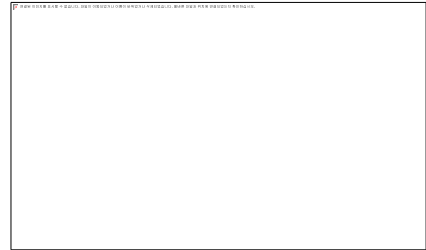




Product Features

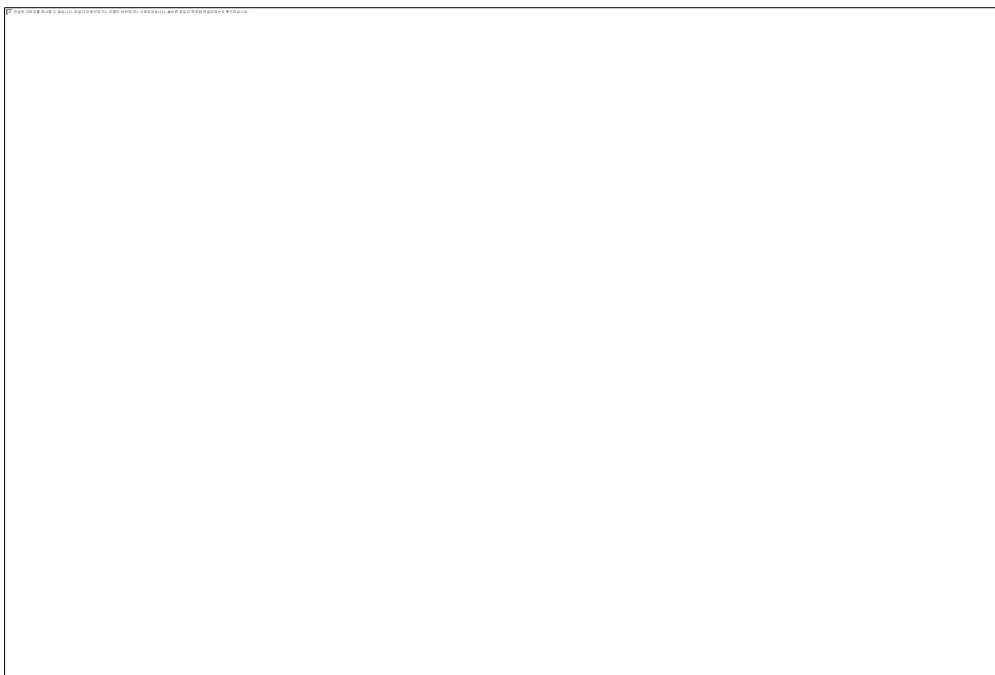
- 8-11GHz GaN MMIC Power Amplifier
- Typical Small-signal Gain 36.9dB
- Typical Power Gain 25.5dB
- Typical Output Power 47.3dBm
- Typical PAE 38.3%
- 28V-32V operation
- * Above Typical values measured at 10GHz and 28V



Applications

- General Purpose
- Communication System
- Radar System

Block Diagram





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 to +2	Volts	25°C
Storage Temperature ³	T _{STG}	-65 to +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_A=25°C, F₀=10GHz, V_{DD}=28V, I_{DQ}=740mA)

Parameter	Symbol	MIN	TYP	MAX	Units	Conditions
Small Signal Gain	G		36.9		dB	Pulse Width=100μsec, Duty Cycle=10%
Power Gain	G _P		25.5		dB	P _{sat} @ I _{gs} =1mA
Saturated Output Power	P _{OUT}		47.3		dBm	P _{sat} @ I _{gs} =1mA
Power Added Efficiency	PAE		38.3		%	P _{sat} @ I _{gs} =1mA

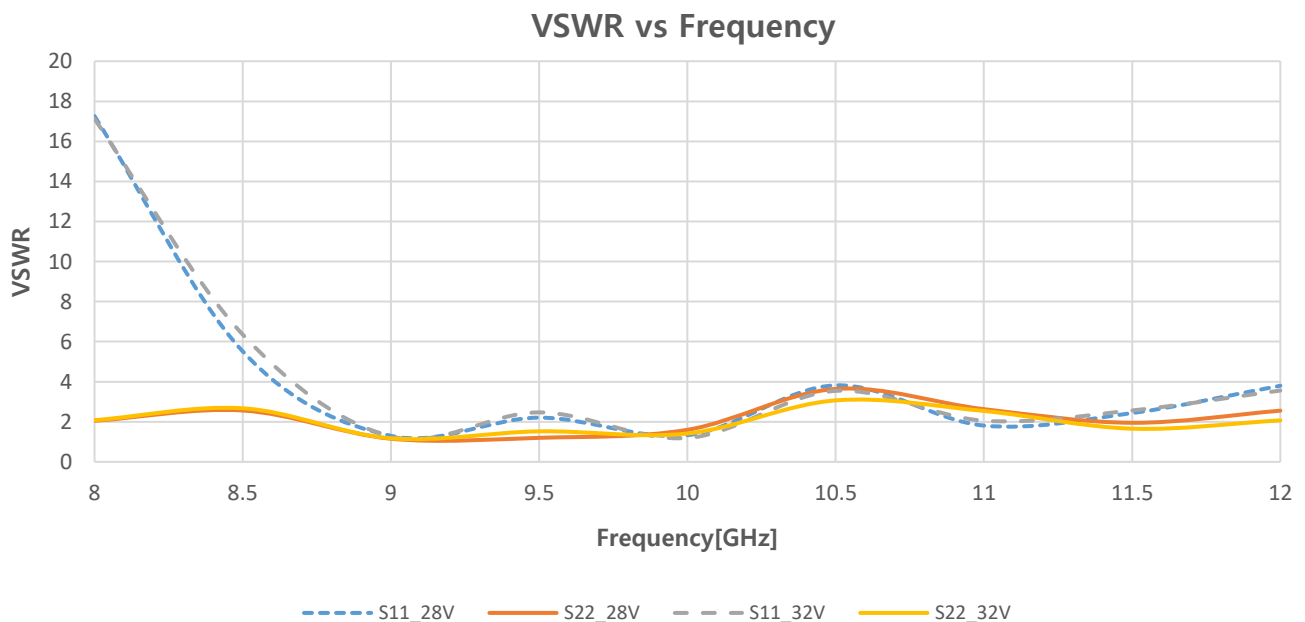
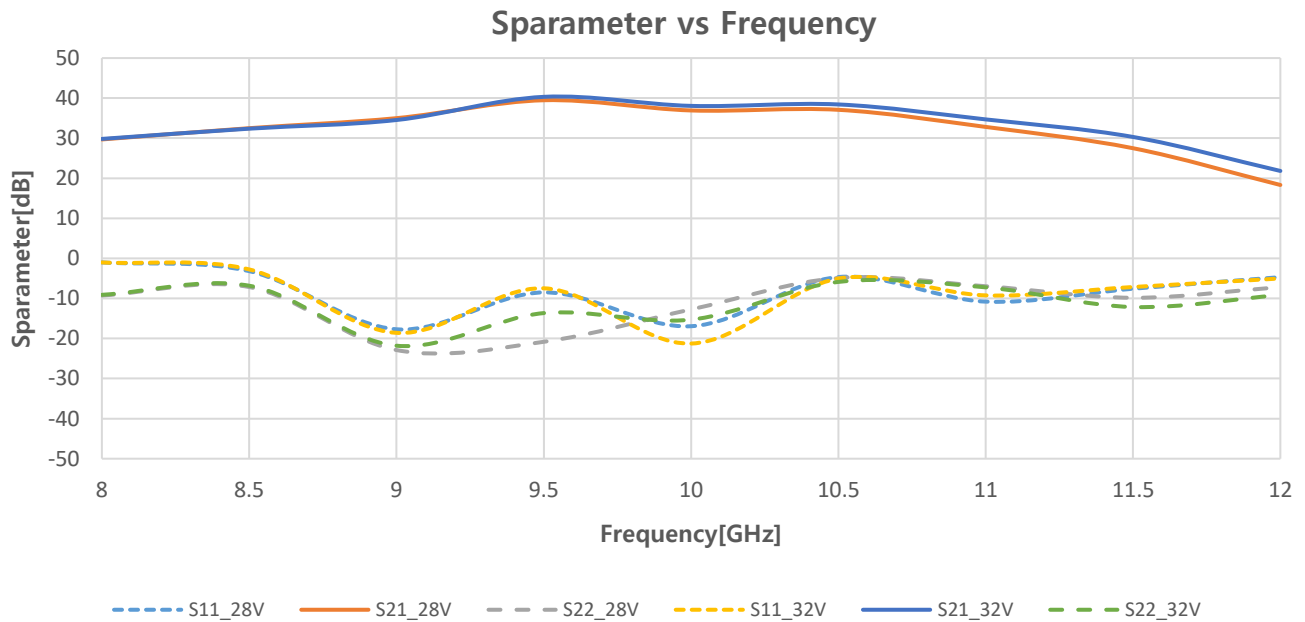
Specifications (T_A=25°C, F₀=10GHz, V_{DD}=32V, I_{DQ}=820mA)

Parameter	Symbol	MIN	TYP	MAX	Units	Conditions
Small Signal Gain	G		38.1		dB	Pulse Width=100μsec, Duty Cycle=10%
Power Gain	G _P		25.6		dB	P _{sat} @ I _{gs} =1mA
Saturated Output Power	P _{OUT}		48.3		dBm	P _{sat} @ I _{gs} =1mA
Power Added Efficiency	PAE		38.5		%	P _{sat} @ I _{gs} =1mA



Small-Signal Performance ($T_A=25^\circ\text{C}$)

Drain Voltage= (28V IDQ=740mA), (32V IDQ=820mA)

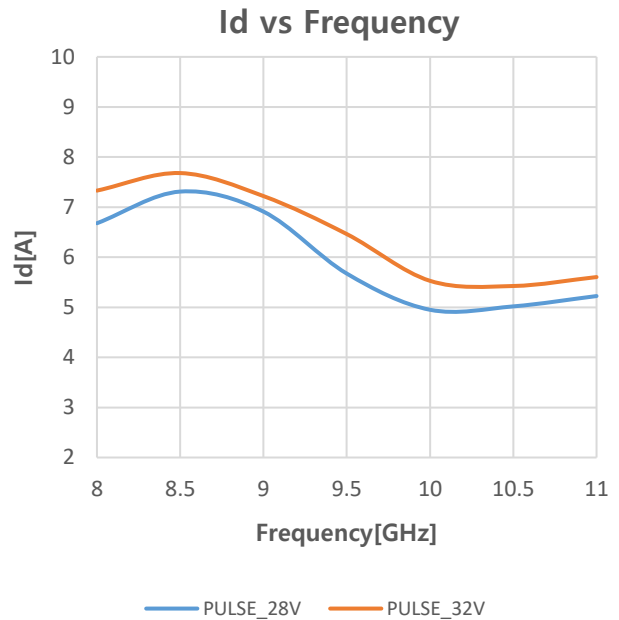
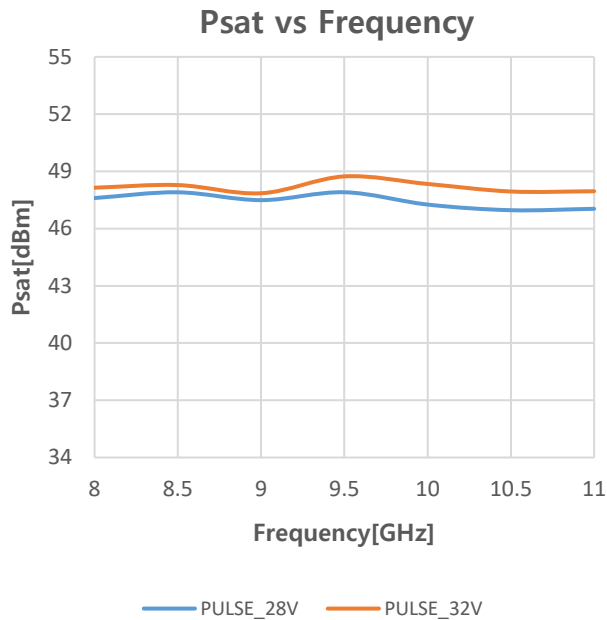




Psat, Id vs Frequency Performance (TA=25°C)

Drain Voltage= (28V IDQ=740mA), (32V IDQ=820mA)

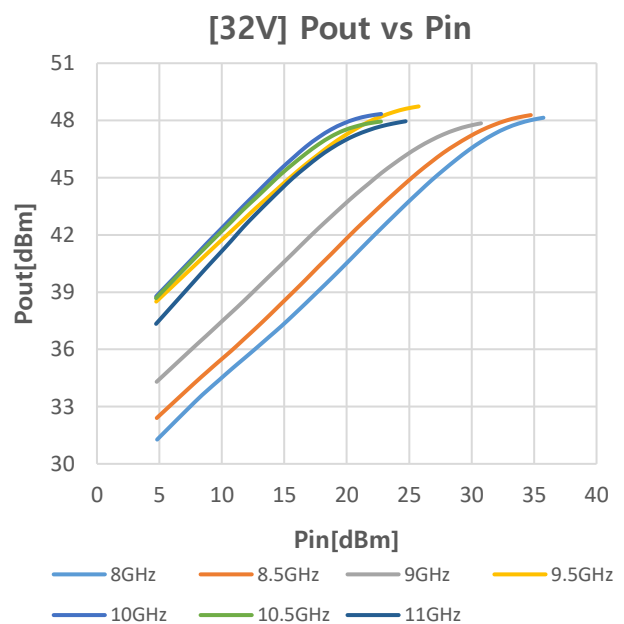
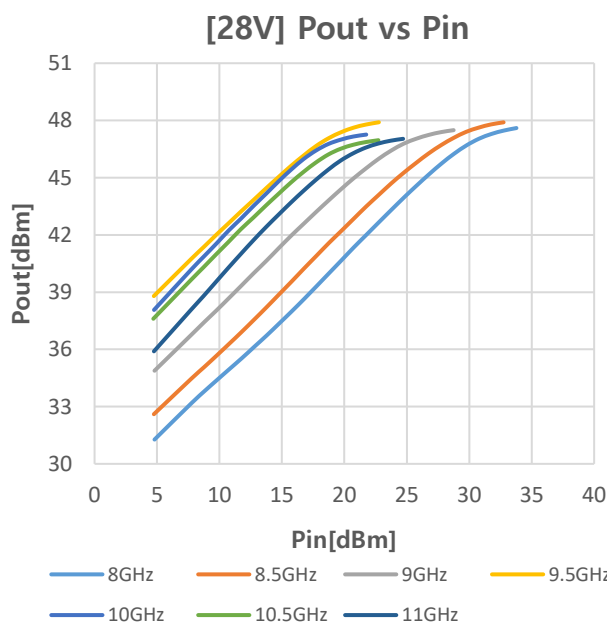
Pulse-Mode(Pulse Width=100μsec, Duty Cycle=10%)



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

Drain Voltage= (28V IDQ=740mA), (32V IDQ=820mA)

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

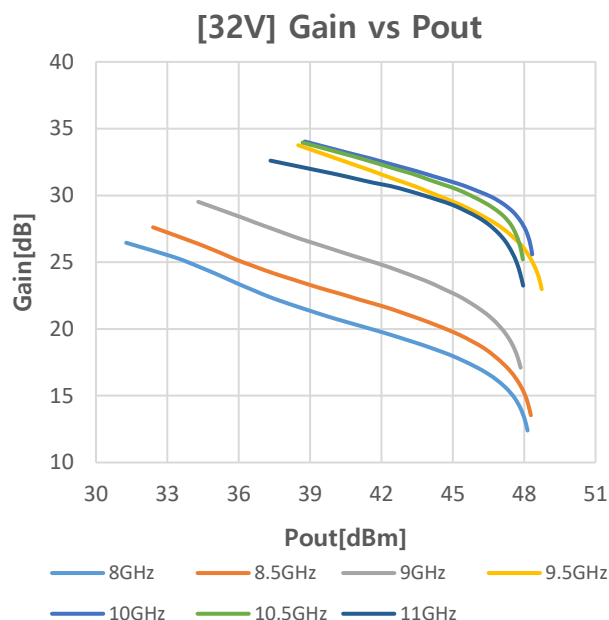
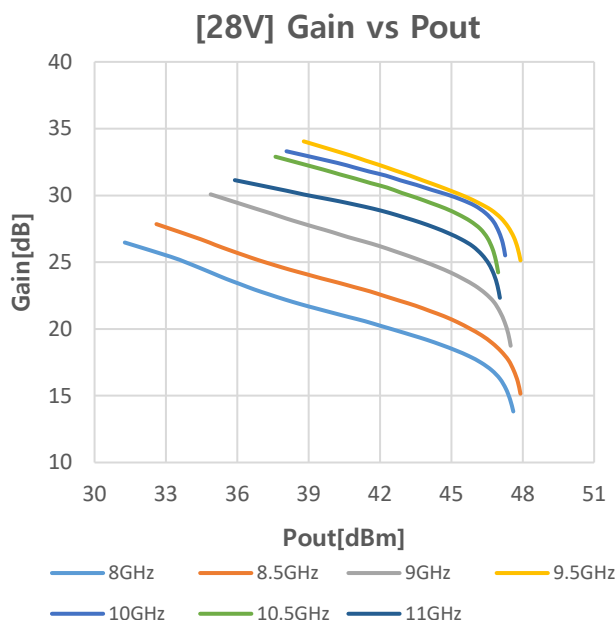




Gain vs Output Power (Pout) Performance (T_A=25°C)

Drain Voltage= (28V IDQ=740mA), (32V IDQ=820mA)

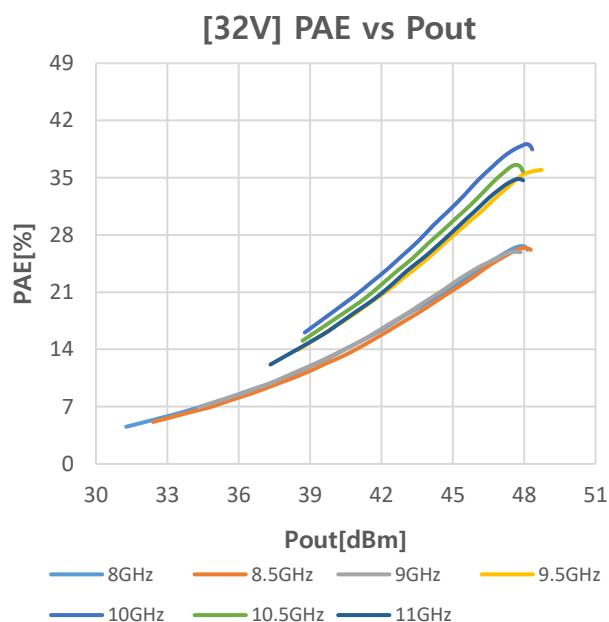
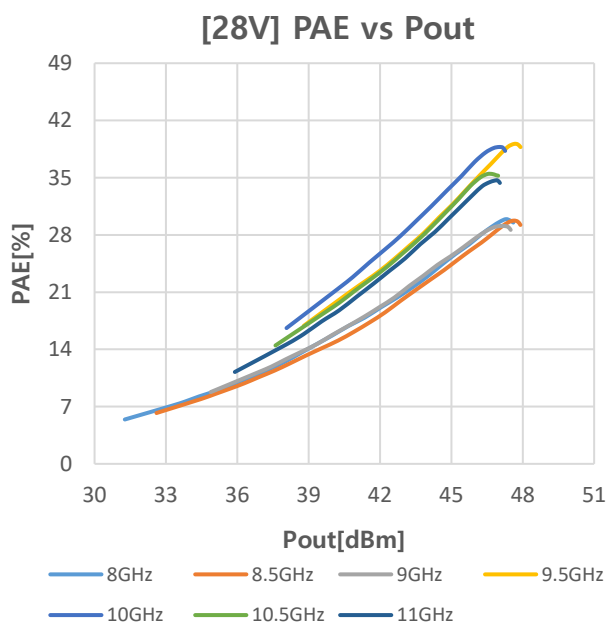
Pulse-Mode(Pulse Width=100μsec, Duty Cycle=10%)



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

Drain Voltage= (28V IDQ=740mA), (32V IDQ=820mA)

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

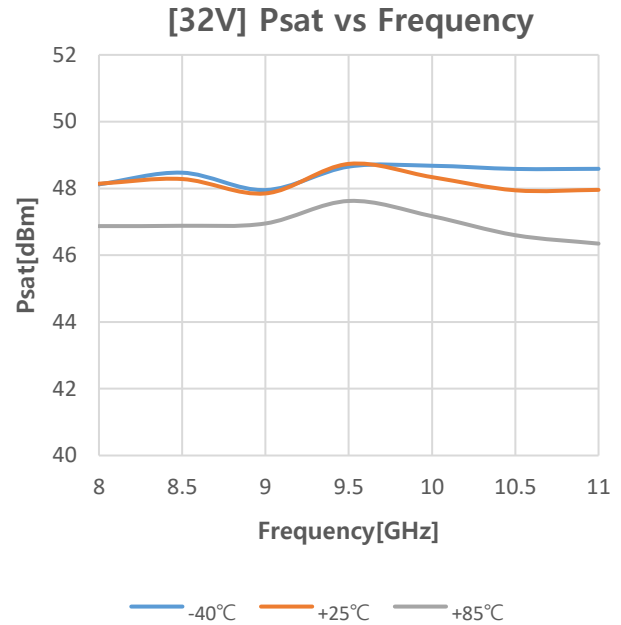
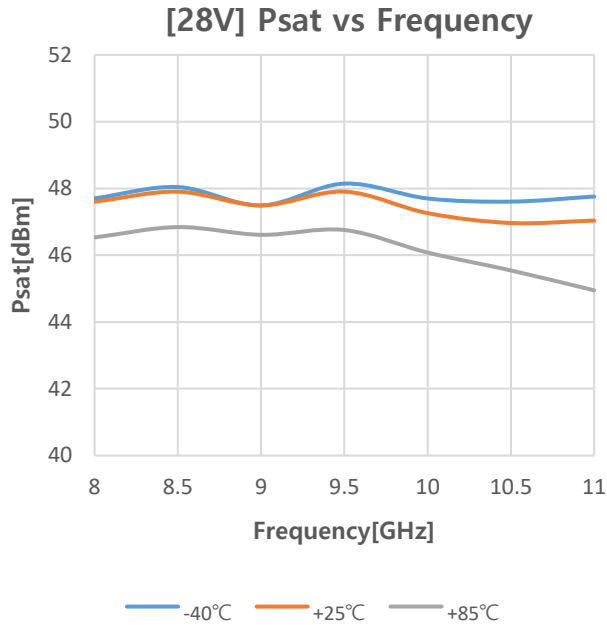




Psat vs Frequency Temperatures Performance

Drain Voltage= (28V IDQ=740mA), (32V IDQ=820mA)

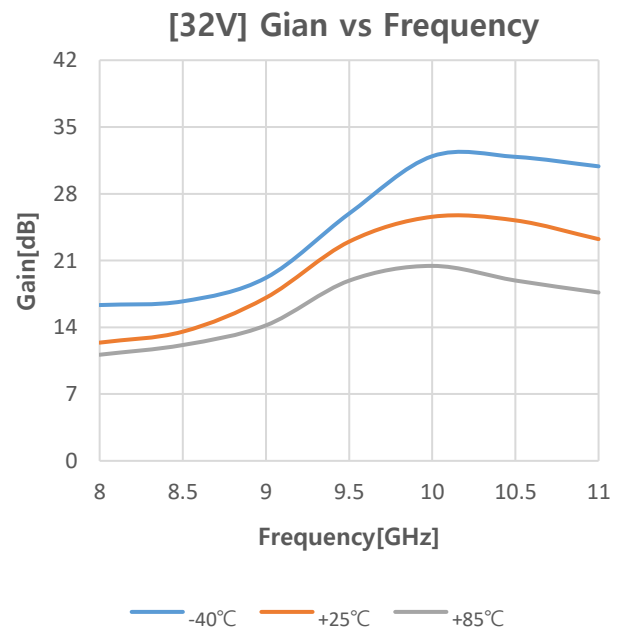
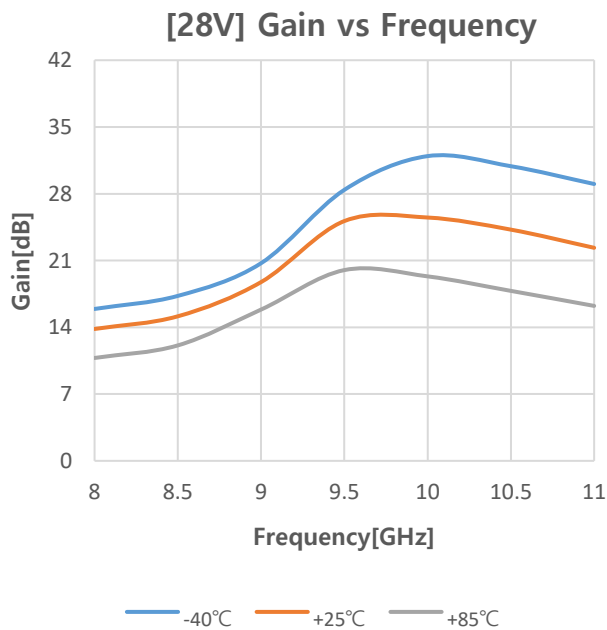
Pulse-Mode(Pulse Width=100μsec, Duty Cycle=10%)



Gain vs Frequency Temperatures Performance

Drain Voltage= (28V IDQ=740mA), (32V IDQ=820mA)

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

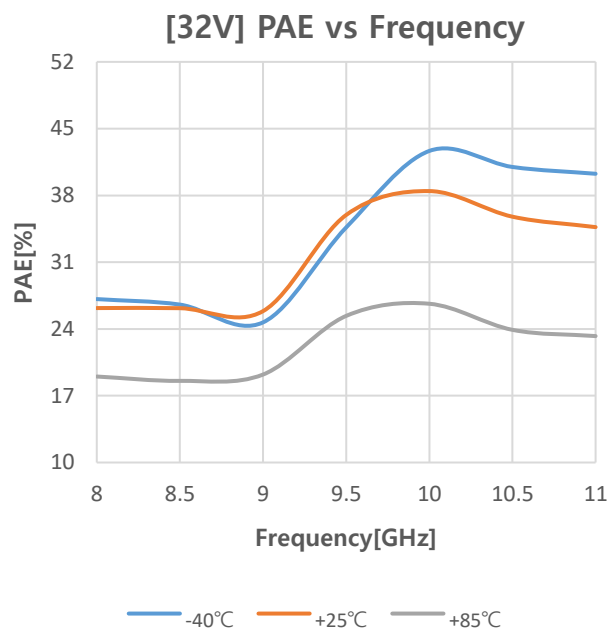
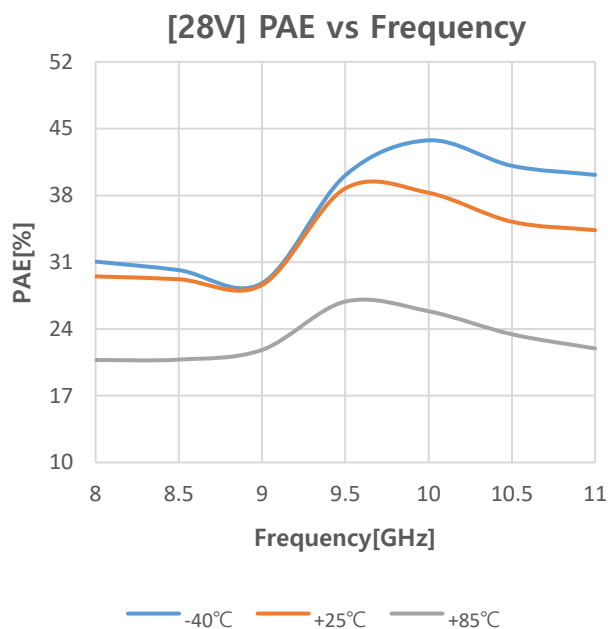




PAE vs Frequency Temperatures Performance

Drain Voltage= (28V IDQ=740mA), (32V IDQ=820mA)

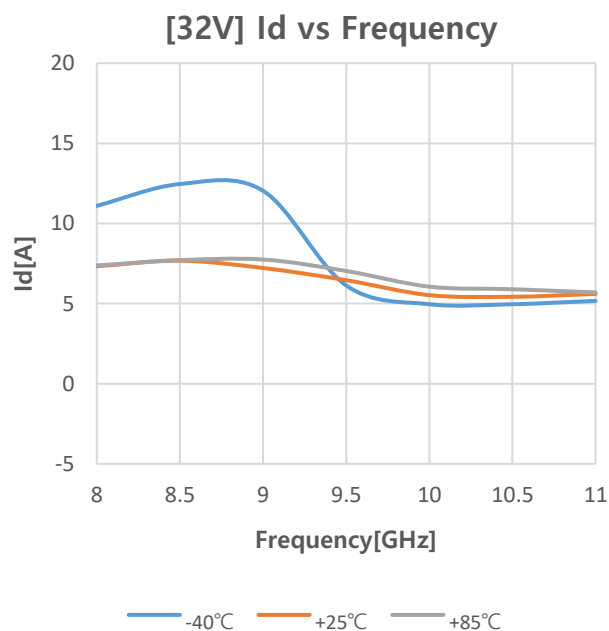
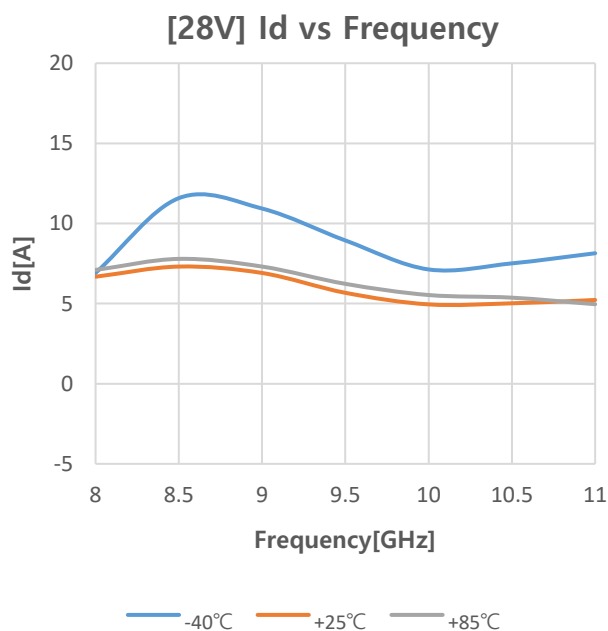
Pulse-Mode(Pulse Width=100μsec, Duty Cycle=10%)



Id vs Frequency Temperatures Performance

Drain Voltage= (28V IDQ=740mA), (32V IDQ=820mA)

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

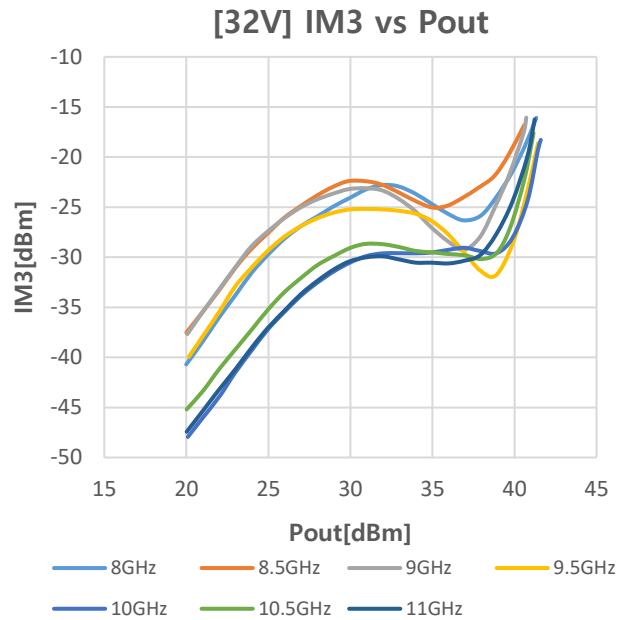
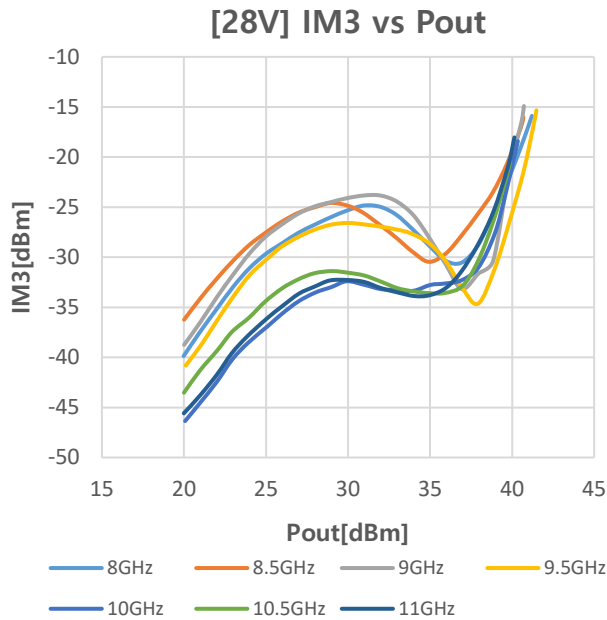




IM3 vs Output Power (Pout) Performance

Drain Voltage= (28V IDQ=740mA), (32V IDQ=820mA)

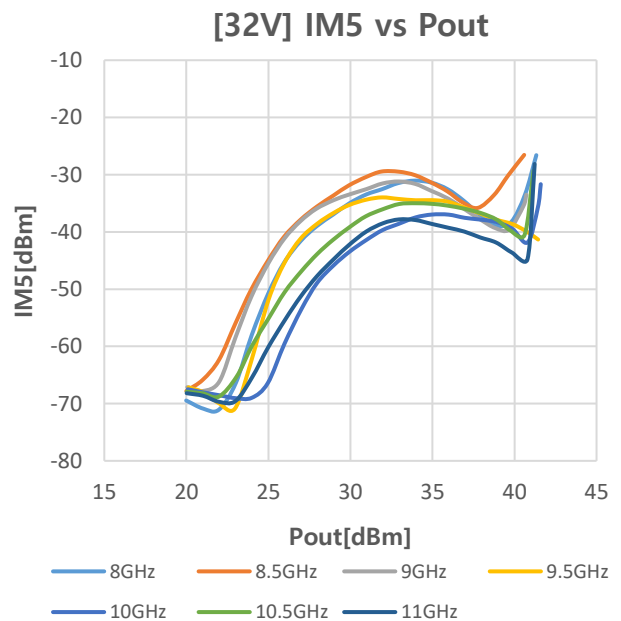
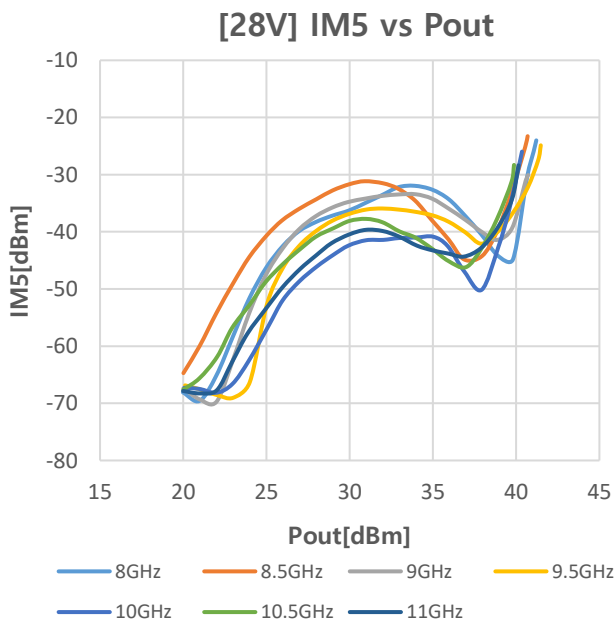
Tone Spacing = 10MHz



IM5 vs Output Power (Pout) Performance

Drain Voltage= (28V IDQ=740mA), (32V IDQ=820mA)

Tone Spacing = 10MHz

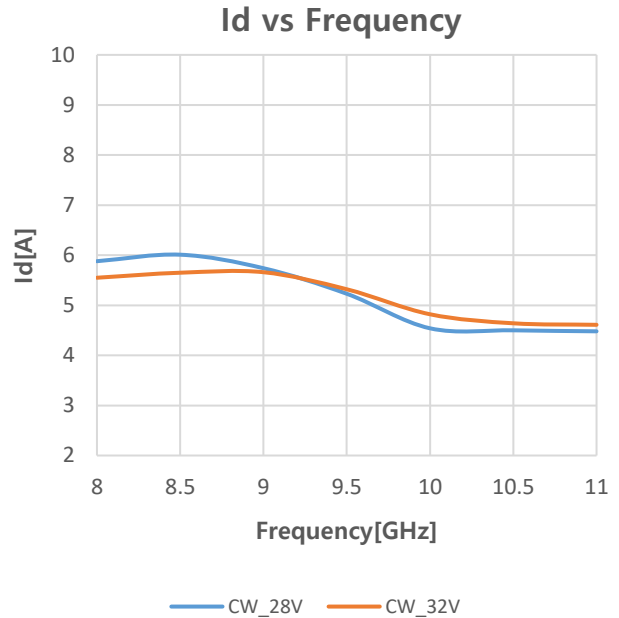
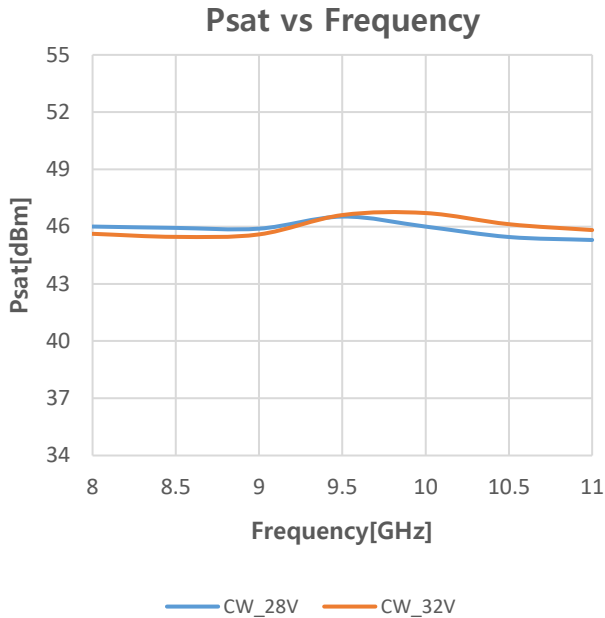




Psat, Id vs Frequency Performance (TA=25°C)

Drain Voltage= 28V IDQ=740mA

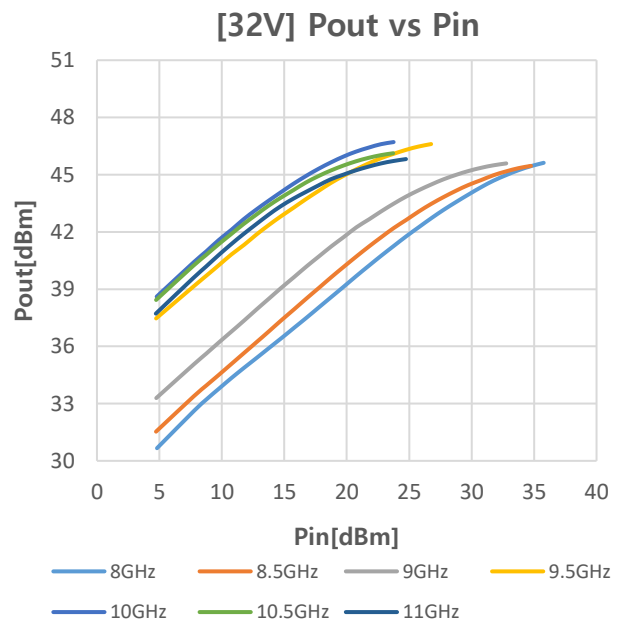
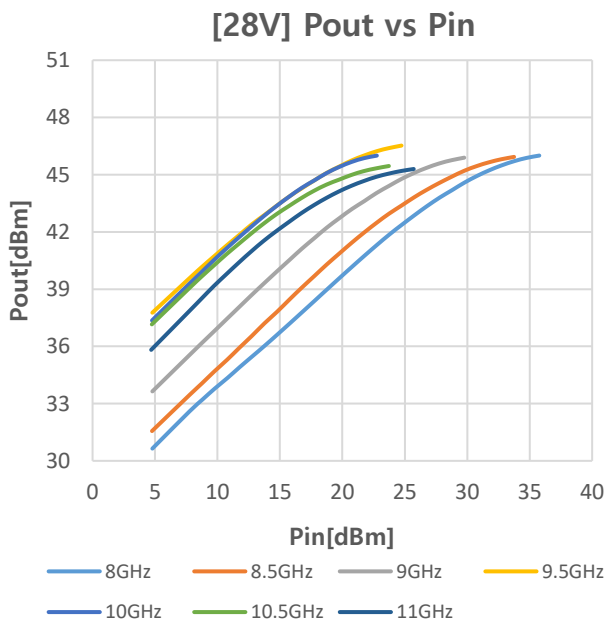
CW-Mode



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

Drain Voltage= (28V IDQ=740mA), (32V IDQ=820mA)

CW-Mode

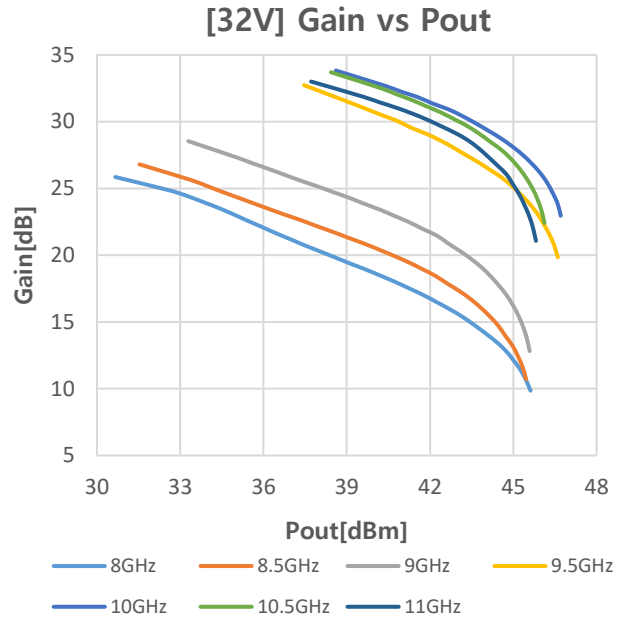
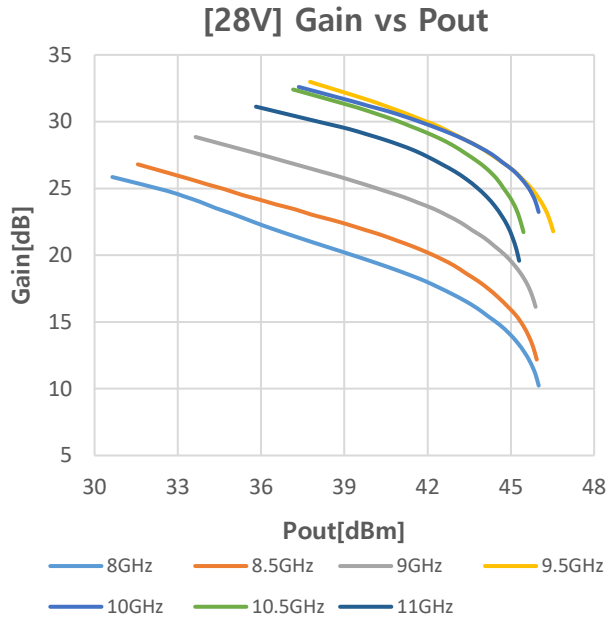




Gain vs Output Power (Pout) Performance (T_A=25°C)

Drain Voltage= (28V IDQ=740mA), (32V IDQ=820mA)

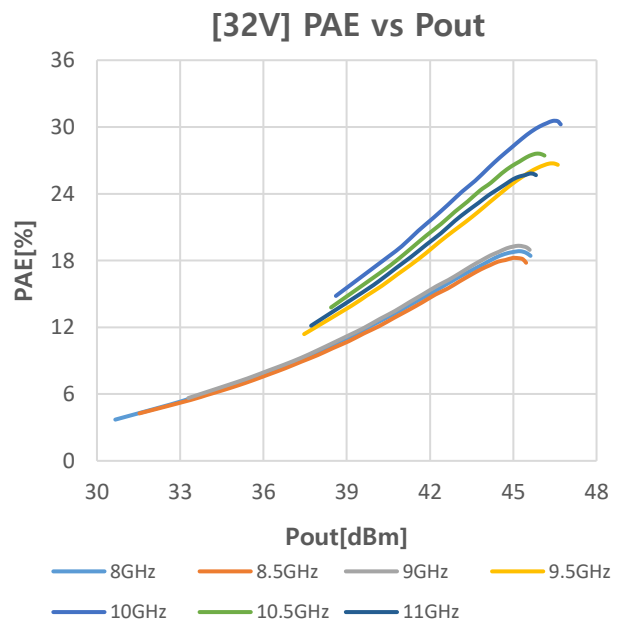
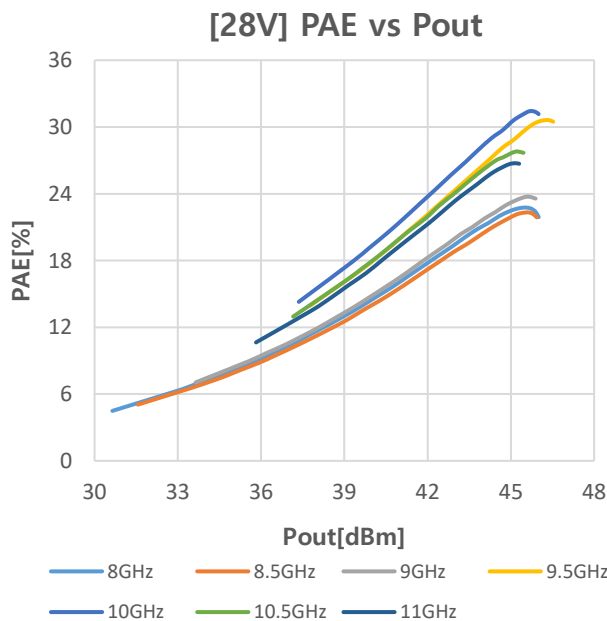
CW-Mode



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

Drain Voltage= (28V IDQ=740mA), (32V IDQ=820mA)

CW-Mode

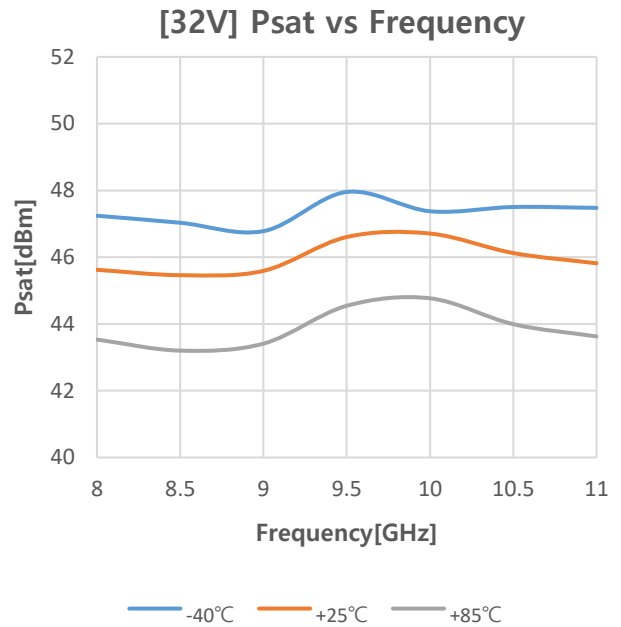
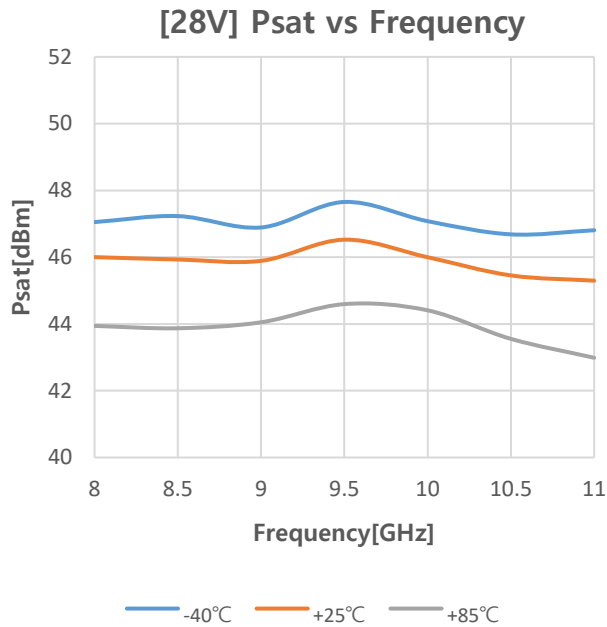




Psat vs Frequency Temperatures Performance

Drain Voltage= (28V IDQ=740mA), (32V IDQ=820mA)

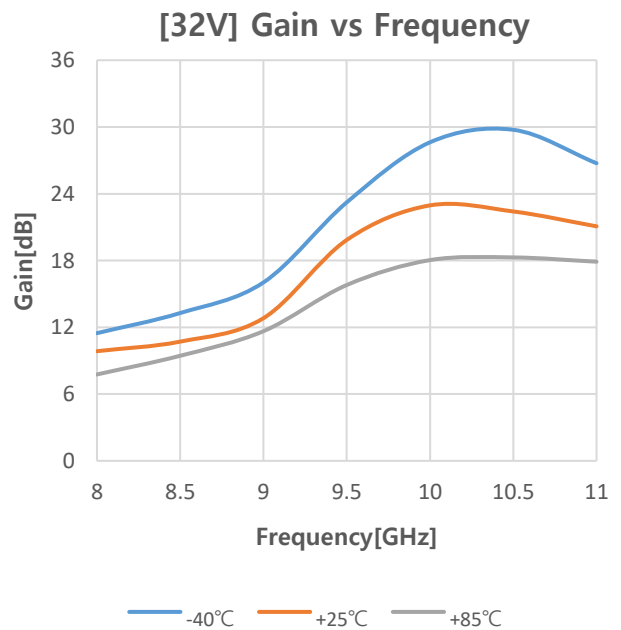
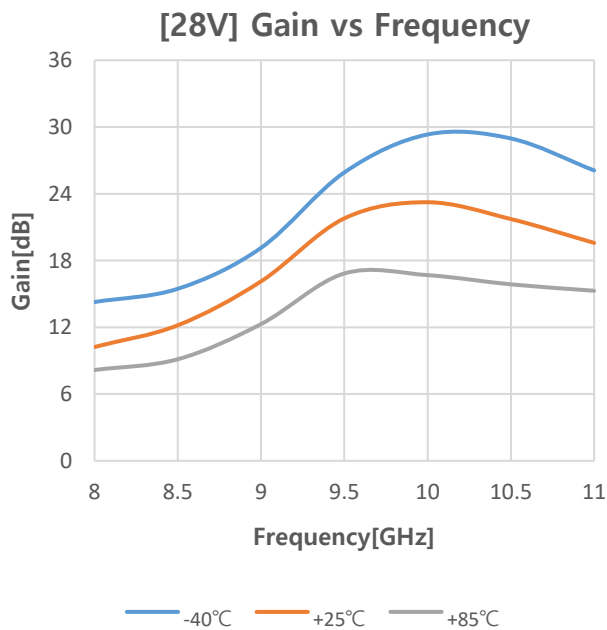
CW-Mode



Gain vs Frequency Temperatures Performance

Drain Voltage= (28V IDQ=740mA), (32V IDQ=820mA)

CW-Mode

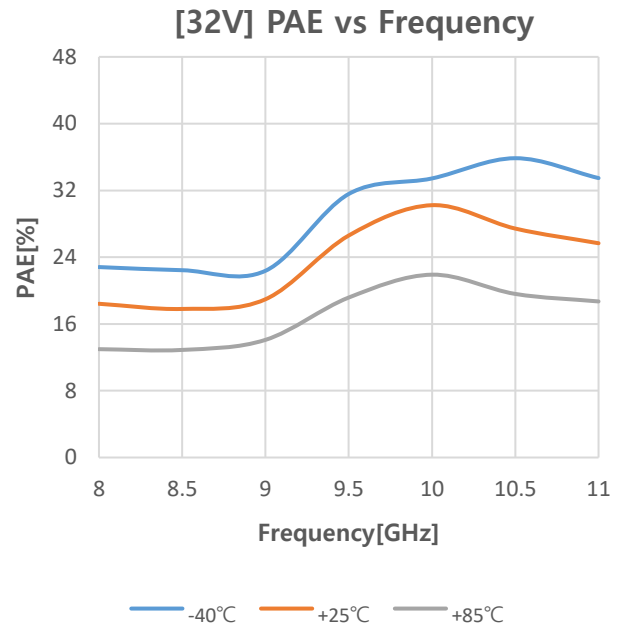
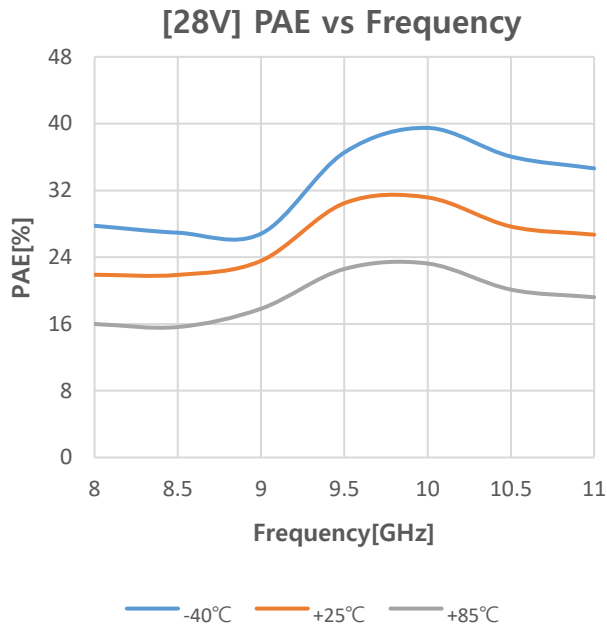




PAE vs Frequency Temperatures Performance

Drain Voltage= (28V IDQ=740mA), (32V IDQ=820mA)

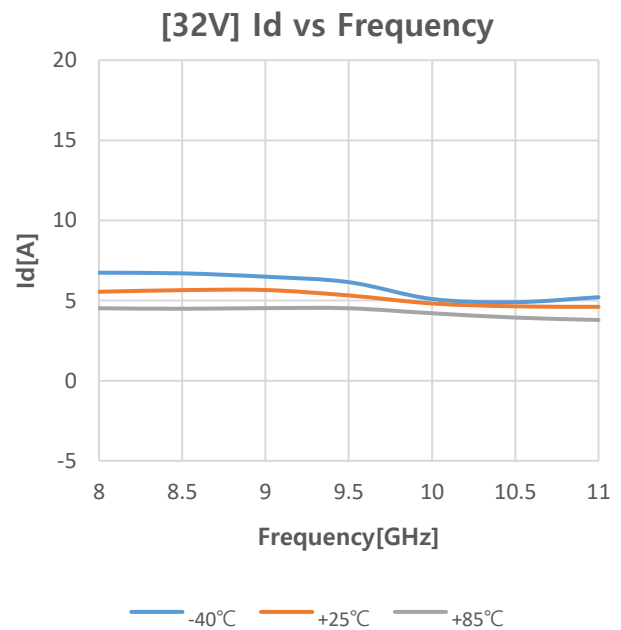
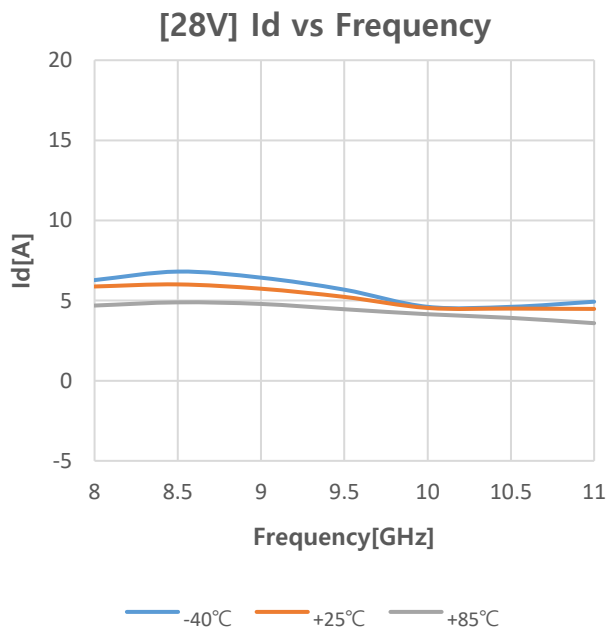
CW-Mode



Id vs Frequency Temperatures Performance

Drain Voltage= (28V IDQ=740mA), (32V IDQ=820mA)

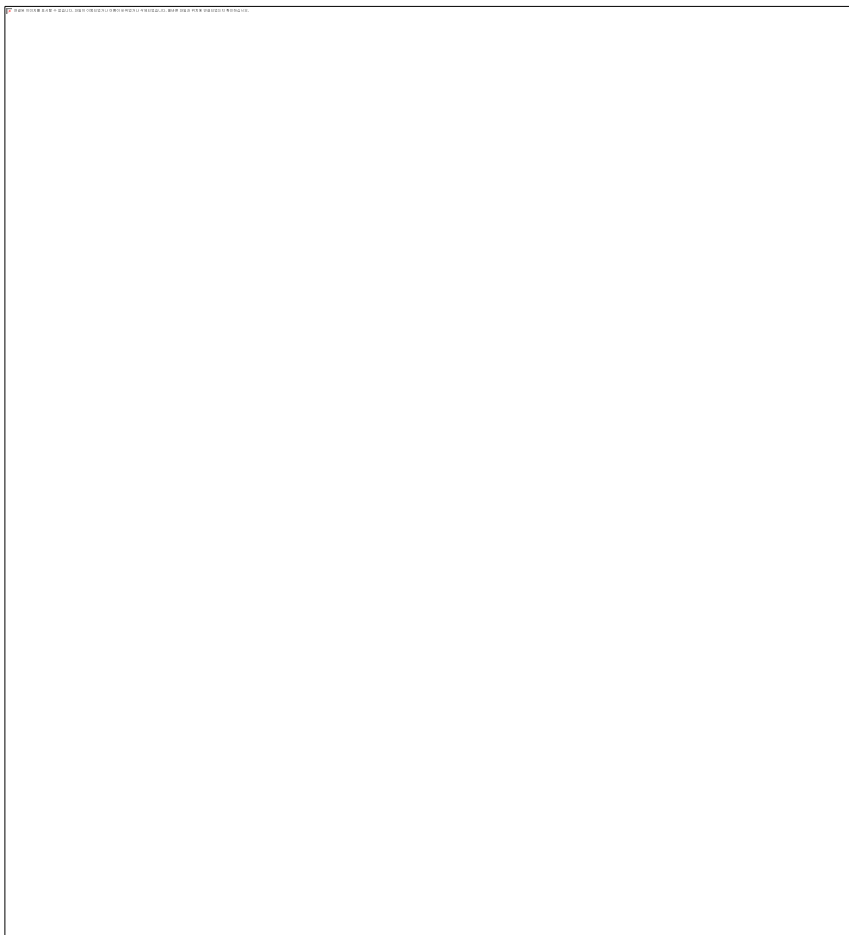
CW-Mode





Product Dimension

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



Pin No.	Function	Description
1, 5	VG	Gate Bias, bias must be applied to both pins
2, 4	No Connect	Pin can be open circuit
3	RF IN	50 ohm RF input, included DC Blocking Capacitors
6, 10	VD	Drain, Bias, bias must be applied to both pins
7, 9	No Connect	Pin can be open circuit
8	RF OUT	50 ohm RF output, included DC Blocking Capacitors
Flange	Ground	RF and DC Ground



Bias Sequence

1. Both sides must be connected to VG.
2. Both sides must be connected to VD.
3. VG bias must be applied before VD.

Bias On Sequence

1. Ensure RF is turned-off
2. Apply pinch-off voltage of -5V to the gate (Vg)
3. Apply nominal drain voltage (Vd)
4. Adjust Vg to obtain desired Idq
5. Apply RF

Bias Off Sequence

1. Turn RF off
2. Apply pinch-off voltage to the gate (Vg= -5V)
3. Turn off drain voltage (Vd)
4. Turn off gate voltage (Vg)

Test Condition

1. VD=28V, IDQ=740mA, VG=-2.37V
2. VD=32V, IDQ=820mA, VG=-2.37V



Evaluation Board

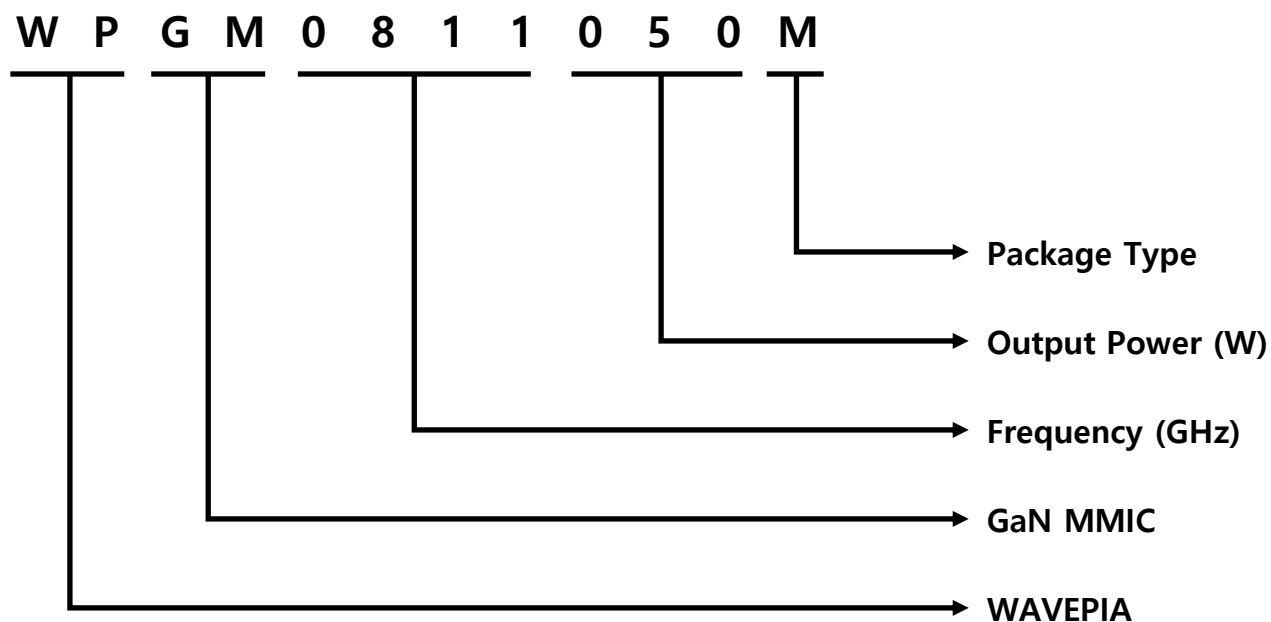


Evaluation Board Circuit Bill of Materials

No	Reference	Value	Description	Manufacturer	EA
1	C1, C2	47uF / 16VDC	Cap, 2917, 16V, 10%, Ta, -55~125°C, RoHS	Various	2
2	C3, C4	10uF / 35VDC	Cap, 2917, 25V, ±10%, Ta, SMD	Various	2
3	C9, C10, C11, C12	100pF	Cap ,MLCC, SMD/ SMT	Various	4
4	C7, C8, C13, C14	10nF	Cap, MLCC ,0805 ,100V ,±10%, X7R, SMD/SMT	Various	4
5	C5, C6, C15, C16	470nF	Cap, MLCC, 0805, 100V, 10%, X7S, SMD/SMT	Various	4
6	C17, C18	470nF	Cap, 1812, 100V, 10%, X7R	Various	2
7	C19, C20	10uF	Cap, 2220, 100V, ±10%, SMD	Various	2
8	R1, R2	10 Ohm	Chip Resistor	Various	2
9	C21, C22	47uF / 50V	electrolytic capacitor	Various	2
10	-	DC To 26.5 GHz	SMA 4 Hole	Various	2
11	-	100pF	Feed through Capacitor	Various	4
12	-	-	Terminals / Turret Connectors	Various	4



Part Number System

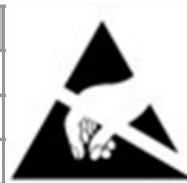


Parameter	Value	Units
Lower Frequency	8	GHz
Upper Frequency	11	GHz
Output Power	50	W
Transistor Type	GaN MMIC	-
Package	MPKG	-



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:

Web : www.wavepia.com
Tel : 82 - (0)31 - 8058 - 3374
Email : sales@wavepia.com

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