MITSUBISHI ELECTRIC

< X/Ku band internally matched power GaAs FET >

MGFK41A4045

14.0 – 14.5 GHz BAND / 12W

DESCRIPTION

The MGFK41A4045 is an internally impedance-matched GaAs power FET especially designed for use in 14.0 – 14.5 GHz band amplifiers. The hermetically sealed metal-ceramic package guarantees high reliability.

FEATURES

Internally impedance matched
- High output power
  P1dB=41dBm (TYP.) @f=14.0 – 14.5GHz
- High linear power gain
  GLP=7.0dB (TYP.) @f=14.0 – 14.5GHz

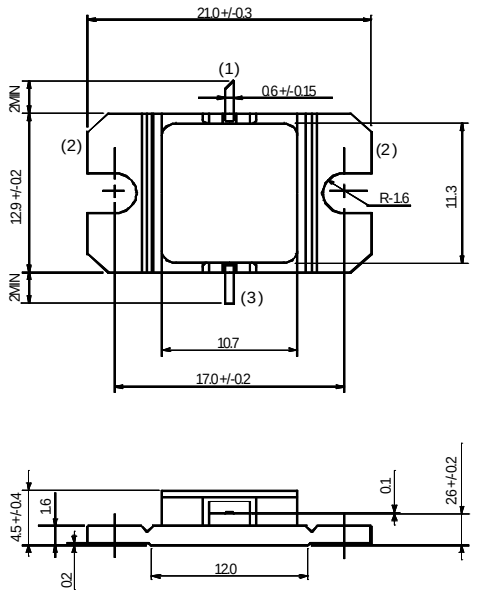
APPLICATION

- For use in 14.0 – 14.5 GHz band amplifiers

QUALITY GRADE

- IG

OUTLINE DRAWING Unit : millimeters



GF-8

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

RECOMMENDED BIAS CONDITIONS

- VDS=10V - ID=3.0A - RG=50ohm

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
ID	Drain current	11	A
IGR	Reverse gate current	-36	mA
IGF	Forward gate current	72	mA
PT *1	Total power dissipation	68.2	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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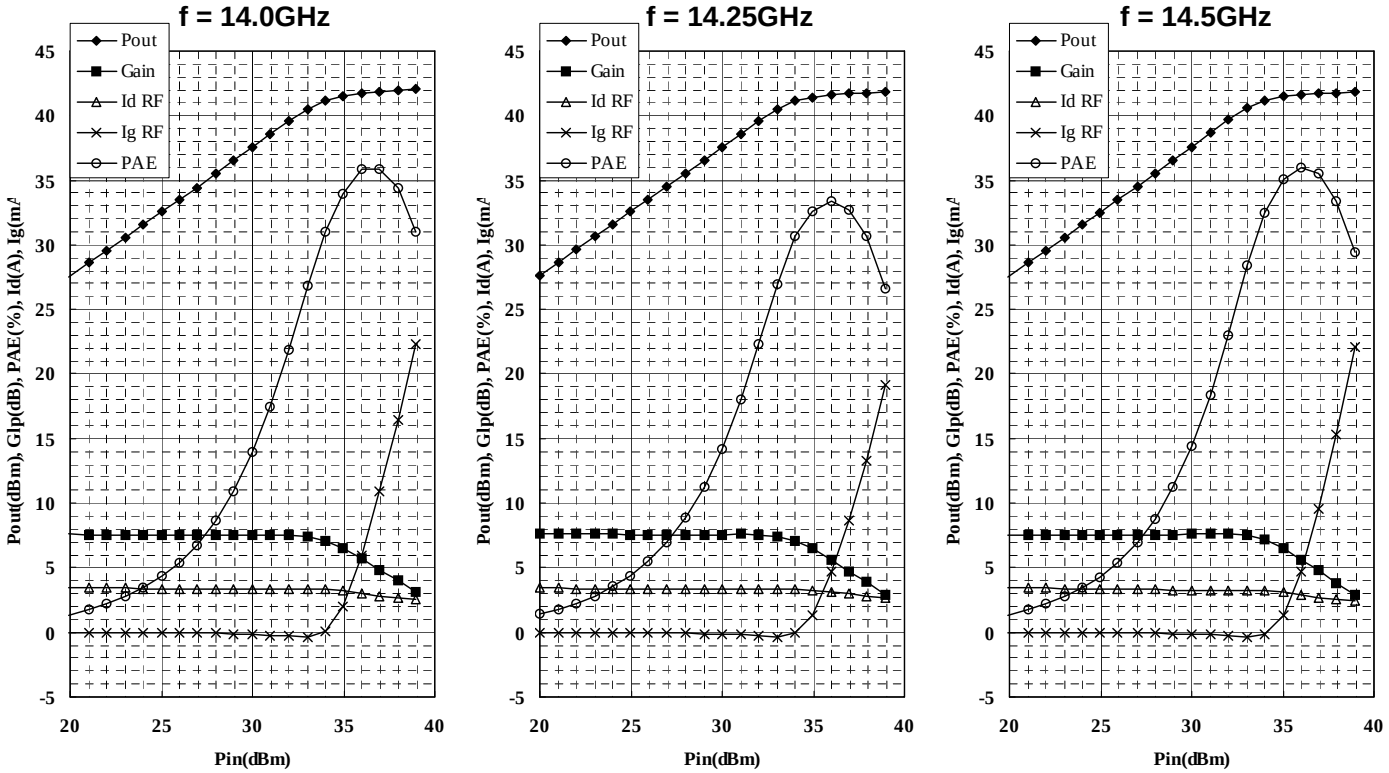
Electrical characteristics (Ta=25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
IDSS	Saturated drain current	VDS=3V,VG=0V	-	8	-	A
gm	Transconductance	VDS=0V,ID=3.0A	-	4	-	S
VGS(off)	Gate to source cut-off voltage	VDS=3V,ID=42mA	-1	-1.5	-4	V
P1dB	Output power at 1dB gain compression	VDS=10V,ID(RF off)=3.0A	40	41	-	dBm
GLP	Linear Power Gain	f=14.0 – 14.5GHz	6	7	-	dB
PAE	Power added efficiency		-	25	-	%
Rth(ch-c) *2	Thermal resistance	delta Vf method	-	1.8	2.2	°C/W

*2 : Channel-case

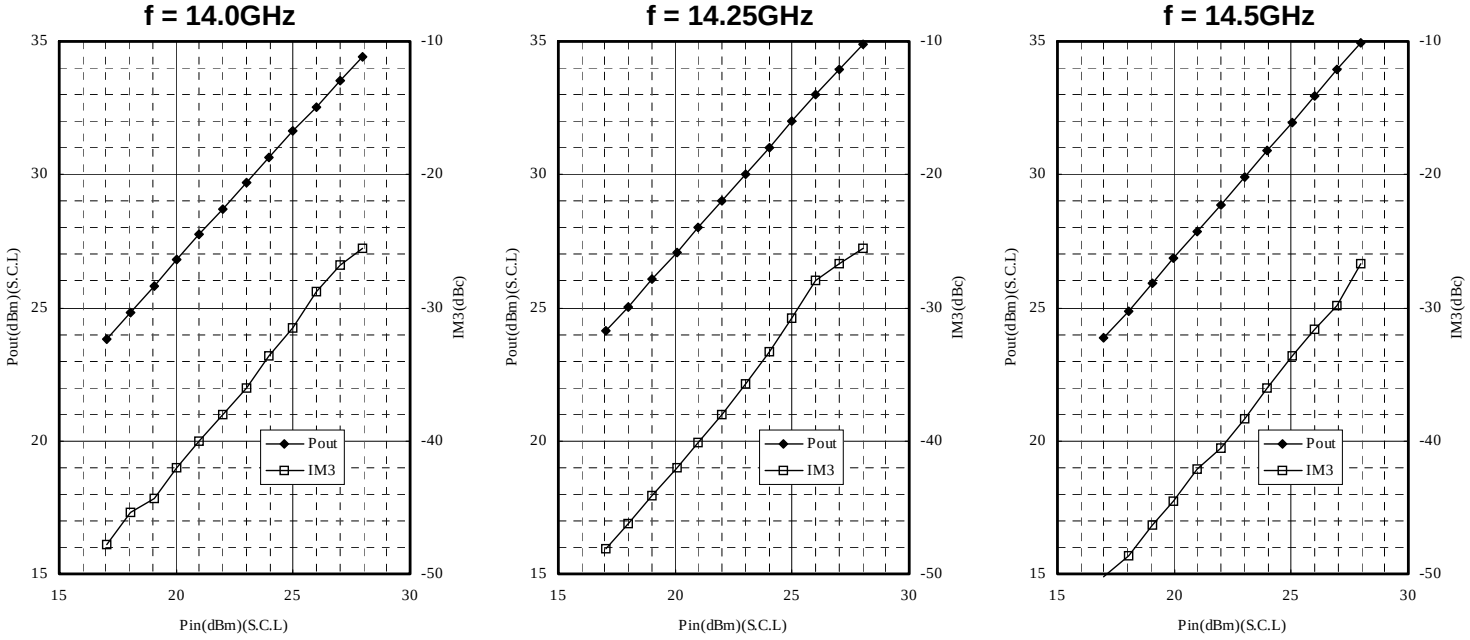
MGFK41A4045 TYPICAL CHARACTERISTICS

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



Test Condition
Vds=10V,Idq=3.0A, Rg=50ohm,Ta=25deg.C

Pout , IM3 vs. Pin



Test Condition
Vds=10V,Idq=3.0A,Rg=50ohm,Ta=25deg.C
2-tone test, Δf=10MHz

MGFK41A4045 S-parameters(Ta=25deg.C , VDS=10(V),IDS=3(A))

f	S Parameters (TYP.)							
	S11		S21		S12		S22	
(GHz)	Mag.	Ang(deg.)	Mag.	Ang(deg.)	Mag.	Ang(deg.)	Mag.	Ang(deg.)
13.00	0.738	-103.4	1.278	34.7	0.057	14.1	0.668	-81.0
13.10	0.716	-109.9	1.349	26.6	0.060	7.6	0.649	-87.3
13.20	0.693	-116.7	1.427	18.2	0.064	0.8	0.628	-93.7
13.30	0.665	-123.8	1.517	9.1	0.068	-6.4	0.609	-101.0
13.40	0.633	-132.2	1.607	-0.1	0.074	-13.6	0.588	-109.0
13.50	0.593	-140.9	1.705	-10.3	0.081	-22.2	0.559	-118.7
13.60	0.546	-151.8	1.809	-23.6	0.087	-33.8	0.521	-131.2
13.70	0.493	-162.0	1.896	-34.7	0.095	-42.9	0.482	-141.7
13.80	0.434	-172.4	1.976	-46.0	0.102	-53.5	0.434	-153.0
13.90	0.369	175.1	2.059	-58.0	0.109	-63.7	0.383	-167.1
14.00	0.303	161.4	2.132	-70.3	0.118	-75.4	0.324	177.1
14.10	0.238	144.2	2.192	-83.2	0.122	-88.5	0.266	159.0
14.20	0.176	120.7	2.241	-96.3	0.127	-100.8	0.215	135.8
14.30	0.118	83.1	2.268	-110.1	0.131	-113.0	0.176	104.0
14.40	0.106	28.9	2.263	-124.6	0.130	-126.2	0.166	64.0
14.50	0.156	-12.7	2.217	-138.9	0.130	-138.3	0.179	28.6
14.60	0.225	-38.3	2.134	-153.0	0.126	-151.4	0.216	0.6
14.70	0.281	-57.4	2.018	-167.1	0.121	-163.3	0.266	-17.8
14.80	0.335	-72.0	1.885	179.9	0.113	-173.9	0.318	-32.7
14.90	0.381	-86.1	1.750	166.9	0.105	176.0	0.353	-46.8
15.00	0.413	-98.3	1.616	154.8	0.098	166.5	0.368	-59.2

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