

**MOTOROLA  
SEMICONDUCTOR  
TECHNICAL DATA**

**The RF Line  
NPN Silicon  
High Frequency Transistor**

... designed for thick and thin-film circuits using surface mount components and requiring low-noise, high-gain signal amplification at frequencies to 1 GHz.

- High Gain —  $G_{pe} = 11 \text{ dB Typ @ } f = 500 \text{ MHz}$
- Low Noise —  $NF = 1.9 \text{ dB Typ @ } f = 500 \text{ MHz}$

**MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	12	V <sub>dc</sub>
Collector-Base Voltage	V <sub>CBO</sub>	15	V <sub>dc</sub>
Emitter-Base Voltage	V <sub>EBO</sub>	3.0	V <sub>dc</sub>
Collector Current — Continuous	I <sub>C</sub>	35	mAdc
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to +150	°C

**THERMAL CHARACTERISTICS**

Characteristic	Symbol	Max	Unit
*Total Device Dissipation, T <sub>A</sub> = 25°C Derate above 25°C	P <sub>D</sub>	350 2.8	mW mW/°C
Storage Temperature	T <sub>stg</sub>	150	°C
*Thermal Resistance Junction to Ambient	R <sub>θJA</sub>	357	°C/W

\*Package mounted on 99.5% alumina 10 x 8 x 0.6 mm.

**DEVICE MARKING**

MMBR930 = 7C

**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted.)**

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector-Emitter Breakdown Voltage (I <sub>C</sub> = 1.0 mAdc, I <sub>B</sub> = 0)	V <sub>(BR)CEO</sub>	12	—	—	V <sub>dc</sub>
Collector-Base Breakdown Voltage (I <sub>C</sub> = 0.1 mAdc, I <sub>E</sub> = 0)	V <sub>(BR)CBO</sub>	15	—	—	V <sub>dc</sub>
Emitter-Base Breakdown Voltage (I <sub>E</sub> = 0.1 mAdc, I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	3.0	—	—	V <sub>dc</sub>
Collector Cutoff Current (V <sub>CB</sub> = 5.0 V <sub>dc</sub> , I <sub>E</sub> = 0)	I <sub>CBO</sub>	—	—	50	nAdc
<b>ON CHARACTERISTICS</b>					
DC Current Gain (I <sub>C</sub> = 30 mAdc, V <sub>CE</sub> = 5.0 V <sub>dc</sub> )	h <sub>FE</sub>	25	—	250	—
<b>SMALL-SIGNAL CHARACTERISTICS</b>					
Collector-Base Capacitance (V <sub>CB</sub> = 10 V <sub>dc</sub> , I <sub>E</sub> = 0, f = 1.0 MHz)	C <sub>cb</sub>	—	—	1.0	pF
Noise Figure (I <sub>C</sub> = 2.0 mAdc, V <sub>CE</sub> = 5.0 V <sub>dc</sub> , f = 0.5 GHz) (I <sub>C</sub> = 2.0 mAdc, V <sub>CE</sub> = 5.0 V <sub>dc</sub> , f = 1.0 GHz)	NF	—	1.9 2.5	—	dB
Common-Emitter Amplifier Power Gain (I <sub>C</sub> = 2.0 mAdc, V <sub>CE</sub> = 5.0 V <sub>dc</sub> , f = 0.5 GHz) (I <sub>C</sub> = 2.0 mAdc, V <sub>CE</sub> = 5.0 V <sub>dc</sub> , f = 0.5 GHz)	G <sub>pe</sub>	—	11 8.0	—	dB

**MMBR930**

**AMPLIFIER TRANSISTOR  
NPN SILICON**



CASE 318-05, STYLE 6  
SOT-23  
(TO-236AA/AB)