

# 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

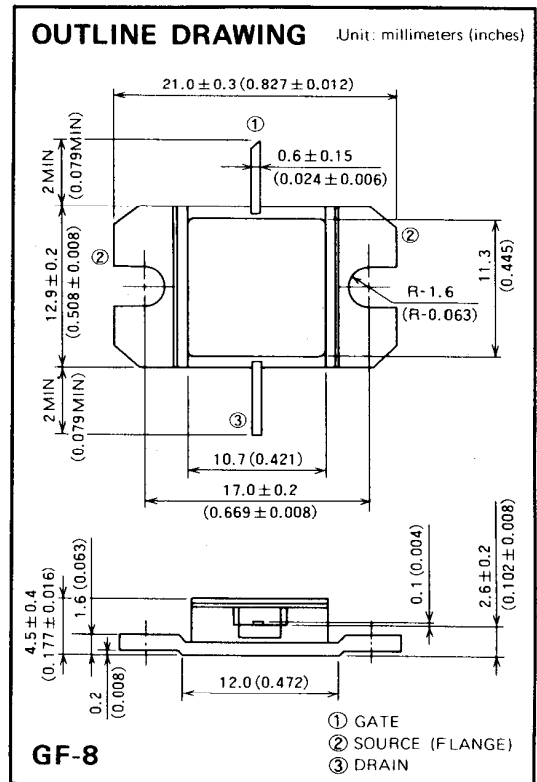
- Class A operation
- Internally matched to 50Ω system
- High output power  
 $P_{1dB} = 8 \text{ W (TYP) @ 5.2 ~ 5.8 GHz}$
- High power gain  
 $G_{LP} = 9 \text{ dB (TYP) @ 5.2 ~ 5.8 GHz}$
- High power added efficiency  
 $\eta_{add} = 30\% \text{ (TYP) @ 5.2 ~ 5.8 GHz, } P_{1dB}$
- Hermetically sealed metal-ceramic package

### APPLICATION

5.2 ~ 5.8 GHz band power amplifiers.

### QUALITY GRADE

- IG



### ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Symbol	Parameter	Ratings	Unit
V <sub>GDO</sub>	Gate to drain voltage	-15	V
V <sub>GSO</sub>	Gate to source voltage	-15	V
I <sub>D</sub>	Drain current	5.6	A
I <sub>GR</sub>	Reverse gate current	-20	mA
I <sub>GF</sub>	Forward gate current	+42	mA
P <sub>T</sub>	Total power dissipation * 1	42.8	W
T <sub>ch</sub>	Channel temperature	175	°C
T <sub>stg</sub>	Storage temperature	-65 ~ +175	°C

\* 1: T<sub>C</sub> = 25°C

### RECOMMENDED BIAS CONDITIONS

- V<sub>DS</sub> = 10V
- I<sub>D</sub> = 2.4A
- R<sub>g</sub> = 50Ω
- Refer to Bias Procedure

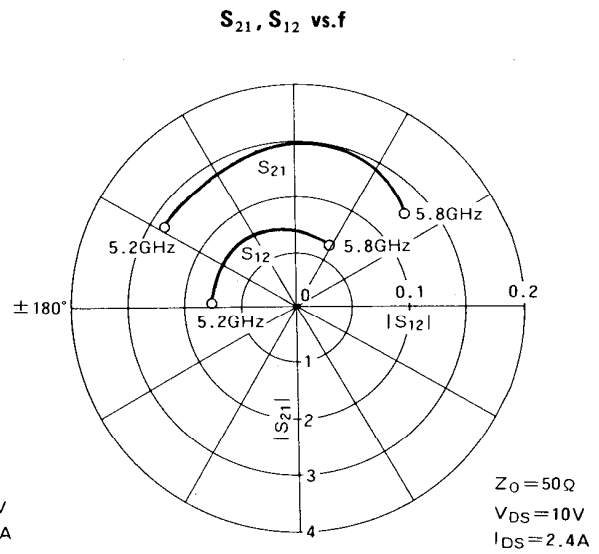
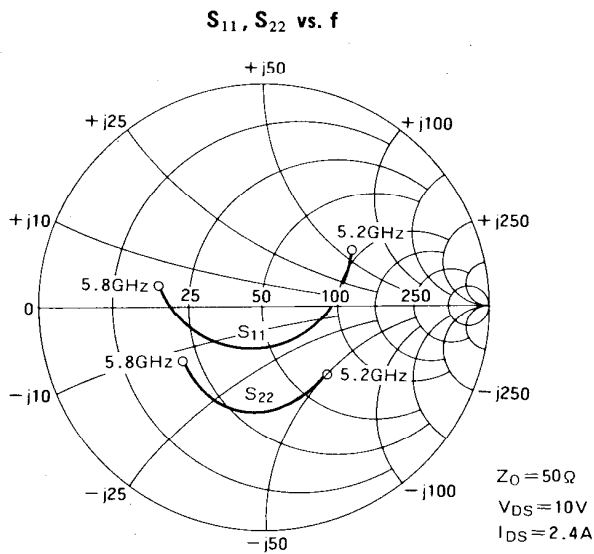
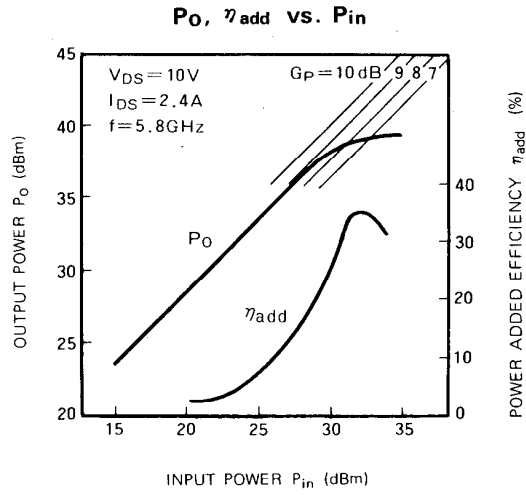
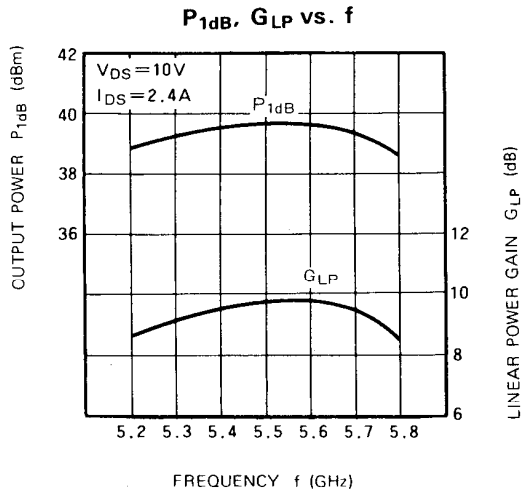
### ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I <sub>DSS</sub>	Saturated drain current	V <sub>DS</sub> = 3V, V <sub>GS</sub> = 0V	—	4.0	5.6	A
g <sub>m</sub>	Transconductance	V <sub>DS</sub> = 3V, I <sub>D</sub> = 2.2A	—	2.0	—	S
V <sub>GS(off)</sub>	Gate to source cut-off voltage	V <sub>DS</sub> = 3V, I <sub>D</sub> = 20mA	-2	-3	-4	V
P <sub>1dB</sub>	Output power at 1dB gain compression	V <sub>DS</sub> = 10V, I <sub>D</sub> = 2.4A, f = 5.2 ~ 5.8GHz	38	39	—	dBm
G <sub>LP</sub>	Linear power gain		8	9	—	dB
I <sub>D</sub>	Drain current		—	2.2	1.4	A
η <sub>add</sub>	Power added efficiency		—	30	—	%
R <sub>th(ch-c)</sub>	Thermal resistance * 1		ΔV <sub>f</sub> method	—	—	3.5

\* 1: Channel to case

**5.2~5.8GHz BAND 8W INTERNALLY MATCHED GaAs FET**

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



**S PARAMETERS** ( $T_a=25^\circ\text{C}$ ,  $V_{DS}=10\text{V}$ ,  $I_{DS}=2.4\text{A}$ )

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.)
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