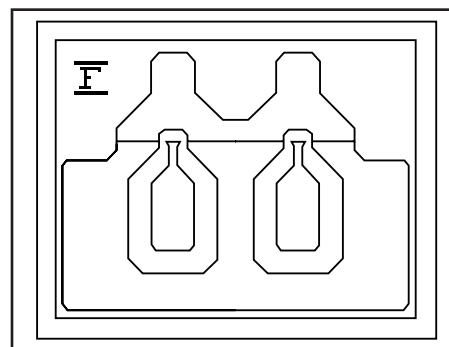


FEATURES

- Low Noise Figure: 1.0dB (Typ.)@f=18GHz
- High Associated Gain: 9.0dB (Typ.)@f=18GHz
- $L_g \leq 0.25\mu\text{m}$, $W_g = 200\mu\text{m}$
- Gold Gate Metallization for High Reliability

DESCRIPTION

The FHR02X is a High Electron Mobility Transistor(HEMT) intended for general purpose, ultra-low noise and high gain amplifiers in the 4-22GHz frequency range. This device is well suited for telecommunication, radio link or other low noise applications.



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

ABSOLUTE MAXIMUM RATING (Ambient Temperature Ta=25°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_{tot}	Note	180	mW
Storage Temperature	T_{stg}		-65 to +175	°C
Channel Temperature	T_{ch}		175	°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.

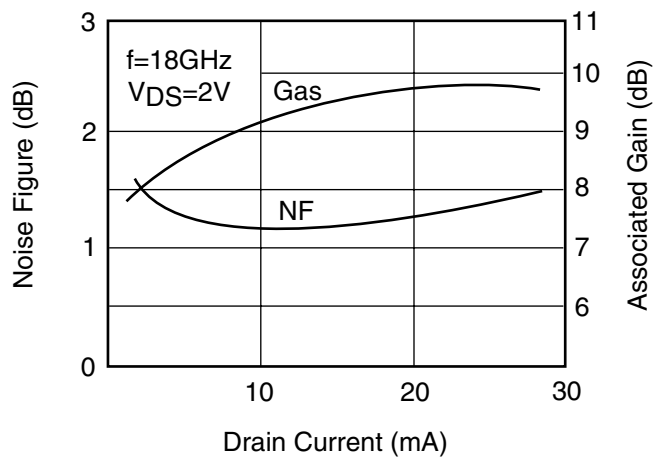
ELECTRICAL CHARACTERISTICS (Ambient Temperature Ta=25°C)

Item	Symbol	Test Conditions	Limit			Unit
			Min.	Typ.	Max.	
Saturated Drain Current	I_{DSS}	$V_{DS} = 2V$, $V_{GS} = 0V$	15	30	60	mA
Transconductance	g_m	$V_{DS} = 2V$, $I_{DS} = 10mA$	35	45	-	mS
Pinch-off Voltage	V_p	$V_{DS} = 2V$, $I_{DS} = 1mA$	-0.2	-0.7	-1.5	V
Gate Source Breakdown Voltage	V_{GSO}	$I_{GS} = -10\mu A$	-3.0	-	-	V
Noise Figure	NF	$V_{DS} = 2V$ $I_{DS} = 10mA$ $f = 18GHz$	-	1.0	1.2	dB
Associated Gain	G_{as}		8	9	-	dB
Thermal Resistance	R_{th}	Channel to Case	-	220	300	°C/W

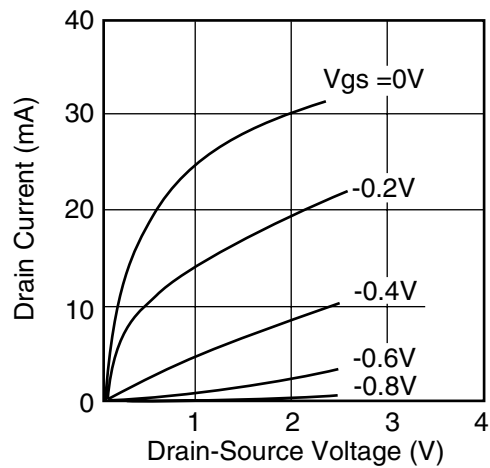
Note: RF parameter sample size 10pcs. criteria (accept/reject)=(2/3)

The chip must be enclosed in a hermetically sealed environment for optimum performance and reliability.

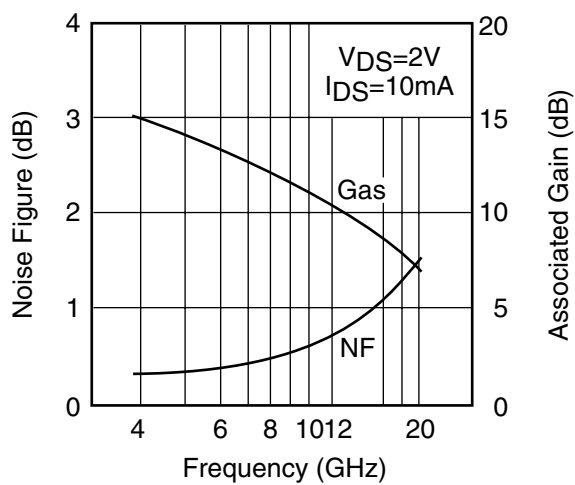
NF & Gas vs. I_{DS}



DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



NF & Gas vs. Frequency



S-PARAMETERS

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

FREQUENCY (MHZ)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	1.000	-1.0	4.073	179.2	.001	89.5	.607	-0.4
500	.999	-4.8	4.068	175.9	.007	87.7	.607	-2.2
1000	.995	-9.6	4.054	171.9	.013	85.4	.605	-4.3
2000	.982	-19.1	3.999	163.9	.026	80.9	.599	-8.6
4000	.934	-37.4	3.801	148.5	.049	72.7	.576	-16.5
6000	.868	-54.5	3.530	134.5	.068	65.9	.544	-23.5
8000	.799	-70.3	3.237	121.9	.082	60.9	.511	-29.5
10000	.734	-84.9	2.955	110.8	.093	57.5	.479	-34.8
12000	.678	-98.4	2.700	100.8	.101	55.6	.450	-39.6
14000	.633	-111.2	2.476	91.7	.108	55.0	.424	-44.1
16000	.597	-123.1	2.282	83.5	.115	55.4	.402	-48.6
18000	.571	-134.5	2.114	75.9	.122	56.6	.382	-53.3
20000	.553	-145.2	1.969	68.9	.131	58.1	.364	-58.4
22000	.543	-155.2	1.842	62.3	.141	59.6	.348	-63.9
24000	.539	-164.7	1.731	56.0	.154	61.0	.334	-70.0
26000	.540	-173.5	1.633	50.1	.168	62.0	.320	-76.9
28000	.545	178.2	1.544	44.5	.185	62.5	.309	-84.5
30000	.554	170.5	1.465	39.1	.203	62.4	.300	-93.0

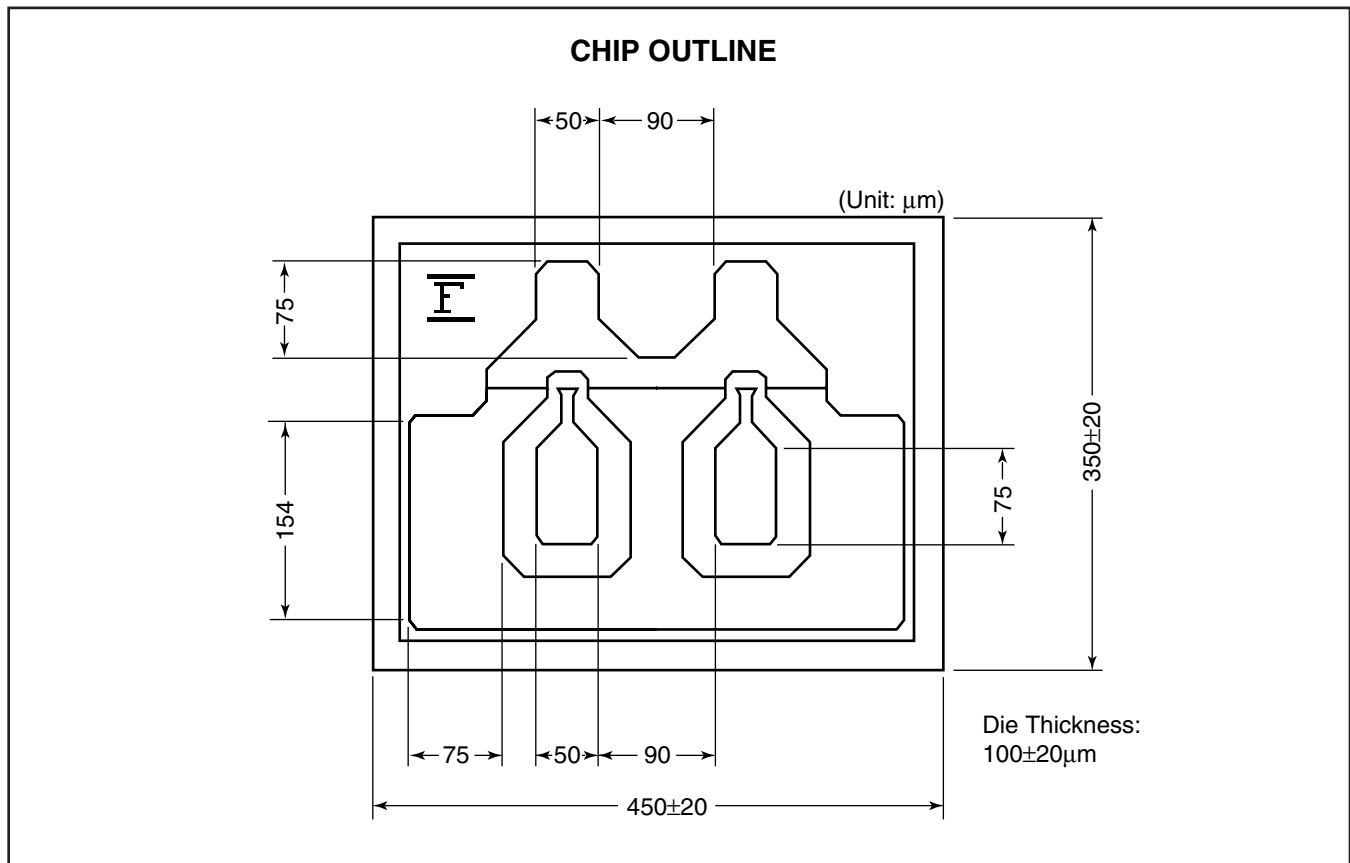
NOTE:* The data includes bonding wires.

n: number of wires Gate n=2 (0.2mm length, 25µm Dia Au wire)
 Drain n=2 (0.2mm length, 25µm Dia Au wire)
 Source n=4 (0.3mm length, 25µm Dia Au wire)

NOISE PARAMETERS

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

Freq. (GHz)	Γ_{opt}		NFmin (dB)	Rn/50
	(MAG)	(ANG)		
2	0.80	16	0.33	0.50
4	0.74	31	0.35	0.45
6	0.68	46	0.44	0.40
8	0.63	61	0.53	0.30
10	0.58	75	0.63	0.23
12	0.52	89	0.70	0.18
14	0.47	102	0.81	0.14
16	0.42	114	0.92	0.12
18	0.38	126	1.04	0.10
20	0.33	137	1.16	0.09
22	0.30	146	1.34	0.09
24	0.28	155	1.56	0.09
26	0.26	162	1.78	0.08
28	0.25	171	2.00	0.08
30	0.24	-170	2.34	0.08



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- 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.

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