DATA SHEET

RENESAS

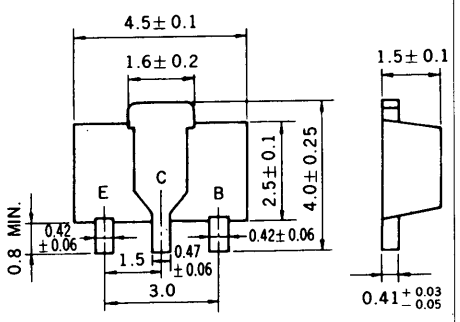
SILICON TRANSISTOR
2SD1702

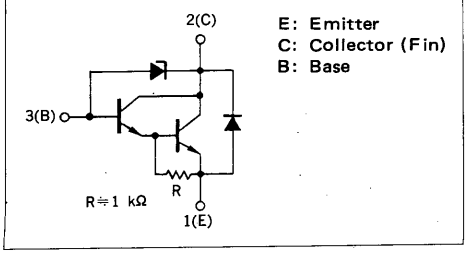
NPN SILICON EPITAXIAL TRANSISTOR
POWER MINI MOLD

DESCRIPTION

The 2SD1702 is NPN silicon epitaxial darlington transistor designed for pulse motor, printer driver, solenoid driver.

PACKAGE DIMENSIONS
in millimeters





E: Emitter
C: Collector (Fin)
B: Base

FEATURES

- High DC Current gain.
- Zener Diode between Collector and Base for Absorbing Surge Voltage is built-in.
- Reverse Diode between Collector and Emitter is built-in.

ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Currents (T_a = 25 °C)			
Collector to Base Voltage	V_{CBO}	60±10	V
Collector to Emitter Voltage	V_{CEO}	60±10	V
Emitter to Base Voltage	V_{EBO}	8.0	V
Collector Current (DC)	I_C	±0.8	A
Collector Current (Pulse)*	I_C	±1.2	A
Maximum Power Dissipation			
Total Power Dissipation at 25 °C Ambient Temperature**	P_T	2.0	W
Maximum Temperatures			
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	−55 to +150	°C

* PW ≦ 10 ms, Duty Cycle ≦ 50 %
** When mounted on ceramic substrate of 16 cm² x 0.7 mm

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDICTIONS
DC Current Gain	h_{FE1}***	4000		50000		V_{CE} = 2.0 V, I_C = 0.5 A
DC Current Gain	h_{FE2}***	1000				V_{CE} = 2.0 V, I_C = 0.8 A
Turn-on Time	t_{on}		0.5		μs	I_C = 0.5 A I_{B1} = −I_{B2} = 1.0 mA V_{CC} = 40 V, R_L = 80 Ω
Storage Time	t_{stg}		2.5		μs	
Fall Time	t_f		1.0		μs	
Collector Saturation Voltage	$V_{CE(sat)}$***		0.9	1.2	V	I_C = 0.5 A, I_B = 1.0 mA
Base Saturation Voltage	$V_{BE(sat)}$***		1.5	2.0	V	I_C = 0.5 A, I_B = 1.0 mA
Collector to Base Voltage	V_{CBO}	50	60	70	V	I_C = 0.1 mA, I_E = 0
Collector to Emitter Voltage	V_{CEO}	50	60	70	V	I_C = 5.0 mA, I_B = 0
Collector Cutoff Current	I_{CBO}			1.0	μA	V_{CB} = 40 V, I_E = 0
Emitter Cutoff Current	I_{EBO}			1.0	μA	V_{EB} = 5.0 V, I_C = 0

***Pulsed: PW ≦ 350 μs, Duty Cycle ≦ 2 %

h_{FE} Classification

MARKING	TF	TE
h_{FE}	4000 to 12000	8000 to 50000

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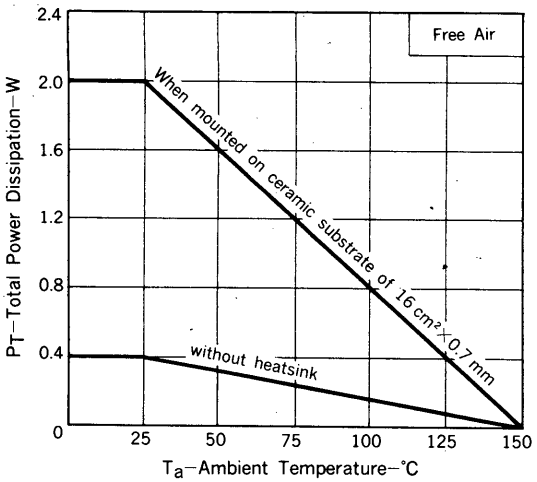
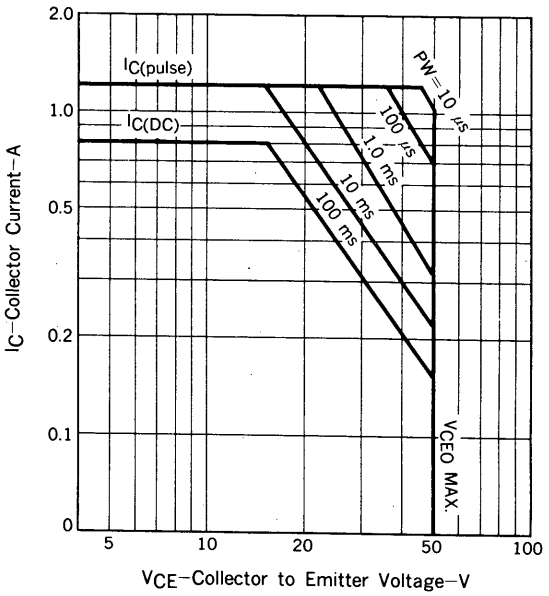
TYPICAL CHARACTERISTICS (T_a = 25 °C)

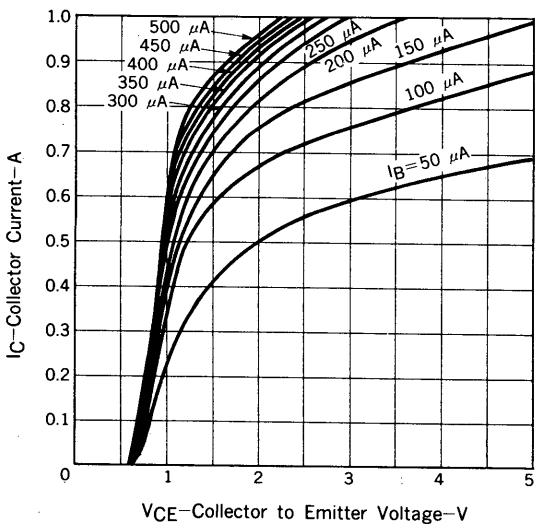
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



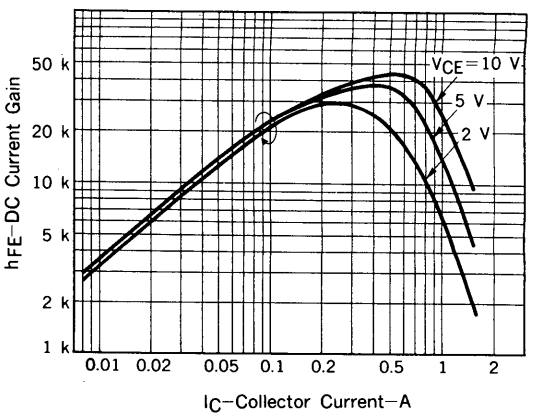
SAFE OPERATING AREAS (TRANSIENT THERMAL RESISTANCE METHOD)



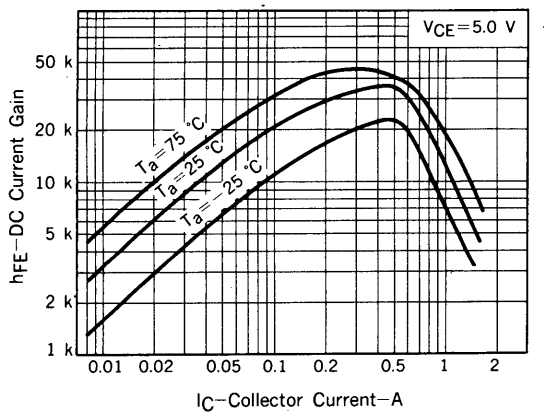
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



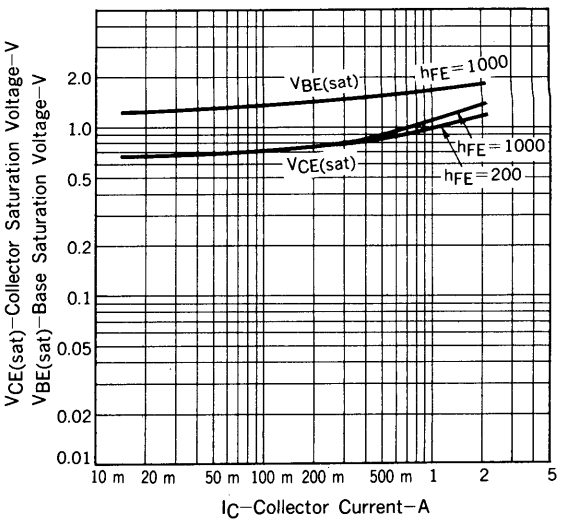
DC CURRENT GAIN vs. COLLECTOR CURRENT



DC CURRENT GAIN vs.
COLLECTOR CURRENT



BASE AND COLLECTOR SATURATION
VOLTAGE vs. COLLECTOR CURRENT



REFERENCE

Document Name	Document No.
NEC semiconductor device reliability/quality control system.	TEI-1202
Quality grade on NEC semiconductor devices.	IEI-1209
Semiconductor device mounting technology manual.	IEI-1207
Semiconductor device package manual.	IEI-1213
Guide to quality assurance for semiconductor devices.	MEI-1202
Semiconductor selection guide.	MF-1134

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