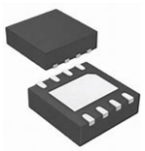
6W 28V RF Power GaN HEMT

NGAH60006PD



DFN8 4x4mm

Description

The NGAH60006PD is an unmatched 6W GaN HEMT, designed for applications up to 6GHz. The transistor is packaged in a surface mounted 4x4mm DFN8 package.
This is a versatile product that can be used in a multitude of applications with different signal formats such as CW, pulsed radar or with complex modulation schemes.

Applications and Features

- 5G, LTE and multi-mode wireless communication
- Radar
- Wideband amplifiers
- EMC testing, ISM

Maximum Ratings

Ratings	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	110	Vdc
Gate-Source Voltage	V_{GS}	-10,+2	Vdc
Operating Voltage	V_{DD}	40	Vdc
Maximum Forward Gate Current @ T_C = 25°C	I_{Gmax}	1.5	mA
Storage Temperature Range	Tstg	-65 to +150	°C
Case Operating Temperature	T_C	+150	°C
Operating Junction Temperature	T_J	+200	°C
Total Device Power Dissipation (@ T_C=25°C)	P_{DISS}	14	W
Thermal Resistance (T_C= 85°C, T_J=200°C, CW)	$R_{\theta JC}$	11	˚C/W
Maximum mismatch all phase angles	VSWR	10:1	Ψ

Electrical Characteristics

DC Characteristics

Characteristics	Symbol	Min	Typ	Max	Unit	Conditions
Drain-Source Breakdown Voltage	V_{DSS}		125		V	V_{GS}=-8V; I_{DS}=1.5mA
Gate Threshold Voltage	$V_{GS(th)}$		-2.7		V	V_{DS} = 28V, I_D =1.5 mA
Gate Quiescent Voltage	$V_{GS(Q)}$		-2.25		V	V_{DS} =28V, I_{DS}=50mA,

RF Characteristics

(As measured in standard Test Fixture) V_{DD} = 28 V_{dc}, I_{DQ} = 30 mA, f = 3.5GHz, Pulsed 20µs/10%

Characteristics	Symbol	Min	Typ	Max	Unit
Power Gain	G_{P-1dB}		18.5		dB
Drain Efficiency @ P_{SAT}	Eff		66		%
Saturated Power	P_{SAT}	38	39.5		dBm
Input Return Loss	RTL		-8		dB

Typical performance in standard class AB circuits

Freq (GHz)	V_{DD} =28 V, I_{DQ} =30 mA, Pulse 20 µs/10%.				
	P1dB (dBm)	Gain@ P1dB (dB)	P3dB (dBm)	□Eff@P3 (%)	Note
2.5	39.17	18.7	39.94	62.7	Fixture 1
2.6	39.27	18.8	39.78	64.5	
2.7	39.13	18.9	39.67	63.6	
3.4	39.0	17.5	39.8	65.0	Fixture 2
3.5	38.7	18.4	39.5	66.6	
3.6	38.2	18.2	39.3	67.2	
4.8	38.56	15.0	39.36	61.4	Fixture 3
4.9	38.46	15.2	39.30	61.5	
5	38.10	15.1	39.18	61.7	
5.7	38.74	12.6	39.86	60.4	Fixture 4
5.8	38.60	13.0	39.65	60.0	
5.9	38.16	12.7	39.50	62.2	

Typical performance

As measured in standard test fixture

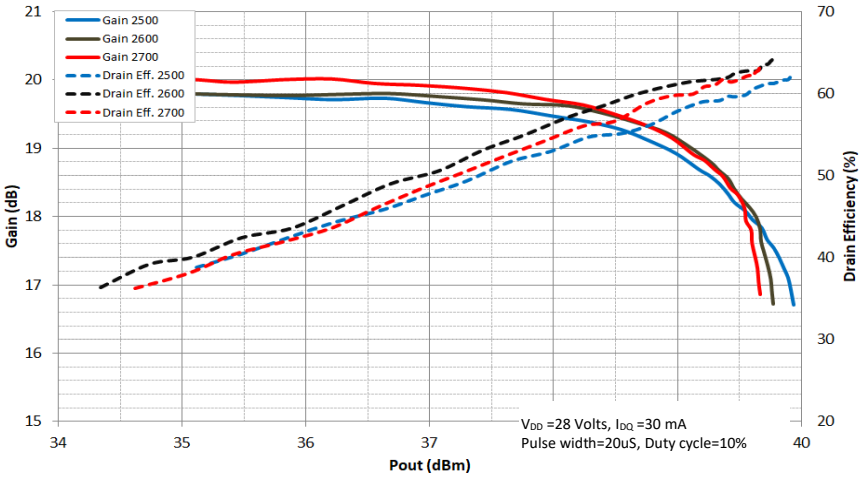
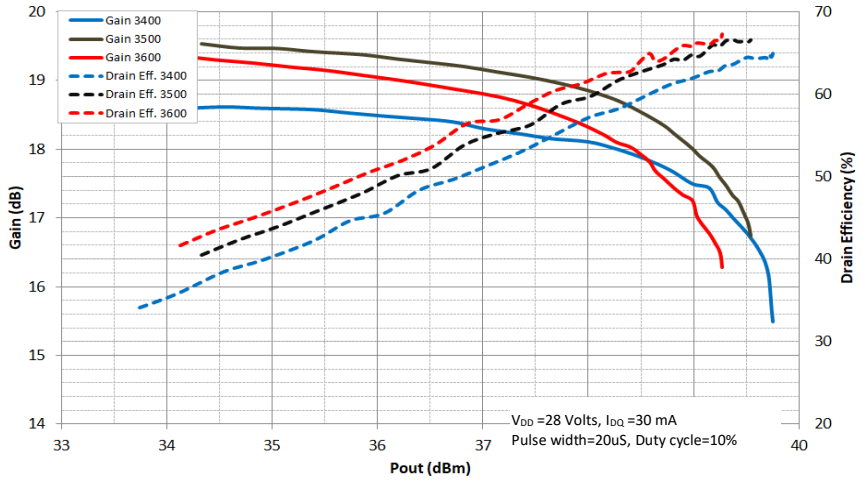


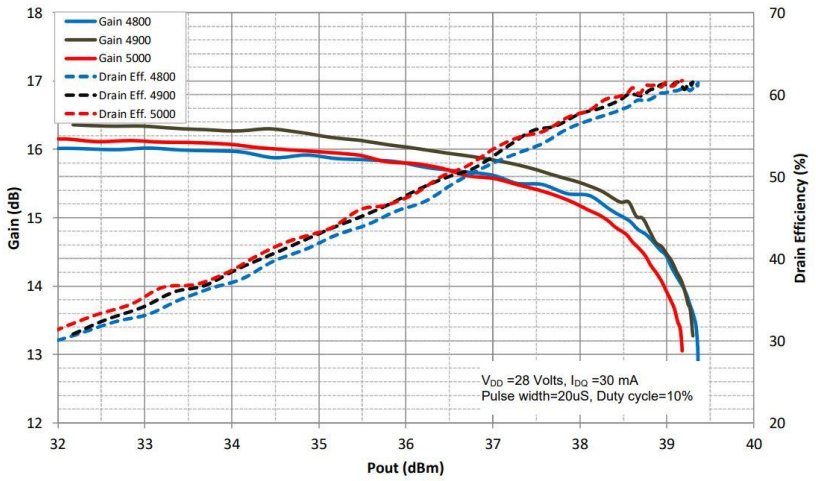
Figure 2. Power Gain and Drain Efficiency vs Output Power



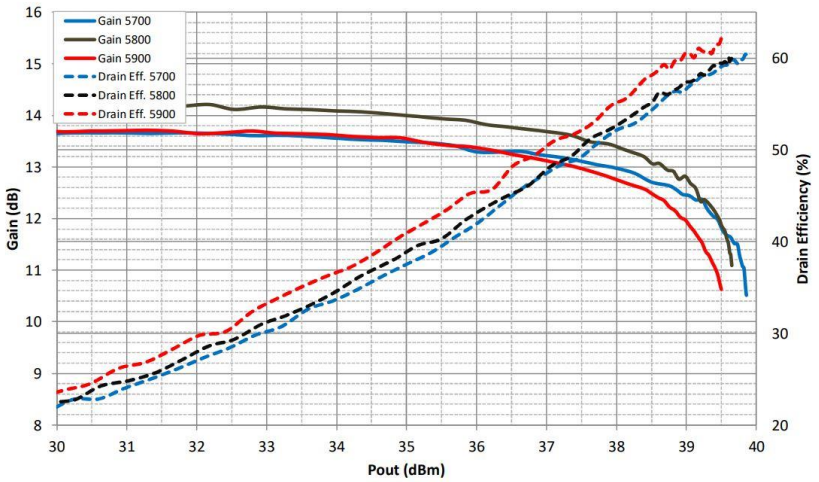
Power Gain and Drain Efficiency vs Output Power

Typical performance

As measured in standard test fixture



Power Gain and Drain Efficiency vs Output Power



Power Gain and Drain Efficiency vs Output Power

Reference test fixture

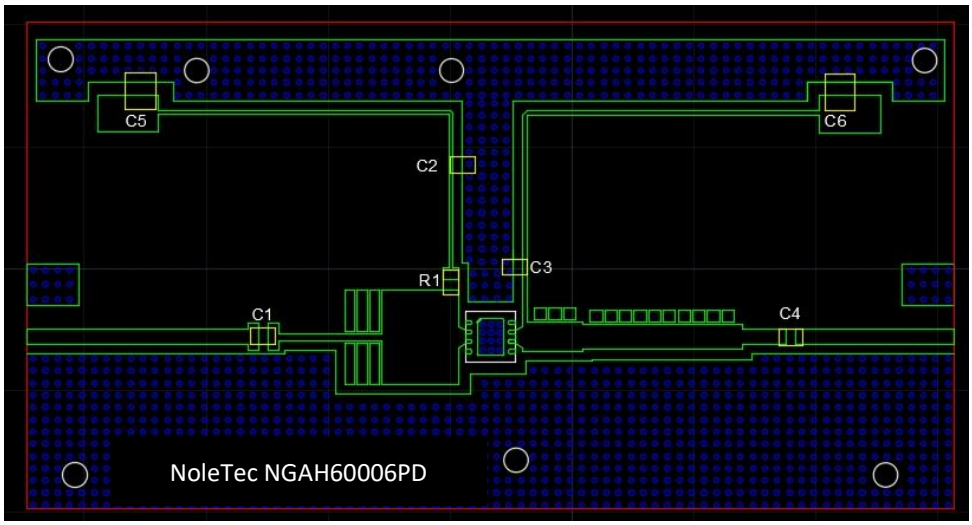


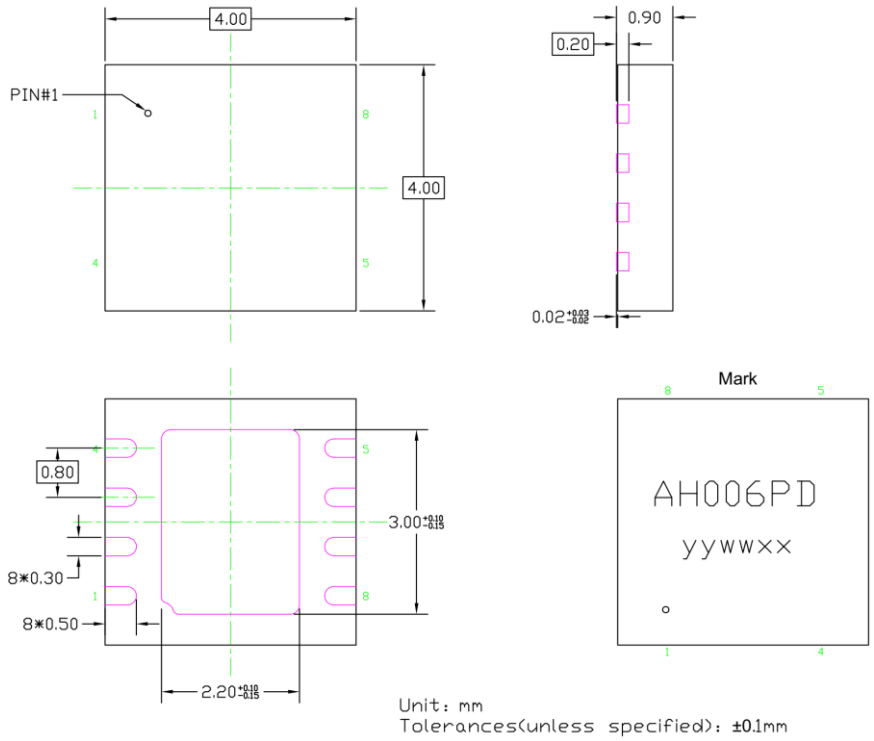
Figure 5. 3400-3600MHz fixture
(Same PCB layout may be reused also for other frequency bands)

BOM 3400-3600Mhz fixture

Component	Description	Suggested Manufacturer	P/N
C5、C6	10uF	TDK1206	
C1、C2、C4	8.2pF	ATC600S	
C3	6.8pF	ATC600S	
R1	10Ω	0603	
PCB	0.508mm [0.020"] thick, εr=3.48, Rogers RO4350B, 1 oz. copper		

Package drawing

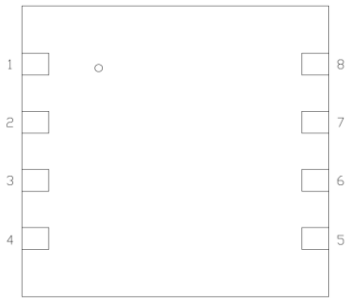
4x4 DFN8 Package



Notes:

1. All dimensions are in mm;
2. The tolerances unless specified are ±0.1mm.

Pin Configuration (Top view)



Pin No.	Symbol	Description
2, 3	RF IN /VGS	RF Input, Gate Bias
6, 7	RF OUT /VDS	RF Output, Drain Bias
1, 4, 5, 8	NC	Not connected internally. May be connect to PCB ground
Package Base	GND	Ground. Must be connected to PCB ground and soldered atop tightly stitched array of filled vias or copper coin for adequate heat transfer and RF performance.