

# SILICON TRANSISTORS

## 2SD1615, 2SD1615A

### NPN SILICON EPITAXIAL TRANSISTORS

#### POWER MINI MOLD

#### DESCRIPTION

2SD1615, 1615A are designed for audio frequency power amplifier and switching application, especially in Hybrid Integrated Circuits.

#### FEATURES

- World Standard Miniature Package
- Low  $V_{CE(sat)}$   $V_{CE(sat)} = 0.15$  V
- Complement to 2SB1115, 2SD1115A

#### ABSOLUTE MAXIMUM RATINGS

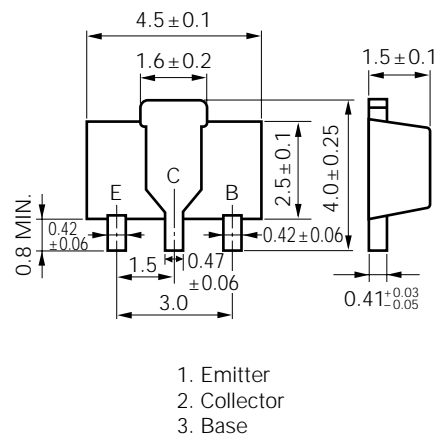
Maximum Voltages and Currents ( $T_A = 25$ °C)		2SD1615	2SD1615A	
Collector to Base Voltage	$V_{CBO}$	60	120	V
Collector to Emitter Voltage	$V_{CEO}$	50	60	V
Emitter to Base Voltage	$V_{EBO}$		6	V
Collector Current (DC)	$I_C$		1	A
Collector Current (Pulse)*	$I_C$		2	A
Maximum Power Dissipation				
Total 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

\*  $PW \leq 10$  ms, Duty Cycle  $\leq 50$  %

\*\* When mounted on ceramic substrate of  $16 \text{ cm}^2 \times 0.7 \text{ mm}$

#### PACKAGE DIMENSIONS

in millimeters



#### ELECTRICAL CHARACTERISTICS ( $T_A = 25$ °C)

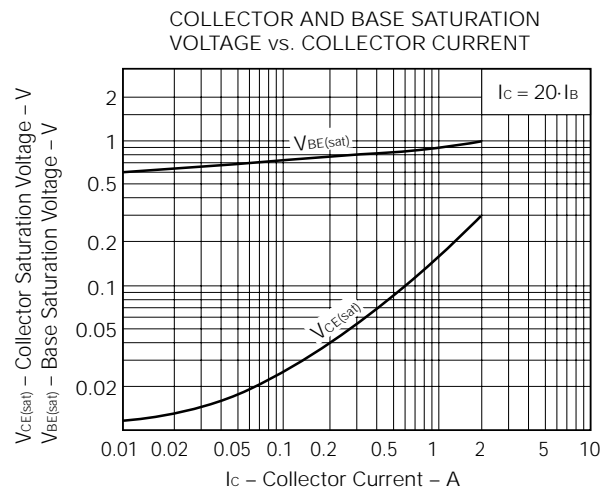
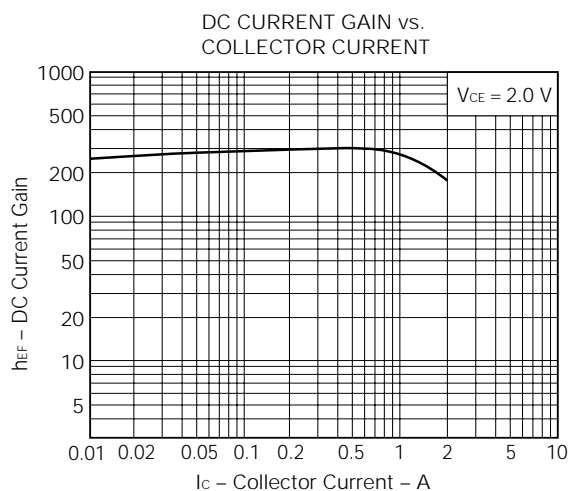
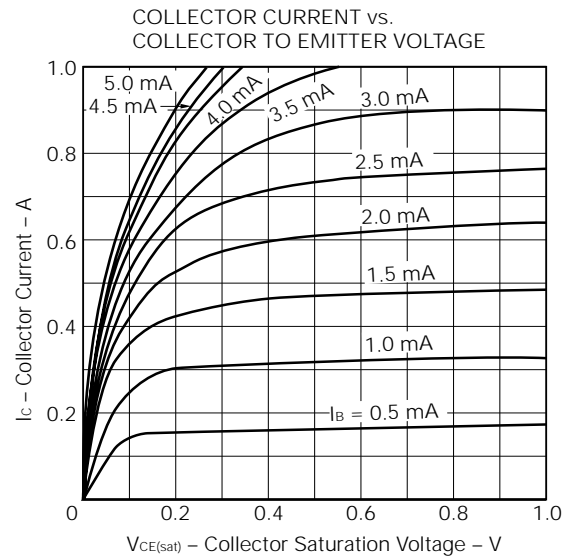
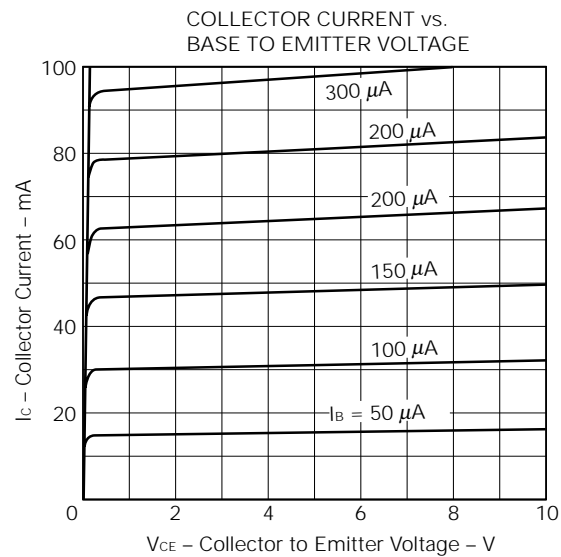
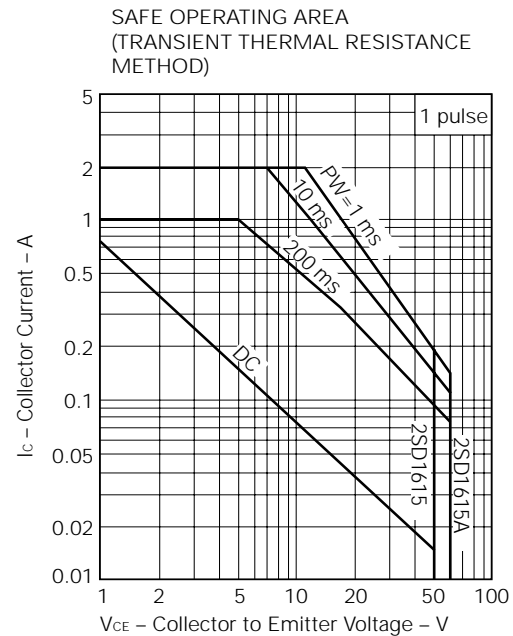
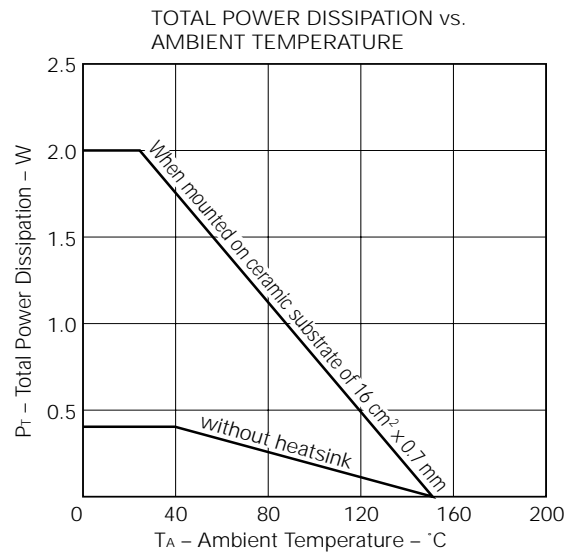
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS	
Collector Cutoff Current	I <sub>CBO</sub>			100	nA	2SD1615	V <sub>CB</sub> = 60 V, I <sub>E</sub> = 0
				100	nA	2SD1615A	V <sub>CB</sub> = 120 V, I <sub>E</sub> = 0
Emitter Cutoff Current	I <sub>EBO</sub>			100	nA	V <sub>EB</sub> = 6.0 V, I <sub>C</sub> = 0	
DC Current Gain	h <sub>FE1</sub> ***	135	290	600		2SC1615	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 100 mA
		135		400		2SD1615A	
DC Current Gain	h <sub>FE2</sub> ***	81	270			V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 1.0 A	
Collector Saturation Voltage	V <sub>CE(sat)</sub> ***		0.15	0.3	V	I <sub>C</sub> = 1.0 A, I <sub>B</sub> = 50 mA	
Base Saturation Voltage	V <sub>BE(sat)</sub> ***		0.9	1.2	V	I <sub>C</sub> = 1.0 A, I <sub>B</sub> = 50 mA	
Base to Emitter Voltage	V <sub>BE</sub> ***	600		700	mV	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 50 mA	
Gain Bandwidth Product	f <sub>T</sub>	80	160		MHz	V <sub>CE</sub> = 2.0 V, I <sub>E</sub> = -100 mA	
Output Capacitance	C <sub>ob</sub>		19		pF	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0, f = 1.0 MHz	

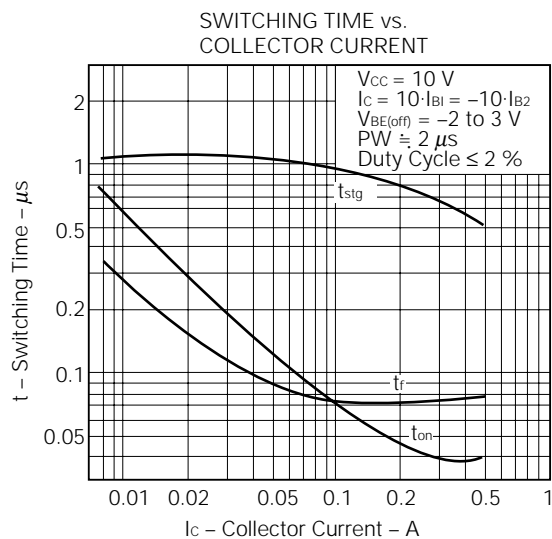
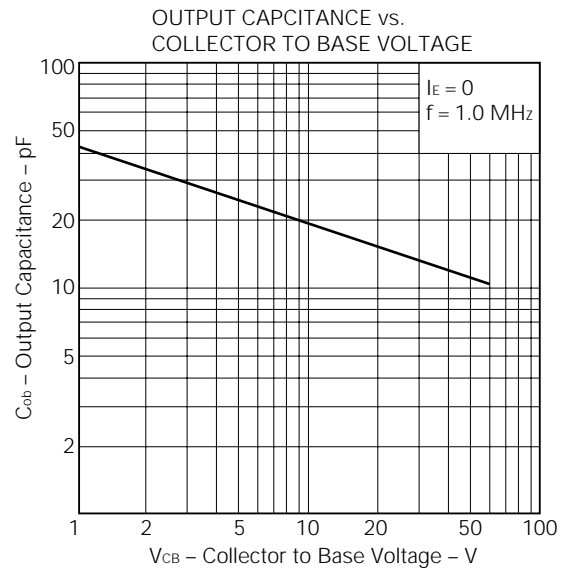
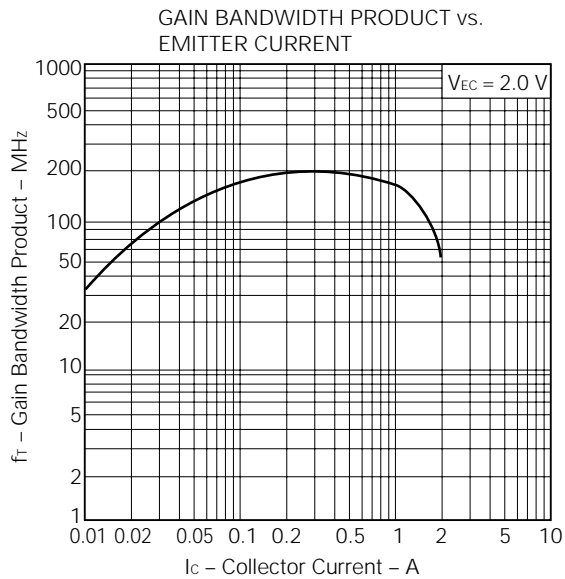
\*\*\* Pulsed:  $PW \leq 350$   $\mu$ s, Duty Cycle  $\leq 2$  %

#### $h_{FE}$ Classification

MARKING	2SD1615	GM	GL	GK
	2SD1615A	GQ	GP	
$h_{FE}$		135 to 270	200 to 400	300 to 600

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





## 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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Anti-radioactive design is not implemented in this product.