

PRELIMINARY

Notice: This is not a final specification.
Some parametric limits are subject to change.

MITSUBISHI SEMICONDUCTOR <GaAs FET>

MGFS44V2527

2.5~2.7GHz BAND 24W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFS44V2527 is an internally impedance-matched GaAs power FET especially designed for use in 2.5~2.7 GHz band amplifiers. The hermetically sealed metal-ceramic package guarantees high reliability.

FEATURES

- Class A operation
- Internally matched to 25Ω system
- High output power
P_{1dB} = 24W (TYP) @ 2.5~2.7GHz
- High power gain
G_{LP} = 11dB (TYP) @ 2.5~2.7GHz
- High power added efficiency
η_{add} = 40% (TYP) @ 2.5~2.7GHz, P_{1dB}
- Hermetically sealed metal-ceramic package
- Low distortion {Item: -51}
IM₃ = -45dBc (TYP) @ P_o = 33.5(dBm) S.C.L.

APPLICATION

Item-01: 2.5~2.7 GHz band power amplifiers.
Item-51: Digital radio communication.

QUALITY GRADE

- IG

ABSOLUTE MAXIMUM RATINGS (T_a = 25°C)

Symbol	Parameter	Ratings	Unit
V _{GD0}	Gate to drain voltage	-15	V
V _{GS0}	Gate to source voltage	-15	V
I _D	Drain current	24	A
I _{GR}	Reverse gate current	-60	mA
I _{GF}	Forward gate current	126	mA
P _T	Total power dissipation *1	100	W
T _{ch}	Channel temperature	175	°C
T _{stg}	Storage temperature	-65 ~ +175	°C

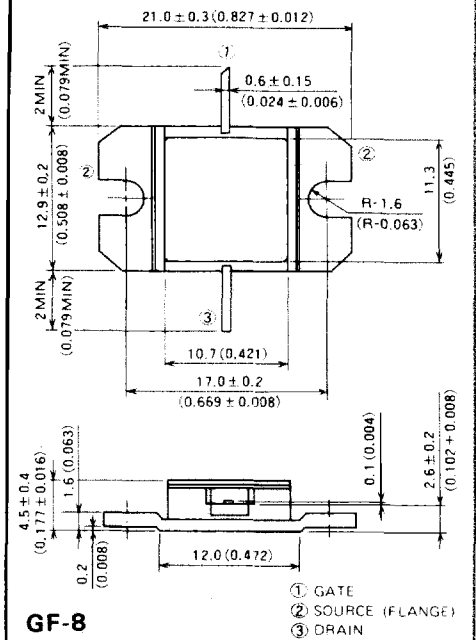
*1: T_c = 25°C

ELECTRICAL CHARACTERISTICS (T_a = 25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I _{DSS}	Saturated drain current	V _{DS} = 3V, V _{GS} = 0V	—	20	—	A
g _m	Transconductance	V _{DS} = 3V, I _D = 6.4A	—	6	—	S
V _{GS(off)}	Gate to source cut-off voltage	V _{DS} = 3V, I _D = 120mA	—	—	-4.5	V
P _{1dB}	Output power at 1dB gain compression	V _{DS} = 10V, I _D = 6.4A, f = 2.5 ~ 2.7GHz	43	44	—	dBm
G _{LP}	Linear power gain		10	11	—	dB
I _D	Drain current		—	7	—	A
η _{add}	Power added efficiency		—	40	—	%
IM ₃	3rd order IM distortion *1		-42	-45	—	dBc
R _{th(ch-c)}	Thermal resistance *2		ΔV _f method	—	—	1.6

*1: Item-51, 2-tone test P_o = 34dBm Single Carrier Level f = 2.7GHz Δf = 5MHz, *2: Channel to case

OUTLINE DRAWING Unit: millimeters (inches)



RECOMMENDED BIAS CONDITIONS

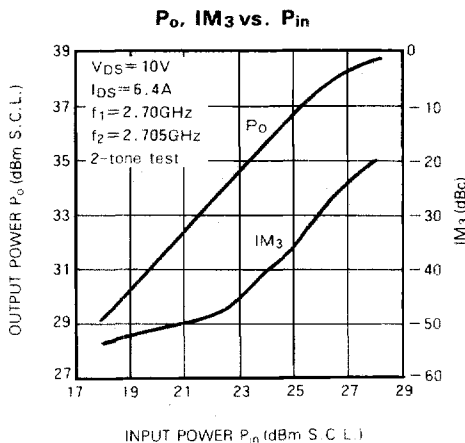
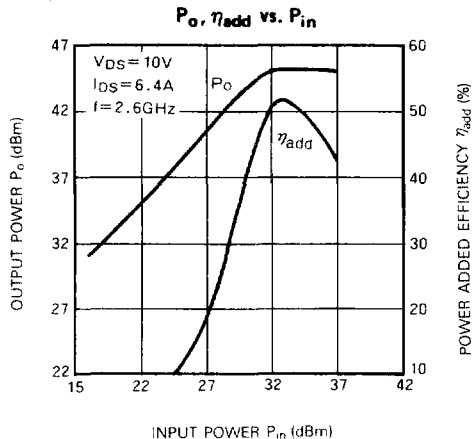
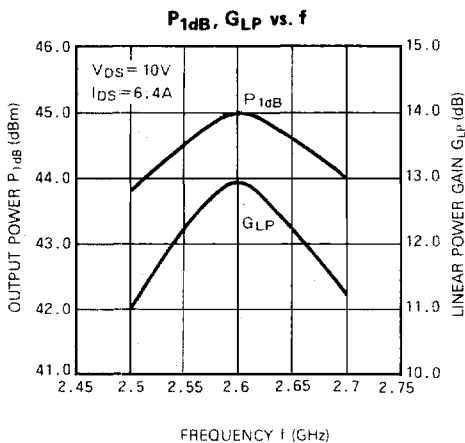
- V_{DS} = 10V
- I_D = 6.4A
- R_g = 25Ω
- Refer to Bias Procedure

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TYPICAL CHARACTERISTICS (Ta = 25°C)



S PARAMETERS (Ta = 25°C, V_{DS} = 10V, I_{DS} = 6.4A)

f (GHz)	S Parameter (TYP.)							
	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)
2.40	0.617	58	3.35	-116	0.038	-176	0.54	107
2.45	0.517	40	3.76	-130	0.041	171	0.50	105
2.50	0.414	14	4.14	-146	0.042	156	0.43	103
2.55	0.335	-24	4.39	-165	0.050	135	0.33	98
2.60	0.354	-75	4.48	175	0.057	112	0.22	105
2.65	0.430	-113	4.31	157	0.057	99	0.16	130
2.70	0.540	-140	3.99	140	0.054	75	0.20	158
2.75	0.630	-158	3.63	124	0.043	66	0.28	169
2.80	0.700	-173	3.24	111	0.043	51	0.36	169