

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

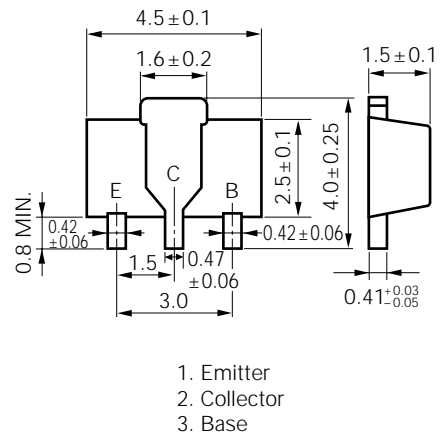
ABSOLUTE MAXIMUM RATINGS

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	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

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

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

PACKAGE DIMENSIONS  
in millimeters



ELECTRICAL CHARACTERISTICS ( $T_A = 25$  °C)

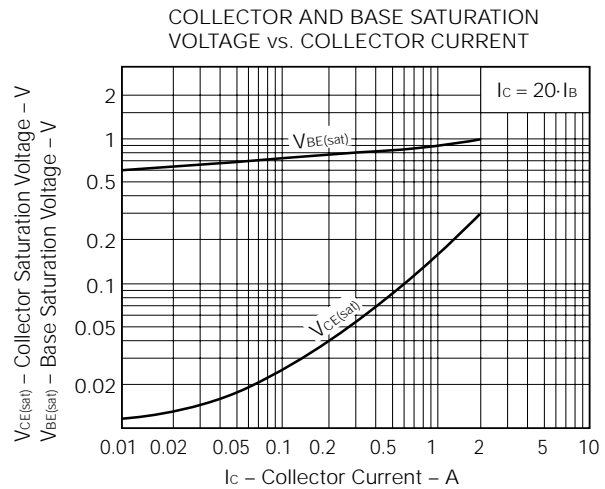
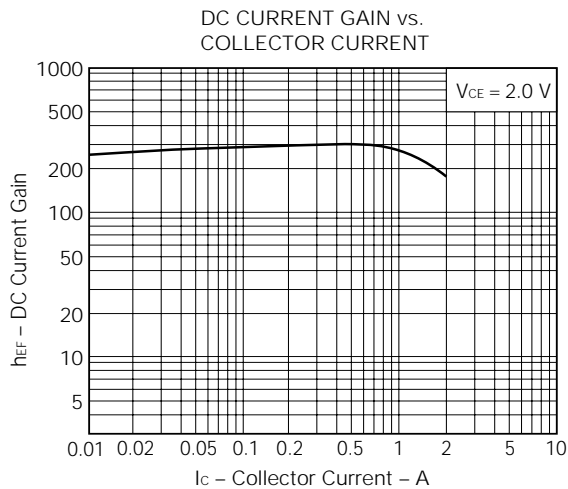
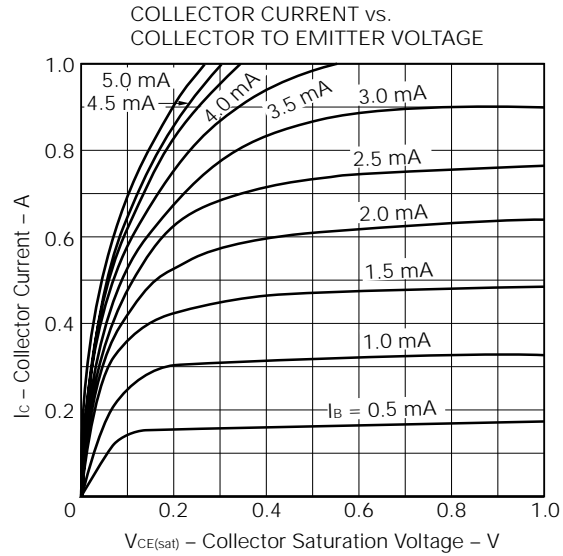
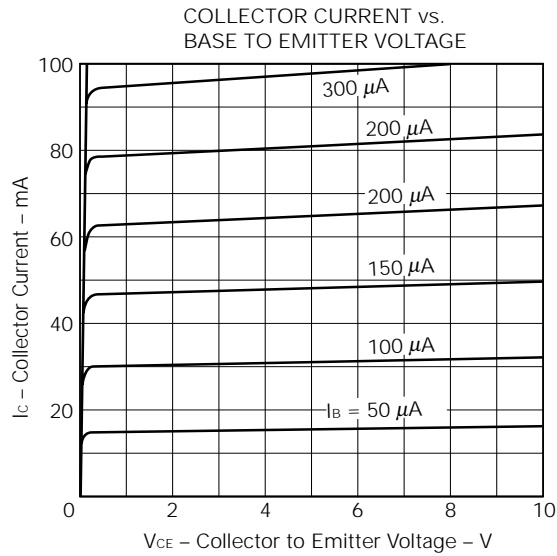
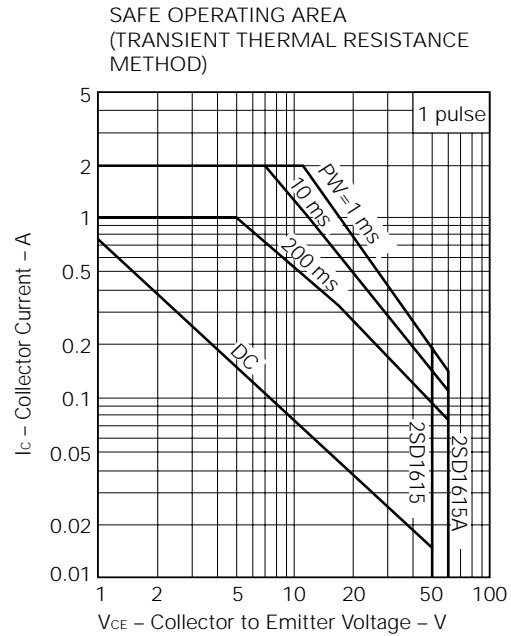
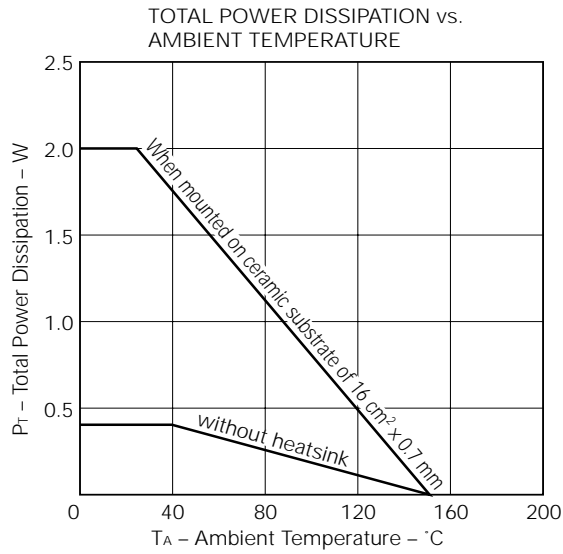
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS	
Collector Cutoff Current	$I_{CBO}$			100	nA	2SD1615	$V_{CB} = 60$ V, $I_E = 0$
				100	nA	2SD1615A	$V_{CB} = 120$ V, $I_E = 0$
Emitter Cutoff Current	$I_{EBO}$			100	nA	$V_{EB} = 6.0$ V, $I_C = 0$	
DC Current Gain	$h_{FE1}^{***}$	135	290	600		2SD1615	$V_{CE} = 2.0$ 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	

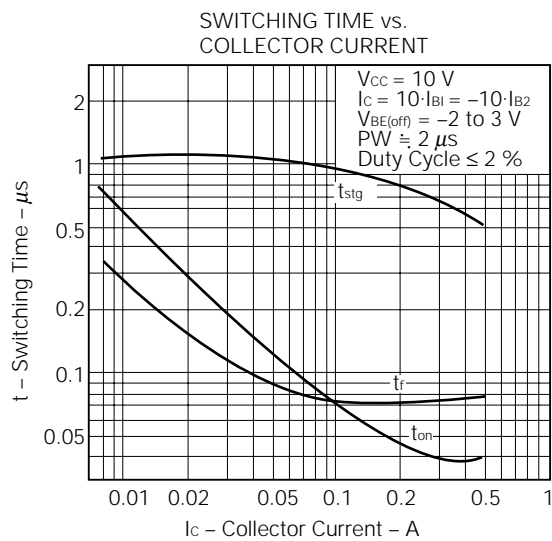
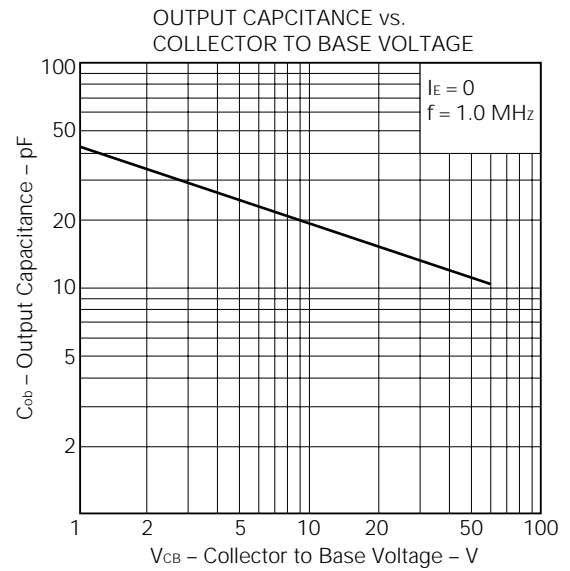
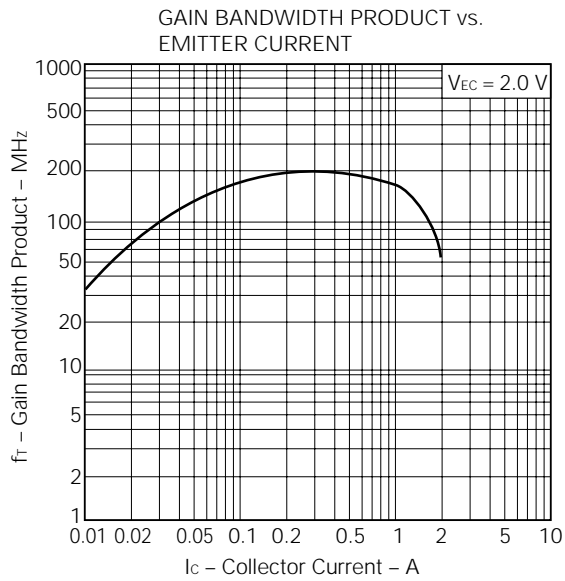
\*\*\* Pulsed:  $PW \leq 350$   $\mu$ s, Duty Cycle  $\leq 2$  %

$h_{FE}$  Classification

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

TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25 °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.