



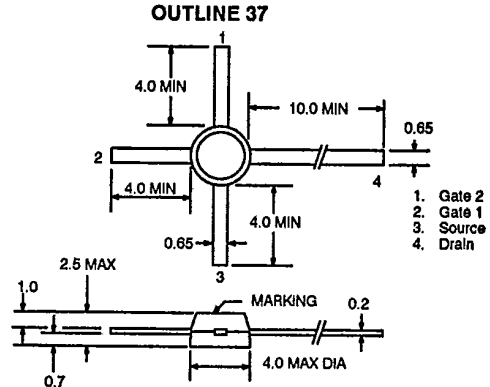
**GENERAL PURPOSE
DUAL-GATE GaAs MESFET**

**NE25337
NE25339**

FEATURES

- SUITABLE FOR USE AS RF AMPLIFIER AND MIXER IN UHF APPLICATIONS
- LOW C_{rss} : 0.02 pF (TYP)
- HIGH G_{ps} : 20 dB (TYP)
- LOW NF : 1.1 dB (TYP)
- GATE WIDTH: $W_g = 800$ Microns
- ION IMPLANTATION
- AVAILABLE IN TAPE & REEL OR BULK

OUTLINE DIMENSIONS (Units in mm)



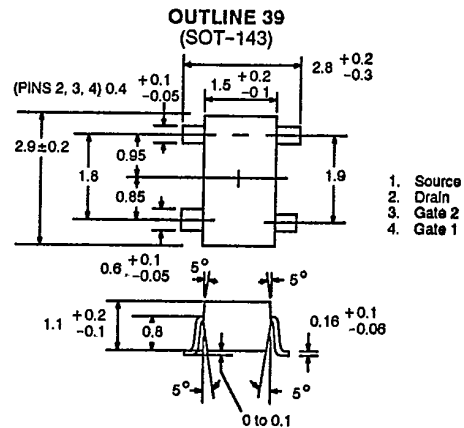
DESCRIPTION AND APPLICATIONS

The NE253 is an 800 μ m 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 disk mold and mini-mold (surface mount).



ABSOLUTE MAXIMUM RATINGS (TA = 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
P_T	Total Power Dissipation	mW	200
T_{CH}	Channel Temperature	°C	125
T_{STG}	Storage Temperature	°C	-55 to +125



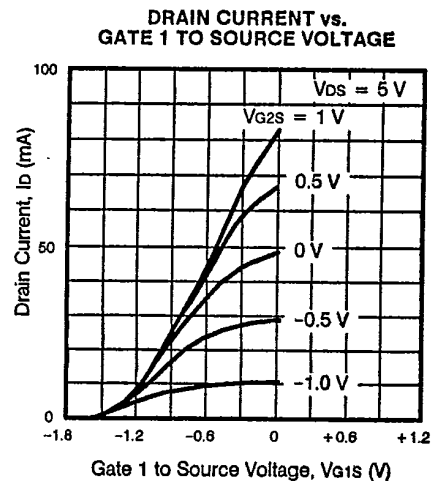
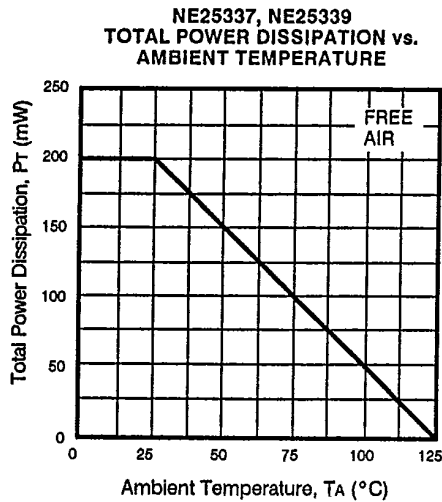
ELECTRICAL CHARACTERISTICS (TA = 25°C)

PART NUMBER PACKAGE OUTLINE			NE25337, NE25339 37, 39		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
BVDSX	Drain to Source Breakdown Voltage at VG1S = -4 V, VG2S = 0 V, IDS = 20 μA	V	10		
IDSS	Drain Current at VDS = 5 V, VG2S = 0 V, VG1S = 0 V	mA	10	40	80
VG1S (off)	Gate 1 to Source Cutoff Voltage at VDS = 5 V, VG2S = 0 V, IDS = 100 μA	V			-3.5
VG2S (off)	Gate 2 to Source Cutoff Voltage at VDS = 5 V, VG1S = 0 V, IDS = 100 μA	V			-3.5
IG1SS	Gate 1 Reverse Current at VDS = 0, VG1S = -4 V, VG2S = 0	μA			10
IG2SS	Gate 2 Reverse Current at VDS = 0, VG2S = -4 V, VG1S = 0	μA			10
Yfs	Forward Transfer Admittance at VDS = 5 V, VG2S = 1 V, IDS = 10 mA, f = 1.0 kHz	mS	25	35	
Ciss	Input Capacitance at VDS = 5 V, VG2S = 1 V, IDS = 10 mA, f = 1 MHz	pF	1.0	1.5	2.0
Crss	Reverse Transfer Capacitance at VDS = 5 V, VG2S = 1 V, IDS = 10 mA, f = 1 MHz	pF		0.02	0.035
Gps	Power Gain at VDS = 5 V, VG2S = 1 V, IDS = 10 mA, f = 900 MHz	dB	16	20	
NF	Noise Figure at VDS = 5 V, VG2S = 1 V, IDS = 10 mA, f = 900 MHz	dB		1.1	2.5

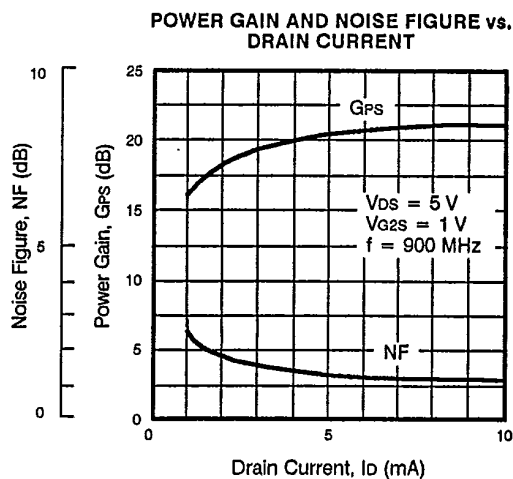
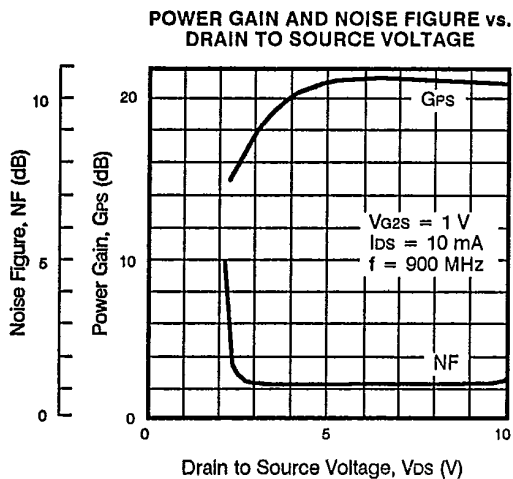
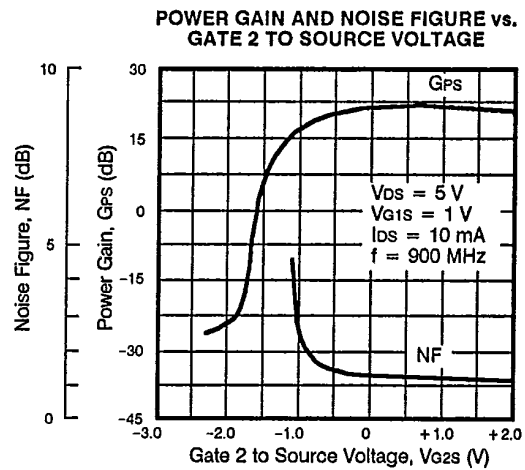
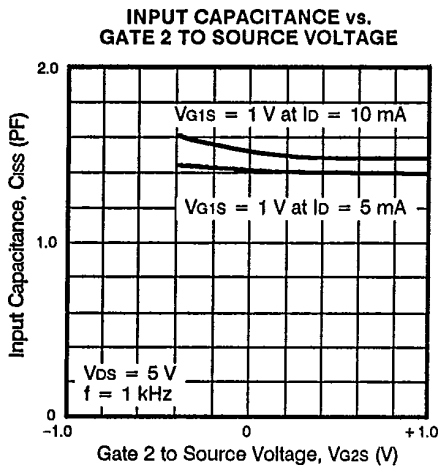
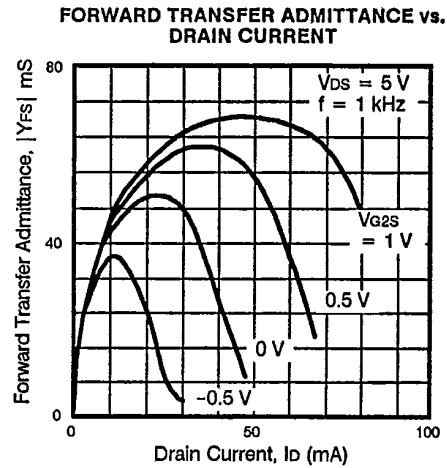
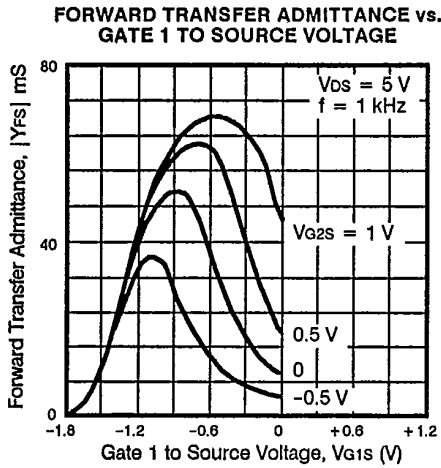
IDSS CLASSIFICATION (Units in mA)

IDSS	10 TO 25	20 TO 35	30 TO 50	45 TO 80
NE25337 Marking	N	M	L	K
NE25339 Marking	U76	U77	U78	U79

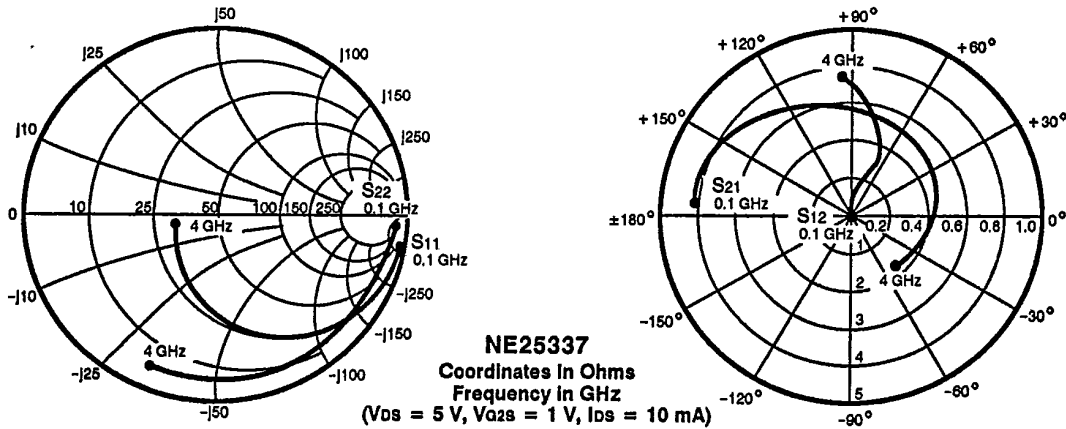
TYPICAL PERFORMANCE CHARACTERISTICS (TA = 25°C)



TYPICAL PERFORMANCE CHARACTERISTICS (TA = 25°C)



TYPICAL SMALL SIGNAL COMMON SOURCE SCATTERING PARAMETERS

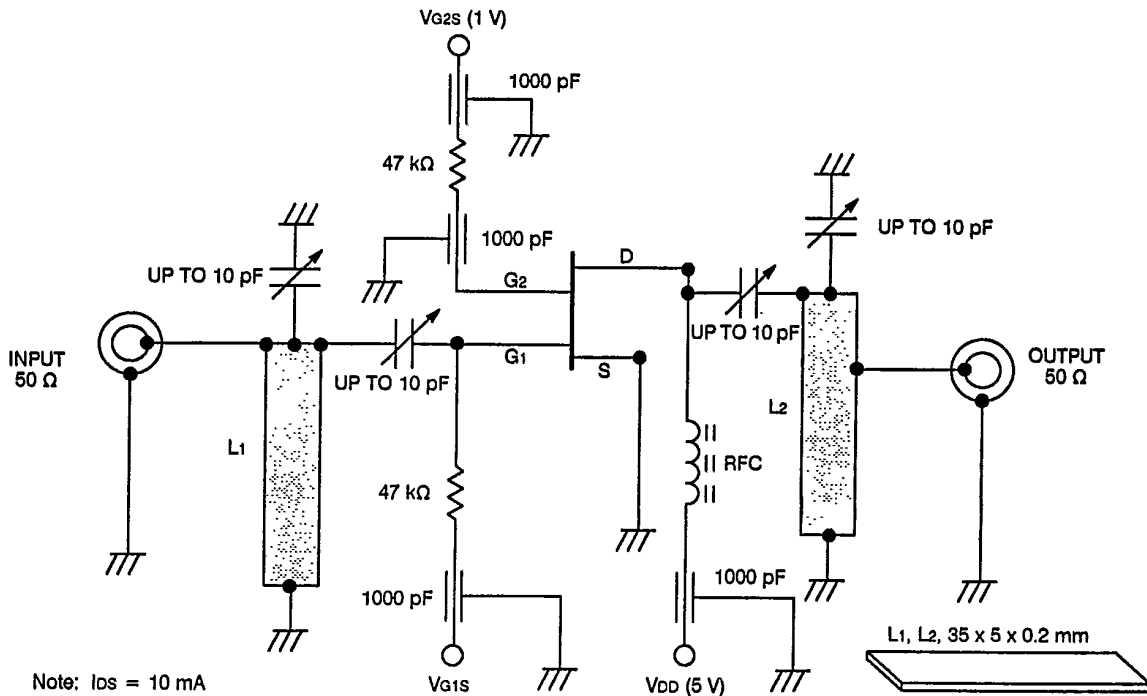


S-MAGN AND ANGLES:
V_{DS} = 5 V, V_{G2S} = 1 V, I_{DS} = 10 mA

FREQUENCY (MHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		k	MAG (dB)
100	1.00	-6	4.23	174	.001	98	.95	-2	-.12	35.5
200	.99	-12	4.15	165	.002	97	.95	-5	.02	33.6
400	.98	-23	4.08	149	.004	95	.94	11	.06	30.1
600	.92	-34	3.84	136	.006	93	.92	-15	.45	28.1
800	.86	-47	3.57	121	.012	91	.90	-19	.50	24.9
1000	.80	-57	3.36	111	.019	85	.89	-23	.58	22.6
1200	.72	-65	3.20	100	.022	79	.86	-27	.89	21.5
1400	.66	-76	3.05	89	.024	76	.87	-30	.99	21.0
1600	.60	-86	2.97	78	.028	72	.86	-35	1.01	19.6
1800	.53	-95	2.82	68	.028	74	.86	-39	1.18	17.5
2000	.45	-102	2.65	56	.032	72	.86	-43		
2500	.33	-123	2.38	32	.039	78	.88	-55		
3000	.24	-144	2.21	7	.049	82	.91	-69		
3500	.20	-159	2.09	-21	.059	88	.95	-89		
4000	.22	-168	1.96	-50	.078	93	.94	-115		

TEST CIRCUIT DIAGRAM

900 MHz GPS AND NF TEST CIRCUIT



NE25337 TYPICAL NOISE PARAMETERS

FREQ. (GHz)	NF _{MIN} (dB)	G _A (dB)	Γ _{OPT}		R _n /50
			(MAG)	(ANG)	
0.5	.65	23.5	0.80	15	0.49
0.9	.79	19.5	0.63	40	0.40
1.0	.81	19.2	0.61	46	0.38
2.0	1.25	14.8	0.39	95	0.28
3.0	2.10	11.9	0.29	150	0.20
4.0	3.20	9.9	0.25	170	0.18

(V_{DS} = 5 V, V_{G2S} = 1 V, I_{DS} = 10 mA)