

FEATURES

- **HIGH OUTPUT POWER:** 36.5 dBm TYP
- **HIGH LINEAR GAIN:** 8.0 dB TYP
- **HIGH EFFICIENCY:** 30% TYP
- **INDUSTRY STANDARD PACKAGE**
- **INTERNALLY MATCHED FOR OPTIMUM PERFORMANCE IN 10.7 TO 11.7 GHz BAND**

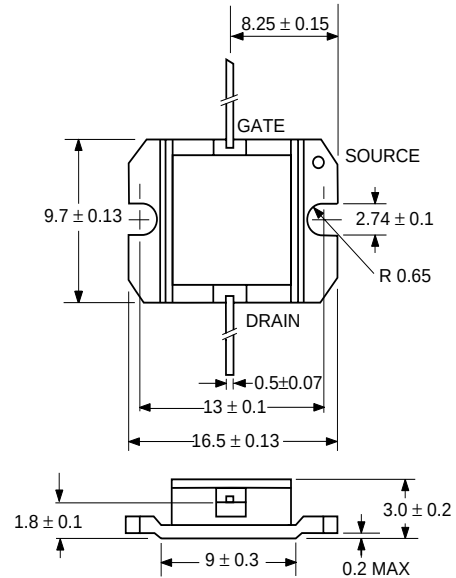
DESCRIPTION

The NEZ1011-4E 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, SiO₂ glassivation for surface stability, and a plated heat sink for reduced thermal resistance.

The NEZ1011-4E transistors are manufactured to NEC's stringent quality assurance standards to ensure highest reliability and consistent superior performance.

OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE X-17



RECOMMENDED OPERATING LIMITS

SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
V _{DS}	Drain to Source Voltage	V	9	9	9
T _{CH}	Channel Temperature	°C			130
G _{COMP}	Gain Compression	dB			3
R _g	Gate Resistance	Ω	50	100	100

ELECTRICAL CHARACTERISTICS (T_C = 25°C)

PART NUMBER			NEZ1011-4E			TEST CONDITIONS
SYMBOLS	CHARACTERISTICS	UNITS	MIN	TYP	MAX	
P _{1dB}	Output Power at 1 dB compression	dBm	35.5	36.5		f = 10.7, 11.2, 11.7 GHz V _{DS} = 9 V, I _{DSQ} = 1.0 A R _g = 100 Ω
G _L	Linear Gain	dB	7.5	8.0		
η_{ADD}	Power Added Efficiency	%		30		
I _{DS}	Drain Current	A		1.5	2.0	V _{DS} = 1.5 V, V _{GS} = 0 V
I _{DSS}	Saturated Drain Current	A	1.0	3.0	5.0	
V _P	Pinch-off Voltage	V	-3.0	-1.3	-0.5	V _{DS} = 2.5 V, I _{DS} = 20 mA
BV _{GD}	Gate to Drain Breakdown Voltage	V	15	18		I _{GD} = 20 mA
R _{TH}	Thermal Resistance	°C/W		4.5	5.0	Channel to Case

ABSOLUTE MAXIMUM RATINGS¹

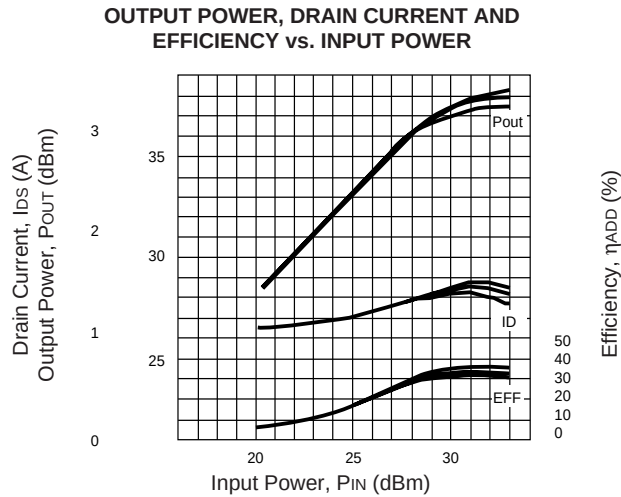
(T_A = 25 °C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V _{DS}	Drain to Source Voltage	V	15
V _{GS}	Gate to Source Voltage	V	-7
I _{DS}	Drain Current	A	4.5
I _{GF}	Gate Forward Current	mA	40
I _{GR}	Gate Reverse Current	mA	-40
P _T	Total Power Dissipation ²	W	30
T _{CH}	Channel Temperature	°C	175
T _{STG}	Storage Temperature	°C	-65 to +175

Note:

- Operation in excess of any one of these parameters may result in permanent damage.
- T_c = 25° C

TYPICAL PERFORMANCE CURVES

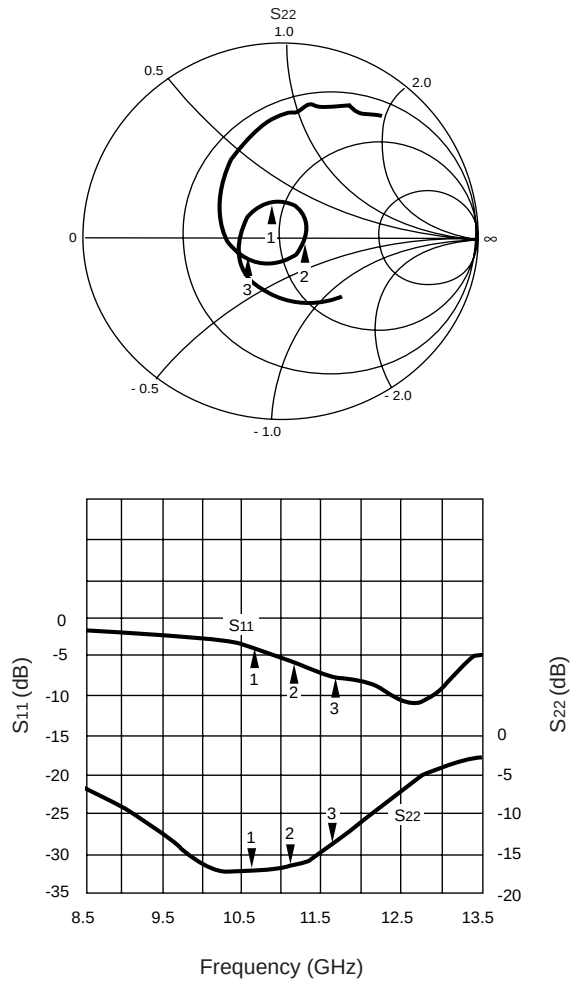
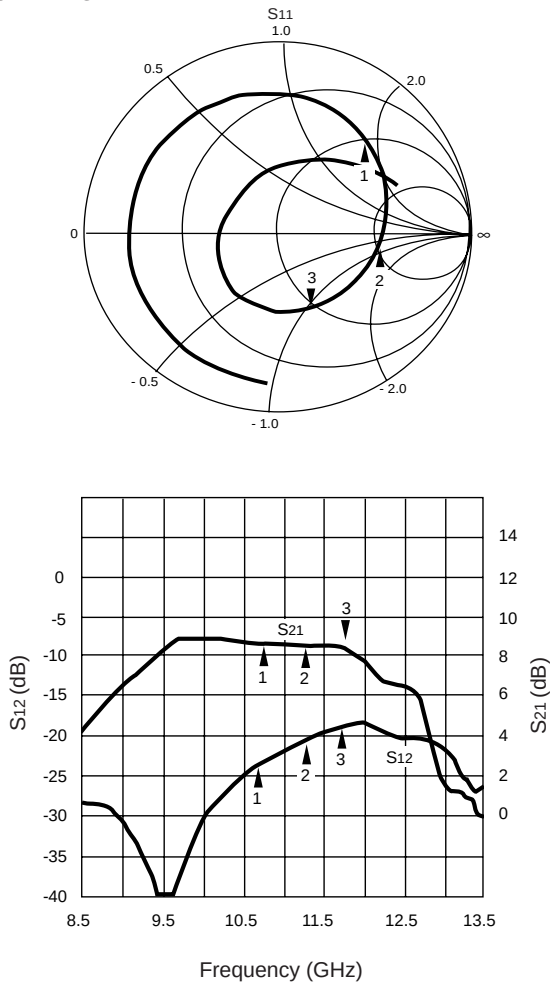


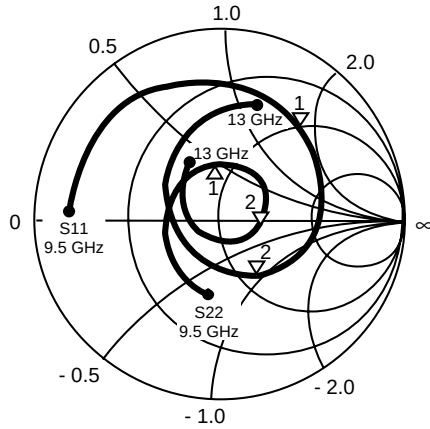
SMALL SIGNAL IMPEDANCES

V_{ds} = 9 V, I_{ds} = 1 A

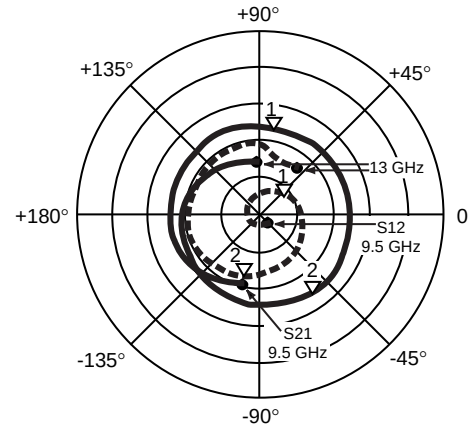
- ▲ 1 = 10.7 GHz
- ▲ 2 = 11.2 GHz
- ▲ 3 = 11.7 GHz

Start: 8.5 GHz
Stop: 13.5 GHz



TYPICAL SCATTERING PARAMETERS ($T_A = 25^\circ\text{C}$)

MARKER
1. 10.7 GHz
2. 11.7 GHz



NEZ1011-4E

$V_{DS} = 9\text{ V}$, $I_{DS} = 1.0\text{ mA}$

FREQUENCY GHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
10.1	0.749	112.65	2.461	168.24	0.015	151.68	0.285	-163.97
10.3	0.710	89.86	2.488	138.45	0.024	99.88	0.251	162.98
10.5	0.669	67.94	2.475	109.52	0.034	66.26	0.239	128.31
10.7	0.627	47.46	2.431	81.18	0.044	35.15	0.250	97.19
10.9	0.588	27.68	2.407	53.23	0.054	5.01	0.269	71.62
11.1	0.550	8.22	2.432	25.68	0.062	-21.46	0.282	49.71
11.3	0.506	-11.79	2.418	-2.18	0.070	-48.43	0.289	29.87
11.5	0.451	-33.98	2.470	-31.74	0.079	-75.81	0.279	10.00
11.7	0.379	-60.57	2.480	-59.67	0.093	-104.01	0.253	-10.32
11.9	0.304	-95.77	2.478	-92.96	0.098	-134.93	0.216	-34.36
12.1	0.263	-145.73	2.435	-124.80	0.094	-165.65	0.169	-66.38
12.3	0.303	162.34	2.240	-158.17	0.096	165.64	0.134	-113.11

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