

MGFC38V6472

6.4~7.2GHz BAND 6W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC38V6472 is an internally impedance-matched GaAs power FET especially designed for use in 6.4~7.2 GHz band amplifiers. The hermetically sealed metal-ceramic package guarantees high reliability.

FEATURES

- Class A operation
- Internally matched to 50Ω system
- High output power
 $P_{1dB} = 6W$ (TYP) @ 6.4~7.2GHz
- High power gain
 $G_{LP} = 9$ dB (TYP) @ 6.4~7.2GHz
- High power added efficiency
 $\eta_{add} = 31\%$ (TYP) @ 6.4~7.2GHz, P_{1dB}
- Hermetically sealed metal-ceramic package
- Low distortion [Item: -51]
 $IM_3 = -45$ dBc (TYP) @ $P_o = 27$ (dBm) S.C.L.

APPLICATION

Item-01: 6.4~7.2GHz band power amplifier
Item-51: Digital radio communication

QUALITY GRADE

- IG

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

Symbol	Parameter	Ratings	Unit
V_{GDO}	Gate to drain voltage	-15	V
V_{GSO}	Gate to source voltage	-15	V
I_D	Drain current	5.0	A
I_{GR}	Reverse gate current	-15	mA
I_{GF}	Forward gate current	31.5	mA
P_T	Total power dissipation *1	30	W
T_{ch}	Channel temperature	175	$^\circ C$
T_{stg}	Storage temperature	-65 ~ +175	$^\circ C$

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

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

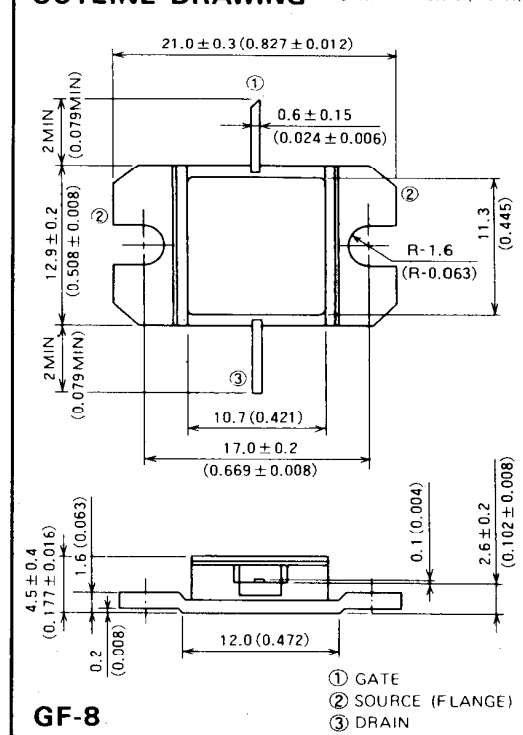
Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{DSS}	Saturated drain current	$V_{DS} = 3V, V_{GS} = 0V$	—	—	5.0	A
g_m	Transconductance	$V_{DS} = 3V, I_D = 1.5A$	—	2	—	S
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS} = 3V, I_D = 15mA$	—	-3.5	-5.0	V
P_{1dB}	Output power at 1dB gain compression	$V_{DS} = 10V, I_D = 1.8A, f = 6.4 \sim 7.2GHz$	37	38	—	dBm
G_{LP}	Linear power gain		8	9	—	dB
I_D	Drain current		—	1.7	—	A
η_{add}	Power added efficiency		—	31	—	%
* IM_3	3rd order IM distortion *1		-42	-45	—	dBc
$R_{th(ch-c)}$	Thermal resistance *2	ΔV_f method	—	—	5.0	$^\circ C/W$

*1: Item-51, 2-tone test $P_o = 27$ dBm Single Carrier Level $f = 7.2GHz$ $\Delta f = 10$ MHz.

*2: Channel to case

OUTLINE DRAWING

Unit: millimeters (inches)

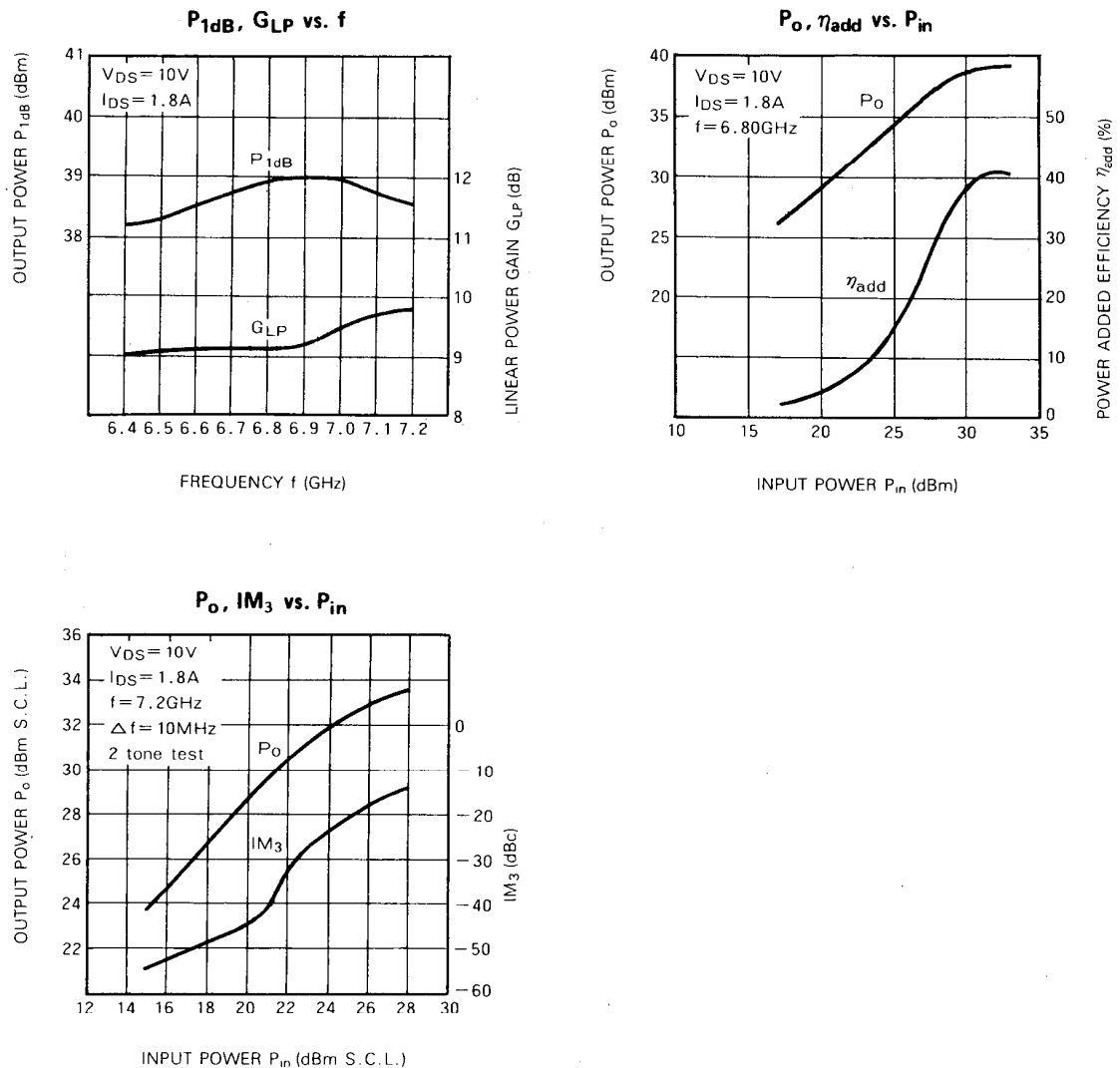


RECOMMENDED BIAS CONDITIONS

- $V_{DS} = 10V$
- $I_D = 1.8A$
- $R_g = 100\Omega$
- Refer to Bias Procedure

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



S PARAMETERS ($T_a = 25^\circ\text{C}$, $V_{DS} = 10\text{V}$, $I_{DS} = 1.8\text{A}$)

f (GHz)	S Parameters (TYP.)							
	S_{11}		S_{21}		S_{12}		S_{22}	
	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)
6.4	0.56	154	2.86	-47	0.049	-91	0.15	-172
6.5	0.52	142	2.96	-64	0.051	-105	0.17	148
6.6	0.45	131	2.94	-80	0.053	-123	0.21	128
6.7	0.39	123	3.01	-97	0.059	-138	0.27	106
6.8	0.30	119	3.02	-115	0.062	-155	0.30	89
6.9	0.25	126	2.98	-134	0.071	-171	0.31	76
7.0	0.21	143	2.91	-153	0.070	170	0.30	57
7.1	0.24	153	2.84	-166	0.070	161	0.28	44
7.2	0.33	161	2.68	174	0.063	138	0.26	30