

FEATURES

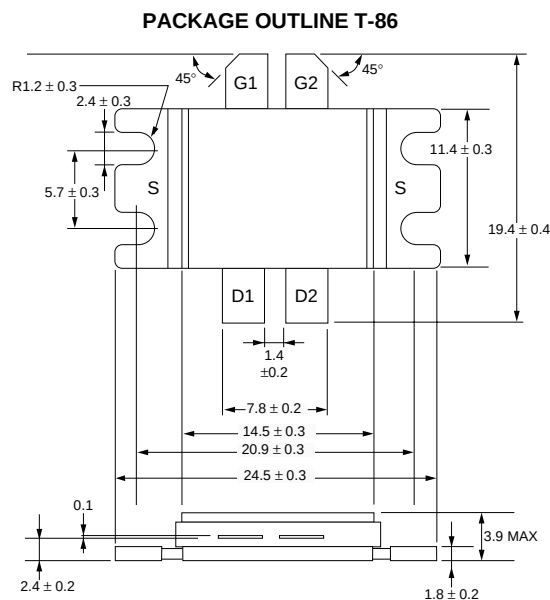
- **HIGH OUTPUT POWER:** 50 W TYP
- **HIGH DRAIN EFFICIENCY:**
52 % TYP @ $V_{DS} = 10\text{ V}$, $I_D = 2\text{ A}$, $f = 1.96\text{ GHz}$
- **HIGH LINEAR GAIN:** 10.5 dB TYP
- **PUSH-PULL CONFIGURATION**

DESCRIPTION

The NES1821P-50 is a 50 W push-pull type GaAs MESFET designed for high power transmitter applications for PCS, DCS and PHS base station systems. It is capable of delivering 50 watts of output power (CW) with high linear gain, high efficiency and excellent distortion. Its primary band is 1.8 to 2.1 GHz, however with different matching, 60 MHz or less of instantaneous bandwidth can be achieved anywhere from 1.5 to 2.1 GHz. The device employs $0.9\text{ }\mu\text{m}$ Tungsten Silicide gates, via holes, plated heat sink, and silicon dioxide passivation for superior performance, thermal characteristics, and reliability.

Reliability and performance uniformity are assured by NEC's stringent quality and control procedures.

OUTLINE DIMENSIONS (Units in mm)



G1, G2 : Gate
D1, D2 : Drain
S : Source

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

PART NUMBER PACKAGE OUTLINE				NES1821P-50 T-86			TEST CONDITIONS
	SYMBOLS	CHARACTERISTICS	UNITS	MIN	TYP	MAX	
Functional Characteristics	P_{OUT}	Output Power	dBm	46	47		$V_{DS} = 10\text{ V}$ $f = 1.96\text{ GHz}$ $I_{Dset} = 2.0\text{ A Total (RF off)}$ $P_{IN} = +39.5\text{ dBm}$ $RG = 20\text{ }\Omega$ Note 2
	G_L^1	Linear Gain	dB	9.5	10.5		
	η_D	Drain Efficiency	%		52		
	I_D	Drain Current	A		10	13	
Electrical DC Characteristics	I_{DSS}	Saturated Drain Current	A		30		$V_{DS} = 2.5\text{ V}; V_{GS} = 0\text{ V}$
	V_P	Pinch-off Voltage	V	-4.0	-2.6		$V_{DS} = 2.5\text{ V}; I_{DS} = 130\text{ mA}$
	R_{TH}	Thermal Resistance	$^\circ\text{C/W}$		1.0	1.5	Channel to Case

Note:

1. $P_{IN} = +30\text{ dBm}$ for Linear Gain.
2. $I_{Dset} = 1.0\text{ A}$ Each Drain.

ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V _{DS}	Drain to Source Voltage	V	15
V _{GSO}	Gate to Source Voltage	V	-7
V _{GDO}	Gate to Drain Voltage	V	-18
I _D	Drain Current	A	30
I _G	Gate Current	mA	200
P _T	Total Power Dissipation	W	110
T _{CH}	Channel Temperature	°C	175
T _{STG}	Storage Temperature	°C	-65 to +175

Notes:

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

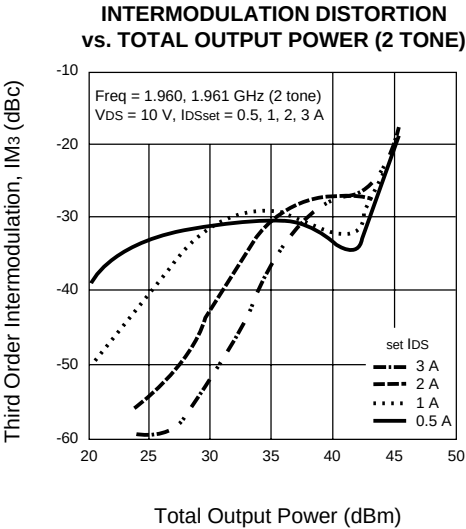
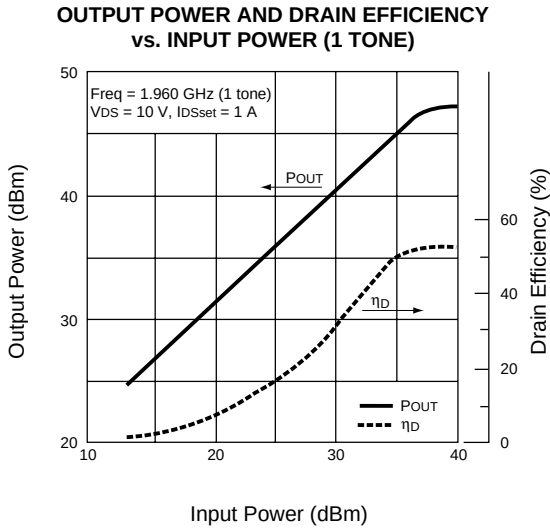
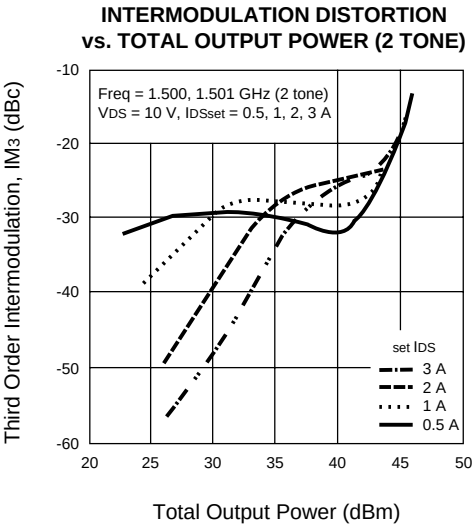
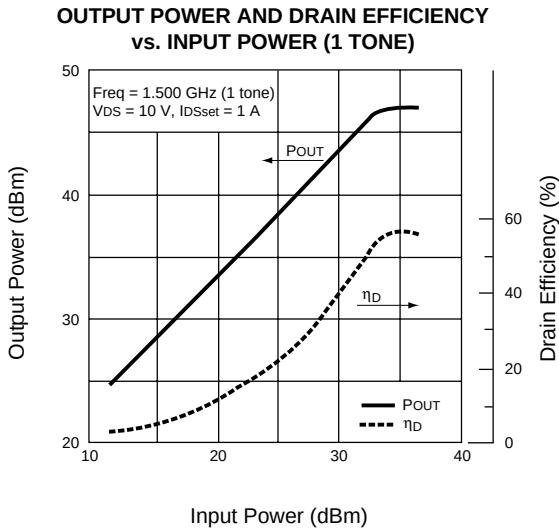
RECOMMENDED OPERATING LIMITS

SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
V _{DS}	Drain to Source Voltage	V		10	10
G _{COMP}	Gain Compression	dB _{COMP}			3
T _{CH}	Channel Temperature	°C			150
I _{Dset}	Set Drain Current ¹	A			4
R _G	Gate Resistance ²	Ω		10	20

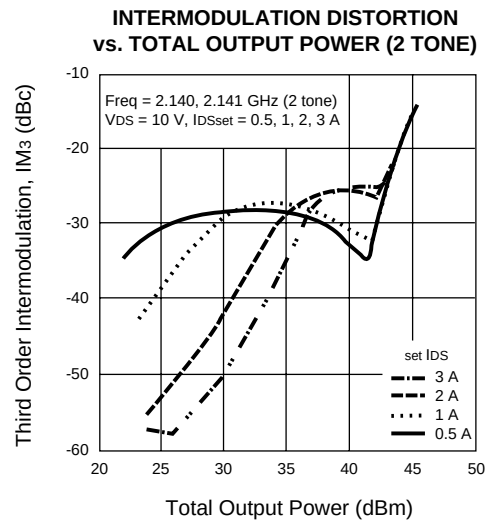
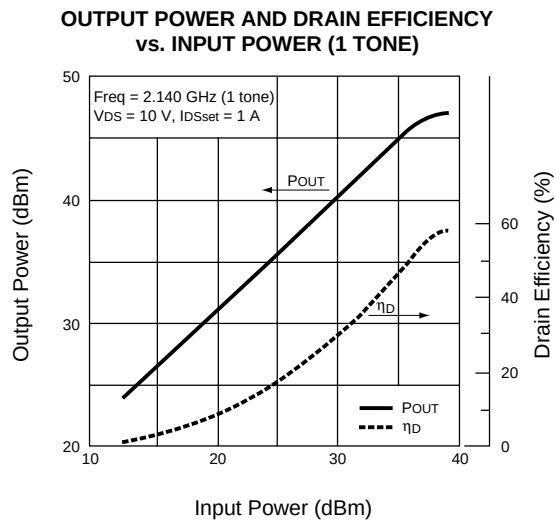
Notes:

1. V_{DS} = 10 V, RF OFF
2. R_G is the series resistance between the gate supply and the FET gate.

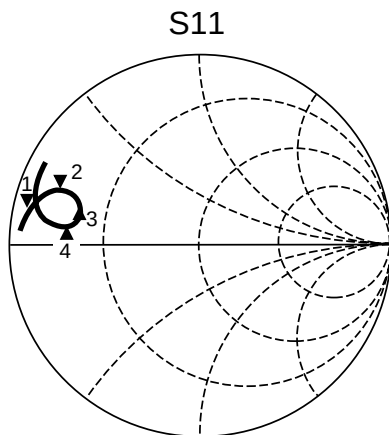
TYPICAL PERFORMANCE CURVES (T_A = 25°C)



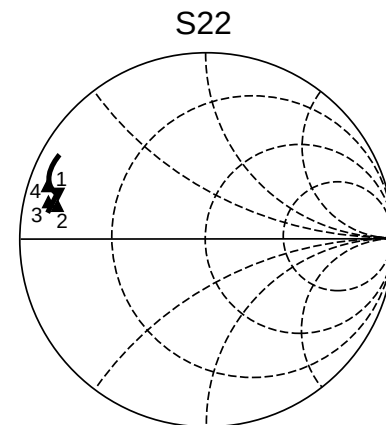
TYPICAL PERFORMANCE CURVES ($T_A = 25^\circ\text{C}$)



TYPICAL S-PARAMETERS (VDS = 10 V, IDSset = 1 A)



Start 1 GHz



Stop 3 GHz

Marker

- ▲ 1: 1.50 GHz
- ▲ 2: 1.76 GHz
- ▲ 3: 1.96 GHz
- ▲ 4: 2.16 GHz

ORDERING INFORMATION

PART NUMBER	PACKAGE
NES1821P-50	T-86

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