MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

PRELIMINARY DATA

MRFS3960HXV/HS

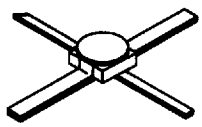
PROCESSED TO MIL-S-19500/399

SURFACE MOUNTABLE R.F. TRANSISTOR

12 VOLT, 30 MILLIAMPERE BIPOLAR NPN

DMO

Discrete Military Operation



CASE 303-01

MAXIMUM RATINGS			
Rating	**Symbol**	**Value**	**Unit**
Collector-Emitter Voltage	V_{CEO}	12	Vdc
Collector-Base Voltage	V_{CBO}	20	Vdc
Emitter-Base Voltage	V_{EBO}	4.5	Vdc
Collector Current — Continuous	I_C	30	mAdc
Device Dissipation @ 25°C Derate above 25°C	P_T	200 1.14	mW mW/°C
Operating Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +200	°C

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

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless noted)				
Characteristic	**Symbol**	**Min**	**Max**	**Unit**
Collector-Emitter Breakdown Voltage I_C = 10 mAdc, I_E = 0	$V_{(BR)CEO}$	12	—	Vdc
Collector-Base Breakdown Voltage I_C = 10 μAdc, I_E = 0	$V_{(BR)CBO}$	20	—	Vdc
Emitter-Base Breakdown Voltage I_E = 10 μAdc, I_C = 0	$V_{(BR)EBO}$	4.5	—	Vdc
Collector Cutoff Current V_{BE} = 0.4 Vdc, V_{CE} = 10 Vdc V_{EB} = 2.0 Vdc, V_{CE} = 10 Vdc V_{EB} = 2.0 Vdc, V_{CE} = 10 Vdc, T_A = +150°C	I_{CEX}	 — — —	 1.0 5.0 5.0	 μAdc nAdc μAdc
DC Current Gain I_C = 1.0 mAdc, V_{CE} = 1.0 Vdc I_C = 10 mAdc, V_{CE} = 1.0 Vdc I_C = 30 mAdc, V_{CE} = 1.0 Vdc I_C = 10 mAdc, V_{CE} = 1.0 Vdc, T_A = −55°C	h_{FE}	 40 60 30 30	 — 300 — —	—
Collector-Emitter Saturation Voltage I_C = 1.0 mAdc, I_B = 0.1 mAdc I_C = 30 mAdc, I_B = 3.0 mAdc	$V_{CE(sat)}$	 — —	 0.2 0.3	Vdc
Base-Emitter Saturation Voltage I_C = 1.0 mAdc, I_B = 0.1 mAdc I_C = 30 mAdc, I_B = 3.0 mAdc	$V_{BE(sat)}$	 — —	 0.8 1.0	Vdc
Output Capacitance V_{CB} = 4.0 Vdc, I_E = 0, f = 0.1 to 1.0 MHz	C_{obo}	—	2.5	pF
Input Capacitance V_{EB} = 0.5 Vdc, I_C = 0, f = 0.1 to 1.0 MHz	C_{ibo}	—	2.5	pF
Small-Signal Current Transfer Ratio, Magnitude I_C = 5.0 mAdc, V_{CE} = 4.0 Vdc, f = 100 MHz I_C = 10 mAdc, V_{CE} = 4.0 Vdc, f = 100 MHz I_C = 30 mAdc, V_{CE} = 4.0 Vdc, f = 100 MHz	$\lvert h_{fe} \rvert$	 13 14 12	 — — —	—

ASSURANCE TESTING (Pre/Post Burn-In) **Burn-In Test Conditions: T_A = 25 ±3°C, V_{CB} = 10 Vdc, P_T = 200 mW**				
Characteristics Tested	**Symbol**	**Min**	**Max**	**Unit**
Collector Cutoff Current V_{CE} = 10 Vdc, V_{EB} = 2.0 Vdc	I_{CEX}	—	5.0	nAdc
DC Current Gain I_C = 10 mAdc, V_{CE} = 1.0 Vdc	h_{FE}	60	300	—

Delta from Pre-Burn-In Measured Values			
Delta Collector Cutoff Current	ΔI_{CEX}	100 or 2.0 whichever is greater	% initial nAdc
Delta DC Current Gain	Δh_{FE}	±20	% initial