

TOSHIBA

MICROWAVE SEMICONDUCTOR TECHNICAL DATA

MICROWAVE POWER MMIC AMPLIFIER

TPM1919-60

FEATURES

- High Power
P1dB=48.0dBm at 1.96GHz
- High Power Gain
G1dB=13dB at 1.96GHz
- Partially Matched Type
- Hermetically Sealed Package

RF PERFORMANCE SPECIFICATIONS (Ta=25 °C)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Output Power at 1dB Gain Compression Point	P1dB	VDS=12V f=1.96GHz	dBm	47.0	48.0	—
Power Gain at 1dB Gain Compression Point	G1dB		dB	12.0	13.0	—
Drain Current	IDS		A	—	12	15
Power Added Efficiency	η_{add}		%	—	42	—
Channel-Temperature Rise	ΔT_{ch}	Notes 1	°C	—	—	100

ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Transconductance	gm	VDS=3V IDS=12.0A	S	—	20	—
Pinch off Voltage	VGSoff	VDS=3V IDS=300mA	V	-0.5	-1.8	-2.5
Saturated Drain Current	IDSS	VDS=3V VGS=0V	A	—	38	46
Gate-Source Breakdown Voltage	VGSO	IGS= -900 μ A	V	-5	—	—
Thermal Resistance	Rth (c-c)	Channel to Case	°C/W	—	0.6	0.8

Notes 1: $\Delta T_{ch} = (VDS \times IDS + Pin - Po) \times Rth (c-c)$

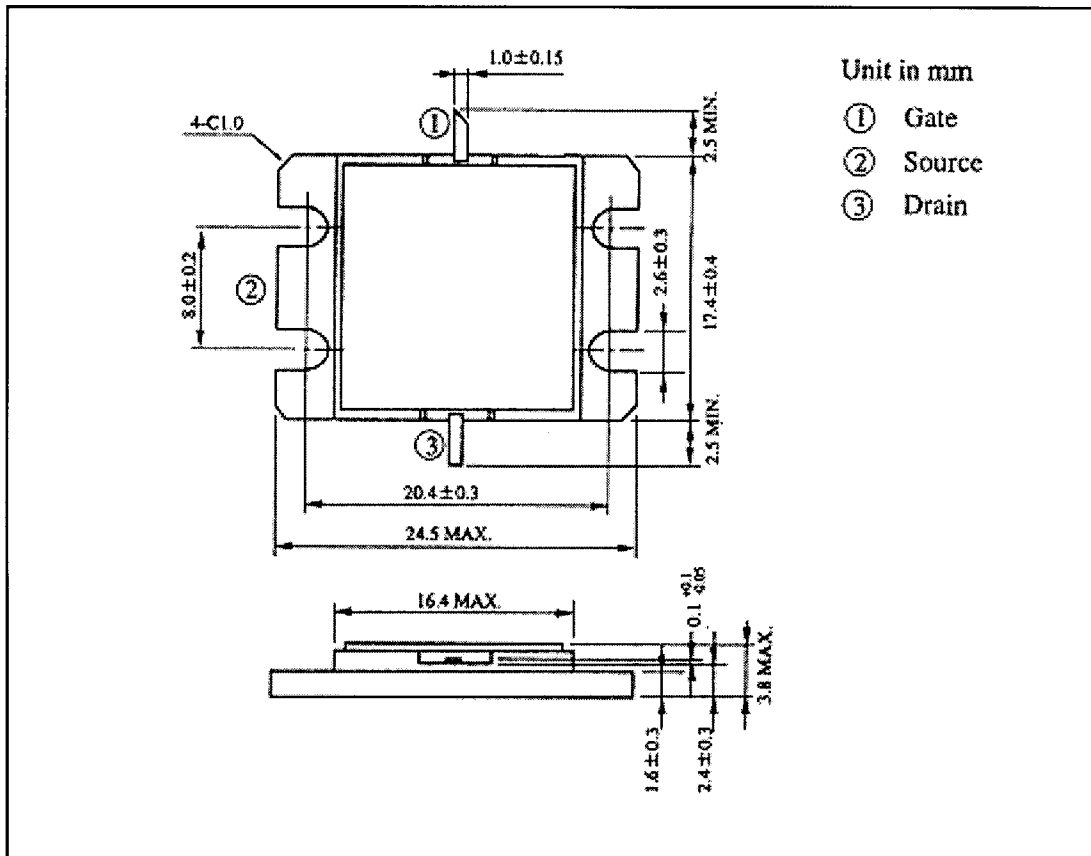
Notes 2: Recommended Gate Resistance (Rg): $Rg = Rg1(10\Omega) + Rg2(18\Omega) = 28\Omega (MAX)$.

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ABSOLUTE MAXIMUM RATINGS(Ta=25°C)

CHARACTERISTICS	SYMBOL	UNIT	RATINGS
Drain - Source Voltage	VDS	V	15
Gate - Source Voltage	VGS	V	-5
Drain Current	IDS	A	46
Total Power Dissipation (Tc = 25 °C)	PT	W	185
Channel Temperature	Tch	°C	175
Storage Temperature	Tstg	°C	-65+ - 175

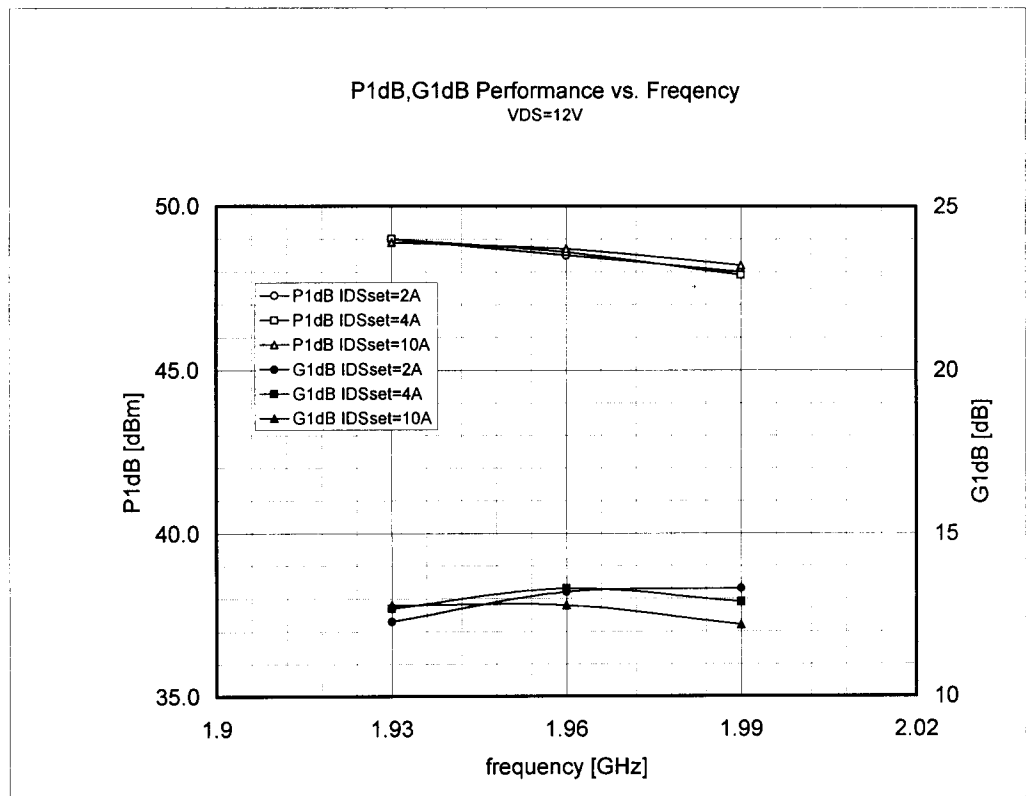
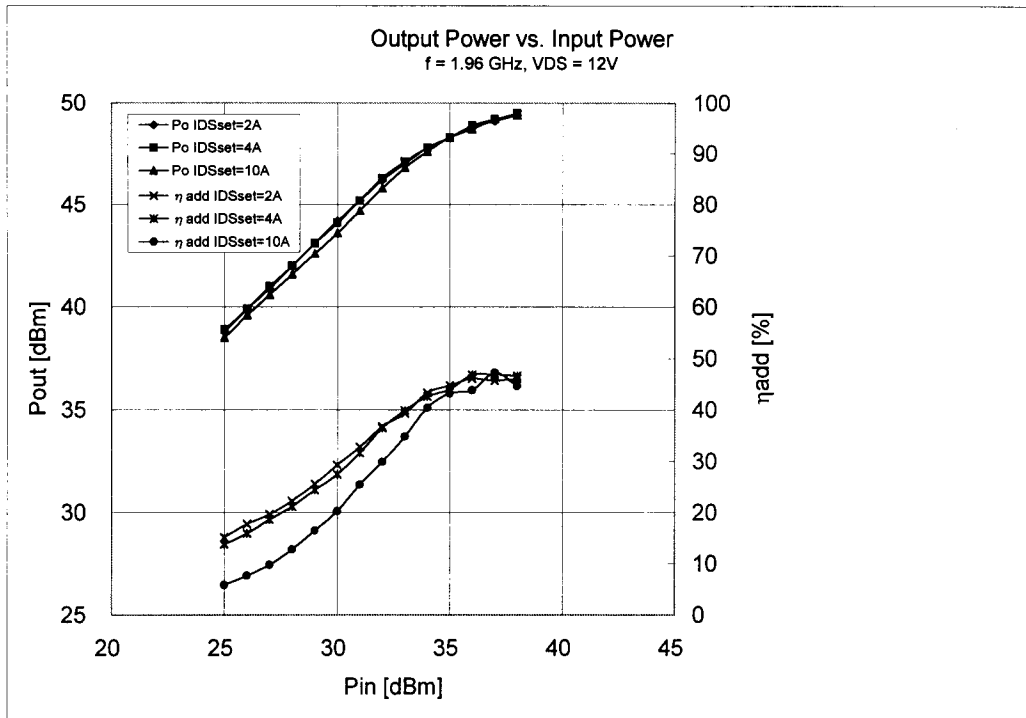
PACKAGE OUTLINE (2-16G6A)



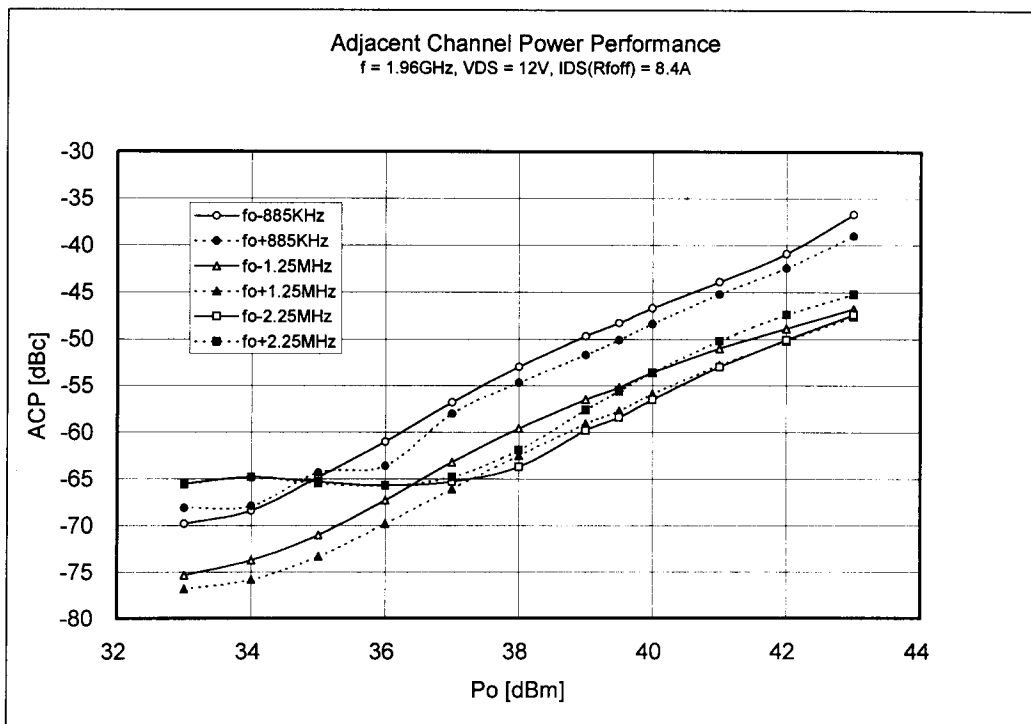
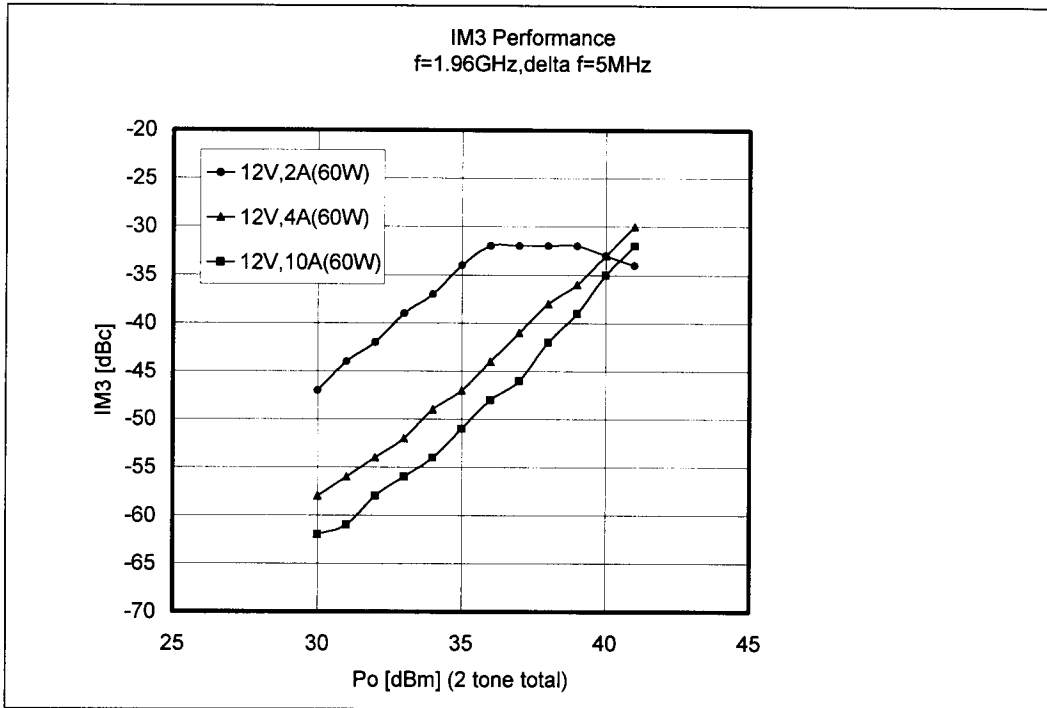
HANDLING PRECAUTIONS FOR PACKAGED TYPE

Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260 °C.

Typical RF Performance



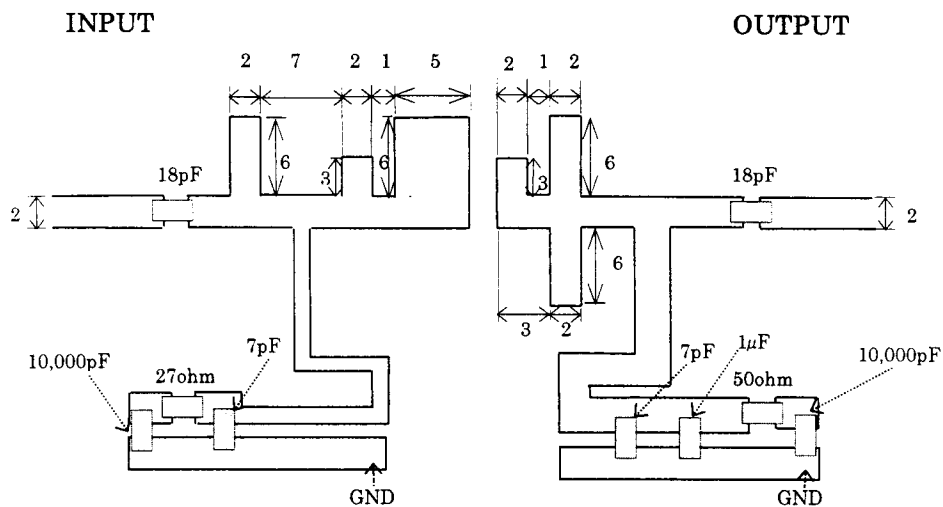
Typical RF Performance(Cont'd)



DRAWING OF RECOMMENDED MATCHING NETWORK

TPM1919-60 (@f=1.96GHz)

DRAWING OF POWER MATCHING NETWORK



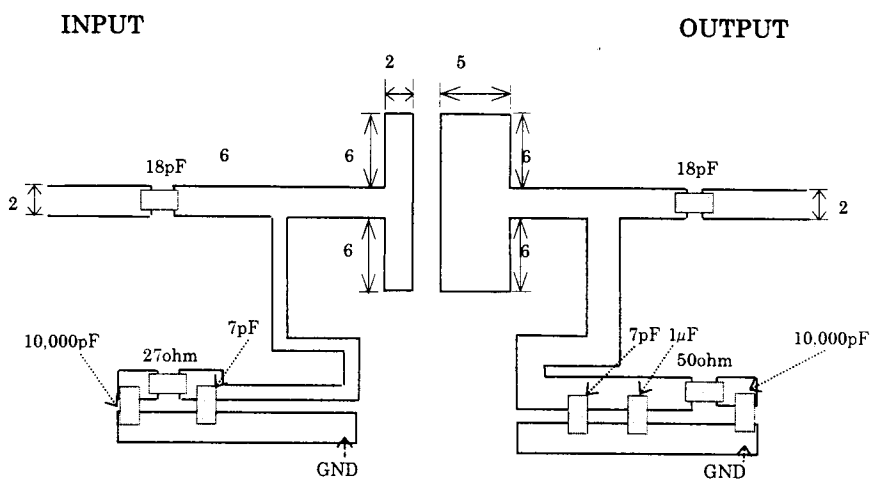
Unit in mm

Substrate Material : Teflon ($\epsilon r = 2.8$)

Thickness : 0.76 mm

TPM1919-60 (@f=1.96GHz)

DRAWING OF ACP MATCHING NETWORK

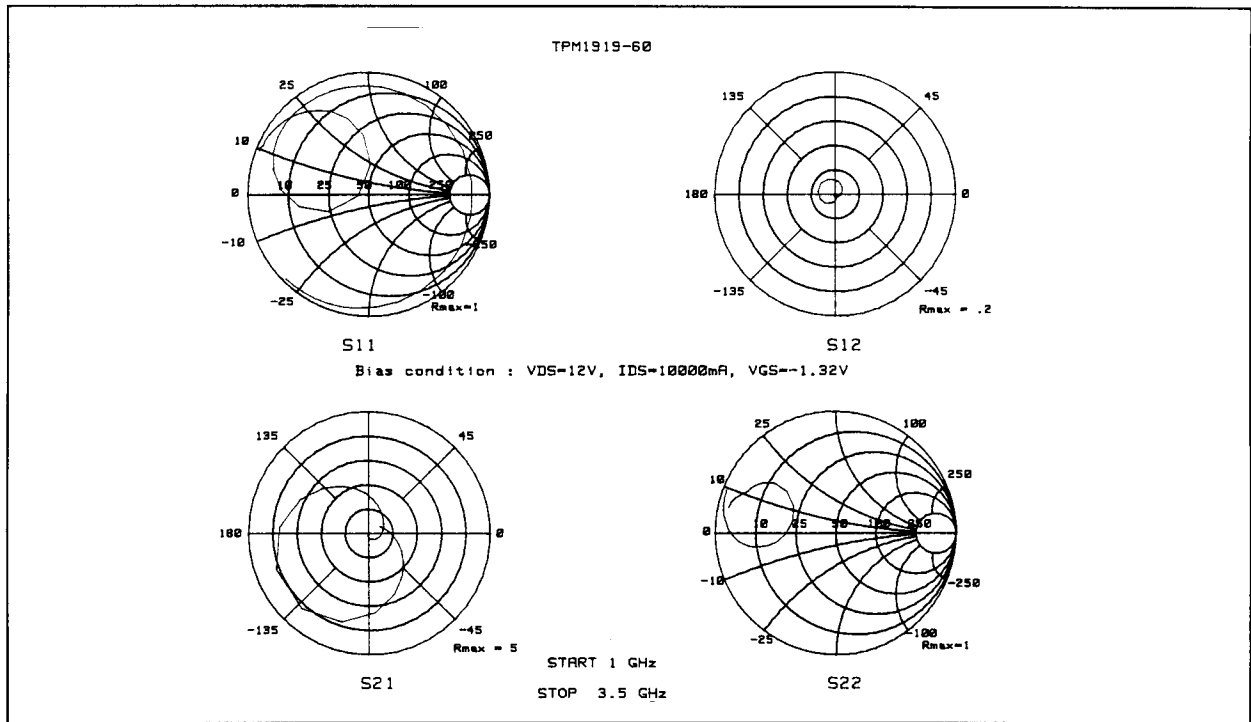


Unit in mm

Substrate Material : Teflon ($\epsilon r = 2.8$)

Thickness : 0.76 mm

TPM1919-60 S-PARAMETERS
(MAGN. And ANGLES)



FREQ (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1000	0.976	159.3	0.530	36.6	0.002	-19.0	0.912	167.3
1100	0.973	156.2	0.576	29.0	0.002	-25.9	0.911	165.6
1200	0.965	152.4	0.646	20.7	0.003	-33.9	0.903	163.7
1300	0.954	148.0	0.751	11.4	0.004	-42.9	0.889	161.9
1400	0.938	142.7	0.911	0.6	0.005	-53.1	0.875	160.2
1500	0.910	136.1	1.160	-12.4	0.006	-66.8	0.850	158.3
1600	0.857	127.1	1.562	-28.9	0.009	-83.9	0.829	156.6
1700	0.744	114.0	2.223	-51.4	0.014	-107.3	0.804	154.3
1800	0.481	94.3	3.256	-84.7	0.022	-141.5	0.776	149.6
1900	0.082	-175.8	4.157	-132.5	0.029	169.7	0.652	140.7
2000	0.585	-171.0	3.712	175.9	0.028	117.4	0.413	147.7
2100	0.815	165.1	2.701	136.1	0.022	77.2	0.408	179.0
2200	0.887	147.9	1.913	106.1	0.016	46.7	0.550	-170.1
2300	0.907	133.3	1.397	82.0	0.013	22.8	0.682	-170.6
2400	0.910	118.8	1.058	61.5	0.010	1.9	0.770	-173.8
2500	0.902	102.2	0.836	42.4	0.008	-15.6	0.833	-177.4
2600	0.889	81.8	0.684	23.7	0.007	-34.1	0.875	179.2
2700	0.872	56.1	0.566	3.6	0.006	-52.9	0.902	176.1
2800	0.860	24.3	0.464	-17.8	0.005	-72.6	0.923	173.2
2900	0.862	-11.0	0.365	-39.8	0.004	-92.1	0.939	171.0
3000	0.884	-44.5	0.273	-60.7	0.003	-111.1	0.949	168.7
3100	0.912	-72.7	0.197	-78.9	0.002	-126.6	0.954	166.6
3200	0.933	-94.7	0.141	-94.0	0.002	-140.1	0.960	164.7
3300	0.950	-111.6	0.102	-106.5	0.001	-149.9	0.964	162.6
3400	0.962	-124.6	0.075	-117.2	0.001	-163.8	0.966	160.5
3500	0.969	-135.0	0.057	-126.2	0.001	179.5	0.971	158.5