

**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 ( ) system
- High output power  
 $P_{1dB}=30W$  (TYP.) @ $f=2.1\sim 2.3GHz$
- High power gain  
 $GLP=12dB$  (TYP.) @ $f=2.1\sim 2.3GHz$
- High power added efficiency  
 $add=45\%$  (TYP.) @ $f=2.1\sim 2.3GHz$
- Low distortion [item -51]  
 $IM3=-45dBc$  (TYP.) @ $P_o=34.5dBm$  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

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

## ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Symbol	Parameter	Ratings	Unit
VGDO	Gate to drain voltage	-15	V
VGSO	Gate to source voltage	-15	V
ID	Drain current	22	A
IGR	Reverse gate current	-61	mA
IGF	Forward gate current	76	mA
PT	Total power dissipation *1	88	W
Tch	Channel temperature	175	°C
Tstg	Storage temperature	-65 ~ +175	°C

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

## ELECTRICAL CHARACTERISTICS (Ta=25°C)

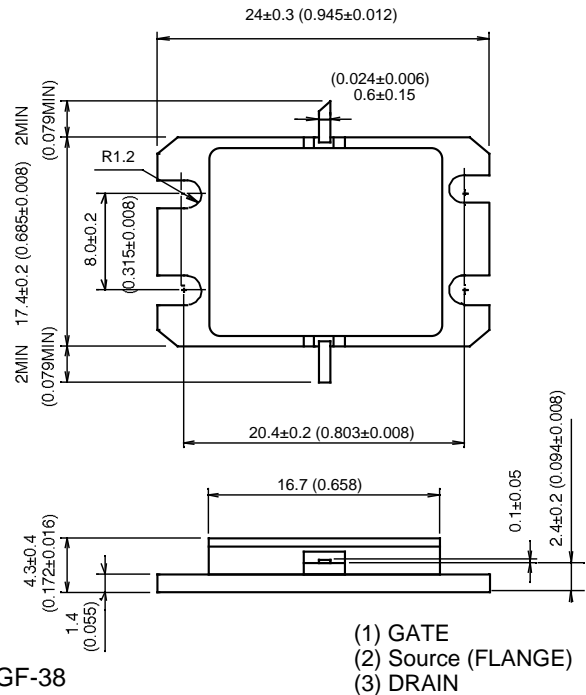
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max	
VGS (off)	Saturated drain current	$V_{DS}=3V, I_D=60mA$	—	—	-5	V
$P_{1dB}$	Output power at 1dB gain compression	$V_{DS}=10V, I_D(RF\ off)=6.5A, f=2.1\sim 2.3GHz$	44	45	—	dBm
GLP	Linear power gain		11	12	—	dB
ID	Drain current		—	7.5	—	A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

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

\*2 : Channel to case

## OUTLINE DRAWING

Until : millimeters (inches)



< 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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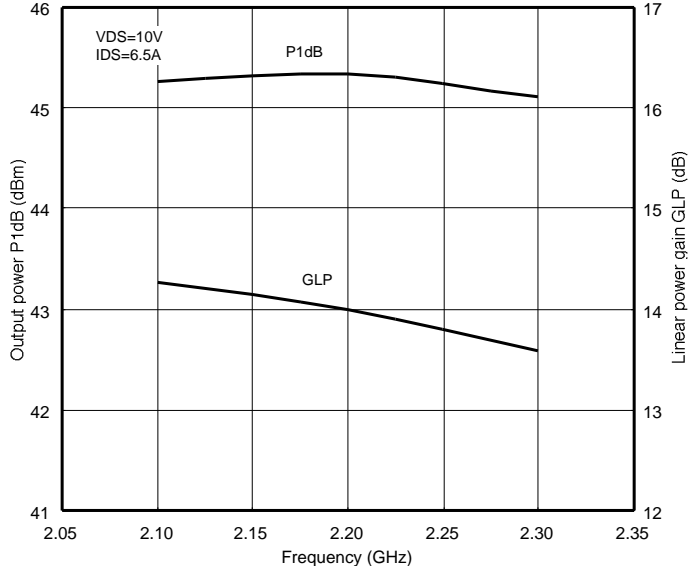
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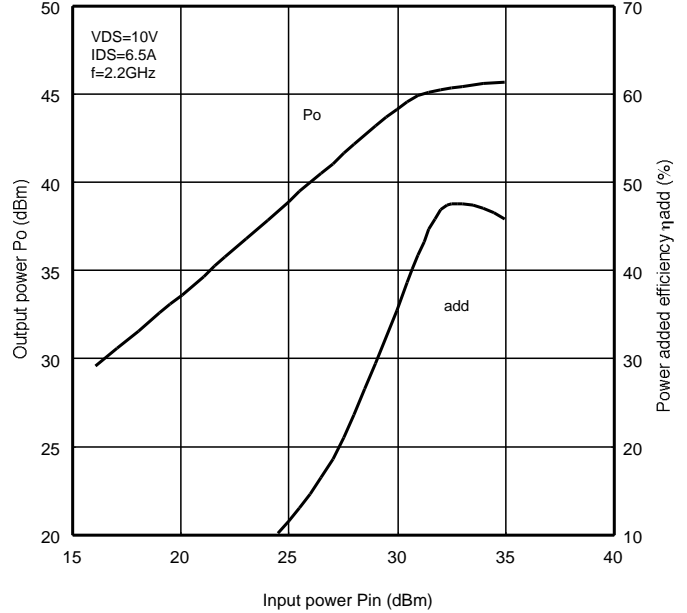
2.1~2.3GHz BAND 30W INTERNALLY MATCHED GaAs FET

## TYPICAL CHARACTERISTICS

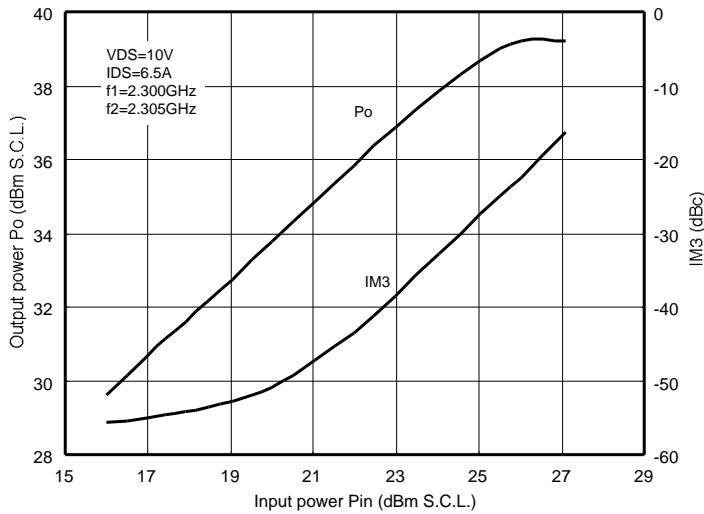
P1dB, GLP vs. Freq.



Po, add vs. Pin



Po, IM3 vs. Pin



S Parameters ( Tc=25°C, VDS=10V, IDS=6.5A )

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