

MICROWAVE LOW NOISE AMPLIFIER
NPN SILICON EPITAXIAL TRANSISTOR

DESCRIPTION

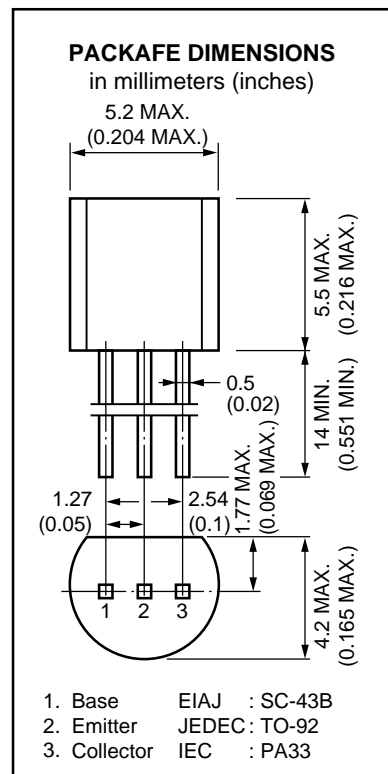
The 2SC3582 is an NPN epitaxial silicon transistor designed for use in low-noise and small signal amplifiers from VHF band to UHF band. Low-noise figure, high gain, and high current capability achieve a very wide dynamic range and excellent linearity. This is achieved by direct nitride passivated base surface process (DNP process) which is an NEC proprietary new fabrication technique.

FEATURES

- NF 1.2 dB TYP. @f = 1.0 GHz
- Ga 12 dB TYP. @f = 1.0 GHz

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C)

Collector to Base Voltage	V _{CB0}	20	V
Collector to Emitter Voltage	V _{CEO}	10	V
Emitter to Base Voltage	V _{EBO}	1.5	V
Collector Current	I _C	65	mA
Total Power Dissipation	P _T	600	mW
Junction Temperature	T _J	150	°C
Storage Temperature	T _{stg}	-65 to +150	°C



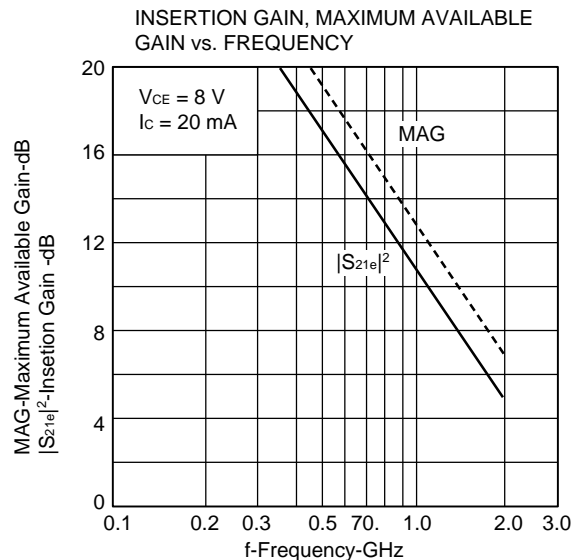
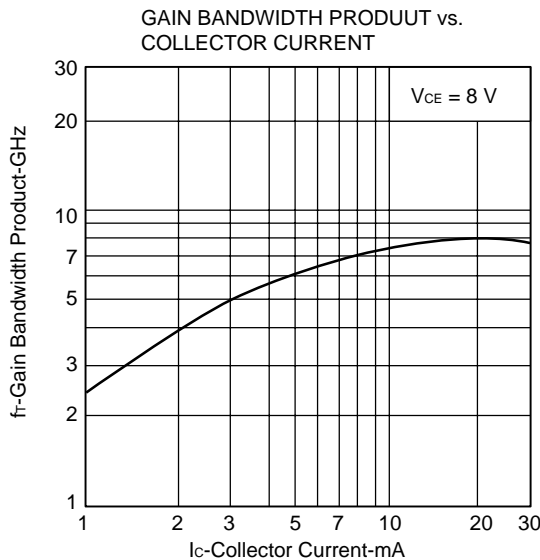
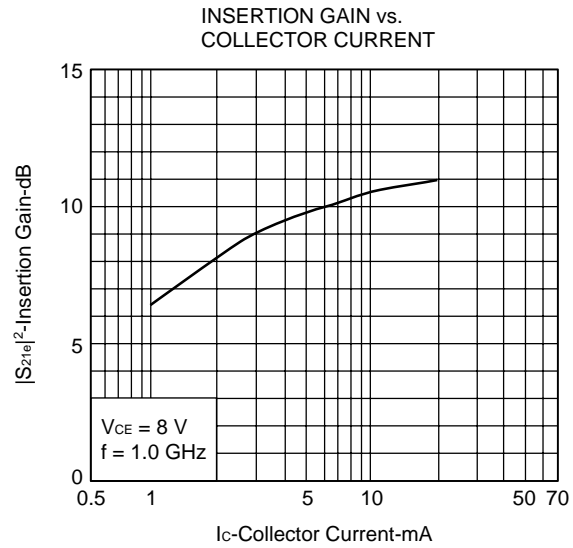
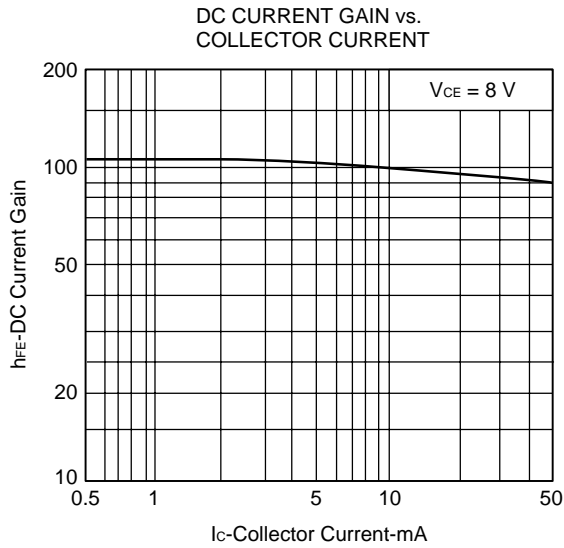
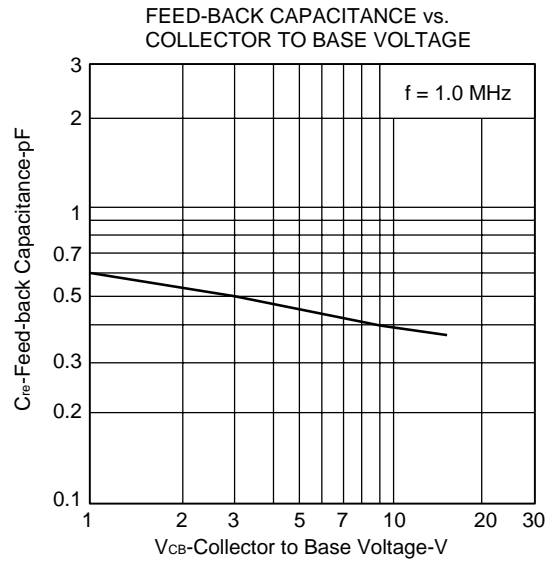
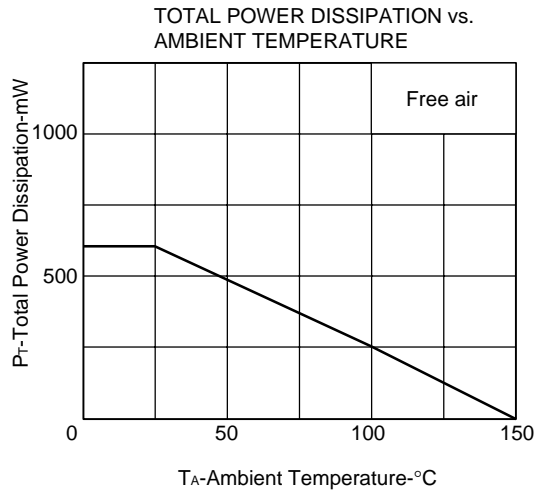
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

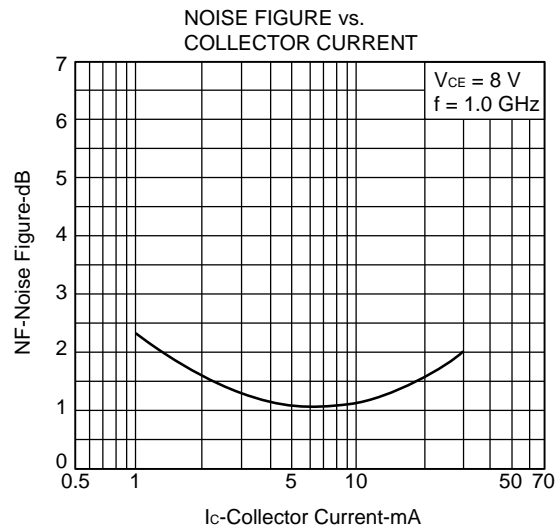
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I _{CBO}			1.0	μA	V _{CB} = 10 V, I _E = 0
Emitter Cutoff Current	I _{EBO}			1.0	μA	V _{EB} = 1 V, I _C = 0
DC Current Gain	h _{FE}	50	100	250		V _{CE} = 8 V, I _C = 20 mA
Gain Bandwidth Product	f _T		8		GHz	V _{CE} = 8 V, I _C = 20 mA
Feed-Back Capacitance	C _{re}		0.4	0.9	pF	V _{CB} = 10 V, I _E = 0, f = 1.0 MHz
Insertion Power Gain	S _{21e} ²	9	11		dB	V _{CE} = 8 V, I _C = 20 mA, f = 1.0 GHz
Maximum Available Gain	MAG		13		dB	V _{CE} = 8 V, I _C = 20 mA, f = 1.0 GHz
Noise Figure	NF		1.2	2.5	dB	V _{CE} = 8 V, I _E = 7 mA, f = 1.0 GHz

h_{FE} Classification

Class	K
Marking	K
h _{FE}	50 to 250

TYPICAL CHARACTERISTICS (T_A = 25 °C)





S-PARAMETER

$V_{CE} = 8.0\text{ V}$, $I_c = 5.0\text{ mA}$, $Z_o = 50\ \Omega$

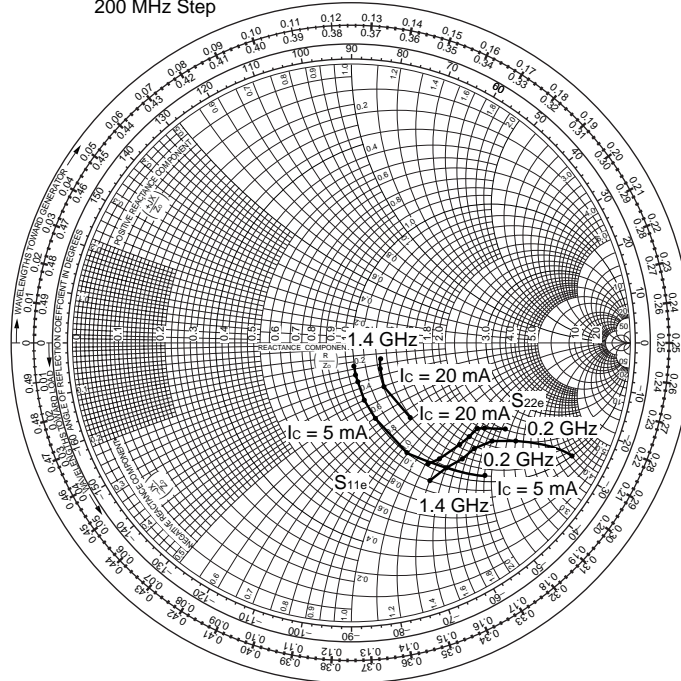
f (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.668	-45.8	11.385	128.9	0.049	83.5	0.833	-26.9
400	0.425	-61.5	7.014	103.7	0.063	76.3	0.681	-31.1
600	0.294	-73.2	5.189	88.6	0.088	68.5	0.620	-36.0
800	0.214	-79.4	3.967	75.4	0.103	64.5	0.580	-40.8
1000	0.167	-79.5	3.485	64.7	0.123	60.8	0.561	-46.3
1200	0.132	-79.8	2.831	57.0	0.147	55.9	0.549	-53.4
1400	0.098	-75.2	2.604	48.5	0.175	50.7	0.561	-60.3
1600	0.073	-72.0	2.182	39.1	0.192	47.9	0.573	-69.1
1800	0.071	-63.7	2.135	31.0	0.215	44.2	0.595	-71.8
2000	0.070	-60.6	1.879	21.6	0.221	38.0	0.617	-78.0

$V_{CE} = 8.0\text{ V}$, $I_c = 20\text{ mA}$, $Z_o = 50\ \Omega$

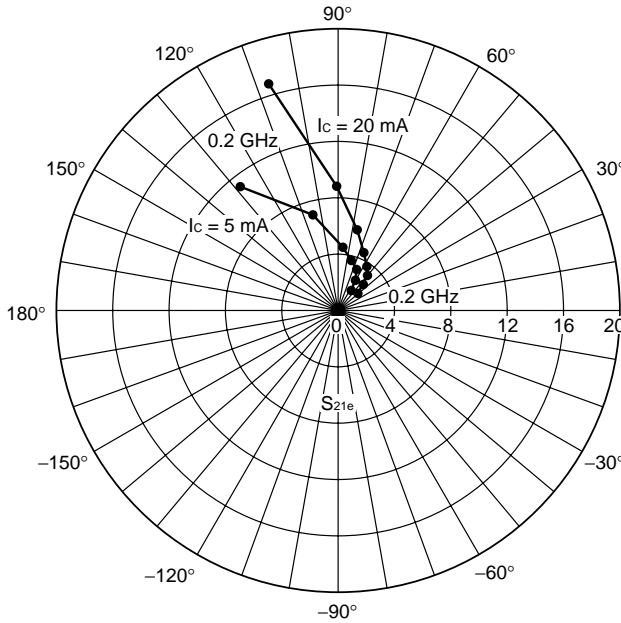
f (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.333	-51.4	17.197	107.7	0.053	97.5	0.638	-29.7
400	0.195	-49.2	8.729	89.7	0.064	90.1	0.585	-31.8
600	0.158	-44.3	6.149	78.8	0.078	80.3	0.573	-35.0
800	0.156	-41.0	4.603	68.7	0.111	70.0	0.549	-38.2
1000	0.146	-35.8	3.997	60.4	0.136	64.2	0.537	-42.4
1200	0.143	-30.7	3.205	54.1	0.168	58.1	0.524	-57.1
1400	0.134	-25.8	2.939	46.7	0.185	53.2	0.524	-55.4
1600	0.132	-22.3	2.463	38.1	0.218	47.3	0.524	-62.0
1800	0.131	-20.0	2.396	30.7	0.234	41.3	0.557	-68.5
2000	0.130	-17.8	2.107	22.1	0.238	36.5	0.579	-74.8

S-PARAMETER

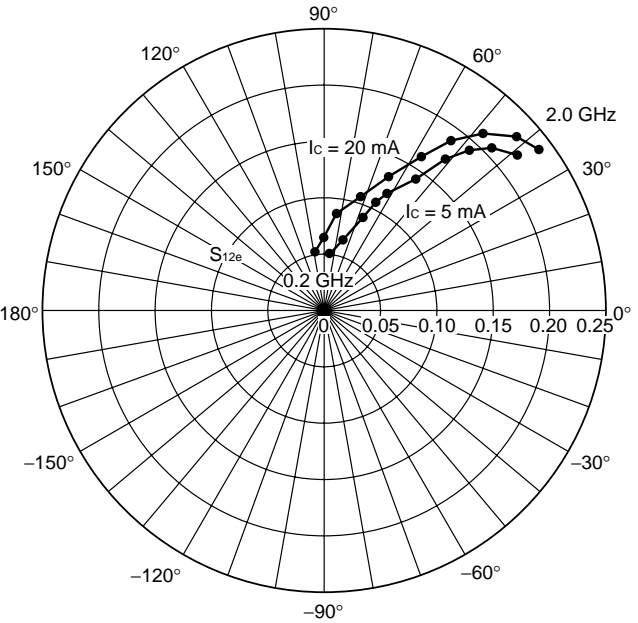
S_{11e}, S_{22e}-FREQUENCY CONDITION V_{CE} = 8 V
200 MHz Step



S_{21e}-FREQUENCY CONDITION V_{CE} = 8 V



S_{12e}-FREQUENCY CONDITION V_{CE} = 8 V



[MEMO]

[MEMO]

[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.

While NEC Corporation has been making continuous effort to enhance the reliability of its semiconductor devices, the possibility of defects cannot be eliminated entirely. To minimize risks of damage or injury to persons or property arising from a defect in an NEC semiconductor device, customers must incorporate sufficient safety measures in its design, such as redundancy, fire-containment, and anti-failure features.

NEC devices are classified into the following three quality grades:

"Standard", "Special", and "Specific". The Specific quality grade applies only to devices developed based on a customer designated "quality assurance program" for a specific application. The recommended applications of a device depend on its quality grade, as indicated below. Customers must check the quality grade of each device 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: Aircrafts, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.

The quality grade of NEC devices is "Standard" unless otherwise specified in NEC's Data Sheets or Data Books. If customers intend to use NEC devices for applications other than those specified for Standard quality grade, they should contact an NEC sales representative in advance.

Anti-radioactive design is not implemented in this product.

This datasheet has been download from:

www.datasheetcatalog.com

Datasheets for electronics components.