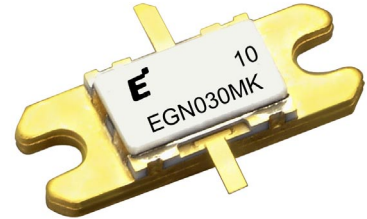# Eudyna GaN-HEMT 30W

EGN030MK

Preliminary

High Voltage - High Power GaN-HEMT

FEATURES

- High Voltage Operation : V_{DS}=50V
- High Power : 46.5dBm (typ.) @ P3dB
- High Efficiency: 60%(typ.) @ P3dB
- Linear Gain : 12dB(typ.) @ f=2700MHz
- Broad Frequency Range : 800 to 2800MHz
- Proven Reliability

DESCRIPTION

Eudyna's GaN-HEMT offers high efficiency, ease of matching, greater consistency and broad bandwidth for high power L-band amplifiers wit 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}	Tc=25ºC	-5	V
Total Power Dissipation	P_t		56.25	W
Storage Temperature	T_{stg}		-65 to +175	ºC
Channel Temperature	T_{ch}		250	ºC

RECOMMENDED OPERATING CONDITION(Case Temperature Tc= 25ºC)

Item	Symbol	Condition	Limit	Unit
DC Input Voltage	V_{DS}		50	V
Forward Gate Current	I_{GF}	R_G=15 Ω	<6.1	mA
Reverse Gate Current	I_{GR}	R_G=15 Ω	>-2.2	mA
Channel Temperature	T_{ch}		200	ºC

ELECTRICAL CHARACTERISTICS (Case Temperature Tc=25ºC)

| Item	Symbol	Condition	Limit			Unit
			min.	Typ.	Max.	
Pinch-Off Voltage	V_p	VDS=50V IDS=11mA	-1.0	-2.0	-3.5	V
Gate-Drain Breakdown Voltage	V_{GDO}	IGS=- 5.6 mA	-	-350	-	V
3dB Gain Compression Power	P_{3dB}	VDS=50V	45.5	46.5	-	dBm
Drain Efficiency	η_d	IDS(DC)=200mA	-	60	-	%
Linear Gain	GL	f=2.7GHz	11.0	12.0	-	dB
Thermal Resistance	R_{th}	Channel to Case	-	3.0	4.0	ºC/W

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High Voltage - High Power GaN-HEMT

Output Power vs. Frequency
VDS=50V IDS(DC)=200mA
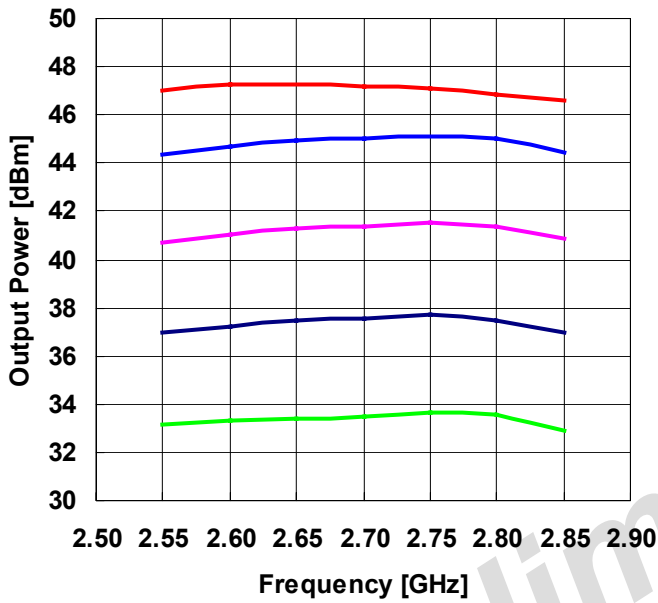
Output Power and Drain Efficiency vs. Input Power
VDS=50V IDS(DC)=200mA f=2.7GHz

Output Power

Drain Effi.
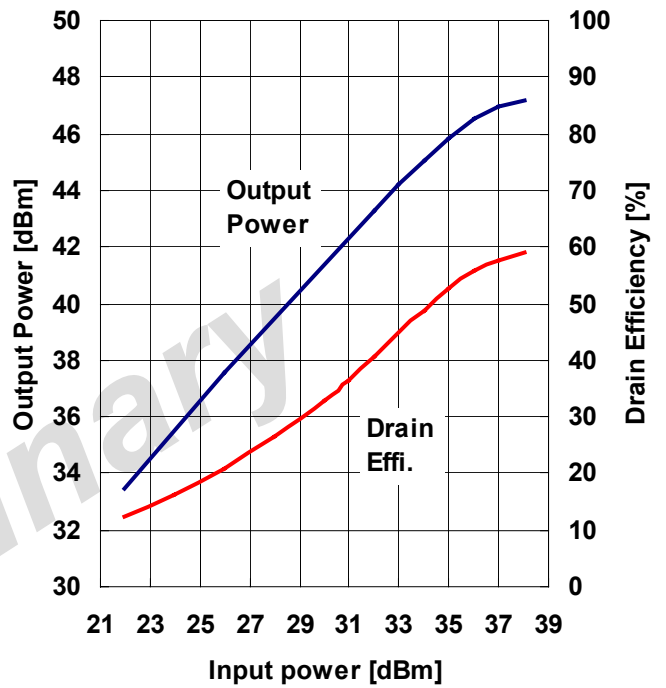
Pin=22dBm ——— Pin=26dBm ——— Pin=30dBm ———
Pin=34dBm ——— Pin=38dBm ———

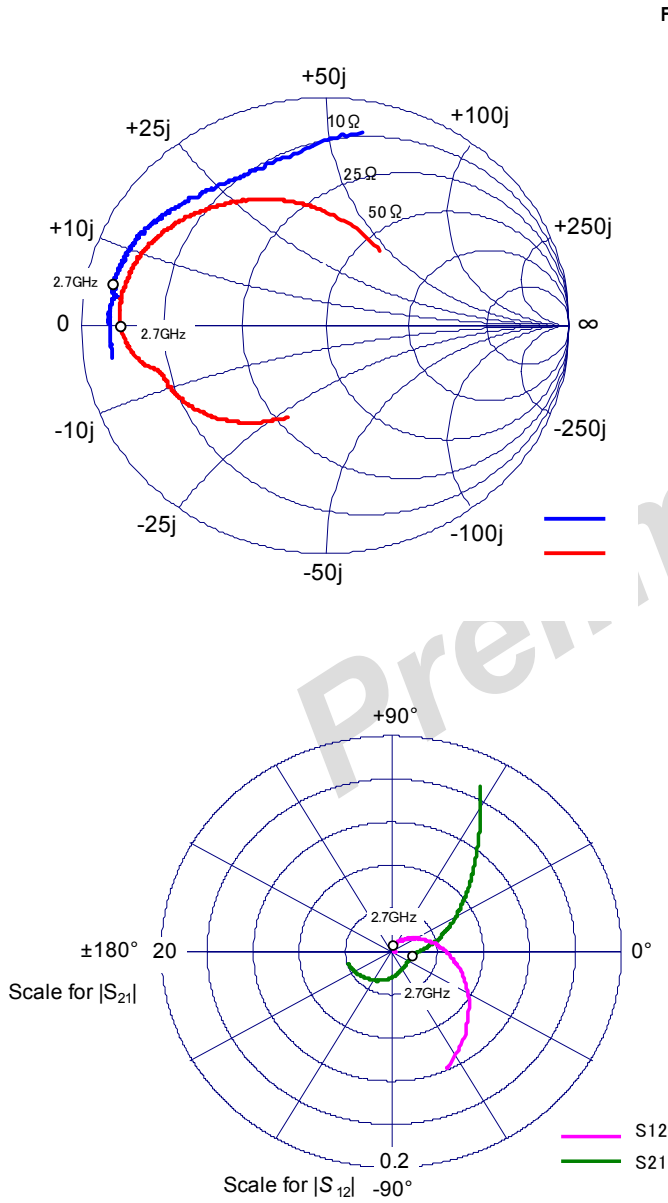### Power Derating Curve

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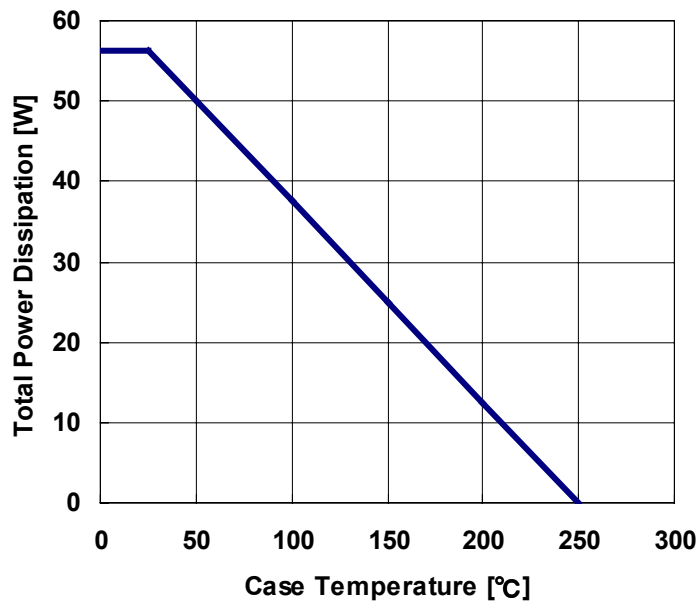
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High Voltage - High Power GaN-HEMT

S-Parameters @V_{DS}=50V I_{DS}=200mA f=0.5 to 5.5 GHz

$Z_l = Z_s = 50\ ohm$ **Marker : 2.7GHz**

Freq [GHz]	S11 MAG	S11 ANG	S21 MAG	S21 ANG	S12 MAG	S12 ANG	S22 MAG	S22 ANG
0.5	0.885	-170.7	8.614	63.5	0.010	-4.5	0.429	-110.7
0.6	0.882	-173.9	6.953	56.2	0.009	-8.0	0.475	-118.1
0.7	0.882	-176.4	5.755	50.0	0.009	-8.5	0.517	-124.5
0.8	0.882	-178.5	4.860	44.1	0.008	-9.5	0.555	-130.2
0.9	0.884	179.6	4.124	38.6	0.007	-6.3	0.589	-135.4
1.0	0.884	177.8	3.576	33.4	0.006	-2.4	0.617	-140.4
1.1	0.883	176.3	3.118	28.6	0.006	1.3	0.643	-144.8
1.2	0.883	174.8	2.739	24.0	0.006	5.5	0.661	-148.7
1.3	0.880	173.9	2.427	20.0	0.006	15.7	0.676	-152.5
1.4	0.876	172.7	2.160	16.1	0.005	21.3	0.690	-155.6
1.5	0.872	171.9	1.941	12.5	0.005	26.3	0.694	-158.6
1.6	0.867	171.5	1.732	9.6	0.006	32.6	0.698	-160.6
1.7	0.864	171.3	1.575	7.5	0.006	38.4	0.703	-162.5
1.8	0.864	171.3	1.443	5.4	0.007	44.4	0.712	-163.8
1.9	0.861	171.6	1.340	3.7	0.007	47.8	0.724	-164.8
2.0	0.866	171.8	1.259	1.8	0.009	47.8	0.742	-166.2
2.1	0.868	171.7	1.195	-0.4	0.009	53.1	0.767	-167.6
2.2	0.871	171.5	1.138	-2.5	0.009	58.2	0.782	-169.6
2.3	0.876	171.4	1.090	-4.9	0.011	59.4	0.798	-171.6
2.4	0.881	170.8	1.051	-7.3	0.011	60.1	0.810	-173.6
2.5	0.878	170.3	1.013	-9.8	0.013	66.8	0.818	-175.5
2.6	0.873	169.2	0.983	-12.3	0.014	64.0	0.827	-177.2
2.7	0.886	168.3	0.961	-14.9	0.016	62.7	0.832	-179.3
2.8	0.887	166.9	0.936	-17.6	0.017	59.1	0.840	178.8
2.9	0.882	166.0	0.919	-20.3	0.018	61.6	0.842	177.0
3.0	0.881	164.5	0.897	-23.0	0.020	59.7	0.843	175.4
3.1	0.880	162.8	0.893	-25.9	0.023	58.8	0.847	173.3
3.2	0.876	161.1	0.877	-28.7	0.026	57.5	0.843	171.3
3.3	0.869	159.4	0.869	-31.5	0.027	56.4	0.838	169.4
3.4	0.869	157.9	0.868	-34.6	0.030	55.4	0.838	167.4
3.5	0.865	156.3	0.868	-37.8	0.033	51.6	0.832	165.2
3.6	0.861	154.7	0.864	-40.8	0.035	49.6	0.831	162.7
3.7	0.856	152.9	0.873	-44.2	0.039	45.6	0.822	160.4
3.8	0.848	151.1	0.884	-47.6	0.042	42.9	0.814	158.0
3.9	0.846	149.5	0.898	-51.0	0.046	39.5	0.804	155.4
4.0	0.839	148.1	0.910	-54.6	0.051	36.2	0.797	152.4
4.1	0.833	146.5	0.942	-58.5	0.056	33.6	0.787	149.6
4.2	0.825	144.6	0.974	-62.2	0.061	30.4	0.769	146.3
4.3	0.811	142.6	0.995	-66.4	0.068	26.0	0.753	143.0
4.4	0.805	140.2	1.041	-71.3	0.075	21.3	0.736	139.6
4.5	0.790	137.1	1.077	-76.6	0.084	16.7	0.715	135.9
4.6	0.783	134.4	1.143	-82.0	0.095	12.3	0.697	131.9
4.7	0.766	130.9	1.199	-88.3	0.106	5.2	0.672	127.6
4.8	0.754	127.4	1.272	-94.5	0.119	0.2	0.650	122.5
4.9	0.746	122.2	1.348	-102.2	0.135	-7.3	0.623	117.4
5.0	0.736	117.5	1.429	-110.2	0.152	-14.2	0.592	111.6
5.1	0.740	112.1	1.526	-118.7	0.172	-22.6	0.561	104.9
5.2	0.752	106.0	1.617	-127.9	0.197	-31.8	0.526	96.3
5.3	0.767	98.5	1.708	-138.2	0.226	-42.2	0.487	86.3
5.4	0.810	90.2	1.846	-149.8	0.257	-53.1	0.443	73.2
5.5	0.859	79.9	1.936	-162.7	0.296	-65.6	0.395	55.5

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