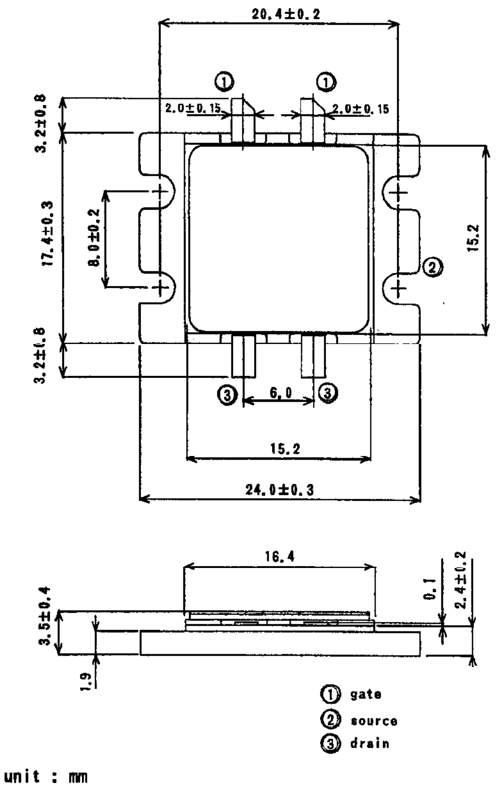
MGFL48V1920

1.9 - 2.0GHz BAND 60W GaAs FET

DESCRIPTION

The MGFL48V1920 is a 60W push-pull type GaAs Power FET especially designed for use in 1.9 - 2.0GHz band amplifiers.
The hermetically sealed metal-ceramic package guarantees high reliability.

OUTLINE



FEATURES

Push-pull configuration
High output power
    Pout = 60W (TYP.) @ f=1.9 - 2.0 GHz
High power gain
    GLP = 11.5 dB (TYP.) @ f=1.9 - 2.0GHz
High power added efficiency
    P.A.E. = 45 % (TYP.) @ f=1.9 - 2.0GHz

APPLICATION

1.9-2.0GHz band power amplifier

QUALITY GRADE

IG

RECOMMENDED BIAS CONDITIONS

VDS = 12 (V)
ID = 4.0 (A)
RG=20 (ohm) for each gate

ABSOLUTE MAXIMUM RATINGS (Ta=25deg.C)

Symbol	Parameter	Ratings	Unit
VGDO	Gate to drain voltage	-20	V
VGSO	Gate to source voltage	-10	V
PT *1	Total power dissipation	T.B.D.	W
Tch	Channel temperature	175	deg.C
Tstg	Storage temperature	-65 / +175	deg.C

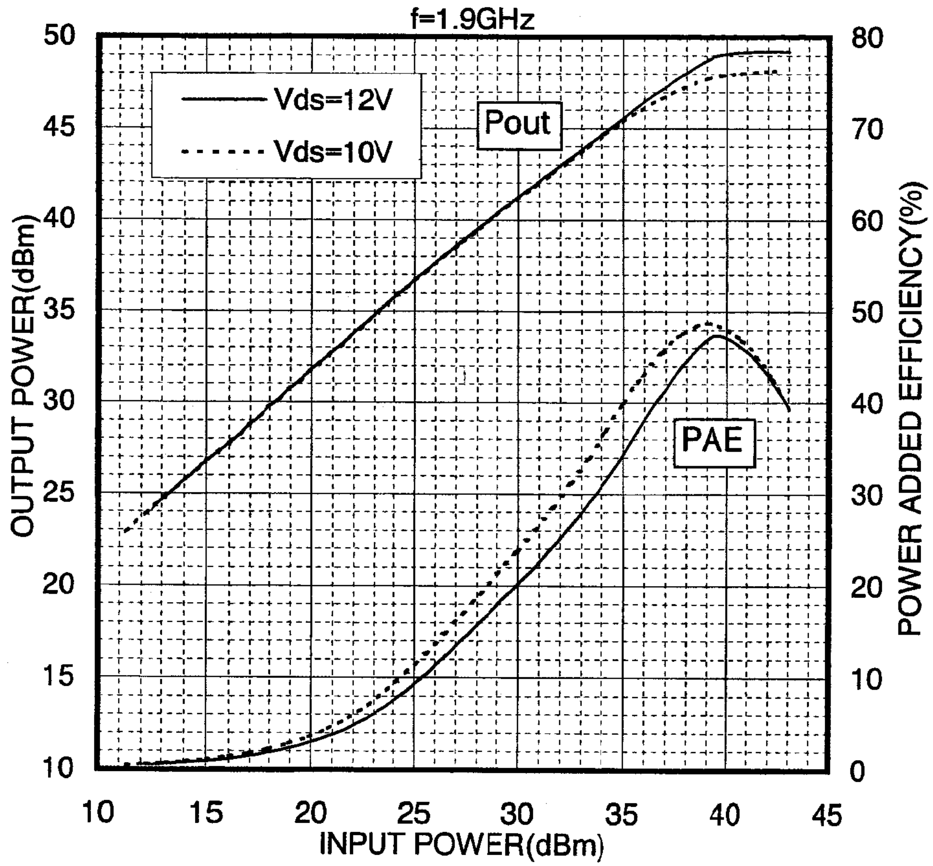
*1 : Tc=25deg.C

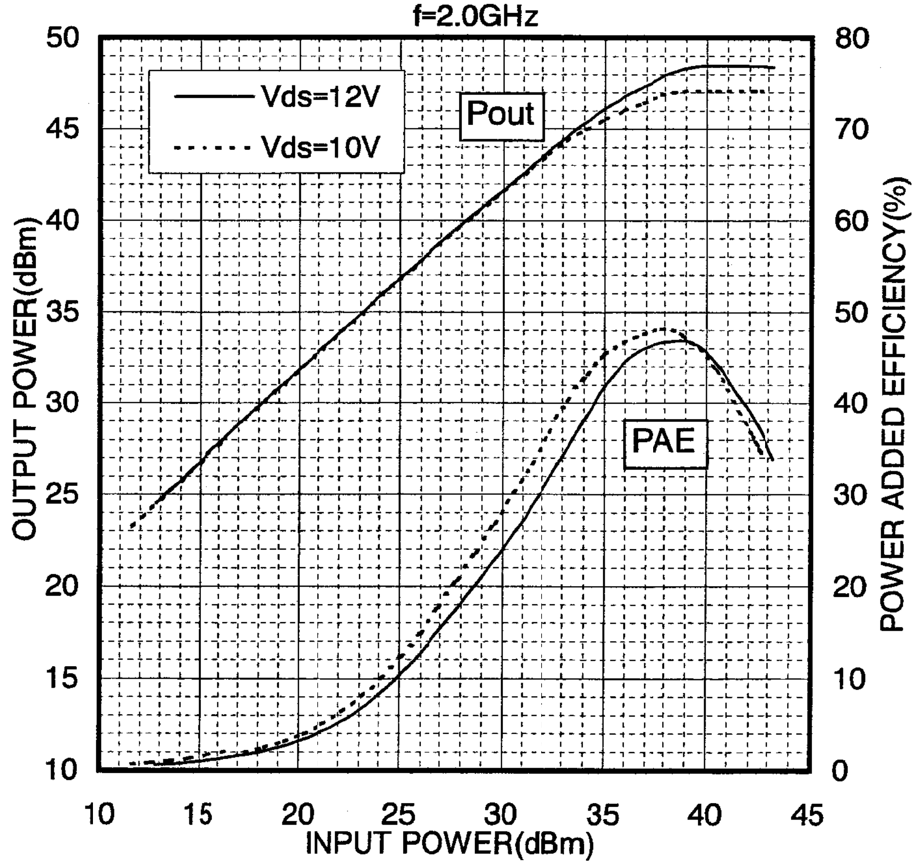
< Keep safety first in your circuit designs! >
Mitsubishi Electric Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property 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)	Saturated drain current	VDS = 3V , ID = 17.3mA	-1	-	-4	V
P2dB	Output power at 2dB gain compression	VDS=12V, ID(RF off)=4.0A, f=1.9 - 2.0GHz	47	48	-	dBm
GLP	Linear power gain	VDS=12V, ID(RF off)=4.0A, f=1.9 - 2.0GHz	10	11.5	-	dB
ID(RF)	Drain current	VDS=12V, ID(RF off)=4.0A, f=1.9 - 2.0GHz	-	11	15	A
P.A.E.	Power added efficiency	VDS=12V, ID(RF off)=4.0A, f=1.9 - 2.0GHz	-	45	-	%
Rth (ch-c)	Thermal resistance	Channel to Case	-	-	T.B.D.	deg.C/W

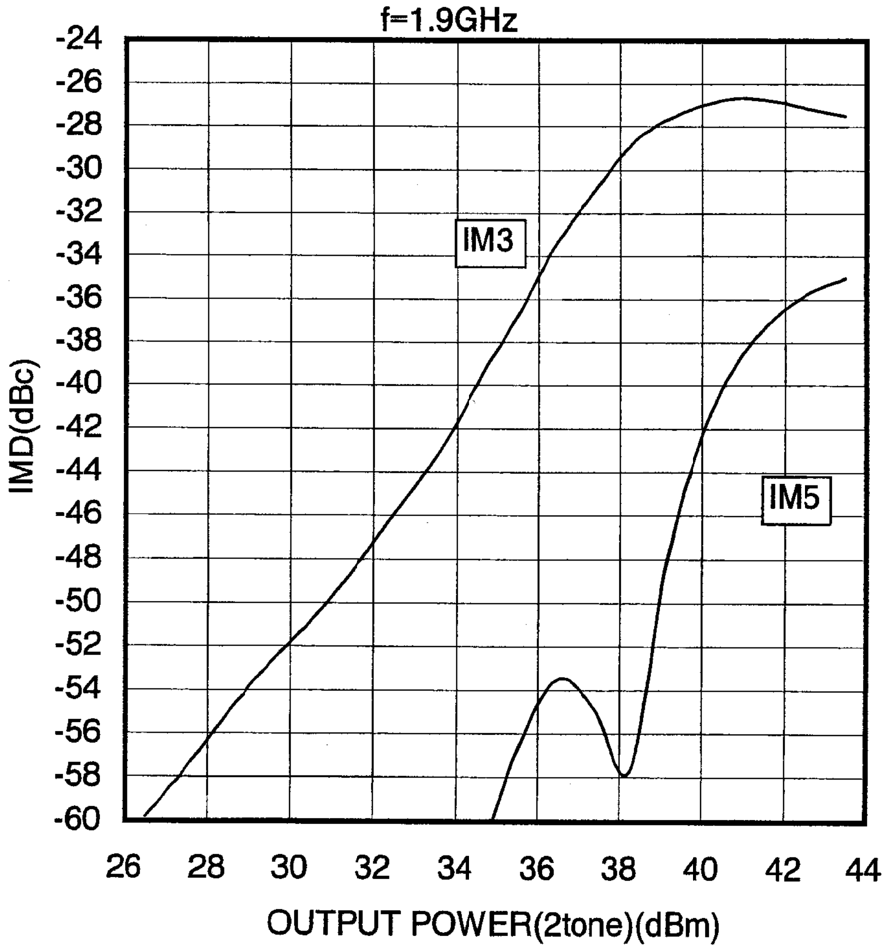
OUTPUT POWER & POWER ADDED EFFICIENCY vs. INPUT POWER
TEST CONDITIONS : Ids(RFoff)=4A

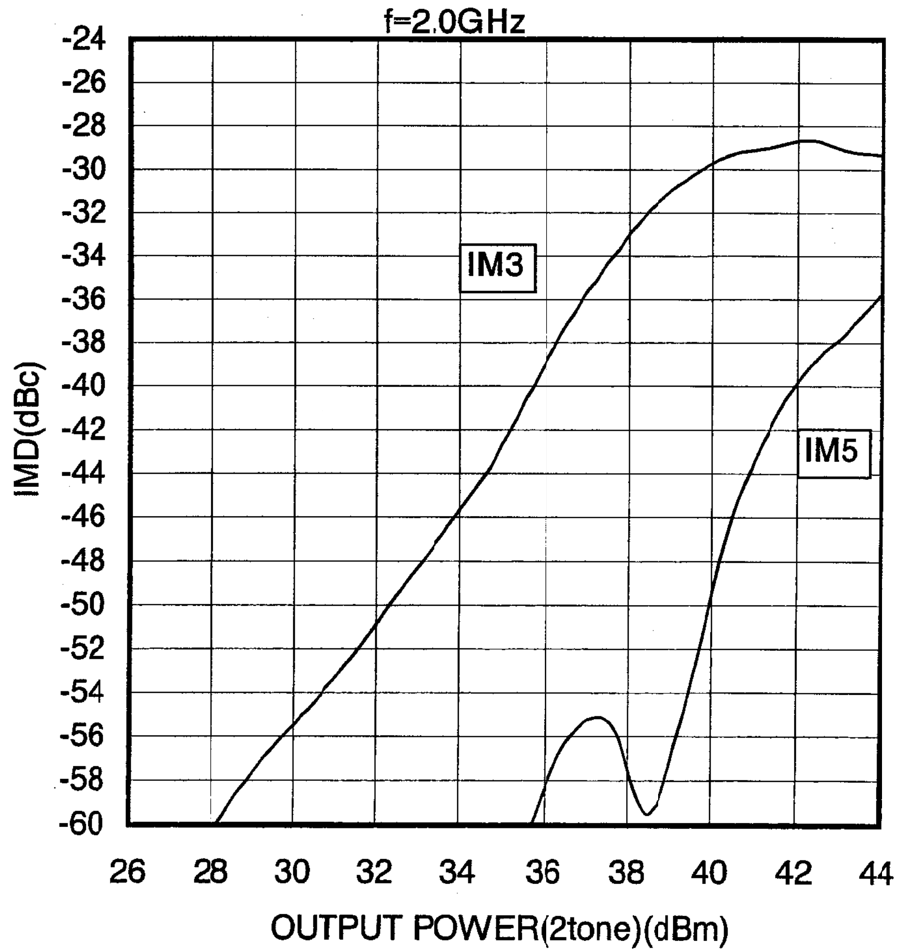




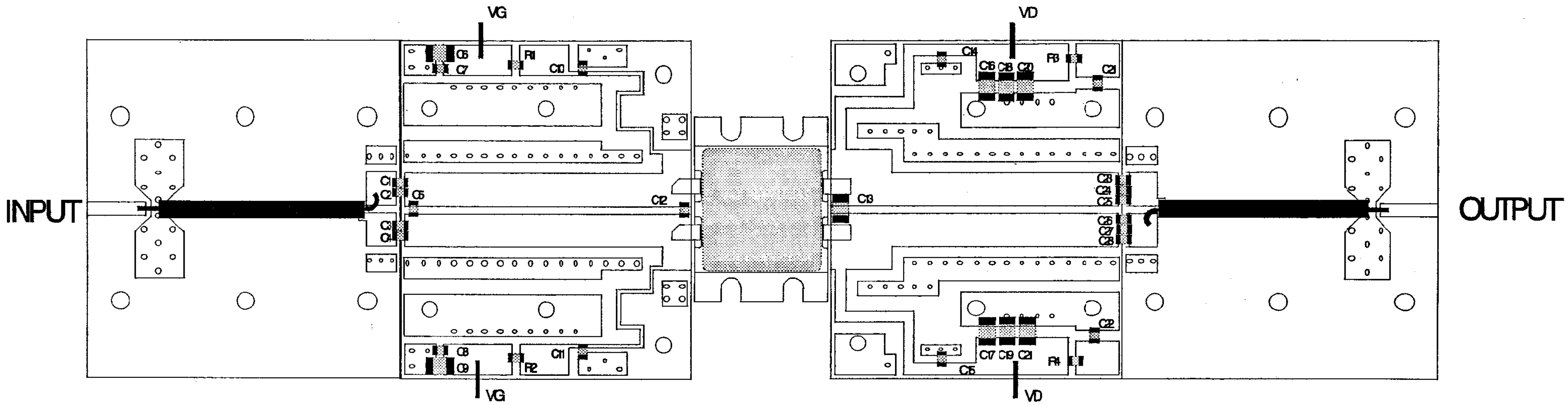
IMD vs. OUTPUT POWER

TEST CONDITIONS : VDS=12V,ID(RF off)=4.0A
2-tone test , Δf=5MHz





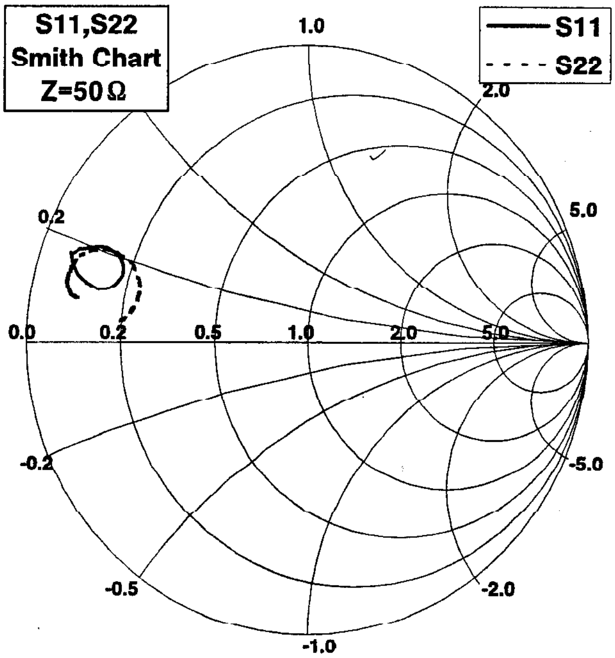
TEST CIRCUIT

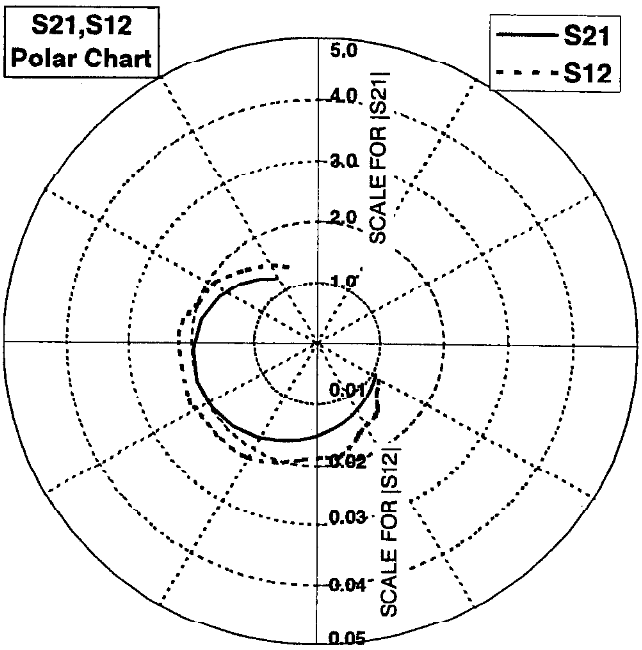


C1,C2,C3,C4:8pF(GR708)
C5:0.5pF(GR40)
C7,C8:4700pF(GR40)
C6,C9,C16,C17,C18,C19,C20,C21:4.7uF(CM32)
C10,C11,C14,C15:20pF(GR40)
C12:1.5pF(GR40)
C13:2pF(GR110)
C21,C22:1000pF(GR40)
C23,C24,C25,C26,C27,C28:13pF(GR708)
R1,R2=20ohm
R3,R4=51ohm

Board material:Teflon Thickness=0.6(mm)
Specific dielectric constant=2.6

TEST CONDITIONS : f=1.5-2.5GHz,VDS=12V,ID=2.0A





S PARAMETERS (Ta=25deg.C,VDS=12V,ID=2.0A)

f	S Parameters (TYP.)							
	S11		S21		S12		S22	
(GHz)	Mag.	Ang(deg.)	Mag.	Ang(deg.)	Mag.	Ang(deg.)	Mag.	Ang(deg.)
1.50	0.889	160.2	1.056	-28.4	0.012	-31.0	0.830	169.7
1.55	0.879	159.5	1.101	-35.3	0.012	-38.3	0.837	169.6
1.60	0.869	158.7	1.147	-42.4	0.013	-40.8	0.840	169.5
1.65	0.854	158.2	1.197	-49.6	0.014	-48.0	0.846	169.4
1.70	0.843	157.6	1.253	-57.1	0.015	-50.4	0.854	169.2
1.75	0.829	157.2	1.310	-64.9	0.016	-65.6	0.862	168.6
1.80	0.814	156.6	1.379	-73.0	0.017	-67.8	0.870	167.7
1.85	0.800	156.3	1.451	-81.6	0.019	-79.1	0.878	166.8
1.90	0.782	155.8	1.529	-90.6	0.019	-88.1	0.881	165.3
1.95	0.761	155.9	1.617	-100.0	0.019	-98.3	0.877	163.8
2.00	0.741	156.1	1.710	-110.3	0.020	-108.0	0.873	161.9
2.05	0.722	157.0	1.813	-121.5	0.022	-121.7	0.858	159.8
2.10	0.705	158.5	1.909	-133.8	0.022	-136.4	0.827	157.7
2.15	0.697	160.7	1.977	-147.2	0.022	-150.5	0.782	156.1
2.20	0.707	163.6	2.005	-161.9	0.022	-153.5	0.732	156.0
2.25	0.730	165.5	1.971	-176.8	0.022	176.6	0.673	157.4
2.30	0.769	166.6	1.873	168.3	0.020	161.0	0.635	161.2
2.35	0.811	165.6	1.725	154.3	0.019	148.0	0.624	166.0
2.40	0.847	164.3	1.560	141.6	0.016	132.7	0.635	170.3
2.45	0.875	162.3	1.395	130.6	0.015	118.7	0.661	173.3
2.50	0.895	160.1	1.246	120.8	0.013	105.3	0.687	175.2

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