Preliminary

MITSUBISHI SEMICONDUCTOR <GaAs FET>

MGFS48V2527

2.5 - 2.7GHz BAND 60W GaAs FET

DESCRIPTION

The MGFS48V2527 is a 60W push-pull type GaAs Power FET especially designed for use in 2.5 - 2.7GHz band amplifiers.
The hermetically sealed metal-ceramic package guarantees high reliability.

FEATURES

Push-pull configuration
High output power
Pout = 60W (TYP.) @ f=2.5 - 2.7 GHz
High power gain
GLP = 10 dB (TYP.) @ f=2.5 - 2.7GHz
High power added efficiency
P.A.E. = 45 % (TYP.) @ f=2.5 - 2.7GHz

APPLICATION

2.5-2.7GHz band power amplifier

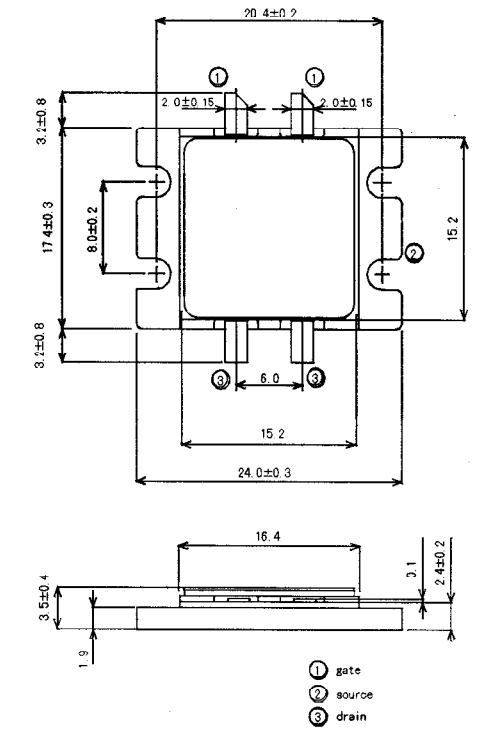
QUALITY GRADE

IG

RECOMMENDED BIAS CONDITIONS

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

OUTLINE



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	107.1	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)	Cut-off voltage	VDS = 3V , ID = 17.3mA	-1	-	-4	V
P2dB	Output power at 2dB gain compression	VDS=12V, ID(RF off)=4.0A, f=2.5 - 2.7GHz	47	48	-	dBm
GLP	Linear power gain		9	10	-	dB
ID(RF)	Drain current		-	11	15	A
P.A.E.	Power added efficiency		-	45	-	%
Rth (Ch-C)	Thermal resistance	Channel to Case	-	1.0	1.4	deg.C/W

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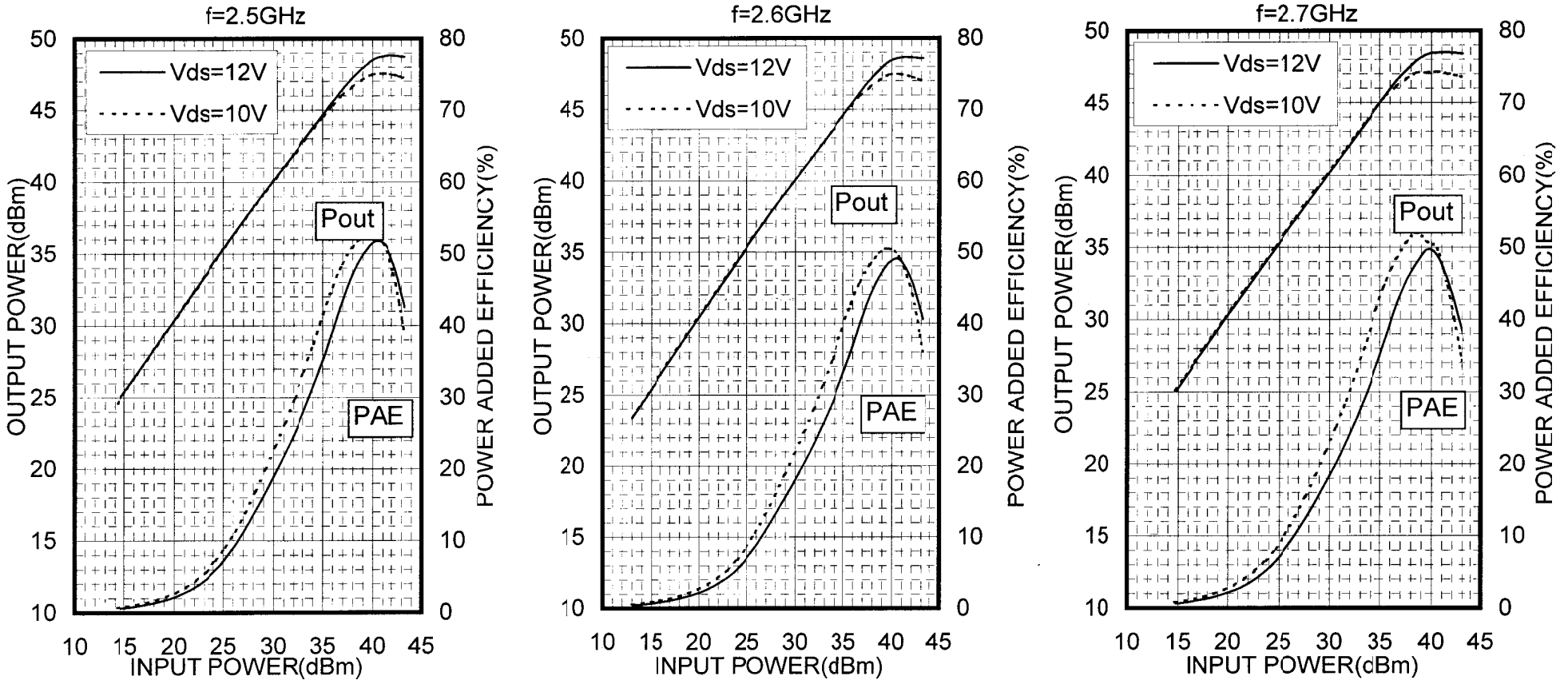
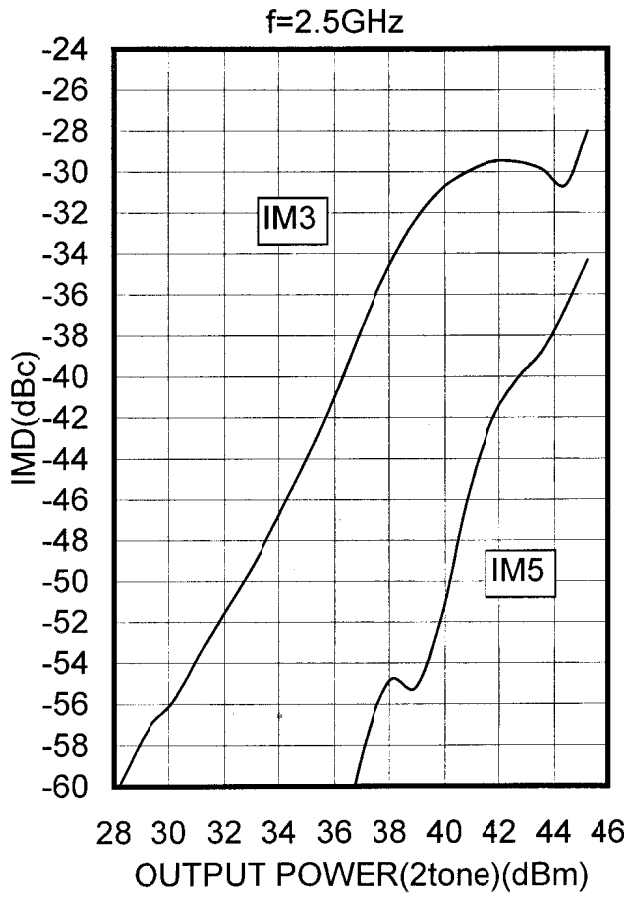
Nov.1999

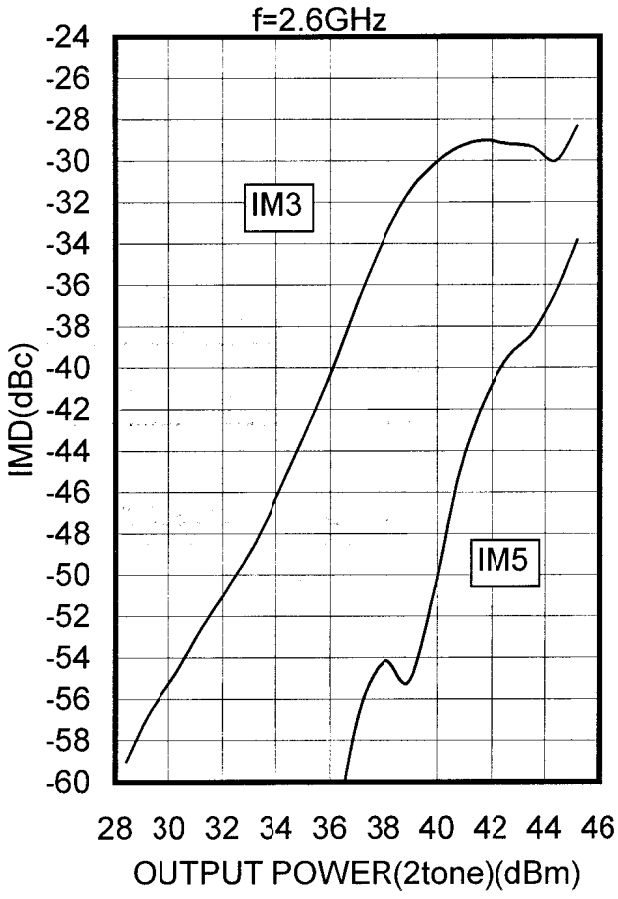
OUTPUT POWER & POWER ADDED EFFICIENCY vs. INPUT POWER
TEST CONDITIONS : Ids(RFoff)=4A

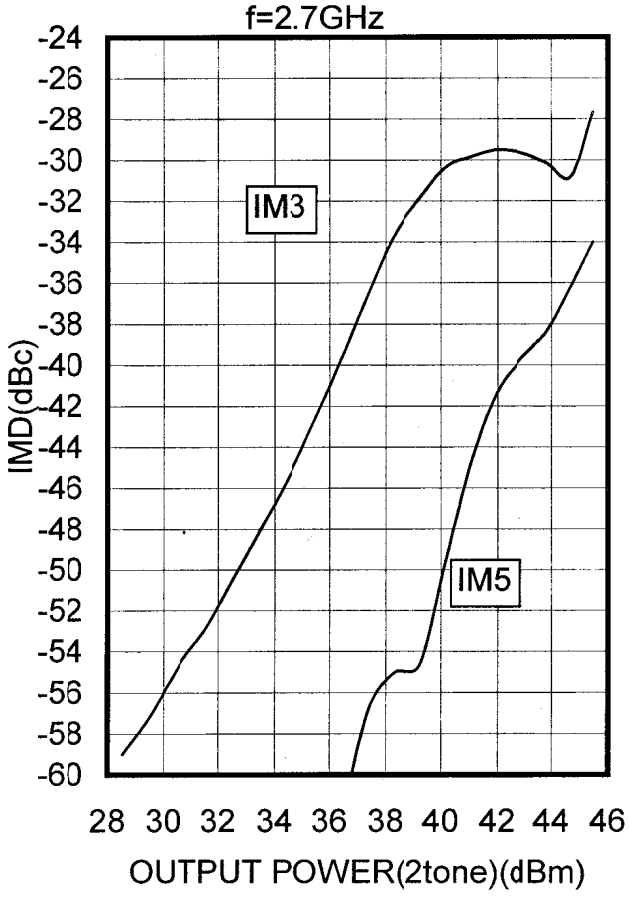


IMD vs. OUTPUT POWER

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

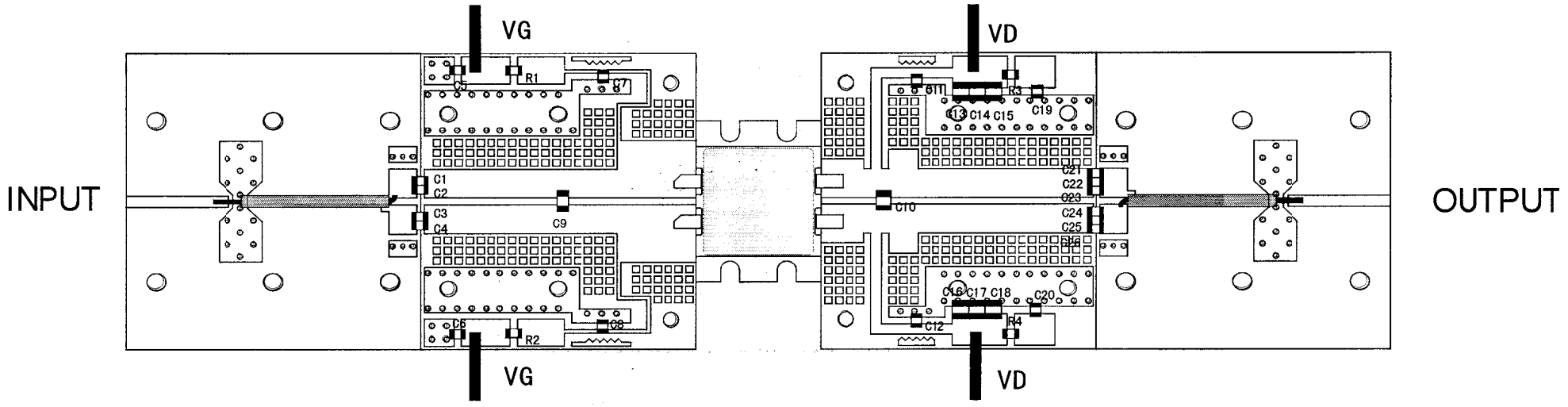






TEST CIRCUIT

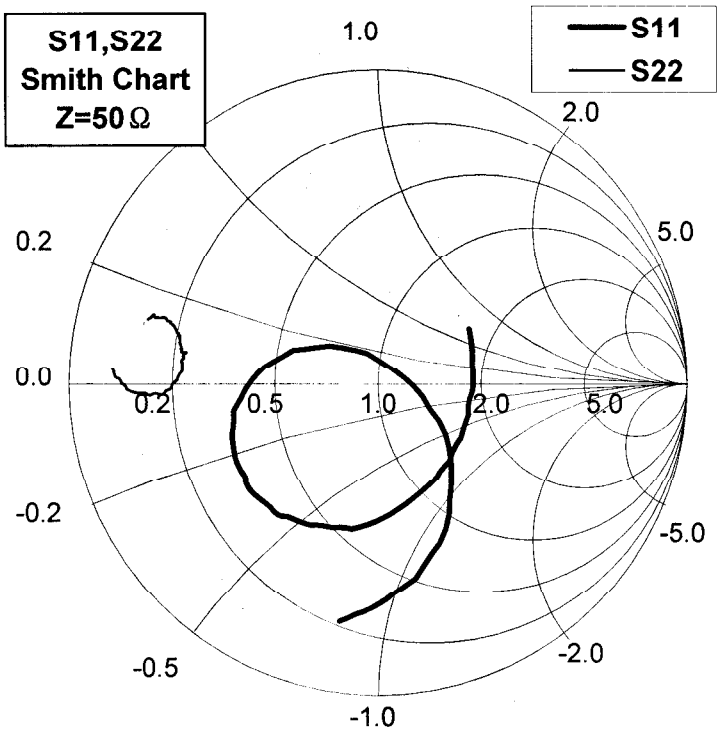
MGFS48V2527

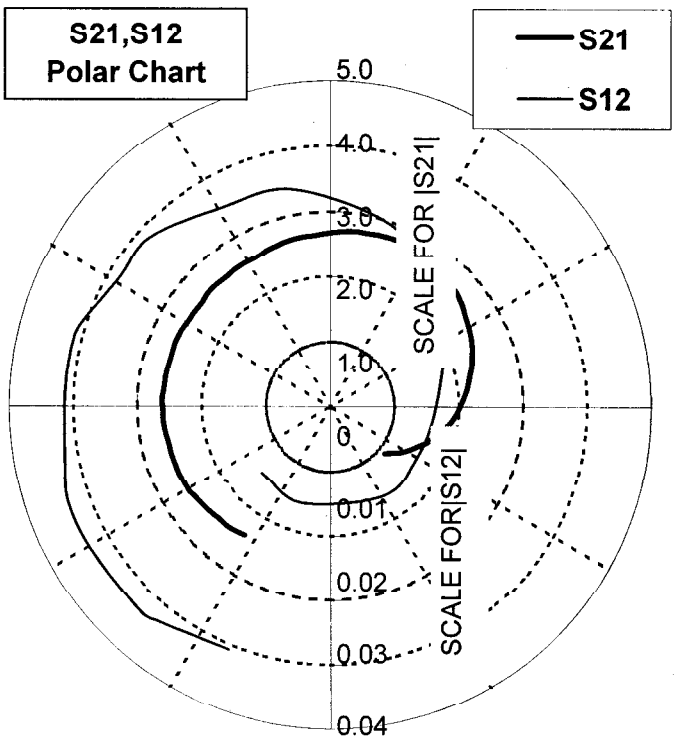


C1, C2, C3, C4	:8pF (GR708)
C5, C6	:1000pF (GR40)
C7, C8	:20pF (GR40)
C9	:1.5pF (GR111)
C10	:1pF (GR111)
C11, C12	:20pF (GR40)
C13, C14, C15	:4.7μF (CM32B475K)
C16, C17, C18	:4.7μF (CM32B475K)
C19, C20	:1000pF (GR40)
C21, C22, C23, C24, C25, C26	:13pF (GR40)
R1, R2	:20ohm
R3, R4	:51ohm

Board material:Tefron thickness=0.6mm
Specific dielectric constant=2.6

TEST CONDITIONS : f=2.0-3.0GHz,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.)
2.00	0.343	30.9	2.391	-124.1	0.042	-112.1	0.773	164.4
2.05	0.311	11.3	2.448	-135.3	0.042	-129.0	0.760	163.0
2.10	0.301	-13.6	2.529	-147.0	0.046	-134.8	0.746	163.3
2.15	0.318	-37.2	2.575	-159.1	0.042	-148.3	0.724	162.9
2.20	0.354	-57.5	2.594	-170.4	0.044	-160.2	0.700	163.5
2.25	0.399	-78.1	2.620	176.5	0.045	-167.5	0.690	164.1
2.30	0.452	-94.0	2.597	164.9	0.039	176.5	0.673	165.6
2.35	0.484	-107.7	2.603	153.3	0.042	164.3	0.659	166.6
2.40	0.512	-121.8	2.558	141.8	0.040	161.2	0.655	167.8
2.45	0.529	-134.1	2.569	130.9	0.037	147.6	0.649	169.7
2.50	0.523	-145.4	2.573	119.6	0.039	135.6	0.629	170.7
2.55	0.504	-159.0	2.629	106.5	0.032	121.1	0.636	172.5
2.60	0.460	-171.7	2.665	92.9	0.034	100.6	0.636	175.1
2.65	0.369	171.2	2.734	78.3	0.030	78.4	0.645	177.6
2.70	0.231	149.6	2.731	59.9	0.027	58.1	0.666	-179.9
2.75	0.074	85.3	2.623	41.6	0.022	31.9	0.695	-177.4
2.80	0.188	-26.1	2.380	22.2	0.014	-3.2	0.740	-177.1
2.85	0.395	-53.1	2.085	4.0	0.014	-39.0	0.781	-177.8
2.90	0.569	-72.1	1.730	-13.8	0.018	-60.5	0.818	-179.5
2.95	0.694	-88.0	1.389	-28.6	0.016	-111.6	0.844	178.8
3.00	0.773	-99.3	1.108	-40.4	0.015	-136.5	0.862	176.7

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