MITSUBISHI SEMICONDUCTOR <GaAs FET>

MGF2124G

FOR MICROWAVE POWER AMPLIFIERS CHIP-CARRIER TYPE

DESCRIPTION

The MGF2124G combines the advantages of the least parasitics of a chip device and the easy assembly of a package device. The device gives excellent performance even in Ku-band.

FEATURES

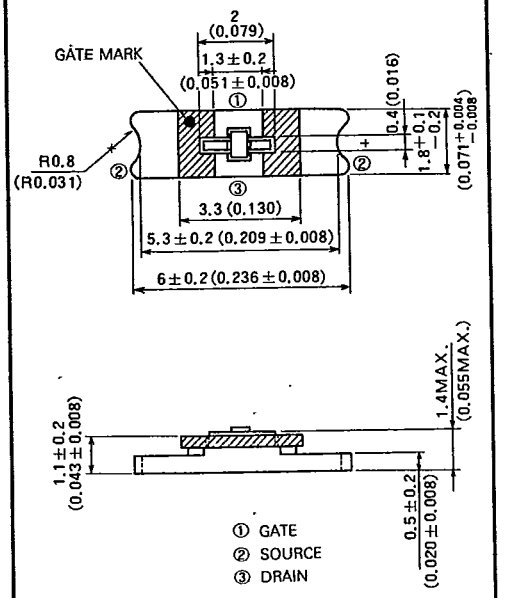
- Chip-carrier type 1.8 mm Width
- Flip-chip mounted.
- High output power
  P_{1dB} = 0.7 W (TYP.) @ f = 14 GHz
- High linear power gain
  G_{LP} = 5.5 dB (TYP.) @ f = 14 GHz
- High power added efficiency
  η_{add} = 18% (TYP.) @ f = 14 GHz, P_{1dB}

QUALITY GRADE

- IG

OUTLINE DRAWING

Unit: millimeters (inches)



ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Symbol	Parameter	Rating	Unit
V_{GDO}	Gate to drain voltage	−11	V
V_{GSO}	Gate to source voltage	−11	V
I_D	Drain current	800	mA
I_{GR}	Reverse gate current	−2.0	mA
I_{GF}	Forward gate current	4.5	mA
P_T	Total power dissipation	5	W
Tch	Channel temperature	175	°C
Tstg	Storage temperature	−55~+175	°C
Rth(ch-c)	Thermal resistance	30	°C/W

ELECTRICAL CHARACTERISTICS (Ta=25°C)

Symbol	Paramter	Conditions		Limits			Unit
				Min	Typ	Max	
I_{DSS}	Saturated drain current	V_{DS}=3V, V_{GS}=0V		450	650	800	mA
$V_{GS(off)}$	Gate to source cut-off voltage	V_{DS}=3V; I_D=1mA		−2		−7	V
g_m	Transconductance	V_{DS}=3V, I_D=300mA		180	250		mS
P_{1dB} *	Output power at 1 dB gain compression	V_{DS}=8V, I_D=300mA	f=12GHz	0.7	1.0		W
			f=14GHz		0.7		
G_{LP} *	Linear power gain		f=12GHz	5.3	6.3		dB
			f=14GHz		5.5		
η_{add} *	Power added efficiency		f=12GHz		25		%
			f=14GHz		18		

* Sampling inspection

MITSUBISHI ELECTRIC

MGF2124G

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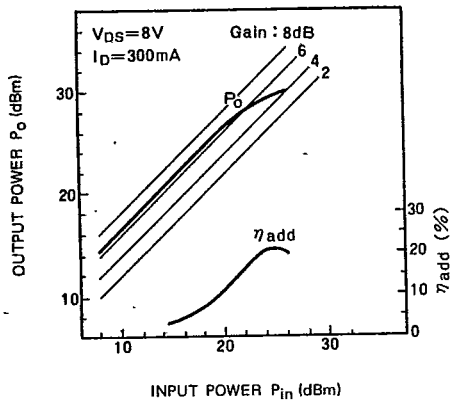
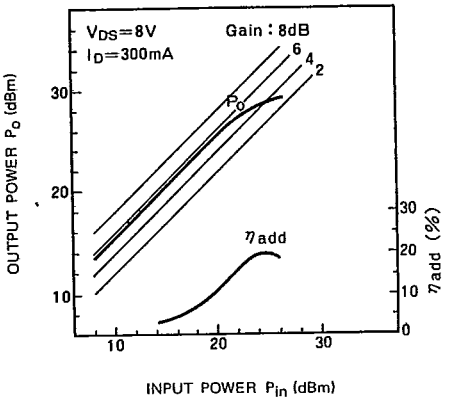
T-39-05

TYPICAL CHARACTERISTICS (Ta=25°C)

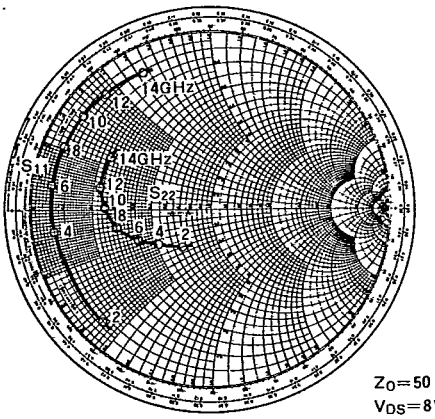
P_o, η_{add} vs. P_{in} (f = 12 GHz)



P_o, η_{add} vs. P_{in} (f = 14 GHz)

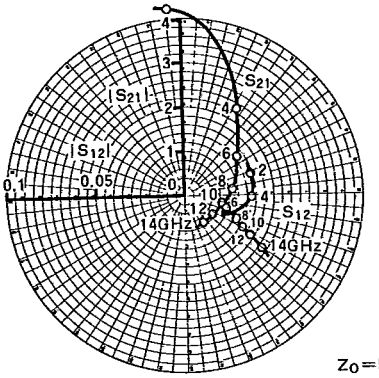


S_{11}, S_{22} vs. f



ZO=50Ω
VDS=8V
ID=300mA

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



ZO=50Ω
VDS=8V
ID=300mA

S PARAMETERS (Ta=25°C, VDS=8V, ID=300mA)

f (GHz)	S Parameters (TYP.)							
	S_{11}		S_{12}		S_{21}		S_{22}	
	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)
2	0.868	−132.1	0.033	21.9	4.26	95.1	0.245	−126.4
4	0.869	−172.1	0.034	−1.5	2.22	58.7	0.342	−146.3
6	0.863	172.0	0.016	−5.3	1.57	34.5	0.433	−157.4
8	0.889	155.0	0.033	−20.3	1.09	6.7	0.520	−169.5
10	0.891	143.1	0.038	−26.8	0.80	−10.4	0.578	179.0
12	0.890	132.0	0.047	−29.3	0.78	−30.8	0.625	167.8
14	0.863	115.7	0.051	−35.3	0.72	−55.8	0.612	152.3