replacement.

Document Number: MHL9236N

Rev. 9, 12/2006

# **Cellular Band RF Linear LDMOS Amplifier**

Designed for ultra-linear amplifier applications in 50 ohm systems operating in the cellular frequency band. A silicon FET Class A design provides outstanding linearity and gain. In addition, the excellent group delay and phase linearity characteristics are ideal for the most demanding analog or digital modulation systems, such as TDMA, CDMA or QPSK.

Replaced by MHL9236NN. There are no form, fit or function changes with this part

- Third Order Intercept: 47 dBm Typ
- Power Gain: 30.5 dB Typ (@ f = 880 MHz)
- Input and Output VSWR ≤ 1.5:1

#### **Features**

- Excellent Phase Linearity and Group Delay Characteristics
- Ideal for Feedforward Base Station Applications
- For Use in TDMA, CDMA, QPSK or Analog Systems
- N Suffix Indicates Lead-Free Terminations

# **MHL9236N**

800 - 960 MHz 2.5 W, 30.5 dB RF LINEAR LDMOS AMPLIFIER

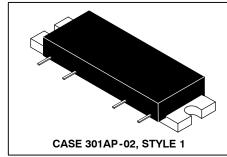


Table 1. Absolute Maximum Ratings (T<sub>C</sub> = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
DC Supply Voltage	V <sub>DD</sub>	30	Vdc
RF Input Power	P <sub>in</sub>	+10	dBm
Storage Temperature Range	T <sub>stg</sub>	- 40 to +100	°C
Operating Case Temperature Range	T <sub>C</sub>	- 20 to +100	°C

Table 2. Electrical Characteristics (V<sub>DD</sub> = 26 Vdc, T<sub>C</sub> = 25°C; 50 Ω System)

Characteristi	Symbol	Min	Тур	Max	Unit	
Supply Current		I <sub>DD</sub>	_	550	620	mA
Power Gain	(f = 880 MHz)	G <sub>p</sub>	29	30.5	32	dB
Gain Flatness	(f = 800 - 960 MHz)	G <sub>F</sub>	_	0.1	0.3	dB
Power Output @ 1 dB Compression	(f = 880 MHz)	P1dB	33	34	_	dBm
Third Order Intercept (f1 = 879 MHz, f2 = 884 MHz)		ITO	46	47	_	dBm
Noise Figure	(f = 800-960 MHz)	NF	_	3.5	4.5	dB

NOTE - CAUTION - MOS devices are susceptible to damage from electrostatic charge. Reasonable precautions in handling and packaging MOS devices should be observed.

## **TYPICAL CHARACTERISTICS**

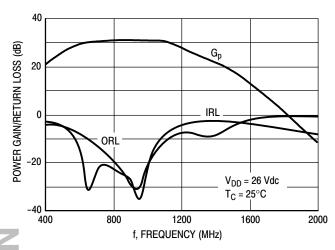


Figure 1. Power Gain, Input Return Loss, **Output Return Loss versus Frequency** 

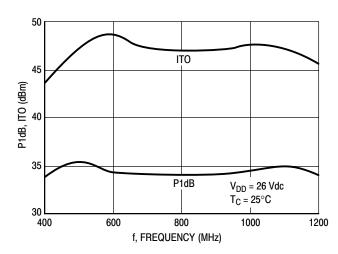


Figure 2. P1dB, ITO versus Frequency

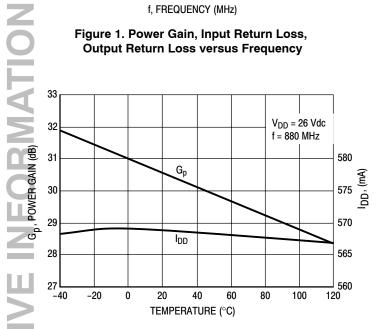


Figure 3. Power Gain, I<sub>DD</sub> versus Temperature

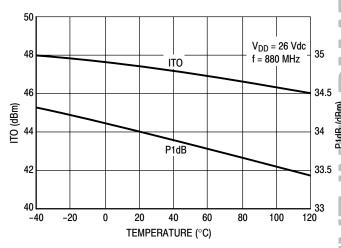


Figure 4. ITO, P1dB versus Temperature

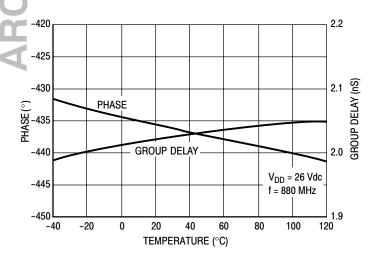


Figure 5. Phase<sup>(1)</sup>, Group Delay<sup>(1)</sup> versus Temperature 1. In Production Test Fixture

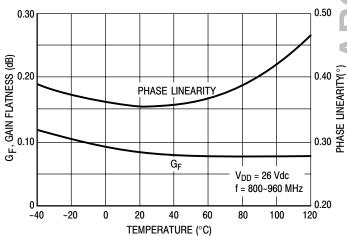
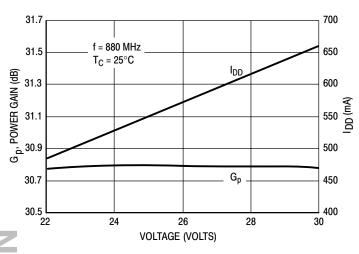


Figure 6. Gain Flatness, Phase Linearity versus Temperature

# MHL9236N

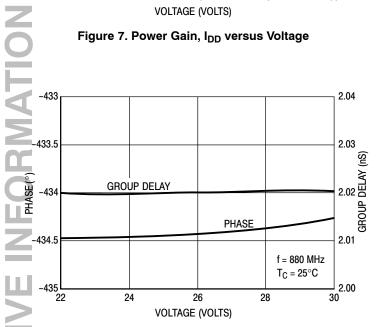
# **TYPICAL CHARACTERISTICS**



50 48 36 ITO 35 46 ITO (dBm) P1dB (dBm) 34 P1dB f = 880 MHz 42 33  $T_C = 25^{\circ}C$ 40 L 22 32 24 26 28 30 VOLTAGE (VOLTS)

Figure 7. Power Gain,  $I_{DD}$  versus Voltage

Figure 8. ITO, P1dB versus Voltage



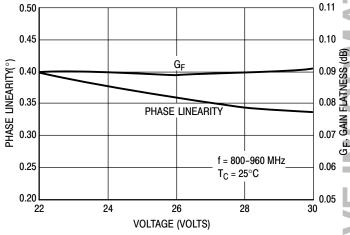
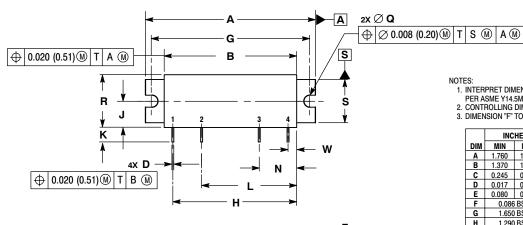


Figure 9. Phase<sup>(1)</sup>, Group Delay<sup>(1)</sup> versus Voltage

1. In Production Test Fixture

Figure 10. Phase Linearity, Gain Flatness versus Voltage

# **PACKAGE DIMENSIONS**





- NOTES:
  1. INTERPRET DIMENSIONS AND TOLERANCES
  PER ASME Y14.5M, 1994.
  2. CONTROLLING DIMENSION: INCH.
  3. DIMENSION "F" TO CENTER OF LEADS.

	INC	HES	MILLIMETERS		
DIM	MIN	MAX	MIN	MAX	
Α	1.760	1.780	44.70	45.21	
В	1.370	1.390	34.80	35.31	
С	0.245	0.265	6.22	6.73	
D	0.017	0.023	0.43	0.58	
Е	0.080	0.100	2.03	2.54	
F	0.086 BSC		2.18 BSC		
G	1.650 BSC		41.91 BSC		
Н	1.290 BSC		32.77 BSC		
J	0.266	0.280	6.76	7.11	
K	0.125	0.165	3.18	4.19	
L	0.990 BSC		25.15 BSC		

E	0.080	0.100	2.03	2.54	
F	0.086 BSC		2.18 BSC		
G	1.650 BSC		41.91 BSC		
Н	1.290 BSC		32.77 BSC		
J	0.266	0.280	6.76	7.11	
K	0.125	0.165	3.18	4.19	
L	0.990 BSC		25.15 BSC		
N	0.390 BSC		9.91 BSC		
P	0.008	0.013	0.20	0.33	
Q	0.118	0.132	3.00	3.35	
R	0.535	0.555	13.59	14.10	
S	0.445	0.465	11.30	11.81	
W	0.090 BSC		2.29 BSC		

STYLE 1: PIN 1. RF INPUT

2. VDD1 3. VDD2 4. RF OUTPUT CASE: GROUND

**CASE 301AP-02** ISSUE E

# **REVISION HISTORY**

The following table summarizes revisions to this document.

Revision	Date	Description	
9	Dec. 2006	Added replacement part information, p. 1	

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