MITSUBISHI SEMICONDUCTOR 〈GaAs FET〉

MGFC36V7785A

PRELIMINARY

Notice: This is not a final specification.
Some parametric limits are subject to change.

7.7~8.5GHz BAND 4W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC36V7785A is an internally impedance-matched GaAs power FET especially designed for use in 7.7~8.5GHz 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} = 4W(TYP) @7.7~8.5GHz
- High power gain
  G_{LP} = 8dB(TYP) @7.7~8.5GHz
- High power added efficiency
  η_{add} = 29%(TYP) @7.7~8.5GHz
- Hermetically sealed metal-ceramic package
- Low distortion [Item : –51]
  IM_3 = –45dBc(TYP) @P_o = 25(dBm) S.C.L.

APPLICATION

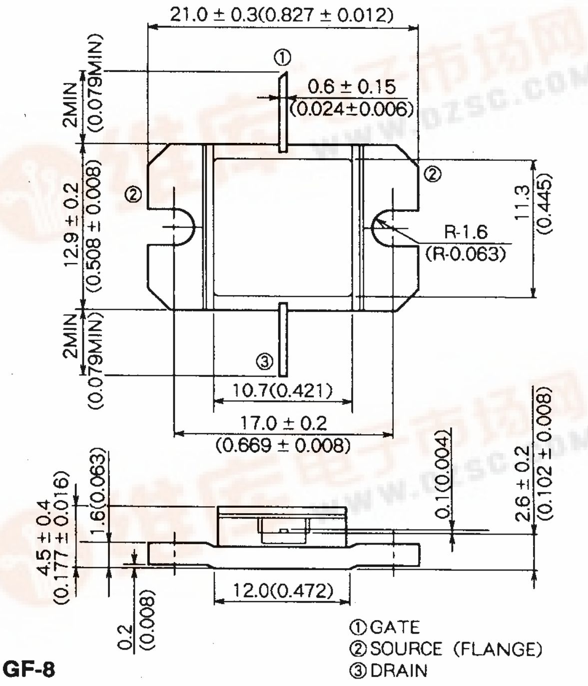
Item-01 : 7.7~8.5GHz band power amplifier
Item-51 : Digital radio communication

QUALITY GRADE

- IG

OUTLINE DRAWING

Unit : millimeters (inches)



RECOMMENDED BIAS CONDITIONS

- V_{DS} = 10V
- I_D = 1.2A
- R_G = 100(Ω)
- Refer to Bias Procedure

ABSOLUTE MAXIMUM RATINGS (Ta = 25℃)

Symbol	Parameter	Ratings	Unit
V_{GDO}	Gate to drain voltage	–15	V
V_{GSO}	Gate to source voltage	–15	V
I_D	Drain current	3.75	A
I_{GR}	Reverse gate current	–10	mA
I_{GF}	Forward gate current	21	mA
P_T	Total power dissipation ＊1	25	W
T_{ch}	Channel temperature	175	℃
T_{stg}	Storage temperature	–65~+175	℃

＊1 : Tc = 25℃

ELECTRICAL CHARACTERISTICS (Ta = 25℃)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{DSS}	Saturated drain current	V_{DS} = 3V, V_{GS} = 0V	–	–	3.75	A
g_m	Transconductance	V_{DS} = 3V, I_D = 1.1A	–	1	–	S
$V_{GS(off)}$	Gate to source cut-off voltage	V_{DS} = 3V, I_D = 10mA	–	–	–4.5	V
P_{1dB}	Output power at 1dB gain compression	V_{DS} = 10V, I_D = 1.2A, f = 7.7~8.5GHz	35	36	–	dBm
G_{LP}	Linear power gain		7	8	–	dB
I_D	Drain current		–	–	1.8	A
η_{add}	Power added efficiency		–	29	–	%
IM_3	3rd order IM distortion ＊1		–42	–45	–	dBc
$R_{th(ch-c)}$	Thermal resistance ＊2	ΔVf method	–	5	6	℃/W

＊1 : Item-51, 2-tone test Po = 25dBm Single Carrier Level f = 8.5GHz Δf = 10MHz ＊2 : Channel to case

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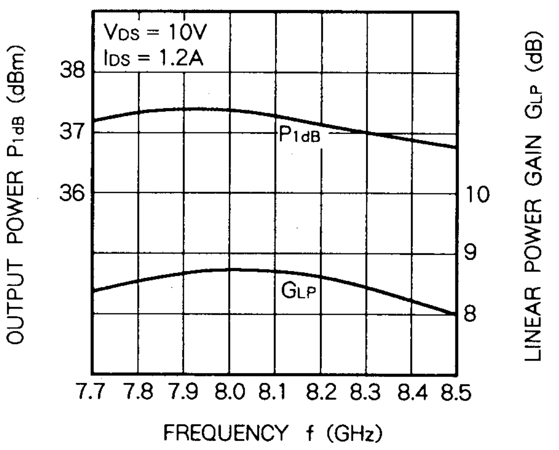
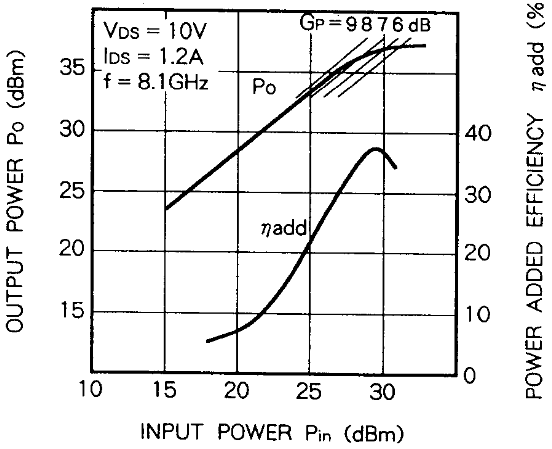
TYPICAL CHARACTERISTICS

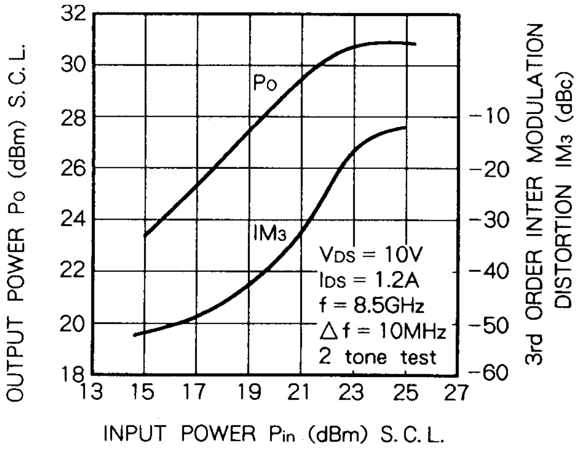
P_{1dB}, G_{LP} vs. f



Po, η add vs. Pin



Po, IM3 vs. Pin



S PARAMETERS (Ta = 25℃, V_{DS} = 10V, I_{DS} = 1.2A)

f (GHz)	S parameters							
	S_{11}		S_{21}		S_{12}		S_{22}	
	Magn.	Angle(deg.)	Magn.	Angle(deg.)	Magn.	Angle(deg.)	Magn.	Angle(deg.)
7.7	0.58	57	2.66	−135	0.069	−179	0.22	124
7.8	0.50	47	2.74	−145	0.072	171	0.20	102
7.9	0.45	39	2.76	−155	0.076	161	0.22	78
8.0	0.40	32	2.73	−165	0.077	152	0.25	63
8.1	0.36	25	2.65	−174	0.074	143	0.32	62
8.2	0.32	14	2.60	178	0.073	135	0.34	70
8.3	0.26	-3	2.56	169	0.071	128	0.32	83
8.4	0.20	-31	2.55	161	0.069	120	0.27	99
8.5	0.18	-80	2.53	151	0.066	111	0.18	122