

WP482P45030UH

30W RF GaN Power Transistor



WAVEPIA
I C D E S I G N

Product Features

- Up to 3.5 GHz Operation
- 19.6 dB Small Signal Gain at 2.45 GHz
- 30.9W Typical P_{sat} at 2.45 GHz CW Mode
- 63 % Efficiency at P_{sat} at 2.45 GHz CW Mode
- 48 V Operation



Applications

- Broadband Amplifiers
- Cellular Infrastructure
- Test Instrumentation
- WiMAX, LTE, WCDMA, GSM
- Radar application

Absolute Maximum Ratings

Parameter	Symbol	Rating	Units	Conditions
Drain-Source Voltage	V_{DSS}	160	Volts	25 °C
Gate-to-Source Voltage ³	V_{GS}	-10, +2	Volts	25 °C
Storage Temperature ³	T_{STG}	-65, +150	° C	
Operating Junction Temperature ^{1,3}	T_J	225	° C	
Maximum Forward Gate Current ³	I_{GMAX}	30	mA	25 °C
Maximum Drain Current ²	I_{DMAX}	1	A	$I_d @ V_d = 10V, V_g = 1V$
Soldering Temperature ³	T_S	245	° C	
Storage Temperature ³	T_{STG}	-65, +150	° C	

Note:

1. Continuous use at maximum temperature will affect MTTF.
2. Current limit for long term, reliable operation
3. After additional updates

DC Characteristics¹ (TC = 25 ° C)

Parameter	Symbol	MIN	TYP	MAX	Units	Conditions
Gate Threshold Voltage	$V_{GS(th)}$		-3.1		V_{DC}	$V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$
Gate Quiescent Voltage	$V_{GS(Q)}$		-2.66		V_{DC}	$V_{DS} = 48\text{ V}, I_D = 100\text{ mA}$
Saturated Drain Current ²	I_{DS}		1000		mA/mm	$V_{DS} = 10\text{ V}, V_{GS} = 1\text{ V}$
Drain-Source Breakdown Voltage	V_{BR}	160			V_{DC}	$I_D = 1\text{ mA/mm}$

Note:

1. Measured on wafer prior to packaging.
2. Scaled from PCM data.

RF Characteristics (TC = 25 ° C , F0 = 245 GHz unless otherwise noted)

Parameter	Symbol	MIN	TYP	MAX	Units	Conditions
Small Signal Gain	G_{SS}		19.6		dB	$V_{DD} = 4.8\text{ V}, I_{DQ} = 100\text{ mA}$
Saturated Output Power	P_{SAT}		30.9		W	$V_{DD} = 4.8\text{ V}, I_{DQ} = 100\text{ mA}, CW$
Pulsed Drain Efficiency ¹	η		63		%	$V_{DD} = 4.8\text{ V}, I_{DQ} = 100\text{ mA}, CW$
Output Mismatch Stress	VSWR	-	-	10:1		No damage at all phase angles, $V_{DD} = 48\text{ V}, I_{DQ} = 100\text{ mA}, P_{OUT} = 1\text{ W CW}$

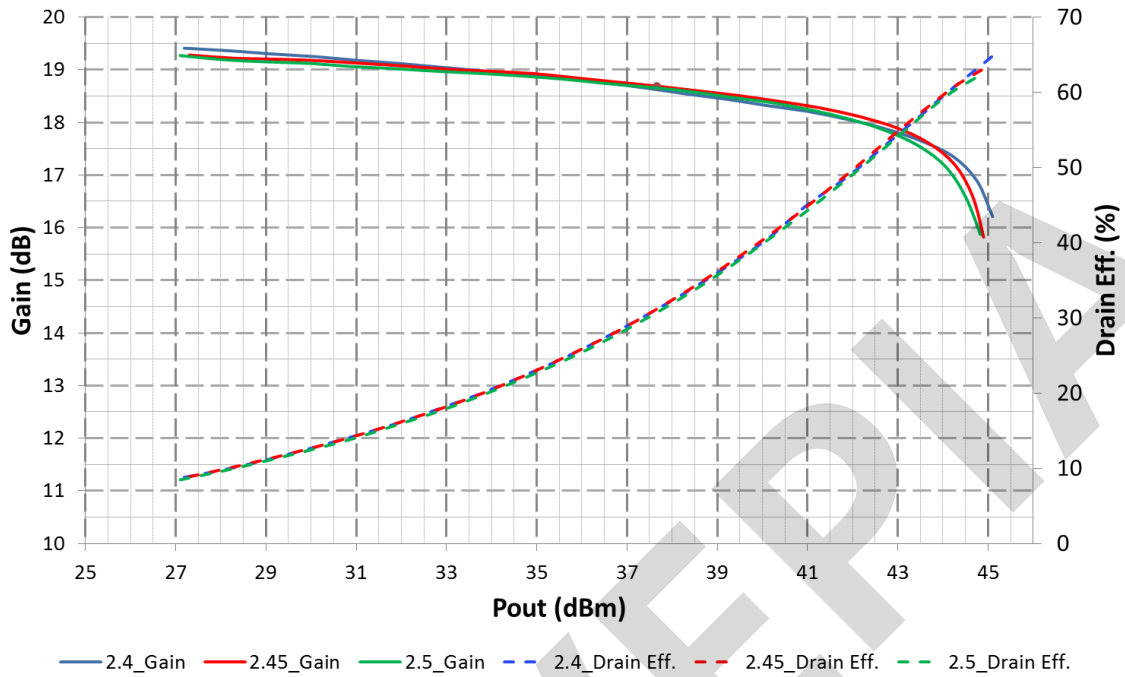
Note:

1. Drain Efficiency = P_{OUT}/P_{DC}

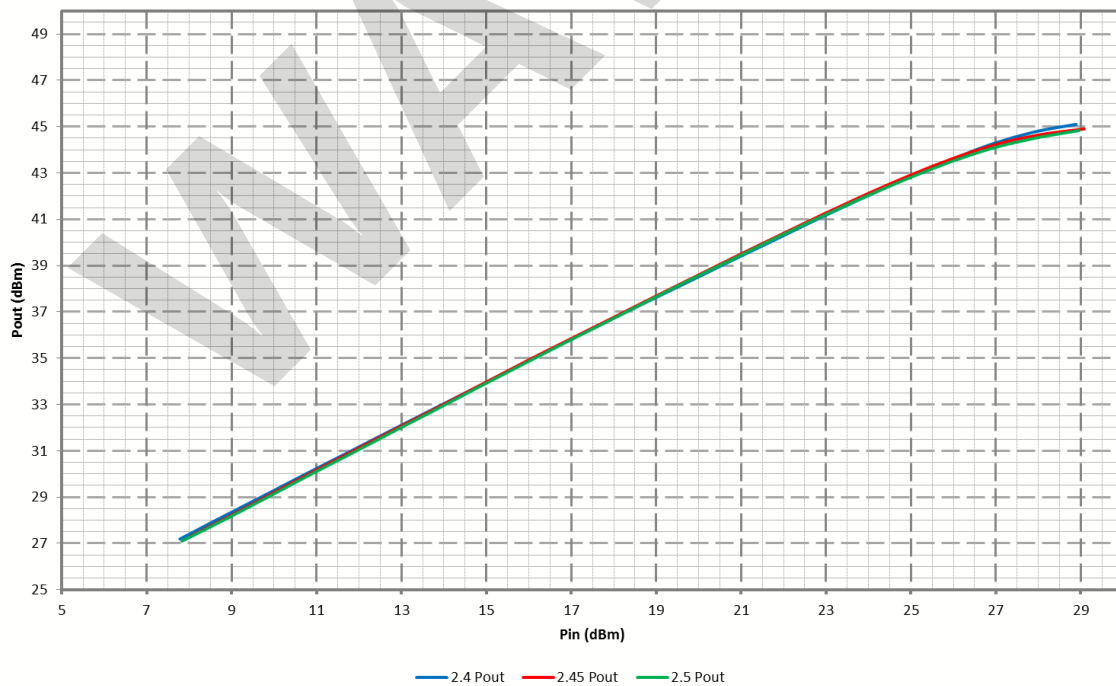
Pulse Signal Performance (Tc=25°C, Measured in the test board amplifier circuit)

VDD = 48V, IDQ = 100 mA, CW

Gain, Drain Eff. vs. Pout



Pout vs. Pin

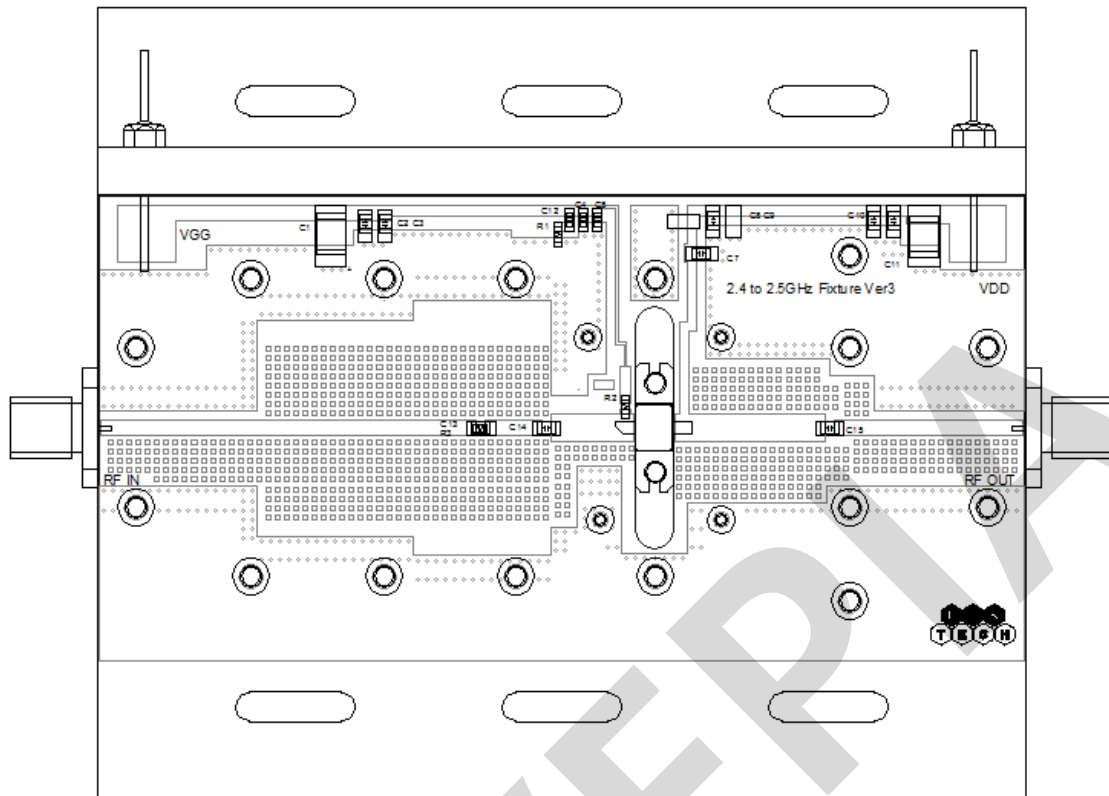


Small Signal Performance (Tc=25°C, Measured in the test board amplifier circuit)

VDD = 48 V, IDQ = 100 mA



Demonstration board



Reference	Value	Description	Package	Manufacturer
C14	0.5pF	High Q Capacitor	CHA	TEMEX
C15	2.4pF	High Q Capacitor	CHA	TEMEX
C13	9.1pF	High Q Capacitor	CHA	TEMEX
C3	100pF	Ceramic Capacitor	2012	Murata
C2	100nF	Ceramic Capacitor	2012	Murata
C6	10pF	Ceramic Capacitor	1608	Murata
C4	100pF	Ceramic Capacitor	1608	Murata
C5	10F	Ceramic Capacitor	1608	Murata
C12	1nF	Ceramic Capacitor	1608	Murata
C1	20uF/16V	Tantalum Capacitor	-	-
C8	100pF	High Q Capacitor	CHA	TEMEX
C7,C10	10pF	High Q Capacitor	CHA	TEMEX
C11	470nF	High V Capacitor	3528	Johanson Dielectrics
R1	50Ω	Chip Resistor	1608	Walsin
R2	10Ω	Chip Resistor	1608	Walsin
R3	100Ω	Chip Resistor	1608	Walsin

