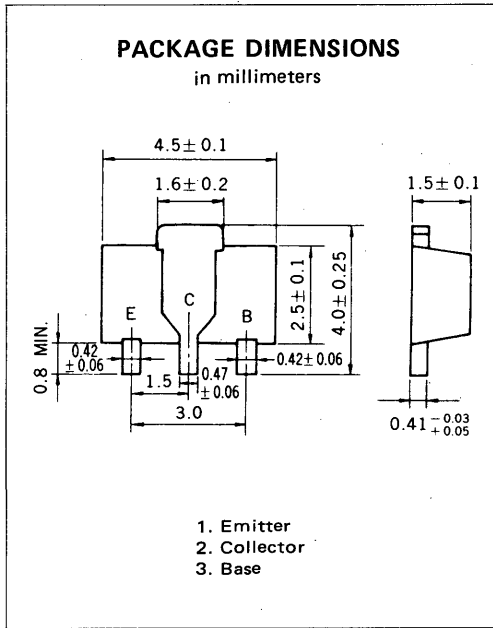


**NPN SILICON EPITAXIAL TRANSISTOR**  
**POWER MINI MOLD**

**DESCRIPTION**

2SD1614 is designed for audio frequency power amplifier and switching application, especially in Hybrid Integrated Circuits.



**FEATURES**

- World Standard Miniature Package
- High DC Current Gain :  $h_{FE}$  135 to 600
- Low  $V_{CE(sat)}$  :  $V_{CE(sat)} = 0.2$  V
- Complement to 2SB1114

**ABSOLUTE MAXIMUM RATINGS**

Maximum Voltages and Currents ( $T_a = 25^\circ\text{C}$ )

Collector to Base Voltage	$V_{CBO}$	40	V
Collector to Emitter Voltage	$V_{CEO}$	20	V
Emitter to Base Voltage	$V_{EBO}$	6	V
Collector Current (DC)	$I_C$	2	A
Collector Current (Pulse)*	$I_C$	3	A

Maximum Power Dissipation

Total Power Dissipation at $25^\circ\text{C}$ 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  $16\text{ cm}^2 \times 0.7\text{ mm}$

**ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )**

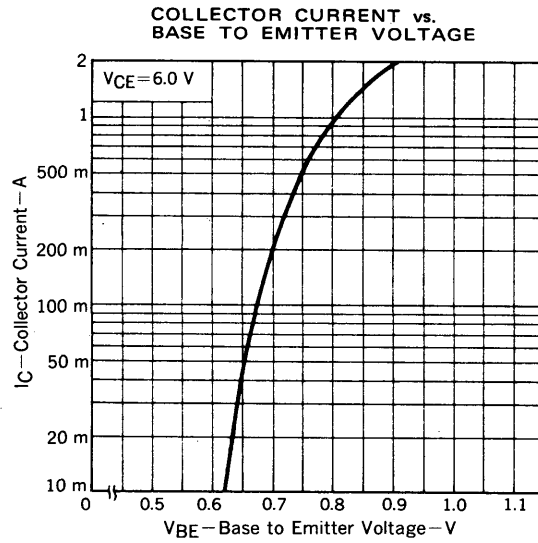
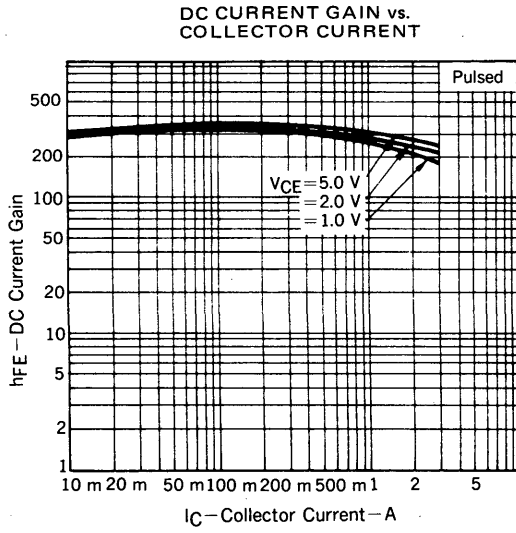
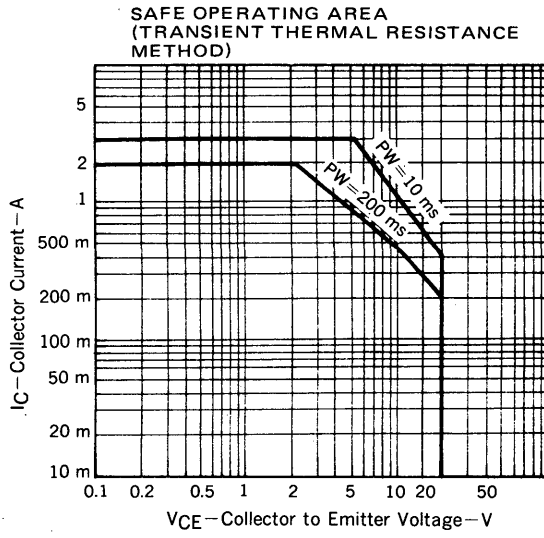
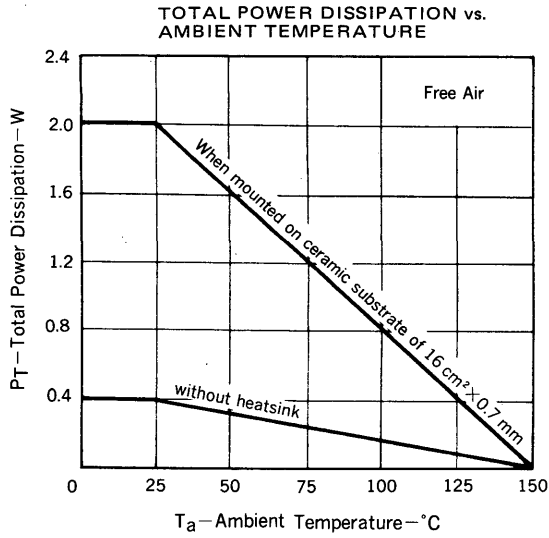
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	$I_{CBO}$			100	nA	$V_{CB} = 30\text{ V}, I_E = 0$
Emitter Cutoff Current	$I_{EBO}$			100	nA	$V_{EB} = 6.0\text{ V}, I_C = 0$
DC Current Gain	$h_{FE1}$ ***	135	350	600		$V_{CE} = 2.0\text{ V}, I_C = 100\text{ mA}$
DC Current Gain	$h_{FE2}$ ***	40				$V_{CE} = 2.0\text{ V}, I_C = 2.0\text{ A}$
Collector Saturation Voltage	$V_{CE(sat)}$ ***		0.3	0.5	V	$I_C = 2.0\text{ A}, I_B = 50\text{ mA}$
Base Saturation Voltage	$V_{BE(sat)}$ ***		0.95	1.2	V	$I_C = 2.0\text{ A}, I_B = 50\text{ mA}$
Base to Emitter Voltage	$V_{BE}$ ***	650	680	750	mV	$V_{CE} = 6.0\text{ V}, I_C = 100\text{ mA}$
Gain Bandwidth Product	$f_T$		200		MHz	$V_{CE} = 10\text{ V}, I_E = -50\text{ mA}$
Output Capacitance	$C_{ob}$		28		pF	$V_{CB} = 10\text{ V}, I_E = 0, f = 1.0\text{ MHz}$

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

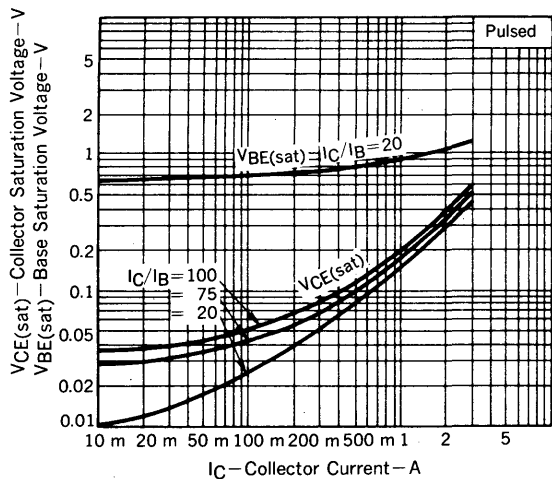
**$h_{FE}$  Classification**

MARKING	XM	XL	XK
$h_{FE}$	135 to 270	200 to 400	300 to 600

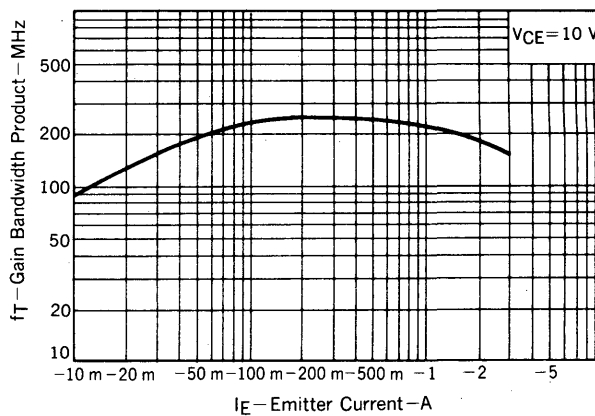
TYPICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )



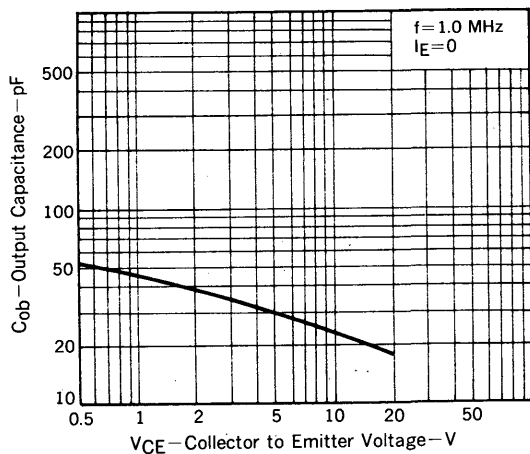
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



OUTPUT CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



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

[MEMO]

No part of this document may be copied or reproduced in any form or by any means without the prior written consent of NEC Corporation. NEC Corporation assumes no responsibility for any errors which may appear in this document.

NEC Corporation does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from use of a device described herein or any other liability arising from use of such device. No license, either express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC Corporation or others.

The devices listed in this document are not suitable for use in aerospace equipment, submarine cables, nuclear reactor control systems and life support systems. If customers intend to use NEC devices for above applications or they intend to use "Standard" quality grade NEC devices for applications not intended by NEC, please contact our sales people in advance.

Application examples recommended by NEC Corporation

Standard: Computer, Office equipment, Communication equipment, Test and Measurement equipment, Machine tools, Industrial robots, Audio and Visual equipment, Other consumer products, etc.

Special: Automotive and Transportation equipment, Traffic control systems, Antidisaster systems, Anticrime systems, etc.