

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_{CEO}	12	Vdc
Collector-Base Voltage	V_{CBO}	15	Vdc
Emitter-Base Voltage	V_{EBO}	3.0	Vdc
Collector Current — Continuous	I_C	35	mA dc
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
*Total Device Dissipation, $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	350 2.8	mW mW/°C
Storage Temperature	T_{stg}	150	°C
*Thermal Resistance Junction to Ambient	$R_{\theta JA}$	357	°C/W

*Package mounted on 99.5% alumina $10 \times 8 \times 0.8 \text{ mm}$.

DEVICE MARKING

MMBR930L = 7C

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ($I_C = 1.0 \text{ mA dc}, I_E = 0$)	$V_{(BR)CEO}$	12	—	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 0.1 \text{ mA dc}, I_E = 0$)	$V_{(BR)CBO}$	15	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 0.1 \text{ mA dc}, I_C = 0$)	$V_{(BR)EBO}$	3.0	—	—	Vdc
Collector Cutoff Current ($V_{CB} = 5.0 \text{ Vdc}, I_E = 0$)	I_{CBO}	—	—	50	nA dc
ON CHARACTERISTICS					
DC Current Gain ($I_C = 30 \text{ mA dc}, V_{CE} = 5.0 \text{ Vdc}$)	h_{FE}	25	—	250	—
SMALL-SIGNAL CHARACTERISTICS					
Collector-Base Capacitance ($V_{CB} = 10 \text{ Vdc}, I_E = 0, f = 1.0 \text{ MHz}$)	C_{cb}	—	—	1.0	pF
Noise Figure ($I_C = 2.0 \text{ mA dc}, V_{CE} = 5.0 \text{ Vdc}, f = 0.5 \text{ GHz}$) ($I_C = 2.0 \text{ mA dc}, V_{CE} = 5.0 \text{ Vdc}, f = 1.0 \text{ GHz}$)	NF	—	1.9 2.5	—	dB
Common-Emitter Amplifier Power Gain ($I_C = 2.0 \text{ mA dc}, V_{CE} = 5.0 \text{ Vdc}, f = 0.5 \text{ GHz}$) ($I_C = 2.0 \text{ mA dc}, V_{CE} = 5.0 \text{ Vdc}, f = 0.5 \text{ GHz}$)	G_{pe}	—	11 8.0	—	dB

T31-19

MMBR930L

AMPLIFIER TRANSISTOR

NPN SILICON

2



CASE 318-07, STYLE 6
SOT-23
LOW PROFILE
(TO-236AA/AB)