NEC®

ULTRA LOW NOISE Ku-BAND HETERO JUNCTION FET

NE20300 NE20383A

FEATURES

- **LOW NOISE FIGURE**
  1.25 dB TYP at f = 12 GHz
- **HIGH ASSOCIATED GAIN**
  10 dB TYP at f = 12 GHz
- **n+ AlGaAs/UNDOPED GaAs HETERO-STRUCTURE**
- **GATE LENGTH:** Lg = 0.3 µm
- **GATE WIDTH:** Wg = 280 µm
- **MESFET COMPATIBLE**

DESCRIPTION AND APPLICATIONS

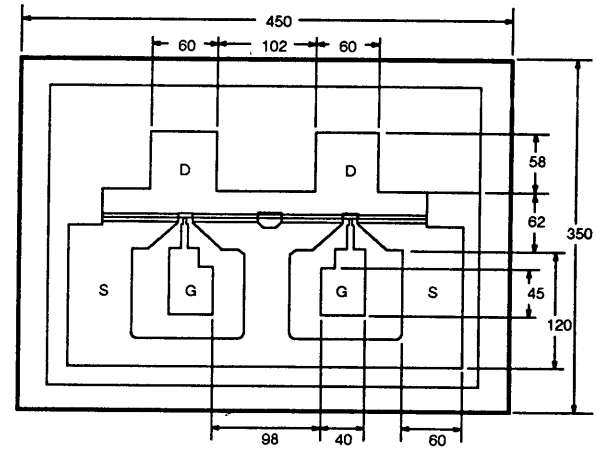
The NE203 is a Hetero Junction FET that utilizes the hetero-junction between Si-doped AlGaAs and undoped GaAs to create high mobility electrons. Its excellent low noise and high associated gain make it suitable for satellite communications and commercial systems. The NE203 has a 40% larger gate width than the NE202, offering a higher P_{1dB}. The device also has excellent compatibility to MESFET bias conditions operating at V_{DS} = 3 V.

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V_{DS}	Drain to Source Voltage	V	4
V_{GS}	Gate to Source Voltage	V	-3
I_{DS}	Drain Current	mA	70
I_G	Gate Current	µA	10
P_T	Total Power Dissipation	mW	200
T_{CH}	Channel Temperature	°C	175
T_{STG}	Storage Temperature	°C	-65 to +175

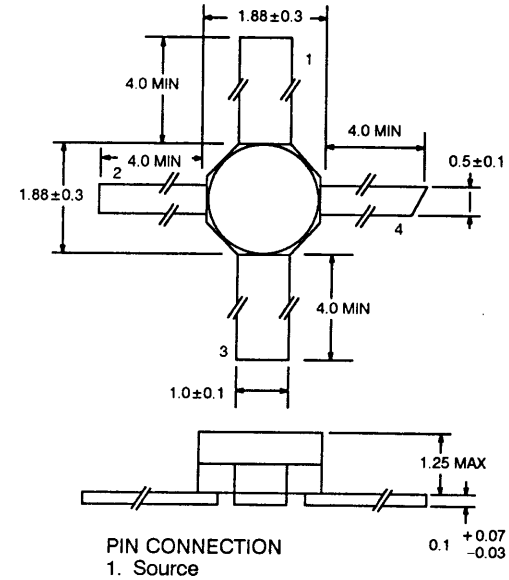
OUTLINE DIMENSIONS

NE20300 (CHIP)
(Units in µm)



Chip Thickness: 140 µm

OUTLINE 83A
(Units in mm)



PIN CONNECTION
1. Source
2. Drain
3. Source
4. Gate

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

PART NUMBER PACKAGE OUTLINE			NE20300 00 (CHIP)			NE20383A 83A		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX	MIN	TYP	MAX
I_{DSX}	Drain to Source Leakage Current at V_{DS} = 4 V, V_{GS} = -2 V	µA			100			100
I_{DSS}	Saturated Drain Current at V_{DS} = 3 V, V_{GS} = 0	mA	15	35	70	15	35	70
$V_{GS(OFF)}$	Gate to Source Leakage Current at V_{GS} = -3 V	V	-0.3	-0.8	-2.0	-0.3	-0.8	-2
I_{GSO}	Gate to Source Cutoff Voltage at V_{DS} = 3 V, I_{DS} = 100 µA	µA		1	10		1	10
g_M	Transconductance at V_{DS} = 3 V, I_{DS} = 12 mA	mS	40	55		40	55	
NF	Noise Figure at V_{DS} = 3 V, I_D = 12 mA, f = 12 GHz	dB		1.25	1.4		1.25	1.4
G_A	Associated Gain at V_{DS} = 3 V, I_D = 12 mA, f = 12 GHz	dB	9.5	10		9.5	10	
P_{1dB}	Output Power at 1 dB Gain Compression Point V_{DS} = 3 V, I_{DS} = 12 mA, f = 12 GHz	dBm		13			13	

NE20300 TYPICAL NOISE PARAMETERS*

FREQ. (GHz)	NF_{MIN} (dB)	G_A (dB)	Γ_{OPT}** (MAG)	Γ_{OPT}** (ANG)	Rn/50
2	0.35	20.5	0.79	26	0.40
4	0.40	16.5	0.71	53	0.31
6	0.50	14.0	0.67	76	0.25
8	0.65	12.5	0.62	94	0.20
10	0.85	11.0	0.56	109	0.17
12	1.15	10.0	0.51	124	0.15
14	1.40	9.0	0.47	134	0.13
16	1.65	8.0	0.44	143	0.11
18	1.95	7.5	0.42	153	0.09
20	2.15	7.0	0.40	161	0.08

* V_{DS} = 3 V, I_D = 12 mA

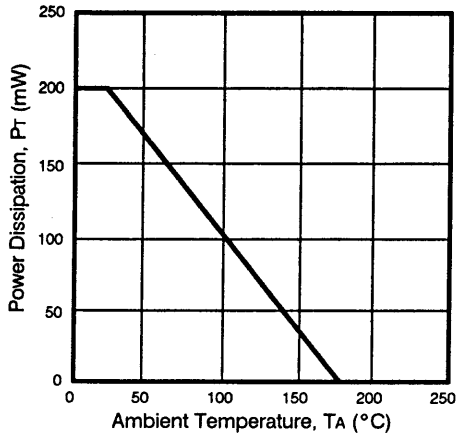
** Γ_{OPT} includes bond wires.
Bond wires used during testing:
Gate: 2 wires total, 1 per bond pad, 0.013" long each wire.
Drain: 2 wires total, 1 per bond pad, 0.01" long each wire.
Source: 4 wires total, 2 per side, 0.007" long each wire.
Wire: 0.0008" diameter, gold.

NE20383A TYPICAL NOISE PARAMETERS*

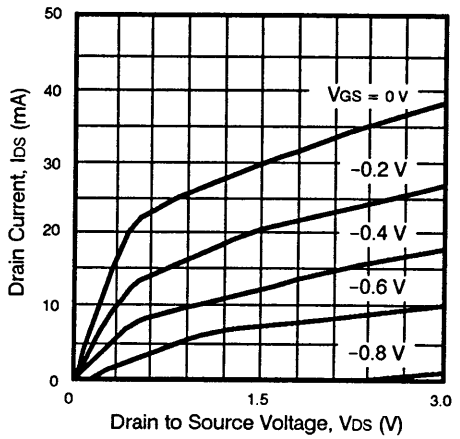
FREQ. (GHz)	NF_{MIN} (dB)	G_A (dB)	Γ_{OPT}** (MAG)	Γ_{OPT}** (ANG)	Rn/50
2	0.35	19.0	0.70	27	0.41
4	0.40	15.5	0.68	58	0.30
6	0.50	13.5	0.66	82	0.27
8	0.65	12.0	0.58	107	0.22
10	0.85	10.5	0.56	135	0.18
12	1.20	9.5	0.39	156	0.16
14	1.40	9.0	0.31	178	0.14
16	1.70	8.0	0.25	-159	0.11
18	2.00	7.5	0.22	-139	0.09

TYPICAL PERFORMANCE CHARACTERISTICS (T_A = 25°C)

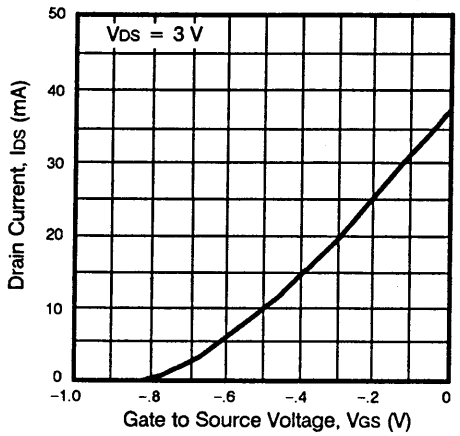
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



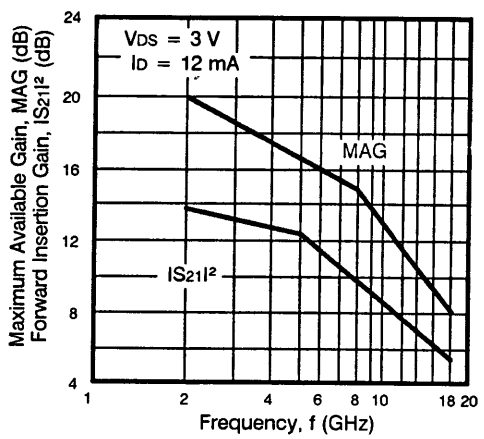
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



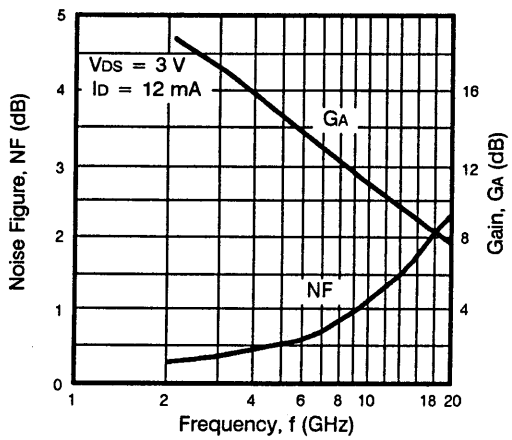
DRAIN CURRENT vs. GATE TO SOURCE VOLTAGE



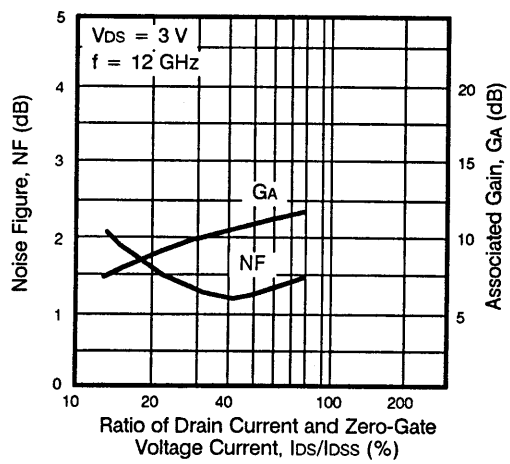
MAXIMUM AVAILABLE GAIN, FORWARD INSERTION GAIN vs. FREQUENCY



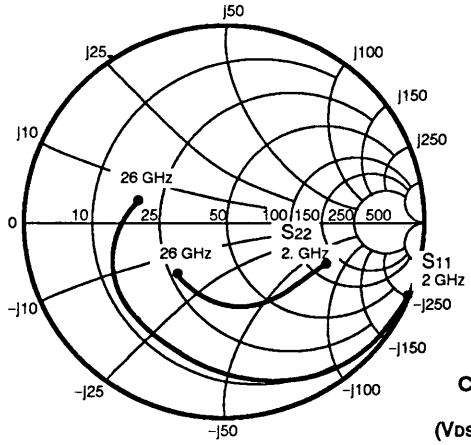
NOISE FIGURE, ASSOCIATED GAIN vs. FREQUENCY

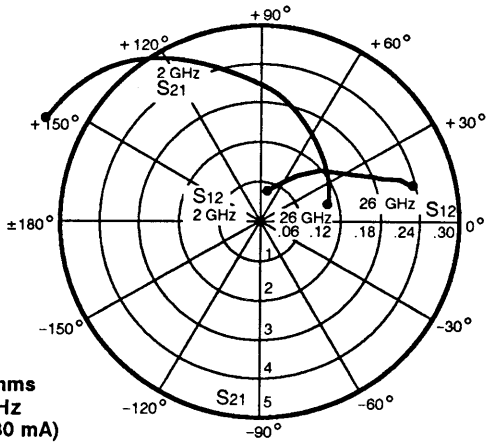


NOISE FIGURE, ASSOCIATED GAIN vs. RATIO OF DRAIN CURRENT AND ZERO-GATE VOLTAGE



TYPICAL COMMON SOURCE SCATTERING PARAMETERS





NE20300*
Coordinates in Ohms
Frequency in GHz
(V_{DS} = 3 V, I_{DS} = 30 mA)

S-MAGN AND ANGLES:

V_{DS} = 3 V, I_{DS} = 12 mA

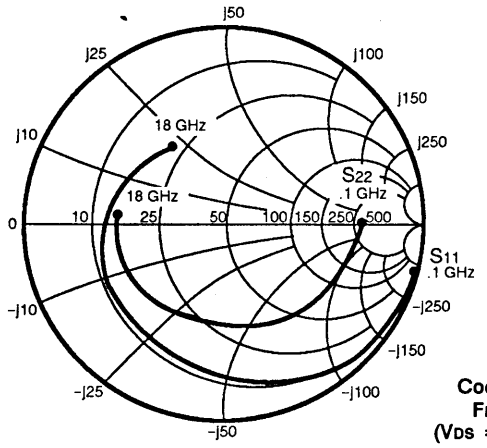
FREQUENCY (MHz)	S_{11}		S_{21}		S_{12}		S_{22}	
2000	.96	-30	4.83	155	.049	70	.58	-23
3000	.93	-44	4.59	144	.069	63	.56	-34
4000	.88	-56	4.30	133	.087	56	.54	-43
5000	.84	-68	4.02	123	.101	49	.51	-52
6000	.80	-77	3.72	114	.112	46	.49	-58
7000	.76	-86	3.45	107	.121	39	.47	-65
8000	.73	-95	3.26	99	.128	35	.45	-71
9000	.69	-103	3.02	92	.131	31	.44	-77
10000	.67	-110	2.88	86	.138	29	.43	-83
11000	.65	-118	2.72	79	.143	25	.42	-89
12000	.63	-125	2.59	73	.146	22	.41	-94
13000	.62	-131	2.45	67	.147	19	.40	-98
14000	.60	-137	2.33	62	.148	17	.39	-102
15000	.59	-142	2.23	57	.150	16	.39	-104
16000	.58	-147	2.15	52	.154	15	.40	-107
17000	.57	-151	2.07	48	.154	15	.40	-110
18000	.55	-155	2.02	43	.161	14	.40	-113
19000	.53	-158	1.91	40	.157	14	.39	-113
20000	.52	-161	1.86	36	.168	14	.40	-115
21000	.52	-164	1.78	33	.173	14	.40	-118
22000	.51	-169	1.76	29	.172	13	.40	-121
23000	.50	-172	1.66	25	.177	13	.41	-125
24000	.49	-177	1.59	21	.182	13	.41	-128
25000	.47	179	1.56	19	.187	13	.38	-131
26000	.46	174	1.52	13	.187	10	.38	-136

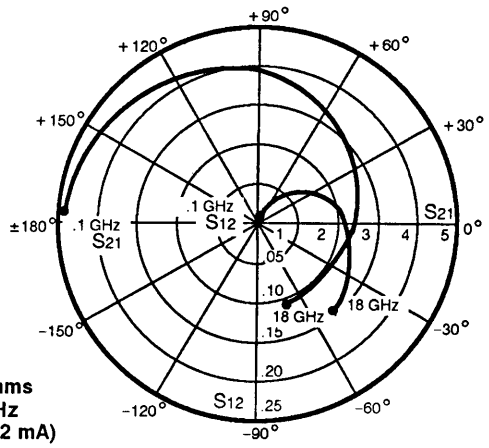
V_{DS} = 3 V, I_{DS} = 30 mA

2000	.96	-34	5.94	153	.045	69	.53	-26
3000	.91	-49	5.54	140	.062	62	.50	-36
4000	.86	-62	5.11	130	.077	56	.48	-45
5000	.81	-74	4.71	120	.089	49	.45	-54
6000	.76	-83	4.30	111	.099	46	.43	-60
7000	.72	-93	3.96	104	.106	40	.41	-66
8000	.69	-102	3.70	96	.112	37	.40	-73
9000	.66	-110	3.41	90	.115	34	.38	-78
10000	.64	-117	3.24	84	.121	33	.39	-85
11000	.62	-125	3.04	77	.126	28	.38	-91
12000	.60	-132	2.87	71	.129	26	.37	-95
13000	.59	-138	2.70	66	.130	25	.36	-99
14000	.58	-144	2.57	60	.134	23	.36	-102
15000	.56	-149	2.44	56	.136	22	.36	-106
16000	.55	-153	2.35	51	.142	22	.37	-108
17000	.55	-158	2.25	47	.145	22	.37	-110
18000	.53	-161	2.19	42	.151	21	.36	-113
19000	.52	-163	2.06	39	.154	23	.35	-113
20000	.51	-166	2.00	36	.163	22	.36	-115
21000	.50	-169	1.93	33	.166	21	.38	-117
22000	.49	-172	1.90	29	.174	20	.38	-120
23000	.48	-177	1.80	25	.176	19	.37	-124
24000	.47	177	1.70	21	.176	18	.37	-128
25000	.44	175	1.67	20	.186	18	.35	-131
26000	.44	168	1.62	14	.186	16	.35	-135

*SEE NOTES ON PG 5.

TYPICAL COMMON SOURCE SCATTERING PARAMETERS





NE20383A
Coordinates in Ohms
Frequency in GHz
(V_{DS} = 3 V, I_{DS} = 12 mA)

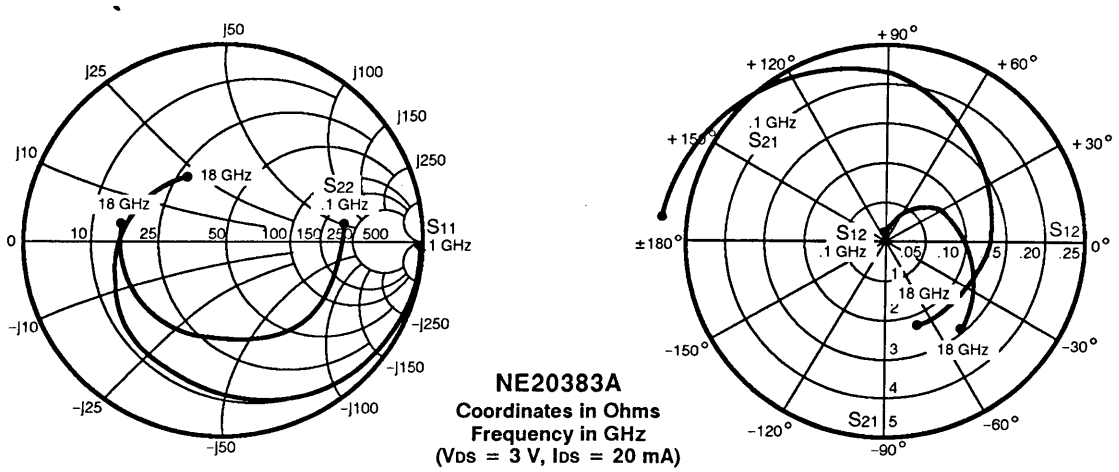
S-MAGN AND ANGLES:
V_{DS} = 3 V, I_{DS} = 12 mA

FREQUENCY (MHz)	S_{11}		S_{21}		S_{12}		S_{22}	
100	1.00	-2	4.70	177	.001	25	.64	-1
200	1.00	-4	4.68	175	.001	76	.64	-3
300	1.00	-7	4.65	173	.002	85	.64	-4
400	.99	-9	4.62	171	.005	85	.64	-6
500	.99	-11	4.59	169	.007	84	.64	-8
600	.98	-13	4.55	167	.010	82	.64	-9
700	.98	-15	4.51	165	.012	81	.64	-11
800	.97	-17	4.48	163	.015	79	.64	-12
900	.97	-19	4.45	161	.018	77	.64	-14
1000	.96	-21	4.42	159	.021	76	.64	-16
2000	.94	-40	4.27	142	.041	62	.62	-31
3000	.90	-57	3.97	124	.057	50	.59	-46
4000	.86	-75	3.77	106	.070	38	.57	-60
5000	.79	-91	3.43	91	.078	27	.54	-74
6000	.75	-105	3.21	75	.085	18	.52	-86
7000	.71	-119	2.98	62	.088	10	.52	-97
8000	.68	-130	2.77	50	.091	4	.51	-106
9000	.65	-141	2.59	37	.093	-3	.52	-115
10000	.63	-152	2.43	26	.093	-6	.52	-125
11000	.61	-161	2.28	15	.093	-12	.52	-133
12000	.57	-172	2.22	2	.098	-19	.52	-141
13000	.54	180	2.12	-8	.099	-22	.52	-148
14000	.50	171	2.03	-19	.103	-27	.51	-155
15000	.48	161	2.00	-32	.107	-33	.51	-163
16000	.45	150	1.98	-40	.116	-36	.51	-172
17000	.43	139	1.95	-54	.119	-45	.51	179
18000	.39	127	1.95	-66	.132	-53	.51	169

*NE20300

S-parameters include bond wires.
Gate: 2 wires total, 1 per bond pad, 0.013" long each wire.
Drain: 2 wires total, 1 per bond pad, 0.011" long each wire.
Source: 4 wires total, 2 per side, 0.013" long each wire.
Wire: 0.0008" diameter gold.

TYPICAL COMMON SOURCE SCATTERING PARAMETERS



NE20383A
Coordinates in Ohms
Frequency in GHz
(V_{DS} = 3 V, I_{DS} = 20 mA)

S-MAGN AND ANGLES:
V_{DS} = 3 V, I_{DS} = 20 mA

FREQUENCY (MHz)	S_{11}		S_{21}		S_{12}		S_{22}	
100	1.00	-2	5.73	177	.001	37	.60	-1
200	1.00	-5	5.70	175	.001	72	.60	-3
300	1.00	-7	5.66	173	.002	85	.60	-5
400	.99	-9	5.62	171	.004	86	.60	-6
500	.99	-12	5.57	168	.006	84	.60	-8
600	.98	-14	5.53	166	.008	83	.60	-9
700	.98	-16	5.48	164	.011	81	.59	-11
800	.97	-18	5.44	162	.013	79	.59	-13
900	.96	-20	5.40	160	.016	78	.59	-14
1000	.96	-22	5.36	158	.019	76	.59	-16
2000	.93	-42	5.13	140	.037	63	.57	-32
3000	.88	-60	4.74	122	.052	51	.54	-46
4000	.83	-78	4.42	104	.064	39	.51	-60
5000	.76	-95	3.99	89	.072	30	.49	-74
6000	.71	-109	3.70	73	.078	22	.47	-85
7000	.67	-122	3.41	59	.082	14	.47	-96
8000	.63	-134	3.14	48	.085	9	.46	-105
9000	.61	-144	2.93	34	.088	2	.47	-114
10000	.58	-155	2.72	25	.091	-1	.48	-123
11000	.56	-163	2.54	13	.092	-6	.49	-131
12000	.53	-174	2.47	1	.098	-13	.49	-139
13000	.49	178	2.35	-10	.101	-16	.49	-145
14000	.46	169	2.26	-21	.106	-22	.49	-152
15000	.43	160	2.20	-33	.112	-28	.49	-160
16000	.41	149	2.18	-42	.122	-33	.49	-169
17000	.38	138	2.14	-55	.125	-42	.50	-178
18000	.35	127	2.13	-68	.138	-51	.50	173

NEC®

LOW COST/LOW NOISE K-BAND HETERO JUNCTION FET

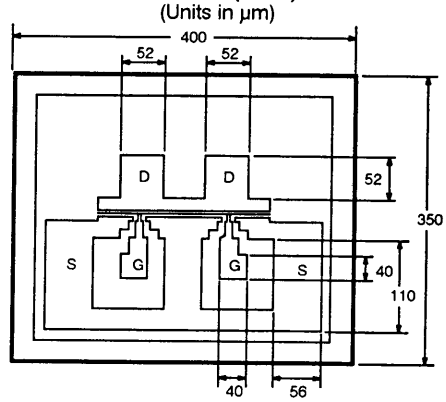
NE32000
NE32083A
NE32084

FEATURES

- **LOW NOISE FIGURE**
  1.2 dB TYP at f = 12 GHz (NE32083A)
  1.3 dB TYP at f = 12 GHz (NE32084)
- **HIGH ASSOCIATED GAIN**
  10 dB TYP at f = 12 GHz
- **LOW COST**
- **n+ AlGaAs/UNDOPED GaAs HETERO-JUNCTION STRUCTURE**
- **GATE LENGTH:** Lg = 0.3 microns
- **GATE WIDTH:** Wg = 200 microns
- **PASSIVATION ON CHIP FOR HIGH RELIABILITY**

OUTLINE DIMENSIONS

NE32000 (CHIP)
(Units in µm)

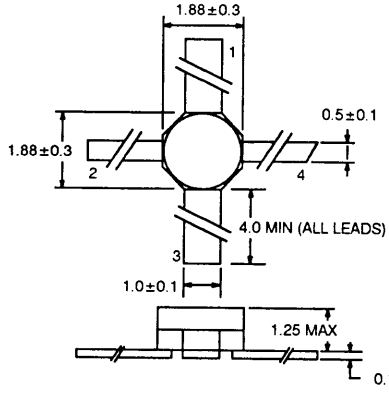


Chip Thickness: 140±10 µm

DESCRIPTION AND APPLICATIONS

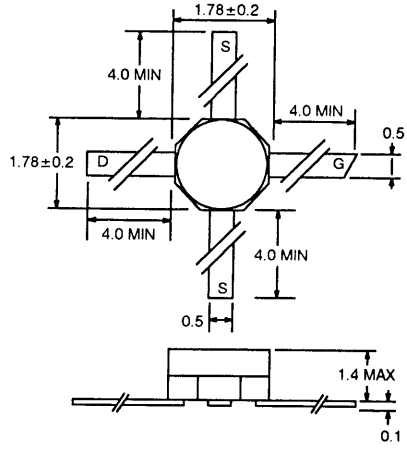
The NE320 is a Hetero Junction FET that utilizes the hetero-junction between Si-doped AlGaAs and undoped GaAs to create high mobility electrons. Its excellent low noise and high associated gain make it suitable for satellite communications and commercial systems. The NE320 is available as a chip (NE32000) and in two hermetically sealed stripline packages (NE32083A and NE32084).

OUTLINE 83A
(Units in mm)



LEAD CONNECTION
1. Source
2. Drain
3. Source
4. Gate

OUTLINE 84
(Units in mm)



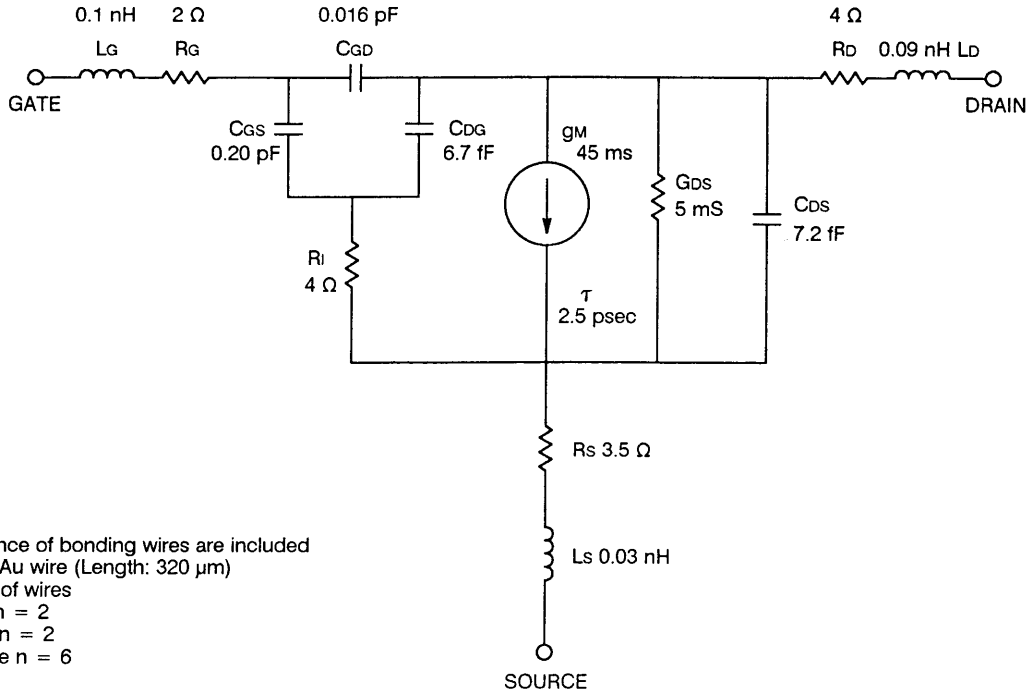
ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V_{DS}	Drain to Source Voltage	V	4
V_{GS}	Gate to Source Voltage	V	-3
I_{DS}	Drain Current	mA	60
I_G	Gate Current	µA	10
P_T	Total Power Dissipation (NE32083A, NE32084)	mW	200
T_{CH}	Channel Temperature	°C	175
T_{STG}	Storage Temperature	°C	-65 to +175
P_{IN}	Input Power	dBm	+5

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

PART NUMBER PACKAGE OUTLINE			NE32000 00 (CHIP)			NE32083A 83A			NE32084 84		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
I_{DSX}	Drain to Source Leakage Current at V_{DS} = 4 V, V_{GS} = -2 V	µA			100			100			100
I_{DSS}	Saturated Drain Current at V_{DS} = 2 V, V_{GS} = 0	mA	12	30	60	12	30	60	12	30	60
I_{GSO}	Gate to Source Leakage Current at V_{GS} = -3 V	µA		1	10		1	10		1	10
V_{GS} (OFF)	Gate to Source Cutoff Voltage at V_{DS} = 2 V, I_{DS} = 100 µA	V	-0.3	-0.8	-2	-0.3	-0.8	-2	-0.3	-0.8	-2
g_M	Transconductance at V_{DS} = 2 V, I_{DS} = 10 mA	mS	30	45		30	45		30	45	
NF	Noise Figure at V_{DS} = 2 V, I_{DS} = 10 mA, f = 12 GHz	dB		1.2	1.4		1.2	1.4		1.3	1.5
G_A	Associated Gain at V_{DS} = 2 V, I_{DS} = 10 mA, f = 12 GHz	dB	9.5	10		9.5	10		9	10	

EQUIVALENT CIRCUIT (NE32000)



I_{DS} = 10 mA
V_{DS} = 2 V
L_G = 0.3 µm
W_G = 200 µm

NOTE: Inductance of bonding wires are included
20 µm dia. Au wire (Length: 320 µm)
n: Number of wires
Gate n = 2
Drain n = 2
Source n = 6

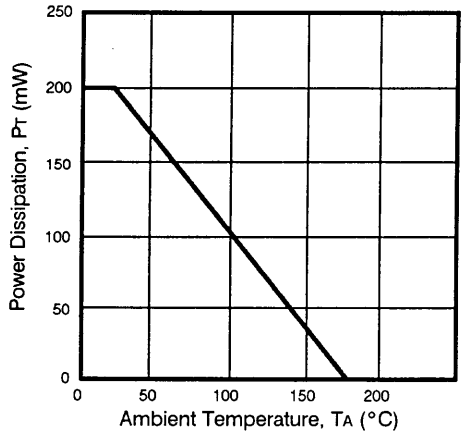
RECOMMENDED DIE ATTACHING AND BONDING CONDITIONS (NE32000)

1) Die Attaching:
Solder : AuSn
Temperature : 300 ±10°C
Atmosphere : N_2
Within 10 seconds

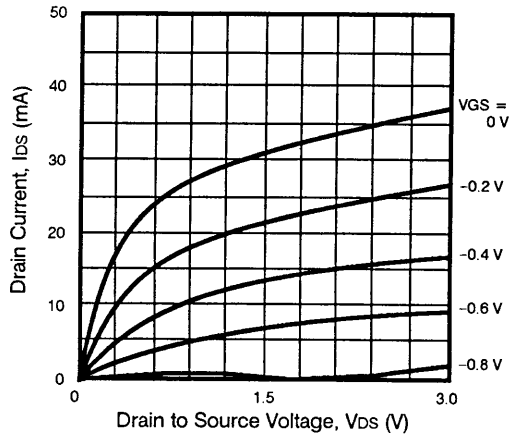
2) Bonding:
Wire : 20µm Dia. Au
Method : Thermocompression Bonding
Temperature : 260 ±10°C
Atmosphere : N_2
Within 5 minutes

TYPICAL PERFORMANCE CHARACTERISTICS (T_A = 25°C)

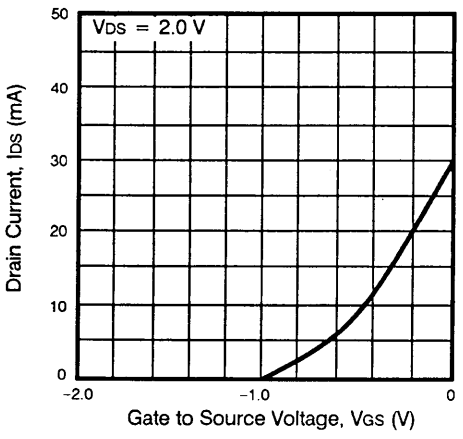
NE32083A
TOTAL POWER DISSIPATION vs.
AMBIENT TEMPERATURE



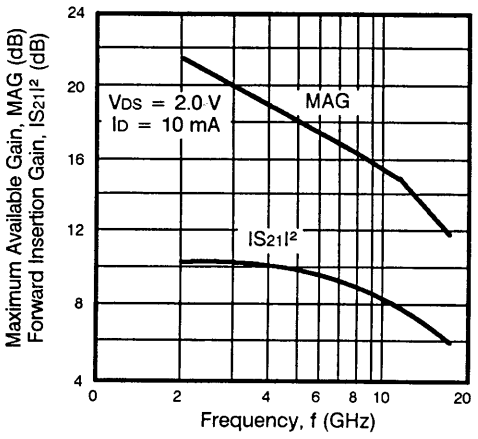
DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



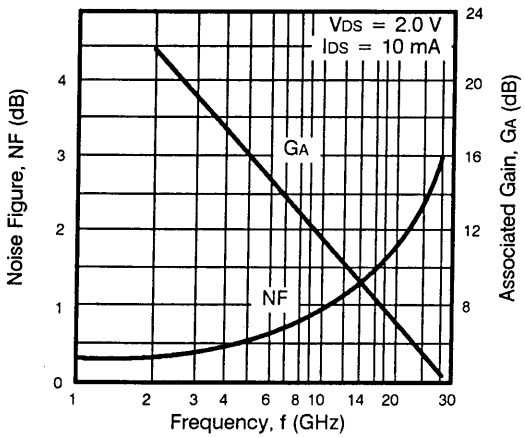
DRAIN CURRENT vs.
GATE TO SOURCE VOLTAGE



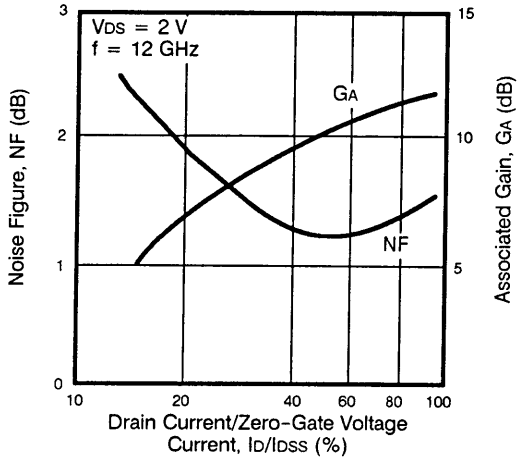
MAXIMUM AVAILABLE GAIN, FORWARD
INSERTION GAIN vs. FREQUENCY



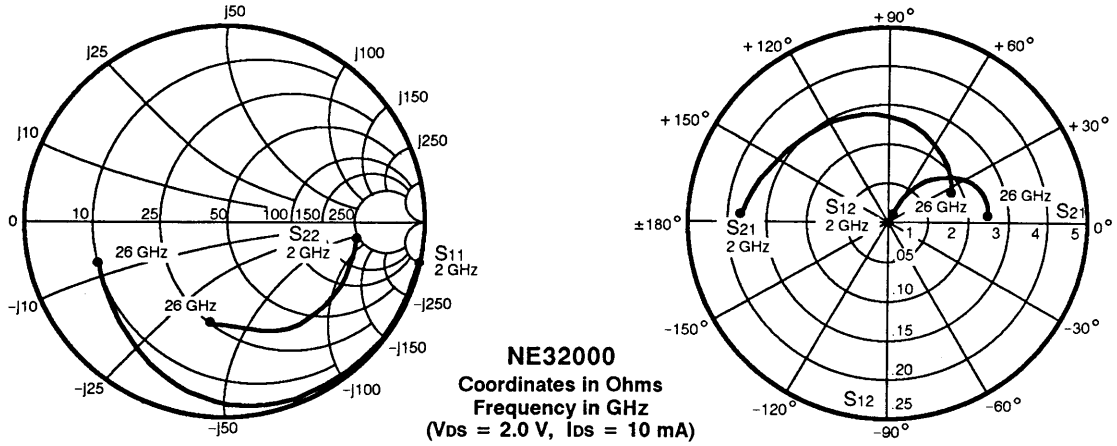
NOISE FIGURE, ASSOCIATED
GAIN vs. FREQUENCY



NOISE FIGURE, ASSOCIATED GAIN vs.
RATIO OF DRAIN CURRENT
AND ZERO-GATE VOLTAGE



TYPICAL COMMON SOURCE SCATTERING PARAMETERS



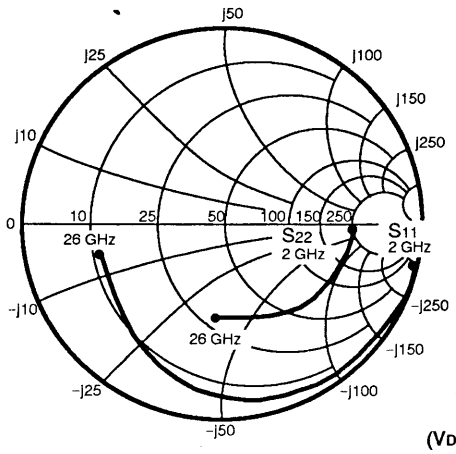
NE32000
Coordinates in Ohms
Frequency in GHz
(V_{DS} = 2.0 V, I_{DS} = 10 mA)

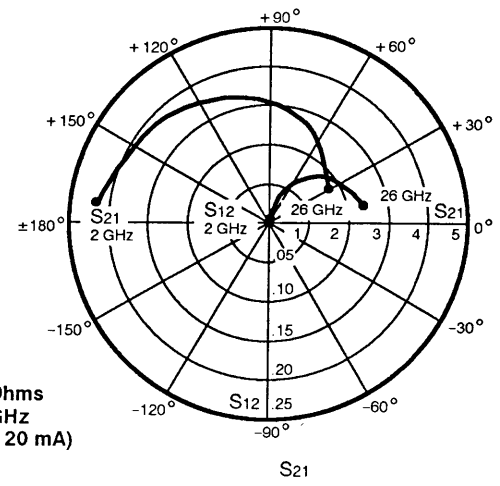
S-MAGN AND PHASE:
V_{DS} = 2.0 V, I_{DS} = 10 mA

FREQUENCY (MHz)	S_{11}		S_{21}		S_{12}		S_{22}		k	MAG (dB)
2000	.996	-16	3.455	165	.024	81	.680	-10	.04	21.6
3000	.985	-27	3.425	155	.035	73	.664	-15	.13	19.9
4000	.972	-34	3.373	150	.047	70	.658	-19	.15	18.6
5000	.957	-41	3.301	144	.058	64	.651	-23	.21	17.5
6000	.952	-48	3.245	138	.068	61	.658	-26	.20	16.8
7000	.942	-56	3.213	131	.076	53	.640	-32	.24	16.3
8000	.915	-62	3.101	124	.080	50	.626	-36	.31	15.9
9000	.913	-68	3.000	118	.086	46	.623	-39	.33	15.4
10000	.929	-75	2.984	113	.091	44	.633	-43	.23	15.2
11000	.887	-83	2.925	105	.097	40	.613	-47	.34	14.8
12000	.871	-89	2.857	98	.102	40	.614	-48	.36	14.5
13000	.852	-96	2.773	91	.108	36	.611	-53	.39	14.1
14000	.823	-103	2.724	86	.114	33	.605	-54	.43	13.8
15000	.787	-110	2.631	79	.118	29	.601	-60	.48	13.5
16000	.778	-117	2.602	74	.120	26	.579	-62	.51	13.4
17000	.734	-123	2.454	69	.124	21	.562	-65	.62	13.0
18000	.705	-128	2.396	65	.124	17	.543	-69	.69	12.9
19000	.680	-133	2.256	62	.123	15	.521	-71	.79	12.6
20000	.679	-138	2.248	58	.122	12	.515	-74	.79	12.6
21000	.663	-141	2.107	53	.119	13	.509	-76	.87	12.5
22000	.688	-144	2.077	49	.120	12	.506	-78	.83	12.4
23000	.672	-149	1.920	44	.124	9	.500	-81	.92	11.9
24000	.655	-150	1.829	38	.122	8	.504	-83	1.01	11.1
25000	.655	-152	1.761	36	.129	12	.515	-86	.95	11.4
26000	.662	-159	1.719	29	.137	11	.505	-92	.89	11.0

NOTE: Bond wires are not de-embedded.
Gate: Total 2 wires, 1 per Bond Pad, 0.013" long each wire.
Drain: Total 2 wires, 1 per Bond Pad, 0.015" long each wire.
Source: Total 4 wires, 2 per side, 0.007" long each wire.
Wire: 0.0008": dia., gold.

TYPICAL COMMON SOURCE SCATTERING PARAMETERS





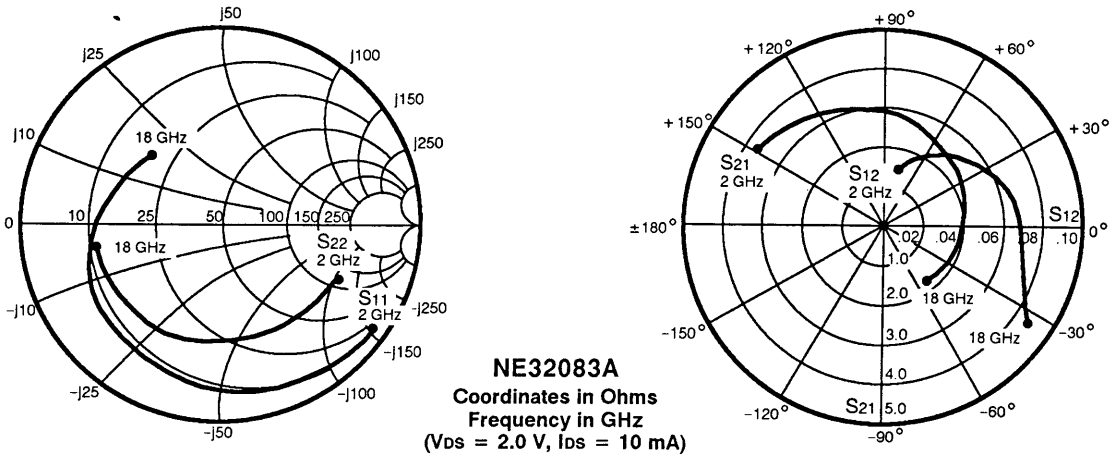
NE32000
Coordinates in Ohms
Frequency in GHz
(V_{DS} = 2.0 V, I_{DS} = 20 mA)

S-MAGN AND PHASE:
VDS = 2.0 V, IDS = 20 mA

FREQUENCY (MHz)	S_{11}		S_{21}		S_{12}		S_{22}		k	MAG (dB)
2000	.989	-19	4.060	162	.023	79	.668	-11	.10	22.5
3000	.980	-29	3.998	154	.033	72	.654	-16	.14	20.8
4000	.964	-36	3.917	149	.043	70	.642	-19	.16	19.6
5000	.946	-44	3.812	142	.055	64	.636	-23	.23	18.4
6000	.944	-51	3.729	137	.064	61	.643	-26	.21	17.7
7000	.930	-59	3.684	129	.070	52	.622	-32	.26	17.2
8000	.897	-66	3.540	123	.074	49	.606	-36	.34	16.8
9000	.894	-71	3.414	116	.077	45	.603	-39	.36	16.4
10000	.906	-79	3.373	111	.083	45	.611	-43	.27	16.1
11000	.864	-87	3.289	103	.087	40	.592	-47	.37	15.8
12000	.849	-93	3.197	97	.092	41	.594	-48	.38	15.4
13000	.823	-101	3.079	90	.098	37	.591	-52	.42	15.0
14000	.800	-108	3.014	84	.101	35	.583	-53	.46	14.7
15000	.762	-115	2.894	77	.106	30	.582	-58	.52	14.4
16000	.751	-122	2.857	72	.110	28	.560	-60	.54	14.1
17000	.708	-128	2.685	68	.109	25	.544	-64	.65	13.9
18000	.684	-133	2.619	64	.112	21	.527	-66	.71	13.7
19000	.658	-137	2.462	61	.110	19	.503	-69	.82	13.5
20000	.663	-142	2.458	58	.111	16	.500	-73	.80	13.5
21000	.647	-145	2.299	53	.109	16	.502	-75	.88	13.2
22000	.669	-148	2.244	49	.111	18	.490	-76	.85	13.1
23000	.653	-153	2.092	43	.116	15	.487	-79	.92	12.6
24000	.632	-155	1.987	38	.112	12	.491	-80	1.05	11.1
25000	.634	-157	1.906	36	.121	17	.509	-83	.95	12.0
26000	.637	-162	1.870	29	.124	14	.490	-90	.96	11.8

NOTE: Bond wires are not de-embedded.
Gate: Total 2 wires, 1 per Bond Pad, 0.013" long each wire.
Drain: Total 2 wires, 1 per Bond Pad, 0.015" long each wire.
Source: Total 4 wires, 2 per side, 0.007" long each wire.
Wire: 0.0008": dia., gold.

TYPICAL COMMON SOURCE SCATTERING PARAMETERS

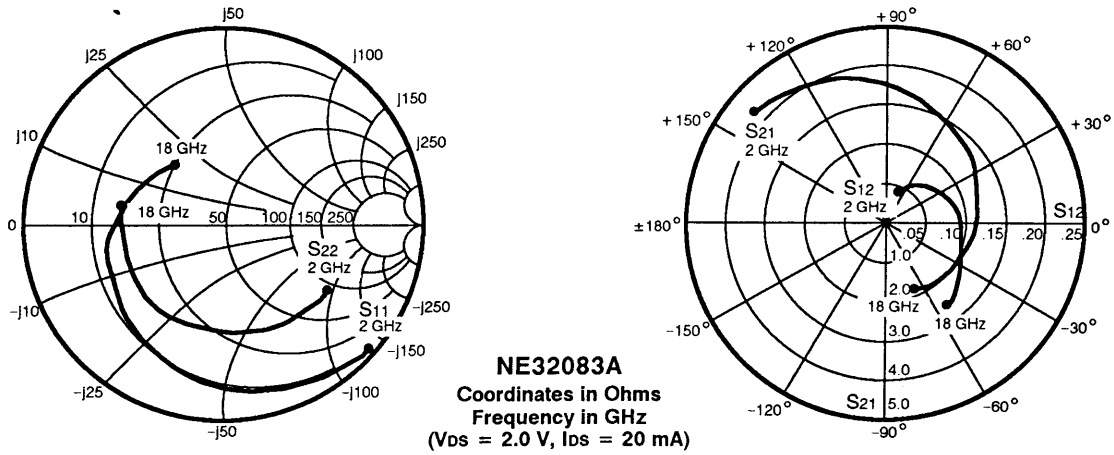


NE32083A
Coordinates in Ohms
Frequency in GHz
(V_{DS} = 2.0 V, I_{DS} = 10 mA)

S-MAGN AND PHASE:
V_{DS} = 2.0 V, I_{DS} = 10 mA

FREQUENCY (GHz)	S_{11}		S_{21}		S_{12}		S_{22}	
2.00	.98	-34	3.55	148	.03	68	.65	-25
3.00	.94	-50	3.39	131	.04	55	.64	-37
4.00	.91	-65	3.22	116	.05	45	.63	-48
5.00	.88	-81	3.09	102	.06	34	.62	-60
6.00	.84	-95	2.91	87	.06	25	.61	-71
7.00	.82	-109	2.83	75	.07	18	.61	-81
8.00	.78	-120	2.63	62	.07	11	.60	-91
9.00	.76	-132	2.52	50	.07	5	.61	-100
10.00	.73	-144	2.36	40	.07	1	.61	-109
11.00	.71	-153	2.22	29	.07	-3	.61	-116
12.00	.69	-164	2.22	18	.07	-7	.62	-124
13.00	.66	-174	2.24	6	.08	-12	.62	-131
14.00	.62	176	2.09	-6	.07	-16	.61	-138
15.00	.60	166	2.01	-18	.08	-18	.61	-146
16.00	.58	156	2.00	-24	.08	-24	.62	-154
17.00	.55	145	2.00	-37	.08	-37	.63	-162
18.00	.51	133	2.00	-49	.09	-49	.63	-170

TYPICAL COMMON SOURCE SCATTERING PARAMETERS



NE32083A
Coordinates in Ohms
Frequency in GHz
(V_{DS} = 2.0 V, I_{DS} = 20 mA)

S-MAGN AND PHASE:
VDS = 2.0 V, IDS = 20 mA

FREQUENCY (GHz)	S_{11}		S_{21}		S_{12}		S_{22}	
2.00	.95	-40	4.31	140	.04	62	.61	-32
3.00	.90	-57	3.97	124	.06	50	.59	-46
4.00	.86	-75	3.77	106	.07	38	.57	-60
5.00	.79	-91	3.43	91	.08	27	.54	-74
6.00	.75	-105	3.21	75	.09	18	.52	-86
7.00	.71	-119	2.98	62	.09	10	.52	-97
8.00	.68	-130	2.77	50	.09	4	.51	-106
9.00	.65	-141	2.59	37	.09	-3	.52	-115
10.00	.63	-152	2.43	26	.09	-6	.52	-125
11.00	.61	-161	2.28	15	.09	-12	.52	-133
12.00	.57	-172	2.22	2	.10	-19	.52	-141
13.00	.54	180	2.12	-8	.10	-22	.52	-148
14.00	.50	171	2.03	-19	.10	-27	.51	-155
15.00	.48	161	2.00	-32	.11	-33	.51	-163
16.00	.45	150	1.98	-40	.12	-36	.51	-172
17.00	.43	139	1.95	-54	.12	-45	.51	179
18.00	.39	127	1.95	-66	.13	-53	.51	169