

FEATURES

- High Power GaN HEMT for DC to 3GHz
- High Power : 130W @ 2.45GHz
- High Efficiency: 59% @ 2.45GHz
- CW Operable
- Easy of Matching: Input Pre-matched for 3GHz
- Small Flangeless Package



DESCRIPTION

Sumitomo GaN-HEMT SGNH130M1H offers high power, high efficiency, ease of matching and greater consistency for DC to 3GHz high power applications with 50V operation.

ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Condition	Rating	Unit
Operating-Voltage	V _{DS}		55	V
Drain-Source Voltage	V _{DS}	V _{GS} =-8V	200	V
Gate-Source Voltage	V _{GS}		-15	V
Total Power Dissipation	P _t	T _c =25deg.C	150	W
Storage Temperature	T _{stg}		-55 to +125	deg.C
Channel Temperature	T _{ch}		250	deg.C

RECOMMENDED OPERATING CONDITION(Case Temperature T_c= 25deg.C)

Item	Symbol	Condition	Limit	Unit
DC Input Voltage	V _{DS}		50	V
Forward Gate Current	I _{GF}	R _G =5 ohm	<125.0	mA
Reverse Gate Current	I _{GR}	R _G =5 ohm	>-7.2	mA
Channel Temperature	T _{ch}		≤ 180	deg.C

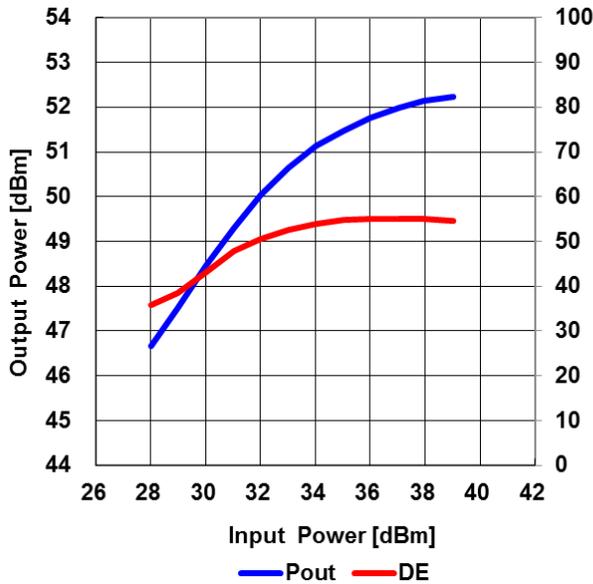
ELECTRICAL CHARACTERISTICS (Case Temperature T_c=25deg.C)

Item	Symbol	Condition	Limit			Unit
			min.	Typ.	Max.	
Pinch-Off Voltage	V _p	V _{DS} =50V, I _{DS} =36mA	-1.5	-2.5	-4.0	V
Saturated Power	P _{sat}	V _{DS} =50V, I _{DS} (DC)=500mA	-	51.1	-	dBm
Drain Efficiency	DE	f=2.45GHz, Pin=38dBm,	-	59	-	%
Linear Gain	G _p	CW	-	13.1	-	dB
Saturated Power	P _{sat}	V _{DS} =50V, I _{DS} (DC)=500mA	51.1	51.9	-	dBm
Drain Efficiency	DE	f=3GHz, Pin=38dBm,	50.0	56.5	-	%
Linear Gain	G _p	PW=200μsec, Duty=10%	-	13.9	-	dB
Thermal Resistance	R _{th}	Channel to Case P _{DC} =90W	-	1.1	1.32	deg.C/W

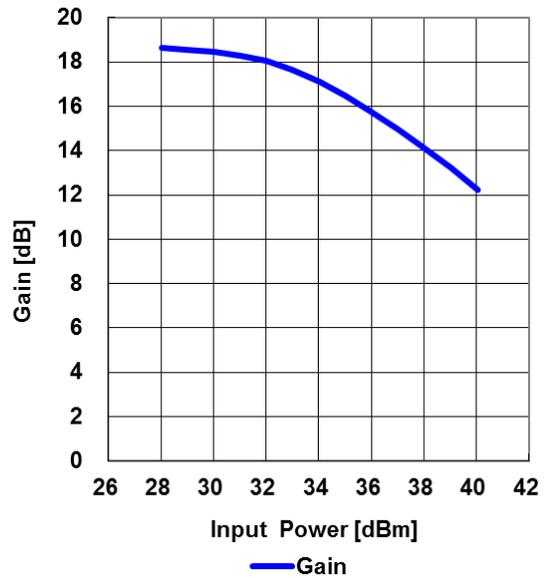
RoHS COMPLIANCE	Yes
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RF characteristics @f=3GHz, Pulse

Output Power and Drain Efficiency vs. Input Power
 VDS=50V, IDS (DC)=0.5A, f=3GHz,
 Pulse Width=200µs, 10%-duty

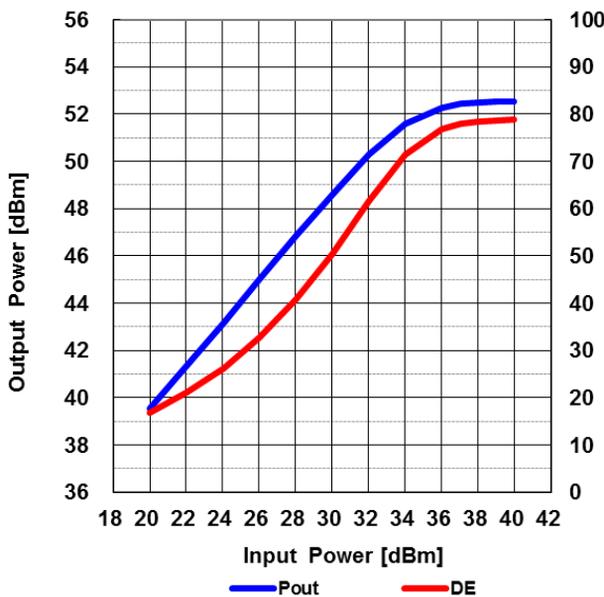


Gain vs. Input Power
 VDS=50V, IDS (DC)=0.5A, f=3GHz,
 Pulse Width=200µs, 10%-duty

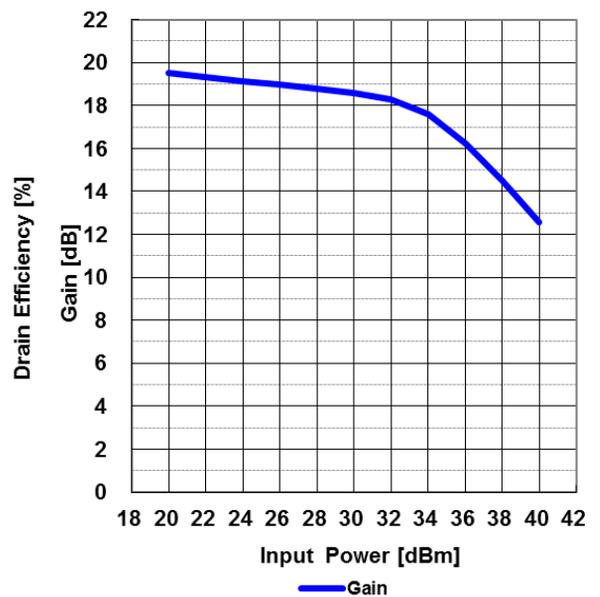


RF characteristics @f=500MHz, CW

Output Power and Drain Efficiency vs. Input Power
 VDS=50V, IDS (DC)=0.5A, f=500MHz, CW

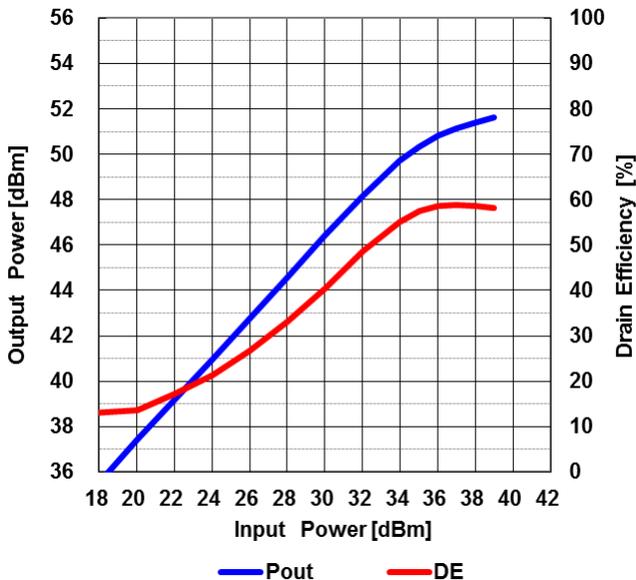


Gain vs. Input Power
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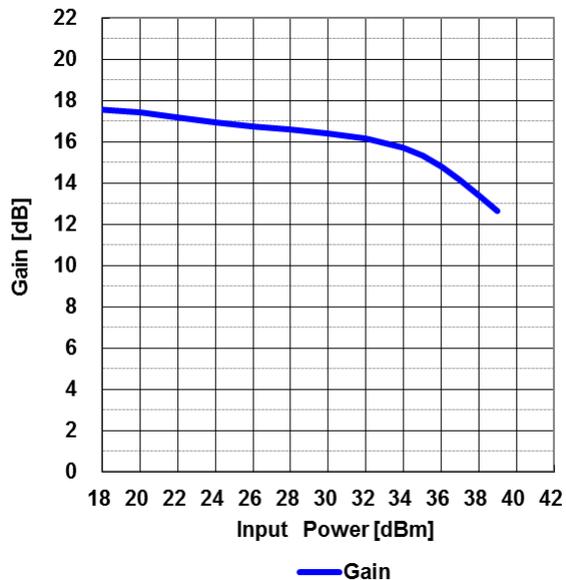


RF characteristics @f=2.45GHz, CW

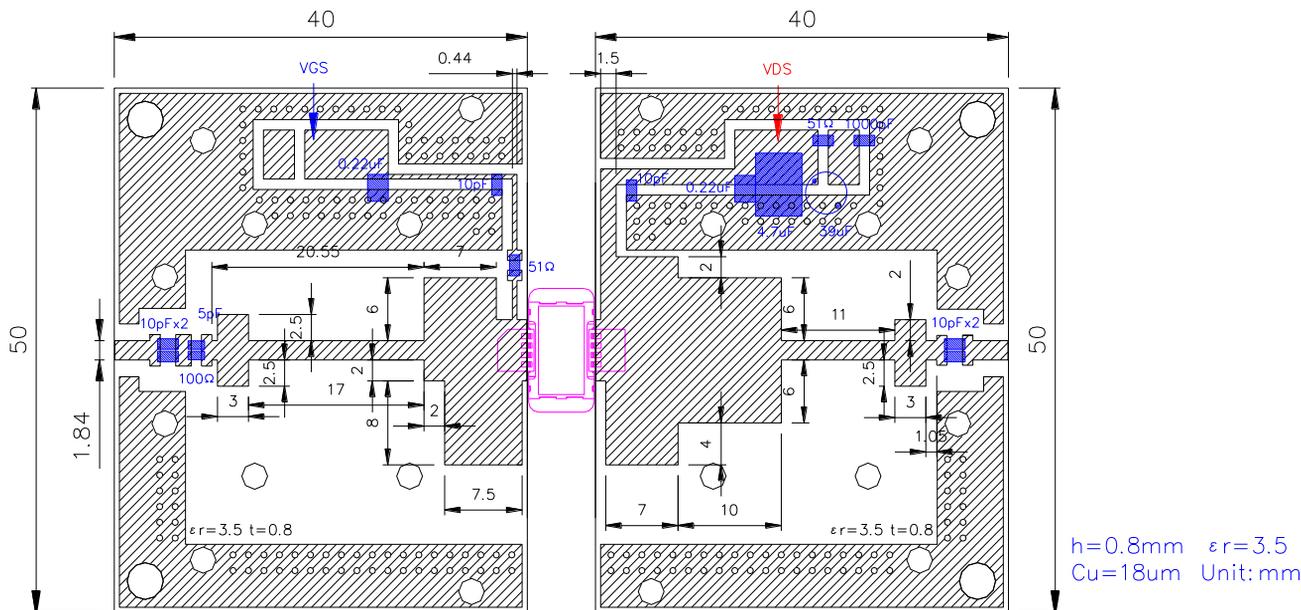
Output Power and Drain Efficiency vs. Frequency
 VDS=50V, IDS (DC)=0.5A, f=2.45GHz, CW



Gain vs. Input Power
 VDS=50V, IDS (DC)=0.5A, f=2.45GHz, CW

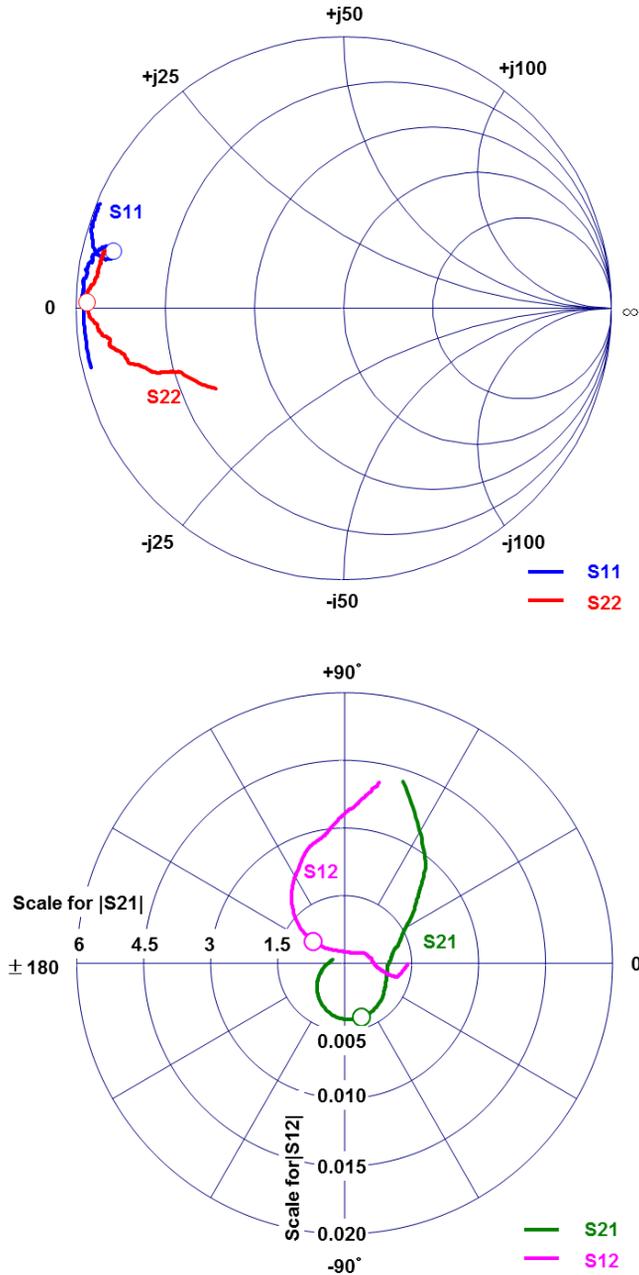


Test Fixture for 2.45GHz



- Reference DATA -

S-Parameters @V_{DS}=50V, I_{DS(DC)}=0.5A, f=0.5 to 4.5GHz
 Z_i = Z_s = 50 ohm Marker : 3.0GHz



Freq. GHz	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.5	0.97	-167.05	4.24	71.99	0.005	-0.66	0.56	-148.35
0.6	0.97	-173.95	3.39	60.26	0.004	-8.18	0.61	-153.37
0.7	0.97	179.51	2.78	49.11	0.004	-14.65	0.65	-158.82
0.8	0.97	178.64	2.36	44.28	0.004	-14.75	0.68	-160.00
0.9	0.97	177.81	2.08	39.76	0.003	-14.21	0.71	-160.62
1.0	0.98	177.21	1.86	35.31	0.003	-13.80	0.74	-161.10
1.1	0.98	176.59	1.65	31.40	0.003	-12.46	0.76	-162.41
1.2	0.97	175.87	1.48	27.56	0.003	-10.67	0.78	-163.90
1.3	0.98	174.88	1.37	23.21	0.003	-8.90	0.80	-164.82
1.4	0.98	174.45	1.28	19.46	0.002	-6.10	0.82	-165.52
1.5	0.98	173.95	1.18	16.16	0.002	-1.93	0.83	-166.83
1.6	0.97	173.28	1.11	12.20	0.002	3.32	0.84	-168.32
1.7	0.97	172.23	1.06	8.41	0.002	7.56	0.85	-169.27
1.8	0.98	171.68	1.04	4.59	0.002	11.16	0.87	-169.92
1.9	0.97	171.23	1.00	0.93	0.002	15.01	0.88	-170.74
2.0	0.97	170.42	0.97	-2.56	0.002	20.40	0.88	-171.72
2.1	0.96	169.96	0.96	-7.02	0.002	23.74	0.89	-172.90
2.2	0.95	168.98	0.97	-11.59	0.002	27.00	0.90	-173.45
2.3	0.96	168.37	0.97	-16.22	0.002	30.41	0.91	-174.36
2.4	0.95	167.93	1.00	-20.33	0.001	36.02	0.92	-175.24
2.5	0.94	167.04	1.03	-26.21	0.001	44.01	0.92	-175.84
2.6	0.93	166.52	1.07	-32.93	0.001	61.81	0.93	-176.77
2.7	0.92	165.95	1.13	-40.30	0.001	92.68	0.95	-177.83
2.8	0.91	165.50	1.18	-49.63	0.001	123.39	0.95	-178.96
2.9	0.89	165.75	1.23	-60.45	0.002	141.60	0.95	-179.94
3.0	0.89	166.27	1.25	-72.72	0.003	145.16	0.96	-178.70
3.1	0.88	167.22	1.25	-86.40	0.004	141.90	0.96	-177.16
3.2	0.89	167.96	1.19	-101.06	0.006	134.24	0.95	-175.90
3.3	0.90	168.49	1.09	-114.81	0.007	125.90	0.95	-175.08
3.4	0.92	168.28	0.96	-127.19	0.008	118.25	0.94	-174.57
3.5	0.95	167.83	0.84	-137.44	0.008	111.98	0.94	-173.75
3.6	0.96	166.77	0.73	-146.27	0.009	106.09	0.93	-172.98
3.7	0.96	165.82	0.63	-154.20	0.009	100.76	0.93	-172.66
3.8	0.97	164.67	0.56	-160.79	0.010	97.10	0.93	-171.98
3.9	0.98	163.40	0.50	-166.67	0.010	94.15	0.93	-171.31
4.0	0.99	162.28	0.44	-172.06	0.011	91.24	0.92	-170.54
4.1	0.99	161.45	0.40	-176.87	0.011	88.55	0.92	-169.99
4.2	0.99	160.28	0.36	-178.49	0.012	86.14	0.92	-169.44
4.3	0.99	158.93	0.33	-173.40	0.012	83.55	0.92	-168.32
4.4	0.99	158.01	0.30	-168.72	0.013	81.18	0.92	-167.54
4.5	0.99	157.10	0.28	-164.35	0.014	78.95	0.92	-166.72

M1H Package Outline Metal-Ceramic Hermetic Package

