NEC

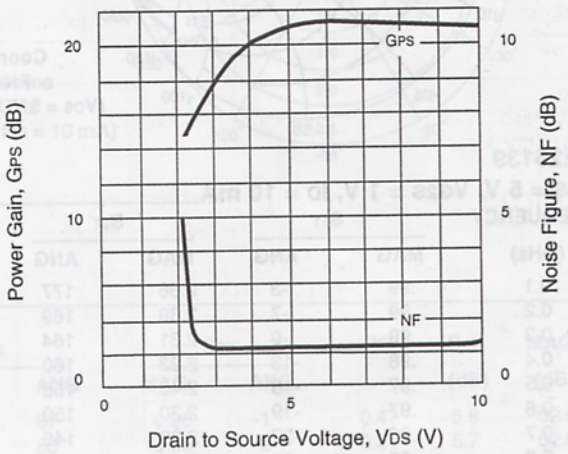
GENERAL PURPOSE DUAL-GATE GaAs MESFET

NE25339

FEATURES

- SUITABLE FOR USE AS RF AMPLIFIER AND MIXER IN UHF APPLICATIONS
- LOW CRSS: 0.02 pF (TYP)
- HIGH GPS: 20 dB (TYP) AT 900 MHz
- LOW NF: 1.1 dB TYP AT 900 MHz
- L_{G1} = 1.0 µm, L_{G2} = 1.5 µm, W_G = 800 µm
- ION IMPLANTATION
- AVAILABLE IN TAPE & REEL OR BULK

POWER GAIN AND NOISE FIGURE vs. DRAIN TO SOURCE VOLTAGE
V_{GS} = 1 V, I_{DS} = 10 mA, f = 900 MHz



DESCRIPTION

The NE253 is an 800 µm dual gate GaAs FET designed to provide flexibility in its application as a mixer, AGC amplifier, or low noise amplifier. As an example, by shorting the second gate to the source, higher gain can be realized than with single gate MESFETs. This device is available in a mini-mold (surface mount) package.

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

PART NUMBER / PACKAGE OUTLINE			NE25339 39		
SYMBOL	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
NF	Noise Figure at V_{DS} = 5 V, V_{G2S} = 1 V, I_D = 10 mA, f = 900 MHz	dB		1.1	2.5
G_{PS}	Power Gain at V_{DS} = 5 V, V_{G2S} = 1 V, I_{DS} = 10 mA, f = 900 MHz	dB	16	20	
BV_{DSX}	Drain to Source Breakdown Voltage at V_{G1S} = -4 V, V_{G2S} = 0, I_{DS} = 20 µA	V	10		
I_{DSS}	Saturated Drain Current at V_{DS} = 5 V, V_{G2S} = 0 V, V_{G1S} = 0 V	mA	10	40	80
$V_{G1S\ (OFF)}$	Gate 1 to Source Cutoff Voltage at V_{DS} = 5 V, V_{G2S} = 0 V, I_D = 100 µA	V			-3.5
$V_{G2S\ (OFF)}$	Gate 2 to Source Cutoff Voltage at V_{DS} = 5 V, V_{G1S} = 0 V, I_D = 100 µA	V			-3.5
I_{G1SS}	Gate 1 Reverse Current at V_{DS} = 0, V_{G1S} = -4V, V_{G2S} = 0	µA			10
I_{G2SS}	Gate 2 Reverse Current at V_{DS} = 0. V_{G2S} = -4V, V_{G1S} = 0	µA			10
$\|Y_{FS}\|$	Forward Transfer Admittance at V_{DS} = 5 V, V_{G2S} = 1 V, I_{DS} = 10 mA, f = 1.0 kHz	mS	25	35	
C_{ISS}	Input Capacitance at V_{DS} = 5 V, V_{G2S} = 1 V, I_D = 10 mA, f = 1 MHz	pF	1.0	1.5	2.0
C_{RSS}	Reverse Transfer Capacitance at V_{DS} = 5 V, V_{G2S} = 1 V, I_{DS} = 10 mA, f = 1 MHz	pF		0.02	0.035

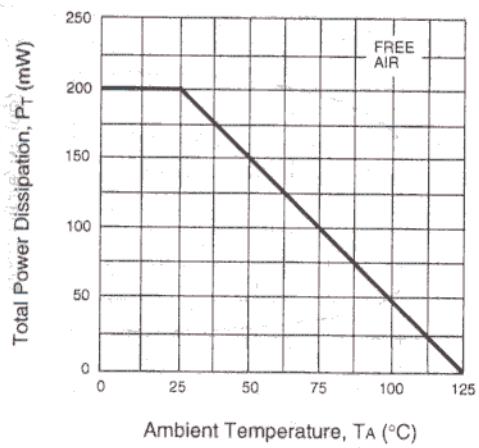
ABSOLUTE MAXIMUM RATINGS[1] (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V_{DSX}	Drain to Source Voltage	V	10
V_{G1S}	Gate 1 to Source Voltage	V	-4.5
V_{G2S}	Gate 2 to Source Voltage	V	-4.5
I_D	Drain Current	mA	80
T_{CH}	Channel Temperature	°C	125
T_{STG}	Storage Temperature	°C	-55 to +125
P_T	Total Power Dissipation	mW	200

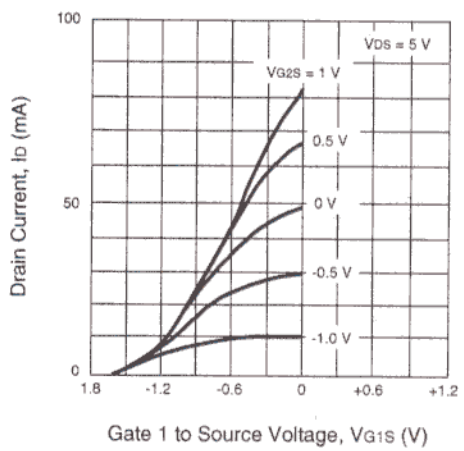
Note:
1. Operation in excess of any one of these parameters may result in permanent damage.

TYPICAL PERFORMANCE CURVES (T_A = 25°C)

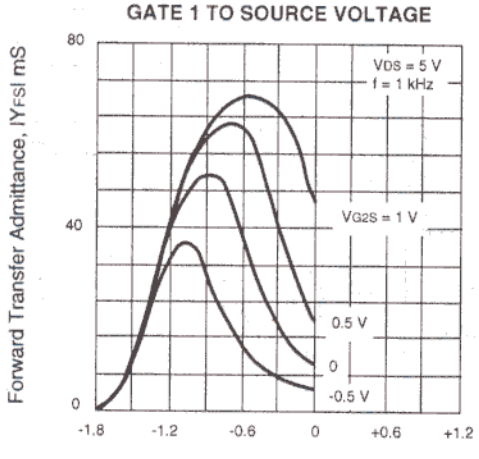
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



DRAIN CURRENT vs. GATE 1 TO SOURCE VOLTAGE



FORWARD TRANSFER ADMITTANCE vs. GATE 1 TO SOURCE VOLTAGE



FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT