

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

MITSUBISHI SEMICONDUCTOR <GaAs FET>

MGFS45V2123

2.1~2.3GHz BAND 30W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFS45V2123 is an internally impedance matched GaAs power FET especially designed for use in 2.1~2.3 GHz band amplifiers. The hermetically sealed metal-ceramic package guarantees high reliability.

FEATURES

- Class A operation
- Internally matched to 50 (Ω) system
- High output power
 $P_{1dB}=30W$ (TYP.) @f=2.1~2.3GHz
- High power gain
 $GLP=12dB$ (TYP.) @f=2.1~2.3GHz
- High power added efficiency
 $\eta_{add}=45\%$ (TYP.) @f=2.1~2.3GHz
- Low distortion [item -51]
 $IM3= -45dBc$ (TYP.) @Po=34.5dBm S.C.L.

APPLICATION

item 01 : 2.1~2.3GHz band power amplifier
 item 51 : 2.1~2.3GHz band digital radio communication

QUALITY GRADE

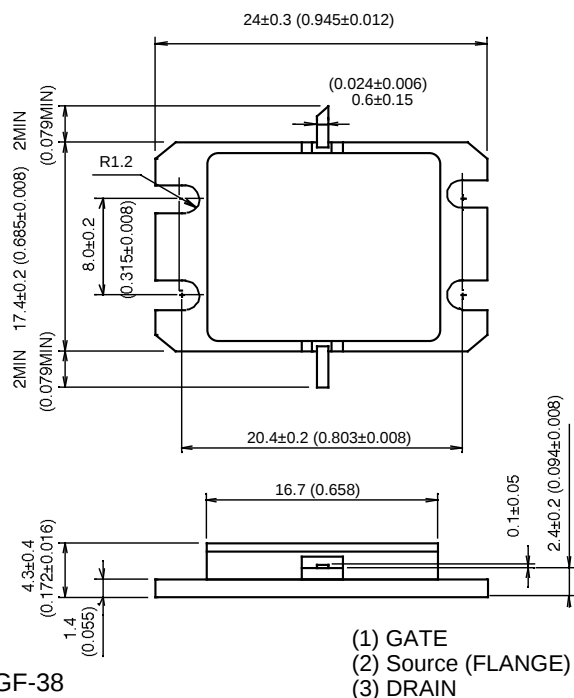
- IG

RECOMMENDED BIAS CONDITIONS

- $V_{DS}=10V$
- $I_D=6.5A$
- $R_G=25\Omega$

OUTLINE DRAWING

Until : millimeters (inches)



ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Symbol	Parameter	Ratings	Unit
V_{GDO}	Gate to drain voltage	-15	V
V_{GSO}	Gate to source voltage	-15	V
I_D	Drain current	22	A
I_{GR}	Reverse gate current	-61	mA
I_{GF}	Forward gate current	76	mA
P_T	Total power dissipation *1	88	W
T_{ch}	Channel temperature	175	°C
T_{stg}	Storage temperature	-65 ~ +175	°C

*1 : $T_C=25^\circ C$

ELECTRICAL CHARACTERISTICS (Ta=25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max	
V_{GS} (off)	Saturated drain current	$V_{DS}=3V, I_D=60mA$	—	—	-5	V
P_{1dB}	Output power at 1dB gain compression	$V_{DS}=10V, I_D(RF \text{ off})=6.5A, f=2.1\sim 2.3GHz$	44	45	—	dBm
GLP	Linear power gain		11	12	—	dB
I_D	Drain current		—	7.5	—	A
η_{add}	Power added efficiency		—	45	—	%
$IM3$	3rd order IM distortion *1		-42	-45	—	dBc
$R_{th} (ch-c)$	Thermal resistance *2	ΔV_f method	—	—	1.7	°C/W

*1 : item -51, 2 tone test, Po=34.5dBm Single Carrier Level, f=2.1, 2.2, 2.3GHz, $\Delta f=5MHz$

*2 : Channel to case

< Keep safety first in your circuit designs! >

Mitsubishi Electric Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage. Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of non-flammable material or (iii) prevention against any malfunction or mishap.



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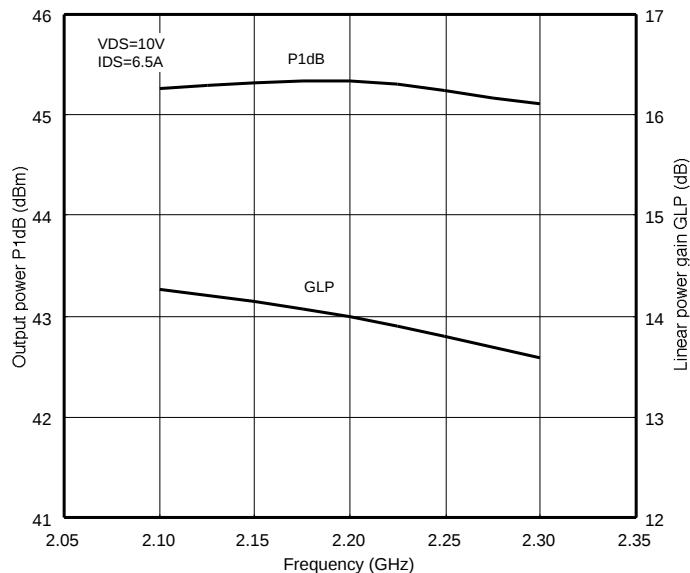
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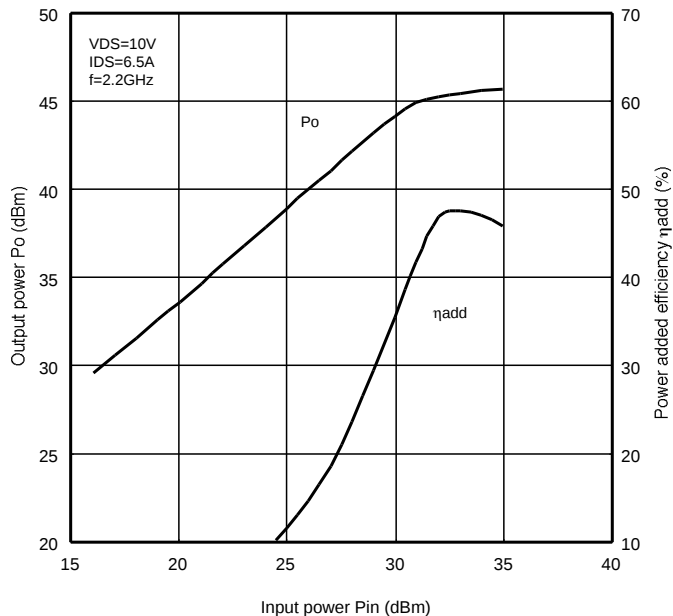
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TYPICAL CHARACTERISTICS

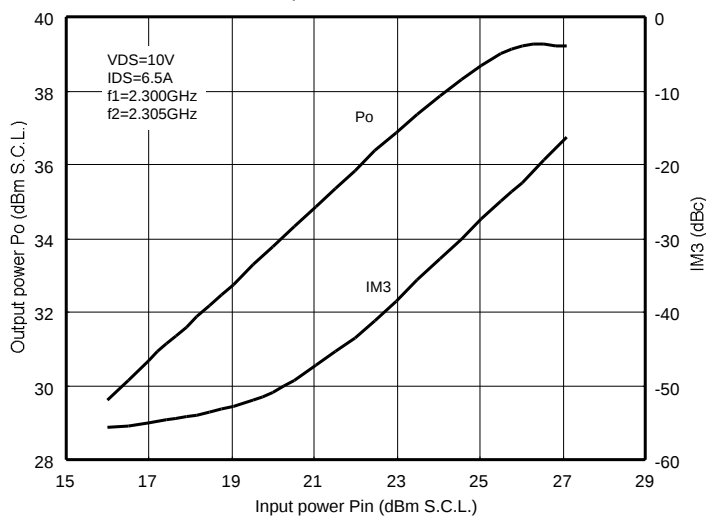
P1dB, GLP vs. Freq.



Po, η_{add} vs. Pin



Po, IM3 vs. Pin



S Parameters ($T_c=25^\circ\text{C}$, $V_{DS}=10\text{V}$, $I_{DS}=6.5\text{A}$)

f (GHz)	S-Parameter (TYP.)							
	S11		S21		S12		S22	
	Magn.	Angle(deg)	Magn.	Angle(deg)	Magn.	Angle(deg)	Magn.	Angle(deg)
2.00	0.31	-34	4.76	148	0.031	123	0.39	17
2.05	0.26	-77	4.96	129	0.032	99	0.34	-2
2.10	0.27	-120	5.02	109	0.035	76	0.30	-26
2.15	0.31	-153	4.99	90	0.035	53	0.28	-51
2.20	0.35	-178	4.88	73	0.034	31	0.29	-72
2.25	0.37	161	4.79	56	0.034	17	0.30	-92
2.30	0.38	143	4.69	39	0.035	-4	0.33	-109
2.35	0.36	126	4.62	22	0.036	-22	0.36	-123
2.40	0.32	107	4.56	5	0.037	-39	0.40	-134



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