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

MITSUBISHI SEMICONDUCTOR <GaAs FET>

MGFK38A3745

13.75 - 14.50GHz BAND 6W INTERNALLY MATCHED GaAs FET

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 - 14.50 GHz
High power gain
GLP = 8 dB (TYP.) @ f=13.75 - 14.50 GHz
High power added efficiency
P.A.E. = 30 % (TYP.) @ f=13.75 - 14.50 GHz

APPLICATION

13.75 - 14.50GHz band power amplifier

QUALITY GRADE

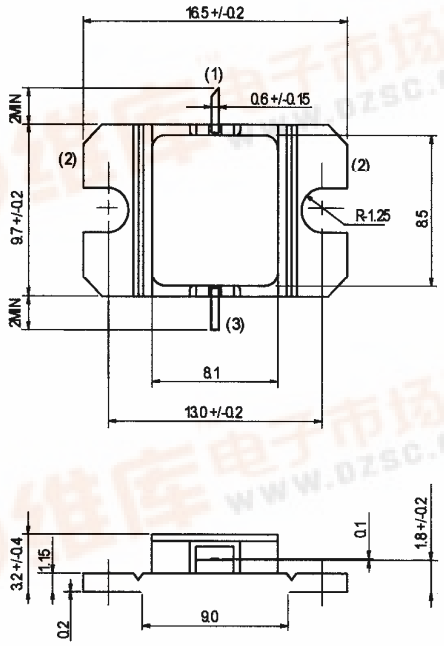
IG

RECOMMENDED BIAS CONDITIONS

VDS = 10 (V)
ID = 1.5 (A)
RG=100 (ohm)

OUTLINE DRAWING

Unit : millimeters



GF-27

(1) GATE
(2) SOURCE (FLANGE)
(3) DRAIN

ABSOLUTE MAXIMUM RATINGS (Ta=25deg.C)

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

*1 : Tc=25deg.C

< Keep safety first in your circuit designs! >

Mitsubishi Electric Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them.Trouble with semiconductors may lead to personal injury, fire or property damage. Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (1)placement of substitutive, auxiliary circuits, (2)use of non-flammable material or (3)prevention against any malfunction or mishap.

ELECTRICAL CARACTERISTICS (Ta=25deg.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	-4.5	V
P1dB	Output power	VDS=10V, ID(RF off)=1.5A, f=13.75 - 14.50GHz	37	38	-	dBm
GLP	Linear power gain		7	8	-	dB
ID	Drain current		-	1.8	-	A
P.A.E.	Power added efficiency		-	30	-	%
Rth(ch-c) *3	Thermal resistance	delta Vf method	-	3.6	4	deg.C/W

*3 : Channel-case

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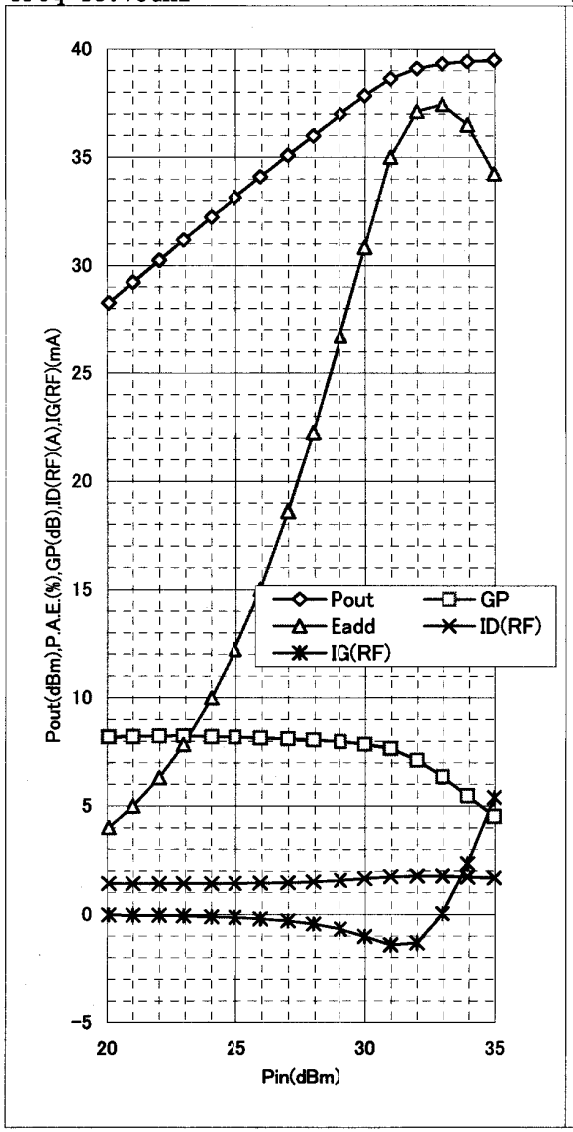
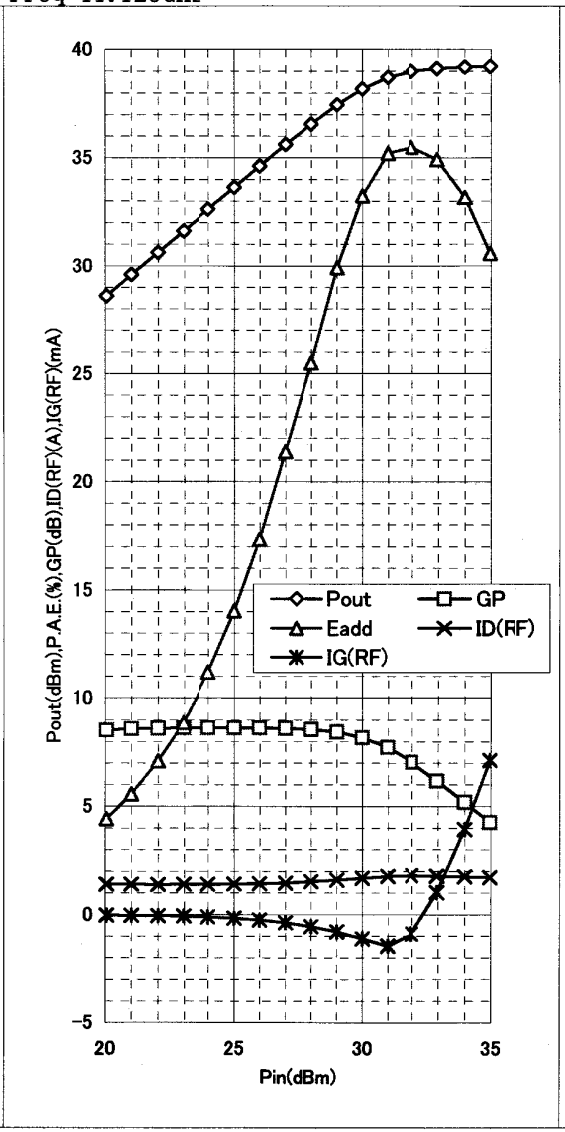
CUTPUT POWER & POWER ADDED EFFICIENCY & LINEAR POWER GAIN vs. INPUT POWER' (VDS=10V,Idq=1.5A,Rg=100ohm, Ta=25deg.C)

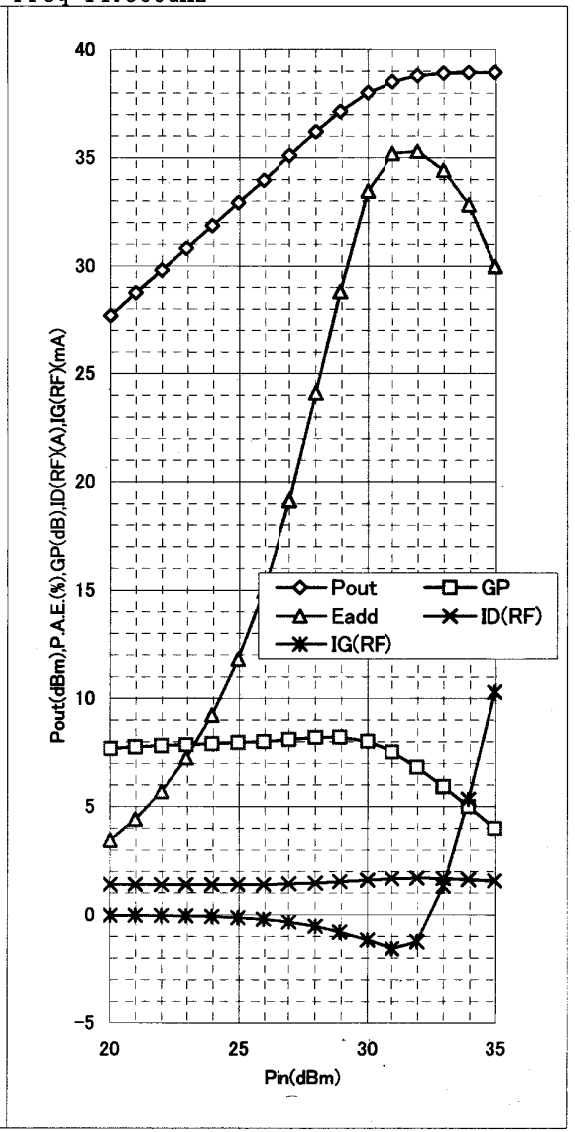
Freq=13.75GHz



Freq=14.125GHz

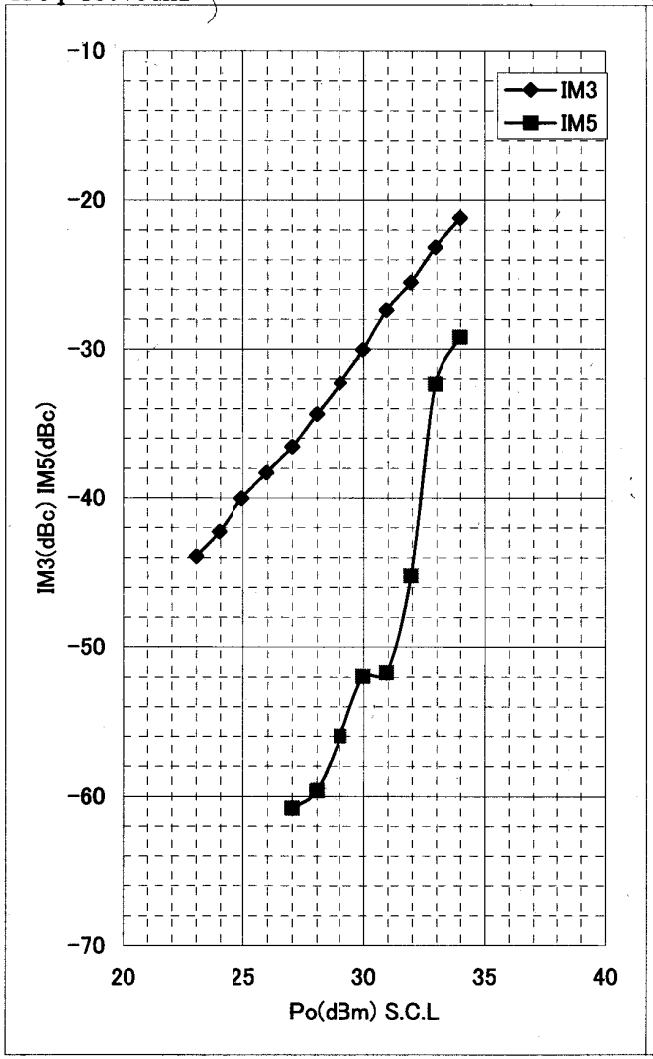


Freq=14.500GHz

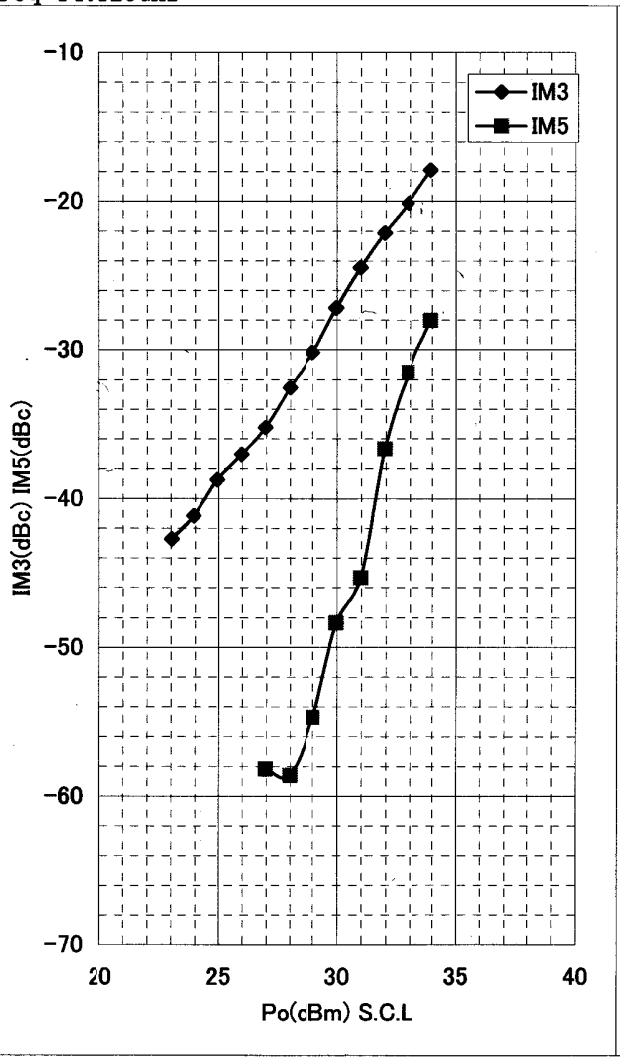


IM3 IM5 vs. OUTPUT POWER (VDS=10V, Idq=1.5A, Rg=100ohm, Ta=25deg.C, Δf=10MHz)

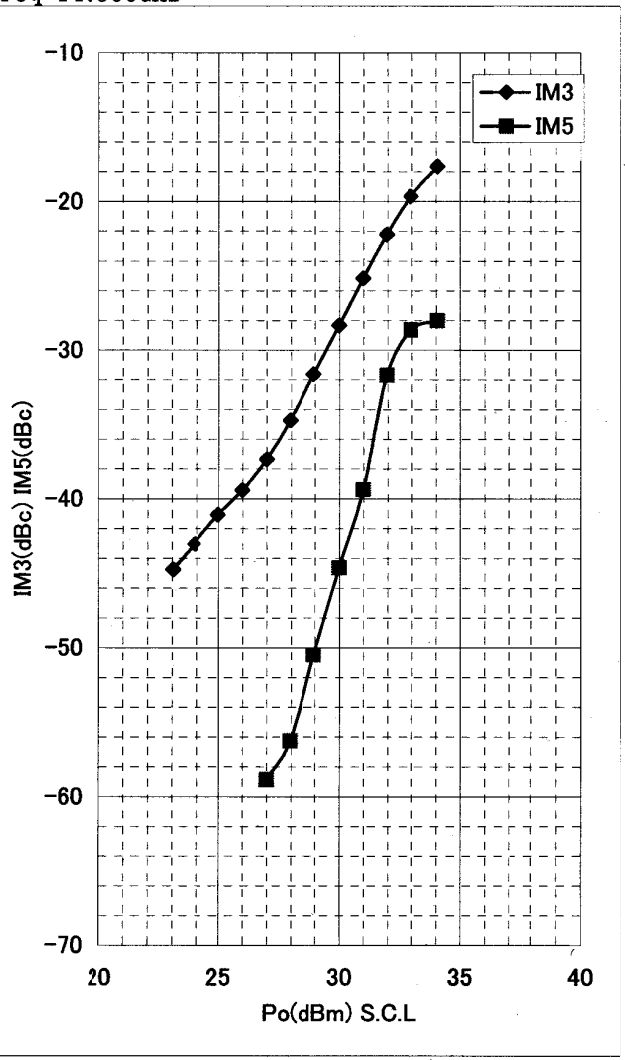
Freq=13.75GHz



Freq=14.125GHz



Freq=14.500GHz



S PARAMETERES(T=25deg.C,VDS=10V,ID=1.5A)

	S11		S21		S12		S22	
Freq	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
13.00	0.81	171.04	1.63	-76.74	0.02	-16.21	0.59	137.23
13.10	0.78	165.69	1.73	-83.87	0.02	-35.59	0.59	130.28
13.20	0.75	159.52	1.85	-91.37	0.03	-56.56	0.59	123.52
13.30	0.71	152.49	1.96	-99.00	0.03	-74.01	0.59	117.33
13.40	0.68	145.21	2.07	-107.14	0.04	-91.33	0.59	109.70
13.50	0.64	137.10	2.19	-115.49	0.04	-107.57	0.58	102.62
13.60	0.58	128.83	2.32	-124.10	0.05	-119.61	0.57	94.61
13.70	0.53	119.41	2.45	-133.09	0.06	-133.66	0.56	85.74
13.80	0.46	107.91	2.57	-142.78	0.07	-145.04	0.54	75.60
13.90	0.38	94.82	2.69	-153.07	0.08	-158.70	0.51	64.08
14.00	0.30	78.06	2.80	-163.74	0.09	-171.17	0.49	51.72
14.10	0.22	55.02	2.88	-174.75	0.10	175.35	0.46	36.88
14.20	0.15	18.65	2.95	173.32	0.11	160.97	0.42	19.98
14.30	0.14	-35.59	2.95	160.62	0.12	148.25	0.38	1.33
14.40	0.19	-79.67	2.88	148.21	0.12	134.98	0.36	-19.05
14.50	0.26	-104.31	2.75	136.23	0.12	122.82	0.34	-40.14
14.60	0.33	-120.66	2.57	125.07	0.11	111.99	0.32	-59.43
14.70	0.39	-132.01	2.40	115.11	0.11	102.41	0.31	-76.85
14.80	0.45	-141.21	2.23	105.99	0.11	93.61	0.33	-91.26
14.90	0.50	-148.69	2.08	97.52	0.10	85.62	0.34	-103.83
15.00	0.54	-155.43	1.94	89.56	0.10	77.89	0.36	-113.31

This S-Parameter data show measurements performed on each single-ended FET

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