

# MGFC45B3436B

## 3.4 - 3.6GHz BAND 30W INTERNALLY MATCHED GaAs FET

### DESCRIPTION

The MGFC45B3436B is an internally impedance-matched GaAs power FET especially designed for use in 3.4 - 3.6 GHz band amplifiers. The hermetically sealed metal-ceramic package guarantees high reliability.

### FEATURES

- Class AB operation
- Internally matched to 50(ohm) system
- High output power  
Po(SAT) = 30W (TYP.) @ f=3.4 - 3.6 GHz
- High power gain  
GLP = 11 dB (TYP.) @ f=3.4 - 3.6 GHz
- Distortion  
ACP = -45dBc (TYP.) @ f=3.4 - 3.6 GHz

### RECOMMENDED BIAS CONDITIONS

- VDS = 12 (V)
- ID = 0.8 (A)
- RG=12 (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
MAXID	Maximum drain current	10	A
PT *1	Total power dissipation	78	W
Tch	Channel temperature	175	deg.C
Tstg	Storage temperature	-65 / +175	deg.C

\*1 : Tc=25deg.C

### ELECTRICAL CHARACTERISTICS

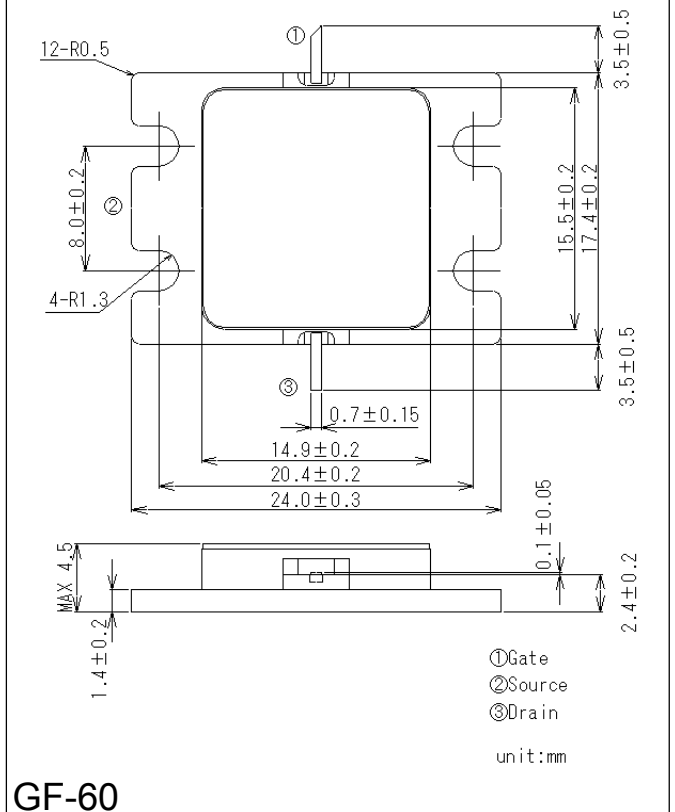
(Ta=25deg.C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
VGS(off)	Gate to source cut-off voltage	VDS = 3V , ID = 100mA	-0.5	-	-3.0	V
Po(SAT)	Output power	VDS=12V, ID(RF off)=0.8A, f=3.4-3.6GHz	-	45	-	dBm
GLP	Linear power gain	VDS=12V, ID(RF off)=0.8A, f=3.4-3.6GHz	10	11	-	dB
ID	Drain current		-	1.2	1.5	A
ACP *2	Adjacent Channel leakage Power		Pout=34dBm	-	-45	-
Rth(ch-c) *3	Thermal resistance	delta Vf method	-	-	1.9	deg.C/W

\*2 : Mod.3GPP TEST MODEL 1 64code Single Signal

\*3 : Channel-case

### OUTLINE DRAWING



< 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.



MITSUBISHI  
ELECTRIC

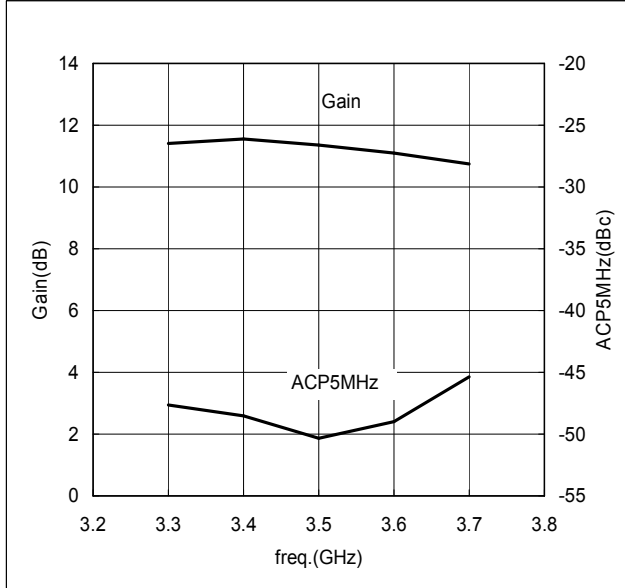
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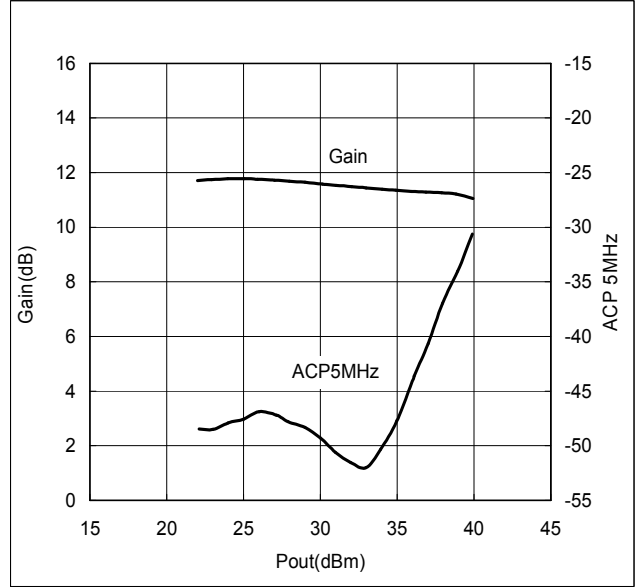
### TYPICAL CHARACTERISTICS

**ACP, Gain vs. Freq. @Pout=34dBm**



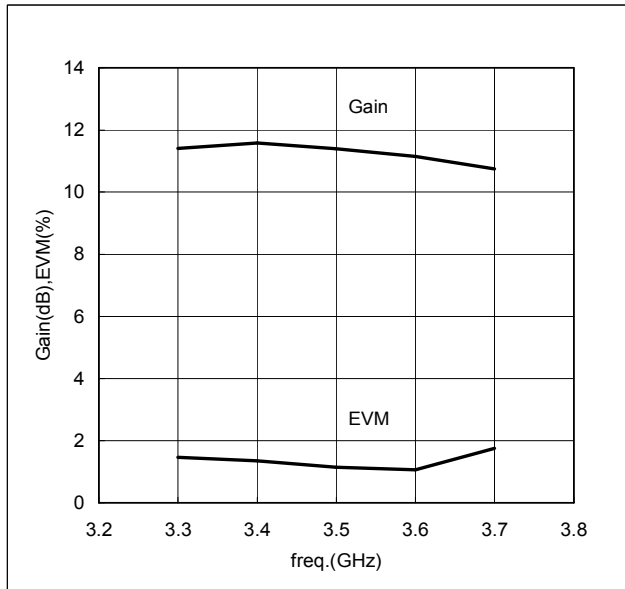
Test Condition:  
 Pout=34dBm, VD=12V, IDQ=0.8A, Ta=25deg.C  
 Mod.: 3GPP TEST MODEL 1 64code Single Signal  
 Channel Bandwidth = 3.84MHz

**ACP, Gain vs. Pout @freq.=3.5GHz**



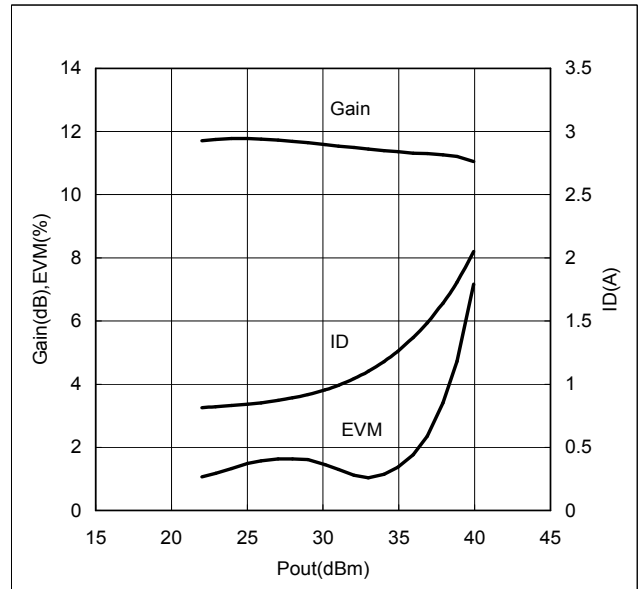
Test Condition:  
 f=3.5GHz, VD=12V, IDQ=0.8A, Ta=25deg.C  
 Mod.: 3GPP TEST MODEL 1 64code Single Signal  
 Channel Bandwidth = 3.84MHz

**EVM, Gain vs. Freq. @Pout=34dBm**



Test Condition:  
 Pout=34dBm, VD=12V, IDQ=0.8A, Ta=25deg.C  
 Mod: WiMAX Downlink, 64QAM Channel Bandwidth: 3.5MHz

**EVM, Gain vs. Pout @freq.=3.5GHz**



Test Condition:  
 f=3.5GHz, VD=12V, IDQ=0.8A, Ta=25deg.C  
 Mod: WiMAX Downlink, 64QAM Channel Bandwidth: 3.5MHz



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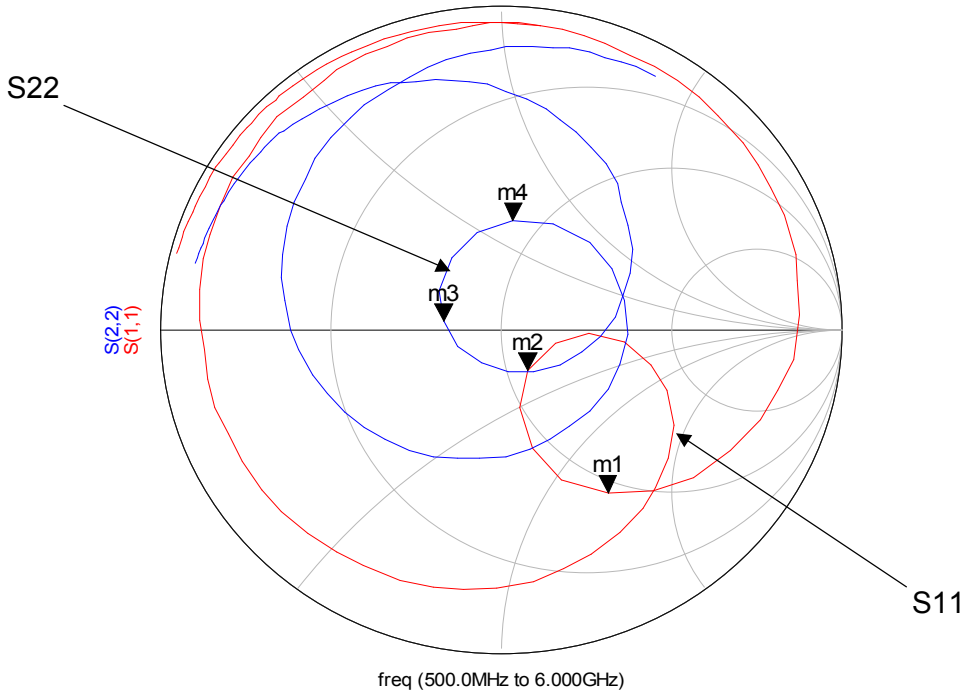
3.4 - 3.6GHz BAND 30W INTERNALLY MATCHED GaAs FET

TYPICAL CHARACTERISTICS

Sparameters

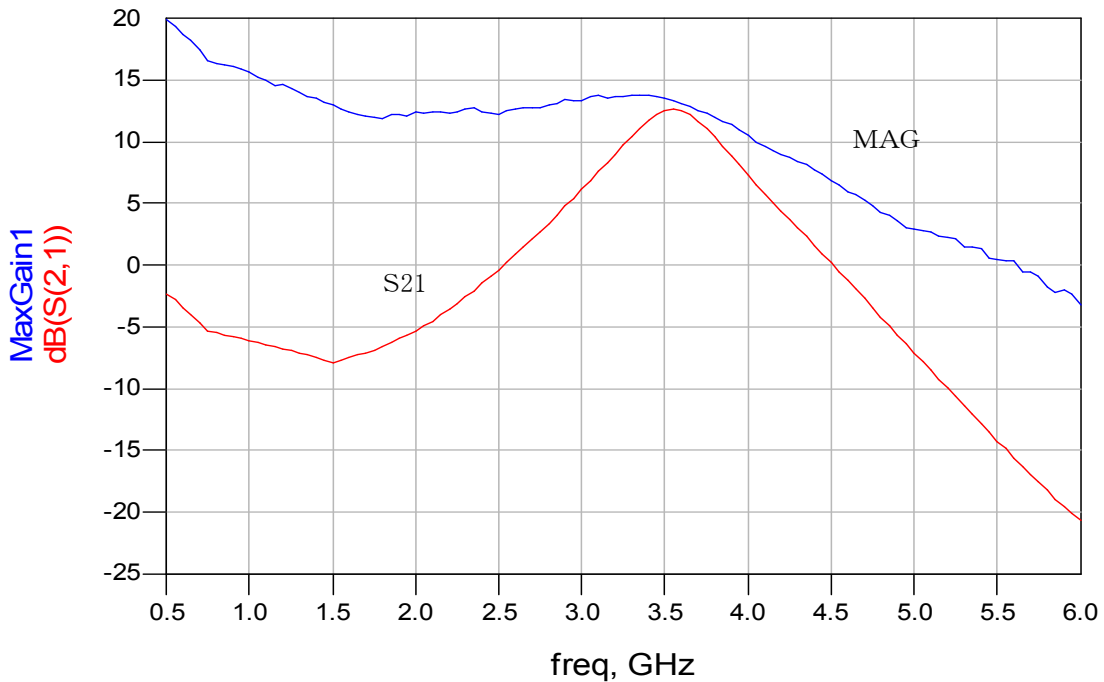
m1  
freq=3.400GHz  
m1=0.593 / -58.000  
impedance = Z0 \* (0.897 - j1.39)

m2  
freq=3.600GHz  
m2=0.148 / -58.000  
impedance = Z0 \* (1.131 - j0.29)



m3  
freq=3.400GHz  
m3=0.171 / 171.000  
impedance = Z0 \* (0.710 + j0.03)

m4  
freq=3.600GHz  
m4=0.340 / 84.000  
impedance = Z0 \* (0.847 + j0.64)



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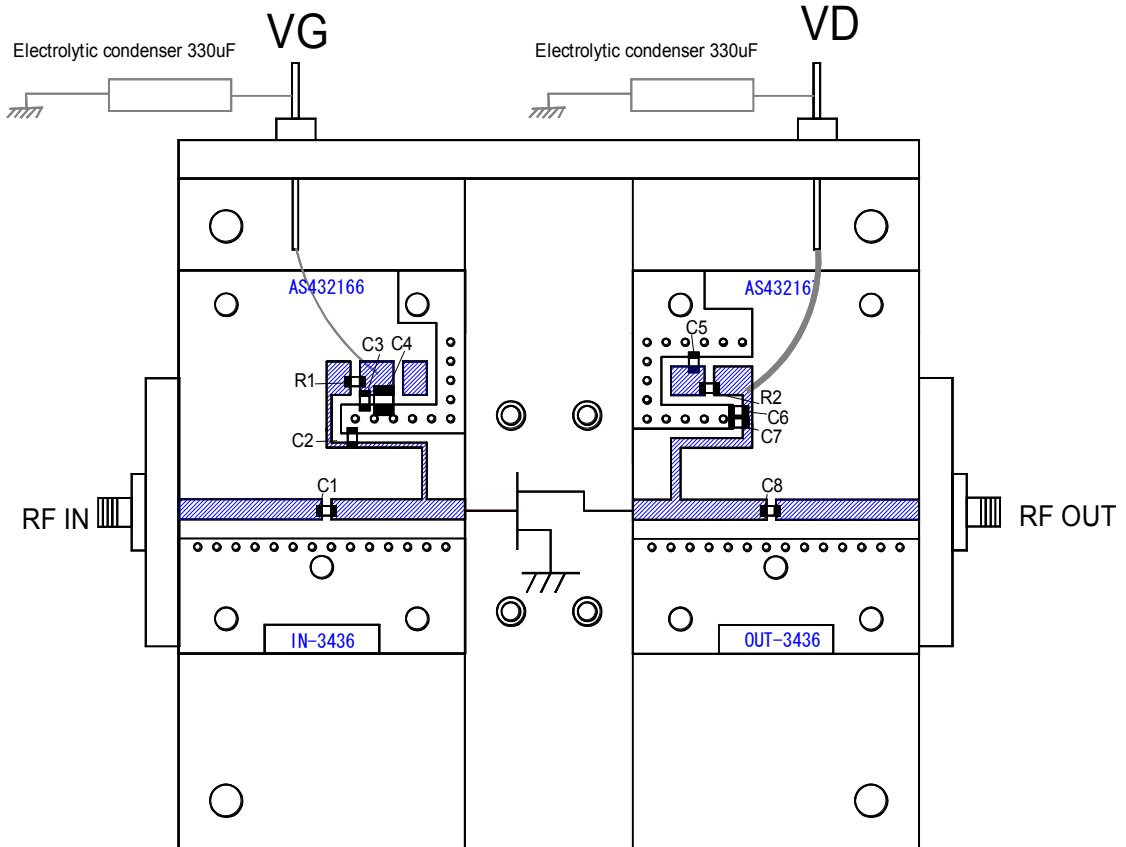
TYPICAL CHARACTERISTICS

Sparameters

freq. GHz	S11		S21		S12		S22	
	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
0.5	0.981	166	0.767	49	0.004	34	0.921	167
0.6	0.979	163	0.676	41	0.004	28	0.919	165
0.7	0.978	160	0.586	33	0.004	21	0.916	163
0.8	0.977	157	0.531	26	0.004	16	0.913	160
0.9	0.977	155	0.522	22	0.004	15	0.912	158
1.0	0.976	153	0.513	18	0.005	14	0.910	157
1.1	0.976	149	0.495	10	0.005	12	0.907	154
1.2	0.975	146	0.476	2	0.005	10	0.904	150
1.3	0.974	142	0.458	-6	0.006	8	0.901	147
1.4	0.973	139	0.440	-14	0.006	6	0.898	144
1.5	0.973	135	0.422	-22	0.006	4	0.895	141
1.6	0.972	132	0.403	-29	0.007	2	0.892	137
1.7	0.969	127	0.422	-38	0.007	-2	0.881	134
1.8	0.966	122	0.440	-46	0.008	-6	0.870	130
1.9	0.963	117	0.468	-56	0.008	-12	0.857	125
2.0	0.961	111	0.504	-66	0.009	-20	0.844	119
2.1	0.958	106	0.540	-76	0.010	-28	0.831	113
2.2	0.957	97	0.592	-88	0.010	-36	0.806	108
2.3	0.950	90	0.663	-100	0.011	-41	0.785	101
2.4	0.946	83	0.741	-111	0.012	-52	0.760	93
2.5	0.940	75	0.844	-125	0.012	-64	0.717	84
2.6	0.929	66	0.954	-139	0.014	-74	0.673	75
2.7	0.927	56	1.104	-155	0.013	-87	0.624	65
2.8	0.918	46	1.273	-170	0.014	-108	0.566	53
2.9	0.912	34	1.476	172	0.011	-120	0.495	41
3.0	0.905	23	1.733	154	0.011	-148	0.418	25
3.1	0.882	10	2.016	135	0.008	-179	0.339	7
3.2	0.864	-6	2.400	113	0.006	110	0.246	-16
3.3	0.809	-20	2.807	90	0.011	54	0.161	-53
3.4	0.728	-39	3.326	64	0.020	6	0.118	-119
3.5	0.593	-58	3.853	36	0.033	-26	0.171	171
3.6	0.375	-76	4.244	2	0.046	-60	0.267	123
3.7	0.148	-58	4.228	-32	0.058	-93	0.340	84
3.8	0.259	-2	3.835	-65	0.061	-127	0.374	46
3.9	0.452	-14	3.294	-96	0.058	-156	0.374	14
4.0	0.587	-30	2.775	-122	0.054	178	0.366	-17
4.1	0.666	-47	2.317	-147	0.052	159	0.361	-44
4.2	0.716	-61	1.939	-168	0.049	136	0.367	-67
4.3	0.760	-76	1.648	171	0.044	113	0.393	-88
4.4	0.799	-91	1.415	151	0.037	93	0.418	-108
4.5	0.820	-104	1.204	130	0.031	69	0.460	-126
4.6	0.833	-119	1.023	111	0.026	53	0.502	-143
4.7	0.846	-132	0.867	92	0.021	36	0.545	-159
4.8	0.859	-145	0.734	74	0.017	20	0.596	-174
4.9	0.863	-158	0.617	57	0.014	5	0.641	172
5.0	0.875	-170	0.520	40	0.011	-6	0.684	160
5.1	0.886	178	0.440	25	0.010	-22	0.724	147
5.2	0.901	166	0.377	8	0.008	-30	0.761	136
5.3	0.910	155	0.319	-6	0.008	-59	0.791	124
5.4	0.915	144	0.268	-21	0.007	-69	0.815	114
5.5	0.929	135	0.228	-35	0.006	-73	0.838	105
5.6	0.930	124	0.193	-47	0.006	-75	0.859	96
5.7	0.941	115	0.166	-61	0.005	-91	0.874	89
5.8	0.944	107	0.141	-72	0.005	-118	0.885	80
5.9	0.938	98	0.122	-84	0.005	-117	0.897	73
6.0	0.951	92	0.106	-94	0.003	-133	0.899	67



**MGFC45B3436B RF TEST FIXTURE**



C1,C2,C7,C8=8pF  
 C4=100nF  
 C3,C5= 1000pF  
 C6=470nF  
 R1=12ohm  
 R2=51ohm  
 Board material :Teflon, t=0.8mm, Specific dielectric constant=2.6  
 UNIT:(mm)



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