

### FEATURES

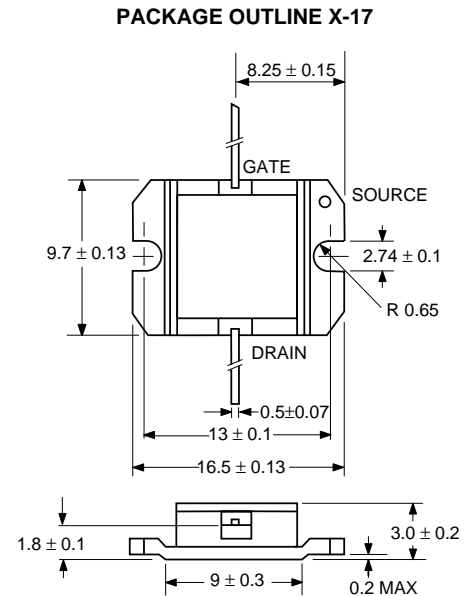
- **HIGH OUTPUT POWER:** 34 dBm TYP
- **HIGH LINEAR GAIN:** 8.5 dB TYP
- **HIGH EFFICIENCY:** 30% TYP
- **INPUT AND OUTPUT INTERNALLY MATCHED FOR OPTIMUM PERFORMANCE**

### DESCRIPTION

The NEZ1011-3E is a power GaAs FET which provides high gain, high efficiency and high output power in X-band. The internal input and output matching enables guaranteed performance to be achieved with only a 50 Ω external circuit. To reduce thermal resistance, the device has a PHS (plated heat sink) structure. The device incorporates a WSi (tungsten silicide) gate structure for high reliability.

The NEZ1011-3E transistors are manufactured to NEC's stringent quality assurance standards to ensure highest reliability and consistent superior performance.

### OUTLINE DIMENSIONS (Units in mm)



### RECOMMENDED OPERATING LIMITS

SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
V <sub>DS</sub>	Drain to Source Voltage	V	10	10	10
T <sub>CH</sub>	Channel Temperature	°C			130
G <sub>COMP</sub>	Gain Compression	dB			3
R <sub>g</sub>	Gate Resistance <sup>1</sup>	Ω	100	200	200

Note:

1. R<sub>g</sub> is the series resistance between the gate supply and the FET gate.

### ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)

PART NUMBER			NEZ1011-3E			TEST CONDITIONS
SYMBOLS	CHARACTERISTICS	UNITS	MIN	TYP	MAX	
P <sub>OUT(1dB)</sub>	Output Power at 1 dB gain compression	dBm	33.5	34.0		f = 10.7, 11.2, 11.7 GHz V <sub>DS</sub> = 10 V, I <sub>DS</sub> = 0.7 A (RF OFF) R <sub>g</sub> = 200 Ω
G <sub>L</sub>	Linear Gain	dB	8.0	8.5		
η <sub>ADD(1dB)</sub>	Power Added Efficiency	%		30		
I <sub>DS(1dB)</sub>	Drain Current at 1 dB gain compression	A		0.9	1.1	V <sub>DS</sub> = 1.5 V, V <sub>GS</sub> = 0 V
I <sub>DSS</sub>	Saturated Drain Current	A	0.7	1.6	2.5	
V <sub>P</sub>	Pinch-off Voltage	V	-2.5	-1.3	-0.5	V <sub>DS</sub> = 2.5 V, I <sub>DS</sub> = 10 mA
BV <sub>GD</sub>	Gate to Drain Breakdown Voltage	V		15		I <sub>GD</sub> = 10 mA
R <sub>TH</sub>	Thermal Resistance	°C/W		5.5	7.0	Channel to Case

**ABSOLUTE MAXIMUM RATINGS<sup>1</sup>**

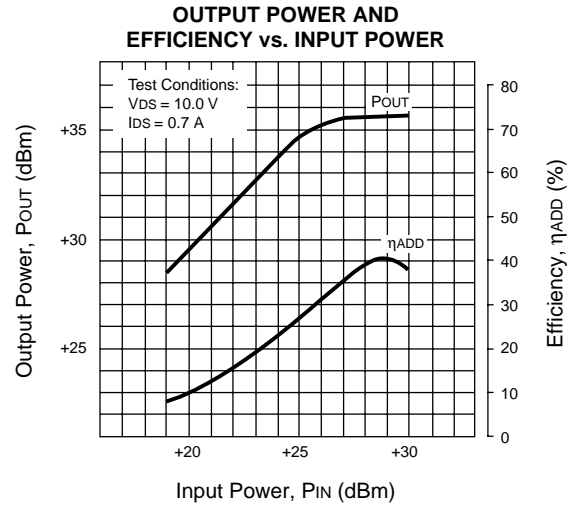
(T<sub>A</sub> = 25 °C unless otherwise noted)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V <sub>DS</sub>	Drain to Source Voltage	V	15
V <sub>GS</sub>	Gate to Source Voltage	V	-7
I <sub>DS</sub>	Drain Current	A	3.0
I <sub>GF</sub>	Gate Forward Current	mA	+20
I <sub>GR</sub>	Gate Reverse Current	mA	-20
P <sub>T</sub>	Total Power Dissipation	W	15
T <sub>CH</sub>	Channel Temperature	°C	175
T <sub>STG</sub>	Storage Temperature	°C	-65 to +175

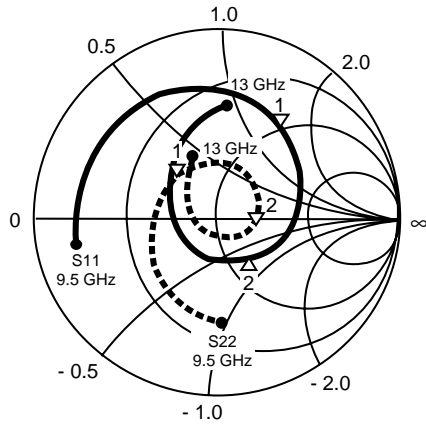
Note:

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

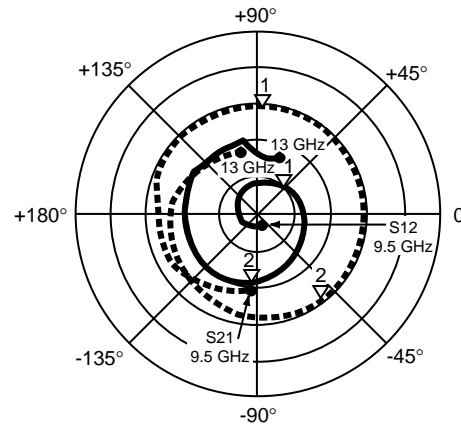
**TYPICAL PERFORMANCE CURVES**



TYPICAL SCATTERING PARAMETERS (T<sub>A</sub> = 25°C)



MARKER  
 1. 10.7 GHz  
 2. 11.7 GHz



NEZ1011-3E

V<sub>DS</sub> = 10 V, I<sub>DS</sub> = 0.7 mA

FREQUENCY GHz	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
9.50	0.758	-167.39	2.070	-95.76	0.016	-38.87	0.646	-84.19
9.60	0.756	-178.08	2.270	-112.00	0.017	-61.60	0.622	-91.49
9.70	0.753	171.53	2.354	-124.08	0.017	-85.66	0.596	-98.42
9.80	0.747	160.11	2.443	-134.99	0.018	-111.75	0.566	-106.28
9.90	0.741	148.58	2.673	-151.69	0.021	-134.47	0.531	-114.98
10.0	0.729	136.70	2.724	-167.75	0.023	-166.06	0.491	-124.12
10.1	0.716	124.86	2.712	176.25	0.027	172.30	0.448	-134.07
10.2	0.699	112.55	2.838	161.63	0.030	148.72	0.407	-145.61
10.3	0.681	100.95	2.852	145.98	0.034	124.79	0.365	-158.26
10.4	0.663	89.42	2.871	130.97	0.039	108.58	0.320	-172.71
10.5	0.641	77.97	2.903	116.20	0.043	89.47	0.283	170.97
10.6	0.622	67.46	2.901	101.01	0.048	72.73	0.252	153.11
10.7	0.594	56.60	2.877	86.32	0.052	55.93	0.230	133.05
10.8	0.575	46.63	2.883	71.80	0.056	39.23	0.220	112.27
10.9	0.552	36.25	2.855	56.97	0.061	23.04	0.221	92.84
11.0	0.526	26.67	2.840	42.96	0.064	7.38	0.227	75.00
11.1	0.506	16.61	2.859	28.79	0.068	-5.91	0.236	58.65
11.2	0.477	6.70	2.845	14.13	0.072	-21.59	0.249	44.18
11.3	0.456	-3.13	2.827	0.09	0.074	-34.56	0.258	30.97
11.4	0.421	-13.55	2.874	-14.50	0.077	-47.80	0.266	19.24
11.5	0.394	-23.84	2.845	-29.76	0.082	-62.82	0.273	7.52
11.6	0.358	-36.37	2.814	-44.12	0.084	-76.49	0.273	-3.61
11.7	0.318	-48.90	2.828	-57.37	0.094	-91.32	0.270	-14.58
11.8	0.279	-64.30	2.845	-74.32	0.094	-106.79	0.264	-25.85
11.9	0.238	-83.35	2.802	-90.23	0.099	-122.49	0.253	-37.42
12.0	0.207	-106.26	2.794	-105.99	0.104	-137.25	0.238	-49.84
12.1	0.196	-137.80	2.770	-121.15	0.096	-154.08	0.217	-64.49
12.2	0.206	-166.81	2.602	-139.28	0.102	-169.14	0.195	-80.31
12.3	0.247	167.14	2.579	-153.95	0.097	177.26	0.170	-98.82
12.4	0.303	147.11	2.518	-167.66	0.095	161.79	0.151	-121.50
12.5	0.355	131.68	2.375	174.50	0.104	145.13	0.139	-147.03
12.6	0.412	118.32	2.236	158.17	0.096	132.63	0.143	-175.15
12.7	0.463	107.59	2.136	143.53	0.101	117.73	0.160	159.25
12.8	0.515	98.52	2.000	129.81	0.106	100.77	0.187	137.81
12.9	0.554	89.20	1.833	115.84	0.082	85.18	0.223	120.09
13.0	0.592	81.59	1.844	101.31	0.088	67.39	0.263	104.51

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 24-Hour Fax-On-Demand: 800-390-3232 (U.S. and Canada only) • Internet: <http://WWW.CEL.COM>

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