

FEATURES

- High Voltage Operation : VDS=50V
- High Power : 45.0dBm (typ.) @ Psat
- Power Gain : 18dB (typ.) @ f=2.60GHz
- Proven Reliability

DESCRIPTION

SEI's GaN-HEMT offers high efficiency, ease of matching, greater consistency and broad bandwidth for high power L-band amplifiers with 50V operation, and gives you higher gain.

This new product is ideally suited for use in 2.6GHz W-CDMA and LTE design requirements as it offers high gain, long term reliability and ease of use.



ABSOLUTE MAXIMUM RATINGS (Case Temperature Tc=25deg.C)

Item	Symbol	Condition	Rating	Unit
Operating Voltage	VDS		55	V
Drain-Source Voltage	VDS	VGS=-8V	160	V
Gate-Source Voltage	VGS		-15	V
Total Power Dissipation	Pt		37.5	W
Storage Temperature	Tstg		-65 to +175	deg.C
Channel Temperature	Tch		250	deg.C

RECOMMENDED OPERATING CONDITION

Item	Symbol	Condition	Limit	Unit
DC Input Voltage	VDS		≤ 55	V
Forward Gate Current	IGF	RG=15ohm	≤ 69	mA
Reverse Gate Current	IGR	RG=15ohm	≥ -1.1	mA
Channel Temperature	Tch		≤ 180	deg.C
Average Output Power	Pave.		≤ 42.0	dBm

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

Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Pinch-Off Voltage	Vp	VDS=50V, IDS=7.8mA	-1.0	-1.5	-2.0	V
Saturated Power	Psat *1	VDS=50V	44.0	45.0	-	dBm
Drain Efficiency	ηd *2	IDS(DC)=150mA	10.5	12.5	-	%
Power Gain	Gp *2	f=2.60GHz	17.0	18.0	-	dB
Thermal Resistance	Rth	Channel to Case at 24W PDC	-	5.0	6.0	deg.C/W

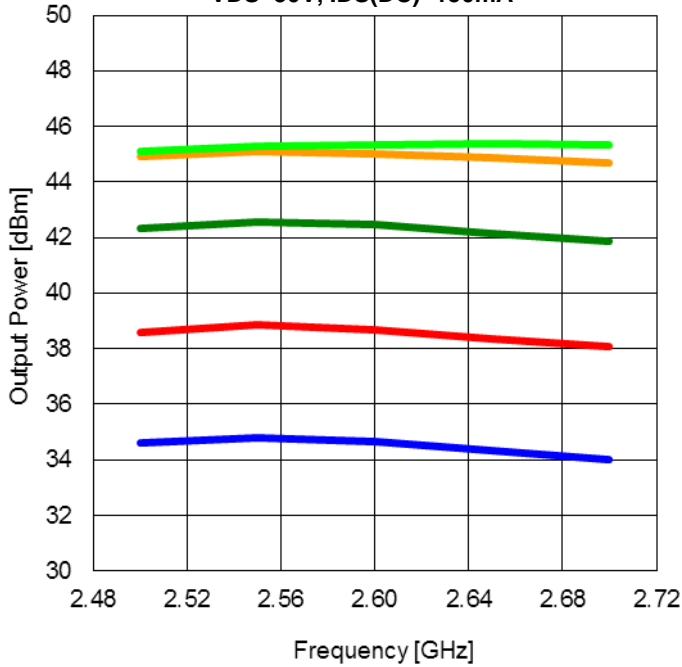
*1 : 10%-duty RF pulse (DC supply constant)

*2 : Pout=31.5dBm, CW

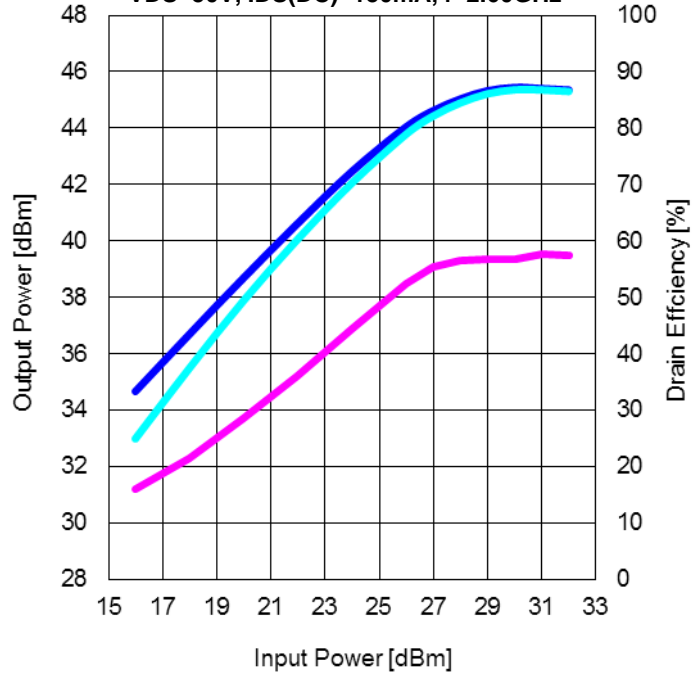
RoHS COMPLIANCE	Yes
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RF characteristics @f=2.6GHz fine tuned

Output Power vs. Frequency
VDS=50V, IDS(DC)=150mA



Output Power and Drain Efficiency vs. Input Power
VDS=50V, IDS(DC)=150mA, f=2.60GHz

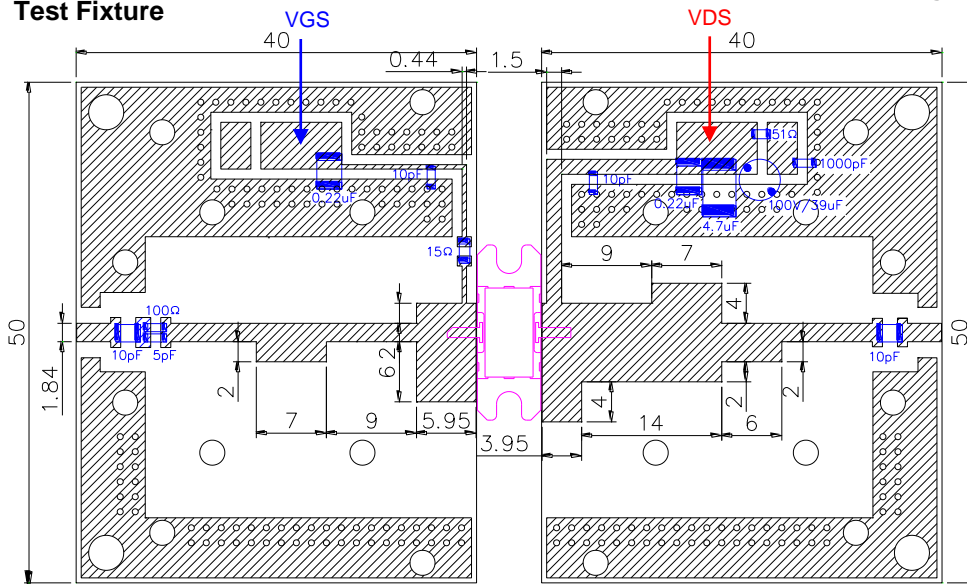


— Pin=16dBm — Pin=20dBm — Pin=24dBm
— Pin=28dBm — Pin=32dBm

— Pout (class AB) — Pout (class B) — Nd (class B)

Pulse Signal (10%-duty, DC : constant)

Test Fixture

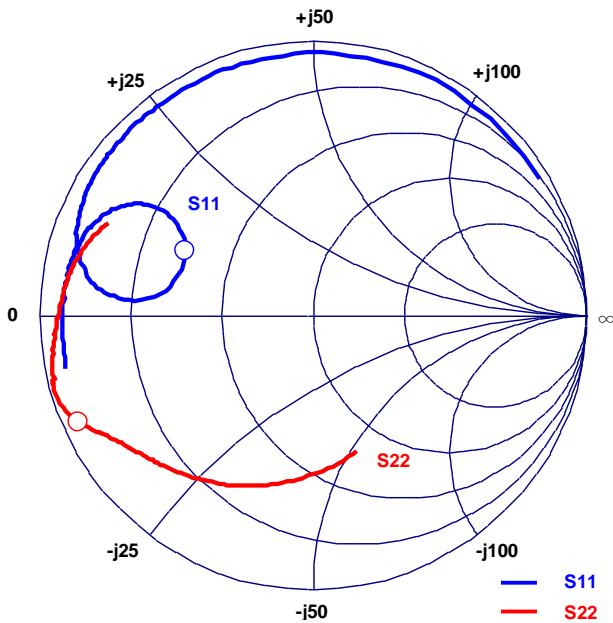


h=0.8mm εr=3.5
Cu=18um Unit:mm

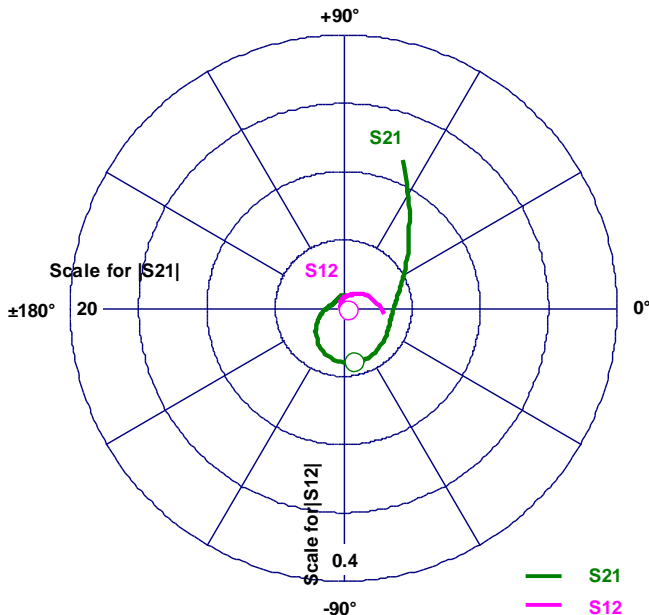
- Reference DATA -

S-Parameters @VDS=50V, IDS(DC)=150mA, f=0.5 to 5.5GHz

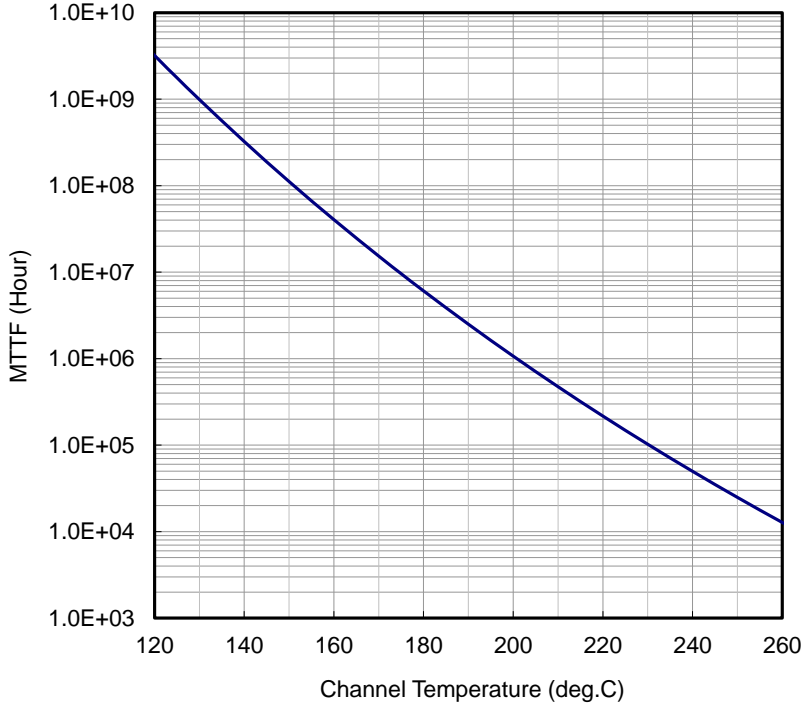
ZI = Zs = 50ohm Marker : 2.14GHz



Freq. GHz	S11			S21			S12			S22		
	MAG	ANG		MAG	ANG		MAG	ANG		MAG	ANG	
0.50	0.92	-167.59	11.70	67.79	0.008	-3.61	0.52	-72.04				
0.60	0.92	-172.48	9.72	60.78	0.007	-7.90	0.55	-80.15				
0.70	0.92	-176.60	8.30	54.02	0.008	-7.03	0.58	-87.84				
0.80	0.92	-179.44	7.19	47.93	0.007	-12.96	0.60	-95.06				
0.90	0.91	-177.63	6.39	41.13	0.007	-12.66	0.63	-101.89				
1.00	0.91	-174.88	5.69	35.94	0.006	-9.94	0.65	-107.94				
1.10	0.91	-172.55	5.19	29.99	0.006	-16.19	0.68	-113.18				
1.20	0.91	-170.24	4.79	24.93	0.005	-14.65	0.70	-117.85				
1.30	0.90	-167.97	4.45	19.72	0.005	-5.79	0.72	-122.32				
1.40	0.90	-165.69	4.17	14.42	0.005	-0.55	0.74	-126.16				
1.50	0.89	-163.35	3.98	9.17	0.005	6.30	0.75	-129.89				
1.60	0.89	-161.40	3.82	4.20	0.005	9.66	0.77	-133.34				
1.70	0.88	-158.96	3.71	-1.39	0.005	10.74	0.78	-136.35				
1.80	0.86	-156.89	3.63	-6.27	0.006	16.54	0.80	-139.23				
1.90	0.85	-154.47	3.61	-12.70	0.006	11.11	0.81	-141.64				
2.00	0.82	-152.07	3.62	-18.57	0.006	10.52	0.83	-144.05				
2.10	0.80	-149.99	3.68	-25.34	0.008	11.04	0.84	-145.93				
2.20	0.76	-147.55	3.77	-32.53	0.009	5.39	0.86	-147.84				
2.30	0.71	-146.24	3.86	-41.62	0.009	1.33	0.87	-149.71				
2.40	0.65	-145.27	4.03	-51.19	0.010	-3.21	0.89	-151.12				
2.50	0.58	-147.18	4.13	-63.84	0.012	-13.71	0.92	-153.08				
2.60	0.52	-153.63	4.14	-77.53	0.011	-24.72	0.94	-155.54				
2.70	0.51	-163.84	4.01	-92.37	0.011	-44.31	0.96	-158.18				
2.80	0.56	-172.23	3.69	-106.85	0.010	-53.14	0.98	-160.88				
2.90	0.65	-175.72	3.31	-121.41	0.009	-69.37	0.99	-163.63				
3.00	0.73	-174.59	2.85	-132.69	0.007	-85.79	0.98	-166.06				
3.10	0.80	-172.88	2.46	-143.63	0.006	-91.42	0.97	-168.12				
3.20	0.84	-170.30	2.11	-151.48	0.005	-110.01	0.97	-169.98				
3.30	0.87	-166.92	1.82	-159.19	0.005	-122.98	0.96	-171.46				
3.40	0.90	-163.95	1.59	-165.58	0.003	-153.13	0.96	-172.89				
3.50	0.91	-161.43	1.40	-171.42	0.003	-171.61	0.95	-174.25				
3.60	0.92	-159.07	1.24	-175.62	0.004	-174.53	0.95	-175.43				
3.70	0.93	-156.66	1.12	-178.88	0.004	-149.65	0.94	-176.73				
3.80	0.93	-154.41	1.01	-175.55	0.005	-140.15	0.94	-177.75				
3.90	0.94	-151.86	0.94	-171.20	0.006	-127.27	0.94	-179.05				
4.00	0.94	-149.46	0.86	-167.38	0.007	-120.23	0.93	-179.79				
4.10	0.95	-146.93	0.82	-163.80	0.008	-111.19	0.92	-178.90				
4.20	0.95	-144.31	0.77	-159.87	0.010	-102.85	0.92	-177.49				
4.30	0.95	-141.61	0.75	-156.19	0.011	-97.08	0.92	-176.59				
4.40	0.95	-138.10	0.72	-152.29	0.014	-90.28	0.91	-175.25				
4.50	0.95	-134.43	0.70	-147.74	0.015	-81.75	0.91	-174.02				
4.60	0.95	-130.16	0.70	-143.86	0.017	-75.18	0.91	-172.64				
4.70	0.95	-125.66	0.69	-139.07	0.018	-69.23	0.91	-171.22				
4.80	0.95	-120.21	0.70	-133.73	0.022	-61.37	0.90	-169.71				
4.90	0.95	-113.90	0.72	-128.40	0.024	-54.72	0.89	-168.18				
5.00	0.95	-106.02	0.74	-122.06	0.027	-47.23	0.88	-166.48				
5.10	0.95	-96.55	0.78	-115.40	0.033	-38.00	0.88	-164.63				
5.20	0.95	-85.01	0.82	-106.59	0.038	-28.89	0.87	-162.71				
5.30	0.96	-70.36	0.87	-97.12	0.044	-17.89	0.85	-160.56				
5.40	0.96	-52.81	0.93	-84.44	0.051	-6.14	0.84	-158.35				
5.50	0.97	-30.93	0.97	-71.24	0.060	-8.37	0.82	-155.95				



**MTTF Calculation
- Estimated MTTF -**



**Ea=1.6eV
Confidence Level=90%**

Channel Temp. (deg.C)	MTTF (Hours)
160	4.05 x 10 ⁷
180	6.07 x 10 ⁶
200	1.07 x 10 ⁶

$$AF = \exp\left[\frac{-Ea}{k}\left(\frac{1}{T_{stress}} - \frac{1}{T_{use}}\right)\right]$$

$$MTTF_{use} = MTTF_{stress} \times AF$$

Where;

AF : acceleration factor

Ea : activation energy (1.6eV)

k : Boltzmann's constant (8.62x10⁻⁵eV/K)

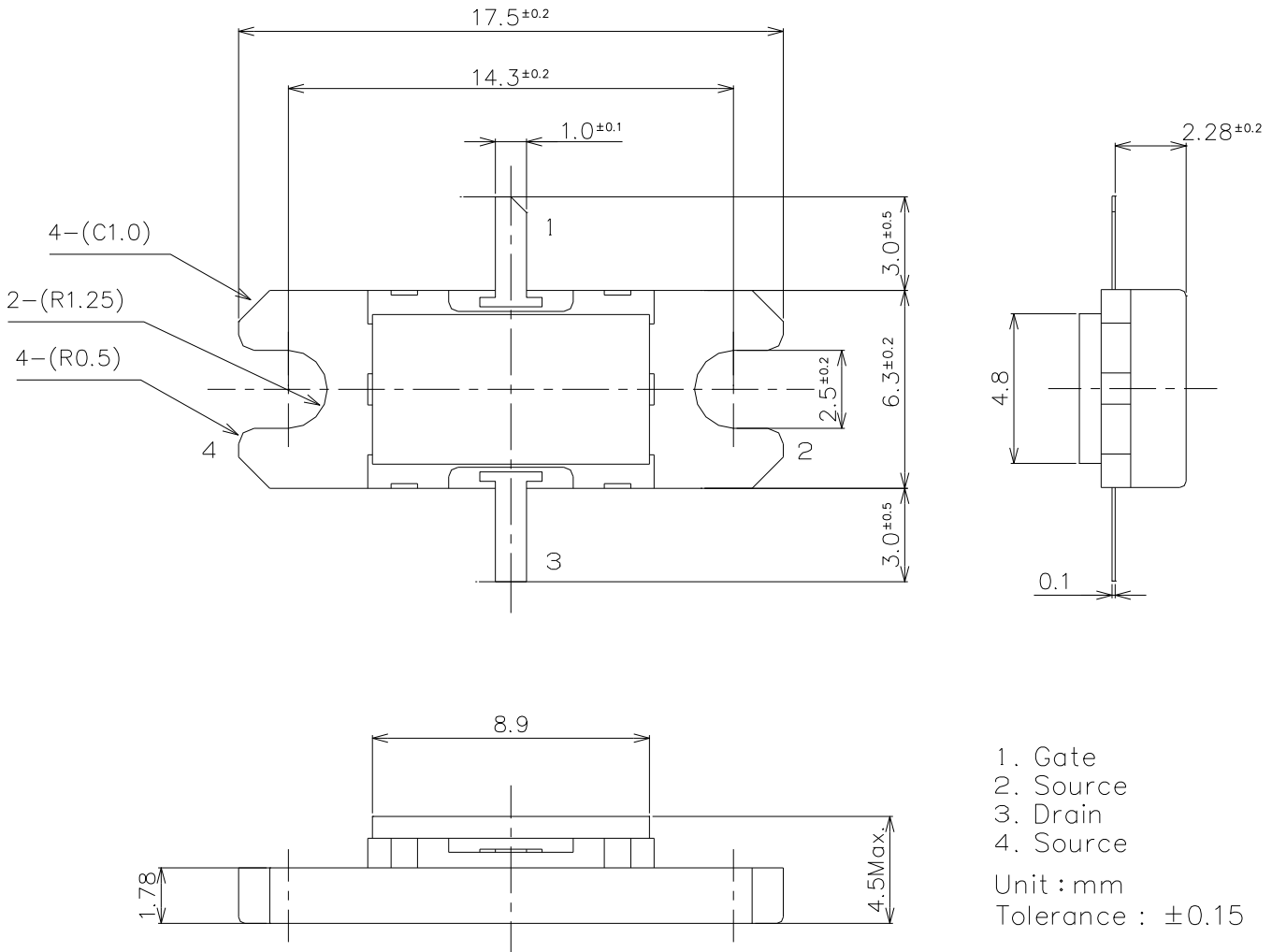
T_{stress} : stress temperature (K)

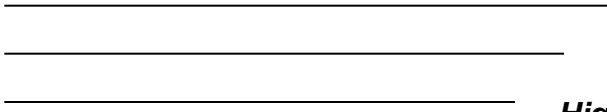
T_{use} : use temperature (K)

ESD characteristic

Test Methodology	Class
Human Body Model (per JESD22-A114)	0
Machine Model (per JEIA/ESD22-A115)	A

MK Package Outline Metal-Ceramic Hermetic Package





EGN26C030MK

High Voltage - High Power GaN-HEMT

For further information please contact:

<http://global-sei.com/Electro-optic/about/office.html>