

MITSUBISHI SEMICONDUCTOR <GaAs FET>

MGF1801BT

TAPE CARRIER MICROWAVE POWER GaAs FET

DESCRIPTION

The MGF1801BT, medium-power GaAs FET with an N-channel Schottky gate, is designed for use S-X band amplifiers and oscillators. The hermetically sealed metal-ceramic package assures minimum parasitic losses, and has a configuration suitable for microstrip circuits.

The MGF1801BT is mounted in the super 24 tape.

FEATURES

- High output power at 1dB gain compression
 $P_{1dB} = 23dBm$ (TYP.) @ $f=8GHz$
- High linear gain
 $G_{LP} = 9dB$ (TYP.) @ $f=8GHz$
- High reliability and stability

APPLICATION

S to X band medium-power amplifiers and oscillators.

QUALITY GRADE

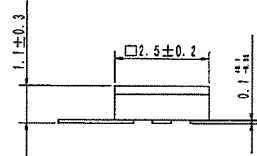
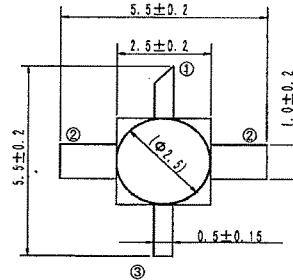
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RECOMMENDED BIAS CONDITIONS

$V_{DS}=6V$, $I_D=100mA$

OUTLINE DRAWING

Unit: millimeters



- ① Gate
- ② Source
- ③ Drain

GD-24

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 (i) placement of substitutive, auxiliary circuits, (ii) use of non-flammable material or (iii) prevention against any malfunction or mishap.

ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

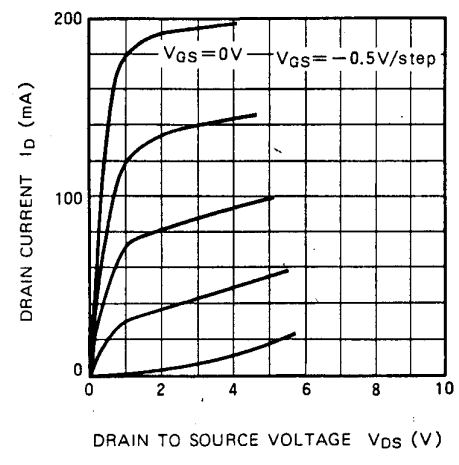
Symbol	Parameter	Ratings	Unit
V_{GDO}	Gate to drain voltage	-8	V
V_{GSO}	Gate to source voltage	-8	V
I_D	Drain current	250	mA
IGR	Reverse gate current	-0.6	mA
IGF	Forward gate current	1.5	mA
PT	Total power dissipation	1.2	W
T_{ch}	Channel temperature	175	°C
T_{stg}	Storage temperature	-65~+175	°C

ELECTRICAL CHARACTERISTICS (Ta=25°C)

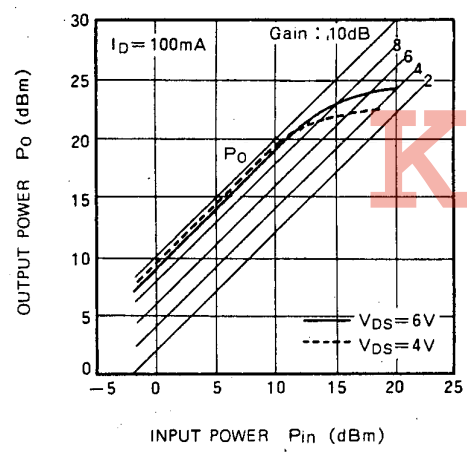
Symbol	Parameter	Test conditions	Limits			Unit
			MIN.	TYP.	MAX.	
$V_{(BR)GDO}$	Gate to drain breakdown voltage	$I_G=-200\mu A$	-8	--	--	V
$V_{(BR)GSO}$	Gate to source breakdown voltage	$I_G=-200\mu A$	-8	--	--	V
I_{GSS}	Gate to source leakage current	$V_{GS}=-3V, V_{DS}=0V$	--	--	20	μA
I_{DSS}	Saturated drain current	$V_{GS}=0V, V_{DS}=3V$	150	200	250	mA
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS}=3V, I_D=100\mu A$	-1.5	--	-4.5	V
gm	Transconductance	$V_{DS}=6V, I_D=100mA$	70	90	--	mS
G_{LP}	Linear power gain	$V_{DS}=6V, I_D=100mA$	7.0	9.0	--	dB
P_{1dB}	Output power at 1dB gain compression	$f=12GHz$	21.8	23.0	--	dBm

TYPICAL CHARACTERISTICS (Ta=25°C)

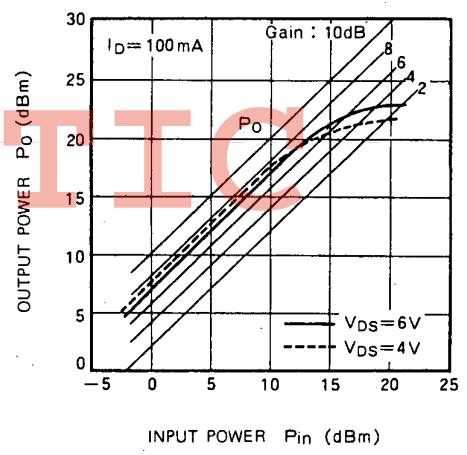
I_D vs. V_{DS}

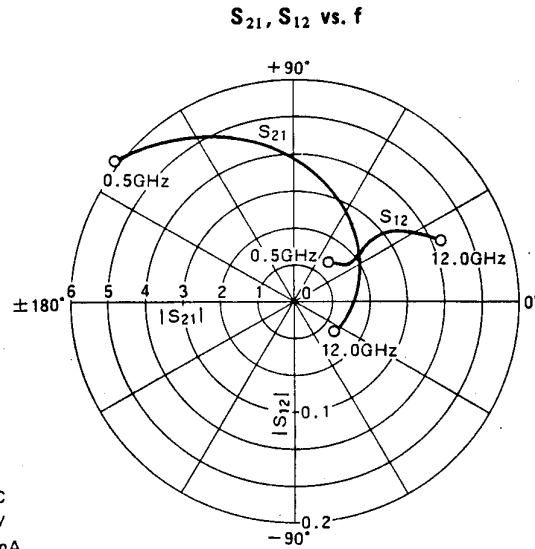
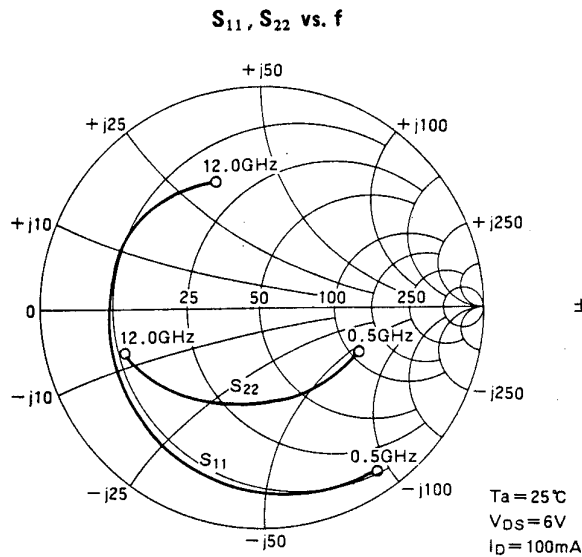


P_o vs. P_{in}
(f = 8 GHz)



P_o vs. P_{in}
(f = 12 GHz)





S PARAMETERS (Ta = 25°C, V_{DS} = 6V, I_D = 100mA)

Freq. (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MSG/MAG (dB)
	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.		
0.5	0.899	-56.8	6.115	140.3	0.047	52.1	0.471	-25.2	0.371	21.2
1.0	0.874	-69.4	5.682	130.4	0.049	49.3	0.462	-32.7	0.394	20.7
1.5	0.848	-82.1	5.248	120.5	0.050	46.4	0.452	-40.1	0.431	20.2
2.0	0.822	-94.7	4.815	110.6	0.052	43.6	0.442	-47.5	0.485	19.7
2.5	0.796	-107.4	4.382	100.6	0.054	40.8	0.432	-54.9	0.558	19.1
3.0	0.771	-120.0	3.949	90.8	0.056	38.0	0.422	-62.4	0.657	18.5
3.5	0.745	-132.7	3.515	80.9	0.057	35.1	0.413	-69.8	0.789	17.9
4.0	0.719	-145.3	3.082	71.0	0.059	32.3	0.403	-77.2	0.964	17.2
4.5	0.713	-153.3	2.863	63.3	0.060	33.3	0.412	-84.2	1.006	16.3
5.0	0.706	-161.3	2.645	55.6	0.062	34.3	0.421	-91.1	1.064	14.8
5.5	0.700	-169.3	2.426	47.9	0.063	35.2	0.431	-98.1	1.142	13.6
6.0	0.694	-177.3	2.207	40.2	0.064	36.2	0.440	-105.0	1.245	12.4
6.5	0.691	176.9	2.090	33.9	0.068	37.6	0.458	-110.3	1.202	12.1
7.0	0.689	171.1	1.973	27.5	0.073	39.0	0.476	-115.5	1.172	11.8
7.5	0.686	165.2	1.856	21.2	0.077	40.4	0.494	-120.8	1.153	11.5
8.0	0.683	159.4	1.739	14.8	0.081	41.8	0.512	-126.0	1.146	11.0
8.5	0.677	153.1	1.671	8.5	0.089	40.5	0.530	-130.8	1.072	11.1
9.0	0.670	146.9	1.602	2.1	0.096	39.3	0.549	-135.5	1.011	11.6
9.5	0.664	140.6	1.534	-4.3	0.104	38.0	0.567	-140.3	0.962	11.7
10.0	0.657	134.3	1.466	-10.6	0.111	36.7	0.585	-145.0	0.922	11.2
10.5	0.645	127.8	1.413	-17.0	0.118	33.2	0.601	-149.4	0.893	10.8
11.0	0.632	121.3	1.360	-23.4	0.126	29.8	0.618	-153.9	0.867	10.4
11.5	0.620	114.8	1.308	-29.7	0.133	26.3	0.635	-158.3	0.844	9.9
12.0	0.608	108.3	1.255	-36.1	0.140	22.8	0.651	-162.7	0.823	9.5

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