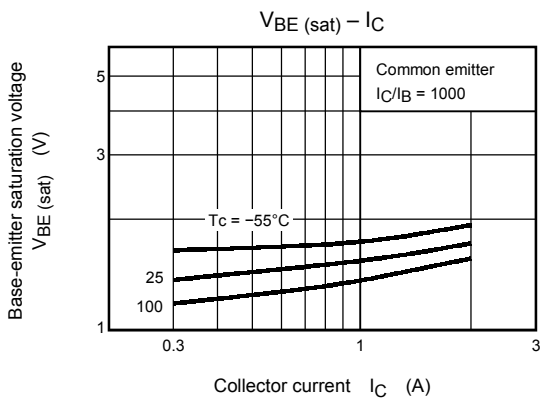
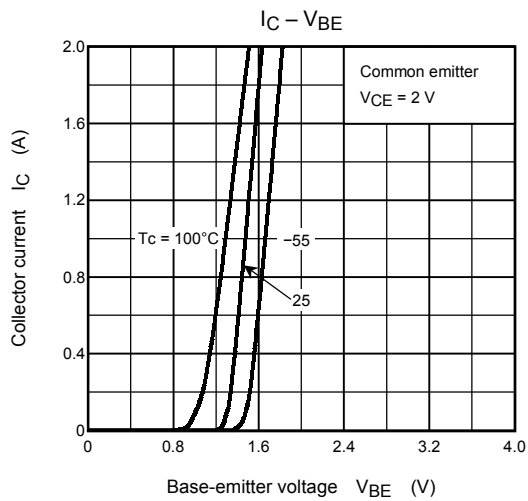
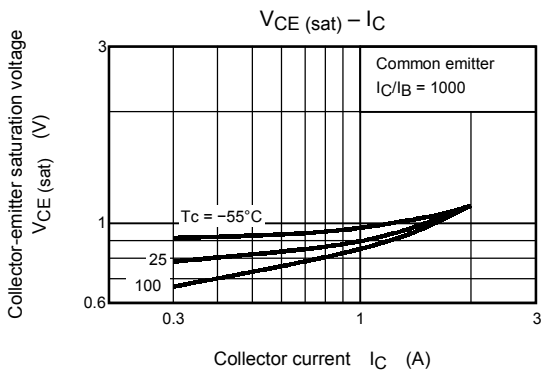
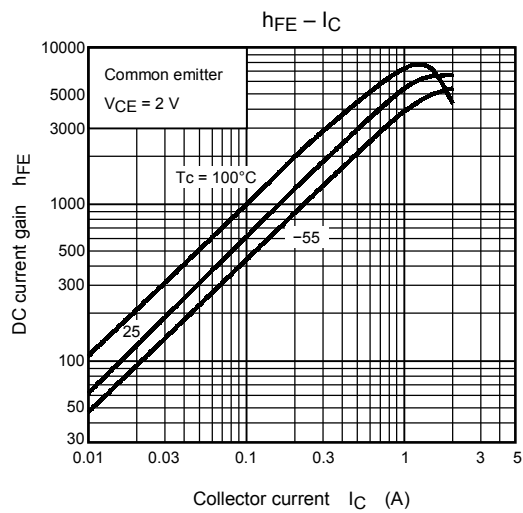
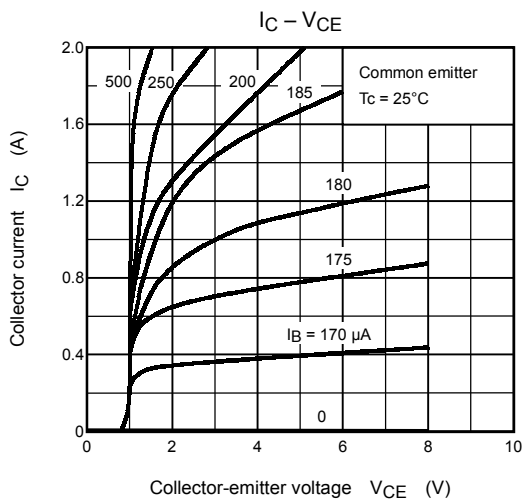
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	$V_{CB} = 45\text{ V}, I_E = 0$	—	—	10	μA
Emitter cut-off current		I_{EBO}	$V_{EB} = 8\text{ V}, I_C = 0$	—	—	4	mA
Collector-emitter breakdown voltage		$V_{(BR)CEO}$	$I_C = 10\text{ mA}, I_B = 0$	50	60	70	V
DC current gain		h_{FE}	$V_{CE} = 2\text{ V}, I_C = 1\text{ A}$	2000	—	—	
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = 1\text{ A}, I_B = 1\text{ mA}$	—	—	1.5	V
Base-emitter saturation voltage		$V_{BE(sat)}$	$I_C = 1\text{ A}, I_B = 1\text{ mA}$	—	—	2.0	V
Transition frequency		f_T	$V_{CE} = 2\text{ V}, I_C = 0.5\text{ A}$	—	100	—	MHz
Collector output capacitance		C_{ob}	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	20	—	pF
Switching time	Turn-on time	t_{on}	 $I_{B1} = -I_{B2} = 1\text{ mA}, \text{duty cycle} \leq 1\%$	—	0.4	—	μs
	Storage time	t_{stg}		—	4.0	—	
	Fall time	t_f		—	0.6	—	

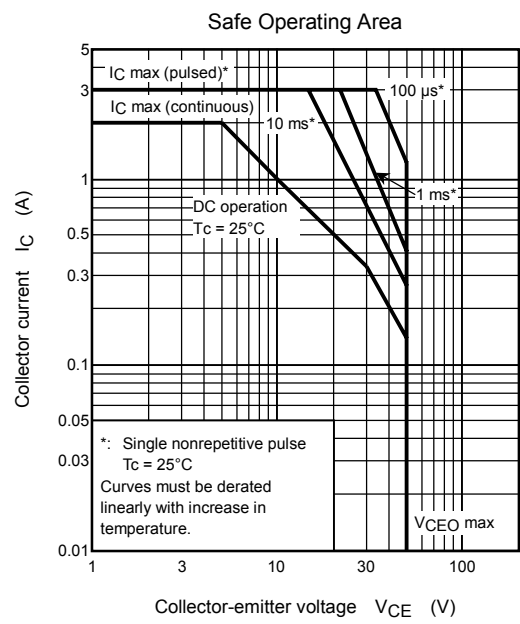
Marking



Explanation of Lot No.







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