

FEATURES

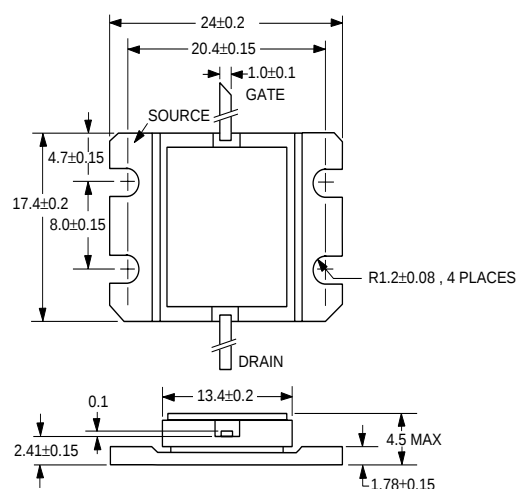
- **HIGH OUTPUT POWER:** 30 W
- **LOW DISTORTION:** -45 dBc IM₃ (@33 dBm SCL)
(Verified by a Wafer Qual Test)
- **HIGH LINEAR GAIN:** 10.0 dB
- **EFFICIENT LINEAR OPERATION:** 6 A I_{dsQ}
- **WIDEBAND OPERATION:**
RF measurements at both 3.4 & 3.6 GHz
- **INTERNALLY MATCHED TO 50 Ω**

DESCRIPTION

The NEZ3436-30E is a 30 W internally matched GaAs MESFET designed for high power transmitter applications for Wireless Local Loop. The internal matching network provides matching to 50 Ω over the 3.4 to 3.6 GHz band, and with external matching, the high end frequency can be increased to over 3.7 GHz. The device contains two chips which employ 0.9 μm Tungsten Silicide gates, via holes, plated heat sink, and silicon dioxide passivation for superior performance, thermal characteristics and reliability. This device is designed to be mass produced for low cost commercial applications.

OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE T-79



ELECTRICAL PERFORMANCE (T_{CASE} = 40° C; T_A = 25° C)

PART NUMBER PACKAGE OUTLINE				NEZ3436-30E T-79			
SYMBOLS		CHARACTERISTICS	UNITS	MIN	TYP	MAX	TEST CONDITIONS
Functional Characteristics	P _{1dB}	Power Out at 1 dB Compression	dBm	44.0	45.0		V _{DS} = 10 V
	GL	Linear Gain	dB	9.0	10.0		f = 3.4 & 3.6 GHz
	η _{ADD}	Power-Added Efficiency @ 1 dB Compression	%	31	37		I _{DSQ} = 6.0 A
	I _{DSRF}	Drain Source Current at 1 dB Compression	A		7.4		R _G = 10 Ω ²
	IM ₃	3rd Order Intermodulation Distortion ¹	dBc		-45	-40 ¹	P _{OUT} = 33 dBm/Tone
Electrical DC Characteristics	I _{DSS}	Saturated Drain Current	A		15		V _{DS} = 2.5 V; V _{GS} = 0 V
	V _P	Pinch-off Voltage	V	-4.0	-2.6		V _{DS} = 2.5 V; I _{DS} = 84 mA
	g _m	Transconductance	mS		8		V _{DS} = 2.5 V; I _{DS} = 84 mA
	R _{TH}	Thermal Resistance Channel to Case	K/W		1.3	1.5	T _{CASE} = 25 °C, 10 V, 6.0 A

Note:

1. Two-tone IM3 is measured as part of Wafer Qualification Tests on a sample basis. Test criteria are set to ensure a maximum IM3 of -40 dBc with a confidence factor of 90%.
2. R_G is the equivalent series resistance between the gate supply and the FET gate.

ABSOLUTE MAXIMUM RATINGS¹(T_{CASE} = 25 °C unless otherwise noted)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V _{DSO}	Drain to Source Voltage	V	15
V _{GDO}	Gate to Drain Voltage	V	-18
V _{GS}	Gate to Source Voltage	V	-7
I _{DS}	Drain Current	A	27
I _{GS}	Gate Current	mA	180
P _T	Total Power Dissipation	W	100
T _{CH}	Channel Temperature	°C	175
T _{STG}	Storage Temperature	°C	-65 to +175

Notes:

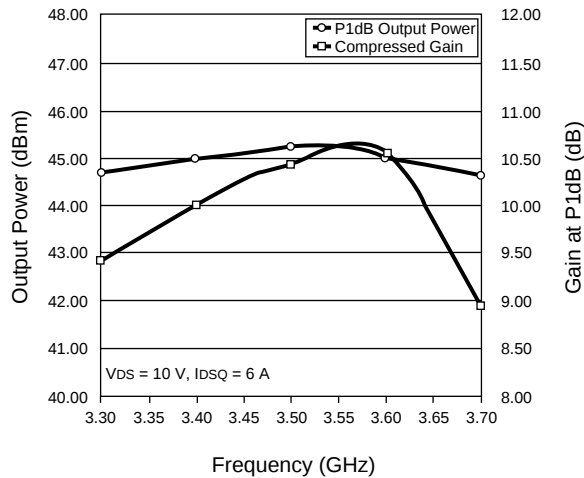
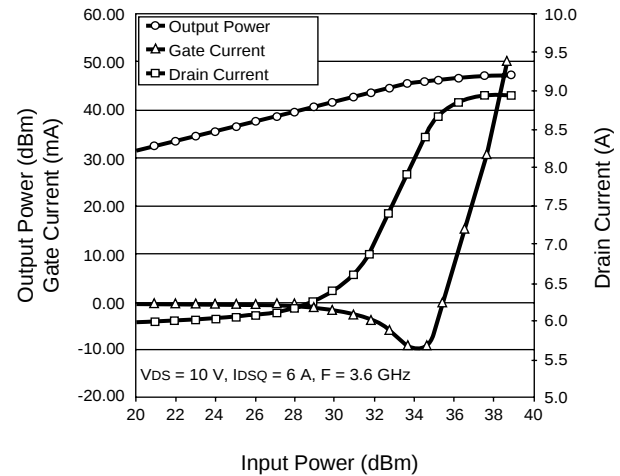
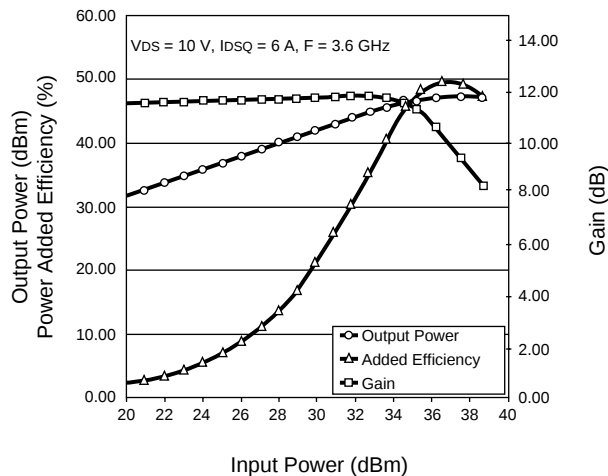
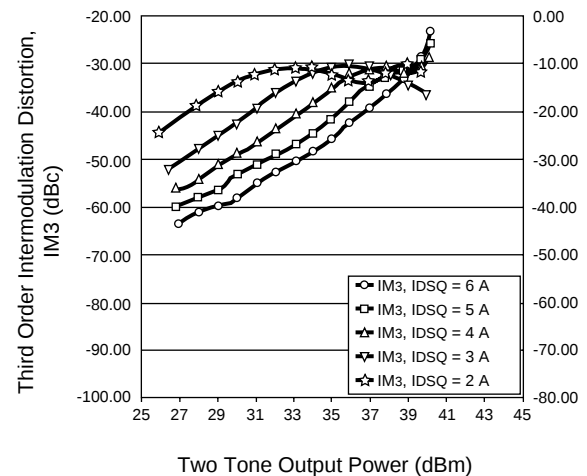
- Operation in excess of any one of these parameters may result in permanent damage.

RECOMMENDED OPERATING LIMITS(Recommended operating conditions for reliable operation, i.e. > 10⁶ hrs MTTF)

SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
V _{DS}	Drain to Source Voltage	V		10.0	10.0
T _{FLANGE} ¹	Flange Temperature	°C			62
G _{COMP}	Gain Compression	dB			3.0
R _G ²	Gate Resistance	Ω			10
I _{DSQ}	Drain Current (RF OFF)	A			6.0

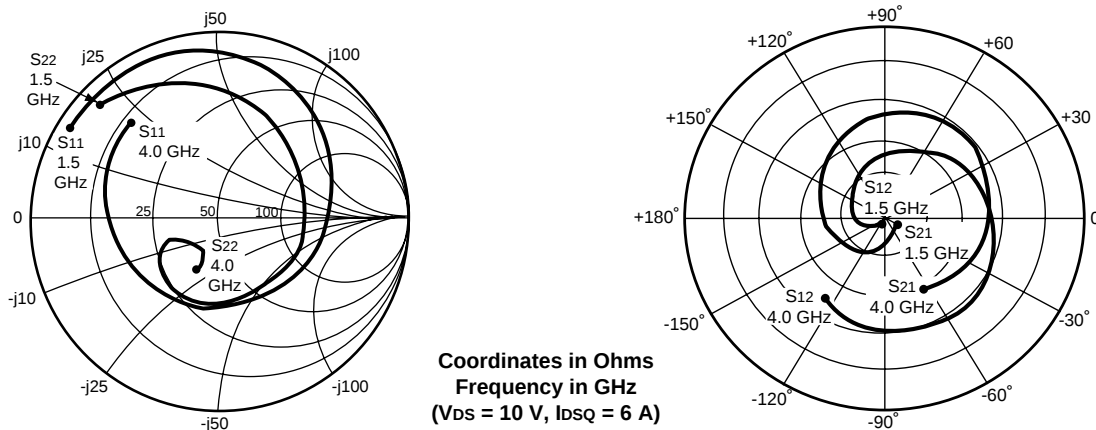
Notes:

- Calculation of maximum flange temperature is based on worst case conditions, that is, maximum R_{TH} @ 62°C flange (1.66) and maximum power dissipation with no RF output. Operation at higher flange temperature may result in a lower MTTF.
- R_G is the series resistance between the gate supply and the FET gate.

TYPICAL PERFORMANCE CURVES (T_C = 25°C)**OUTPUT POWER AND GAIN
vs. FREQUENCY****OUTPUT POWER, DRAIN AND GATE
CURRENTS vs. INPUT POWER****OUTPUT POWER, GAIN AND
POWER ADDED EFFICIENCY
vs. INPUT POWER****INTERMODULATION DISTORTION
vs. OUTPUT POWER**

TYPICAL SCATTERING PARAMETERS (T_A = 25°C)

Note: This file and many other s-parameter files can be downloaded from www.cel.com



NEZ3436-30E

V_{DS} = 10.0 V, I_{DSQ} = 6 A

FREQUENCY	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG ¹
GHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG		(dB)
1.50	0.960	148.5	0.463	-9.1	0.004	-51.0	0.873	135.4	11.52	4.03
2.00	0.940	132.1	0.637	-51.8	0.007	-102.2	0.747	110.1	9.51	5.21
2.50	0.931	111.5	1.114	-108.1	0.016	-166.8	0.562	58.3	11.59	2.56
3.00	0.816	66.7	2.068	172.2	0.037	109.0	0.370	-43.5	11.79	2.00
3.05	0.786	59.6	2.184	161.5	0.040	99.7	0.376	-55.8	11.69	1.98
3.10	0.748	50.2	2.287	150.4	0.043	89.8	0.399	-68.7	11.57	1.97
3.15	0.733	42.3	2.469	141.7	0.047	79.1	0.397	-76.9	12.00	1.80
3.20	0.683	32.5	2.636	132.2	0.051	68.8	0.416	-87.6	12.03	1.77
3.25	0.633	19.9	2.752	120.0	0.055	57.7	0.425	-96.3	11.90	1.76
3.30	0.586	6.9	2.850	107.7	0.059	45.8	0.393	-106.8	11.66	1.81
3.35	0.529	-8.7	3.023	97.5	0.062	34.0	0.412	-114.3	11.86	1.74
3.40	0.482	-27.3	3.137	85.6	0.066	21.8	0.396	-122.2	11.86	1.71
3.45	0.447	-48.7	3.199	72.0	0.070	9.0	0.384	-129.8	11.83	1.67
3.50	0.430	-71.8	3.233	59.0	0.071	-3.6	0.356	-135.4	11.76	1.68
3.55	0.434	-96.6	3.260	46.7	0.073	-16.7	0.340	-140.9	11.84	1.62
3.60	0.463	-117.5	3.280	34.4	0.074	-29.5	0.311	-141.0	11.92	1.59
3.65	0.489	-137.1	3.171	21.3	0.073	-41.7	0.292	-143.7	11.69	1.63
3.70	0.524	-158.0	3.050	8.1	0.072	-53.9	0.278	-137.4	11.45	1.67
3.75	0.570	-173.7	2.952	-3.0	0.072	-65.2	0.251	-134.2	11.36	1.67
3.80	0.601	173.1	2.850	-13.7	0.069	-76.4	0.267	-130.7	11.24	1.70
3.85	0.641	159.0	2.716	-25.1	0.068	-87.1	0.249	-124.1	11.07	1.73
3.90	0.668	147.4	2.540	-36.6	0.065	-97.1	0.270	-126.0	10.74	1.80
3.95	0.670	137.7	2.413	-46.8	0.063	-107.0	0.308	-121.9	10.32	1.92
4.00	0.692	129.3	2.312	-55.4	0.061	-116.2	0.322	-124.1	10.20	1.94

Note:

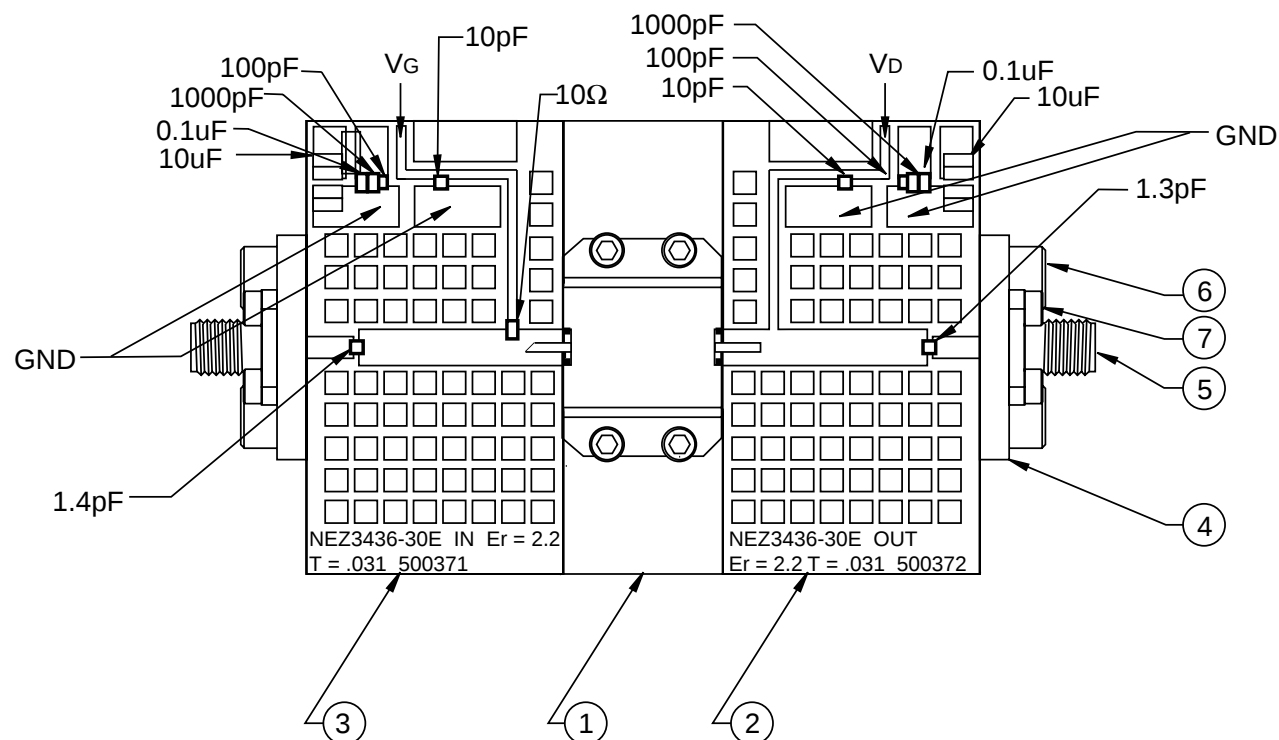
1. Gain Calculations:

$$\text{MAG} = \frac{|S_{21}|}{|S_{12}|} \left(K \pm \sqrt{K^2 - 1} \right). \text{ When } K \leq 1, \text{ MAG is undefined and MSG values are used. } \text{MSG} = \frac{|S_{21}|}{|S_{12}|}, K = \frac{1 + |\Delta|^2 - |S_{11}|^2 - |S_{22}|^2}{2 |S_{12}| |S_{21}|}, \Delta = S_{11} S_{22} - S_{21} S_{12}$$

MAG = Maximum Available Gain

MSG = Maximum Stable Gain

TEST FIXTURE ASSEMBLY



ITEM NO.	SPECIFICATION / MATERIAL
1	Test Fixture Block
2	NEZ3436-30E Output Circuit
3	NEZ3436-30E Input Circuit
4	OSM Connector Flange
5	OSM Connector Macom
6	M4 x 0.7-6H x 8.0 Hex HD Screw
7	M2 x 0.4-6H x 4.0 Hex HD Screw

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