

6367254 MOTOROLA SC (XSTRS/R F)

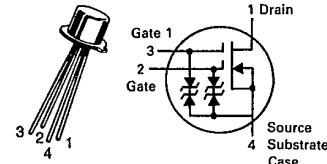
96D 82620 D
T-31-25

MAXIMUM RATINGS

Rating	Symbol	3N211 3N212	3N213	Unit
Drain-Source Voltage	V _{DS}	27	35	Vdc
Drain-Gate Voltage	V _{DG1} V _{DG2}	35 35	40 40	Vdc
Drain Current	I _D	50		mAdc
Gate Current	I _{G1} I _{G2}	±10 ±10		mAdc
Total Device Dissipation @ T _A = 25°C Derate above 25°C	P _D	360		mW
		2.4		mW/°C
Total Device Dissipation @ T _C = 25°C Derate above 25°C	P _D	1.2		Watt
		8.0		mW/°C
Lead Temperature, 1/16" From Seated Surface for 10 seconds	T _L	300		°C
Junction Temperature Range	T _J	-65 to +175		°C
Storage Temperature Range	T _{stg}	-65 to +175		°C

**3N211
3N212
3N213**

**CASE 20-03, STYLE 9
TO-72 (TO-206AF)**



**DUAL-GATE MOSFET
VHF AMPLIFIER**

N-CHANNEL — DEPLETION

Refer to MPF211 for graphs.

6

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Drain-Source Breakdown Voltage(1) (I _D = 10 μAdc, V _{G1S} = V _{G2S} = -4.0 Vdc)	V _{(BR)DSX}	25 30	—	Vdc
Instantaneous Drain-Source Breakdown Voltage) (I _D = 10 μAdc, V _{G1S} = V _{G2S} = -4.0 Vdc)	V _{(BR)DSX}	27 35	—	Vdc
Gate 1-Source Breakdown Voltage(2) (I _{G1} = ±10 mAdc, V _{G2S} = V _{DS} = 0)	V _{(BR)G1SO}	±6.0	—	Vdc
Gate 2-Source Breakdown Voltage(2) (I _{G2} = ±10 mAdc, V _{G1S} = V _{DS} = 0)	V _{(BR)G2SO}	±6.0	—	Vdc
Gate 1 Leakage Current (V _{G1S} = ±5.0 Vdc, V _{G2S} = V _{DS} = 0) (V _{G1S} = -5.0 Vdc, V _{G2S} = V _{DS} = 0, T _A = 150°C)	I _{G1SS}	—	±10 -10	nAdc μAdc
Gate 2 Leakage Current (V _{G2S} = ±5.0 Vdc, V _{G1S} = V _{DS} = 0) (V _{G2S} = -5.0 Vdc, V _{G1S} = V _{DS} = 0, T _A = 150°C)	I _{G2SS}	—	±10 -10	nAdc μAdc
Gate 1 to Source Cutoff Voltage (V _{DS} = 15 Vdc, V _{G2S} = 4.0 Vdc, I _D = 20 μAdc)	V _{G1S(off)}	-0.5 -0.5	-5.5 -4.0	Vdc
Gate 2 to Source Cutoff Voltage (V _{DS} = 15 Vdc, V _{G1S} = 0, I _D = 20 μAdc)	V _{G2S(off)}	-0.2 -0.2	-2.5 -4.0	Vdc
ON CHARACTERISTICS				
Zero-Gate-Voltage Drain Current(3) (V _{DS} = 15 Vdc, V _{G1S} = 0, V _{G2S} = 4.0 Vdc)	I _{DSS}	6.0	40	mAdc
SMALL-SIGNAL CHARACTERISTICS				
Forward Transfer Admittance(4) (V _{DS} = 15 Vdc, V _{G2S} = 4.0 Vdc, V _{G1S} = 0, f = 1.0 kHz)	y _{fs}	17 15	40 35	mmhos
Reverse Transfer Capacitance (V _{DS} = 15 Vdc, V _{G2S} = 4.0 Vdc, I _D = 1.0 mAdc, f = 1.0 MHz)	C _{rss}	0.005	0.05	pF
FUNCTIONAL CHARACTERISTICS				
Noise Figure (V _{DD} = 18 Vdc, V _{GG} = 7.0 Vdc, f = 200 MHz) (V _{DD} = 24 Vdc, V _{GG} = 6.0 Vdc, f = 45 MHz)	NF	—	3.5 4.0	dB

MOTOROLA SMALL-SIGNAL SEMICONDUCTORS

6367254 MOTOROLA SC (XSTRS/R F)

96D 82621 D

3N211, 3N212, 3N213

T-31-25

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

Characteristic		Symbol	Min	Max	Unit
Common Source Power Gain ($V_{DD} = 18\text{ Vdc}$, $V_{GG} = 7.0\text{ Vdc}$, $f = 200\text{ MHz}$) ($V_{DD} = 24\text{ Vdc}$, $V_{GG} = 6.0\text{ Vdc}$, $f = 45\text{ MHz}$) ($V_{DD} = 24\text{ Vdc}$, $V_{GG} = 6.0\text{ Vdc}$, $f = 45\text{ MHz}$) ($V_{DD} = 18\text{ Vdc}$, $f_{LO} = 245\text{ MHz}$, $f_{RF} = 200\text{ MHz}$)	3N211	G_{ps}	24	35	dB
	3N211		29	37	
	3N213	$G_c(6)$	27	35	
	3N212		21	28	
Bandwidth ($V_{DD} = 18\text{ Vdc}$, $V_{GG} = 7.0\text{ Vdc}$, $f = 200\text{ MHz}$) ($V_{DD} = 18\text{ Vdc}$, $f_{LO} = 245\text{ MHz}$, $f_{RF} = 200\text{ MHz}$) ($V_{DD} = 24\text{ Vdc}$, $V_{GG} = 6.0\text{ Vdc}$, $f = 45\text{ MHz}$)	3N211	BW	5.0	12	MHz
	3N212		4.0	7.0	
	3N211,213		3.5	6.0	
Gain Control Gate-Supply Voltage(5) ($V_{DD} = 18\text{ Vdc}$, $\Delta G_{ps} = -30\text{ dB}$, $f = 200\text{ MHz}$) ($V_{DD} = 24\text{ Vdc}$, $\Delta G_{ps} = -30\text{ dB}$, $f = 45\text{ MHz}$)	3N211	$V_{GG}(GC)$	—	-2.0	Vdc
	2N211,213		—	± 1.0	

(1) Measured after five seconds of applied voltage.

(2) All gate breakdown voltages are measured while the device is conducting rated gate current. This ensures that the gate-voltage limiting network is functioning properly.

(3) Pulse Test: Pulse Width = $300\ \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

(4) This parameter must be measured with bias voltages applied for less than 5 seconds to avoid overheating. The signal is applied to gate 1 with gate 2 at ac ground.

(5) ΔG_{ps} is defined as the change in G_{ps} from the value at $V_{GG} = 7.0\text{ Volts}$ (3N211) and $V_{GG} = 6.0\text{ Volts}$ (3N213).(6) Power Gain Conversion. Amplitude at input from local oscillator is adjusted for maximum G_c .