Eudyna GaN-HEMT 180W

EGN21A180IV

Preliminary

High Voltage - High Power GaN-HEMT

FEATURES

- High Voltage Operation : V_{DS}=50V
- High Gain: 15dB(typ.) at P_{out}=45dBm(Avg.)
- High Efficiency: 32%(typ.) at P_{out}=45dBm(Avg.)
- Broad Frequency Range : 2100 to 2200MHz
- Proven Reliability

DESCRIPTION

The EGN21A180IV is a 180 Watt GaN-HEMT that offers high efficiency, high gain, ease of matching, greater consistency and broad bandwidth for high power L-band amplifiers with 50V operation. This device is targeted for high voltage, low current operation in digitally modulated base station applications - ideally suited for W-CDMA base station amplifiers and other HPA designs while offering ease of use.

ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Condition	Rating	Unit
Drain-Source Voltage	V_{DS}		120	V
Gate-Source Voltage	V_{GS}	T_c=25°C	-5	V
Total Power Dissipation	P_t		321	W
Storage Temperature	T_{stg}		-65 to +175	°C
Channel Temperature	T_{ch}		250	°C

RECOMMENDED OPERATING CONDITION(Case Temperature Tc= 25°C)

Item	Symbol	Condition	Limit	Unit
DC Input Voltage	V_{DS}		50	V
Forward Gate Current	I_{GF}	R_G=2 Ω	<38.8	mA
Reverse Gate Current	I_{GR}	R_G=2 Ω	>-14.4	mA
Channel Temperature	T_{ch}		200	°C

ELECTRICAL CHARACTERISTICS (Case Temperature Tc=25°C)

Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Pinch-Off Voltage	V_p	V_{DS}=50V I_{DS}=72mA	-1.0	-2.0	-3.5	V
Gate-Drain Breakdown Voltage	V_{GDO}	I_{GS}=- 36 mA	-	-350	-	V
3rd Order Inter modulation Distortion	IM_3	V_{DS}=50V	-	-32	-	dBc
Power Gain	G_p	$I_{DS(DC)}$=1.0A	14.0	15.0	-	dB
Drain Efficiency	η_d	P_{out}=45dBm(Avg.) Note 1	-	32	-	%
Thermal Resistance	R_{th}	Channel to Case	-	0.55	0.7	°C/W

Note 1 : IM3 and Gain test condition as follows:
IM3 & Gain : fo=2.135GHz, f1=2.145GHz W-CDMA(3GPP3.4 12-00) BS-1 64ch 67% clipping modulation(Peak/Avg. = 8.5dB@0.01% Probability(CCDF)) measured over 3.84MHz at fo-10MHz and fl+10MHz.

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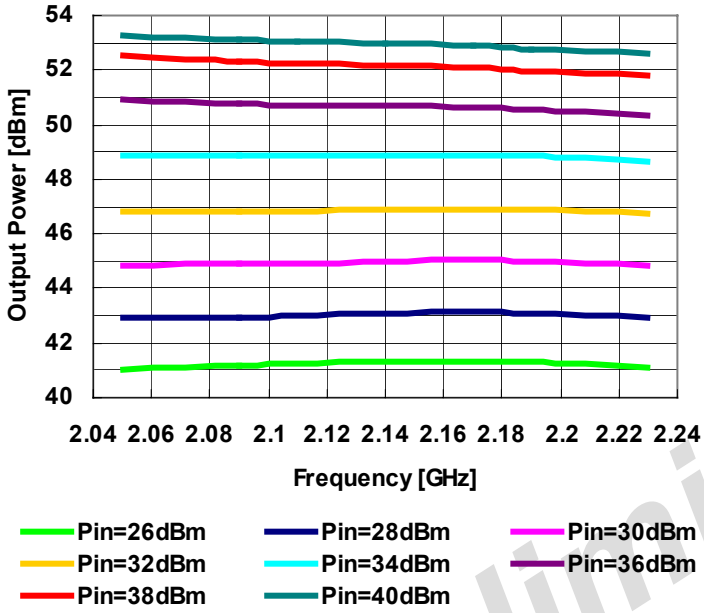
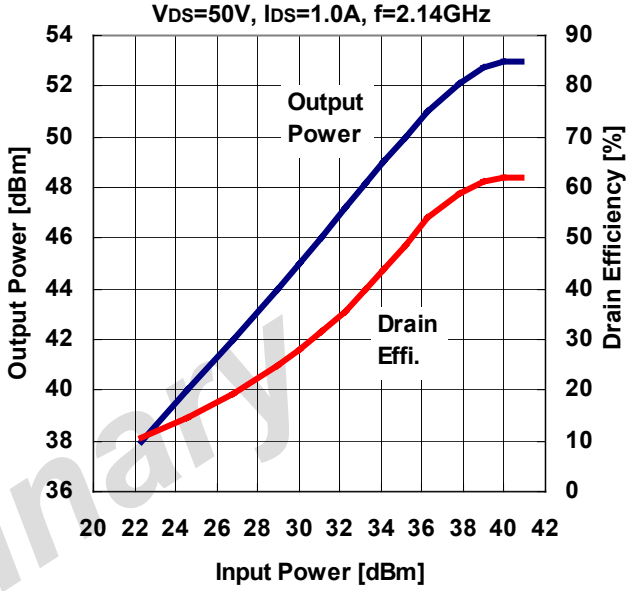
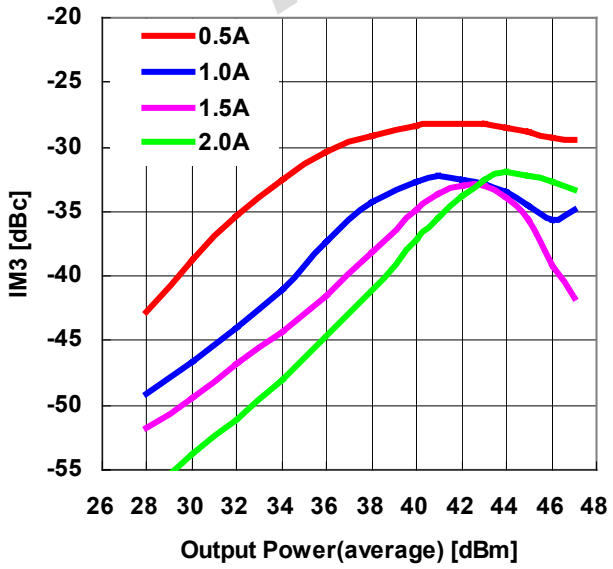
Output Power vs. Frequency
V_{DS}=50V, I_{DS}=1.0A



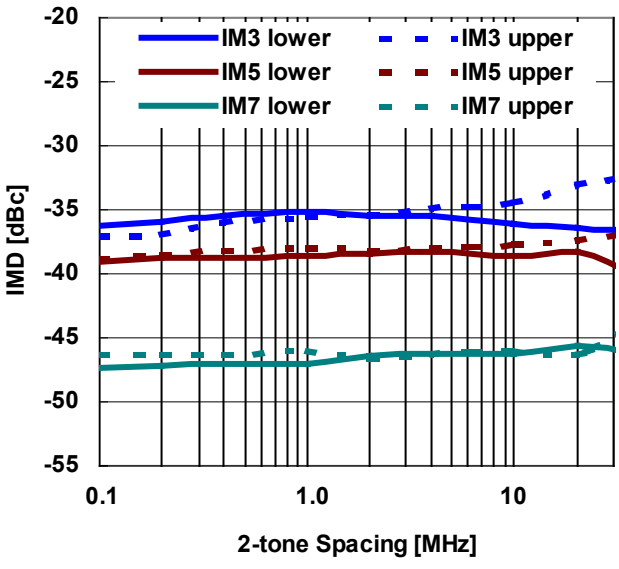
Output Power and Drain Efficiency vs. Input Power
V_{DS}=50V, I_{DS}=1.0A, f=2.14GHz



2-tone IMD vs. Output Power
V_{DS}=50V, f_1=2.135GHz, f_2=2.145GHz, 10MHz Spacing



2-tone IMD vs. Tone Spacing, V_{DS}=50V, I_{DS}=1.0A
P_{out}=45dBm(average) Center Frequency=2.14GHz



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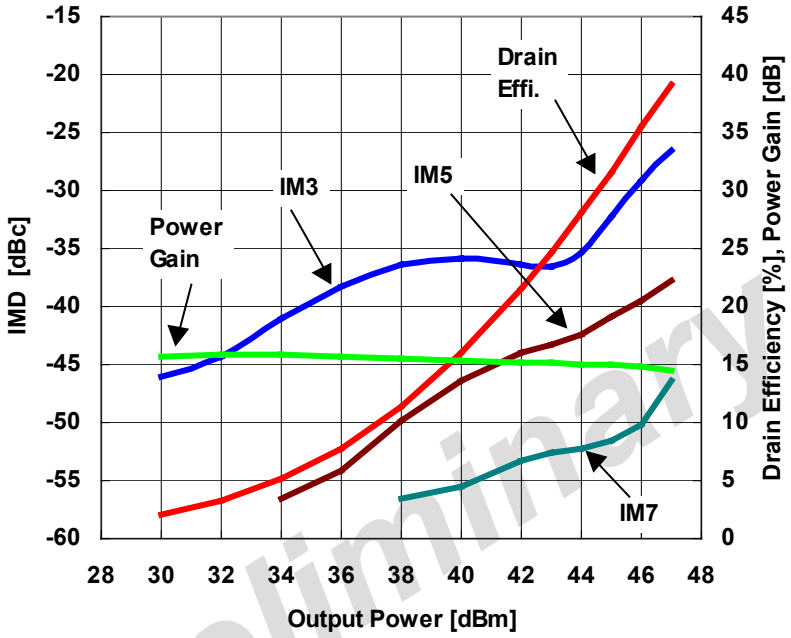
2-Carrier IMD, Drain Efficiency and Power Gain vs. Output Power
V_{DS}=50V, I_{DS}=1.0A, f_1=2.135GHz, f_2=2.145GHz(10MHz Spacing)
Peak/Avg. = 8.5dB@0.01% Probability(CCDF)



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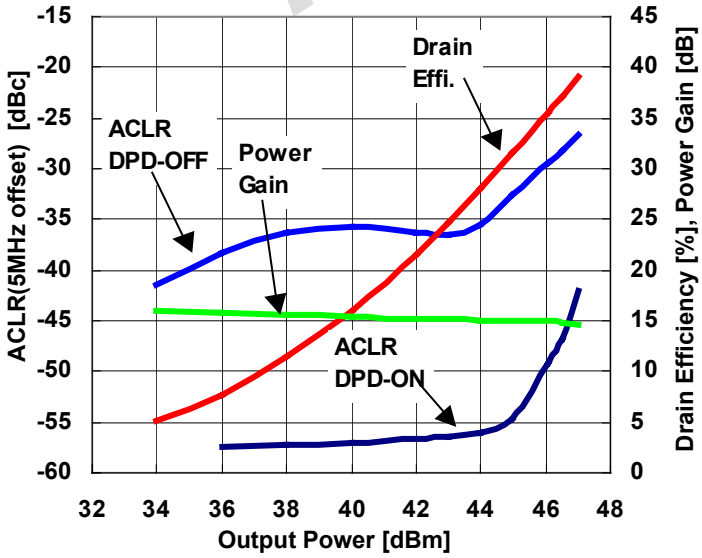
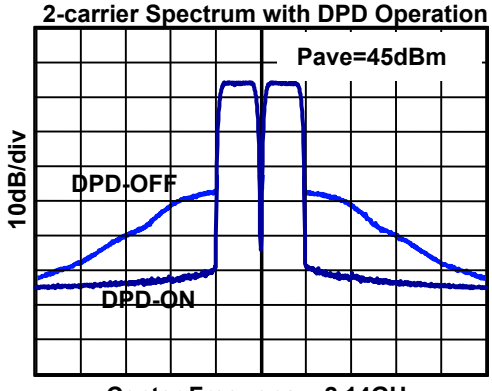
2-Carrier ACLR, Drain Efficiency and Power Gain vs. Output Power with DPD Operation (note
V_{DS}=50V, I_{DS}=1.0A
f_1=2.1375GHz, f_2=2.1425GHz(5MHz Spacing)
Peak/Avg. = 6.5dB@0.01% Probability(CCDF);
Single Carrier Signal
Note) Digital Predistortion evaluation test system:
PMC-Sierra PALADIN-15 DPD chip-set



2-carrier Spectrum with DPD Operation



Center Frequency=2.14GHz
5MHz/div