

# Eudyna GaN-HEMT 10W

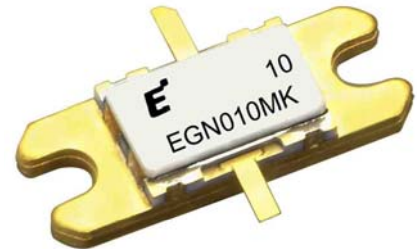
## ES/EGN010MK

**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 : 13dB(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	$^\circ C$

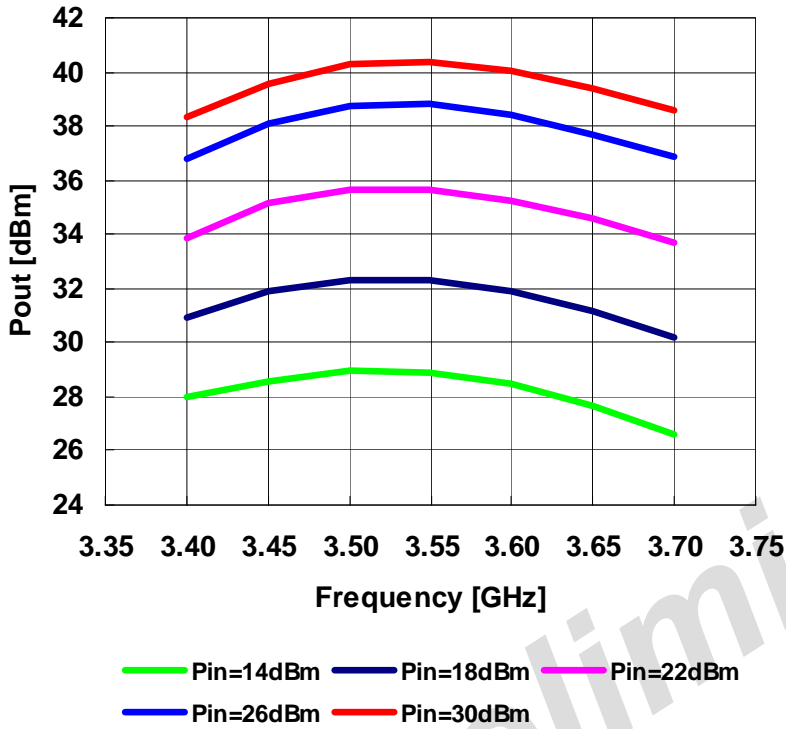
### ELECTRICAL CHARACTERISTICS (Case Temperature $T_c=25^\circ C$ )

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	$\eta_d$	$I_{DS}(DC)=100mA$	-	60	-	%
Linear Gain	GL	$f=3.5GHz$	12.0	13.0	-	dB
Thermal Resistance	$R_{th}$	Channel to Case	-	4.8	5.3	$^\circ C/W$

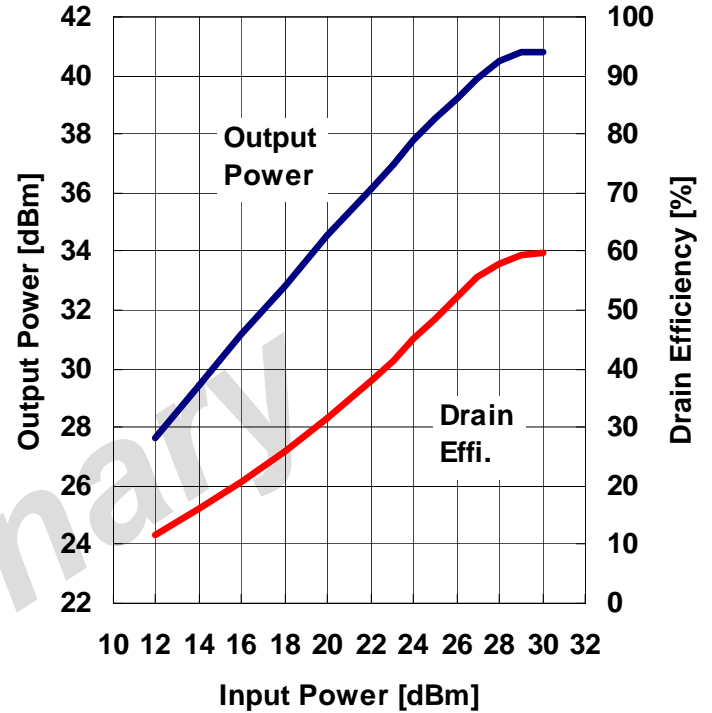
# ES/EGN010MK

## High Voltage - High Power GaN-HEMT

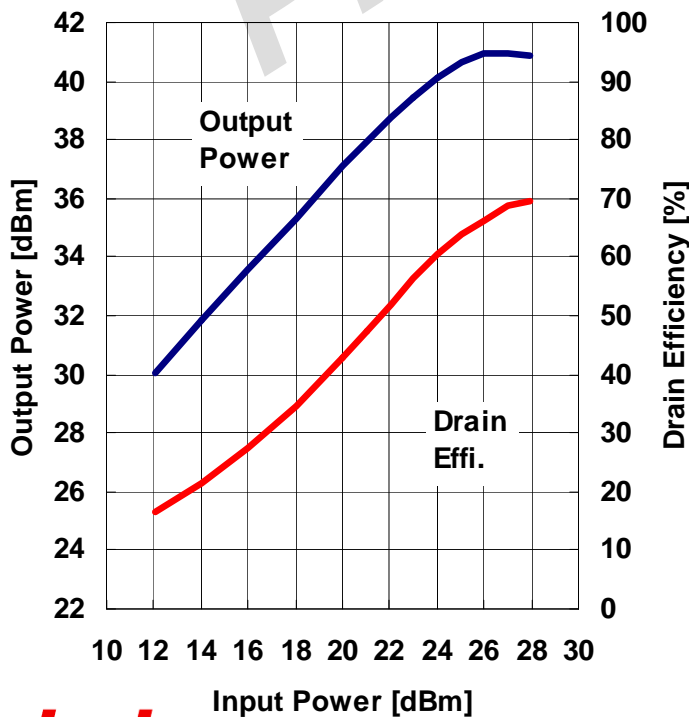
Output Power vs. Frequency  
 $V_{DS}=50V$   $I_{DS(DC)}=100mA$



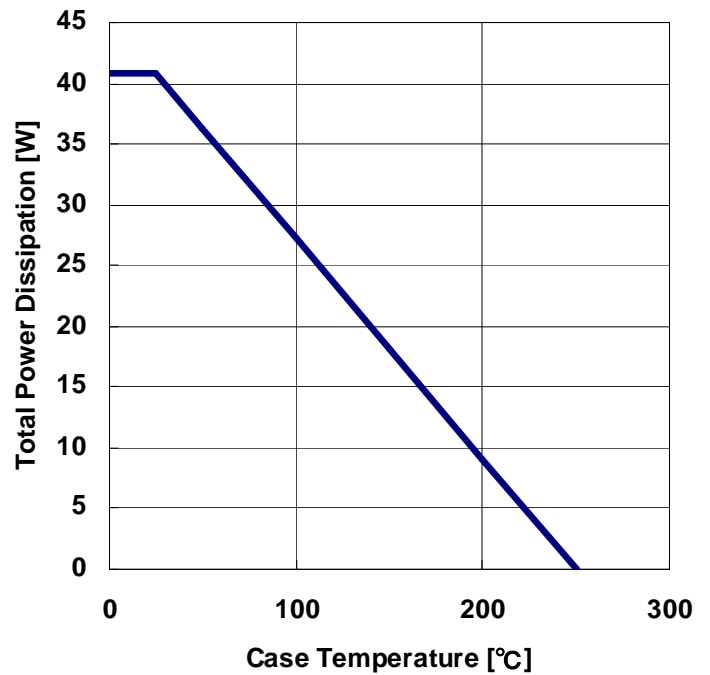
Output Power and Drain Efficiency vs. Input Power  
 $V_{DS}=50V$   $I_{DS(DC)}=100mA$   $f=3.5GHz$



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



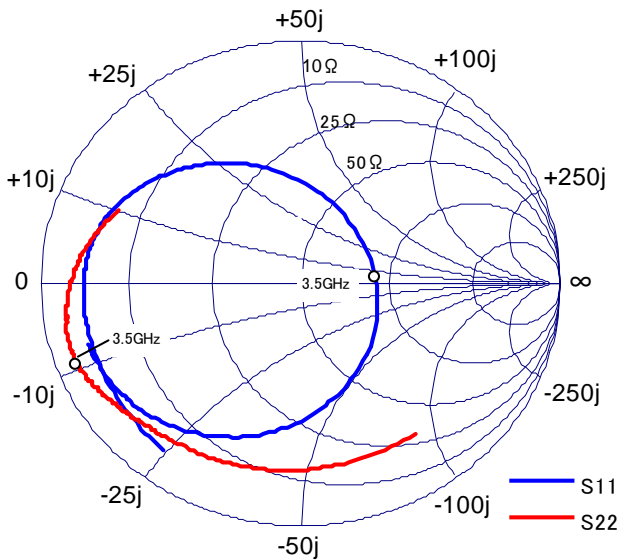
Power Derating Curve



# ES/EGN010MK

High Voltage - High Power GaN-HEMT

S-Parameters @V<sub>ds</sub>=50V I<sub>ds</sub>=100mA f=0.5 to 5.5 GHz  
Z<sub>i</sub> = Z<sub>s</sub> = 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

