DATA SHEET

DARLINGTON POWER TRANSISTOR

2SD1843

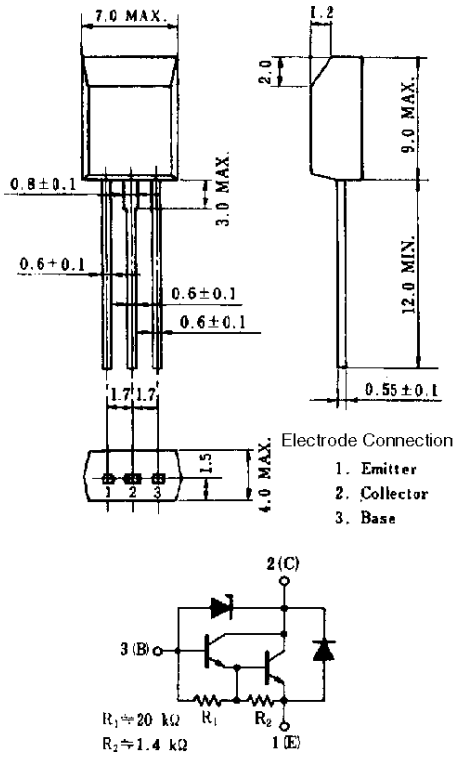
NPN SILICON EPITAXIAL TRANSISTOR (DARLINGTON CONNECTION) FOR LOW-FREQUENCY POWER AMPLIFIERS AND LOW-SPEED SWITCHING

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

PACKAGE DRAWING (UNIT: mm)



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	$P_{T(Ta = 25°C)}$	1.0	W
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	–55 to +150	°C

* PW ≤ 10 ms, duty cycle ≤ 50%

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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

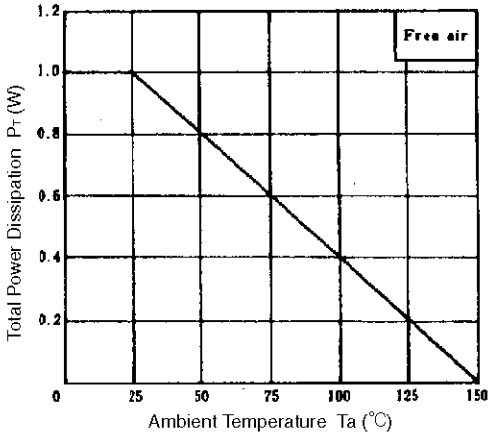
* *Pulse test PW ≤ 350 μs, duty cycle ≤ 2%

h_{FE} CLASSIFICATION

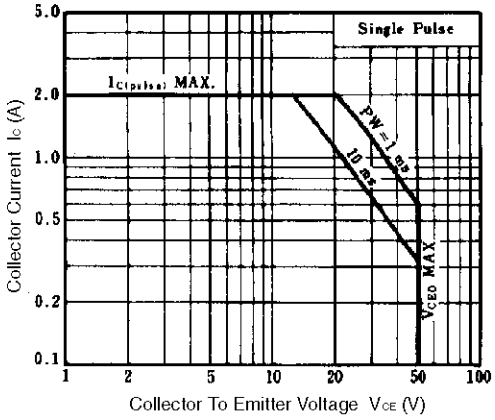
Marking	M	L	K
h_{FE2}	2000 to 5000	4000 to 10000	8000 to 30000

TYPICAL CHARACTERISTICS (Ta = 25°C)

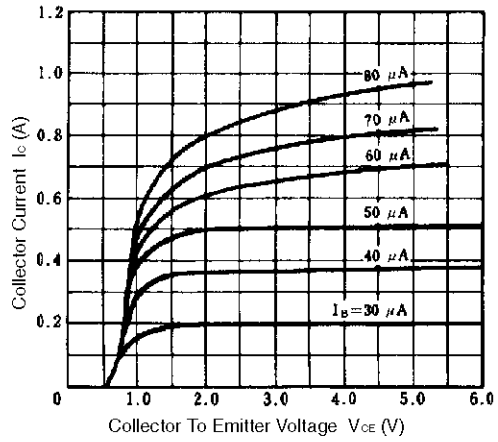
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



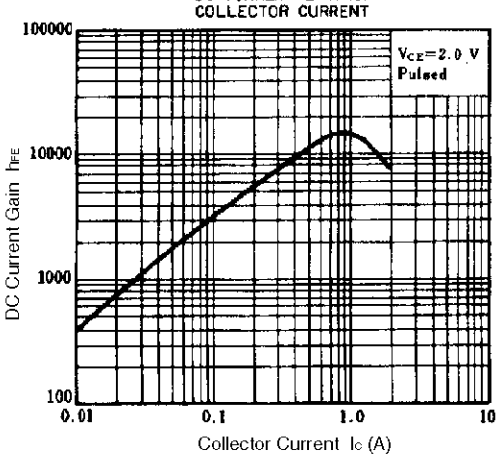
SAFE OPERATING AREA



COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



DC CURRENT GAIN vs. COLLECTOR CURRENT



BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT