

Eudyna GaN-HEMT 10W

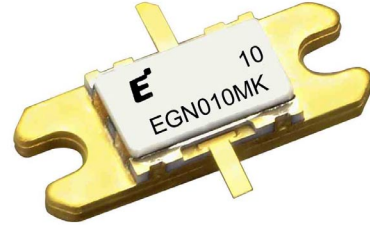
EGN010MK

Preliminary

High Voltage - High Power GaN-HEMT

FEATURES

- High Voltage Operation : $V_{DS}=50V$
- High Power : 41.0dBm (typ.) @ P_{3dB}
- High Efficiency: 60%(typ.) @ P_{3dB}
- Linear Gain : 15dB(typ.) @ $f=3500MHz$
- Broad Frequency Range : 800 to 3700MHz
- 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}		120	V
Gate-Source Voltage	V_{GS}	$T_c=25^{\circ}C$	-5	V
Total Power Dissipation	P_t		40.9	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}	$R_G=50 \Omega$	<2.0	mA
Reverse Gate Current	I_{GR}	$R_G=50 \Omega$	>-0.5	mA
Channel Temperature	T_{ch}		200	$^{\circ}C$

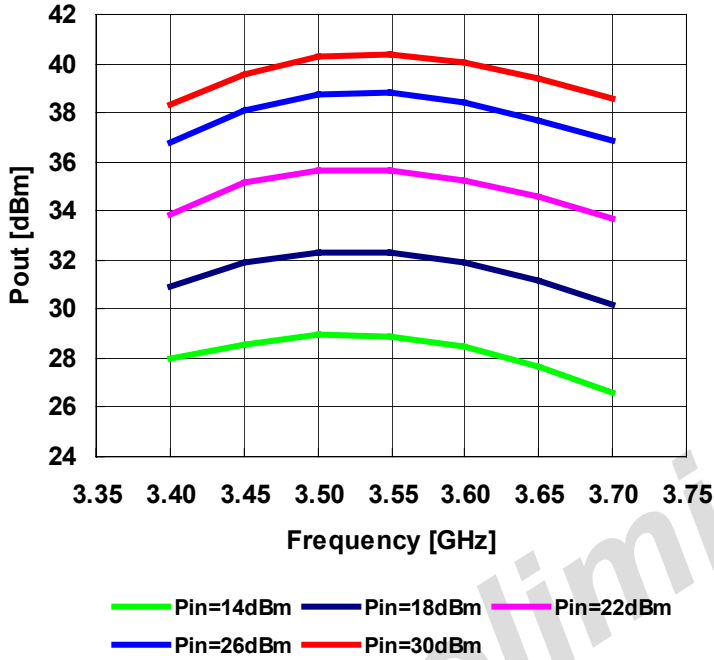
ELECTRICAL CHARACTERISTICS (Case Temperature $T_c=25^{\circ}C$)

Item	Symbol	Condition	Limit			Unit
			min.	Typ.	Max.	
Pinch-Off Voltage	V_p	$V_{DS}=50V$ $I_{DS}=2.6mA$	-1.0	-2.0	-3.5	V
Gate-Drain Breakdown Voltage	V_{GDO}	$I_{GS}=-1.3 mA$	-	-350	-	V
3dB Gain Compression Power	P_{3dB}	$V_{DS}=50V$	40.0	41.0	-	dBm
Drain Efficiency	η_d	$I_{DS}(DC)=100mA$	-	60	-	%
Linear Gain	GL	$f=3.5GHz$	14.0	15.0	-	dB
Thermal Resistance	R_{th}	Channel to Case	-	4.5	5.5	$^{\circ}C/W$

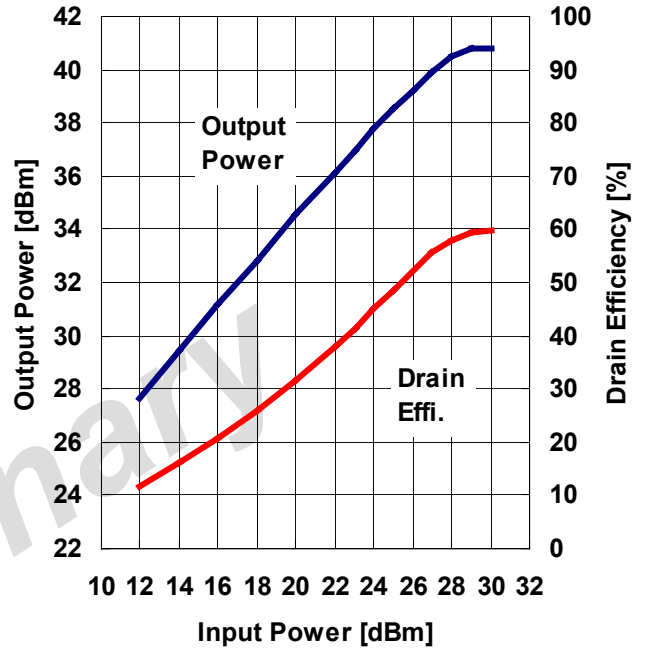
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High Voltage - High Power GaN-HEMT

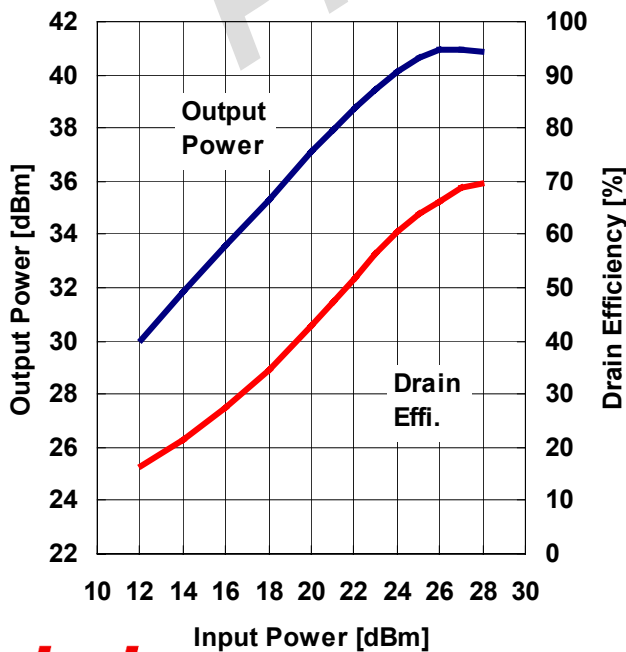
Output Power vs. Frequency
 $V_{DS}=50V$ $I_{DS(DC)}=100mA$



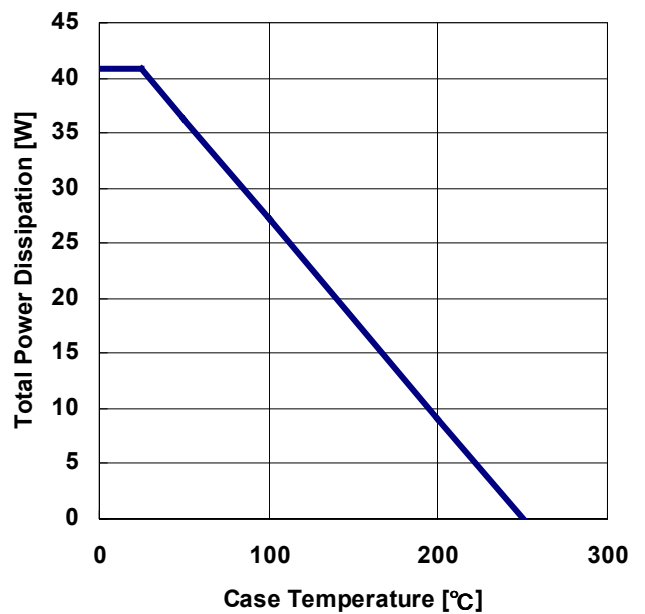
Output Power and Drain Efficiency vs. Input Power
 $V_{DS}=50V$ $I_{DS(DC)}=100mA$ $f=3.5GHz$



Output Power and Drain Efficiency vs. Input Power
 $V_{DS}=50V$ $I_{DS(DC)}=100mA$ $f=2.17GHz$



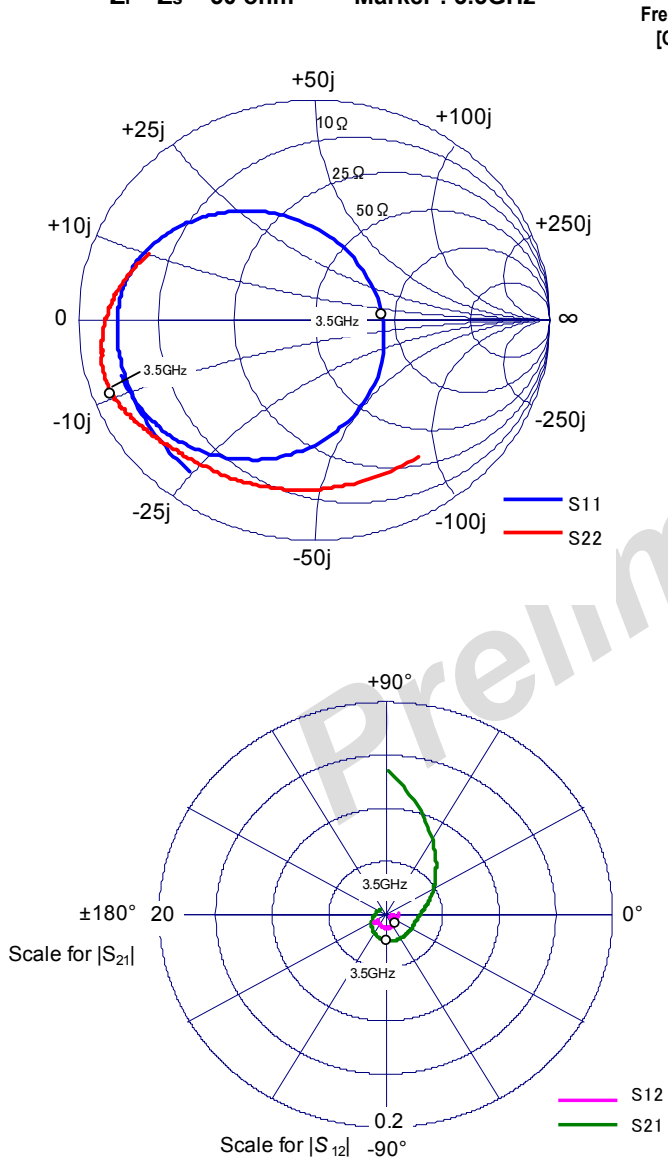
Power Derating Curve



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High Voltage - High Power GaN-HEMT

S-Parameters @Vds=50V Ids=100mA f=0.5 to 5.5 GHz
Zl = Zs = 50 ohm Marker : 3.5GHz



Freq [GHz]	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.5	0.867	-127.5	13.500	88.8	0.011	8.7	0.763	-54.8
0.6	0.853	-137.8	11.482	79.3	0.011	1.3	0.758	-62.8
0.7	0.848	-146.1	9.889	70.8	0.011	-4.9	0.758	-70.5
0.8	0.844	-153.2	8.679	63.1	0.011	-10.4	0.762	-77.5
0.9	0.843	-159.3	7.627	55.9	0.010	-16.2	0.767	-84.4
1.0	0.839	-164.4	6.803	49.4	0.010	-19.8	0.771	-90.5
1.1	0.838	-169.0	6.100	43.4	0.009	-23.1	0.777	-96.5
1.2	0.839	-173.5	5.520	37.3	0.009	-25.7	0.780	-102.0
1.3	0.836	-177.2	5.030	31.8	0.008	-27.4	0.789	-107.0
1.4	0.833	-179.2	4.592	26.4	0.007	-27.7	0.796	-112.1
1.5	0.830	-175.9	4.235	21.8	0.007	-29.7	0.800	-116.2
1.6	0.826	-172.5	3.909	17.0	0.007	-29.8	0.802	-120.0
1.7	0.822	-169.5	3.637	12.5	0.006	-30.1	0.807	-123.3
1.8	0.814	-166.5	3.425	8.6	0.006	-30.1	0.816	-126.5
1.9	0.805	-163.5	3.226	4.4	0.006	-28.7	0.817	-129.8
2.0	0.798	-160.6	3.085	0.2	0.006	-26.9	0.826	-132.4
2.1	0.780	-157.3	2.941	-3.6	0.005	-28.1	0.828	-134.8
2.2	0.767	-154.0	2.848	-7.8	0.005	-23.0	0.839	-136.9
2.3	0.751	-150.4	2.773	-12.0	0.005	-18.6	0.851	-138.8
2.4	0.730	-146.6	2.707	-16.6	0.005	-16.9	0.857	-140.9
2.5	0.703	-142.0	2.664	-21.0	0.005	-13.5	0.863	-142.5
2.6	0.673	-136.9	2.639	-25.9	0.005	-10.1	0.869	-144.5
2.7	0.640	-131.2	2.613	-31.0	0.006	-7.7	0.874	-145.7
2.8	0.600	-124.4	2.611	-36.9	0.006	-7.5	0.881	-147.3
2.9	0.551	-116.5	2.614	-42.9	0.007	-9.9	0.891	-149.0
3.0	0.499	-106.5	2.613	-49.5	0.008	-10.2	0.893	-150.6
3.1	0.441	-94.6	2.608	-56.9	0.008	-11.8	0.900	-151.9
3.2	0.382	-79.6	2.594	-64.3	0.009	-18.0	0.909	-153.9
3.3	0.328	-59.9	2.551	-72.4	0.010	-24.7	0.909	-155.6
3.4	0.291	-34.3	2.513	-81.1	0.011	-33.2	0.916	-157.1
3.5	0.288	5.2	2.429	-89.7	0.012	-41.5	0.922	-158.9
3.6	0.316	-21.9	2.332	-98.4	0.012	-52.5	0.923	-160.7
3.7	0.371	-43.9	2.217	-107.2	0.012	-62.0	0.924	-162.8
3.8	0.433	-61.6	2.069	-115.7	0.013	-69.4	0.919	-164.8
3.9	0.497	-75.6	1.934	-123.7	0.012	-79.5	0.921	-166.7
4.0	0.556	-87.3	1.778	-131.7	0.013	-87.3	0.916	-169.1
4.1	0.604	-97.0	1.652	-138.6	0.012	-95.0	0.910	-170.8
4.2	0.651	-105.5	1.518	-145.6	0.012	-105.1	0.909	-173.0
4.3	0.688	-112.4	1.399	-151.9	0.011	-111.3	0.899	-175.0
4.4	0.718	-119.0	1.291	-157.5	0.011	-117.8	0.895	-176.9
4.5	0.745	-124.4	1.194	-163.4	0.010	-122.8	0.886	-179.5
4.6	0.766	-129.5	1.106	-168.5	0.010	-129.7	0.876	-178.7
4.7	0.787	-134.1	1.037	-173.9	0.010	-132.9	0.869	-176.3
4.8	0.803	-138.2	0.975	-179.3	0.010	-136.2	0.857	-174.3
4.9	0.816	-142.1	0.920	-176.6	0.009	-137.9	0.848	-172.2
5.0	0.825	-145.9	0.877	-171.3	0.009	-139.4	0.838	-169.5
5.1	0.834	-149.4	0.829	-166.6	0.010	-140.0	0.821	-167.2
5.2	0.841	-152.8	0.798	-161.5	0.009	-137.1	0.810	-164.9
5.3	0.845	-156.3	0.768	-155.8	0.011	-140.6	0.793	-162.0
5.4	0.853	-159.9	0.741	-150.3	0.011	-140.3	0.777	-159.7
5.5	0.855	-162.9	0.721	-144.6	0.013	-143.7	0.765	-156.7