

MGFK41A4045

14.0-14.5GHz BAND 12.5W INTERNALLY MATCHED GaAs FET

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 = 41.0dBm(TYP.) @f=14.0-14.5GHz
- +High linear power gain
GLP = 7.0dB(TYP) @f=14.0-14.5GHz

APPLICATION

For use in 14.0-14.5GHz band amplifiers

QUALITY GRADE

4G

RECOMMENDED BIAS CONDITIONS

- VDS = 10 (V)
- ID =3.0 (A)
- RG=50 (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
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	Channel temperature	175	deg.C
Tstg	Storage temperature	-65 / +175	deg.C

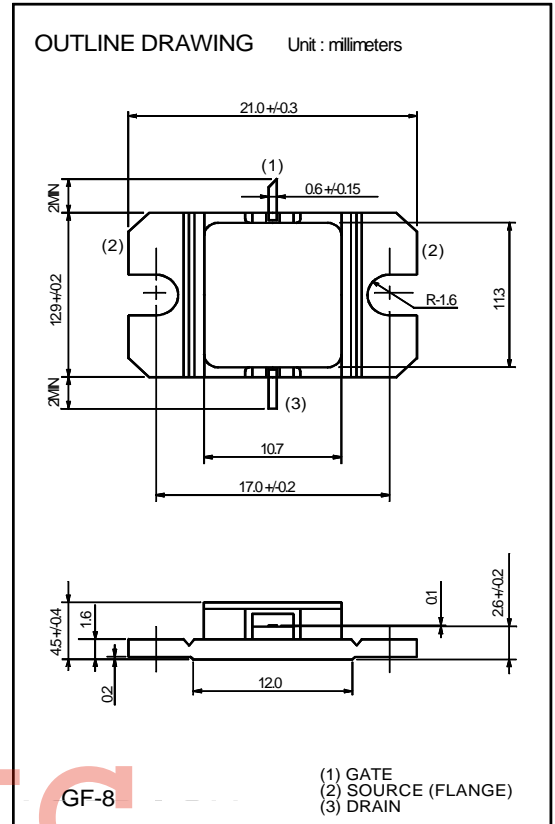
*1 : Tc=25deg.C

ELECTRICAL CHARACTERISTICS

(Ta=25deg.C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
IDSS	Saturated drain current	VDS=3V, VG=0V	--	8.0	--	A
gm	Transconductance	VDS=0V, ID=3.0A	--	4	--	S
VGS(off)	Gate to source cut-off voltage	VDS=3V, ID=42mA	-1.0	-1.5	-4.0	V
P1dB	Output power at 1dB gain compression	VDS=10V, ID(RF off)=3.0A, f=14.0 - 14.5GHz	40	41	--	dBm
GLP	Linear power gain		6.0	7.0	--	dB
P.A.E.	Power added efficiency		--	25	--	%
Rth (Ch-C)	Thermal resistance	Channel to Case	--	1.8	2.2	deg.C/W

OUTLINE

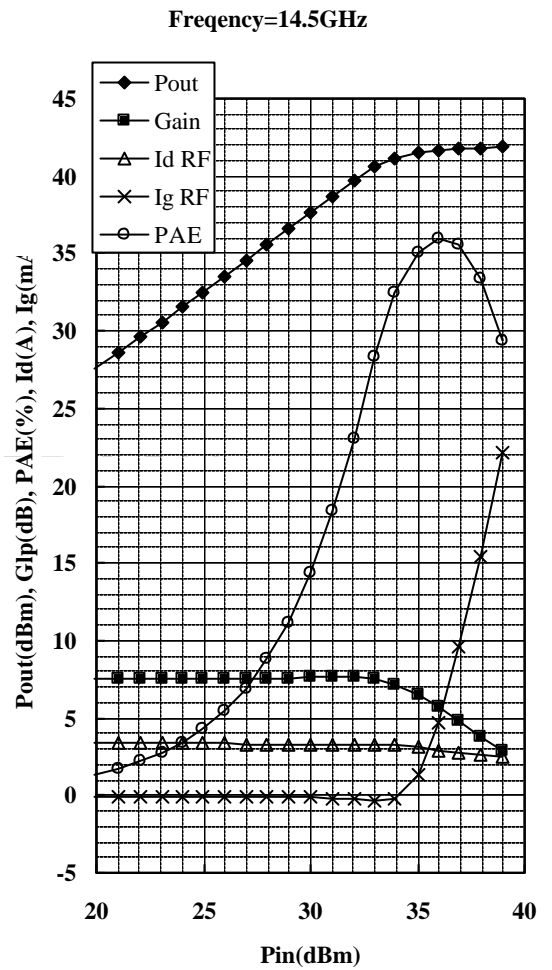
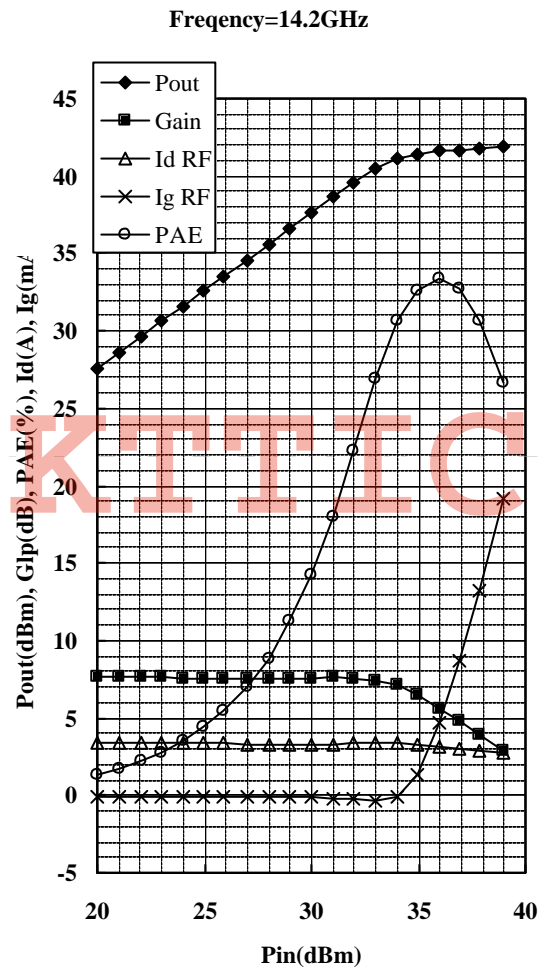
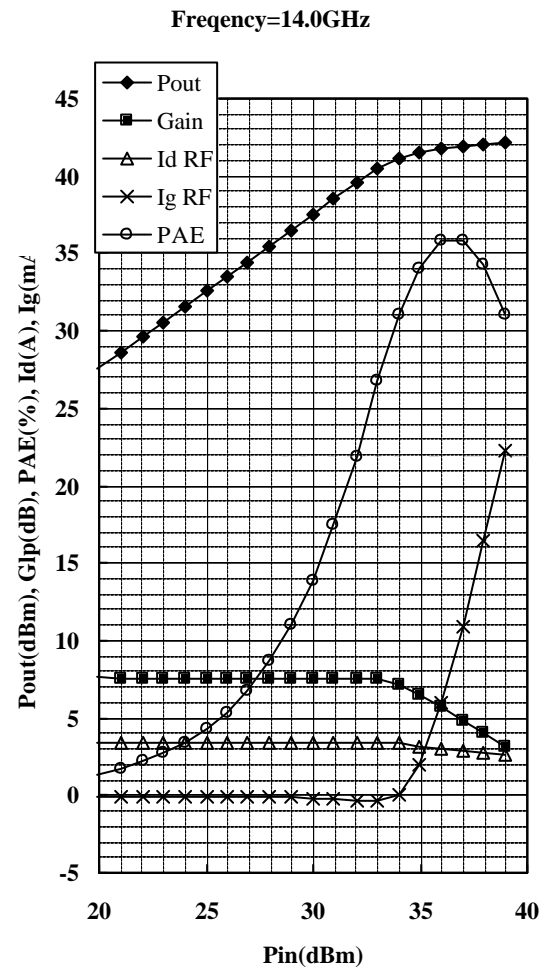


- (1) GATE
- (2) SOURCE (FLANGE)
- (3) DRAIN

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OUTPUT POWER & POWER ADDED EFFICIENCY & GAIN vs. INPUT POWER
 TEST CONDITIONS : $V_{ds}(R_{f\text{off}})=10V, I_{ds}(R_{f\text{off}})=3.0A, R_g=50\text{ohm}$

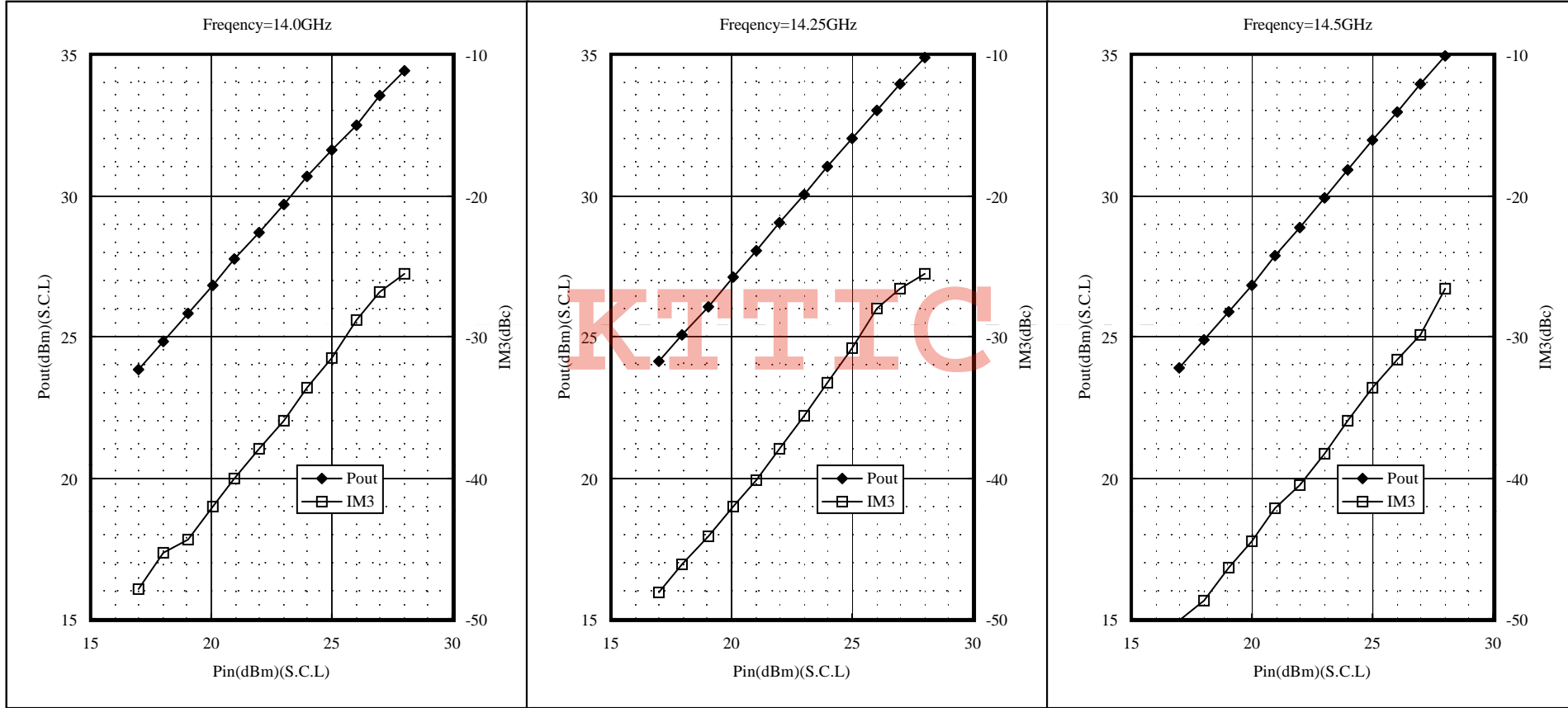


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IM3 vs. OUTPUT POWER

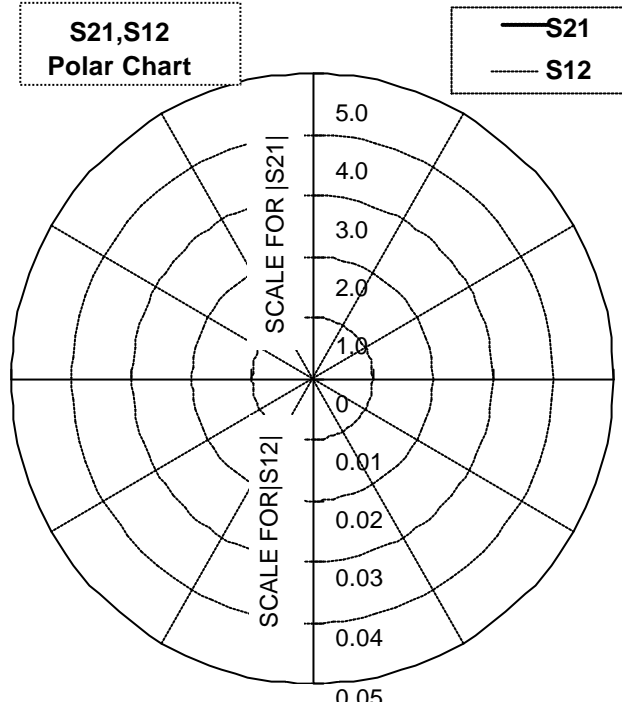
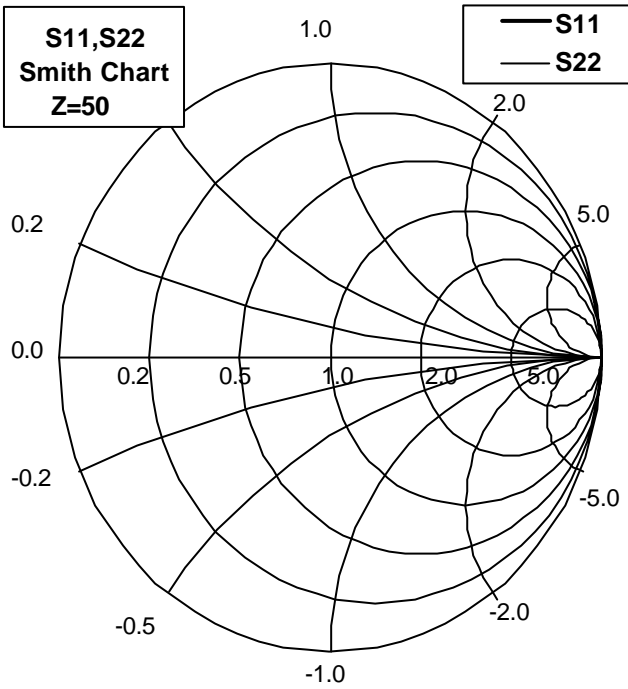
TEST CONDITIONS

$V_{ds}(R_{f\text{off}})=10V, I_{ds}(R_{f\text{off}})=3.0A, R_g=50\text{ohm}$
 2-tone test , $\Delta f=10\text{MHz}$



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TEST CONDITIONS : f=14.0-14.5GHz,VDS=10V,ID=3.0A



S PARAMETERS (Ta=25deg.C,VDS=10V,ID=3.0A)

f (GHz)	S Parameters (TYP.)							
	S11		S21		S12		S22	
	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

MITSUBISHI ELECTRIC CORPORATION

June-'04

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