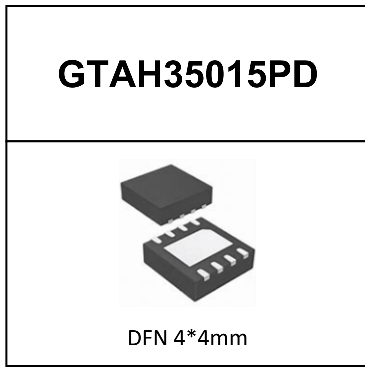
Gallium Nitride 28V 12W, RF Power Transistor

GTAH35015PD



DFN 4*4mm

Description

The GTAH35015PD is a 15W GaN HEMT, designed for multiple applications, up to 5GHz. The transistor is available in a cost effective 4mm*4mm, surface mount, DFN package with 100% DC production test to ensure the quality and consistency.It can be used in CW, Pulse and multiple modulation mode.

It is the low cost version of its ceramic peer GTAH35015M2 with similar performance

There is no guarantee of performance when this part is used in applications designed Outside of these frequencies.

•Typical Performance of 3.4-3.8G, 4.4-5GHz with device soldered through high density grounding vias:
V_{DD} =28 V, I_{DQ} =100 mA, Pulse CW, Pulse Width=20 us, Duty cycle=10%.

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff(%)	P1dB Gain(dB)	P3dB (dBm)	P3dB (W)	P3dB Eff(%)
4400	42.49	17.74	56.14	10.32	43.97	24.94	62.60
4500	42.34	17.14	58.37	10.08	43.81	24.07	64.79
4600	42.18	16.53	60.41	9.58	43.57	22.76	66.67
4700	41.94	15.64	62.25	9.49	43.33	21.52	67.81
4800	41.41	13.84	61.81	9.84	42.89	19.46	68.27
4900	40.81	12.05	58.47	10.23	42.34	17.12	64.05
5000	40.49	11.19	57.07	10.70	42.08	16.14	62.58

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff(%)	P1dB Gain(dB)	P3dB (dBm)	P3dB (W)	P3dB Eff(%)
3400	41.97	15.75	55.66	14.92	43.66	23.20	63.41
3500	41.86	15.36	55.54	15.07	43.54	22.62	63.45
3600	41.26	13.36	53.08	15.26	43.26	21.18	62.78
3700	41.21	13.20	55.33	15.3	42.91	19.54	63.26
3800	40.68	11.69	55.82	15.35	42.61	18.24	64.66

Applications and Features

- Suitable for wireless communication infrastructure, wideband amplifier, EMC testing, ISM etc.
- High Efficiency and Linear Gain Operations
- Thermally Enhanced Industry Standard Package
- High Reliability Metallization Process
- Excellent thermal Stability and Excellent Ruggedness
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

Important Note: Proper Biasing Sequence for GaN HEMT Transistors

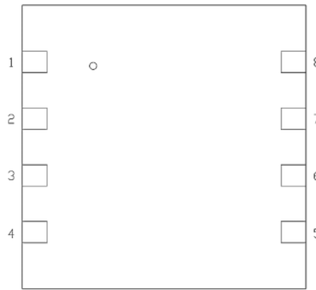
Turning the device ON

1. Set VGS to the pinch--off (VP) voltage, typically –5 V
2. Turn on VDS to nominal supply voltage (28V)
3. Increase VGS until IDS current is attained
4. Apply RF input power to desired level

Turning the device OFF

1. Turn RF power off
2. Reduce VGS down to VP, typically –5 V
3. Reduce VDS down to 0 V
4. Turn off VGS

Pin Configuration and Description(Top view)



Pin No.	Symbol	Description
1, 2, 3, 4	RF IN /VGS	RF Input, Gate Bias
5, 6, 7,8	RF OUT /VDS	RF Output, Drain Bias
Package Base	GND	DC/RF Ground. Must be soldered to EVB ground plane over array of vias for thermal and RF performance. Solder voids under Pkg Base will result in excessive junction temperatures causing permanent damage.

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	125	Vdc
Gate--Source Voltage	V_{GS}	-10,+2	Vdc
Operating Voltage	V_{DD}	40	Vdc
Maximum Forward Gate Current @ T_C = 25°C	Igmax	4	mA
Storage Temperature Range	Tstg	-65 to +150	°C
Case Operating Temperature	T_C	+150	°C
Operating Junction Temperature(See note 1)	T_J	+200	°C
Total Device Power Dissipation (Derated above 25°C, see note 2)	Pdiss	32	W

Note: 1. Continuous operation at maximum junction temperature will affect MTTF
2.Bias Conditions should also satisfy the following expression: Pdiss < (Tj – Tc) / RJC and Tc = Tcase

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case T_C= 85°C, T_J=200°C, RF CW operation	$R_{\theta JC}$	5.4	℃/W

Table 3. Electrical Characteristics (T_C = 25℃ unless otherwise noted)

DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=-8V; I_{DS}=4mA	V_{DSS}		150		V
Gate Threshold Voltage	V_{DS} = 28V, I_D =4mA	V_{GS}(th)		-2.7		V
Gate Quiescent Voltage	V_{DS} =28V, I_{DS}=100mA, Measured in Functional Test	$V_{GS(Q)}$		-2.4		V

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4.4-5GHz

Reference Circuit of Test Fixture Assembly Diagram

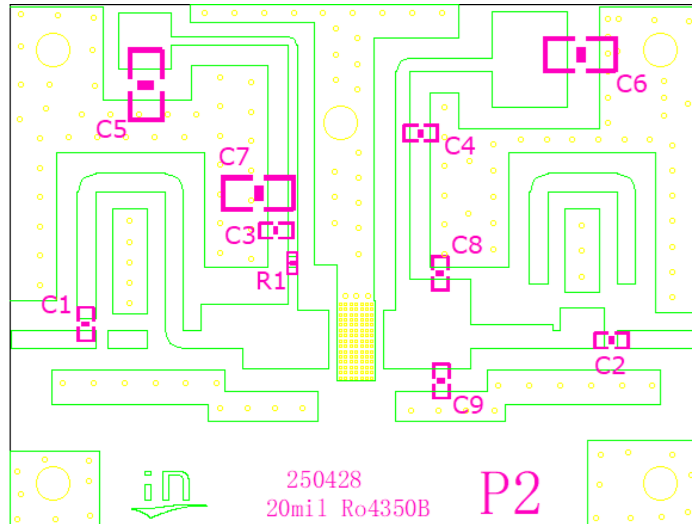


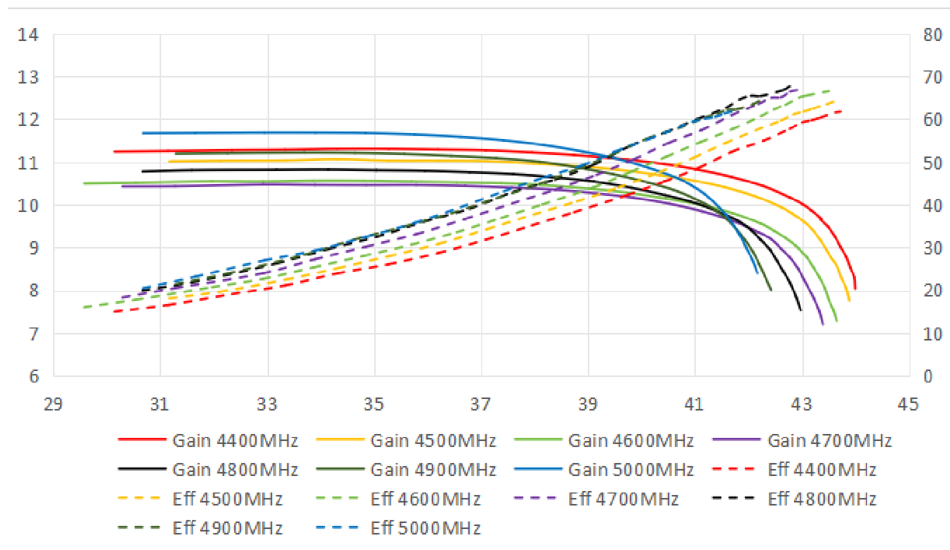
Figure 1. Test Circuit Component Layout

Table 4. Test Circuit Component Designations and Values

Part	Quantity	Description	Part Number	Manufacture
C1,C2,C3,C4	4	5.6pF High Q Capacitor	251SHS5R6BSE	TEMEX
C8	1	0.3pF High Q Capacitor	251SHS0R3BSE	TEMEX
C9	1	0.2pF High Q Capacitor	251SHS0R2BSE	TEMEX
R1	1	10Ω Power Resistor	ESR03EZPF100	ROHM
C5,C6,C7	3	10uF MLCC	GRM32EC72A106ME05	Murata
T1	1	GaNTransistor	GTAH35015PD	Innogration

TYPICAL CHARACTERISTICS

Figure 2: Power gain efficiency as function of Pout at 28V pulsed CW



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3.4-3.8GHz

Reference Circuit of Test Fixture Assembly Diagram

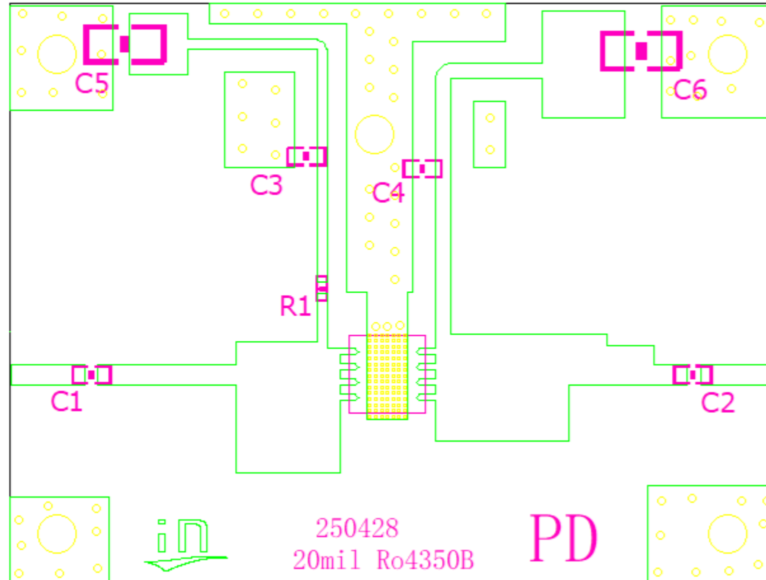


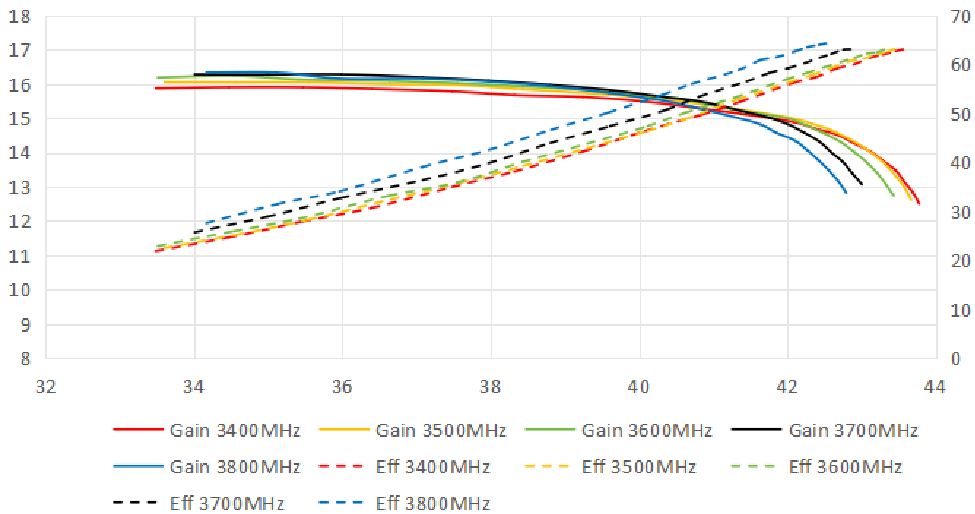
Figure 3. Test Circuit Component Layout

Table 4. Test Circuit Component Designations and Values

Part	Quantity	Description	Part Number	Manufacture
C1,C2,C3,C4	4	8.2Pf High Q Capacitor	251SHS8R2BSE	TEMEX
R1	1	10 Ω Power Resistor	ESR03EZPF100	ROHM
C5,C6	2	10uF MLCC	GRM32EC72A106ME05	Murata
T1	1	GaN Transistor	GTAH35015PD	Innogration

TYPICAL CHARACTERISTICS

Figure 3: Power gain efficiency as function of Pout at 28V pulsed CW



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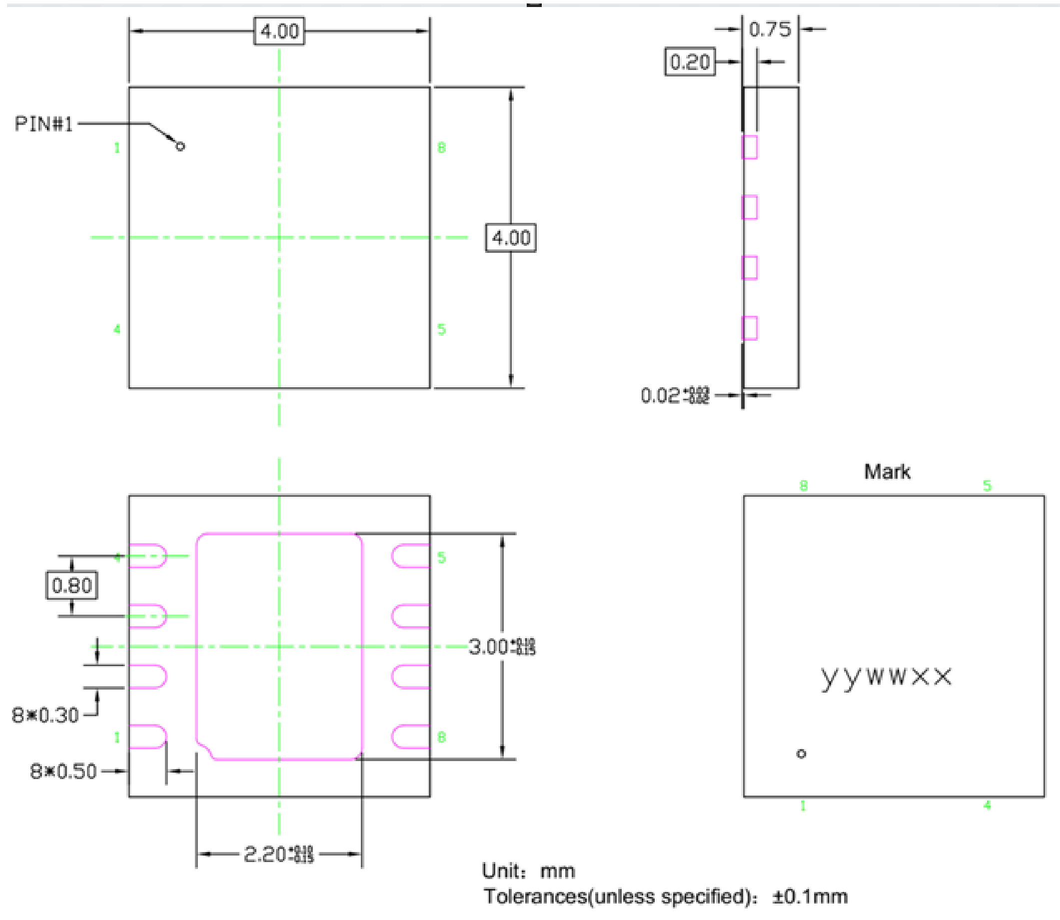
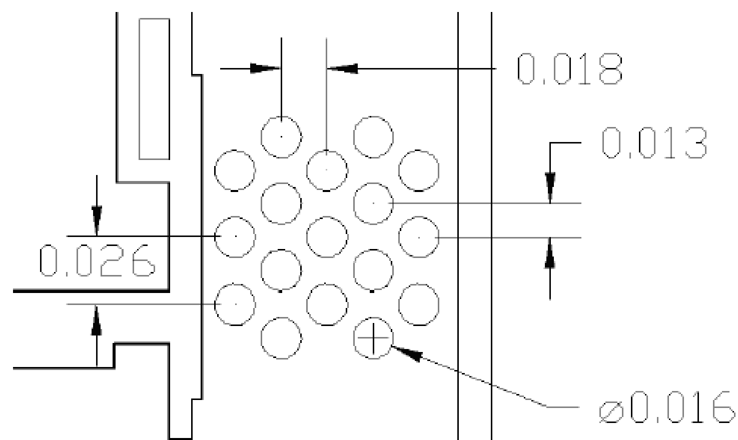
Package Dimensions

4*4 DFN Package



Recommended vias layout: (all in inches)



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Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2025/11/17	V1.0	Preliminary datasheet creation

Application based on HZH-25-16/17

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