

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)

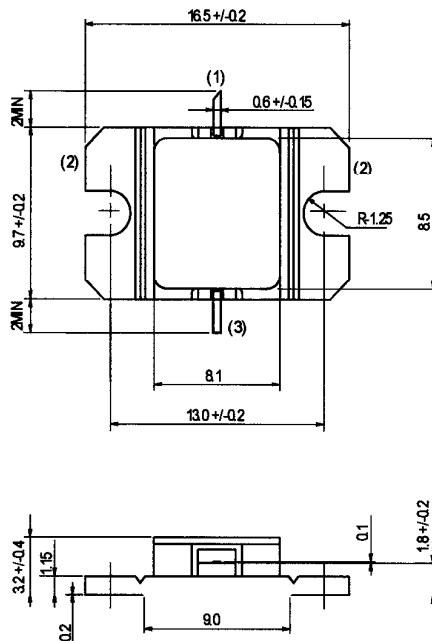
ABSOLUTE MAXIMUM RATINGS

(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

OUTLINE DRAWING Unit : millimeters



GF-27
 (1) GATE
 (2) SOURCE (FLANGE)
 (3) DRAIN

< 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 CHARACTERISTICS

(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

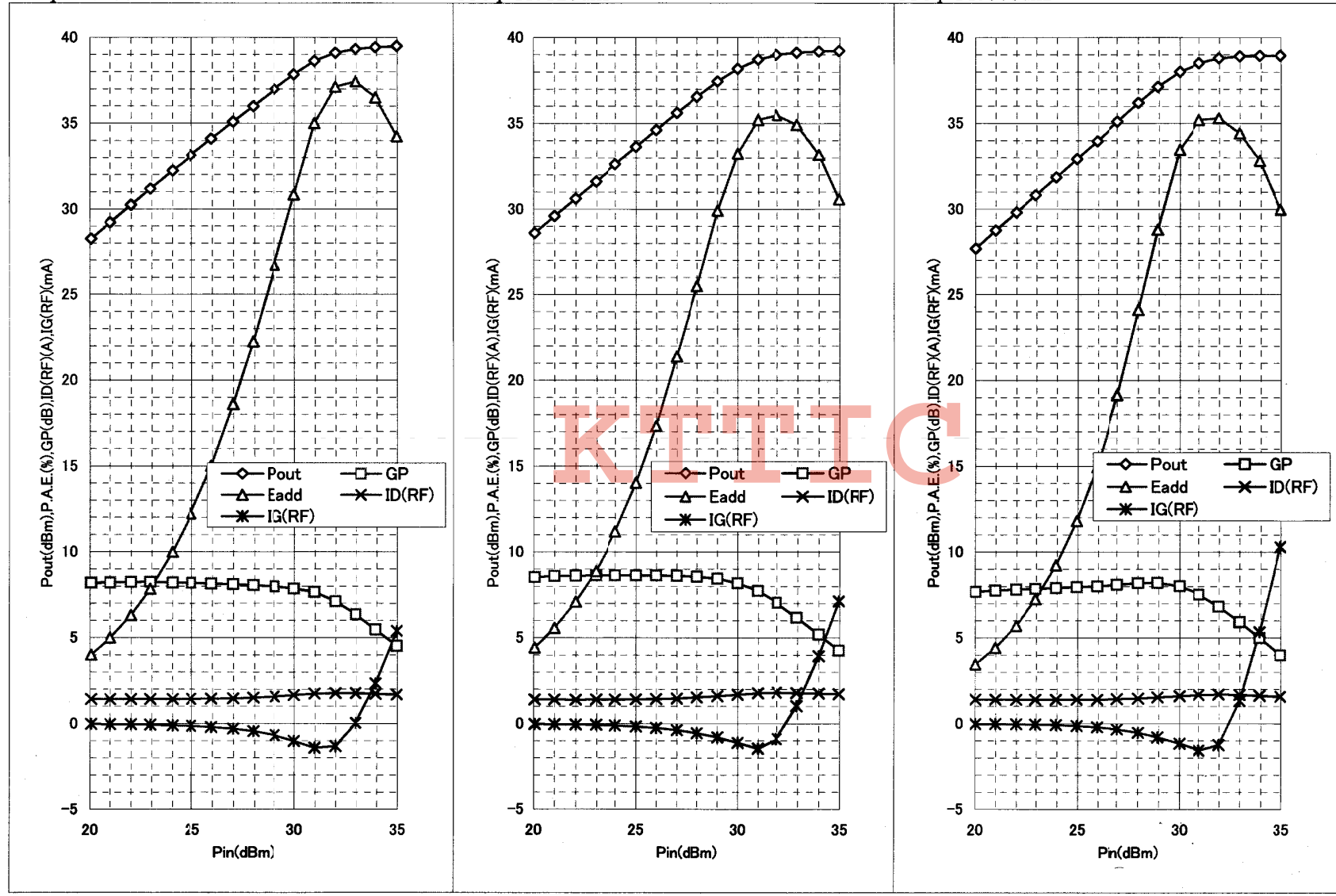


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Aug.'03

Ku-band 6W Power GaAs FET MGFK38A3745

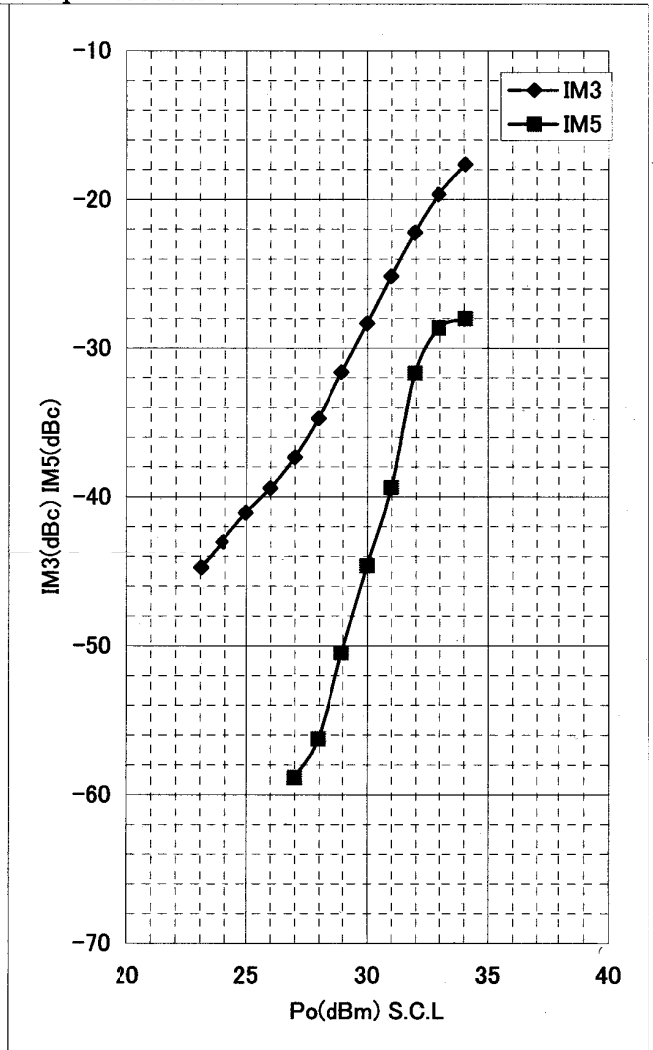
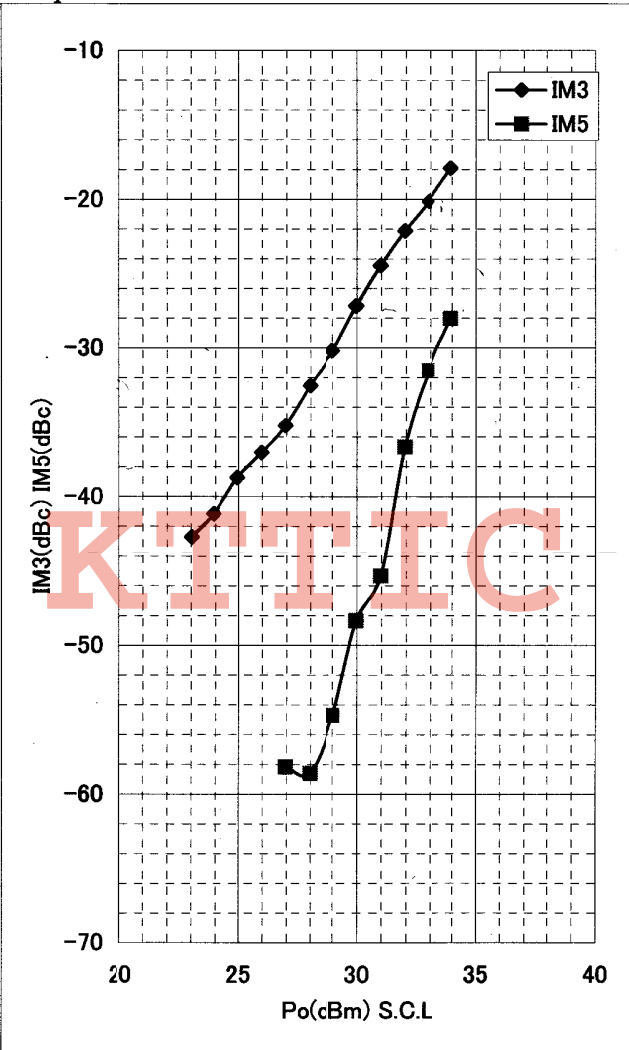
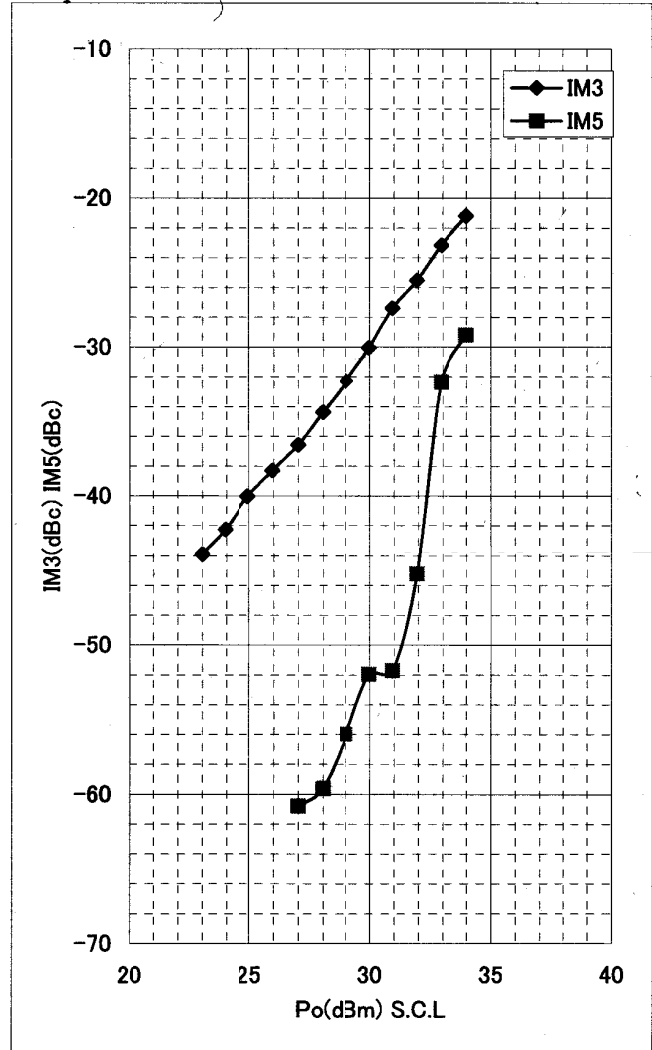
CUTPUT POWER & POWER ADDED EFFICIENCY & LINEAR POWER GAIN vs. INPUT POWER' (VDS=10V, Idq=1.5A, Rg=100ohm, Ta=25deg.C)
 Freq=13.75GHz Freq=14.125GHz Freq=14.500GHz



Ku-band 6W Power GaAs FET MGFK38A3745

Aug.' 03

IM3 IM5 vs. OUTPUT POWER (VDS=10V, Idq=1.5A, Rg=100ohm, Ta=25deg.C, Δf=10MHz)
 Freq=13.75GHz Freq=14.125GHz



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

Freq	S11		S21		S12		S22	
	(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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