

## NPN SILICON DARLINGTON POWER TRANSISTOR 2SD1630

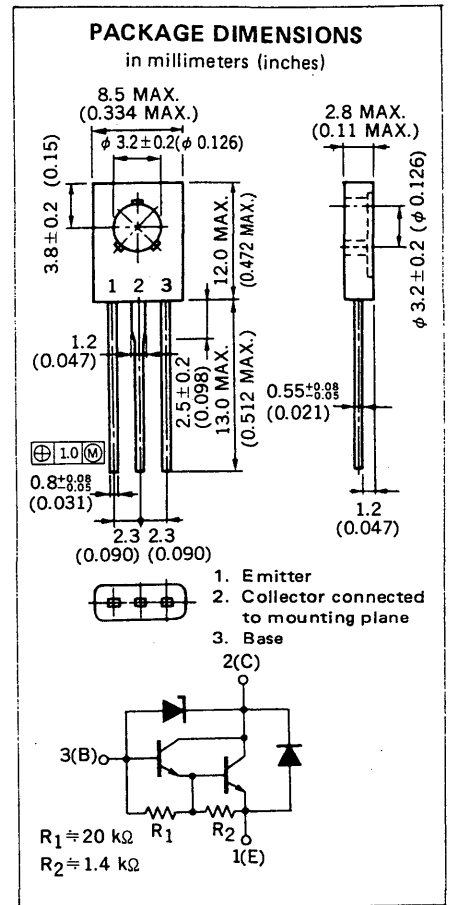
**DESCRIPTION** The 2SD1630 is a darlington transistor built-in a zener diode at B-C and a dumper diode at E-C. It is suitable for use to operate from IC without predriver, such as hammer driver.

- FEATURES**
- High DC Current Gain.
  - Built-in a Zener Diode at B-C and a Dumper Diode at E-C.
  - Low Collector Saturation Voltage.

**ABSOLUTE MAXIMUM RATINGS**

Maximum Temperatures	
Storage Temperature	..... -55 to +150 °C
Junction Temperature	..... +150 °C Maximum
Maximum Power Dissipations	
Total Power Dissipation (T <sub>a</sub> = 25 °C)	..... 1.0 W
Total Power Dissipation (T <sub>c</sub> = 25 °C)	..... 10 W
Maximum Voltages and Currents (T <sub>a</sub> = 25 °C)	
V <sub>CB0</sub>	Collector to Base Voltage ..... 60 ± 10 V
V <sub>CEO</sub>	Collector to Emitter Voltage ... 60 ± 10 V
V <sub>EBO</sub>	Emitter to Base Voltage ..... 7.0 V
I <sub>C(DC)</sub>	Collector Current ..... ± 1.0 A
I <sub>C(pulse)</sub> *	Collector Current ..... ± 2.0 A

\* PW ≤ 10 ms, Duty Cycle ≤ 50 %



**ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)**

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
h <sub>FE1</sub> **	DC Current Gain	1000			—	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.2 A
h <sub>FE2</sub> **	DC Current Gain	2000		30000	—	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.5 A
V <sub>CB0</sub>	Collector to Base Voltage	50	60	70	V	I <sub>C</sub> = 1.0 mA, I <sub>E</sub> = 0
V <sub>CEO</sub>	Collector to Emitter Voltage	50	60	70	V	I <sub>C</sub> = 10 mA, R <sub>BE</sub> = ∞
t <sub>on</sub>	Turn On Time		0.5		μs	I <sub>C</sub> = 0.5 A, R <sub>L</sub> = 100 Ω I <sub>B1</sub> = -I <sub>B2</sub> = 0.5 mA, V <sub>CC</sub> = 50 V
t <sub>stg</sub>	Storage Time		1.0		μs	
t <sub>f</sub>	Fall Time		1.0		μs	
I <sub>CB0</sub>	Collector Cutoff Current			0.5	μA	V <sub>CB</sub> = 40 V, I <sub>E</sub> = 0
I <sub>EBO</sub>	Emitter Cutoff Current			1.0	mA	V <sub>EB</sub> = 5.0 V, I <sub>C</sub> = 0
V <sub>CE(sat)</sub> **	Collector Saturation Voltage			1.5	V	I <sub>C</sub> = 0.5 A, I <sub>B</sub> = 0.5 mA
V <sub>BE(sat)</sub> **	Base Saturation Voltage			2.0	V	I <sub>C</sub> = 0.5 A, I <sub>B</sub> = 0.5 mA

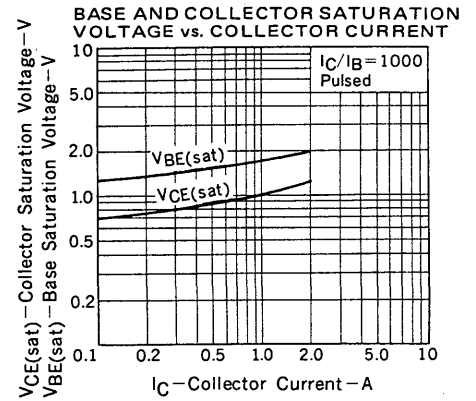
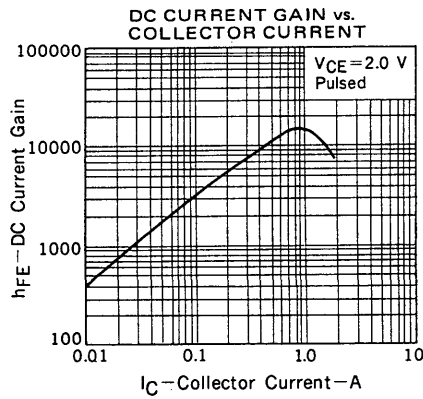
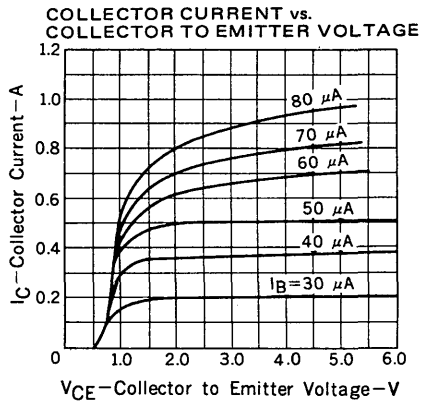
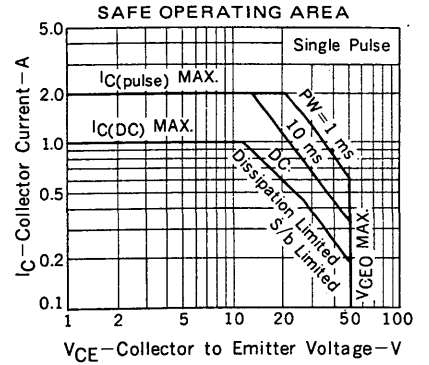
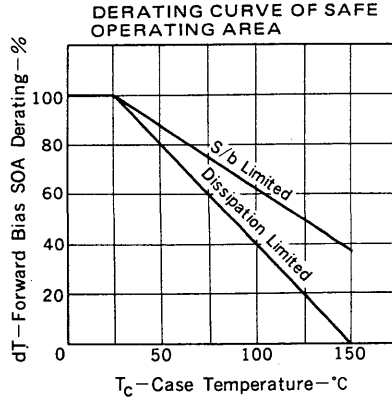
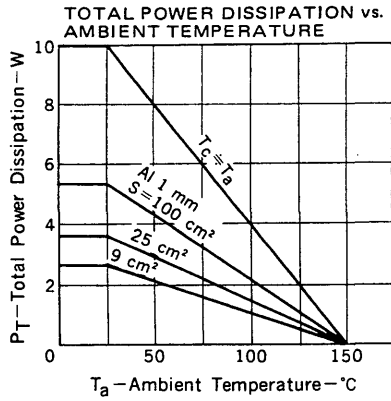
\*\* Pulsed / PW ≤ 350 μs, Duty Cycle ≤ 2 %

**Classification of h<sub>FE2</sub>**

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

Test Conditions: V<sub>CE</sub> = 2.0 V, I<sub>C</sub> = 0.5 A

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



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

