

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

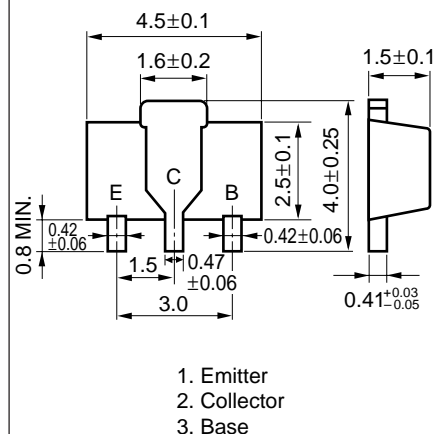
ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Currents ($T_A = 25^\circ\text{C}$)	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	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to +150	$^\circ\text{C}$

* $PW \leq 10$ 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 ($T_A = 25^\circ\text{C}$)

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	

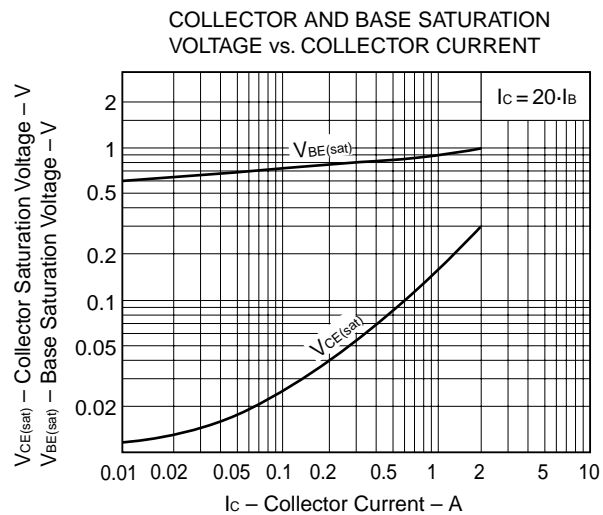
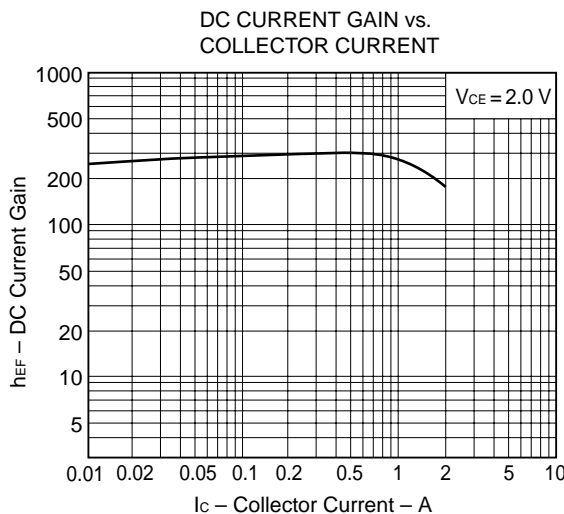
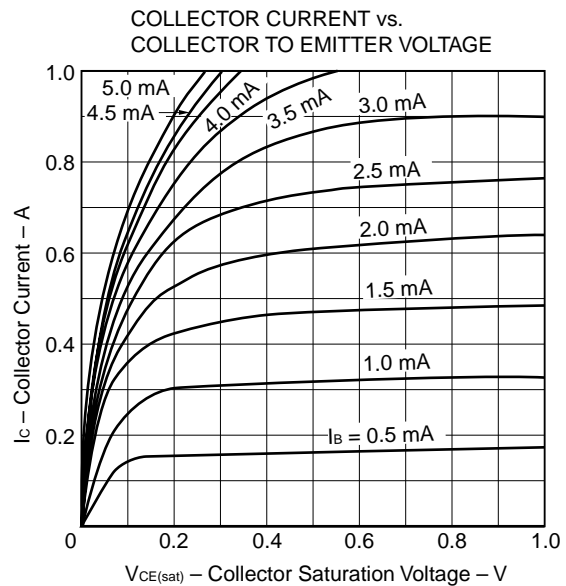
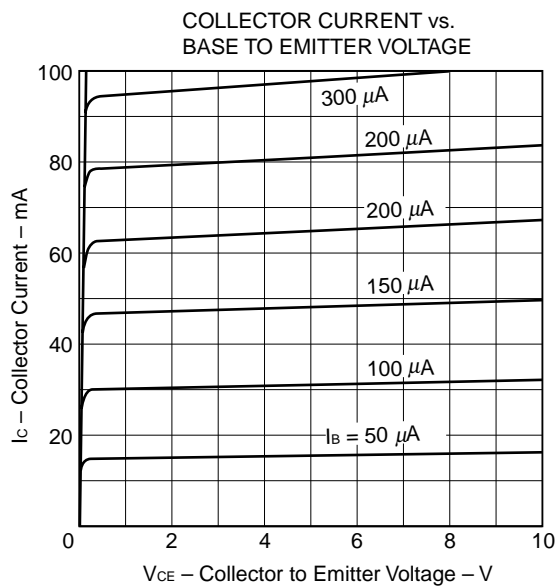
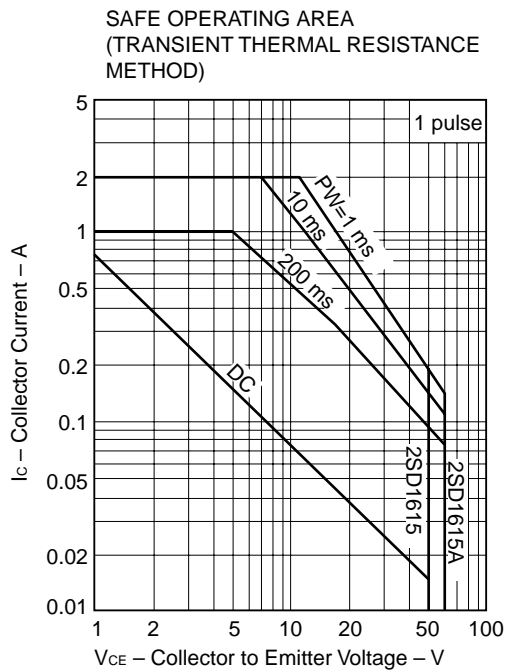
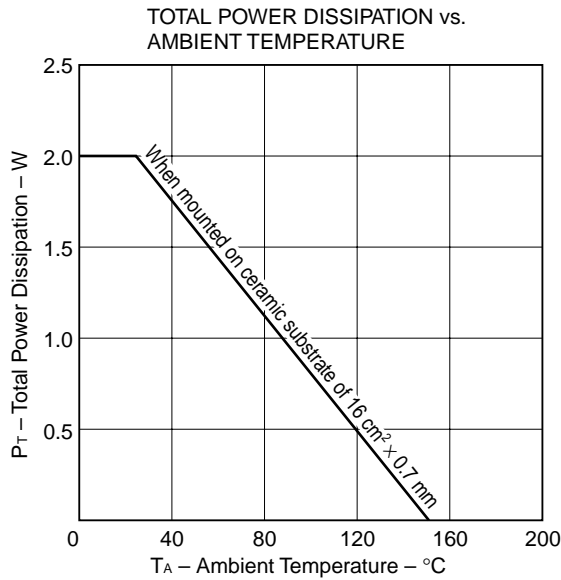
*** Pulsed: $PW \leq 350$ μs , Duty Cycle $\leq 2\%$

h_{FE} Classification

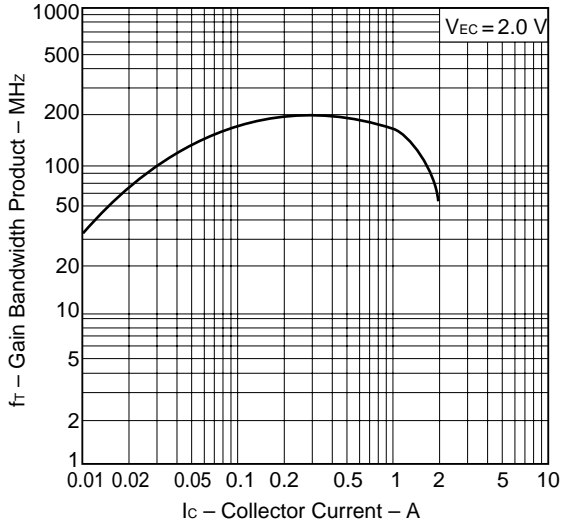
MARKING	2SD1615	GM	GL	GK
	2SD1615A	GQ	GP	
h_{FE}	135 to 270	200 to 400	300 to 600	

The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.

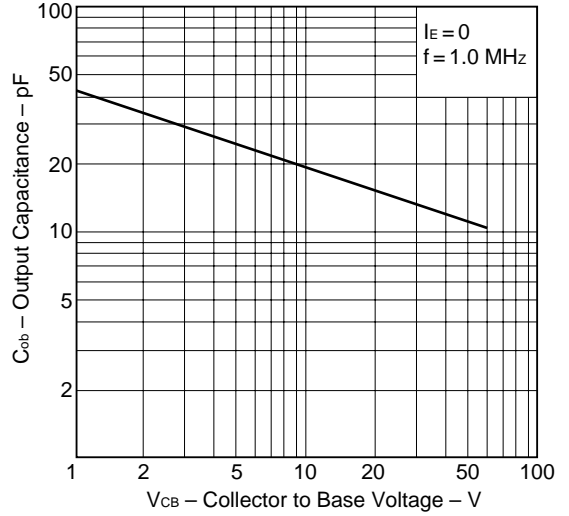
TYPICAL CHARACTERISTICS (T_A = 25°C)



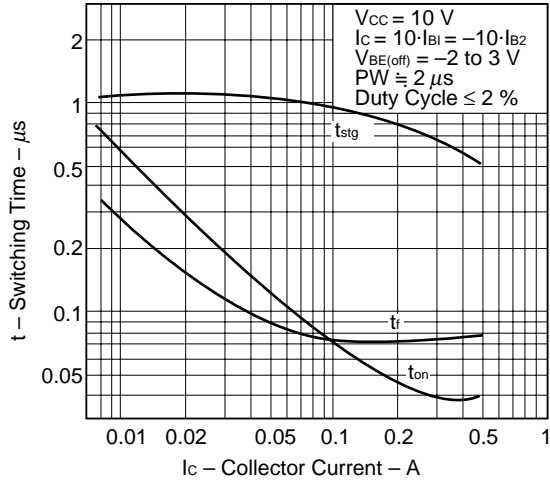
GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



OUTPUT CAPCITANCE vs. COLLECTOR TO BASE VOLTAGE



SWITCHING TIME vs. COLLECTOR CURRENT



[MEMO]

• **The information in this document is current as of October, 2000. The information is subject to change without notice. For actual design-in, refer to the latest publications of NEC's data sheets or data books, etc., for the most up-to-date specifications of NEC semiconductor products. Not all products and/or types are available in every country. Please check with an NEC sales representative for availability and additional information.**

- No part of this document may be copied or reproduced in any form or by any means without prior written consent of NEC. NEC assumes no responsibility for any errors that may appear in this document.
- NEC does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from the use of NEC semiconductor products listed in this document or any other liability arising from the use of such products. No license, express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC or others.
- Descriptions of circuits, software and other related information in this document are provided for illustrative purposes in semiconductor product operation and application examples. The incorporation of these circuits, software and information in the design of customer's equipment shall be done under the full responsibility of customer. NEC assumes no responsibility for any losses incurred by customers or third parties arising from the use of these circuits, software and information.
- While NEC endeavours to enhance the quality, reliability and safety of NEC semiconductor products, customers agree and acknowledge that the possibility of defects thereof cannot be eliminated entirely. To minimize risks of damage to property or injury (including death) to persons arising from defects in NEC semiconductor products, customers must incorporate sufficient safety measures in their design, such as redundancy, fire-containment, and anti-failure features.
- NEC semiconductor products are classified into the following three quality grades:
"Standard", "Special" and "Specific". The "Specific" quality grade applies only to semiconductor products developed based on a customer-designated "quality assurance program" for a specific application. The recommended applications of a semiconductor product depend on its quality grade, as indicated below. Customers must check the quality grade of each semiconductor product before using it in a particular application.

"Standard": Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

"Special": Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

"Specific": Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems and medical equipment for life support, etc.

The quality grade of NEC semiconductor products is "Standard" unless otherwise expressly specified in NEC's data sheets or data books, etc. If customers wish to use NEC semiconductor products in applications not intended by NEC, they must contact an NEC sales representative in advance to determine NEC's willingness to support a given application.

(Note)

- (1) "NEC" as used in this statement means NEC Corporation and also includes its majority-owned subsidiaries.
- (2) "NEC semiconductor products" means any semiconductor product developed or manufactured by or for NEC (as defined above).



LittleDiode supplies new, hard to find or obsolete electronic components and semiconductors all over the world.

With over two million different components listed you are sure to find the part you need.

Feel free to visit us today at our online store:

LittleDiode.com

Looking forward to providing you with the best possible service.