MITSUBISHI ELECTRIC

< X/Ku band internally matched power GaAs FET >

MGFK38A3745

13.75 – 14.50 GHz BAND / 6W

DESCRIPTION

The MGFK38A3745 is an internally impedance-matched GaAs power FET especially designed for use in 13.75 – 14.50 GHz band amplifiers. The hermetically sealed metal-ceramic package guarantees high reliability.

FEATURES

Class A operation
Internally matched to 50(ohm) system
- High output power
  P1dB=6W (TYP.) @f=13.75 – 14.50GHz
- High linear power gain
  GLP=8.0dB (TYP.) @f=13.75 – 14.50GHz
- High power added efficiency
  P.A.E.=30% (TYP.) @f=13.75 – 14.50GHz

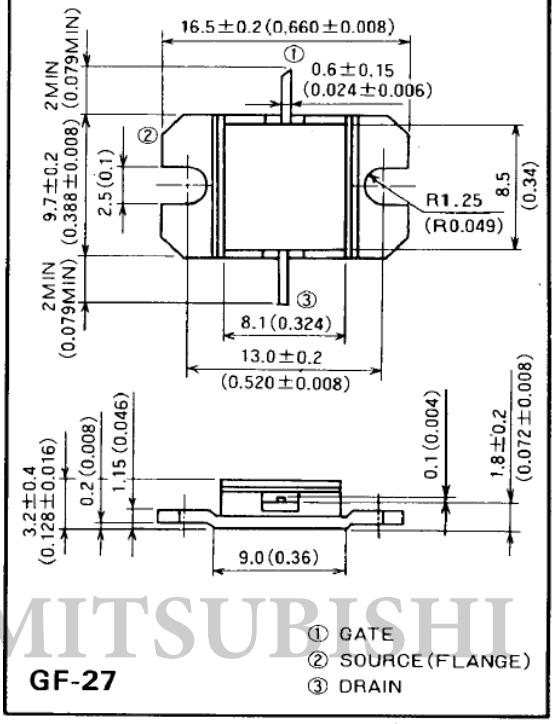
APPLICATION

- 13.75 – 14.50 GHz band power amplifiers

QUALITY GRADE

- IG

OUTLINE DRAWING Unit: millimeters (inches)



RECOMMENDED BIAS CONDITIONS

- VDS=10V • ID=1.5A • RG=100ohm

Absolute maximum ratings (Ta=25°C)

Symbol	Parameter	Ratings	Unit
VGDO	Gate to drain breakdown voltage	-15	V
VGSO	Gate to source breakdown voltage	-10	V
PT *1	Total power dissipation	37.5	W
Tch	Cannel temperature	175	°C
Tstg	Storage temperature	-65 to +175	°C

*1 : Tc=25°C

Keep Safety first in your circuit designs!

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Electrical characteristics (Ta=25°C)

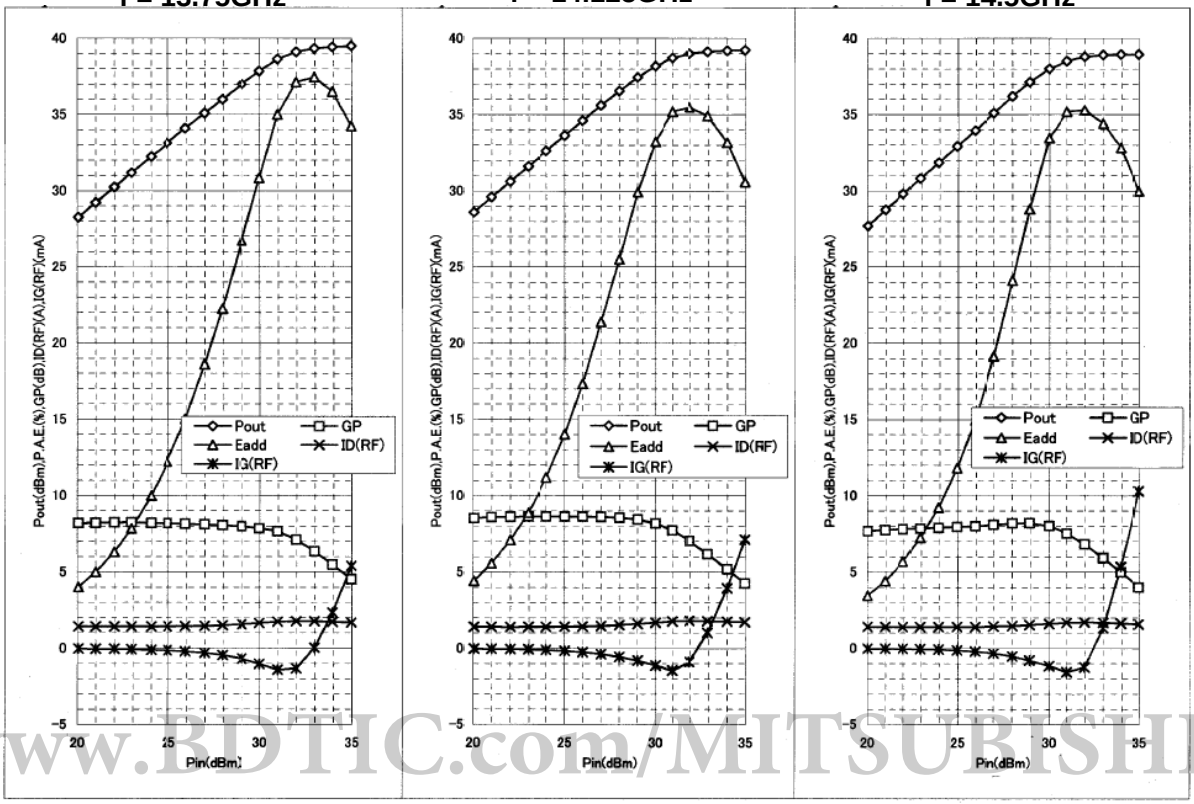
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
VGS(off)	Gate to source cut-off voltage	VDS=3V,ID=21mA	-1	-1.5	-4	V
P1dB	Output power at 1dB gain compression	VDS=10V,ID(RF off)=1.5A	37	38	-	dBm
GLP	Linear Power Gain	f=13.75 – 14.50GHz	7	8	-	dB
ID	Drain current			1.8		A
PAE	Power added efficiency		-	30	-	%
Rth(ch-c) *2	Thermal resistance	delta Vf method	-	3.6	4	°C/W

*2 : Channel-case

MGFK38A3745 TYPICAL CHARACTERISTICS

Pout, Glp, PAE, Id, Ig vs. Pin

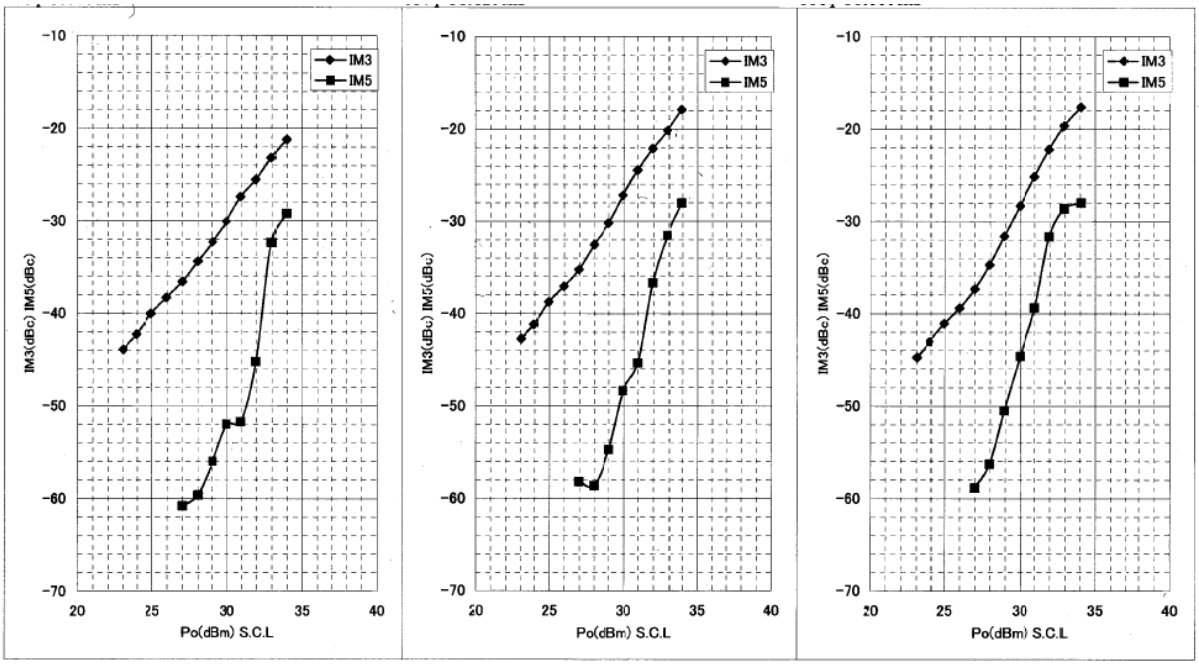
f = 13.75GHz | f = 14.125GHz | f = 14.5GHz



Test Condition : Vds=10V,Idq=1.5A, Rg=100ohm,Ta=25deg.C

IM3, IM5 vs. Pin

f = 13.75GHz | f = 14.125GHz | f = 14.50GHz



Test Condition : Vds=10V,Idq=1.5A,Rg=100ohm,Ta=25deg.C
2-tone test, Δf=10MHz

MGFK38A3745 S-parameters(Ta=25deg.C , VDS=10(V),IDS=1.5(A))

f (GHz)	S Parameters(Typ.)							
	S11		S21		S12		S22	
	Magn.	Angle(deg.)	Magn.	Angle(deg.)	Magn.	Angle(deg.)	Magn.	Angle(deg.)
13.0	0.81	171.04	1.63	-76.74	0.02	-16.21	0.59	137.23
13.1	0.78	165.69	1.73	-83.87	0.02	-35.59	0.59	130.28
13.2	0.75	159.52	1.85	-91.37	0.03	-56.56	0.59	123.52
13.3	0.71	152.49	1.96	-99.00	0.03	-74.01	0.59	117.33
13.4	0.68	145.21	2.07	-107.14	0.04	-91.03	0.59	109.70
13.5	0.64	137.10	2.19	-115.49	0.04	-107.57	0.58	102.62
13.6	0.58	128.83	2.32	-124.10	0.05	-119.61	0.57	94.61
13.7	0.53	119.41	2.45	-133.09	0.06	-133.66	0.56	85.76
13.8	0.46	107.91	2.57	-142.78	0.07	-145.04	0.54	75.60
13.9	0.38	94.82	2.69	-153.07	0.08	-158.70	0.51	64.08
14.0	0.30	78.06	2.80	-163.74	0.09	-171.17	0.49	51.72
14.1	0.22	55.02	2.88	-174.75	0.10	175.35	0.46	36.88
14.2	0.15	18.65	2.95	173.32	0.11	160.87	0.42	19.98
14.3	0.14	-35.59	2.95	160.62	0.12	148.25	0.38	1.33
14.4	0.19	-79.67	2.88	148.21	0.12	134.98	0.36	-19.05
14.5	0.26	-104.31	2.75	136.23	0.12	122.82	0.34	-40.14
14.6	0.33	-120.66	2.57	125.07	0.11	111.09	0.32	-59.43
14.7	0.39	-132.01	2.40	115.11	0.11	102.41	0.31	-76.85
14.8	0.45	-141.21	2.23	105.99	0.11	93.61	0.33	-91.26
14.9	0.50	-148.69	2.08	97.52	0.10	85.62	0.34	-103.83
15.0	0.54	-155.43	1.94	89.56	0.10	77.89	0.36	-113.31

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