

# Eudyna GaN-HEMT 90W

## ES/EGN35A090IV

### Preliminary

High Voltage - High Power GaN-HEMT

#### FEATURES

- High Voltage Operation :  $V_{DS}=50V$
- High Power : 50.0dBm (typ.) @ P3dB
- High Efficiency: 50%(typ.) @ P3dB
- Linear Gain : 12.0dB(typ.) @  $f=3.5GHz$
- 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	$P_t$		150	W
Storage Temperature	$T_{stg}$		-65 to +175	$^{\circ}C$
Channel Temperature	$T_{ch}$		250	$^{\circ}C$

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

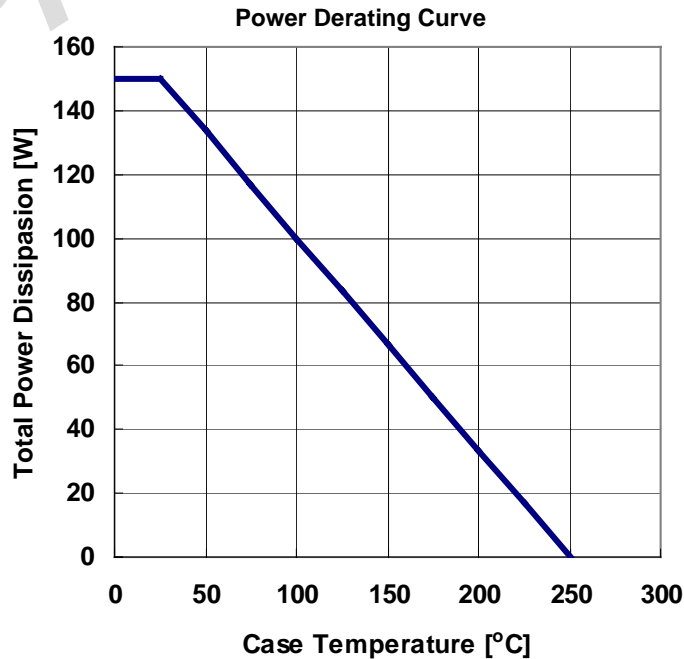
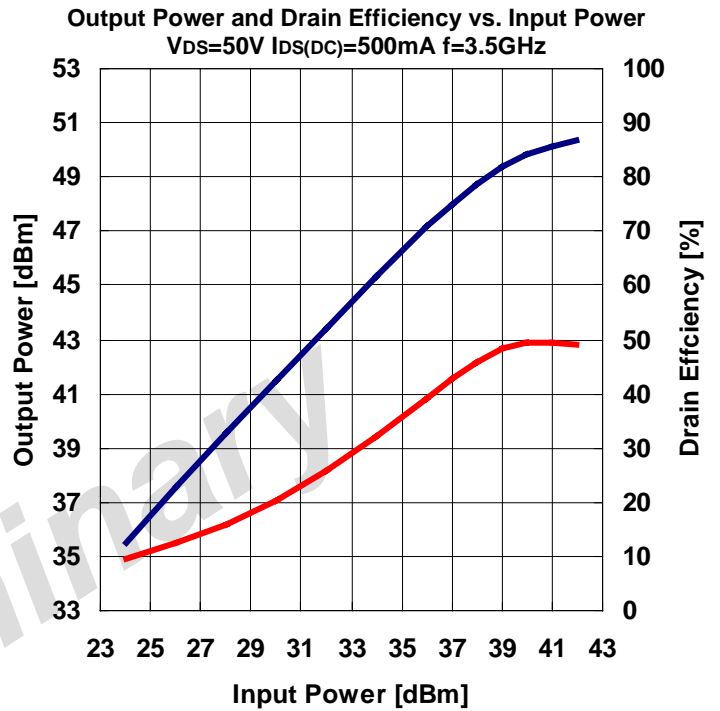
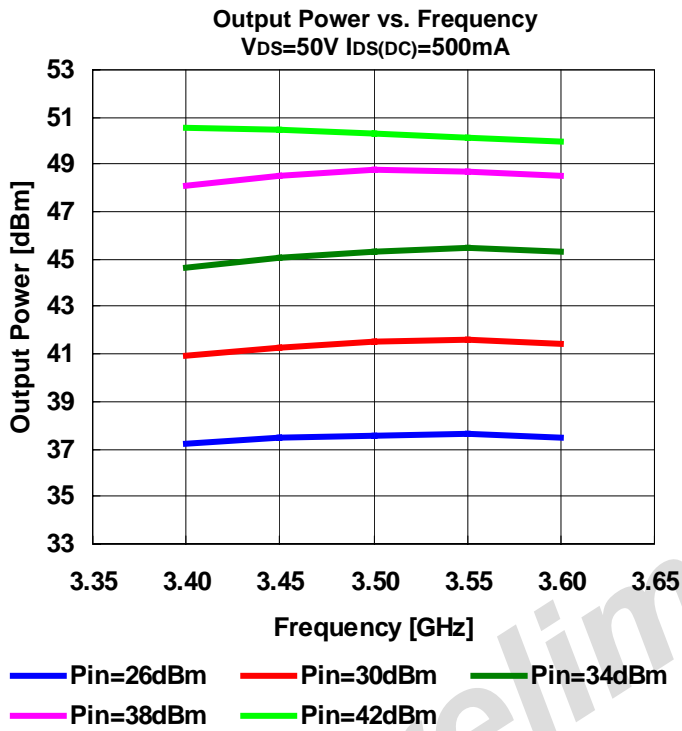
Item	Symbol	Condition	Limit	Unit
DC Input Voltage	$V_{DS}$		50	V
Forward Gate Current	IGF	$R_G=5 \Omega$	<TBD	mA
Reverse Gate Current	IGR	$R_G=5 \Omega$	>-7.2	mA
Channel Temperature	$T_{ch}$		200	$^{\circ}C$

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

Item	Symbol	Condition	Limit			Unit
			min.	Typ.	Max.	
Pinch-Off Voltage	$V_p$	$V_{DS}=50V$ $I_{DS}=36mA$	-1.0	-2.0	-3.5	V
Gate-Drain Breakdown Voltage	$V_{GDO}$	$I_{GS}=-18mA$	-	-350	-	V
3dB Gain Compression Power	$P_{3dB}$	$V_{DS}=50V$	TBD	50.0	-	dBm
Drain Efficiency	$\eta_d$	$I_{DS}(DC)=500mA$	-	50	-	%
Linear Gain	GL	$f=3.5GHz$	TBD	12.0	-	dB
Thermal Resistance	$R_{th}$	Channel to Case	-	1.3	1.5	$^{\circ}C/W$

# ES/EGN35A090IV

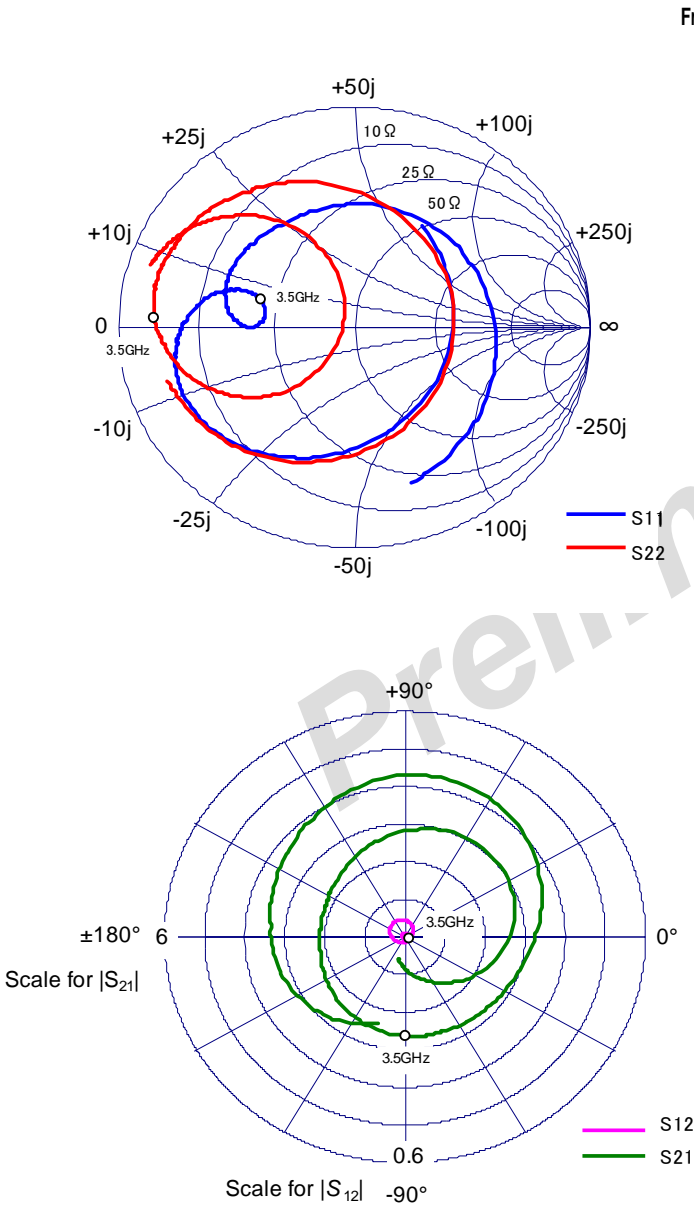
High Voltage - High Power GaN-HEMT



# ES/EGN35A090IV

## High Voltage - High Power GaN-HEMT

S-Parameters @V<sub>DS</sub>=50V, I<sub>DS</sub>=500mA, f=2 to 5 GHz,  
Z<sub>I</sub> = Z<sub>s</sub> = 50 ohm

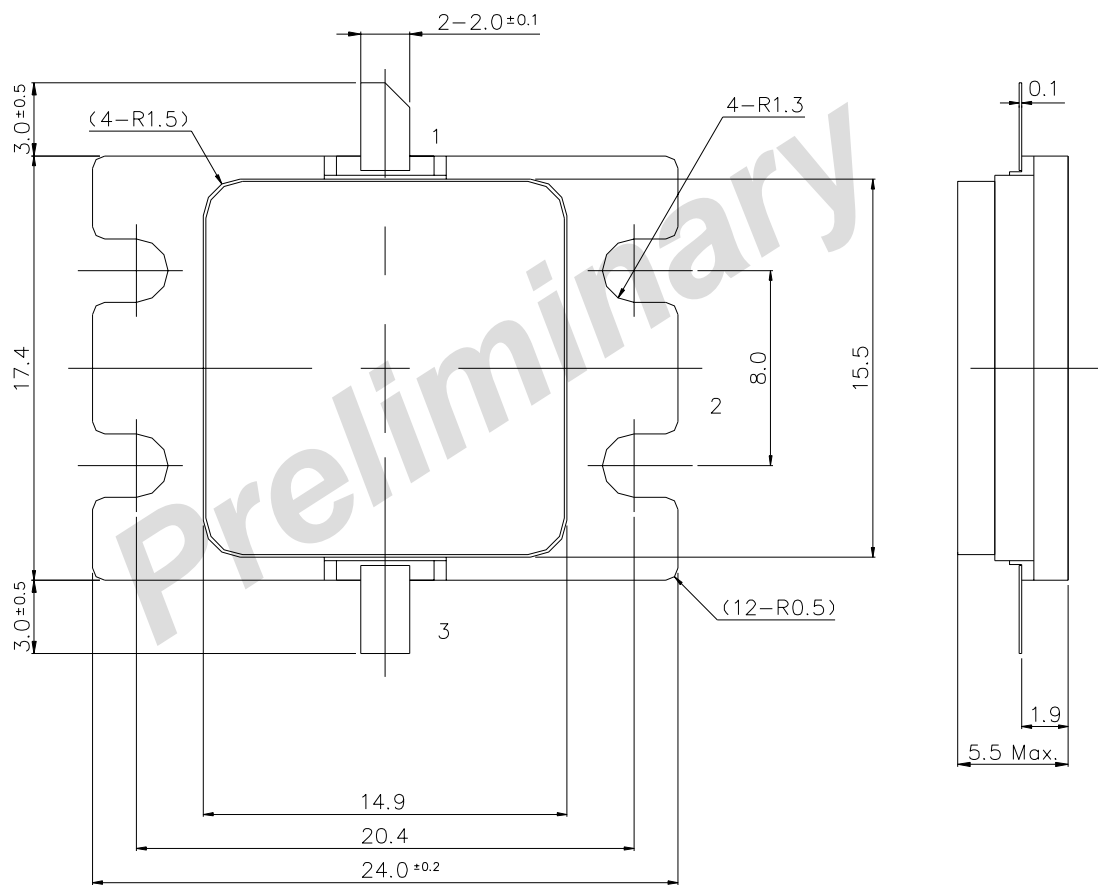


Freq [GHz]	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2.0	0.540	58.0	2.377	-106.7	0.003	-107.5	0.906	161.6
2.1	0.419	7.6	2.834	-130.6	0.003	-131.0	0.893	157.9
2.2	0.443	-51.6	3.156	-155.6	0.004	-150.9	0.869	153.7
2.3	0.556	-92.3	3.342	-179.7	0.005	-176.5	0.833	147.9
2.4	0.660	-116.9	3.522	158.1	0.006	164.9	0.767	139.9
2.5	0.728	-133.8	3.772	135.7	0.007	141.5	0.663	129.8
2.6	0.770	-146.3	4.084	111.4	0.009	124.5	0.479	116.8
2.7	0.787	-156.7	4.332	84.0	0.010	102.0	0.205	105.7
2.8	0.782	-165.3	4.192	55.2	0.011	77.3	0.134	-130.9
2.9	0.760	-172.7	3.786	28.8	0.010	59.6	0.394	-134.4
3.0	0.733	-179.2	3.372	6.5	0.010	42.1	0.570	-146.3
3.1	0.696	174.7	3.044	-13.0	0.009	32.9	0.677	-155.9
3.2	0.646	168.6	2.860	-31.2	0.009	21.8	0.745	-163.6
3.3	0.579	163.3	2.747	-49.7	0.009	8.9	0.788	-170.7
3.4	0.495	160.3	2.680	-69.0	0.010	-6.7	0.819	-176.8
3.5	0.418	162.6	2.632	-89.6	0.011	-23.4	0.847	177.2
3.6	0.382	170.7	2.539	-110.9	0.011	-44.0	0.860	171.4
3.7	0.409	178.5	2.408	-131.3	0.012	-65.8	0.866	165.0
3.8	0.465	179.1	2.257	-151.2	0.012	-82.6	0.857	158.3
3.9	0.522	174.4	2.148	-169.1	0.013	-97.9	0.843	151.7
4.0	0.560	166.6	2.117	172.9	0.014	-113.2	0.829	143.9
4.1	0.580	156.8	2.160	155.2	0.017	-127.9	0.796	133.6
4.2	0.583	145.6	2.299	135.5	0.021	-144.7	0.749	121.0
4.3	0.570	133.0	2.553	112.7	0.028	-166.5	0.668	101.2
4.4	0.555	116.9	2.880	83.9	0.038	167.5	0.538	68.1
4.5	0.559	94.4	3.057	46.7	0.046	133.3	0.424	5.4
4.6	0.565	61.6	2.690	5.0	0.046	96.9	0.510	-69.3
4.7	0.575	21.7	1.978	-32.6	0.039	66.4	0.663	-113.4
4.8	0.618	-16.3	1.339	-63.0	0.030	44.4	0.752	-137.9
4.9	0.680	-47.7	0.890	-86.8	0.021	28.4	0.798	-153.4
5.0	0.742	-71.3	0.610	-106.0	0.017	23.1	0.829	-163.2

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IV Package Outline  
Metal-Ceramic Hermetic Package



PIN ASSIGNMENT  
1 : GATE  
2 : SOURCE(Flange)  
3 : DRAIN

Unit : mm