

isc Silicon NPN RF Transistor

MMBR571L

DESCRIPTION

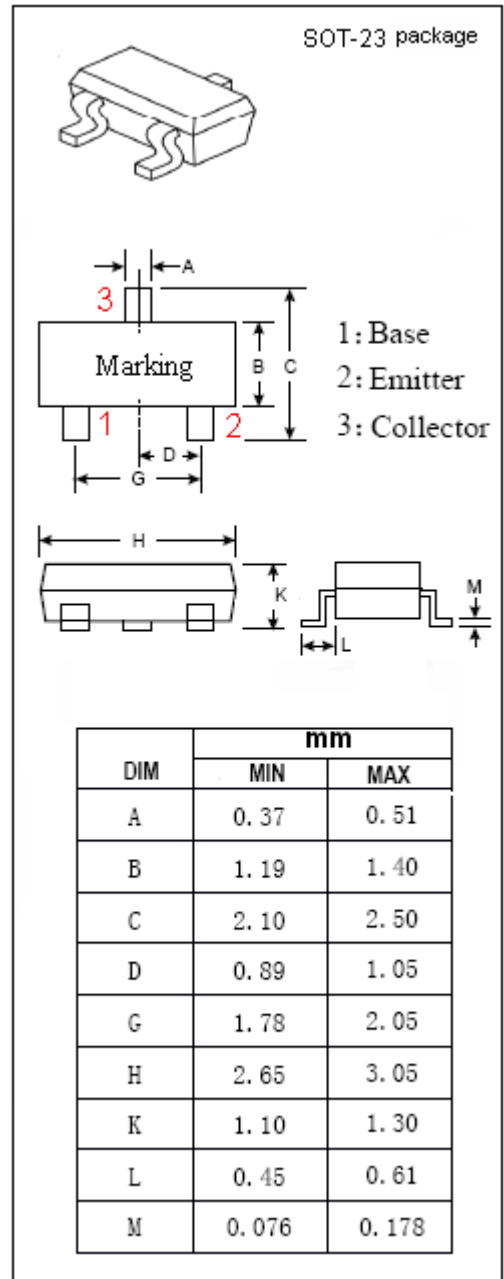
- Low Noise
- High Current-Gain Bandwidth Product  
 $f_T = 8.0 \text{ GHz TYP. @ } I_C = 50 \text{ mA}$
- High Gain  
 $G_{NF} = 16.5 \text{ dB TYP. @ } I_C = 10\text{mA, } f = 0.5 \text{ GHz}$

APPLICATIONS

- Designed for low noise , wide dynamic range front-end amplifiers and low-noise VCO'S.

ABSOLUTE MAXIMUM RATINGS( $T_a=25^\circ\text{C}$ )

SYMBOL	PARAMETER	VALUE	UNIT
$V_{CBO}$	Collector-Base Voltage	20	V
$V_{CEO}$	Collector-Emitter Voltage	10	V
$V_{EBO}$	Emitter-Base Voltage	3	V
$I_C$	Collector Current-Continuous	80	mA
$P_C$	Collector Power Dissipation @ $T_C = 75^\circ\text{C}$	0.33	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{stg}$	Storage Temperature Range	-55~150	$^\circ\text{C}$



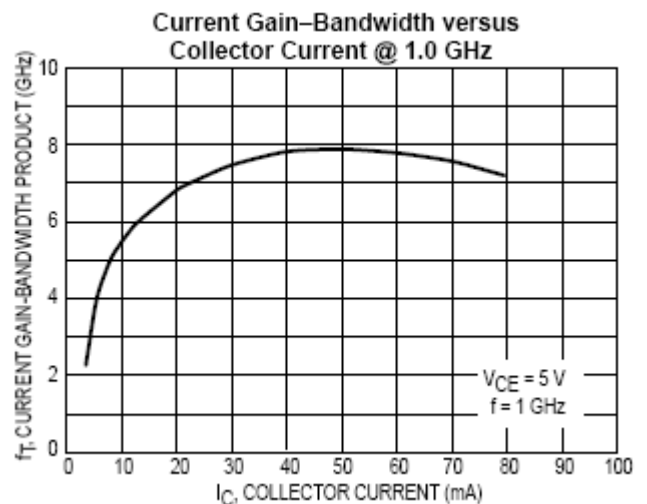
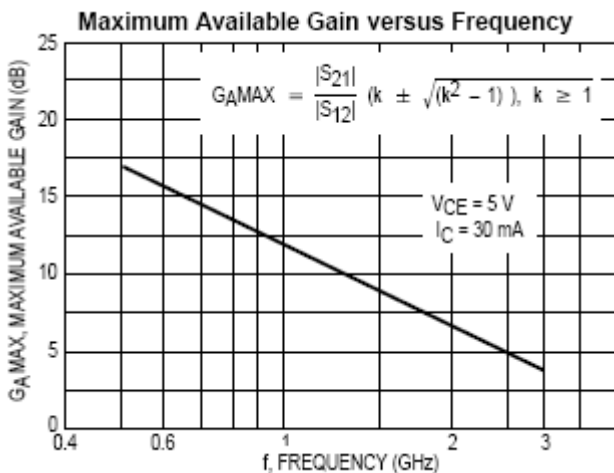
isc Silicon NPN RF Transistor

MMBR571L

ELECTRICAL CHARACTERISTICS

T<sub>C</sub>=25°C unless otherwise specified

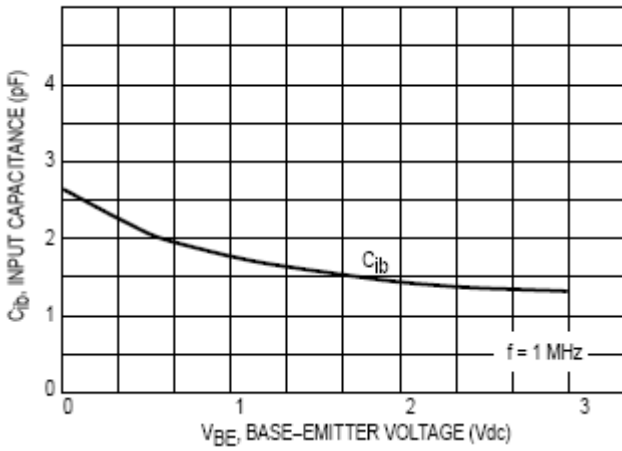
SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
V <sub>(BR)CEO</sub>	Collector-Emitter Breakdown Voltage	I <sub>C</sub> = 1mA ; I <sub>B</sub> = 0	10			V
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage	I <sub>C</sub> = 0.1mA ; I <sub>E</sub> = 0	20			V
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage	I <sub>E</sub> = 50 μ A ; I <sub>C</sub> = 0	3			V
I <sub>CBO</sub>	Collector Cutoff Current	V <sub>CB</sub> = 8V ; I <sub>E</sub> = 0			10	μ A
h <sub>FE</sub>	DC Current Gain	I <sub>C</sub> = 30mA ; V <sub>CE</sub> = 5V	50		300	
C <sub>OB</sub>	Output Capacitance	I <sub>E</sub> = 0 ; V <sub>CB</sub> = 10V ; f= 1MHz		0.7	1.0	pF
f <sub>T</sub>	Current-Gain—Bandwidth Product	I <sub>C</sub> = 50mA ; V <sub>CE</sub> = 5V ; f= 1GHz		8		GHz
G <sub>NF</sub>	Gain@Noise Figure	I <sub>C</sub> = 10mA ; V <sub>CE</sub> = 5V ; f= 0.5GHz		16.5		dB
G <sub>NF</sub>	Gain@Noise Figure	I <sub>C</sub> = 10mA ; V <sub>CE</sub> = 5V ; f= 1GHz		10.5		dB
NF	Noise Figure	I <sub>C</sub> = 10mA ; V <sub>CE</sub> = 5V ; f= 0.5GHz		2.0		dB
NF	Noise Figure	I <sub>C</sub> = 10mA ; V <sub>CE</sub> = 5V ; f= 1GHz		2.6		dB



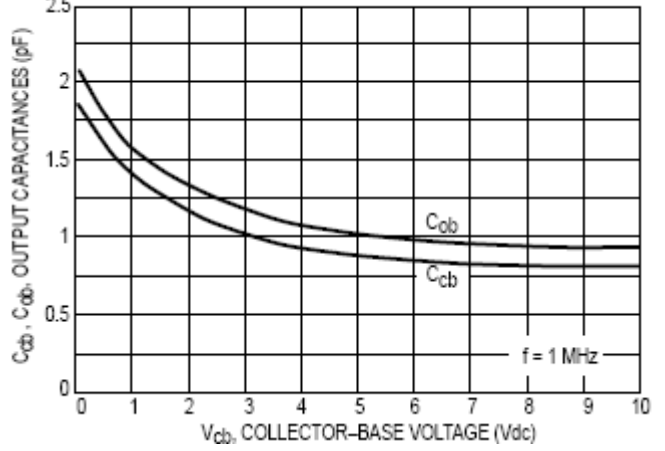
isc Silicon NPN RF Transistor

MMBR571L

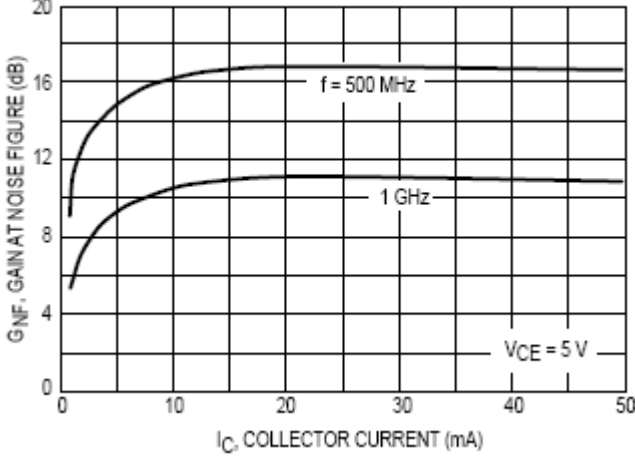
Input Capacitance versus Emitter Base Voltage



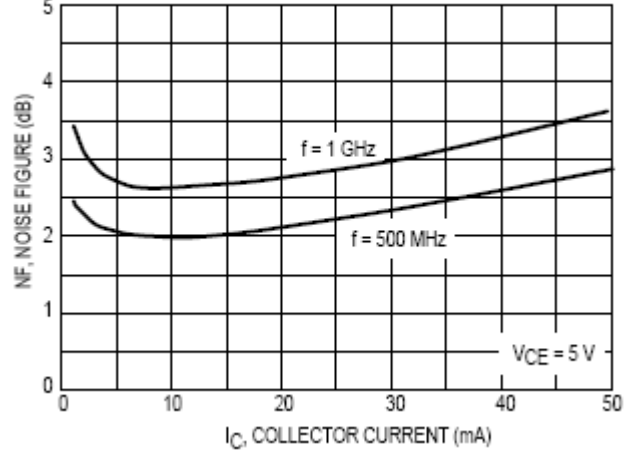
Output Capacitances versus Collector-Base Voltage



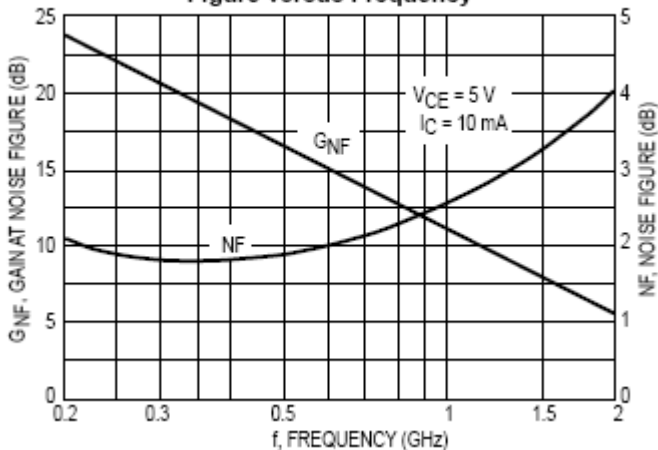
Gain at Noise Figure versus Collector Current



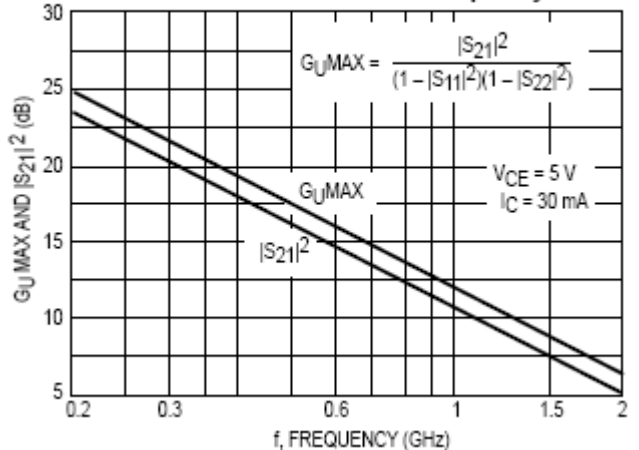
Noise Figure versus Collector Current



Gain at Noise Figure and Noise Figure versus Frequency

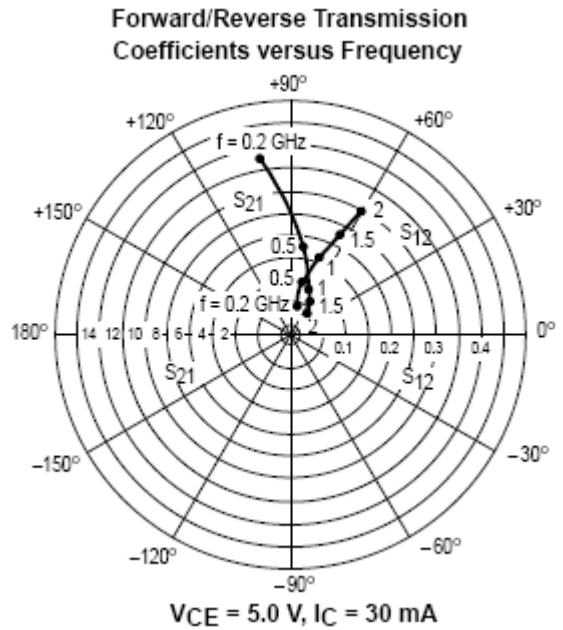
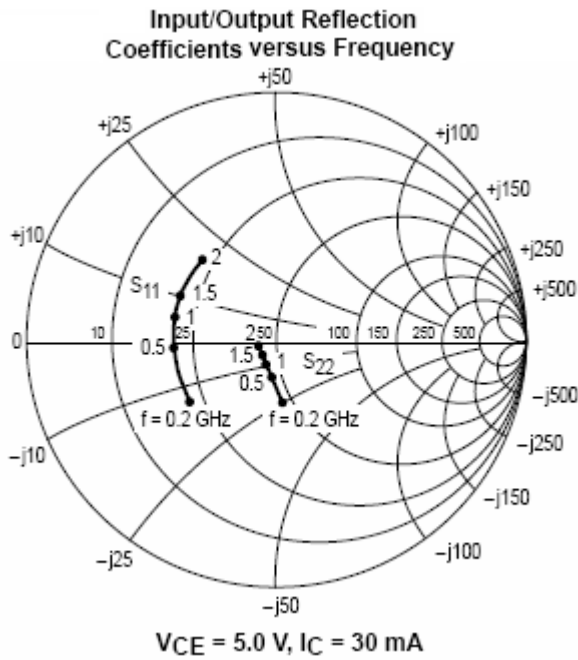


Maximum Unilateral Gain and Insertion Gain versus Frequency



isc Silicon NPN RF Transistor

MMBR571L



S-PARAMETER

VCE = 5 V, IC = 5 mA

f (MHz)	S <sub>11</sub>	∠S <sub>11</sub>	S <sub>21</sub>	∠S <sub>21</sub>	S <sub>12</sub>	∠S <sub>12</sub>	S <sub>22</sub>	∠S <sub>22</sub>
200	0.68	-82	8.41	126	0.07	53	0.61	-45
500	0.52	-142	4.62	93	0.10	46	0.35	-60
1000	0.50	179	2.57	72	0.14	53	0.26	-71
1500	0.51	161	1.82	57	0.19	58	0.24	-77
2000	0.52	143	1.48	45	0.24	59	0.22	-86

VCE = 5 V, IC = 15 mA

f (MHz)	S <sub>11</sub>	∠S <sub>11</sub>	S <sub>21</sub>	∠S <sub>21</sub>	S <sub>12</sub>	∠S <sub>12</sub>	S <sub>22</sub>	∠S <sub>22</sub>
200	0.46	-125	13.65	108	0.05	60	0.35	-73
500	0.43	-169	6.03	86	0.09	66	0.17	-94
1000	0.44	168	3.20	72	0.16	67	0.14	-111
1500	0.45	152	2.21	58	0.22	64	0.11	-118
2000	0.46	137	1.80	48	0.29	59	0.10	-131

## isc Silicon NPN RF Transistor

## MMBR571L

**S-PARAMETER** $V_{CE} = 5\text{ V}$ ,  $I_c = 30\text{ mA}$ 

f (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.42	-148-	14.79	102	0.04	68	0.26	-87
500	0.41	-177-	6.31	84	0.09	72	0.14	-115
1000	0.42	165	3.35	71	0.16	70	0.12	-135
1500	0.44	151	2.29	59	0.23	65	0.11	-144
2000	0.44	135	1.84	48	0.30	60	0.10	-157

 $V_{CE} = 5\text{ V}$ ,  $I_c = 50\text{ mA}$ 

f (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.41	-159-	15.14	98	0.04	73	0.21	-96
500	0.42	179	6.38	83	0.09	75	0.13	-124
1000	0.43	163	3.35	70	0.16	71	0.12	-143
1500	0.44	148	2.32	58	0.23	66	0.10	-151
2000	0.45	134	1.84	48	0.30	60	0.09	-163