EGNB090MK

High Voltage - High Power GaN-HEMT

FEATURES

- High Voltage Operation : V_{DS}=50V
- High Power : 51.0dBm (typ.) @ P3dB
- High Efficiency: 70%(typ.) @ P3dB
- Linear Gain : 18dB(typ.) @ f=0.9GHz
- Proven Reliability

DESCRIPTION

SEDI'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 device target applications are low current and wide band applications for high voltage.

ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Condition	Rating	Unit
Drain-Source Voltage	V_{DS}		120	V
Gate-Source Voltage	V_{GS}		-5	V
Total Power Dissipation	P_t	Tc=25°C	150	W
Storage Temperature	T_{stg}		-65 to +175	°C
Channel Temperature	T_{ch}		250	°C

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

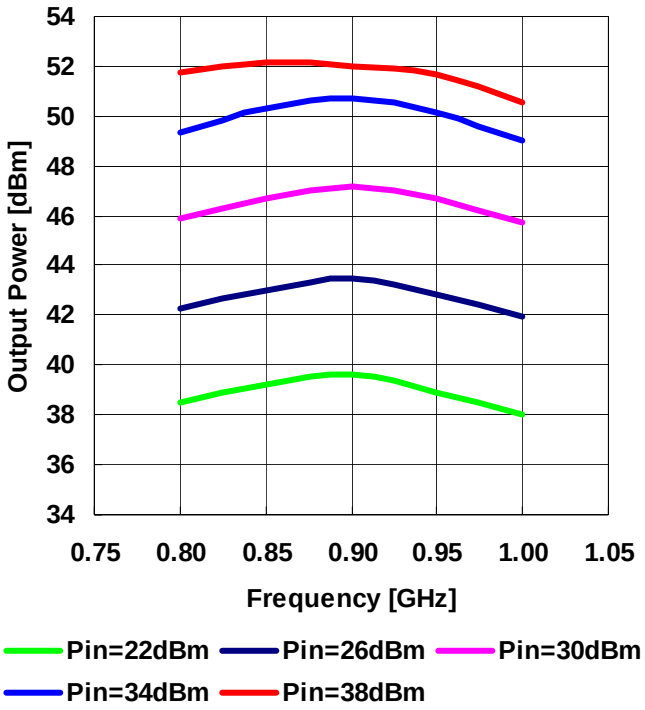
Item	Symbol	Condition	Limit	Unit
DC Input Voltage	V_{DS}		50	V
Forward Gate Current	I_{GF}	R_G=5 Ω	<76.0	mA
Reverse Gate Current	I_{GR}	R_G=5 Ω	>-7.2	mA

ELECTRICAL CHARACTERISTICS (Case Temperature Tc=25°C)

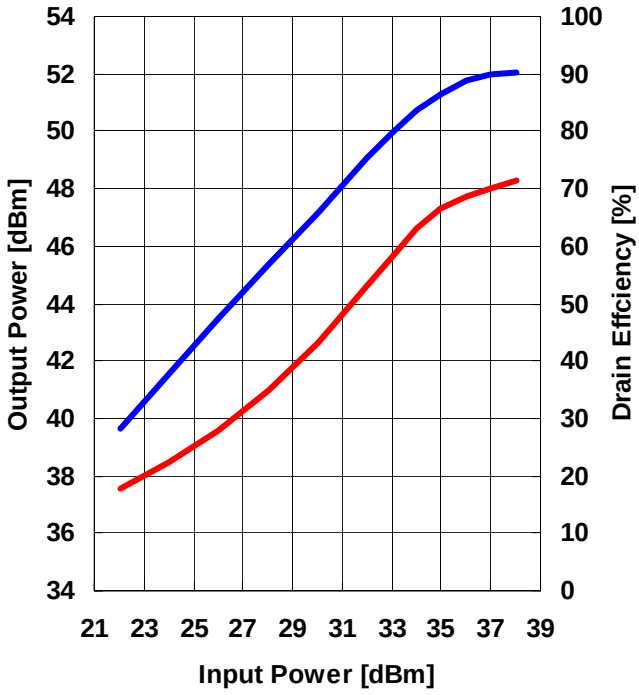
Item	Symbol	Condition	Limit			Unit
			min.	Typ.	Max.	
Pinch-Off Voltage	V_p	V_{DS}=50V I_{DS}=36mA	-1.0	-2.0	-3.5	V
3dB Gain Compression Power	P_{3dB}	V_{DS}=50V	50.0	51.0	-	dBm
Drain Efficiency	η_d	$I_{DS(DC)}$=500mA	-	70	-	%
Linear Gain	G_L	f=0.9GHz	16	18	-	dB
Thermal Resistance	R_{th}	Channel to Case at 90W P_{DC}	-	1.2	1.5	°C/W

RF Performance @f=0.9GHz fine tuned

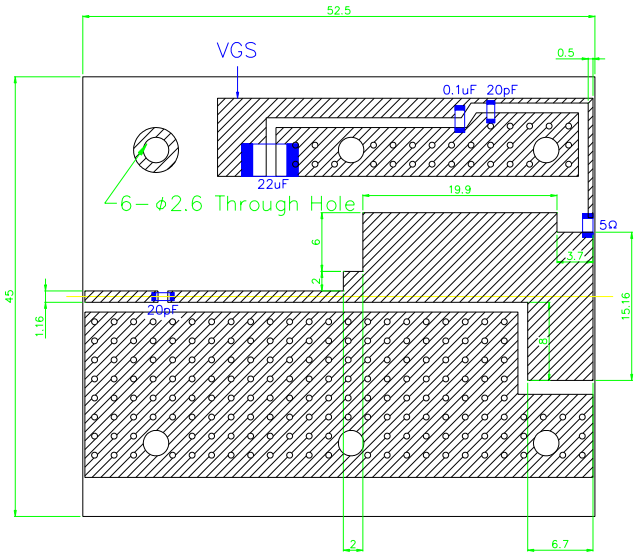
Output Power vs. Frequency
VDS=50V IDS(DC)=500mA

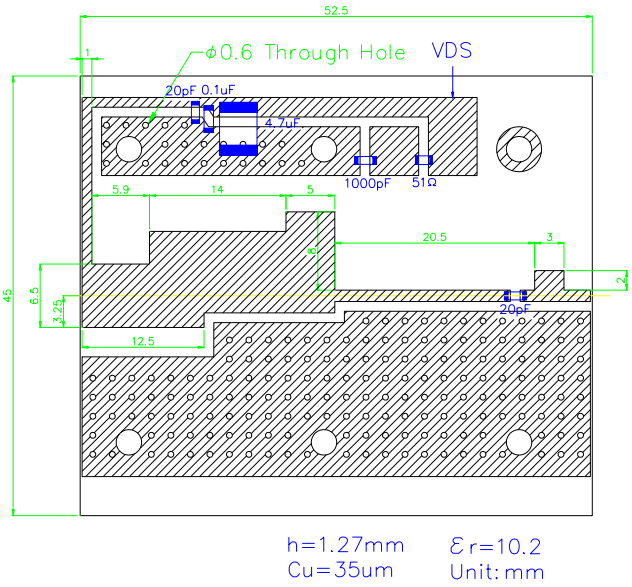


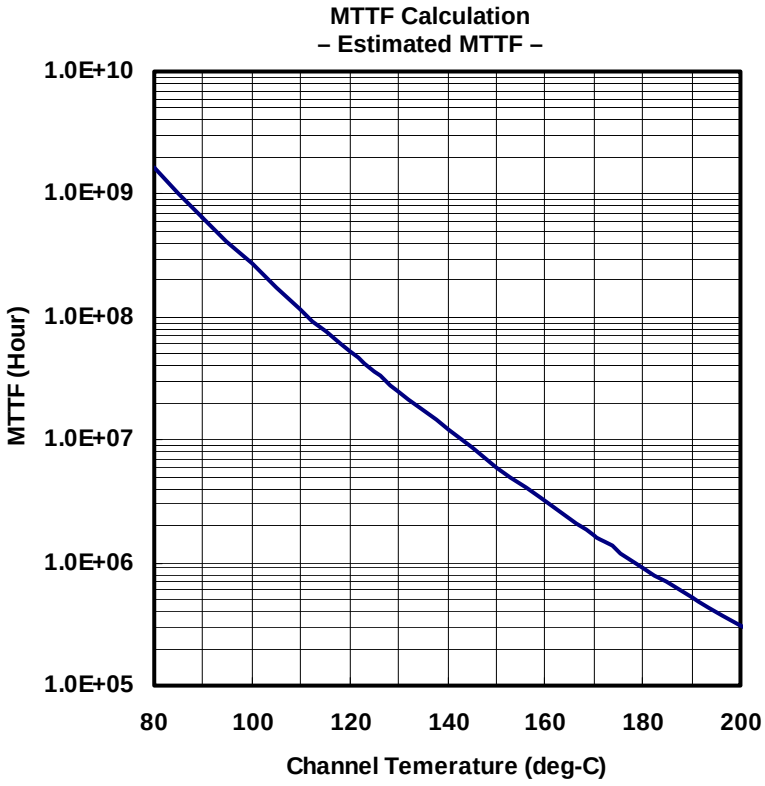
Output Power and Drain Efficiency vs. Input Power
VDS=50V IDS(DC)=500mA f=0.9GHz



Test Fixture

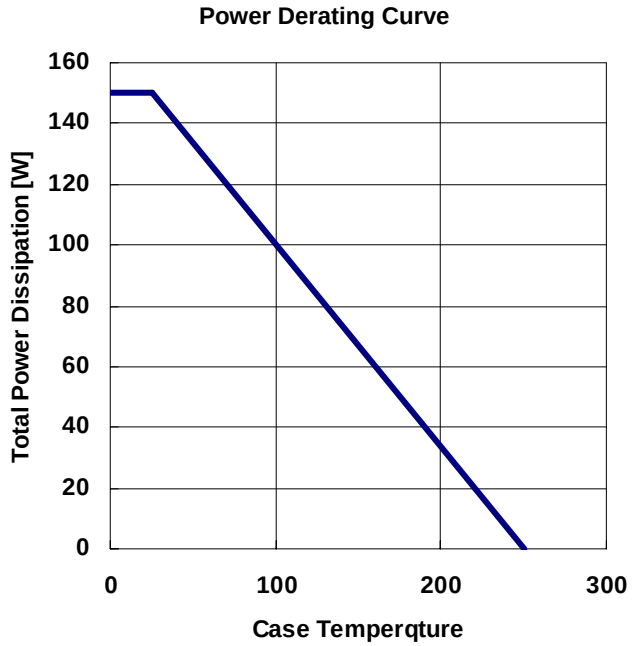






Confidence Level=60%

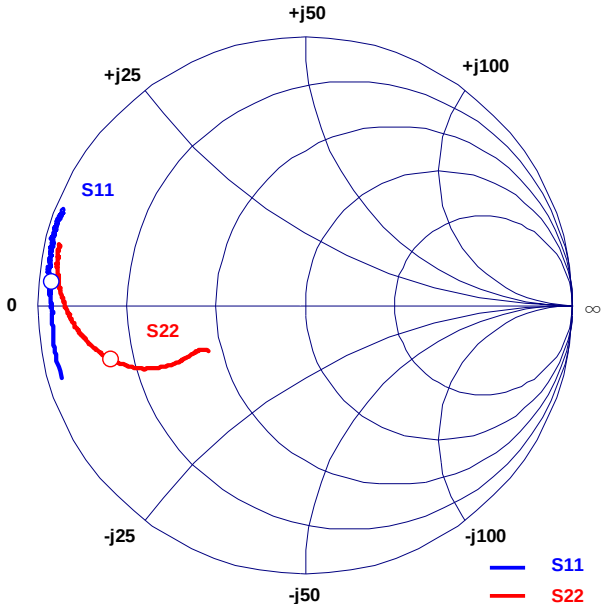
Channel Temp (deg-C)	MTTF (years)
125	3796
150	640
180	98
200	32

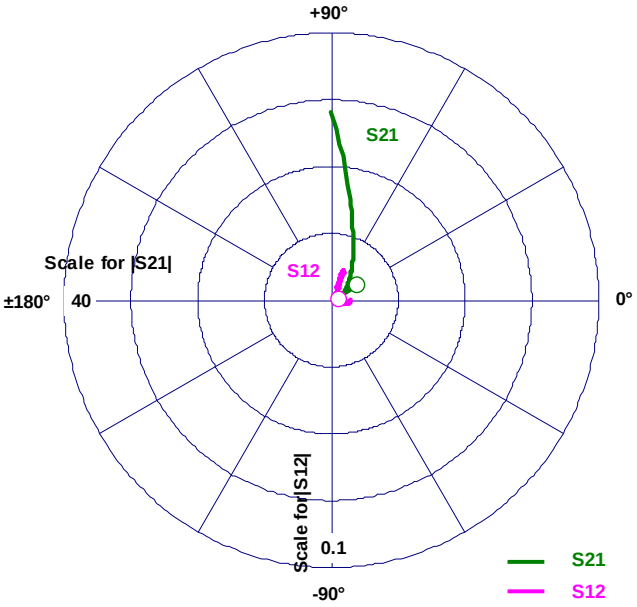


ESD characteristic

Test Methodology	Class
Human Body Model (per JESD22-A114)	1B
Machine Model (per JEIA/ESD22-A115)	A

S-Parameters @V_{DS}=50V I_{DS}=500mA f=0.1 to 3.1 GHz
$Z_l = Z_s$ = 50 ohm Marker : 0.9GHz





Freq.	S11		S21		S12		S22	
GHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.10	0.95	-163.59	28.25	90.39	0.007	3.53	0.40	-154.94
0.20	0.95	-173.13	13.73	77.47	0.007	-6.40	0.44	-157.04
0.30	0.95	-176.51	8.78	68.19	0.006	-12.21	0.49	-156.28
0.40	0.95	-178.84	6.29	60.27	0.006	-11.45	0.54	-156.08
0.50	0.95	179.59	4.76	52.89	0.005	-15.58	0.60	-157.05
0.60	0.95	178.20	3.75	46.56	0.004	-12.27	0.64	-158.44
0.70	0.96	177.09	3.04	40.68	0.004	-9.22	0.69	-160.41
0.80	0.96	175.77	2.49	35.02	0.003	-5.30	0.72	-162.48
0.90	0.95	174.85	4.42	29.82	0.003	3.09	0.75	-164.53
1.00	0.96	173.67	1.78	24.92	0.003	20.77	0.78	-166.57
1.10	0.97	172.58	1.53	20.42	0.003	27.53	0.80	-168.49
1.20	0.97	171.65	1.32	16.02	0.003	30.98	0.82	-170.29
1.30	0.96	170.90	1.15	12.14	0.003	47.43	0.84	-172.09
1.40	0.97	170.21	1.02	8.06	0.004	53.69	0.85	-173.77
1.50	0.97	169.28	0.91	4.44	0.004	58.41	0.87	-175.52
1.60	0.97	168.10	0.81	0.53	0.004	57.70	0.88	-176.99
1.70	0.97	167.19	0.72	-3.10	0.005	58.09	0.89	-178.62
1.80	0.97	166.76	0.66	-6.25	0.006	64.81	0.90	-179.81
1.90	0.98	166.11	0.60	-8.91	0.006	62.86	0.91	178.90
2.00	0.98	165.23	0.56	-12.45	0.006	66.05	0.91	177.65
2.10	0.97	164.82	0.51	-15.26	0.007	66.05	0.92	176.51
2.20	0.97	164.01	0.48	-18.44	0.007	68.64	0.92	175.32
2.30	0.98	162.94	0.44	-22.22	0.008	63.50	0.93	174.16
2.40	0.98	162.66	0.41	-24.66	0.009	68.56	0.93	173.18
2.50	0.97	161.58	0.39	-27.48	0.009	66.77	0.94	172.08
2.60	0.98	161.52	0.37	-29.68	0.010	65.02	0.94	171.19
2.70	0.98	160.72	0.35	-32.99	0.010	65.50	0.94	170.33
2.80	0.98	160.09	0.33	-35.23	0.010	66.48	0.94	169.29
2.90	0.97	159.57	0.32	-38.92	0.011	66.34	0.94	168.30
3.00	0.97	159.08	0.31	-40.35	0.011	66.90	0.95	167.45
3.10	0.97	158.34	0.29	-43.59	0.012	67.67	0.95	166.20

MK Package Outline
Metal-Ceramic Hermetic Package