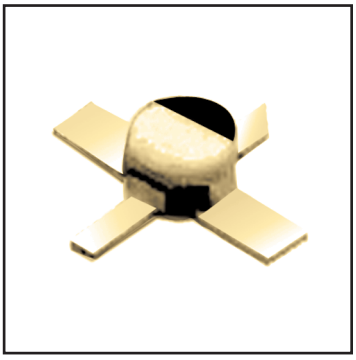
FHX76LP

Super Low Noise HEMT

FEATURES

- Low Noise Figure: NF=0.40dB (Typ.)@f=12GHz
- High Associated Gain: Gas=13.5dB (Typ.)@f=12GHz
- High Reliability
- Small Size SMT Package
- Tape and Reel Packaging Available



DESCRIPTION

The FHX76LP is a low noise SuperHEMT™product designed for DBS applications. This device uses a small ceramic package that is optimized for high volume cost driven requirements.

Eudyna's stringent Quality Assurance Program assures the highest reliability and consistent performance.

ABSOLUTE MAXIMUM RATINGS (Ambient Temperature Ta = 25°C)

Parameter	Symbol	Condition	Rating	Unit
Drain-Source Voltage	V_{DS}		3.5	V
Gate-Source Voltage	V_{GS}		-3.0	V
Total Power Dissipation	P_t	Note	180	mW
Storage Temperature	T_{STG}		-65 to 150	°C
Channel Temperature	T_{CH}		150	°C

Note: Mounted on Al_2O_3 board (30 x 30 x 0.65mm)

Eudyna recommends the following conditions for the reliable operation of GaAs FETs:

1. The drain-source operating voltage (V_{DS}) should not exceed 2 volts.
2. The forward and reverse gate currents should not exceed 0.2 and -0.05 mA respectively with gate resistance of 4000Ω.
3. The operating channel temperature (T_{ch}) should not exceed 80°C.

ELECTRICAL CHARACTERISTICS (Ambient Temperature Ta=25°C)

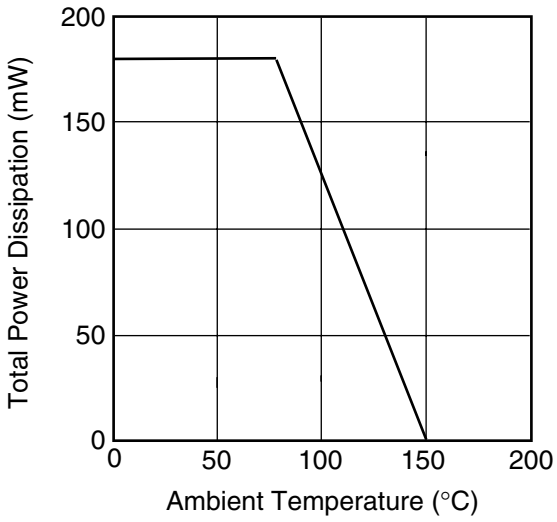
Item	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Saturated Drain Current	I_{DSS}	V_{DS} = 2V, V_{GS}=0V	10	30	60	mA
Transconductance	gm	V_{DS} = 2V, I_{DS}=10mA	35	50	-	mS
Pinch-Off Voltage	V_p	V_{DS} = 2V, I_{DS}=1mA	-0.1	-0.7	-1.5	V
Gate-Source Breakdown Voltage	V_{GSO}	I_{GS} = -10μA	-3.0	-	-	V
Noise Figure	NF	V_{DS} = 2V, I_{DS} = 10mA, f=12GHz	-	0.40	0.50	dB
Associated Gain	Gas		12.0	13.5	-	dB
Thermal Resistance	R_{th}	Channel to Case	-	300	400	°C/W

CASE STYLES: LP

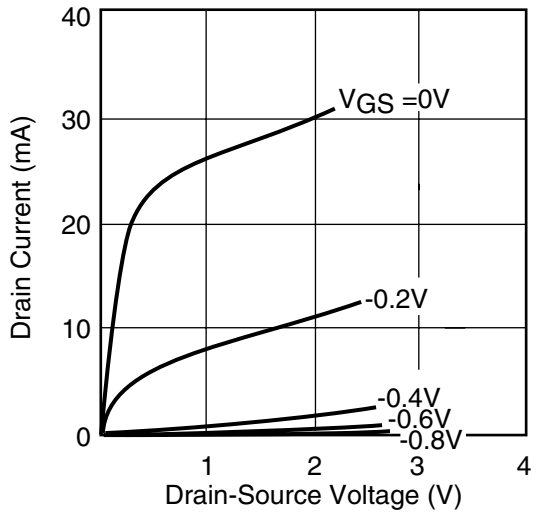
Note: RF parameters for LP devices are measured on a sample basis as follows:

Lot qty.			Sample qty.	Accept/Reject
1200	or	less	125	(0,1)
1201	to	3200	200	(0,1)
3201	to	10000	315	(1,2)
10001	or	over	500	(1,2)

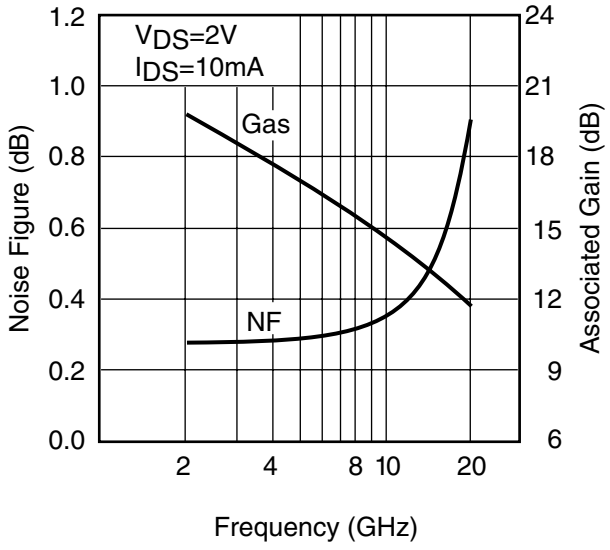
POWER DERATING CURVE



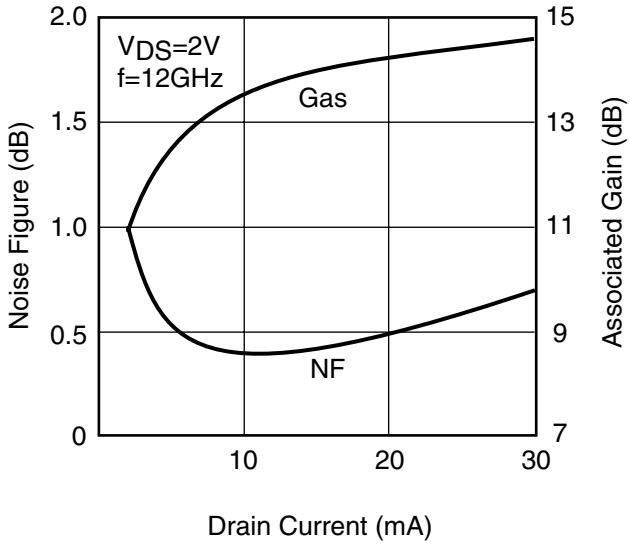
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



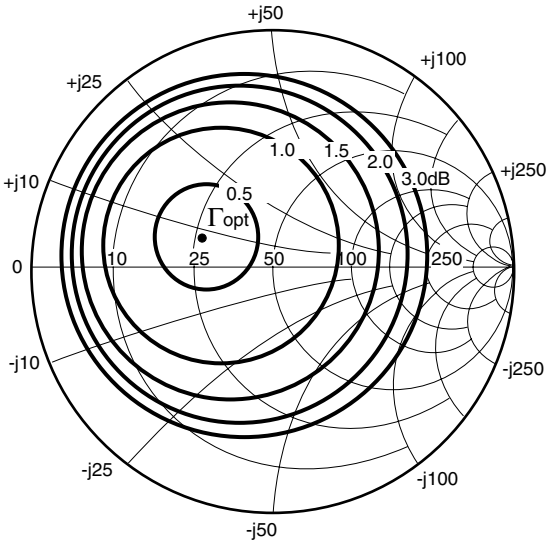
NF & Gas vs. FREQUENCY



NF & Gas vs. I_{DS}



TYPICAL NOISE FIGURE CIRCLE



f=12GHz
V_{DS}=2V
I_{DS}=10mA

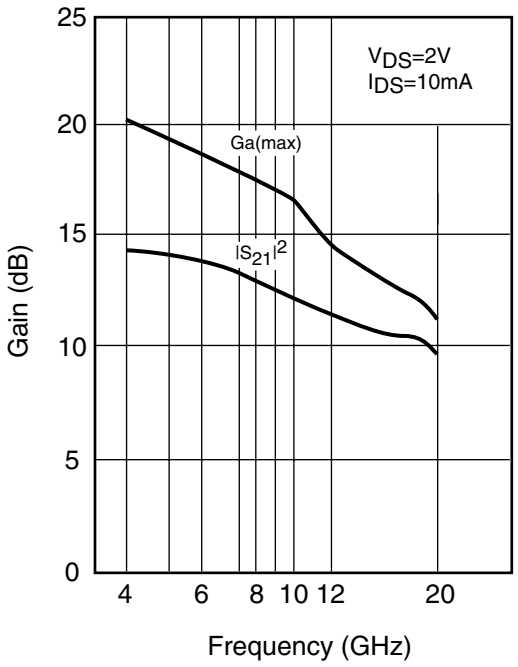
Γopt=0.32∠153.8°
Rn/50=0.06
NFmin=0.40dB

NOISE PARAMETERS

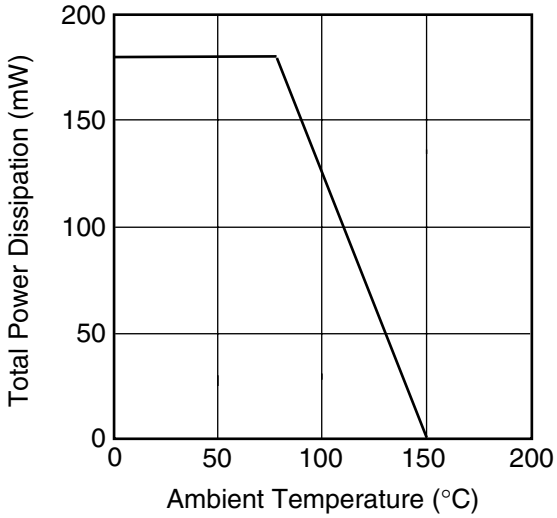
V_{DS}=2V, I_{DS}=10MA

Freq. (GHz)	Γopt (MAG)	Γopt (ANG)	NFmin (dB)	Rn/50
2	0.79	12.5	0.28	.24
4	0.62	30.0	0.29	.20
6	0.50	54.1	0.30	.16
8	0.41	83.6	0.32	.12
10	0.35	117.3	0.35	.08
12	0.32	153.8	0.40	.06
14	0.30	-168.0	0.48	.06
16	0.29	-129.5	0.60	.09
18	0.29	-91.8	0.72	.14
20	0.29	-56.3	0.91	.19

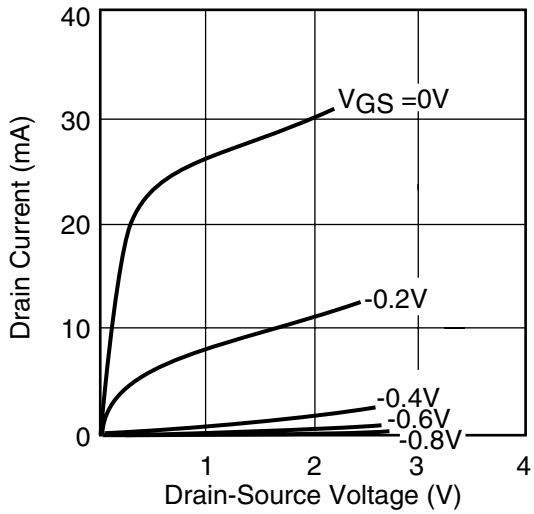
Ga(max) AND $|S_{21}|$ vs. FREQUENCY



POWER DERATING CURVE



DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



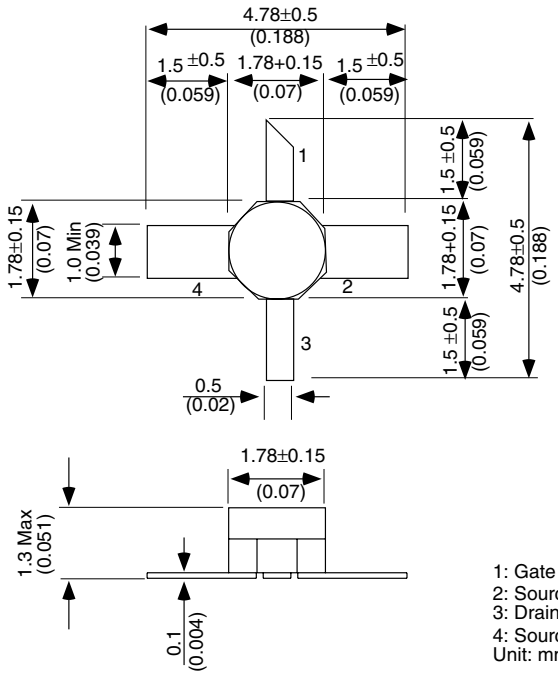
S-PARAMETERS

V_{DS} = 2V, I_{DS} = 10mA

FREQUENCY	S11		S21		S12		S22	
(MHZ)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1000	.987	-14.8	5.535	164.2	.014	80.2	.585	-11.4
2000	.965	-29.4	5.463	148.8	.027	70.2	.567	-22.9
3000	.925	-44.6	5.334	133.2	.041	57.7	.538	-34.7
4000	.878	-58.3	5.154	118.8	.049	50.0	.511	-45.2
5000	.828	-72.9	5.019	104.3	.059	40.6	.480	-56.4
6000	.776	-87.8	4.825	89.8	.067	32.4	.446	-68.4
7000	.719	-102.8	4.606	75.6	.075	23.2	.413	-80.6
8000	.669	-116.6	4.354	61.9	.079	15.2	.394	-92.6
9000	.631	-129.4	4.130	49.5	.083	6.3	.374	-102.4
10000	.590	-141.7	3.982	37.0	.086	.2	.365	-112.5
11000	.548	-155.3	3.849	24.7	.088	-7.6	.335	-121.9
12000	.507	-169.6	3.689	12.4	.091	-14.2	.323	-134.1
13000	.482	177.0	3.545	-.2	.095	-20.8	.313	-145.0
14000	.459	164.7	3.425	-11.9	.096	-28.7	.315	-155.9
15000	.439	152.3	3.330	-24.4	.098	-36.4	.324	-165.4
16000	.419	138.7	3.264	-37.1	.102	-44.1	.322	-174.3
17000	.404	123.9	3.238	-50.3	.103	-54.6	.321	175.4
18000	.383	107.3	3.176	-63.5	.108	-63.4	.316	165.3
19000	.377	93.2	3.101	-78.0	.105	-74.5	.320	153.2
20000	.348	76.5	3.028	-92.3	.110	-87.6	.301	146.1

NOTE:* The data includes bonding wires.
n: number of wires Gate n=1 (0.1mm length, 25µm Dia Au wire)
Drain n=1 (0.1mm length, 25µm Dia Au wire)
Source n=4 (0.2mm length, 25µm Dia Au wire)

Case Style "LP"
Metal-Ceramic Package



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CAUTION

Eudyna Devices Inc. products contain **gallium arsenide (GaAs)** which can be hazardous to the human body and the environment. For safety, observe the following procedures:

- **Do not put this product into the mouth.**
- **Do not alter the form of this product into a gas, powder, or liquid through burning, crushing, or chemical processing as these by-products are dangerous to the human body if inhaled, ingested, or swallowed.**
- **Observe government laws and company regulations when discarding this product. This product must be discarded in accordance with methods specified by applicable hazardous waste procedures.**