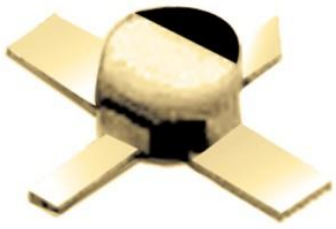
FHX76LP

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 receiver applications. This device uses a small ceramic package. Sumitomo Electric's stringent Quality Assurance Program assures the highest reliability and consistent performance.

ABSOLUTE MAXIMUM RATING (Ambient Temperature Ta=25deg.C)

Item	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	deg.C
Channel Temperature	T_{CH}		150	deg.C

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

FHX76LP is designed for a low noise front-end amplifier.
Sumitomo Electric does not recommend using this device at large signal operation due to the reliability concern.

1. The drain-source operating voltage should not exceed 2V and drain current should be 10mA.
2. The forward and reverse gate currents should not exceed 30 uA and -30 uA respectively.
3. If usage conditions other than the aforementioned are expected, please contact to sales representative.

ELECTRICAL CHARACTERISTICS (Ambient Temperature Ta=25deg.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	Vp	V_{DS} = 2V, I_{DS} = 1mA	-0.1	-0.7	-1.5	V
Gate Source Breakdown Voltage	V_{GSO}	I_{GS} = -10uA	-3.0	-	-	V
Noise Figure	NF	V_{DS} = 2V, I_{DS} = 10mA, f = 12GHz	-	0.40	0.50	dB
Associated Gain	G_{as}		12.0	13.5	-	dB
Thermal Resistance	R_{th}	Channel to Case	-	300	400	deg.C/W

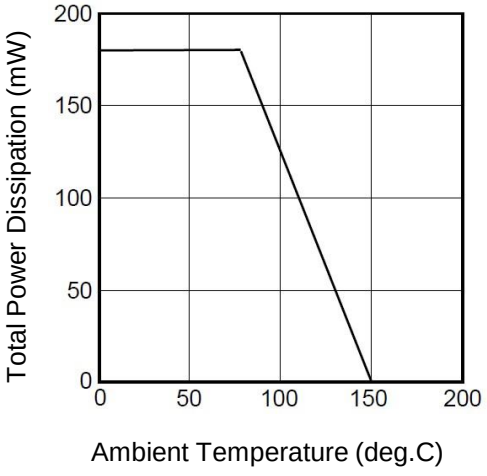
AVAILABLE CASE STYLES:	LP

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

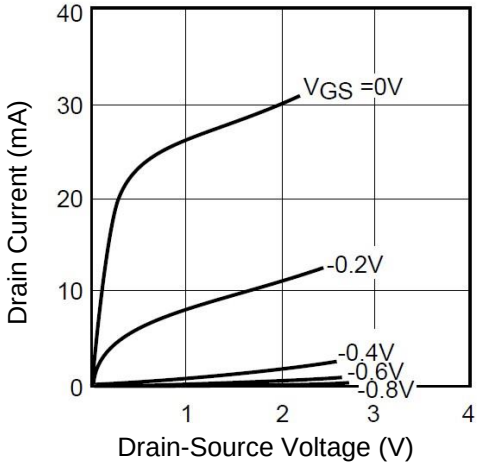
Lot qty.	Sample qty.	Accept/Reject
1200 or less	125	(0, 1)
1201 to 3200	200	(0, 1)
3201 to 10000	315	(1, 2)
10001 or over	500	(1, 2)

RoHS Compliance	**Yes**

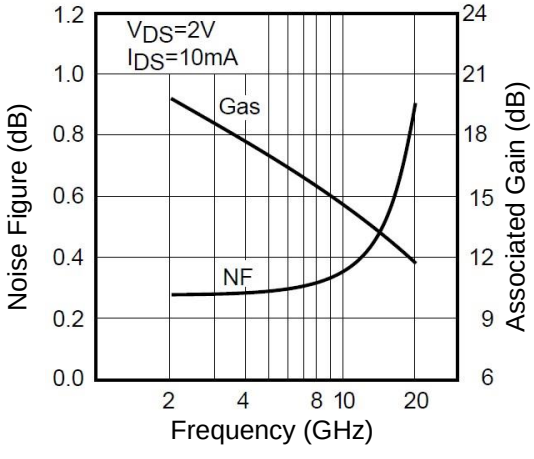
POWER DERATING CURVE



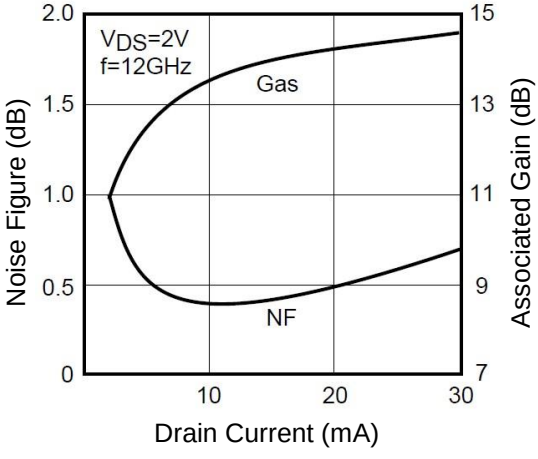
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



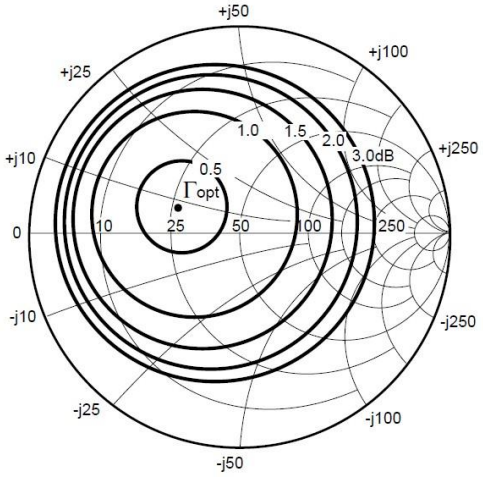
NF & G_{as} vs. FREQUENCY



NF & G_{as} vs. I_{DS}



TYPICAL NOISE FIGURE CIRCLE



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

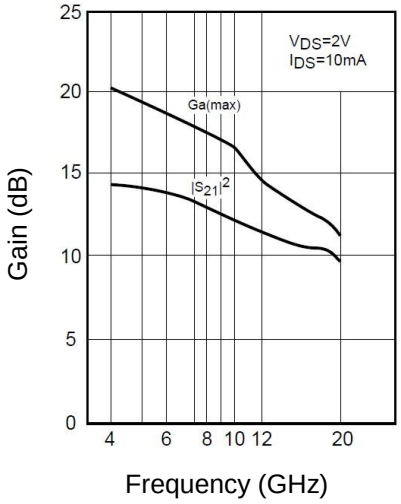
Γopt=0.32∠153.8deg.
Rn/50=0.06
NFmin=0.40dB

NOISE PARAMETERS

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

Freq. (GHz)	Γ opt (MAG)	(ANG)	NFmin (dB)	Rn/50
2	0.79	12.5	0.28	0.24
4	0.62	30.0	0.29	0.20
6	0.50	54.1	0.30	0.16
8	0.41	83.6	0.32	0.12
10	0.35	117.3	0.35	0.08
12	0.32	153.8	0.40	0.06
14	0.30	-168.0	0.48	0.06
16	0.29	-129.5	0.60	0.09
18	0.29	-91.8	0.72	0.14
20	0.29	-56.3	0.91	0.19

G_a(max) AND $|S_{21}|^2$ vs. FREQUENCY



S-PARAMETERS

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

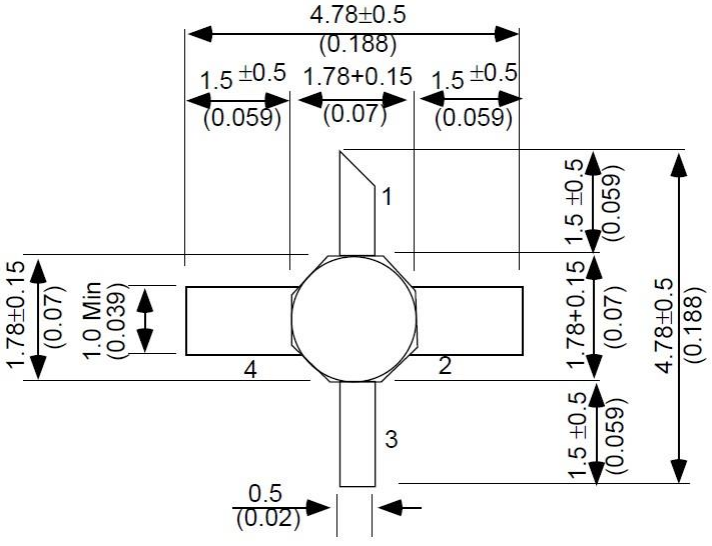
Freq	S11		S21		S12		S22	
(MHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1000	0.987	-14.8	5.535	164.2	0.014	80.2	0.585	-11.4
2000	0.965	-29.4	5.463	148.8	0.027	70.2	0.567	-22.9
3000	0.925	-44.6	5.334	133.2	0.041	57.7	0.538	-34.7
4000	0.878	-58.3	5.154	118.8	0.049	50.0	0.511	-45.2
5000	0.828	-72.9	5.019	104.3	0.059	40.6	0.480	-56.4
6000	0.776	-87.8	4.825	89.8	0.067	32.4	0.446	-68.4
7000	0.719	-102.8	4.606	75.6	0.075	23.2	0.413	-80.6
8000	0.669	-116.6	4.354	61.9	0.079	15.2	0.394	-92.6
9000	0.631	-129.4	4.130	49.5	0.083	6.3	0.374	-102.4
10000	0.590	-141.7	3.982	37.0	0.086	0.2	0.365	-112.5
11000	0.548	-155.3	3.849	24.7	0.088	-7.6	0.335	-121.9
12000	0.507	-169.6	3.689	12.4	0.091	-14.2	0.323	-134.1
13000	0.482	177.0	3.545	-0.2	0.095	-20.8	0.313	-145.0
14000	0.459	164.7	3.425	-11.9	0.096	-28.7	0.315	-155.9
15000	0.439	152.3	3.330	-24.4	0.098	-36.4	0.324	-165.4
16000	0.419	138.7	3.264	-37.1	0.102	-44.1	0.322	-174.3
17000	0.404	123.9	3.238	-50.3	0.103	-54.6	0.321	175.4
18000	0.383	107.3	3.176	-63.5	0.108	-63.4	0.316	165.3
19000	0.377	93.2	3.101	-78.0	0.105	-74.5	0.320	153.2
20000	0.348	76.5	3.028	-92.3	0.110	-87.6	0.301	146.1

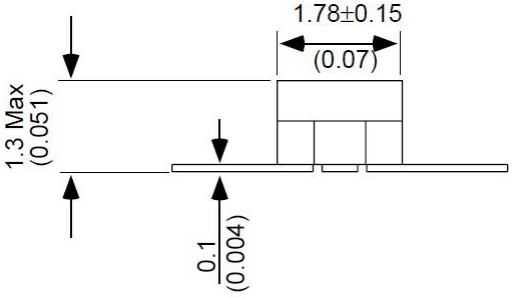
NOTE:* The data includes bonding wires.

n: number of wires
Gate n=2 (0.3mm length, 20um Dia Au wire)
Drain n=2 (0.3mm length, 20um Dia Au wire)
Source n=4 (0.3mm length, 20um Dia Au wire)

Case Style "LP"

Metal-Ceramic Package





Gold Plated Leads

1. Gate
2. Source (Flange)
3. Drain
4. Source (Flange)

Unit: mm (inches)

CAUTION

Sumitomo Electric Device Innovations, 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 these products 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.