

MITSUBISHI SEMICONDUCTOR <GaAs FET>

# MGFC47A4450

4.4~5.0GHz BAND 50W INTERNALLY MATCHED GaAs FET

## DESCRIPTION

The MGFC47A4450 device is an internally impedance-matched GaAs power FET especially designed for use in 4.4 ~ 5.0GHz band amplifiers. The hermetically sealed metal-ceramic package guarantees high reliability.

## FEATURES

- Class AB operation
- Internally matched to 50(ohm) system
- High output power  
P1dB = 47dBm (TYP.) @ f=4.4 ~ 5.0 GHz
- High power gain  
GLP = 10.5 dB (TYP.) @ f=4.4 ~ 5.0GHz
- High power added efficiency  
PAE = 40% (TYP.) @ f=4.4 ~ 5.0GHz

## APPLICATION

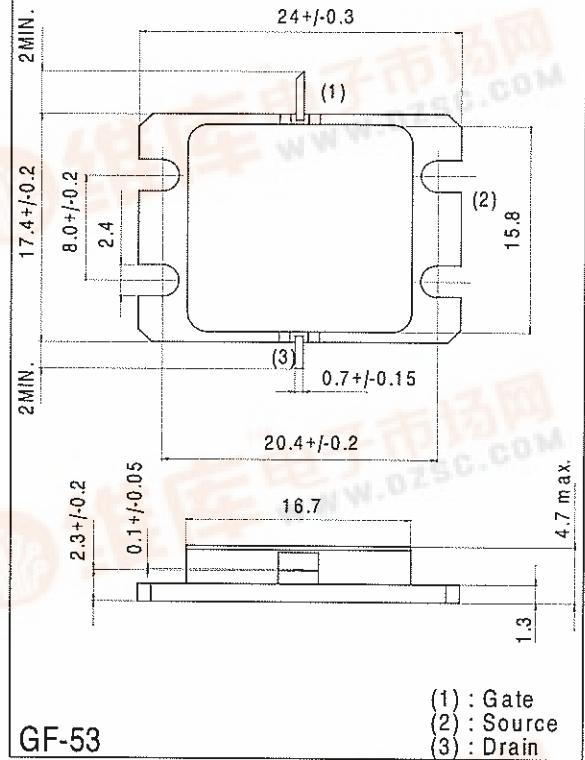
Radio Link

## RECOMMENDED BIAS CONDITIONS

VDS = 10 (V)  
ID = 9.8 (A)  
RG=10 (ohm)

## OUTLINE DRAWING

Unit : millimeters



(1) : Gate  
(2) : Source  
(3) : Drain

## ABSOLUTE MAXIMUM RATINGS (Ta=25deg.C)

Symbol	Parameter	Ratings	Unit
VGDO	Gate to drain voltage	-20	V
VGSO	Gate to source voltage	-10	V
IGR	Reverse gate current	-130	mA
IGF	Forward gate current	168	mA
PT *1	Total power dissipation	166	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 CHARACTERISTICS (Ta=25deg.C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
VGS(off)	Pinch-off voltage	VDS = 3V , ID = 168mA	-1	-	-4	V
P1dB	Output power at 1dB gain compression	VDS=10V, ID(RF off)=9.8A, f=4.4 ~ 5.0GHz	46.0	47.0	-	dBm
GLP	Linear power gain		9.5	10.5	-	dB
ID	Drain Current		-	11	-	A
PAE	Power added efficiency		-	40	-	%
Rth(ch-c)	Thermal resistance	*1 delta Vf method	-	0.8	0.9	deg.C/W

\*1 : Channel-case



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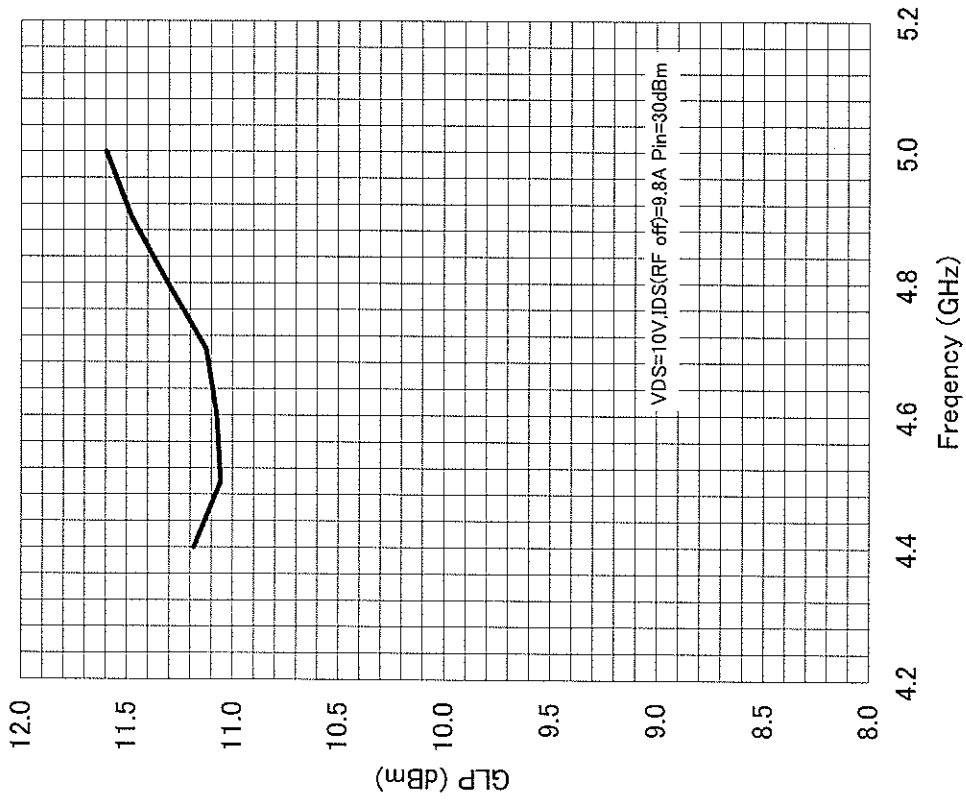
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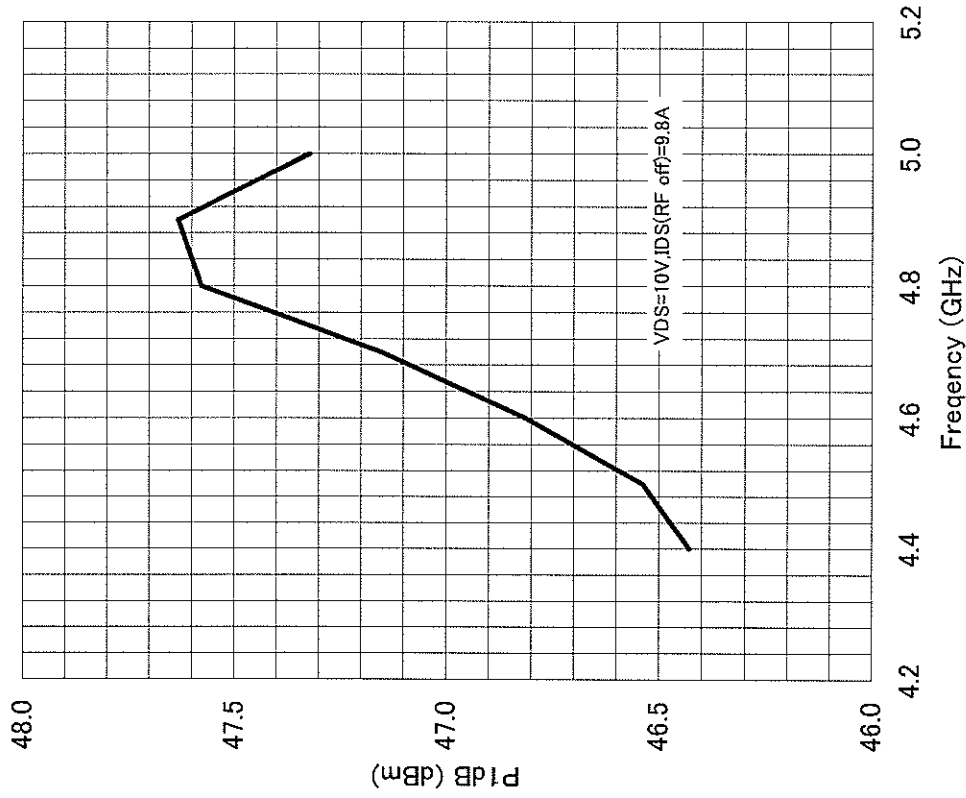
# C-band 50W Power GaAs FET MGFC47A4450

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Frequency vs GLP



Frequency vs P1dB



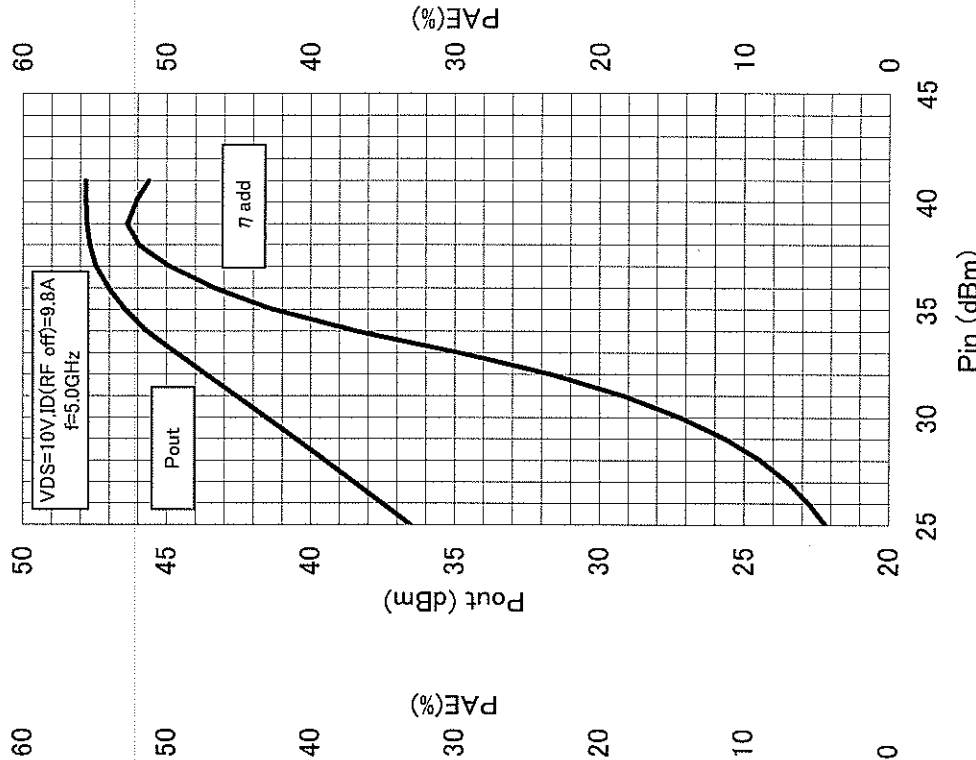
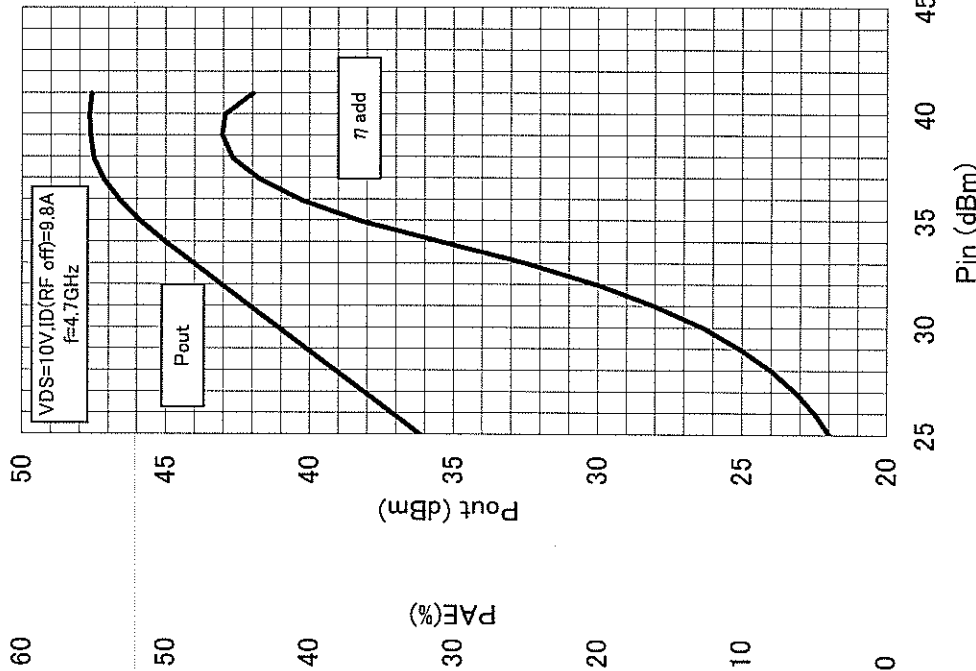
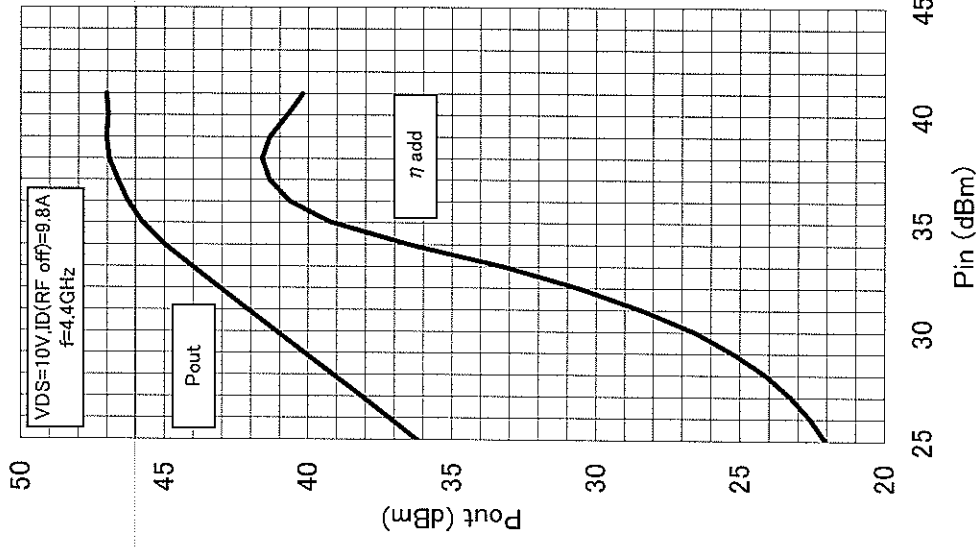
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HIGH FREQUENCY & OPTICAL SEMICONDUCTOR DIV.

# C-band 50W Power GaAs FET MGFC47A4450

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OUTPUT POWER & POWER ADDED EFFICIENCY vs. INPUT POWER



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## S PARAMETERES(T=25deg.C,VDS=10V,ID=8.0A)

f (GHz)	S Parameters(TYP.)							
	S11		S21		S12		S22	
	MAG.	ANG(deg.)	[MAG]	[ANG]	[MAG]	[ANG]	[MAG]	[ANG]
4.20	0.776	24.3	2.862	177.9	0.034	126.1	0.269	57.6
4.25	0.745	14.8	3.067	168.4	0.039	113.5	0.234	47.0
4.30	0.707	3.9	3.276	158.5	0.044	102.5	0.199	36.2
4.35	0.663	-7.9	3.475	148.0	0.049	90.3	0.166	21.3
4.40	0.615	-21.0	3.654	137.2	0.055	78.5	0.130	3.7
4.45	0.567	-35.2	3.836	126.1	0.060	66.1	0.103	-20.4
4.50	0.513	-51.0	3.971	114.6	0.065	54.5	0.086	-49.2
4.55	0.465	-68.2	4.092	102.9	0.070	42.4	0.080	-83.3
4.60	0.421	-87.1	4.162	91.1	0.074	30.3	0.086	-114.7
4.65	0.381	-107.9	4.190	79.1	0.077	18.1	0.099	-143.6
4.70	0.354	-130.1	4.178	67.2	0.081	6.9	0.117	-166.6
4.75	0.334	-153.4	4.126	55.5	0.082	-4.8	0.136	172.9
4.80	0.327	-176.8	4.033	43.7	0.084	-15.6	0.156	155.5
4.85	0.331	160.4	3.921	32.5	0.085	-26.5	0.178	138.1
4.90	0.341	139.1	3.784	21.4	0.086	-37.4	0.204	122.1
4.95	0.360	120.3	3.643	10.7	0.086	-48.3	0.231	107.3
5.00	0.394	103.0	3.514	0.2	0.086	-58.6	0.262	93.9
5.05	0.436	86.8	3.366	-10.6	0.085	-68.9	0.295	80.8
5.10	0.482	71.3	3.204	-21.4	0.083	-79.5	0.333	68.9
5.15	0.526	56.9	3.026	-32.0	0.080	-89.8	0.369	57.6
5.20	0.571	43.7	2.844	-42.4	0.078	-99.9	0.412	47.2

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

**MGFC47A4450****4.4 ~ 5.0GHz BAND 50W INTERNALLY MATCHED GaAs FET****Requests Regarding Safety Designs**

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