

FMM5815X

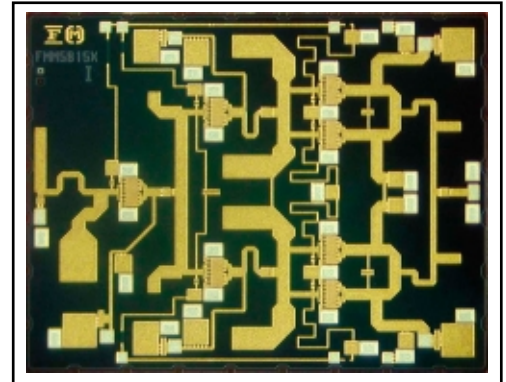
17.5-20GHz Power Amplifier MMIC

FEATURES

- High Output Power: $P_{1dB} = 31\text{dBm}$ (Typ.)
- High Gain: $G_{1dB} = 21\text{dB}$ (Typ.)
- High PAE: $\eta_{add} = 30\%$ (Typ.)
- Impedance Matched $Z_{in}/Z_{out} = 50\Omega$
- 0.25 μm PHEMT Technology

DESCRIPTION

The FMM5815X is a high-gain, high linearity, 3-stage MMIC amplifier designed for operation in the 17.5-20.0 GHz frequency range. This amplifier has an input and output designed for use in 50 Ω systems. This device is well suited for point-to-point communication applications.



ABSOLUTE MAXIMUM RATING (Ambient Temperature $T_a=25^\circ\text{C}$)

Item	Symbol	Condition	Rating	Unit
Drain Voltage	V_{DD}		10	V
Gate Voltage	V_{GG}		-3.0	V
Input Power	P_{in}		22	dBm
Storage Temperature	T_{stg}		-65 to +175	$^\circ\text{C}$
Operating Backside Temperature	T_{op}		-65 to +85	$^\circ\text{C}$

Fujitsu recommends the following conditions for the long term reliable operation of GaAs FETs:

1. The drain-source operating voltage (V_{DD}) should not exceed 6 volts.
2. The forward and reverse gate currents should not exceed 4 and -0.39 mA respectively.
3. This product should be hermetically packaged

ELECTRICAL CHARACTERISTICS (Ambient Temperature $T_c=25^\circ\text{C}$)

Item	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Frequency Range	f		17.5 - 20.0			GHz
Output Power at 1 dB G.C.P.	P_{1dB}		29.5	31	-	dBm
Power Gain at 1 dB G.C.P.	G_{1dB}		19	21	24	dB
Drain Current	I_{ddrf}	$V_{DD} = 6\text{V}$ $I_{DD} = 600\text{mA}$ (Typ.) $Z_S = Z_L = 50\Omega$	-	700	950	mA
Power-Added Efficiency	η_{add}		-	30	-	%
Input Return Loss	RL_{in}		-	-12	-	dB
Output Return Loss	RL_{out}		-	-8	-	dB
3rd Order Intermodulation Distortion	IM_3	$\Delta f = 10\text{MHz}$, 2-Tone Test, $P_{out} = 20\text{dBm}$ S.C.L.	-37.0	-40	-	dBc

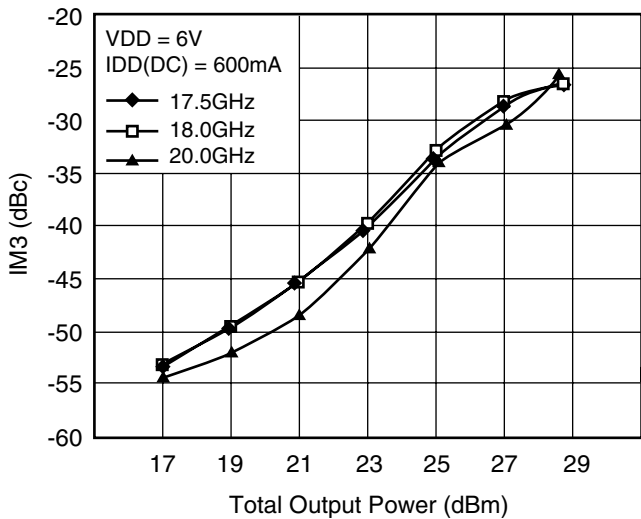
Note 1: RF parameter sample size 10pcs. Criteria (accept/reject)=(0/1)
Note 2: Electrical Characteristic is specified on RF-probe measurements

G.C.P.: Gain Compression Point
S.C.L.: Single Carrier Level

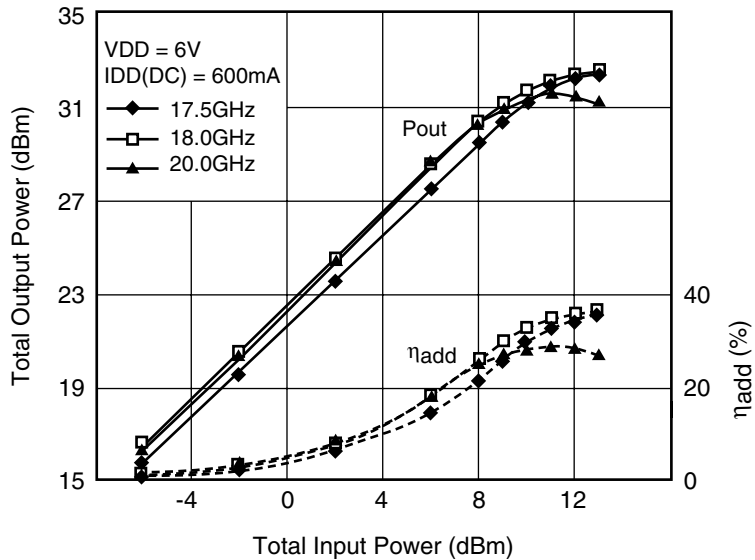
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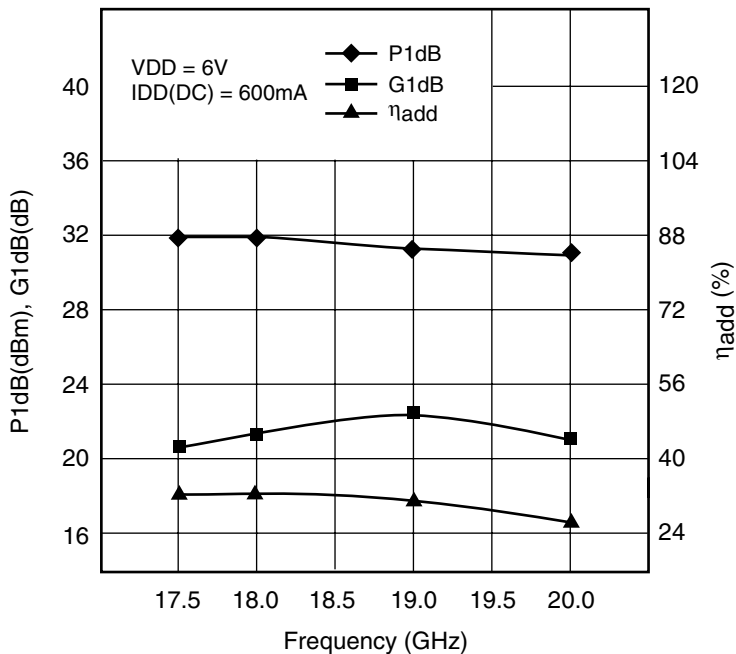
IM3 vs. OUTPUT POWER



OUTPUT POWER vs. INPUT POWER



P1dB & G1dB vs. FREQUENCY



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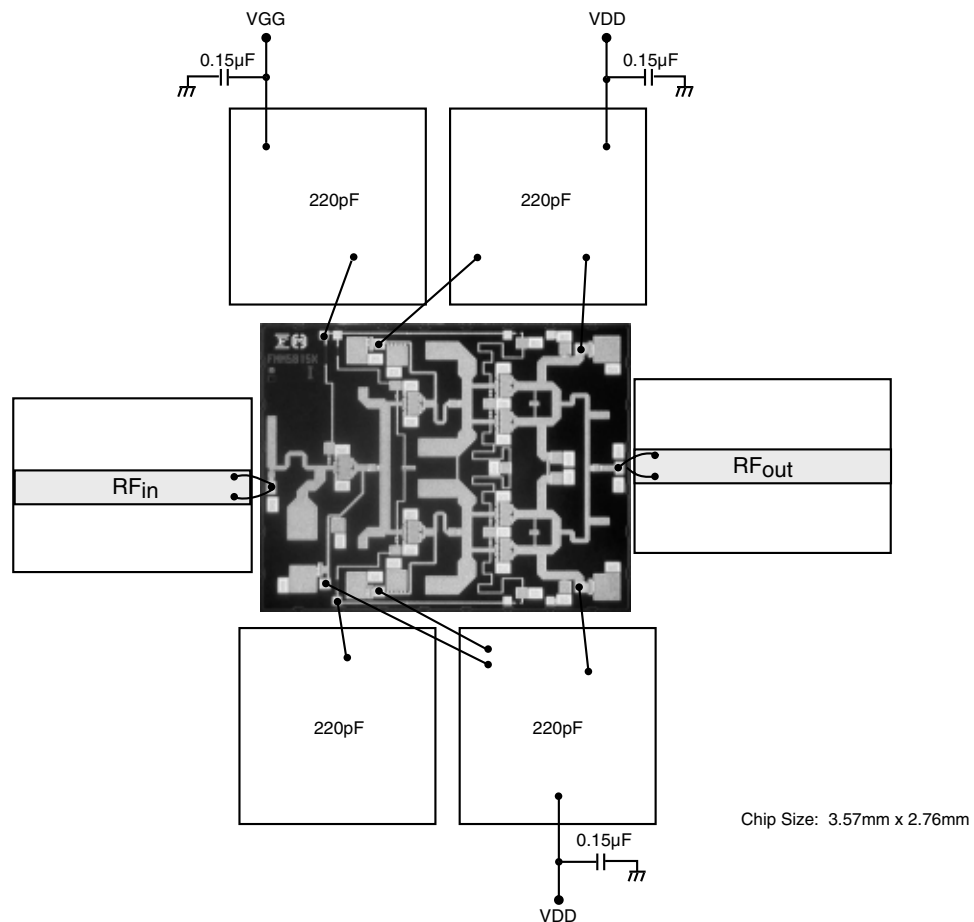
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S-PARAMETERS

$V_{DD} = 6V, I_{DS} = 600mA$

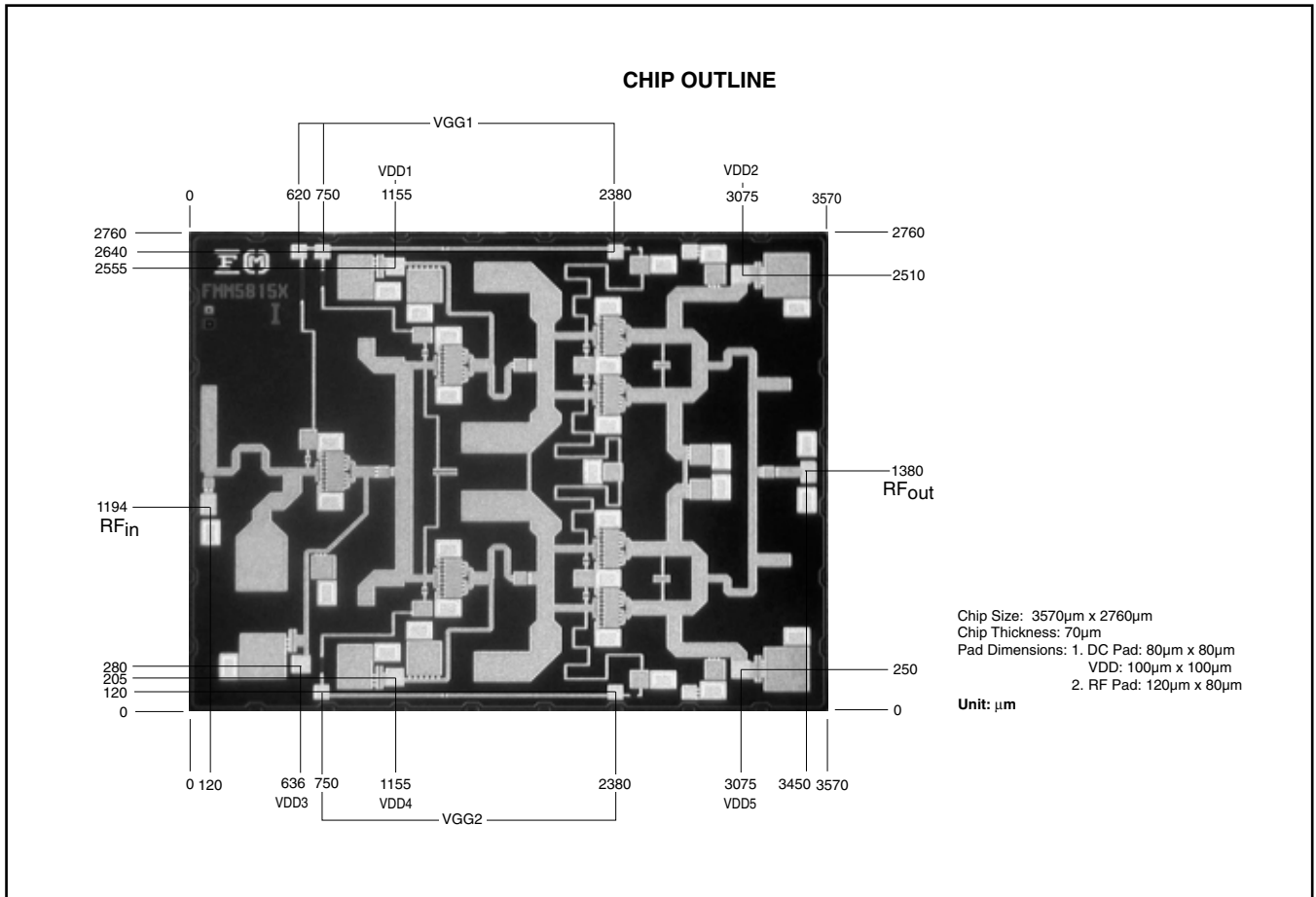
FREQUENCY (MHZ)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
16500	.357	47.0	10.785	-44.4	.004	-51.8	.110	-20.6
17000	.385	19.3	12.059	-80.4	.005	-42.8	.111	-93.5
17500	.443	-10.5	13.360	-117.3	.005	-62.5	.169	-134.6
18000	.512	-39.3	14.483	-156.9	.007	-83.0	.205	-166.6
18500	.566	-66.7	14.782	161.9	.007	-95.1	.220	164.9
19000	.572	-92.9	14.585	120.3	.005	-112.5	.178	137.0
19500	.538	-117.9	13.693	78.7	.005	-142.9	.121	108.3
20000	.459	-144.7	13.188	37.1	.003	94.6	.051	53.6
20500	.346	165.1	12.600	-10.4	.005	33.8	.044	19.8
21000	.307	74.2	11.066	-65.4	.006	-10.5	.080	11.4

ASSEMBLY DRAWING



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- 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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