

MGFC42V5258

5.2~5.8GHz BAND 16W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC42V5258 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
 $P_{1dB} = 18W$ (TYP) @ 5.2~5.8 GHz
- High power gain
 $G_{LP} = 9$ dB (TYP) @ 5.2~5.8 GHz
- High power added efficiency
 $\eta_{add} = 31\%$ (TYP) @ 5.2~5.8 GHz, P_{1dB}
- Hermetically sealed metal-ceramic package

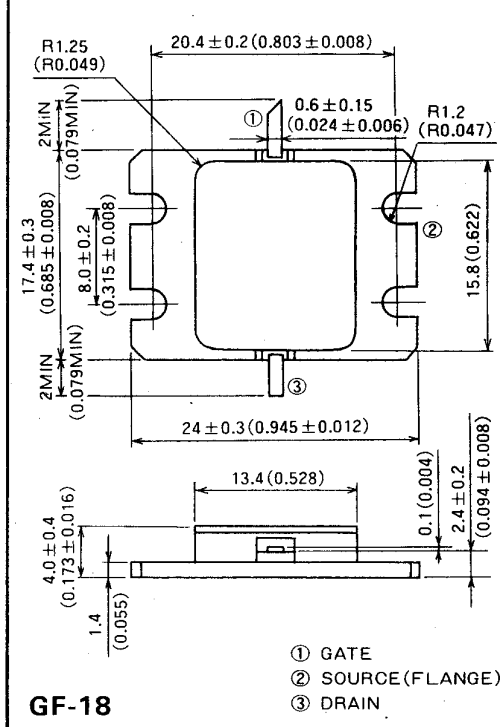
APPLICATION

5.2~5.8GHz band power amplifier

QUALITY GRADE

- 1G

OUTLINE DRAWING Unit: millimeters (inches)



RECOMMENDED BIAS CONDITIONS

- $V_{DS} = 10V$
- $I_D = 4.5A$
- $R_g = 25\Omega$
- Refer to Bias Procedure

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

Symbol	Parameter	Rating	Unit
V_{GDO}	Gate to drain voltage	-15	V
V_{GSO}	Gate to source voltage	-15	V
I_D	Drain current	12	A
I_{GR}	Reverse gate current	-40	mA
I_{GF}	Forward gate current	84	mA
P_T	Total power dissipation *1	78.9	W
T_{ch}	Channel temperature	175	°C
T_{stg}	Storage temperature	-65 ~ +175	°C

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

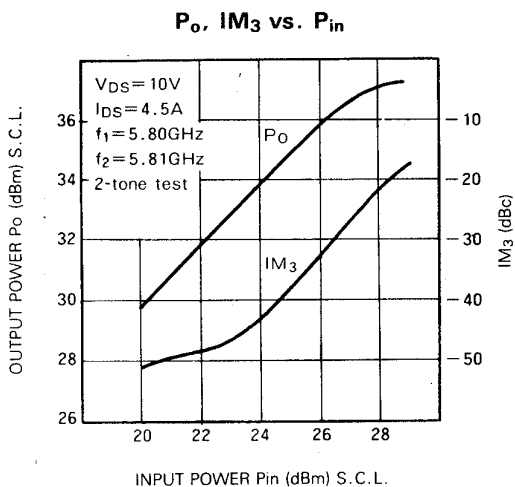
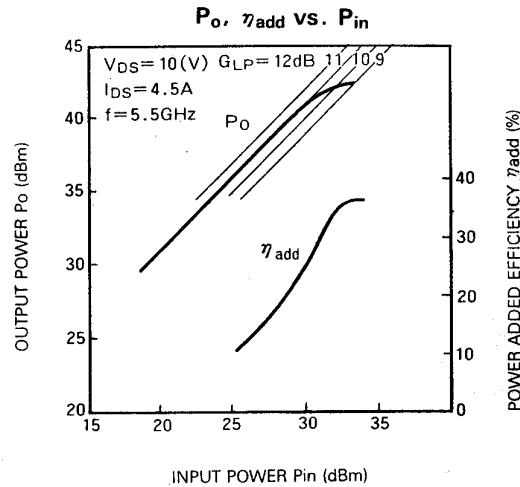
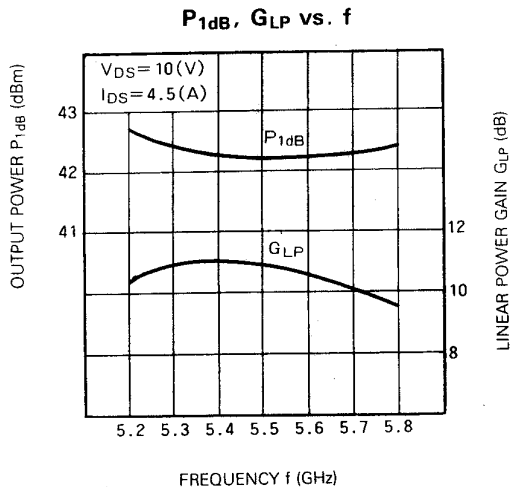
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ C$)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{DSS}	Saturated drain current	$V_{DS} = 3V, V_{GS} = 0V$	—	9	12	A
g_m	Transconductance	$V_{DS} = 3V, I_D = 4.4A$	—	4	—	S
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS} = 3V, I_D = 80mA$	-2	-3	-4	V
P_{1dB}	Output power at 1dB gain compression	$V_{DS} = 10V, I_D = 4.5A, f = 5.2 \sim 5.8GHz$	41.5	42.5	—	dBm
G_{LP}	Linear power gain		8	9	—	dB
I_D	Drain current		—	4.5	—	A
η_{add}	Power added efficiency		—	31	—	%
$R_{th(ch-c)}$	Thermal resistance *1		ΔV_f method	—	—	1.9

*1: Channel to case

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TYPICAL CHARACTERISTICS



S PARAMETERS ($T_a=25^\circ C$, $V_{DS}=10V$, $I_{DS}=4.5A$)

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	0.55	- 87	3.27	43	0.032	- 4	0.20	-109
5.3	0.46	-114	3.47	22	0.035	- 30	0.17	-152
5.4	0.37	-146	3.53	0	0.052	- 55	0.18	166
5.5	0.32	176	3.48	-21	0.058	- 78	0.22	133
5.6	0.30	138	3.24	-42	0.065	- 98	0.25	111
5.7	0.32	105	3.18	-59	0.068	-117	0.28	94
5.8	0.35	80	3.06	-76	0.069	-136	0.29	82