

### FEATURES

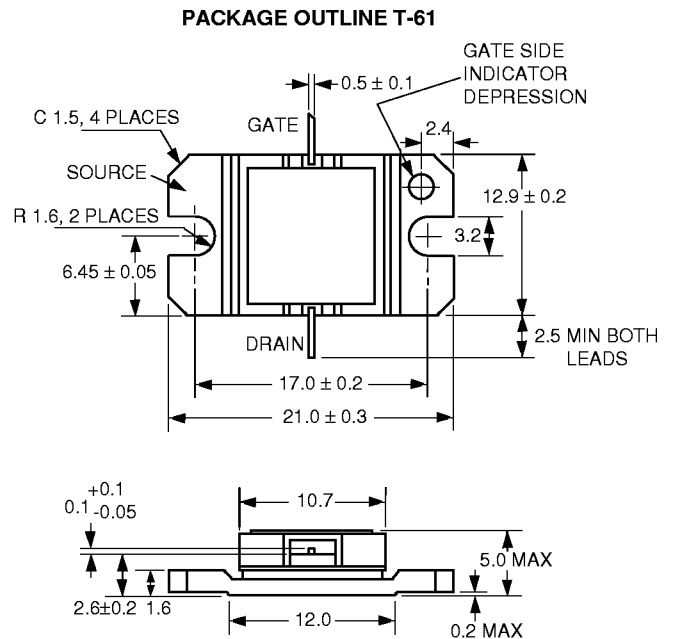
- **HIGH OUTPUT POWER:** 39.5 dBm TYP
- **HIGH LINEAR GAIN:** 6.5 dB TYP
- **HIGH EFFICIENCY:** 25% TYP
- **INDUSTRY STANDARD PACKAGE**
- **INTERNALLY MATCHED FOR OPTIMUM PERFORMANCE IN THE 10.7 TO 11.7 GHz BAND**

### DESCRIPTION

The NEZ1011-8E 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. The device incorporates a Wsi (tungsten silicide) gate structure for high reliability, SiO<sub>2</sub> glassivation for surface stability, and a plated heat sink for reduced thermal resistance.

The NEZ1011-8E 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	9	9	9
T <sub>CH</sub>	Channel Temperature	°C			130
G <sub>COMP</sub>	Input Power	dB <sub>COMP</sub>			3
R <sub>g</sub>	Gate Resistance	Ω		25	50

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

PART NUMBER			NEZ1011-8E			TEST CONDITIONS
SYMBOLS	CHARACTERISTICS	UNITS	MIN	TYP	MAX	
P <sub>1dB</sub>	Output Power at 1 dB compression	dBm	38.5	39.5		f = 10.7, 11.2, 11.7 GHz V <sub>DS</sub> = 9 V, I <sub>DSQ</sub> = 2.0 A R <sub>g</sub> = 100 Ω
GL	Linear Gain	dB	6.0	6.5		
η <sub>ADD</sub>	Power Added Efficiency	%		25		
I <sub>DS</sub>	Drain Current	A		3.0	4.0	P <sub>OUT</sub> = +35 dBm (Two Tones)
IM <sub>3</sub>	Third Order Intermodulation Distortion	dBc		-40		
I <sub>DSS</sub>	Saturated Drain Current	A	2.8	6.4	10.0	V <sub>DS</sub> = 1.5 V, V <sub>GS</sub> = 0 V
V <sub>P</sub>	Pinch-off Voltage	V	-3.0	-1.3	-0.5	V <sub>DS</sub> = 2.5 V, I <sub>DS</sub> = 40 mA
BV <sub>GD</sub>	Gate to Drain Breakdown Voltage	V	15	18		I <sub>GD</sub> = 40 mA
R <sub>TH</sub>	Thermal Resistance	°C/W		2.0	2.5	Channel to Case

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

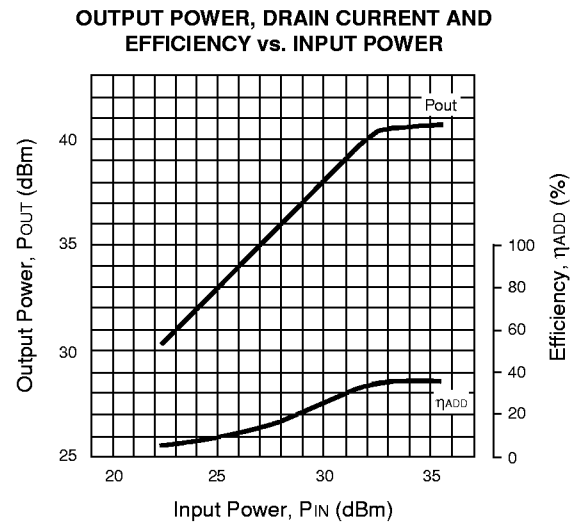
(TA = 25 °C unless otherwise noted)

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	I <sub>DSS</sub>
I <sub>GF</sub>	Gate Forward Current	mA	80
I <sub>GR</sub>	Gate Reverse Current	mA	-80
P <sub>T</sub>	Total Power Dissipation <sup>2</sup>	W	60
T <sub>CH</sub>	Channel Temperature	°C	175
T <sub>STG</sub>	Storage Temperature	°C	-65 to +175

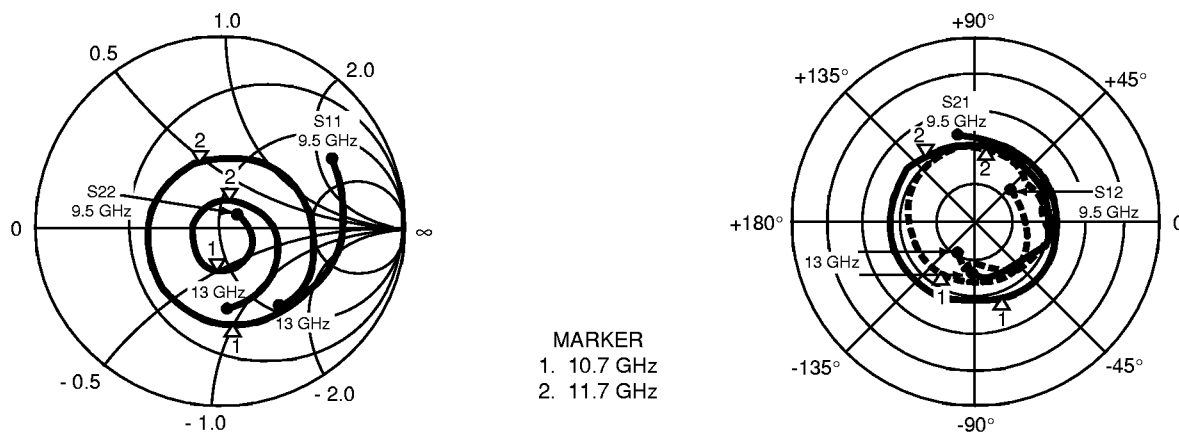
Notes:

1. Operation in excess of any one of these parameters may result in permanent damage.
2. T<sub>c</sub> = 25 °C

**TYPICAL PERFORMANCE CURVES**



**TYPICAL SCATTERING PARAMETERS (TA = 25°C)**



**NEZ1011-8E**

**V<sub>DS</sub> = 9 V, I<sub>DS</sub> = 2.0 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
10.1	0.651	-23.94	2.157	9.63	0.068	-42.73	0.258	-41.16
10.3	0.615	-40.07	2.124	-17.97	0.071	-65.64	0.277	-55.41
10.5	0.590	-57.16	2.168	-46.56	0.077	-94.35	0.286	-71.22
10.7	0.563	-76.46	2.225	-76.37	0.082	-122.32	0.271	-87.48
10.9	0.529	-99.37	2.355	-107.66	0.086	-150.69	0.240	-105.61
11.1	0.472	-126.59	2.383	-140.14	0.094	177.84	0.184	-128.67
11.3	0.401	-158.63	2.441	-173.94	0.100	146.11	0.112	-161.74
11.5	0.341	161.83	2.399	151.91	0.098	112.91	0.068	122.79
11.7	0.327	118.35	2.292	118.38	0.092	80.50	0.123	53.88
11.9	0.362	79.87	2.198	84.49	0.091	50.58	0.208	23.28
12.1	0.420	49.35	2.081	53.46	0.097	19.69	0.289	1.85
12.3	0.473	23.97	2.009	20.17	0.091	-12.61	0.355	-17.42

EXCLUSIVE NORTH AMERICAN AGENT FOR **NEC** RF, MICROWAVE & OPTOELECTRONIC SEMICONDUCTORS

**CEL** CALIFORNIA EASTERN LABORATORIES • Headquarters • 4590 Patrick Henry Drive • Santa Clara, CA 95054-1817 • (408) 988-3500 • Telex 34-6393 • FAX (408) 988-0279  
 24-Hour Fax-On-Demand: 800-390-3232 (U.S. and Canada only) • Internet: <http://WWW.CEL.COM>

DATA SUBJECT TO CHANGE WITHOUT NOTICE

PRINTED IN USA ON RECYCLED PAPER -5/99