

NPN SILICON DARLINGTON TRANSISTOR 2SD1939

DESCRIPTION The 2SD1939 is a darlington transistor including a dumper diode at E-C.

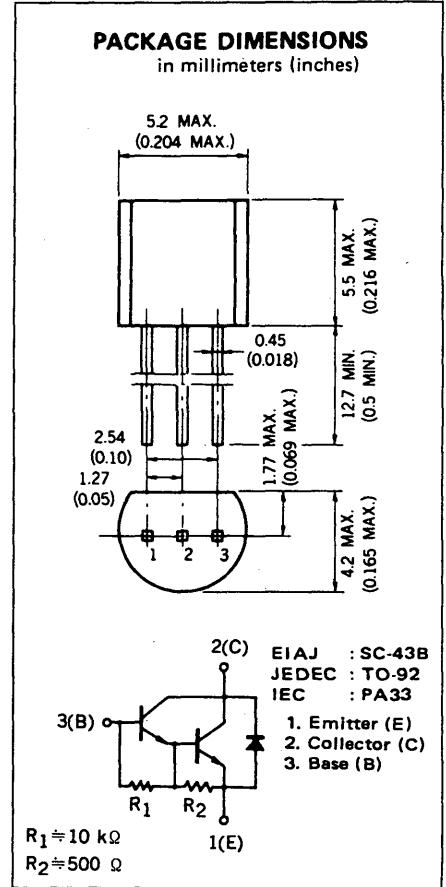
It is suitable for general driving use, such as hammer, solenoid, lamp or motor.

- FEATURES**
- High DC current gain.
 - High current capability, wide ASO and low collector saturation voltage.
 - Includes a dumper diode at E-C.

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures	
Storage Temperature	-55 to +150 °C
Junction Temperature	150 °C Maximum
Maximum Power Dissipation (T _a = 25 °C)	
Total Power Dissipation	0.75 W
Maximum Voltages and Currents (T _a = 25 °C)	
V _{CBO} Collector to Base Voltage	150 V
V _{CEO} Collector to Emitter Voltage	80 V
V _{EBO} Emitter to Base Voltage	8.0 V
I _C Collector Current (DC)	±1.5 A
I _C Collector Current (Pulse)*	±3.0 A
I _B Base Current (DC)	0.15 A

*PW ≤ 300 μs, Duty Cycle ≤ 10 %



ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

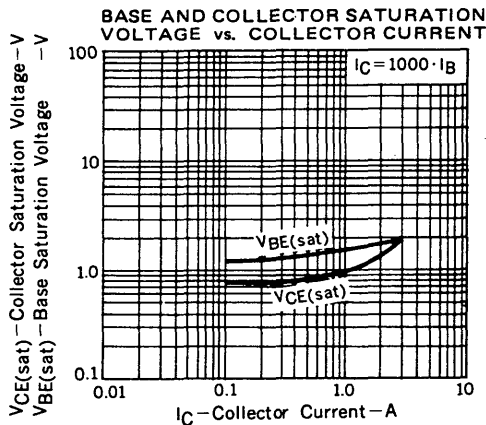
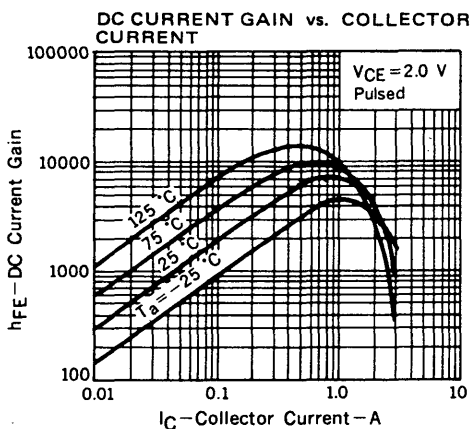
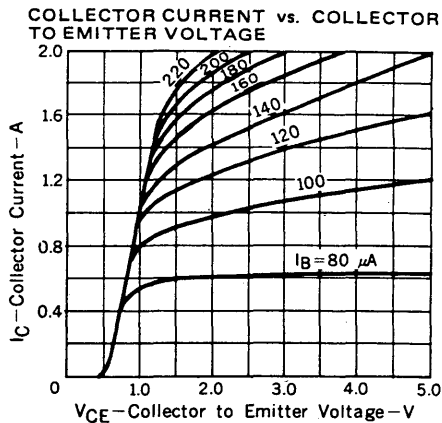
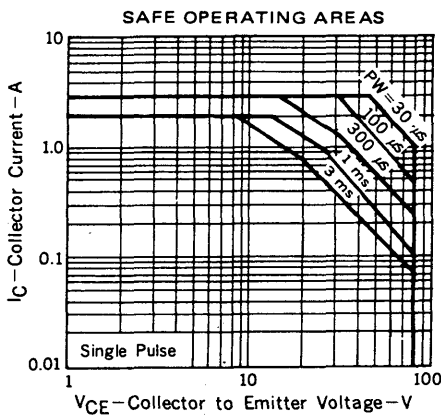
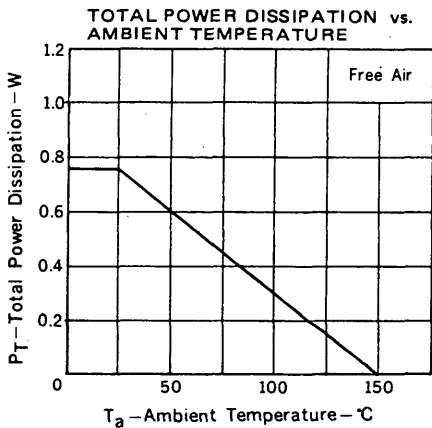
SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
h _{FE1}	DC Current Gain	1000			—	V _{CE} = 2.0 V, I _C = 0.5 A
h _{FE2}	DC Current Gain	2000		30000	—	V _{CE} = 2.0 V, I _C = 1.0 A
t _{on}	Turn-On Time		0.5		μs	(I _C = 1.0 A, R _L = 50 Ω I _{B1} = -I _{B2} = 1.0 mA, V _{CC} = 50 V) See Test Circuit
t _{stg}	Storage Time		1.0		μs	
t _f	Fall Time		1.0		μs	
I _{CBO}	Collector Cutoff Current			10	μA	V _{CB} = 80 V, I _E = 0
I _{CER}	Collector Cutoff Current			1.0	mA	V _{CE} = 80 V, R _{BE} = 51 Ω, T _a = 125 °C
I _{CEX1}	Collector Cutoff Current			10	μA	V _{CE} = 80 V, V _{BE(off)} = -1.5 V
I _{CEX2}	Collector Cutoff Current			1.0	mA	V _{CE} = 80 V, V _{BE(off)} = -15 V, T _a = 125 °C
I _{EBO}	Emitter Cutoff Current			1.0	mA	V _{EB} = 5.0 V, I _C = 0
V _{CE(sat)}	Collector Saturation Voltage			1.5	V	I _C = 1.0 A, I _B = 1.0 mA
V _{BE(sat)}	Base Saturation Voltage			2.0	V	
f _T	Gain Bandwidth Product		60		MHz	V _{CE} = 10 V, I _E = -1.0 A

Classification of h_{FE2}

Rank	M	L	K
Range	2000 to 5000	4000 to 10000	8000 to 30000

Test Conditions: V_{CE} = 2.0 V, I_C = 1.0 A

TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)



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

