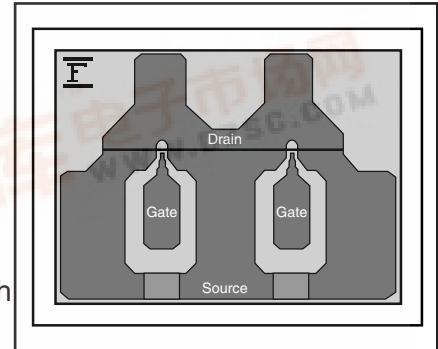


FEATURES

- Low Noise Figure: 0.55dB (Typ.)@f=12GHz
- High Associated Gain: 12.0dB (Typ.)@f=12GHz
- $L_g \leq 0.15\mu\text{m}$, $W_g = 280\mu\text{m}$
- Gold Gate Metallization for High Reliability



DESCRIPTION

The FHX45X is a Super High Electron Mobility Transistor (SuperHEMT™) intended for general purpose, ultra-low noise and high gain amplifiers in the 2-18GHz frequency range. The device is well suited for telecommunication, DBS, TVRO, VSAT or other low noise applications.

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

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

Item	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	3.5	V
Gate-Source Voltage	V_{GS}	-3.0	V
Total Power Dissipation	P_t^*	290	mW
Storage Temperature	T_{stg}	-65 to +175	°C
Channel Temperature	T_{ch}	175	°C

*Note: Mounted on Al₂O₃ board (30 x 30 x 0.65mm)

Fujitsu 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 0.1 and -0.075 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	Condition	Limit			Unit
			Min.	Typ.	Max.	
Saturated Drain Current	I_{DSS}	$V_{DS} = 2V, V_{GS} = 0V$	10	40	85	mA
Transconductance	gm	$V_{DS} = 2V, I_{DS} = 10mA$	45	65	-	mS
Pinch-off Voltage	V_p	$V_{DS} = 2V, I_{DS} = 1mA$	-0.1	-1.0	-2.0	V
Gate Source Breakdown Voltage	V_{GSO}	$I_{GS} = -10\mu A$	-3.0	-	-	V
Noise Figure	NF	$V_{DS} = 2V, I_{DS} = 10mA,$ $f = 12GHz$	-	0.55	0.65	dB
Associated Gain	G_{as}	$f = 12GHz$	10.0	12.0	-	dB
Thermal Resistance	R_{th}	Channel to Case	-	155	200	°C/W

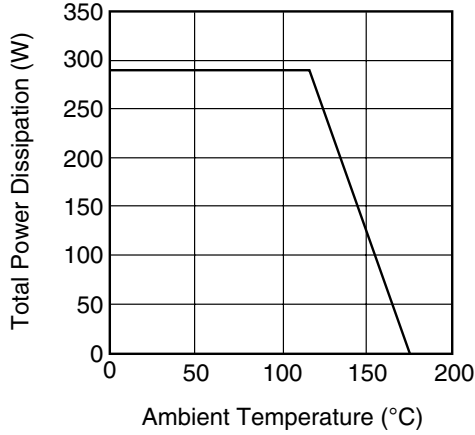
Note: RF parameter sample size 10pcs. criteria (accept/reject)=(2/3)

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

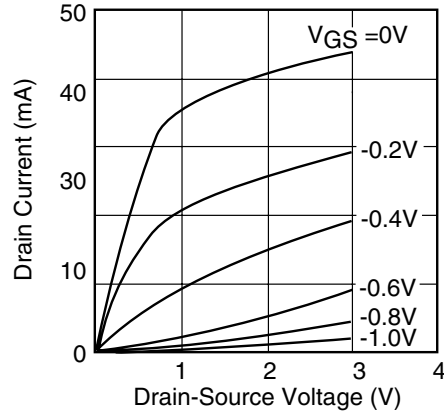
FHX45X

GaAs FET & HEMT Chips

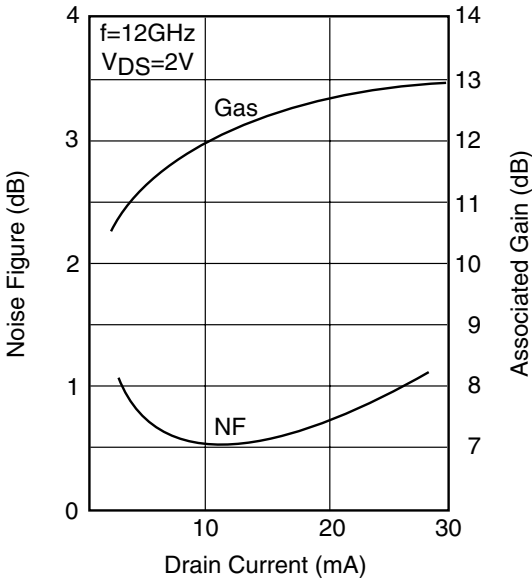
POWER DERATING CURVE



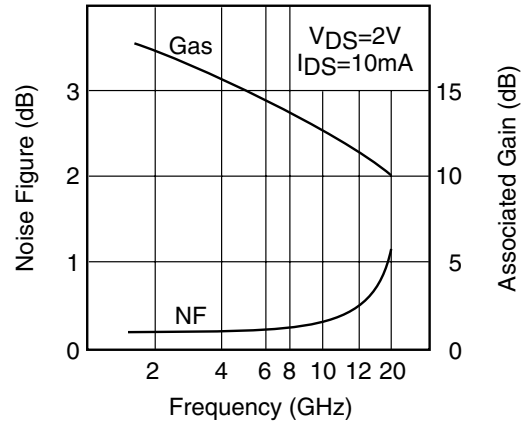
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



NF & Gas vs. I_{DS}



NF & Gas vs. Frequency

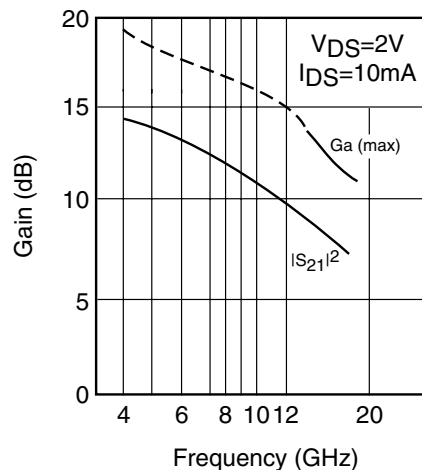


FHX45X NOISE PARAMETERS

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

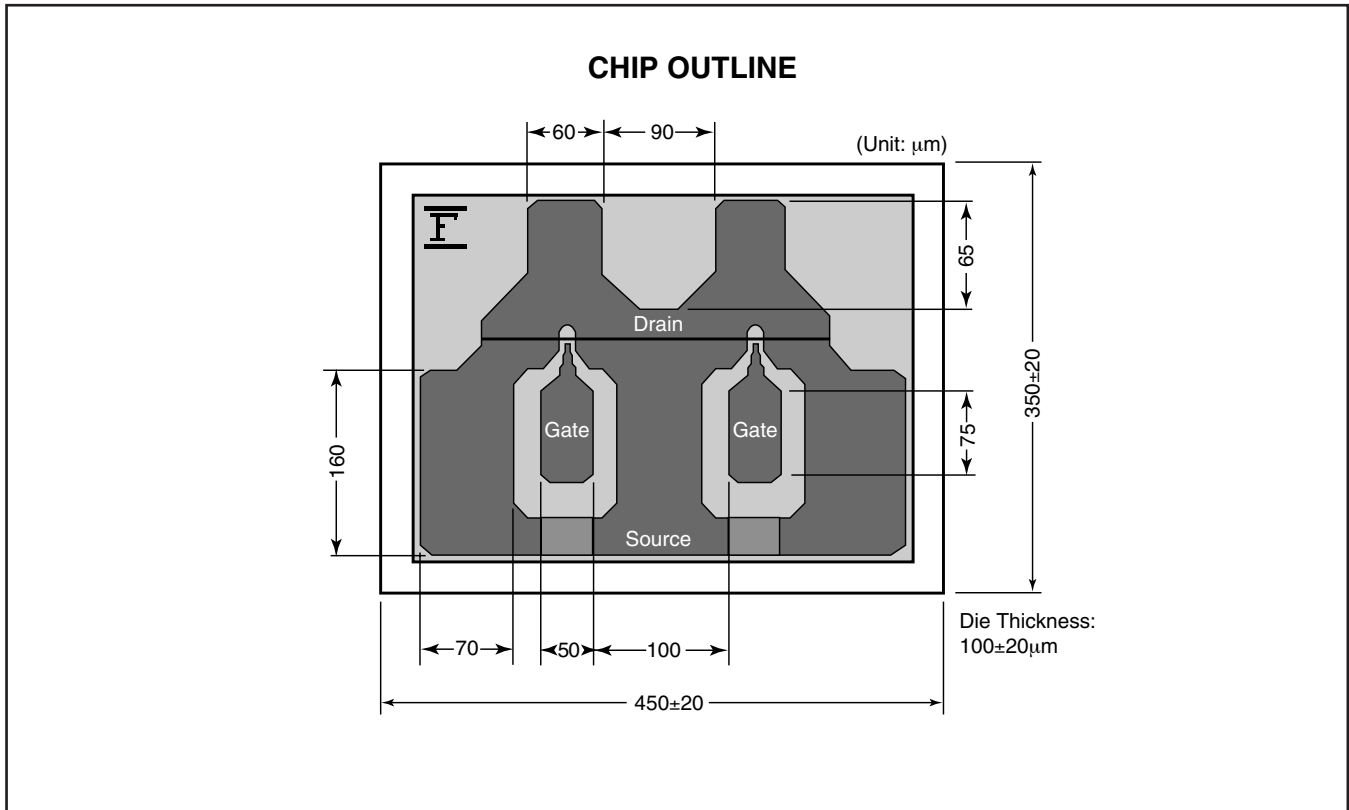
Freq. (GHz)	Γ _{opt}		NF _{min} (dB)	Rn/50
	(MAG)	(ANG)		
2	0.83	12.7	0.28	0.21
4	0.72	28.2	0.30	0.19
6	0.65	45.2	0.34	0.17
8	0.62	62.6	0.39	0.15
10	0.61	79.4	0.47	0.13
12	0.60	94.5	0.55	0.11
14	0.58	106.7	0.67	0.10
16	0.55	115.0	0.81	0.09
18	0.47	118.4	1.00	0.09

Ga (max) & |S₂₁|² vs. FREQUENCY



FHX45X

GaAs FET & HEMT Chips



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Fujitsu Compound Semiconductor 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.

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