

DARLINGTON POWER TRANSISTOR 2SD1843

NPN SILICON EPITAXIAL TRANSISTOR (DARLINGTON CONNECTION) FOR LOW-FREQUENCY POWER AMPLIFIERS AND LOW-SPEED SWITCHING

The 2SD1843 is a Darlington connection transistor with on-chip dumper diode in collector to emitter and zener diode in collector to base. This transistor is ideal for use in acuator drives such as motors, relays, and solenoids.

FEATURES

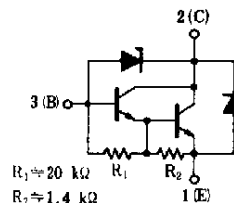
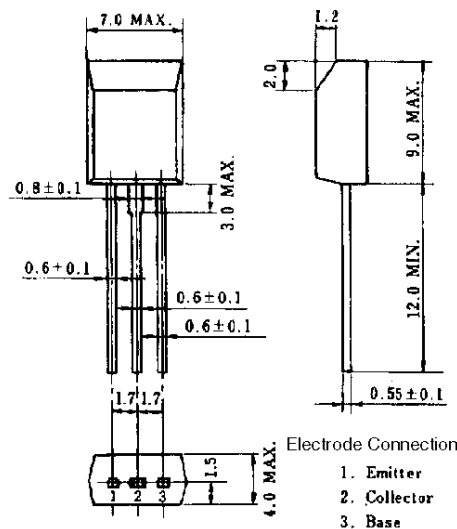
- High DC current gain due to Darlington connection
- High surge resistance due to on-chip protection elements:
C to E: Dumper diode
C to B: Zener diode
- Low collector saturation voltage

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Parameter	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	60±10	V
Collector to emitter voltage	V_{CEO}	60±10	V
Emitter to base voltage	V_{EBO}	7.0	V
Collector current (DC)	$I_{C(DC)}$	±1.0	A
Collector current (pulse)	$I_{C(pulse)^{*}}$	±2.0	A
Total power dissipation	$P_{T(Ta=25^{\circ}C)}$	1.0	W
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

* PW ≤ 10 ms, duty cycle ≤ 50%

PACKAGE DRAWING (UNIT: mm)



ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = 40 \text{ V}, I_E = 0$			0.5	μA
Emitter cutoff current	I_{EBO}	$V_{EB} = 5.0 \text{ V}, I_C = 0$			1.0	mA
DC current gain	h_{FE2}^{**}	$V_{CE} = 2.0 \text{ V}, I_C = 0.2 \text{ A}$	1000			
DC current gain	h_{FE2}^{**}	$V_{CE} = 2.0 \text{ V}, I_C = 0.5 \text{ A}$	2000		30000	
Collector saturation voltage	$V_{CE(sat)}^{**}$	$I_C = 0.5 \text{ A}, I_B = 0.5 \text{ mA}$			1.5	V
Base saturation voltage	$V_{BE(sat)}^{**}$	$I_C = 0.5 \text{ A}, I_B = 0.5 \text{ mA}$			2.0	V
Turn-on time	t_{ON}	$I_C = 0.5 \text{ A}, R_L = 100 \Omega$		0.5		μs
Storage time	t_{stg}	$I_{B1} = -I_{B2} = 0.1 \text{ mA}, V_{CC} = 50 \text{ V}$		1.0		μs
Fall time	t_r			1.0		μs

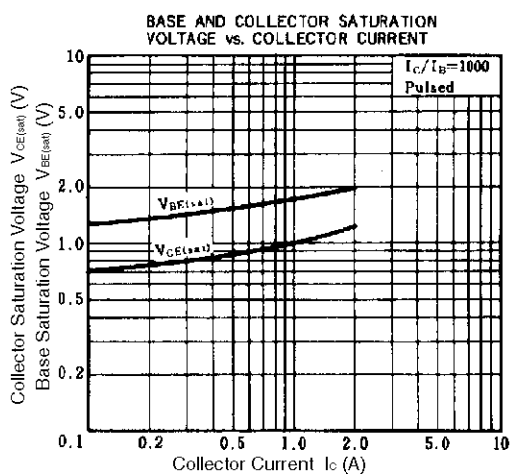
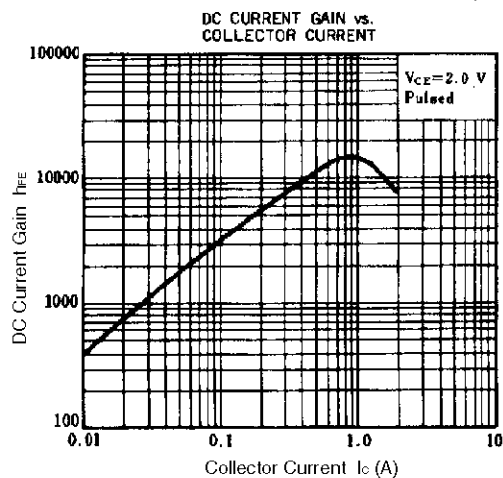
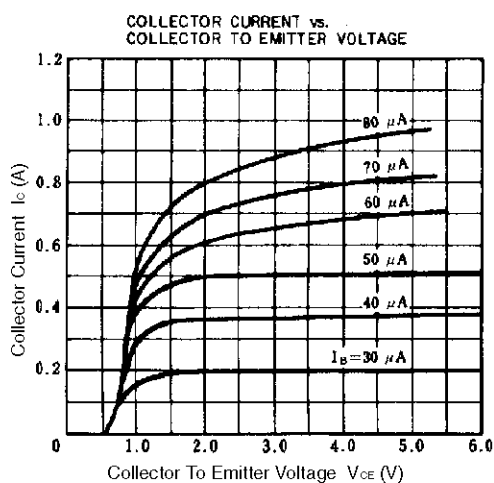
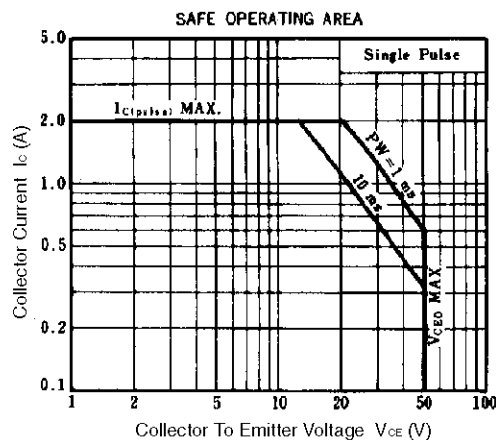
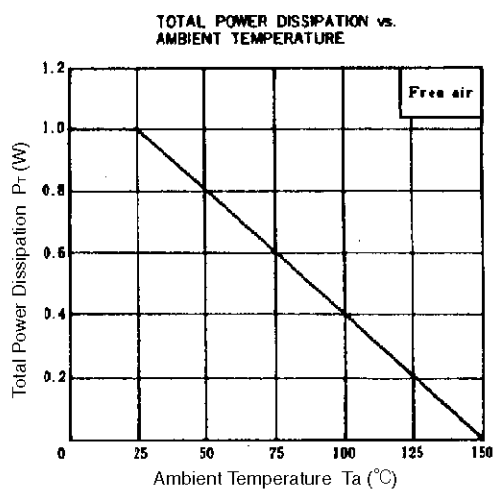
* *Pulse test PW ≤ 350 μs , duty cycle ≤ 2%

hFE CLASSIFICATION

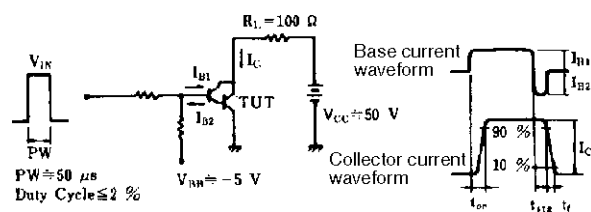
Marking	M	L	K
h_{FE2}	2000 to 5000	4000 to 10000	8000 to 30000

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TYPICAL CHARACTERISTICS (Ta = 25°C)



SWITCHING TIME (t_{on} , t_{stg} , t_f) TEST CIRCUIT



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