

**MOTOROLA**  
**SEMICONDUCTOR**  
**TECHNICAL DATA**

**MMBR931**

Die Source Same as MRF931

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

... designed primarily for use in low-power amplifiers to 1 GHz. Ideal for pagers and other battery operated systems where power consumption is critical.

**RF AMPLIFIER TRANSISTOR**  
**NPN SILICON**

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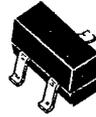
**MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	5.0	Vdc
Collector-Base Voltage	V <sub>CBO</sub>	10	Vdc
Emitter-Base Voltage	V <sub>EBO</sub>	2.0	Vdc
Collector Current — Continuous	I <sub>C</sub>	5.0	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>	50 0.4	mW mW/°C
Storage Temperature	T <sub>stg</sub>	150	°C
*Thermal Resistance Junction to Ambient	R <sub>θJA</sub>	2500	°C/W

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



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

**DEVICE MARKING**

MMBR931 = 7D

**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> = 0.1 mAdc, I <sub>B</sub> = 0)	V <sub>(BR)CEO</sub>	5.0	—	—	Vdc
Collector-Base Breakdown Voltage (I <sub>C</sub> = 0.01 mAdc, I <sub>E</sub> = 0)	V <sub>(BR)CBO</sub>	10	—	—	Vdc
Emitter-Base Breakdown Voltage (I <sub>E</sub> = 0.1 mAdc, I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	2.0	—	—	Vdc
Collector Cutoff Current (V <sub>CB</sub> = 5.0 Vdc, I <sub>E</sub> = 0)	I <sub>CBO</sub>	—	—	50	nAdc
<b>ON CHARACTERISTICS</b>					
DC Current Gain (I <sub>C</sub> = 0.25 mAdc, V <sub>CE</sub> = 1.0 Vdc)	h <sub>FE</sub>	30	—	150	—
<b>SMALL-SIGNAL CHARACTERISTICS</b>					
Collector-Base Capacitance (V <sub>CB</sub> = 1.0 Vdc, I <sub>E</sub> = 0, f = 1.0 MHz)	C <sub>cb</sub>	—	—	0.5	pF
Noise Figure (I <sub>E</sub> = 0.25 mAdc, V <sub>CE</sub> = 1.0 Vdc, f = 1.0 GHz)	NF	—	4.3	—	dB
Power Gain at Optimum Noise Figure (I <sub>E</sub> = 0.25 mAdc, V <sub>CE</sub> = 1.0 Vdc, f = 1.0 GHz)	G <sub>NF</sub>	—	10	—	—