

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

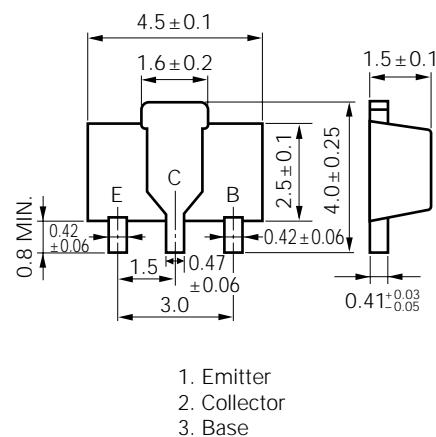
	2SD1615	2SD1615A	V
Collector to Base Voltage	$V_{CBO}$	60	120
Collector to Emitter Voltage	$V_{CEO}$	50	60
Emitter to Base Voltage	$V_{EBO}$	6	A
Collector Current (DC)	$I_C$	1	A
Collector Current (Pulse)*	$I_C$	2	A
Maximum Power Dissipation			
Total Power Dissipation at 25 °C Ambient Temperature**	$P_T$	2.0	W
Maximum Temperatures			
Junction Temperature	$T_J$	150	°C
Storage Temperature Range	$T_{Stg}$	-55 to +150	°C

\* PW ≤ 10 ms, Duty Cycle ≤ 50 %

\*\* When mounted on ceramic substrate of 16 cm<sup>2</sup> × 0.7 mm

## PACKAGE DIMENSIONS

in millimeters

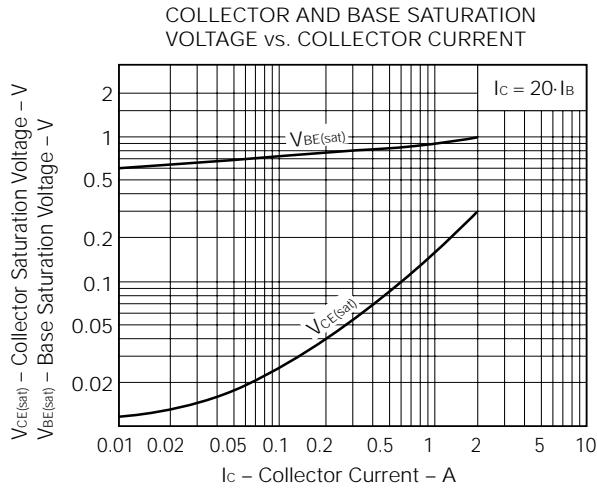
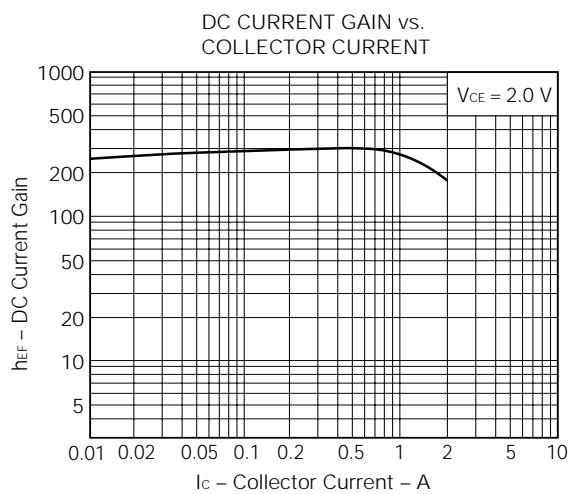
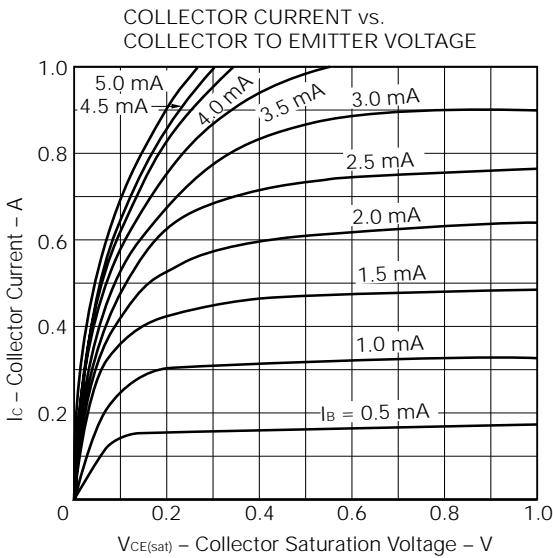
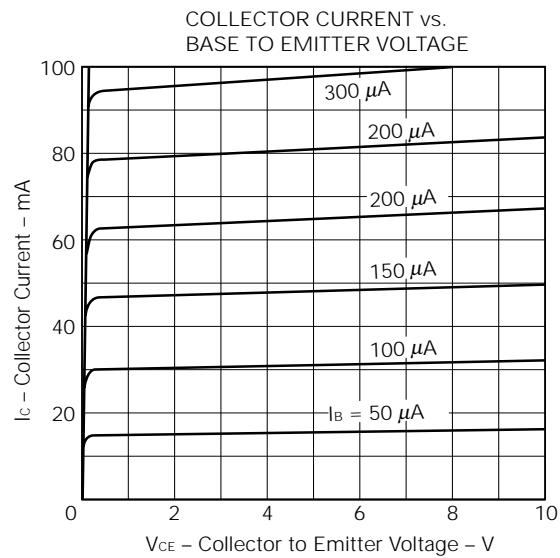
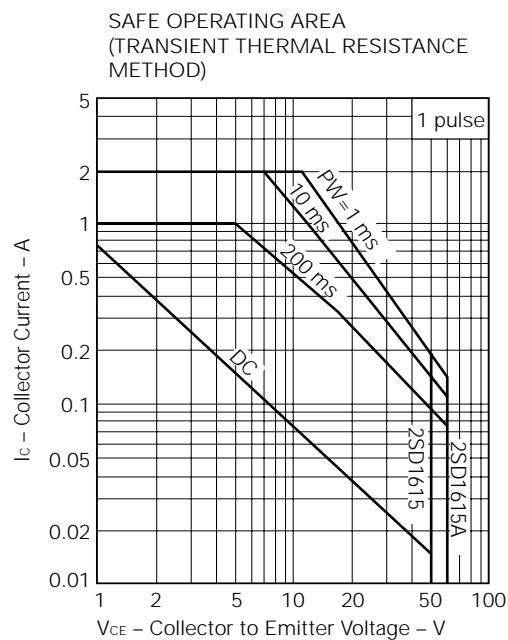
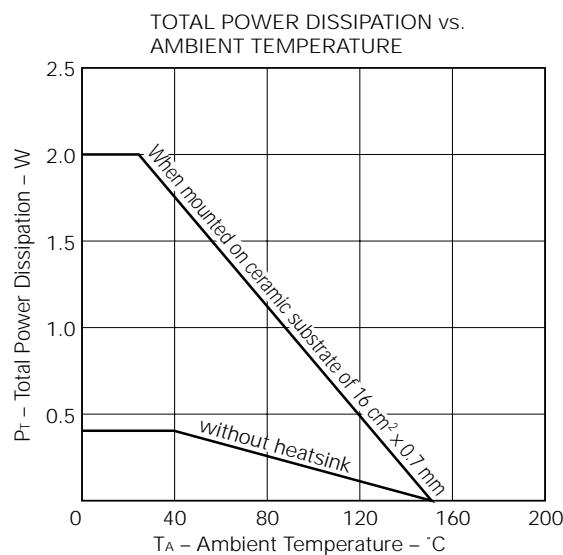
ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)

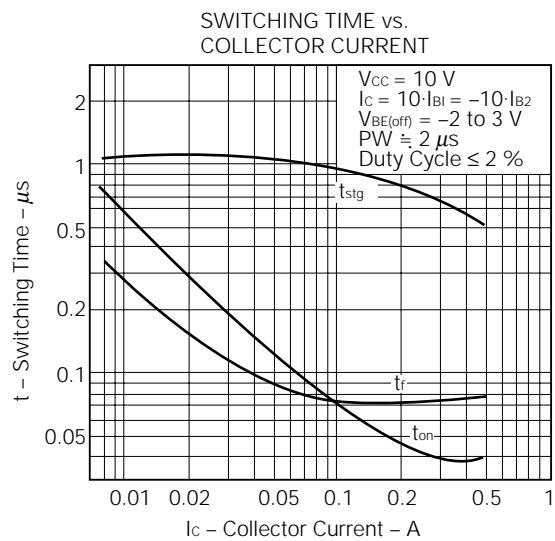
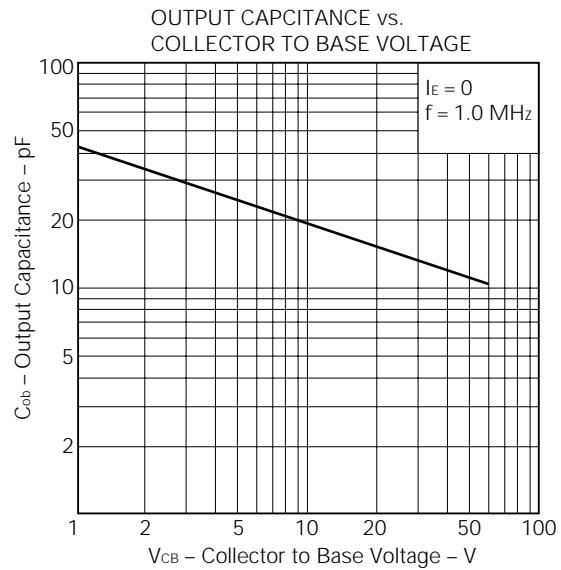
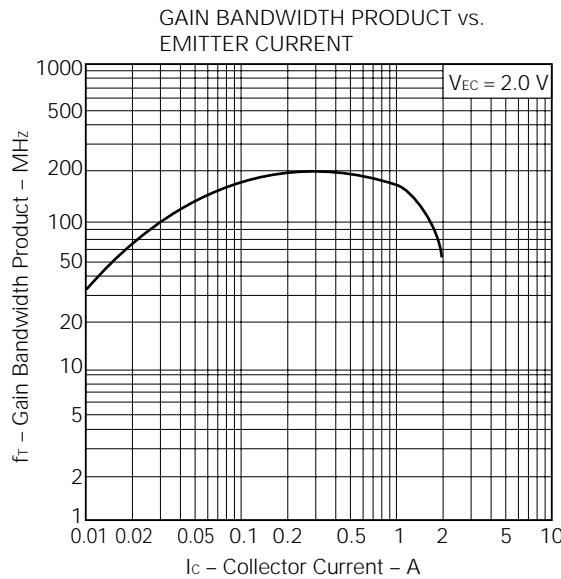
CHARACTERISTIC	SYMBOL	MIN.	Typ.	MAX.	UNIT	TEST CONDITIONS		
Collector Cutoff Current	$I_{CBO}$			100	nA	2SD1615	$V_{CB} = 60$ V, $I_E = 0$	
				100	nA	2SD1615A	$V_{CB} = 120$ V, $I_E = 0$	
Emitter Cutoff Current	$I_{EBO}$			100	nA	$V_{EB} = 6.0$ V, $I_C = 0$		
DC Current Gain	$h_{FE1}^{***}$	135	290	600		2SC1615	$V_{CE} = 2.0$ V, $I_C = 100$ mA	
		135		400		2SD1615A		
DC Current Gain	$h_{FE2}^{***}$	81	270			$V_{CE} = 2.0$ V, $I_C = 1.0$ A		
Collector Saturation Voltage	$V_{CE(sat)}^{***}$		0.15	0.3	V	$I_C = 1.0$ A, $I_B = 50$ mA		
Base Saturation Voltage	$V_{BE(sat)}^{***}$		0.9	1.2	V	$I_C = 1.0$ A, $I_B = 50$ mA		
Base to Emitter Voltage	$V_{BE}^{***}$	600		700	mV	$V_{CE} = 2.0$ V, $I_C = 50$ mA		
Gain Bandwidth Product	$f_T$	80	160		MHz	$V_{CE} = 2.0$ V, $I_E = -100$ mA		
Output Capacitance	$C_{ob}$		19		pF	$V_{CB} = 10$ V, $I_E = 0$ , $f = 1.0$ MHz		

\*\*\* Pulsed: PW ≤ 350 μs, Duty Cycle ≤ 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.