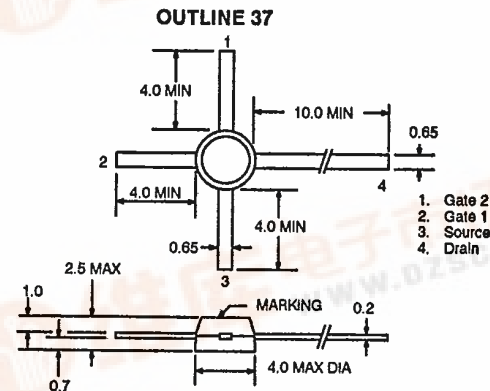


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NEC[®]**GENERAL PURPOSE
DUAL-GATE GaAs MESFET****NE25337
NE25339****FEATURES**

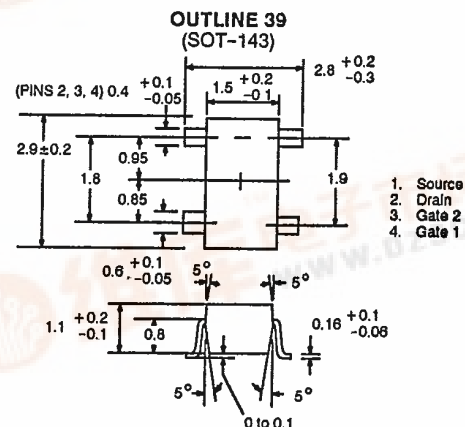
- SUITABLE FOR USE AS RF AMPLIFIER AND MIXER IN UHF APPLICATIONS
- LOW C_{rss} : 0.02 pF (TYP)
- HIGH G_{fs} : 20 dB (TYP)
- LOW NF : 1.1 dB (TYP)
- GATE WIDTH: $W_g = 800$ Microns
- ION IMPLANTATION
- AVAILABLE IN TAPE & REEL OR BULK

OUTLINE DIMENSIONS (Units in mm)**DESCRIPTION AND APPLICATIONS**

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

3**ABSOLUTE MAXIMUM RATINGS** ($T_A = 25^\circ\text{C}$)

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	$^\circ\text{C}$	125
T_{STG}	Storage Temperature	$^\circ\text{C}$	-55 to +125



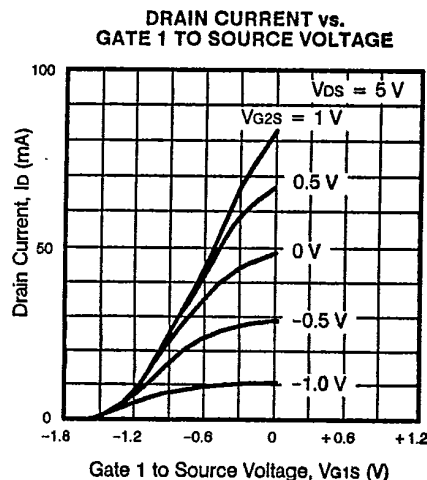
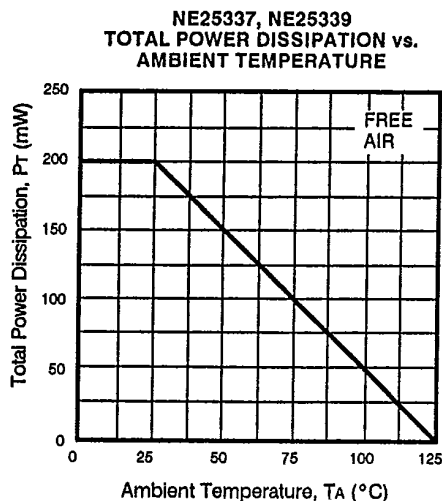
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

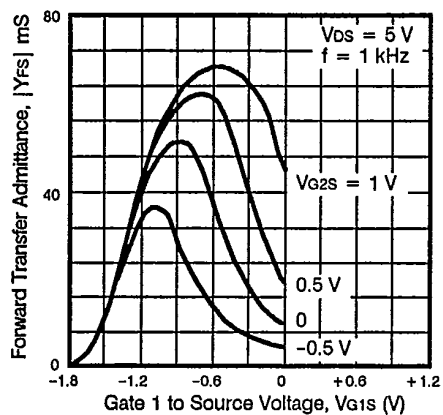
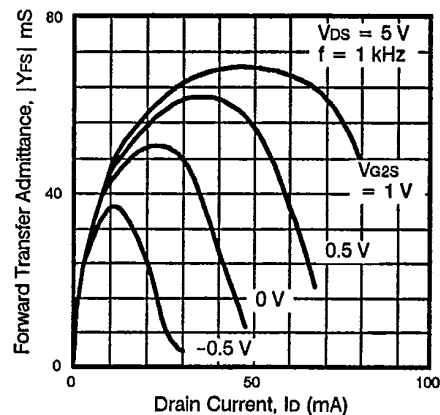
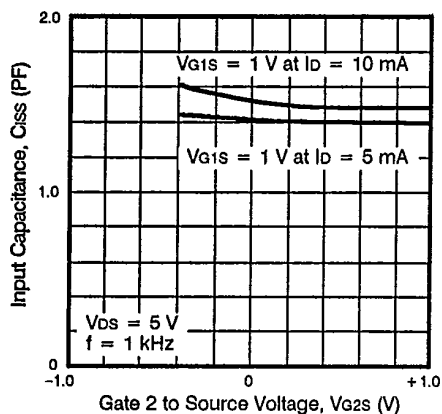
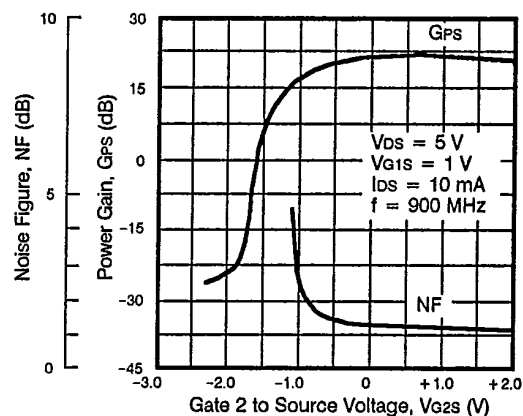
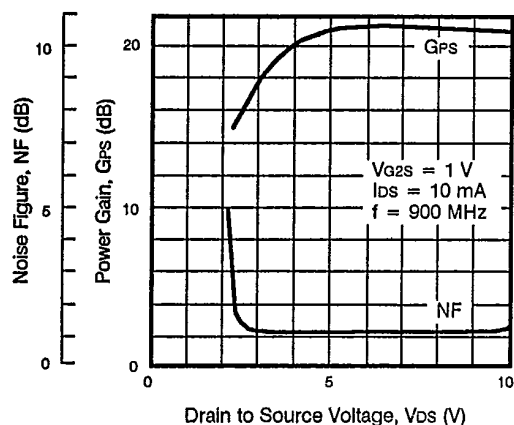
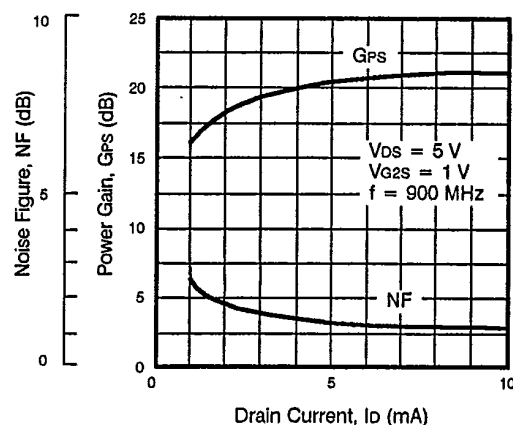
PART NUMBER PACKAGE OUTLINE			NE25337, NE25339 37, 39		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
BV_{DSX}	Drain to Source Breakdown Voltage at $V_{G1S} = -4\text{ V}$, $V_{G2S} = 0\text{ V}$, $I_{DS} = 20\text{ }\mu\text{A}$	V	10		
I_{DSS}	Drain Current at $V_{DS} = 5\text{ V}$, $V_{G2S} = 0\text{ V}$, $V_{G1S} = 0\text{ V}$	mA	10	40	80
$V_{G1S}(\text{off})$	Gate 1 to Source Cutoff Voltage at $V_{DS} = 5\text{ V}$, $V_{G2S} = 0\text{ V}$, $I_{DS} = 100\text{ }\mu\text{A}$	V			-3.5
$V_{G2S}(\text{off})$	Gate 2 to Source Cutoff Voltage at $V_{DS} = 5\text{ V}$, $V_{G1S} = 0\text{ V}$, $I_{DS} = 100\text{ }\mu\text{A}$	V			-3.5
I_{G1SS}	Gate 1 Reverse Current at $V_{DS} = 0$, $V_{G1S} = -4\text{ V}$, $V_{G2S} = 0$	μA			10
I_{G2SS}	Gate 2 Reverse Current at $V_{DS} = 0$, $V_{G2S} = -4\text{ V}$, $V_{G1S} = 0$	μA			10
$ Y_{fs} $	Forward Transfer Admittance at $V_{DS} = 5\text{ V}$, $V_{G2S} = 1\text{ V}$, $I_{DS} = 10\text{ mA}$, $f = 1.0\text{ kHz}$	mS	25	35	
C_{iss}	Input Capacitance at $V_{DS} = 5\text{ V}$, $V_{G2S} = 1\text{ V}$, $I_{DS} = 10\text{ mA}$, $f = 1\text{ MHz}$	pF	1.0	1.5	2.0
C_{rss}	Reverse Transfer Capacitance at $V_{DS} = 5\text{ V}$, $V_{G2S} = 1\text{ V}$, $I_{DS} = 10\text{ mA}$, $f = 1\text{ MHz}$	pF		0.02	0.035
G_{PS}	Power Gain at $V_{DS} = 5\text{ V}$, $V_{G2S} = 1\text{ V}$, $I_{DS} = 10\text{ mA}$, $f = 900\text{ MHz}$	dB	16	20	
NF	Noise Figure at $V_{DS} = 5\text{ V}$, $V_{G2S} = 1\text{ V}$, $I_{DS} = 10\text{ mA}$, $f = 900\text{ MHz}$	dB		1.1	2.5

IDSS CLASSIFICATION (Units in mA)

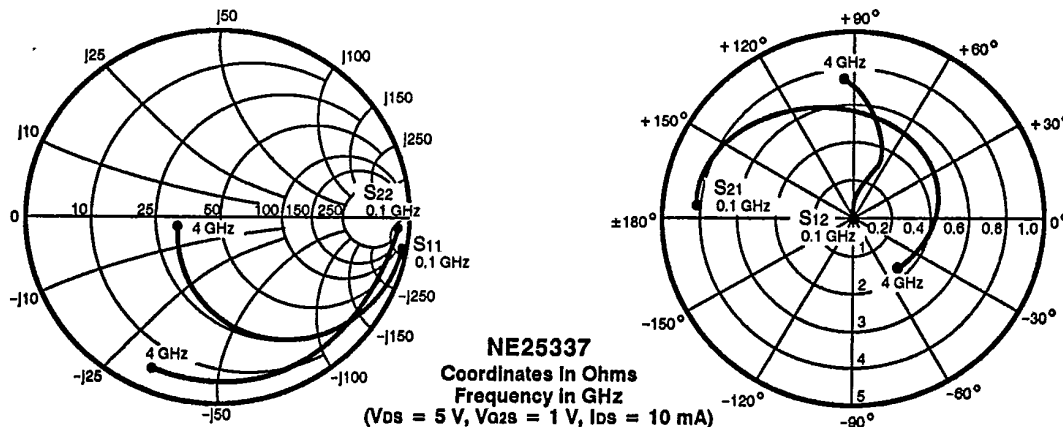
IDSS	10 TO 25	20 TO 35	30 TO 50	45 TO 80
NE25337 Marking	N	M	L	K
NE25339 Marking	U76	U77	U78	U79

TYPICAL PERFORMANCE CHARACTERISTICS ($T_A = 25^\circ\text{C}$)



TYPICAL PERFORMANCE CHARACTERISTICS ($T_A = 25^\circ\text{C}$)FORWARD TRANSFER ADMITTANCE vs.
GATE 1 TO SOURCE VOLTAGEFORWARD TRANSFER ADMITTANCE vs.
DRAIN CURRENTINPUT CAPACITANCE vs.
GATE 2 TO SOURCE VOLTAGEPOWER GAIN AND NOISE FIGURE vs.
GATE 2 TO SOURCE VOLTAGEPOWER GAIN AND NOISE FIGURE vs.
DRAIN TO SOURCE VOLTAGEPOWER GAIN AND NOISE FIGURE vs.
DRAIN CURRENT

TYPICAL SMALL SIGNAL COMMON SOURCE SCATTERING PARAMETERS

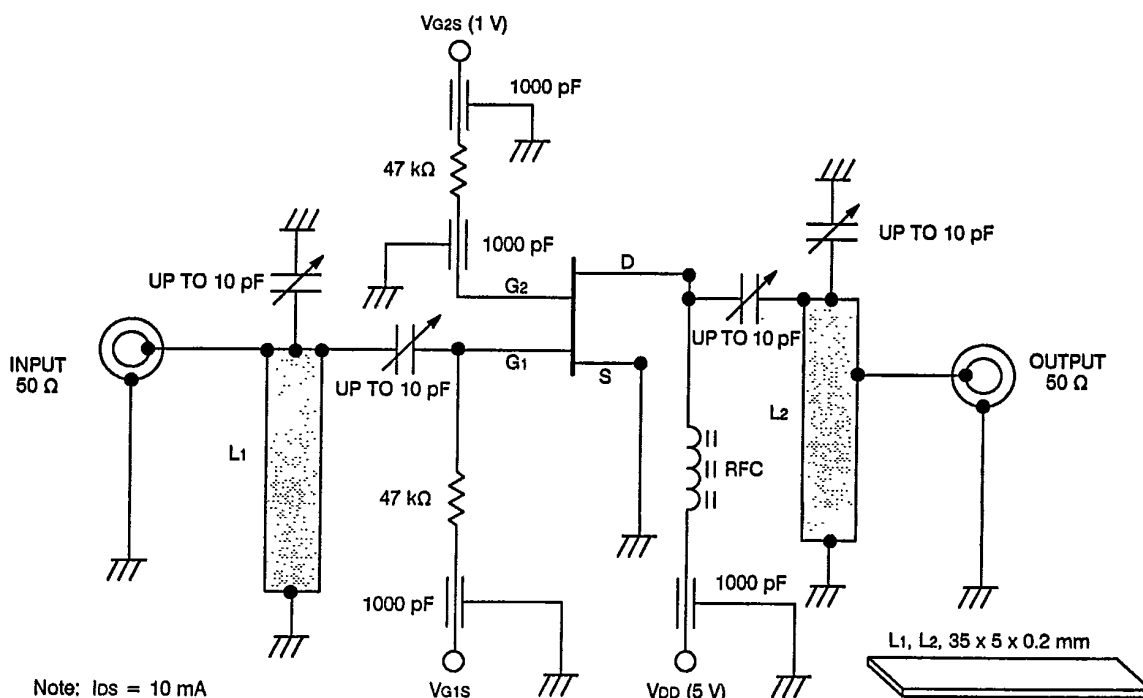


S-MAGN AND ANGLES:
 $V_{DS} = 5\text{ V}$, $V_{G2S} = 1\text{ V}$, $I_{DS} = 10\text{ mA}$

FREQUENCY (MHz)	S11		S21		S12		S22		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)