

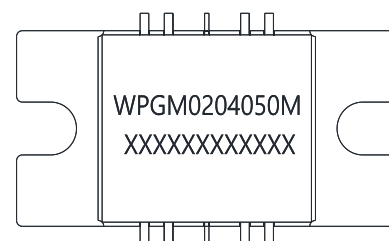
Product Features

- 2.6-3.8GHz GaN MMIC Power Amplifier
- Typical Small-signal Gain 31dB
- Typical Power Gain 23.7dB
- Typical Output Power 48.6dBm
- Typical PAE 61.7%
- 48V-50V operation

* Above Typical values measured at 3.2GHz and 48V

Applications

- General Purpose
- Communication System
- Radar System
- Satellite Communication



Absolute Maximum Rating

Parameter	Symbol	Rating	Units	Conditions
Drain-Source Voltage	V _{DSS}	120	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}	10	mA	25°C
Maximum Drain Current ²	I _{DMAX}	1.04	A	I _d @ V _d =10V, V _g = 1V
Soldering Temperature ³	T _s	245	°C	

1. Continuous use at maximum temperature will affect MTTF.

2. Current limit for long term, reliable operation.

3. After additional updates.

Specifications (T_c=25°C, F₀=3.2GHz, V_{DD}=48V, I_{DQ}=358mA)

Parameter	Symbol	MIN	TYP	MAX	Units	Conditions
Small Signal Gain	G		31		dB	Pulse Width=100μsec, Duty Cycle=10%
Power Gain	G _P		23.7		dB	P _{sat} @ I _{gs} =1mA
Saturated Output Power	P _{OUT}		48.6		dBm	P _{sat} @ I _{gs} =1mA
Power Added Efficiency	PAE		61.7		%	P _{sat} @ I _{gs} =1mA

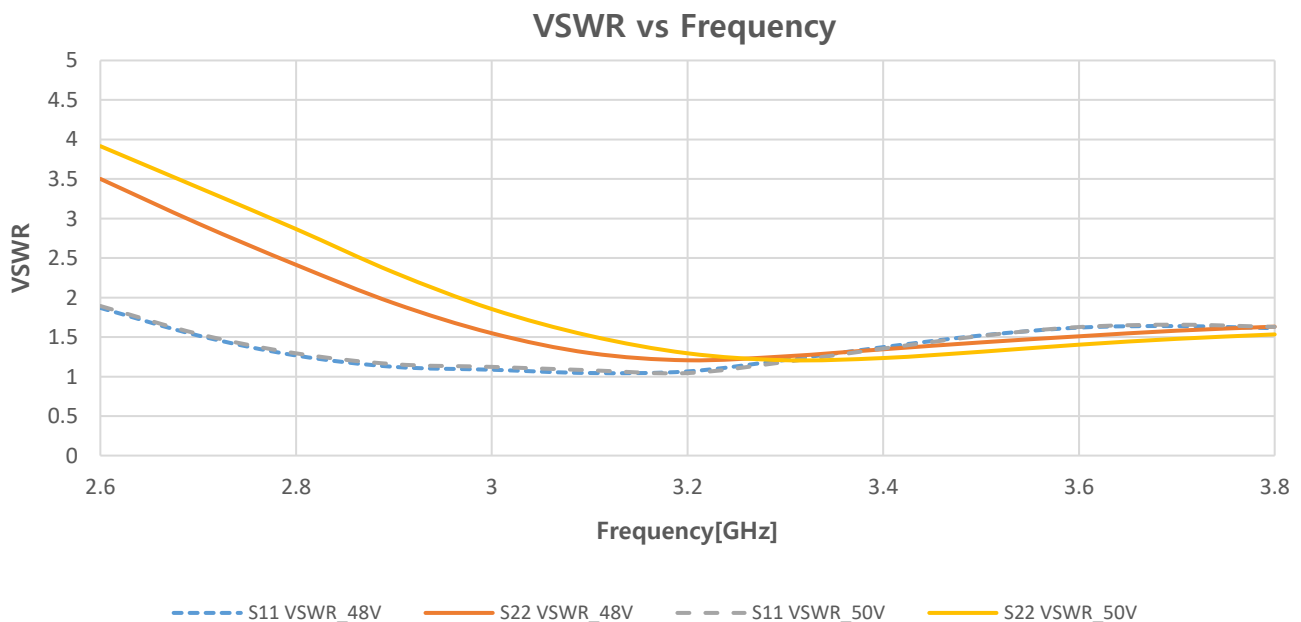
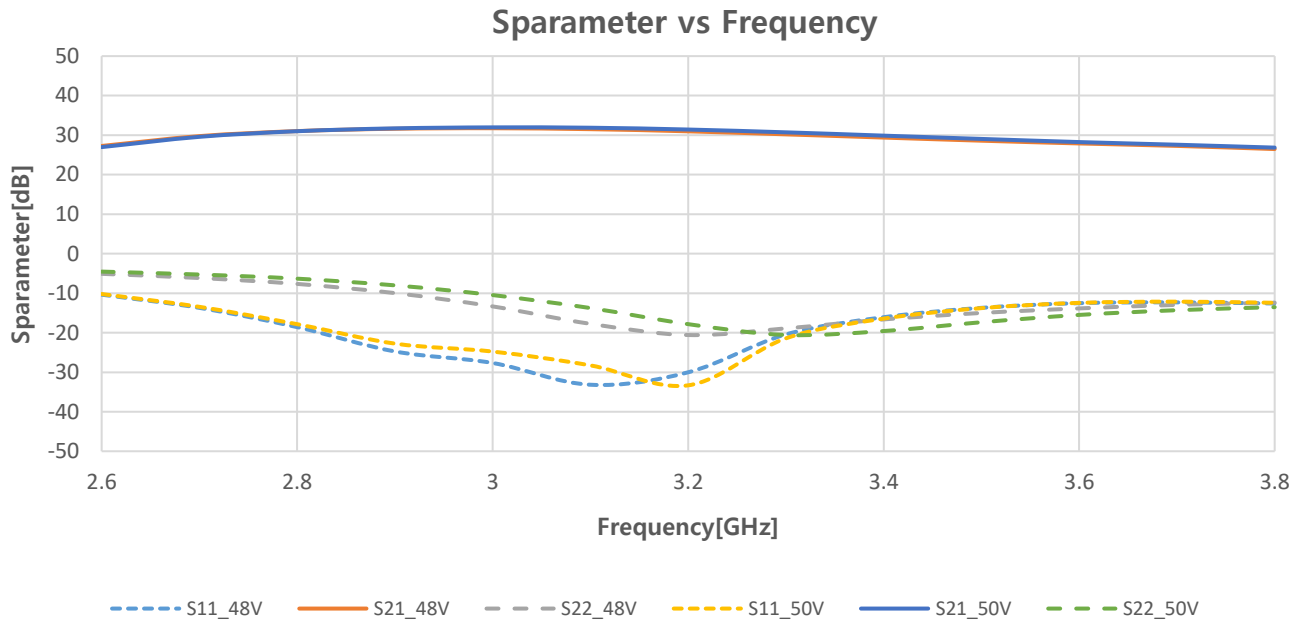
Specifications (T_c=25°C, F₀=3.2GHz, V_{DD}=50V, I_{DQ}=336mA)

Parameter	Symbol	MIN	TYP	MAX	Units	Conditions
Small Signal Gain	G		31.4		dB	Pulse Width=100μsec, Duty Cycle=10%
Power Gain	G _P		24		dB	P _{sat} @ I _{gs} =1mA
Saturated Output Power	P _{OUT}		48.9		dBm	P _{sat} @ I _{gs} =1mA
Power Added Efficiency	PAE		60.9		%	P _{sat} @ I _{gs} =1mA



Small-Signal Performance (Tc=25°C)

Drain Voltage= (48V IDQ=358mA), (50V IDQ=336mA)

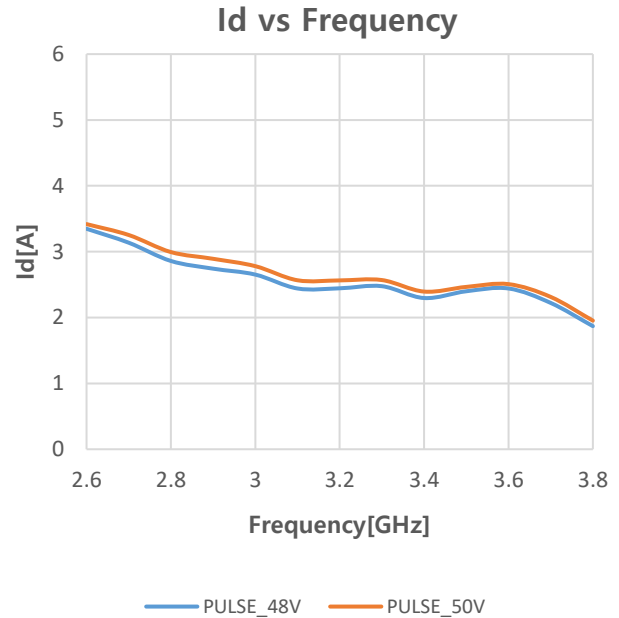
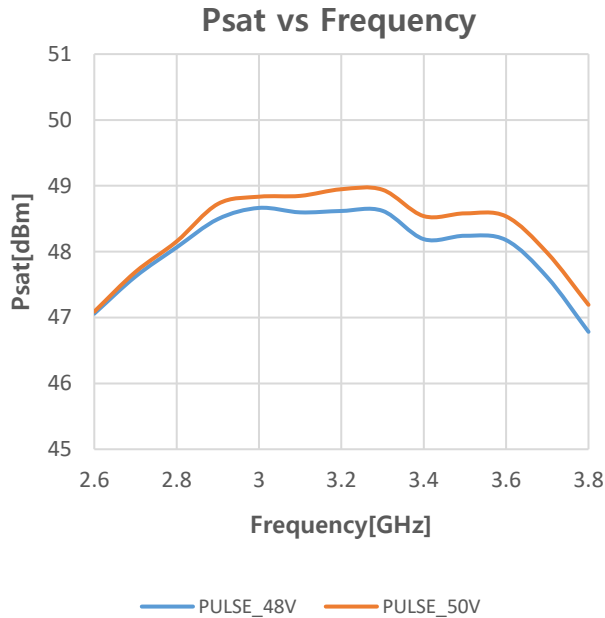




Psat, Id vs Frequency Performance (Tc=25°C)

Drain Voltage= (48V IDQ=358mA), (50V IDQ=336mA)

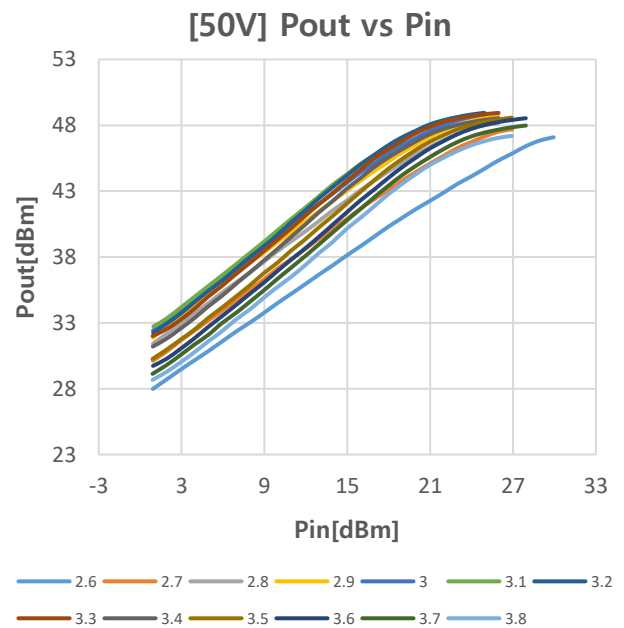
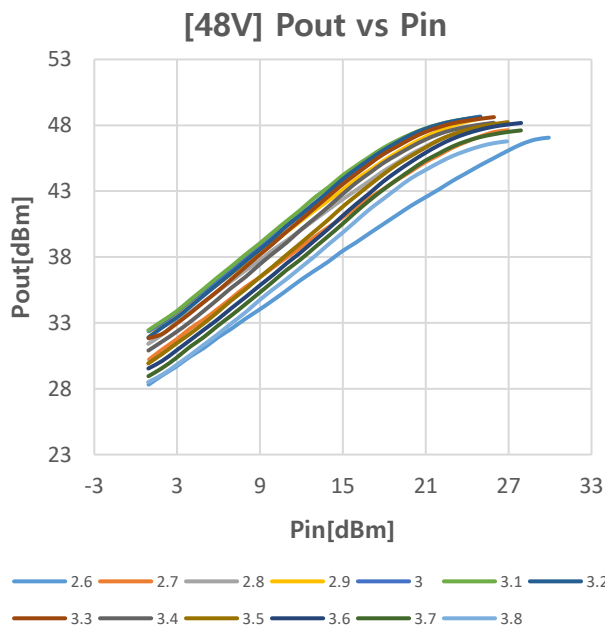
Pulse-Mode(Pulse Width=100μsec, Duty Cycle=10%)



Output Power (Pout) vs Input Power (Pin) Performance (Tc=25°C)

Drain Voltage= (48V IDQ=358mA), (50V IDQ=336mA)

Pulse-Mode(Pulse Width=100μsec, Duty Cycle=10%)

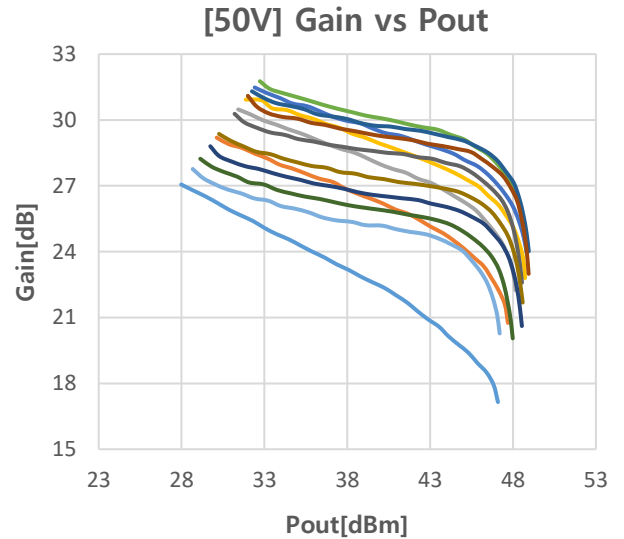
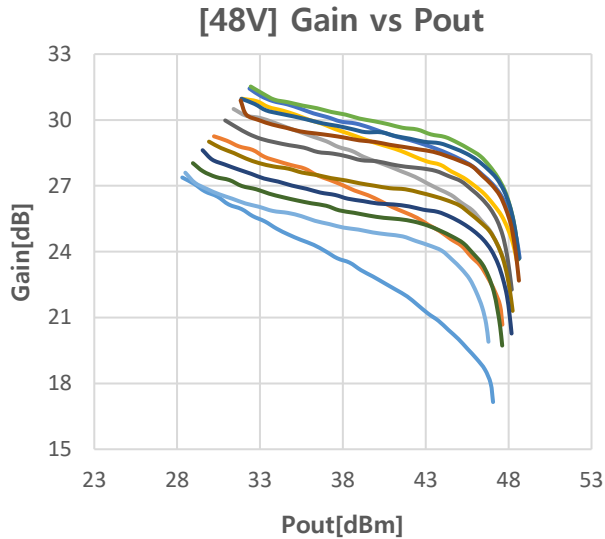




Gain vs Output Power (Pout) Performance (Tc=25°C)

Drain Voltage= (48V IDQ=358mA), (50V IDQ=336mA)

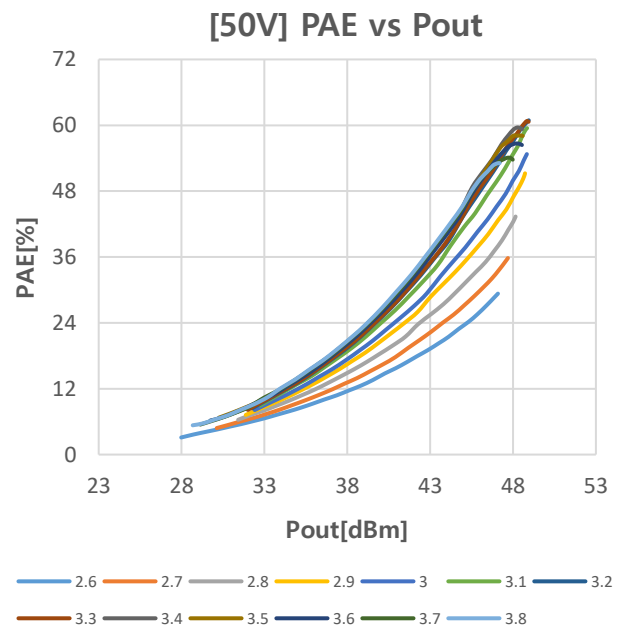
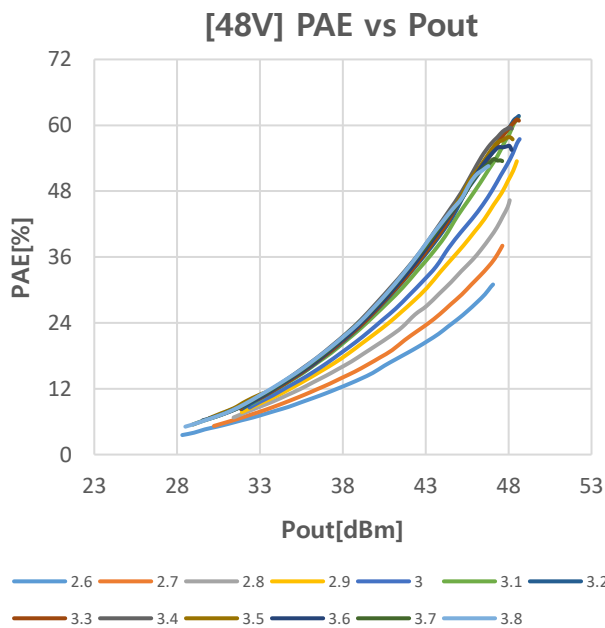
Pulse-Mode(Pulse Width=100μsec, Duty Cycle=10%)



PAE vs Output Power (Pout) Performance (Tc=25°C)

Drain Voltage= (48V IDQ=358mA), (50V IDQ=336mA)

Pulse-Mode(Pulse Width=100μsec, Duty Cycle=10%)

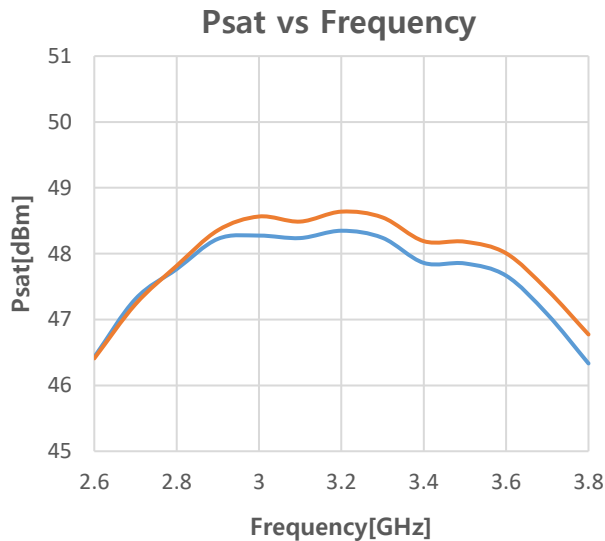




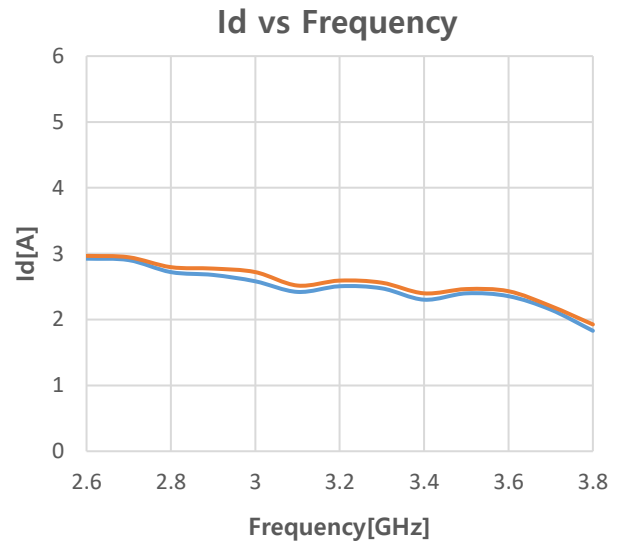
Psat, Id vs Frequency Performance (Tc=25°C)

Drain Voltage= (48V IDQ=358mA), (50V IDQ=336mA)

CW-Mode



— CW_48V — CW_50V

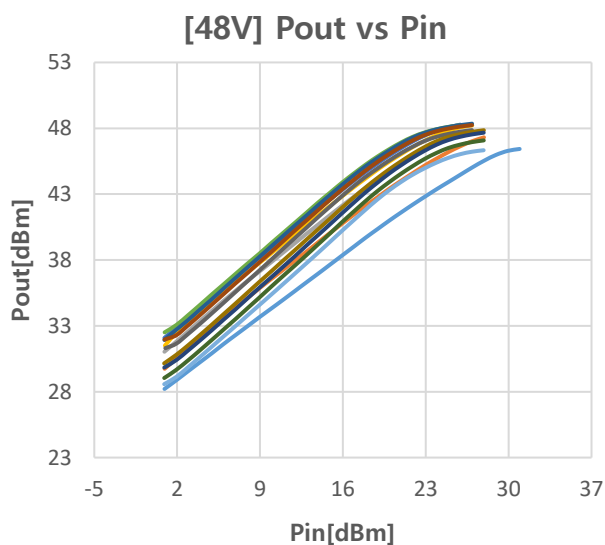


— CW_48V — CW_50V

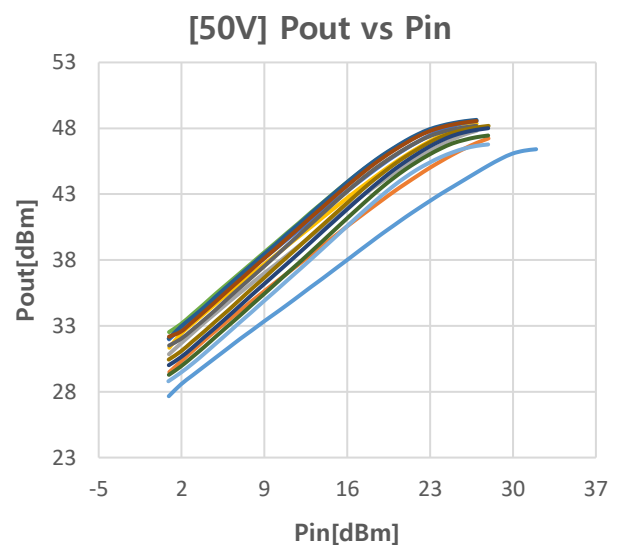
Output Power (Pout) vs Input Power (Pin) Performance (Tc=25°C)

Drain Voltage= (48V IDQ=358mA), (50V IDQ=336mA)

CW-Mode



— 2.6 — 2.7 — 2.8 — 2.9 — 3.0 — 3.1 — 3.2
— 3.3 — 3.4 — 3.5 — 3.6 — 3.7 — 3.8



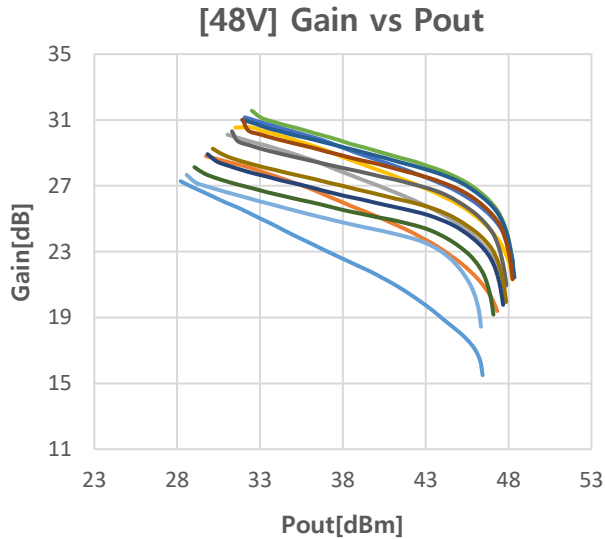
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— 3.3 — 3.4 — 3.5 — 3.6 — 3.7 — 3.8



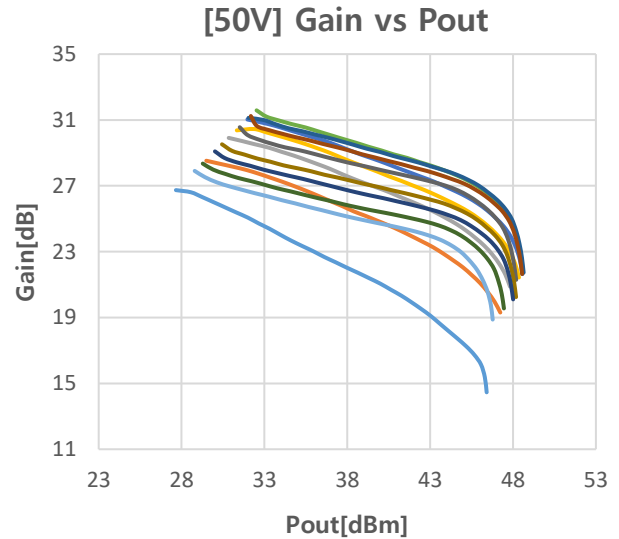
Gain vs Output Power (Pout) Performance (Tc=25°C)

Drain Voltage= (48V IDQ=358mA), (50V IDQ=336mA)

CW-Mode



2.6 2.7 2.8 2.9 3 3.1 3.2
3.3 3.4 3.5 3.6 3.7 3.8

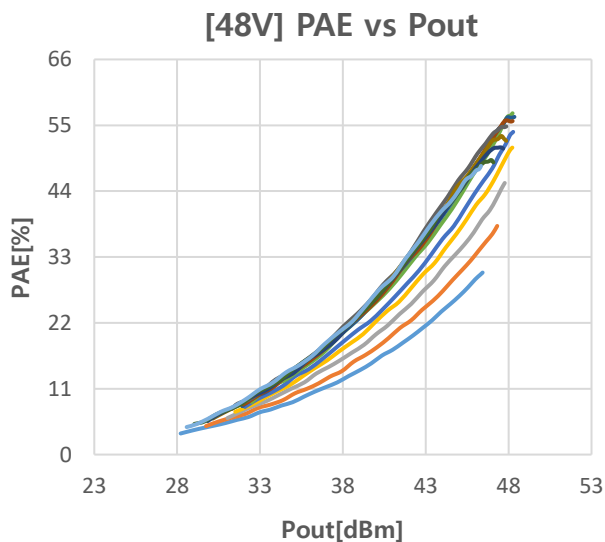


2.6 2.7 2.8 2.9 3 3.1 3.2
3.3 3.4 3.5 3.6 3.7 3.8

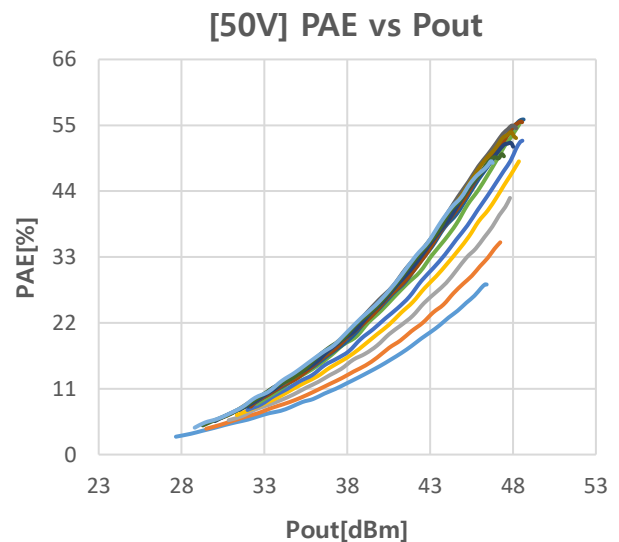
PAE vs Output Power (Pout) Performance (Tc=25°C)

Drain Voltage= (48V IDQ=358mA), (50V IDQ=336mA)

CW-Mode



2.6 2.7 2.8 2.9 3 3.1 3.2
3.3 3.4 3.5 3.6 3.7 3.8

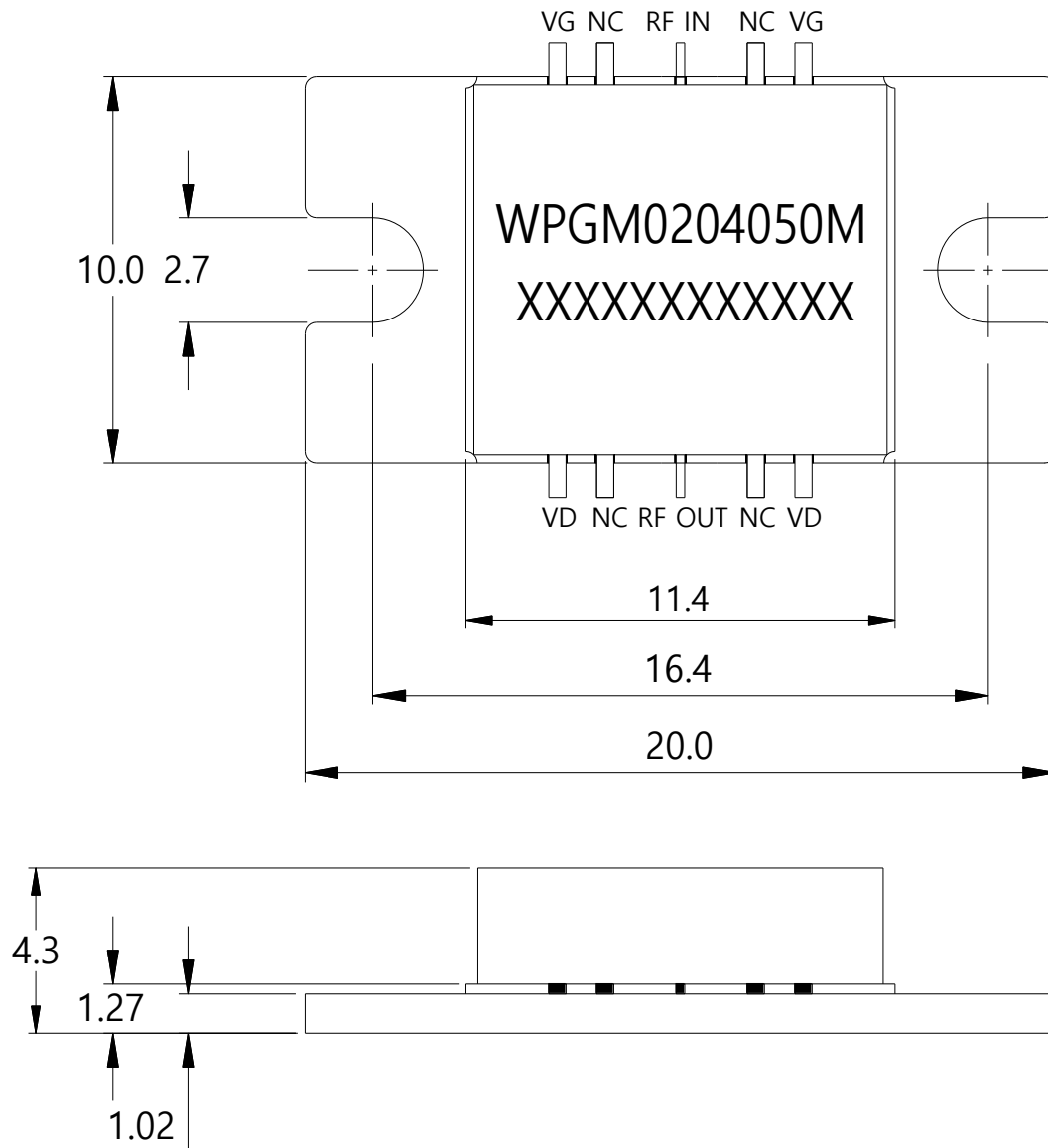


2.6 2.7 2.8 2.9 3 3.1 3.2
3.3 3.4 3.5 3.6 3.7 3.8



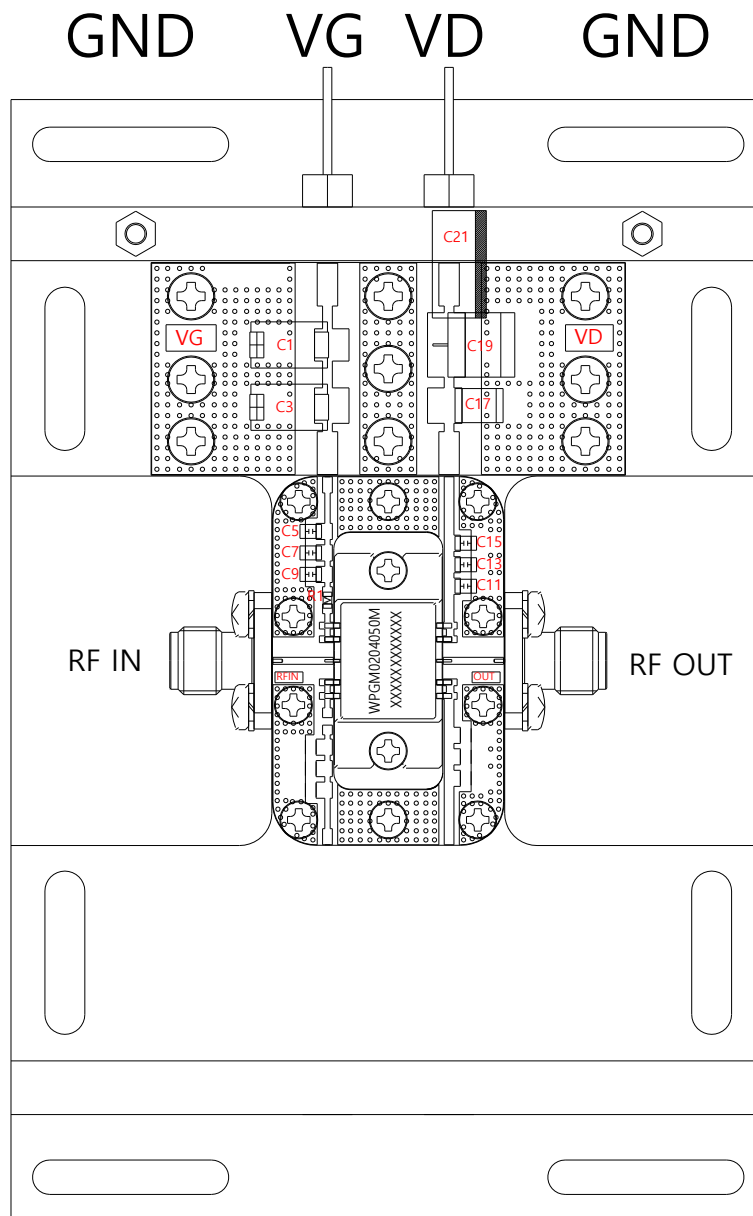
Product Dimension

- Product Type: MPKG, 10-lead bolt-down
- Unit: mm





Evaluation Board Circuit Outline





Bias Sequence

1. VG connection must be biased from up side.
2. VD connection must be biased from up side.
3. VG bias must be applied before VD

Test Condition

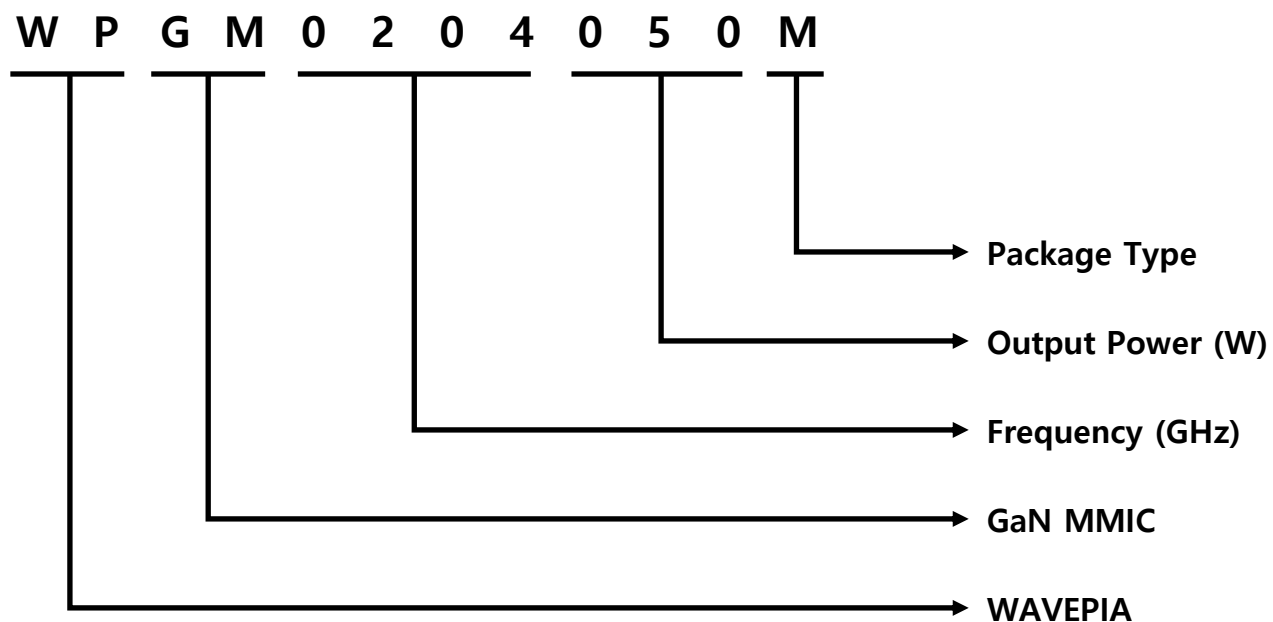
1. VD=48V, IDQ=358mA, VG=-2.62V
2. VD=50V, IDQ=336mA, VG=-2.62V

Evaluation Board Circuit Bill of Materials

Reference	Part Number	Value	Description	Package	Manufacturer	EA
C1	293D476X9016D2TE3	47uF / 16V	Tantalium Capacitor	2917	MICRO TECHNOLOGY	2
C3	TAJD106K035RNJ	10uF / 35V	Tantalium Capacitor	2917	KYOCERA AVX	2
C17	CGA8N3X7R2E474K230KA	470nF / 250V	Ceramic Capacitor	1812	TDK	2
C19	22201C106KAT2A	10uF / 100V	Ceramic Capacitor	2020	KYOCERA AVX	2
C5, C15	C2012X7S2A474K125AB	470nF / 100V	Ceramic Capacitor	0805	TDK	4
C7, C13	CL21B103KCANNNC	10nF / 100V	Ceramic Capacitor	0805	SAMSUNG	4
C9, C11	251R15S101JV4E	100pF / 250V	Ceramic Capacitor	0805	JOHANSON	4
R1	WR06X100 JTL	10ohm	Chip Resistor	0603	WALSIN	2
C21	KMG 100V 47uF MAX	E-Cap (Dip Type)	electrolytic capacitor	0603	SAMYOUNG	2
P1	-	-	RO4003C 12mil	-	Rogers	1
P2	-	-	RO4003C 12mil	-	Rogers	2
Q1	APCM0204050M	-	MMIC	-	APC Technologies	1



Part Number System



Parameter	Value	Units
Lower Frequency	2.6	GHz
Upper Frequency	3.8	GHz
Output Power	50	W
Transistor Type	GaN MMIC	-
Package	MPKG	-



Handling Precautions

Parameter	Classification	Standard
ESD - Human Body Model (HBM)	Class 1A	ANSI/ESDA/JEDEC JS-001-2017
ESD - Charge Device Model (CDM)	Class C2	ANSI/ESDA/JEDEC JS-002-2018
MSL - Moisture Sensitivity Level	N/A	



ATTENTION

Electrostatic
Sensitive Device

Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations:

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Email : sales@wavepia.com

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