Eudyna GaN-HEMT 10W

EMC21L1004GN

Preliminary

High Voltage - High Power GaN-HEMT Power Amplifier Module

FEATURES

- High Voltage Operation : V_{DS}=50V
- High Gain: 28.5dB(typ.) at P_{out}=22dBm(Avg.)
- Broad Frequency Range : 2110 to 2170MHz
- Proven Reliability
- Small and Low Cost Metal Base Package

DESCRIPTION

The EMC21L1004GN is a high-gain and wide-band 2-stage HIC amplifier module with 50V operation.
This module is targeted for high voltage, low current operation in digitally modulated base station. This product is ideally suited not only for W-CDMA base station amplifiers but also other HPA while offering ease for use.

ABSOLUTE MAXIMUM RATING (Case Temperature Tc=25°C)

Item	Symbol	Rating	Unit
DC Input Voltage (Drain)	$V_{dd1,2}$	0 to +52	V
DC Input Voltage (Gate)	$V_{gg1,2}$	-7 to 0	V
Input Power	P_{in}	+20	dBm
Storage Temperature	T_{stg}	-40 to +100	°C
Operating Case Temperature	T_{op}	-20 to +85	°C

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

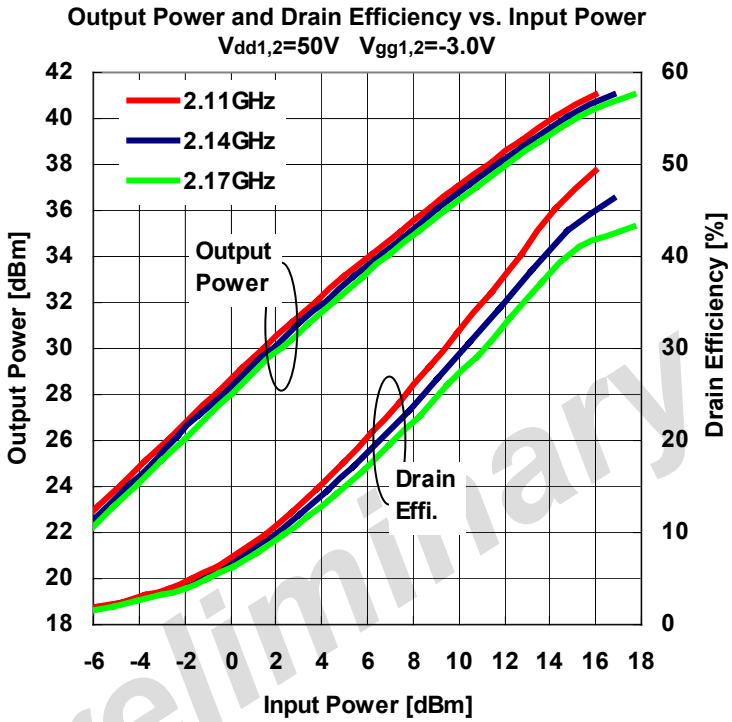
Item	Symbol	Condition	Unit
DC Input Voltage (Drain)	$V_{dd1,2}$	50	V
DC Input Voltage (Gate)	$V_{gg1,2}$	-3	V
Input Power	P_{in}	<10	dBm

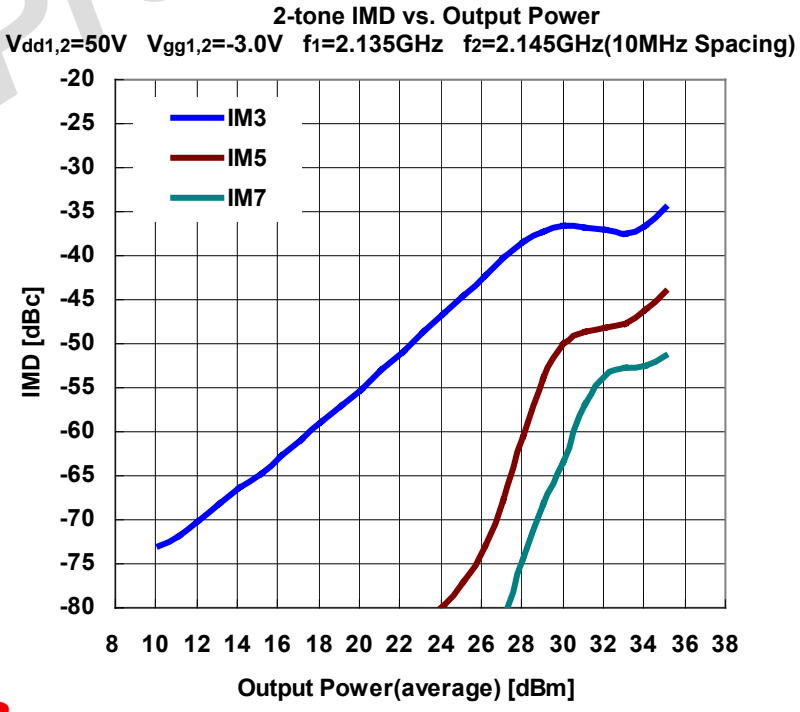
ELECTRICAL CHARACTERISTICS (Case Temperature Tc= 25°C)

Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Frequency	f	-	2.11	-	2.17	GHz
Linear Gain	G_L	$V_{dd1,2}$=50V $V_{gg1,2}$=-3.0V P_{in}=-10dBm	26.0	28.5	31.0	dB
Gain Deviation	d-Ga		-	0.2	0.5	dBp_p
Input VSWR	VSWRi		-	1.5:1	2.5:1	-
DC Input Current	$I_{dd(DC)}$	$V_{dd1,2}$=50V $V_{gg1,2}$=-3.0V Without RF	-	210	250	mA
DC Input Current	$I_{gg(DC)}$		-	6.0	15.0	mA
3rd Order Intermodulation Distortion Ratio	IM_3	$V_{dd1,2}$=50V $V_{gg1,2}$=-3.0V P_{out}=22dBm(Avg.) (Note 1)	-	-47.0	-45.0	dBc
DC Input Current	I_{dd}		-	200	250	mA

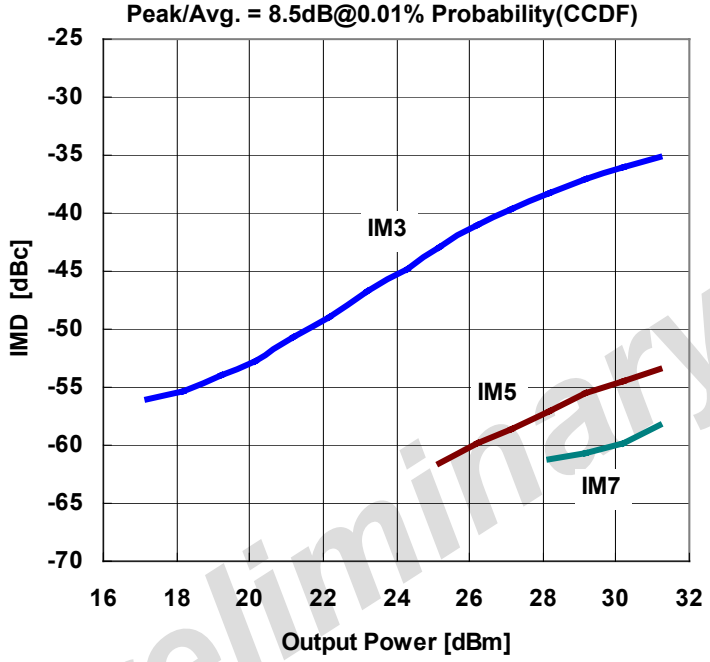
Note 1 : IM_3 and I_{dd} test condition as follows:
IM_3&I_{dd} : f_0=2.135GHz, f_1=2.145GHz W-CDMA(3GPP3.4 12-00) BS-1 64ch 67% clipping modulation(Peak/Avg.=8.5dB@0.01% probability(CCDF)) measured over 3.84MHz at f0-10MHz and f1+10MHz.

Note 2 : The RF parameters are measured with test fixture.

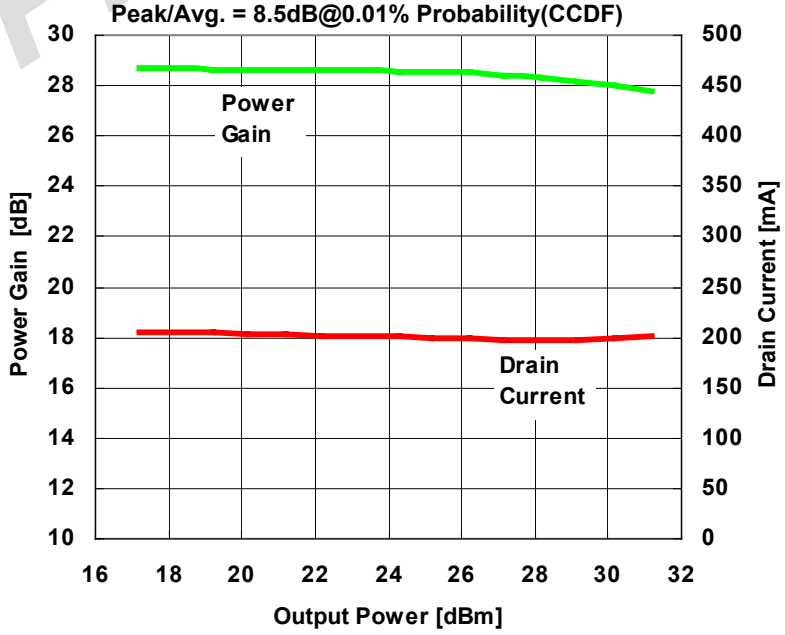




2-Carrier IMD vs. Output Power
$V_{dd1,2}$=50V $V_{gg1,2}$=-3.0V f_1=2.135GHz, f_2=2.145GHz(10MHz Spacing)
Peak/Avg. = 8.5dB@0.01% Probability(CCDF)



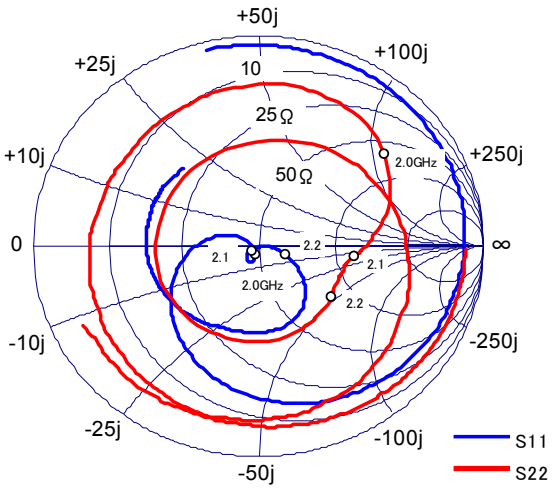
Power Gain and Drain Current vs. Output Power
$V_{dd1,2}$=50V $V_{gg1,2}$=-3.0V f_1=2.135GHz, f_2=2.145GHz(10MHz Spacing)
Peak/Avg. = 8.5dB@0.01% Probability(CCDF)

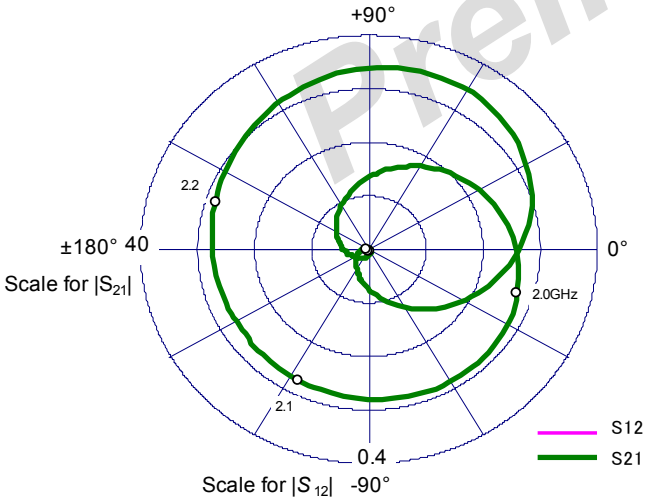


EMC21L1004GN

High Voltage - High Power GaN-HEMT Power Amplifier Module

S-Parameters @ $V_{dd1,2}$=50V $V_{gg1,2}$=-3.0V f=1 to 3 GHz
Zl = Zs = 50 ohm





Freq	S11		S21		S12		S22	
[GHz]	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.00	0.963	103.7	0.033	129.4	0.001	-56.2	0.919	-1.1
1.10	0.953	78.4	0.053	96.8	0.001	-65.9	0.912	-21.8
1.20	0.946	53.2	0.090	63.2	0.001	-98.3	0.899	-43.7
1.30	0.933	27.6	0.155	27.7	0.000	-115.3	0.879	-66.7
1.40	0.914	1.3	0.288	-8.7	0.000	-81.2	0.854	-91.7
1.50	0.883	-26.3	0.565	-48.4	0.000	8.0	0.825	-118.8
1.60	0.824	-56.0	1.168	-92.2	0.001	-30.9	0.787	-148.8
1.70	0.729	-89.1	2.532	-141.8	0.001	-61.0	0.746	178.2
1.80	0.563	-127.9	5.853	159.3	0.000	-28.0	0.724	141.8
1.90	0.290	-177.7	14.167	85.0	0.001	-4.2	0.760	98.1
2.00	0.046	-106.5	27.271	-17.5	0.005	-70.1	0.705	37.9
2.10	0.038	-145.5	27.369	-116.7	0.004	-129.5	0.430	-6.3
2.11	0.024	-143.0	27.163	-125.3	0.004	-130.8	0.414	-8.4
2.12	0.010	-124.3	26.993	-133.5	0.004	-137.8	0.402	-11.0
2.13	0.010	-18.9	26.902	-141.7	0.004	-141.4	0.394	-13.7
2.14	0.025	-3.6	26.841	-149.8	0.004	-145.2	0.393	-16.1
2.15	0.041	-3.4	26.914	-157.7	0.004	-145.2	0.391	-18.8
2.16	0.057	-6.3	26.994	-165.6	0.004	-151.3	0.388	-21.2
2.17	0.074	-9.3	27.225	-173.5	0.004	-150.0	0.387	-24.7
2.18	0.093	-12.4	27.514	178.3	0.004	-157.3	0.388	-28.6
2.19	0.112	-15.8	27.867	170.1	0.004	-162.1	0.395	-32.8
2.20	0.131	-19.5	28.300	161.8	0.004	-166.5	0.403	-36.8
2.30	0.362	-59.2	34.159	54.8	0.004	149.0	0.461	-149.0
2.40	0.414	-102.3	12.482	-60.2	0.002	89.7	0.576	43.4
2.50	0.439	-125.5	4.131	-120.6	0.001	110.4	0.702	-19.3
2.60	0.468	-147.0	1.738	-165.4	0.001	151.9	0.787	-56.8
2.70	0.489	-168.4	0.808	157.7	0.001	152.9	0.826	-87.3
2.80	0.500	171.8	0.418	126.7	0.001	123.9	0.844	-112.5
2.90	0.504	151.8	0.229	100.4	0.001	129.5	0.855	-134.9
3.00	0.499	131.8	0.143	75.1	0.001	269.6	0.864	-154.3