

MOTOROLA

SEMICONDUCTOR

TECHNICAL DATA

PRELIMINARY DATA

MRFS5109HXV/HS

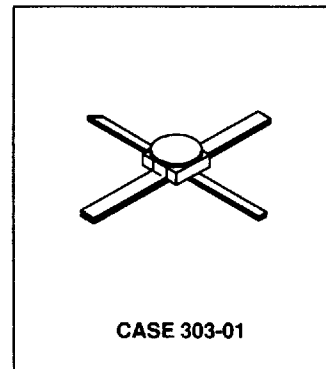
PROCESSED TO MIL-S-19500/453

**SURFACE MOUNTABLE
R.F. TRANSISTOR**

400 VOLT, 400 MILLIAMPERE BIPOLAR NPN



*Discrete
Military
Operation*



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	20	Vdc
Collector-Emitter Voltage	V_{CER}	40	Vdc
Collector-Base Voltage	V_{CBO}	40	Vdc
Emitter-Base Voltage	V_{EBO}	3.0	Vdc
Collector Current	I_C	400	mAdc
Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_T	200 1.14	mW mW/ $^\circ\text{C}$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to +200	$^\circ\text{C}$

This document contains information on a new product. Specifications and information herein are subject to change without notice.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless noted)				
Characteristic	Symbol	Min	Max	Unit
Collector-Emitter Breakdown Voltage $I_C = 5.0 \text{ mA}$	$V_{(BR)CEO}$	20	—	Vdc
Collector-Emitter Breakdown Voltage $I_C = 5.0 \text{ mA}$, $R = 10 \text{ ohms}$	$V_{(BR)CER}$	40	—	Vdc
Collector-Base Breakdown Voltage $I_C = 100 \mu\text{A}$	$V_{(BR)CBO}$	40	—	Vdc
Emitter-Base Breakdown Voltage $I_E = 100 \mu\text{A}$	$V_{(BR)EBO}$	3.0	—	Vdc
Collector Cutoff Current $V_{CE} = 15 \text{ Vdc}$ $V_{CE} = 15 \text{ Vdc}$, $T_A = +150^\circ\text{C}$	I_{CEO}	— —	20 5.0	μA mA
DC Current Gain $I_C = 50 \text{ mA}$, $V_{CE} = 15 \text{ Vdc}$ $I_C = 50 \text{ mA}$, $V_{CE} = 5.0 \text{ Vdc}$, $T_A = -55^\circ\text{C}$	h_{FE}	40 15	150 —	—
Collector-Emitter Saturation Voltage $I_C = 100 \text{ mA}$, $I_B = 10 \text{ mA}$	$V_{CE(sat)}$	—	0.5	Vdc
Output Capacitance $V_{CB} = 28 \text{ Vdc}$, $I_E = 0$, $f = 0.1$ to 1.0 MHz	C_{obo}	—	3.5	pF
Current Transfer Ratio, Magnitude $I_C = 25 \text{ mA}$, $V_{CE} = 15 \text{ Vdc}$, $f = 200 \text{ MHz}$ $I_C = 50 \text{ mA}$, $V_{CE} = 15 \text{ Vdc}$, $f = 200 \text{ MHz}$ $I_C = 100 \text{ mA}$, $V_{CE} = 15 \text{ Vdc}$, $f = 200 \text{ MHz}$	$ h_{fe} $	5.0 6.0 5.0	10 11 10.5	—
Cross Modulation $I_C = 50 \text{ mA}$, $V_{CC} = 15 \text{ Vdc}$	cm	—	-57	dB
Common-Emitter Power Gain $I_C = 50 \text{ mA}$, $V_{CC} = 15 \text{ Vdc}$, $f = 200 \text{ MHz}$	G_{pe}	11	—	dB
Common Emitter Voltage Gain $I_C = 50 \text{ mA}$, $V_{CC} = 15 \text{ Vdc}$, $f = 50$ to 216 MHz	G_{ve}	11	—	dB
Noise Figure $I_C = 10 \text{ mA}$, $V_{CC} = 15 \text{ Vdc}$, $f = 200 \text{ MHz}$	NF	—	3.5	dB

ASSURANCE TESTING (Pre/Post Burn-In)**Burn-In Test Conditions: $T_A = 25 \pm 3^\circ\text{C}$, $V_{CB} = 15 \text{ Vdc}$, $P_T = 200 \text{ mW}$**

Characteristics Tested	Symbol	Min	Max	Unit
Collector Cutoff Current $V_{CE} = 15 \text{ Vdc}$, $I_E = 0$	I_{CEO}	—	20	μA
DC Current Gain $I_C = 50 \text{ mA}$, $V_{CE} = 15 \text{ Vdc}$	h_{FE}	40	150	—

Delta from Pre-Burn-In Measured Values

Delta Collector Cutoff Current	ΔI_{CEO}	100 or 2.0 whichever is greater	% initial μA % initial
Delta DC Current Gain	Δh_{FE}	± 20	% initial