MGFC39V5258

5.2~5.8GHz BAND 8W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC39V5258 is an internally impedance-matched GaAs power FET especially designed for use in 5.2 ~ 5.8 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} = 8 W (TYP) @ 5.2 ~ 5.8 GHz
- High power gain
  G_{LP} = 9 dB (TYP) @ 5.2 ~ 5.8 GHz
- High power added efficiency
  η_{add} = 30% (TYP) @ 5.2 ~ 5.8 GHz, P_{1dB}
- Hermetically sealed metal-ceramic package

APPLICATION

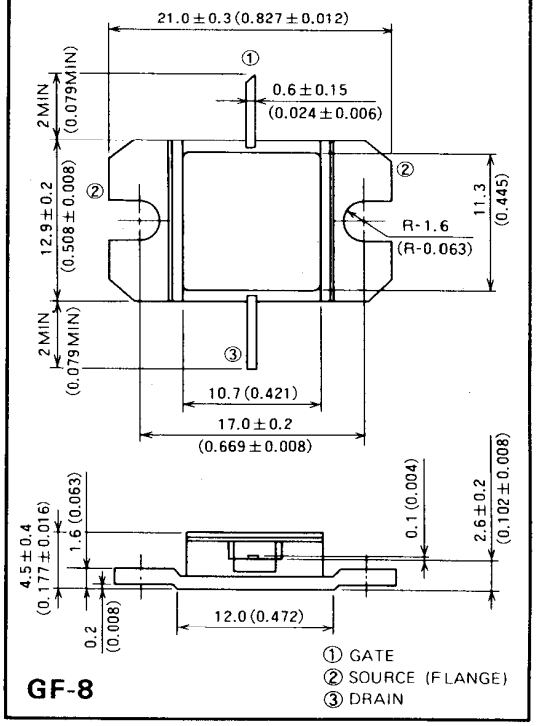
5.2 ~ 5.8 GHz band power amplifiers.

QUALITY GRADE

- IG

OUTLINE DRAWING

Unit: millimeters (inches)



GF-8

RECOMMENDED BIAS CONDITIONS

- V_{DS}=10V
- I_D=2.4A
- Rg=50Ω
- Refer to Bias Procedure

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	5.6	A
I_{GR}	Reverse gate current	−20	mA
I_{GF}	Forward gate current	+42	mA
P_T	Total power dissipation *1	42.8	W
Tch	Channel temperature	175	°C
Tstg	Storage temperature	−65~+175	°C

*1: T_C = 25°C

ELECTRICAL CHARACTERISTICS (Ta=25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{DSS}	Saturated drain current	V_{DS}=3V, V_{GS}=0V	—	4.0	5.6	A
g_m	Transconductance	V_{DS}=3V, I_D=2.2A	—	2.0	—	S
$V_{GS(off)}$	Gate to source cut-off voltage	V_{DS}=3V, I_D=20mA	−2	−3	−4	V
P_{1dB}	Output power at 1dB gain compression	V_{DS}=10V, I_D=2.4A, f=5.2~5.8GHz	38	39	—	dBm
G_{LP}	Linear power gain		8	9	—	dB
ΔI_D	Drain current		—	2.2	1.4	A
η_{add}	Power added efficiency		—	30	—	%
$R_{th(ch-c)}$	Thermal resistance *1	ΔV_f method	—	—	3.5	°C/W

*1: Channel to case

MITSUBISHI ELECTRIC

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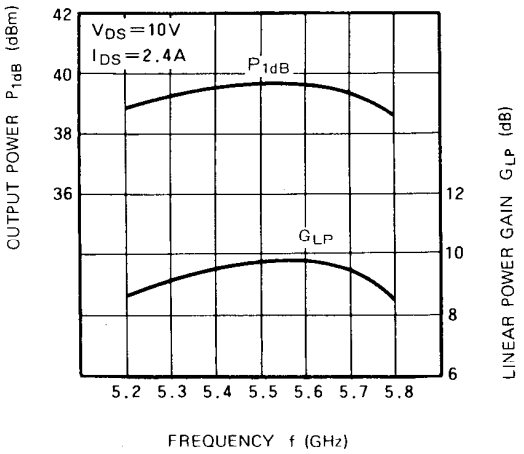
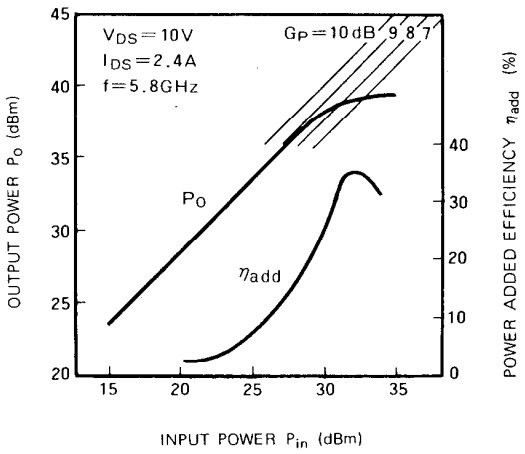
TYPICAL CHARACTERISTICS (T_a=25°C)

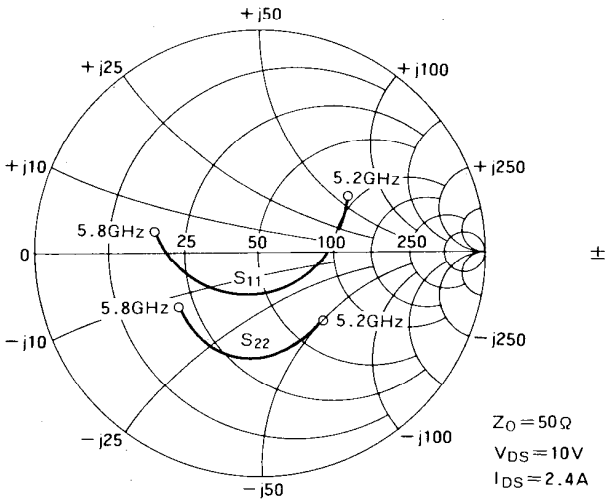
P_{1dB}, G_{LP} vs. f



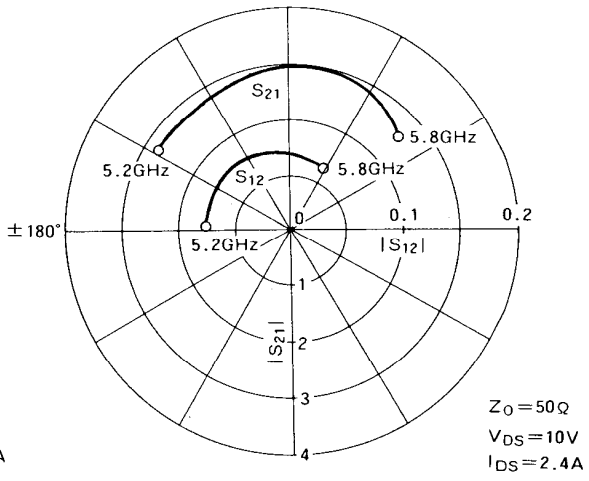
P_O, η_{add} vs. P_{in}



S_{11}, S_{22} vs. f



S_{21}, S_{12} vs.f



S PARAMETERS (T_a=25°C, V_{DS}=10V, I_{DS}=2.4A)

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.)
5.2	0.48	32	2.69	148	0.076	178	0.42	−47
5.3	0.36	11	2.80	133	0.077	164	0.43	−61
5.4	0.26	−19	2.79	114	0.077	146	0.45	−77
5.5	0.19	−71	2.99	99	0.076	127	0.47	−95
5.6	0.26	−139	2.98	81	0.070	105	0.48	−113
5.7	0.38	−170	2.95	62	0.068	84	0.46	−130
5.8	0.49	169	2.70	41	0.065	61	0.45	−146

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