

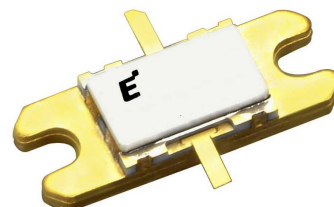


EGNB070MK

High Voltage - High Power GaN-HEMT

FEATURES

- High Voltage Operation : $V_{DS}=50V$
- High Power : 49.5dBm (typ.) @ P3dB
- High Efficiency: 70%(typ.) @ P3dB
- Linear Gain : 18dB(typ.) @ $f=0.9GHz$
- Proven Reliability



DESCRIPTION

Eudyna'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}	$T_c=25^{\circ}C$	120	V
Gate-Source Voltage	V_{GS}		-5	V
Total Power Dissipation	P_t		118.5	W
Storage Temperature	T_{stg}		-65 to +175	$^{\circ}C$
Channel Temperature	T_{ch}		250	$^{\circ}C$

RECOMMENDED OPERATING CONDITION(Case Temperature $T_c= 25^{\circ}C$)

Item	Symbol	Condition	Limit	Unit
DC Input Voltage	V_{DS}		50	V
Forward Gate Current	I_{GF}	$R_G=5\ \Omega$	<57.0	mA
Reverse Gate Current	I_{GR}	$R_G=5\ \Omega$	>-5.4	mA

ELECTRICAL CHARACTERISTICS (Case Temperature $T_c=25^{\circ}C$)

Item	Symbol	Condition	Limit			Unit
			min.	Typ.	Max.	
Pinch-Off Voltage	V_p	$V_{DS}=50V$ $I_{DS}=27mA$	-1.0	-2.0	-3.5	V
3dB Gain Compression Power	P_{3dB}	$V_{DS}=50V$	48.5	49.5	-	dBm
Drain Efficiency	η_d	$I_{DS}(DC)=400mA$	-	70	-	%
Linear Gain	GL	$f=0.9GHz$	16	18	-	dB
Thermal Resistance	R_{th}	Channel to Case at 72W P_{DC}	-	1.5	1.9	$^{\circ}C/W$



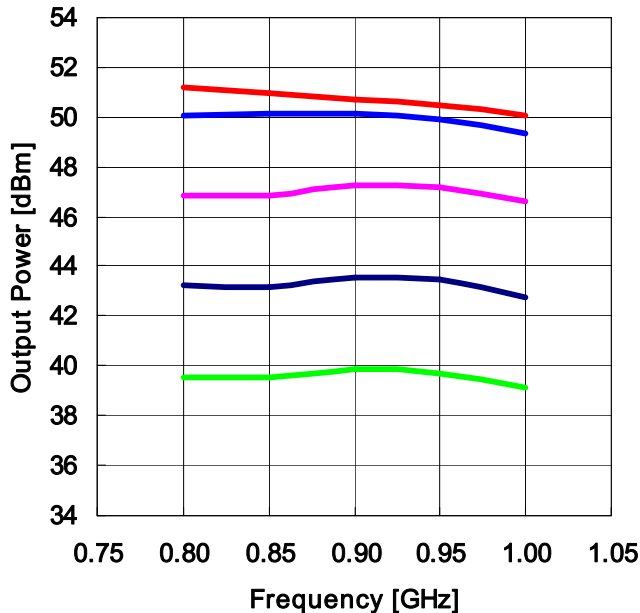


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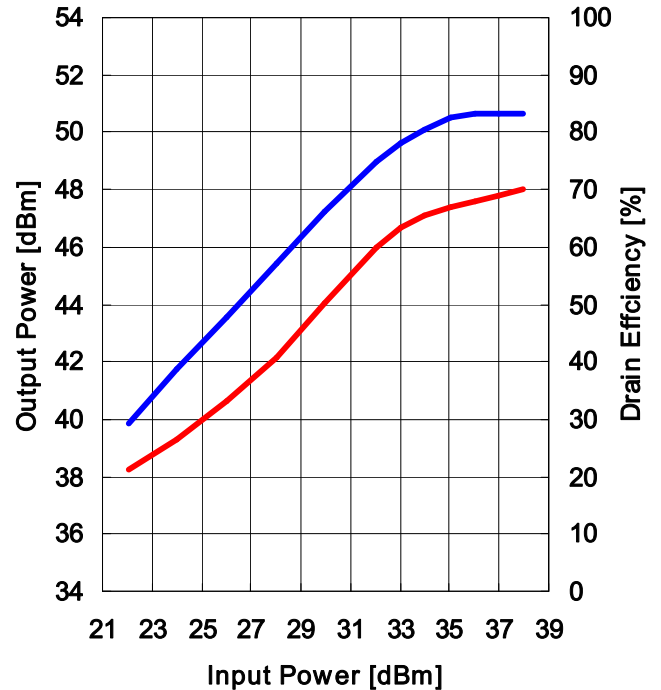
RF Performance @f=0.9GHz fine tuned

Output Power vs. Frequency
V_{DS}=50V I_{DS(DC)}=400mA

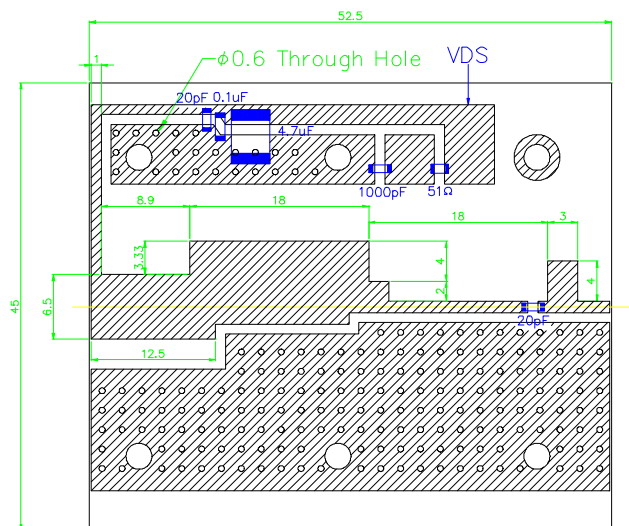
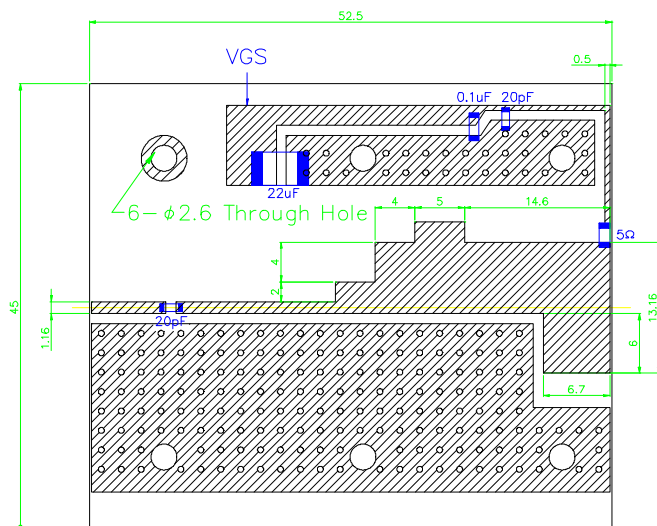


Pin=22dBm Pin=26dBm Pin=30dBm
Pin=34dBm Pin=38dBm

Output Power and Drain Efficiency vs. Input Power
V_{DS}=50V I_{DS(DC)}=400mA f=0.9GHz



Test Fixture



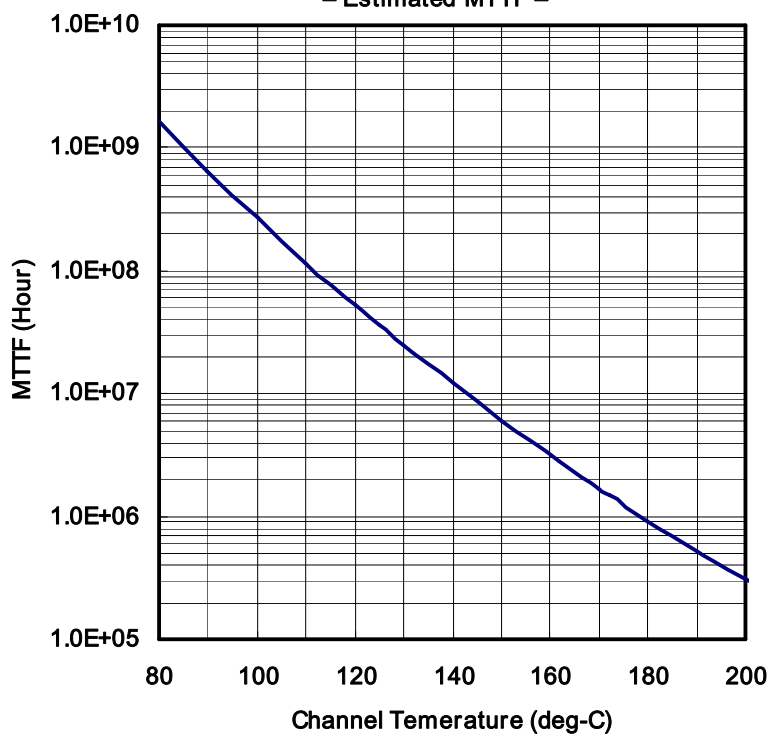
h=1.27mm $\epsilon_r=10.2$
Cu=35um Unit: mm



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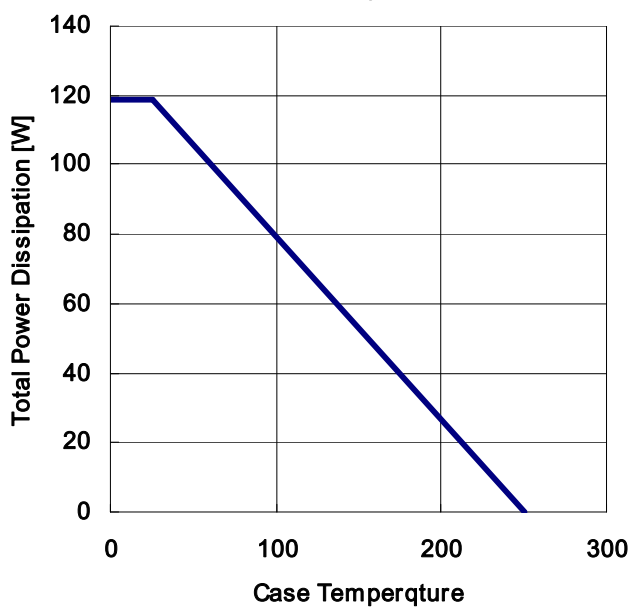
MTTF Calculation
– Estimated MTTF –



Confidence Level=60%

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

Power Derating Curve



ESD characteristic

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

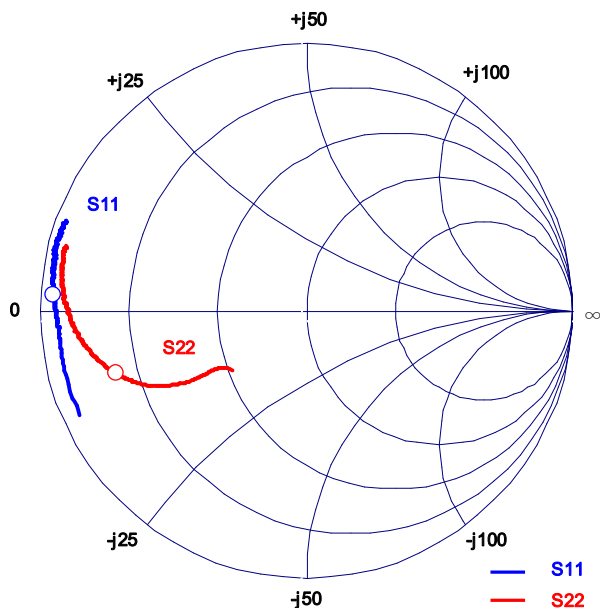




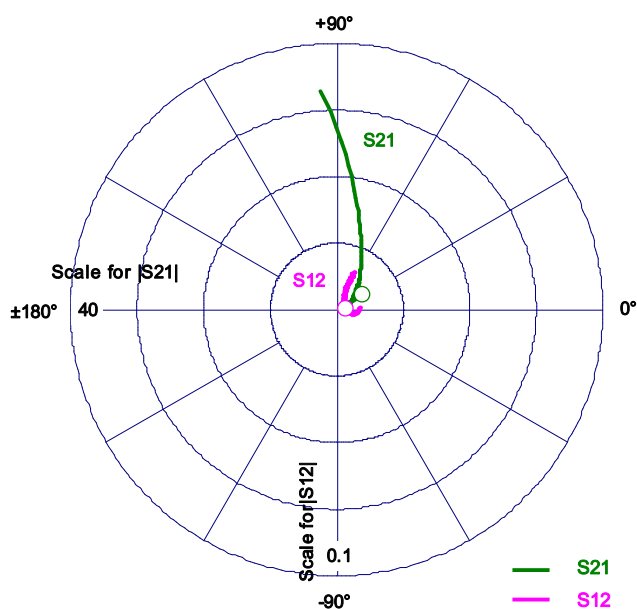
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S-Parameters @V_{DS}=50V I_{DS}=400mA f=0.1 to 3.1 GHz
Z_I = Z_s = 50 ohm Marker : 0.9GHz



Freq. GHz	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.10	0.94	-155.25	32.86	94.23	0.009	6.47	0.36	-141.10
0.20	0.93	-168.77	16.10	79.09	0.008	-4.82	0.41	-147.56
0.30	0.93	-173.52	10.31	69.03	0.007	-11.25	0.46	-148.30
0.40	0.93	-176.17	7.38	60.61	0.007	-13.45	0.52	-149.37
0.50	0.94	-178.14	5.58	53.07	0.006	-15.46	0.58	-151.44
0.60	0.94	-179.72	4.39	46.60	0.005	-16.73	0.63	-153.82
0.70	0.95	-178.93	3.54	40.80	0.004	-11.34	0.68	-156.45
0.80	0.95	-177.56	2.91	34.98	0.004	-7.15	0.72	-159.14
0.90	0.95	-176.46	4.42	29.90	0.003	3.99	0.75	-161.71
1.00	0.96	-175.22	2.06	25.17	0.003	14.18	0.78	-164.28
1.10	0.96	-174.06	1.77	20.74	0.003	26.60	0.80	-166.58
1.20	0.97	-173.14	1.53	16.68	0.003	35.40	0.82	-168.69
1.30	0.96	-172.20	1.33	12.81	0.004	45.18	0.84	-170.78
1.40	0.97	-171.56	1.18	9.35	0.004	53.63	0.85	-172.69
1.50	0.97	-170.45	1.05	6.03	0.005	55.20	0.87	-174.56
1.60	0.96	-169.50	0.94	2.18	0.005	58.56	0.88	-176.36
1.70	0.97	-168.47	0.84	-1.19	0.006	57.62	0.89	-178.04
1.80	0.97	-168.18	0.77	-3.70	0.006	63.11	0.90	-179.50
1.90	0.97	-167.31	0.70	-6.65	0.007	64.89	0.90	-179.05
2.00	0.97	-166.27	0.64	-9.85	0.008	66.69	0.91	-177.70
2.10	0.97	-165.99	0.59	-12.67	0.009	66.05	0.91	-176.52
2.20	0.97	-165.01	0.55	-15.12	0.009	65.97	0.92	-175.20
2.30	0.97	-164.16	0.51	-18.36	0.009	65.82	0.92	-173.96
2.40	0.97	-163.93	0.48	-21.03	0.010	66.15	0.93	-172.74
2.50	0.97	-162.74	0.44	-23.48	0.011	66.18	0.93	-171.62
2.60	0.97	-162.49	0.43	-25.48	0.011	64.52	0.93	-170.51
2.70	0.98	-161.92	0.40	-28.44	0.012	64.30	0.94	-169.58
2.80	0.97	-161.23	0.38	-30.78	0.013	66.19	0.93	-168.32
2.90	0.97	-160.92	0.36	-34.06	0.013	64.40	0.94	-167.21
3.00	0.97	-160.31	0.35	-35.59	0.014	65.64	0.94	-166.20
3.10	0.97	-159.50	0.33	-37.42	0.015	65.18	0.94	-164.99





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MK Package Outline Metal-Ceramic Hermetic Package

