

isc Silicon NPN RF Transistor

MMBR911L

DESCRIPTION

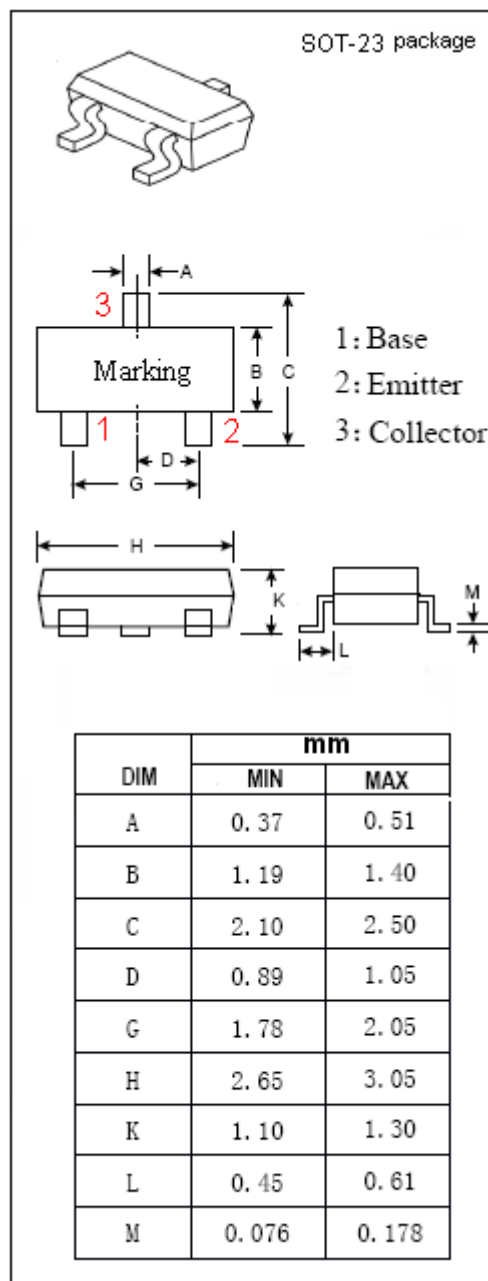
- High Gain
 $G_{NF} = 17 \text{ dB TYP. @ } I_C = 10 \text{ mA, } f = 500 \text{ MHz}$
- Low Noise Figure
 $NF = 1.7 \text{ dB TYP. @ } f = 500 \text{ MHz}$
- High Current-Gain Bandwidth Product
 $f_T = 6.0 \text{ GHz TYP. @ } I_C = 30 \text{ mA}$

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	12	V
V_{EBO}	Emitter-Base Voltage	2	V
I_C	Collector Current-Continuous	60	mA
P_C	Collector Power Dissipation @ $T_C = 75^\circ\text{C}$	0.333	W
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{stg}	Storage Temperature Range	-55~150	$^\circ\text{C}$



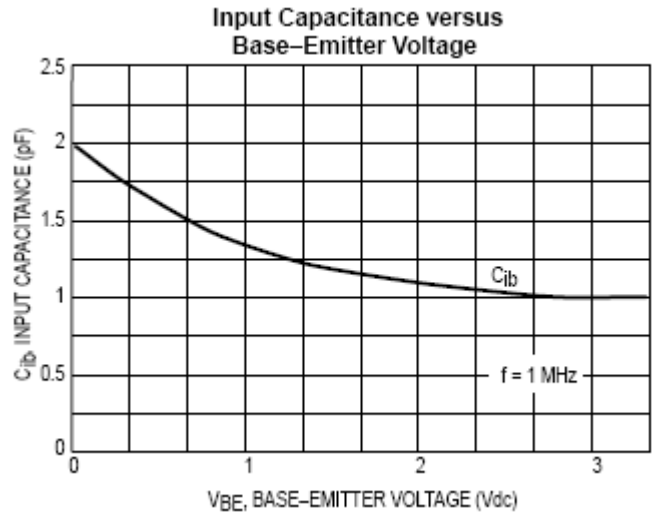
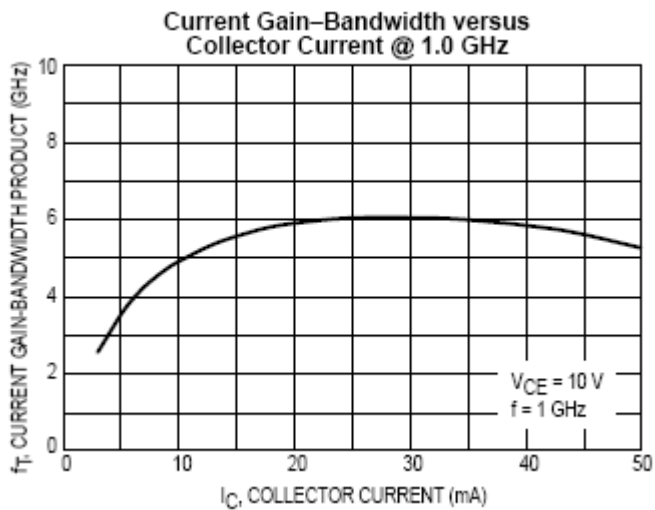
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ELECTRICAL CHARACTERISTICS

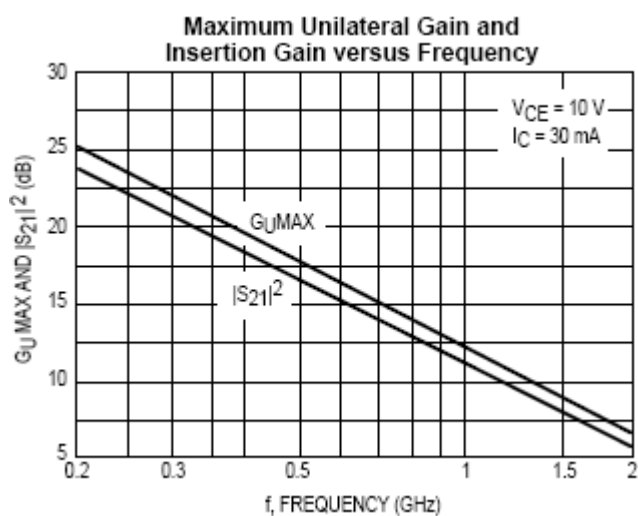
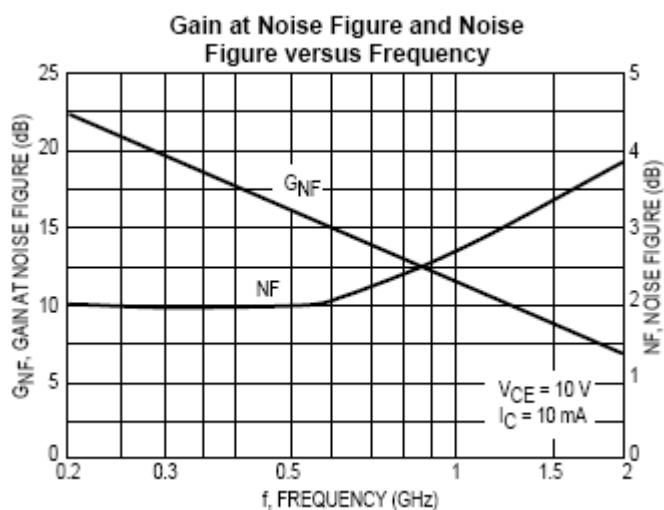
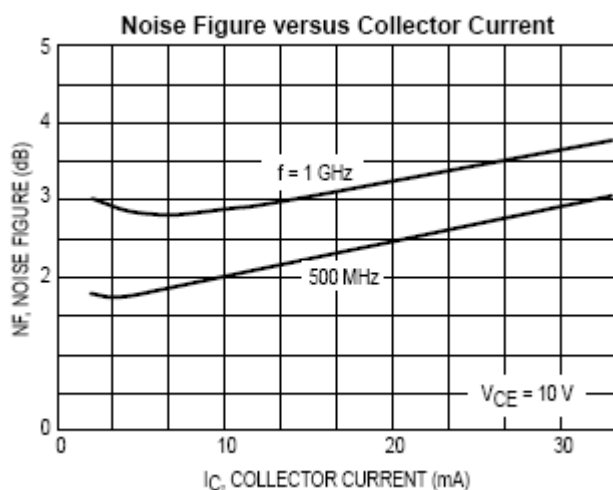
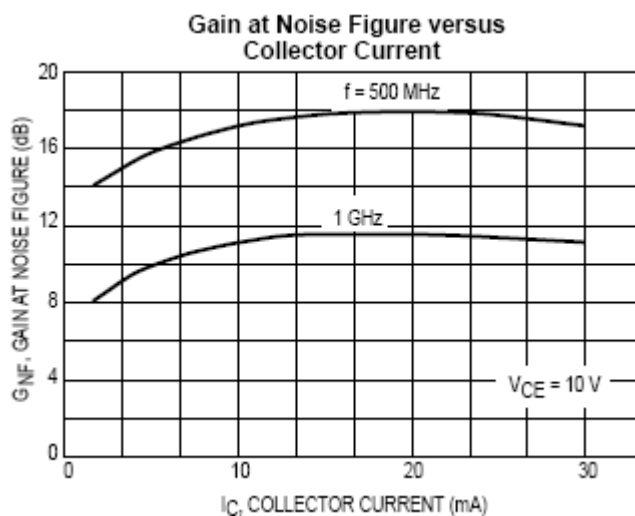
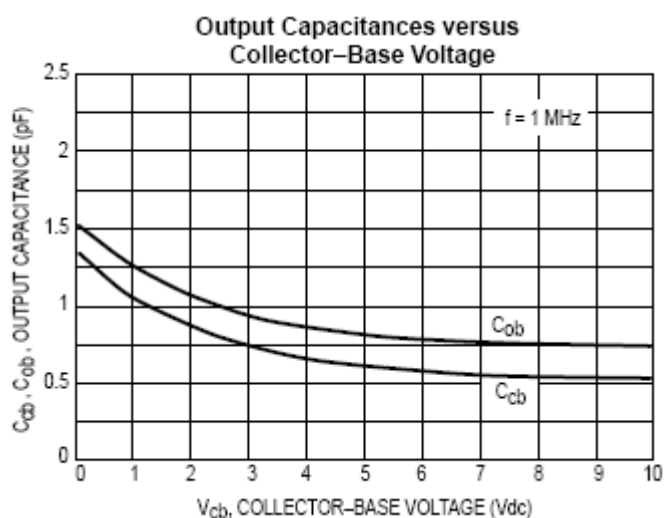
 $T_c=25^{\circ}\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	$I_C=1\text{mA}$; $I_B=0$	12			V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C=0.1\text{mA}$; $I_E=0$	20			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E=0.1\text{mA}$; $I_C=0$	2			V
I_{CBO}	Collector Cutoff Current	$V_{CB}=15\text{V}$; $I_E=0$			0.05	μA
h_{FE}	DC Current Gain	$I_C=30\text{mA}$; $V_{CE}=10\text{V}$	30		200	
C_{OB}	Output Capacitance	$I_E=0$; $V_{CB}=10\text{V}$; $f=1\text{MHz}$			1.0	pF
f_T	Current-Gain—Bandwidth Product	$I_C=30\text{mA}$; $V_{CE}=10\text{V}$; $f=1\text{GHz}$		6.0		GHz
G_{NF}	Gain@ Noise Figure	$I_C=10\text{mA}$; $V_{CE}=10\text{V}$; $f=0.5\text{GHz}$		17		dB
G_{NF}	Gain@ Noise Figure	$I_C=10\text{mA}$; $V_{CE}=10\text{V}$; $f=1\text{GHz}$		11		dB
NF	Noise Figure	$I_C=10\text{mA}$; $V_{CE}=10\text{V}$; $f=0.5\text{GHz}$		2.0		dB
NF	Noise Figure	$I_C=10\text{mA}$; $V_{CE}=10\text{V}$; $f=1\text{GHz}$		2.9		dB



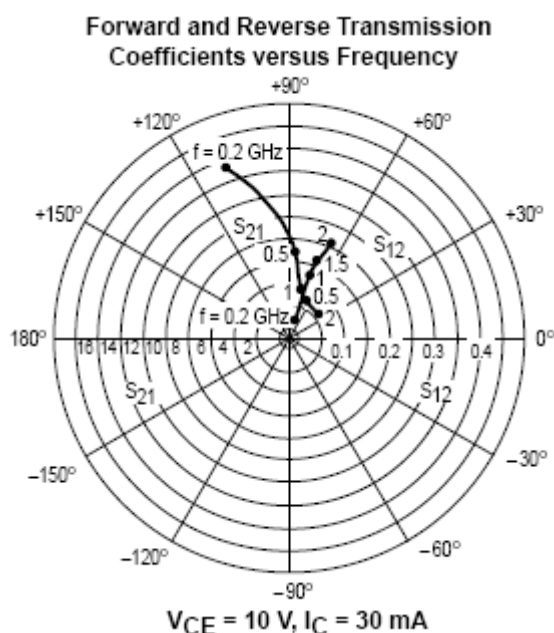
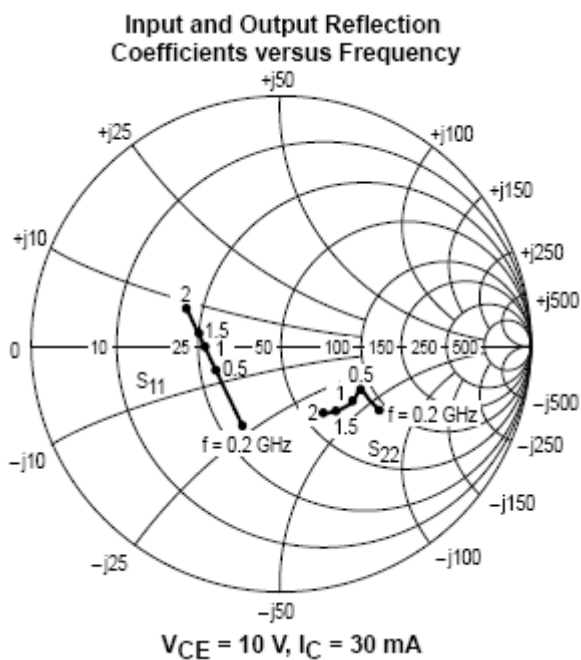
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**S-PARAMETER** $V_{CE} = 10\text{ V}, I_C = 2\text{ mA}$

f (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.82	-45	4.14	145	0.06	66	0.88	-16
500	0.60	-96	3.23	112	0.09	49	0.71	-27
1000	0.47	-149	2.16	85	0.11	49	0.62	-34
1500	0.46	-179	1.59	71	0.13	55	0.58	-43
2000	0.47	162	1.35	57	0.16	62	0.56	-51

 $V_{CE} = 10\text{ V}, I_C = 5\text{ mA}$

f (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.66	-63	8.63	134	0.05	64	0.75	-25
500	0.43	-117	5.29	100	0.07	58	0.55	-31
1000	0.37	-163	3.05	82	0.11	63	0.48	-36
1500	0.38	176	2.17	70	0.15	65	0.45	-44
2000	0.40	160	1.81	57	0.19	65	0.43	-51

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 $V_{CE} = 10\text{ V}$, $I_C = 10\text{ mA}$

f (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.49	-83	12.70	124	0.04	65	0.62	-30
500	0.33	-134	6.42	94	0.07	66	0.44	-32
1000	0.32	-171	3.53	80	0.12	70	0.41	-36
1500	0.35	173	2.46	69	0.16	69	0.38	-45
2000	0.37	159	2.04	58	0.20	66	0.35	-52

 $V_{CE} = 10\text{ V}$, $I_C = 20\text{ mA}$

f (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.36	-103	15.25	114	0.03	69	0.52	-32
500	0.28	-149	6.95	90	0.06	72	0.39	-30
1000	0.29	-176	3.73	78	0.12	73	0.37	-35
1500	0.33	172	2.60	68	0.17	71	0.34	-43
2000	0.36	158	2.14	58	0.21	67	0.32	-52

 $V_{CE} = 10\text{ V}$, $I_C = 30\text{ mA}$

f (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.32	-114	15.64	109	0.03	71	0.48	-29
500	0.27	-156	6.92	88	0.06	73	0.38	-27
1000	0.29	-178	3.71	78	0.12	74	0.37	-33
1500	0.34	170	2.58	68	0.16	72	0.34	-44
2000	0.37	156	2.13	57	0.21	68	0.32	-51