

DESCRIPTION

The FA13205A is a high power, high gain amplifier module used for the 13GHz-band SSPA.

This module is a 2-stage high power GaAs FET amplifier and operates only by controlling drain current with gate bias voltage.

FEATURES

- High output power
 $P_{1dB} = 21 \text{ dBm (TYP) @}$
 $f = 13.6 \sim 14.1 \text{ GHz}$
- High linear power gain
 $G_{LP} = 30 \text{ dB (TYP) @}$
 $f = 13.6 \sim 14.1 \text{ GHz}$

APPLICATION

- 13.6 ~ 14.1 GHz band solid-state amplifiers

QUALITY GRADE

- GG

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

SYMBOL	PARAMETER	RATINGS		UNIT
		1st STAGE	2nd STAGE	
V_{DD}	DC supply voltage (Note 1)	0	15	V
V_{GG}	Gate bias voltage (Note 2)	-15	-15	V
I_D	Dissipation current	260	200	mA
P_{IN}	Input power	-3		dBm
P_T	Total power dissipation (Note 3)	800	1500	mW
T_{opr}	Operating temperature	-40 ~ +90		$^\circ\text{C}$
T_{stg}	Storage temperature	-40 ~ +90		$^\circ\text{C}$

Note 1: $V_{GG} = 0\text{V}$

Note 2: $V_{DD} = 0\text{V}$

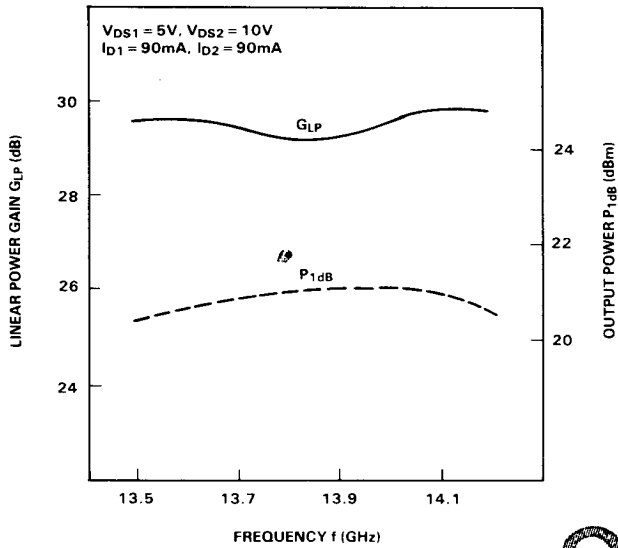
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

SYMBOL	PARAMETER	CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
G_{LP}	Linear power gain	$V_{DS1} = 5\text{V}, I_{D1} = 90\text{mA}$ $V_{DS2} = 10\text{V}, I_{D2} = 90\text{mA}$ $f = 13.6 \sim 14.1\text{GHz}$	27	30		dB
P_{1dB}	Output power at 1dB gain compression		19	21		dBm
ρ_{IN}	Input VSWR				3.0	
ρ_{OUT}	Output VSWR				3.0	

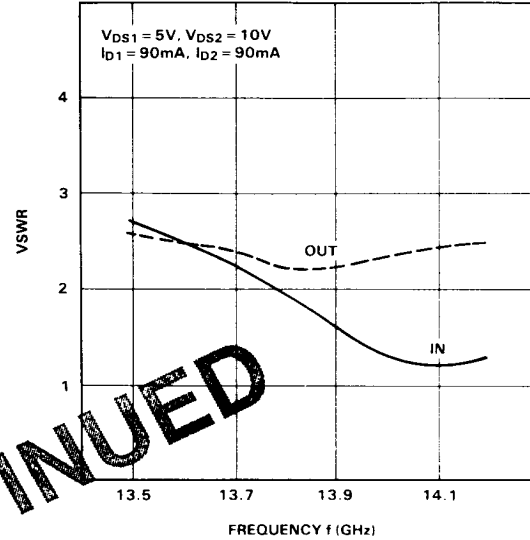
I_{D1} = 1st stage drain current, I_{D2} = 2nd stage drain current

TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

G_{LP} and P_{1dB} vs. f

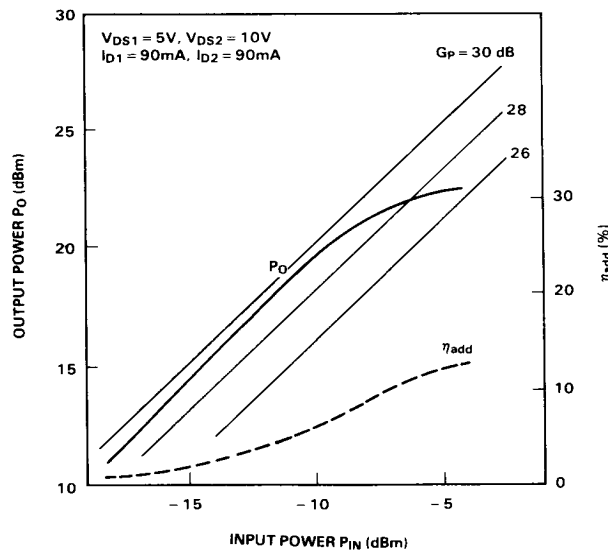


VSWR vs. f

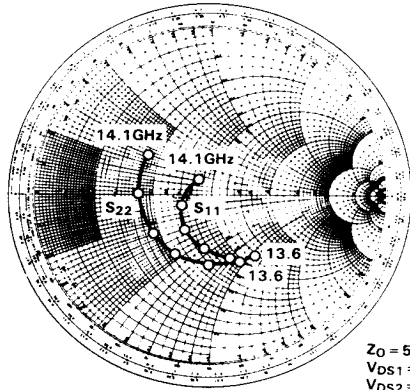


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P_O and η_{add} vs. P_{IN}
($f = 13.9$ GHz)

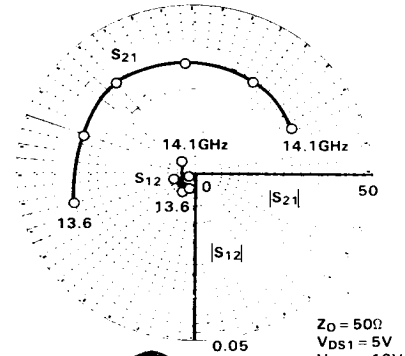


S₁₁, S₂₂ vs. f



Z₀ = 50Ω
V_{DS1} = 5V
V_{DS2} = 10V
I_{D1} = 90mA
I_{D2} = 90mA

S₁₂, S₂₁ vs. f

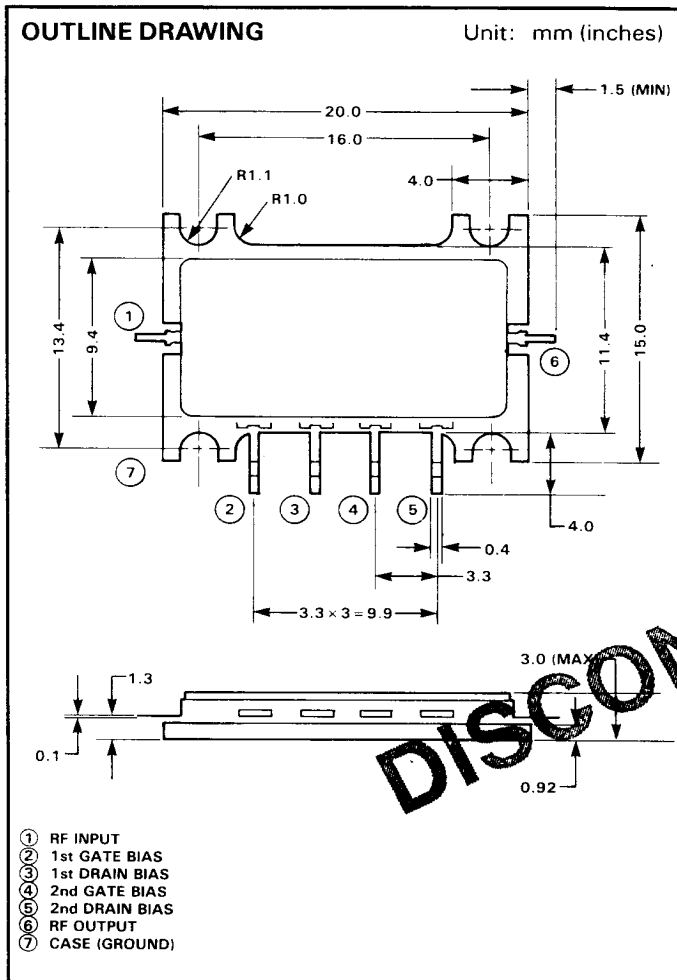


Z₀ = 50Ω
V_{DS1} = 5V
V_{DS2} = 10V
I_{D1} = 90mA
I_{D2} = 90mA

S PARAMETERS (T_a = 25°C, V_{DS1} = 5V, V_{DS2} = 10V, I_{D1} = 90 mA, I_{D2} = 90 mA)

Frequency (GHz)	S ₁₁		S ₁₂		S ₂₁		S ₂₂	
	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
13.6	0.44	-125	0.007	-125	35.51	-165	0.43	-66
13.7	0.40	-127	0.007	-167	33.59	161	0.42	-90
13.8	0.33	-94	0.009	-131	35.34	129	0.38	-117
13.9	0.24	-122	0.003	-155	33.35	96	0.38	-145
14.0	0.15	-163	0.006	-162	32.39	60	0.40	179
14.1	0.10	119	0.008	141	30.75	29	0.41	144

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