

TOSHIBA

**MICROWAVE SEMICONDUCTOR
TECHNICAL DATA**

MICROWAVE POWER GaAs FET

TPM2323-30

FEATURES :

- HIGH POWER
P_{1dB} = 44.5 dBm at 2.3 GHz
- HIGH GAIN
G_{1dB} = 11.5 dB at 2.3 GHz
- PARTIALLY MATCHED TYPE
- HERMETICALLY SEALED PACKAGE

RF PERFORMANCE SPECIFICATIONS (Ta = 25°C)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Output Power at 1dB Compression Point	P _{1dB}	V _{DS} = 10 V f = 2.3 GHz	dBm	43.5	44.5	—
Power Gain at 1dB Compression Point	G _{1dB}		dB	10.5	11.5	—
Drain Current	I _{DS}		A	—	7.5	9.0
Power Added Efficiency	η _{add}		%	—	35	—
Channel-Temperature Rise	ΔT _{ch}	NOTE 1	°C	—	—	80

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Transconductance	gm	V _{DS} = 3 V I _{DS} = 7.0 A	mS	—	6300	—
Pinch-off Voltage	V _{GSoff}	V _{DS} = 3 V I _{DS} = 140 mA	V	-1.0	-3.0	-4.0
Saturated Drain Current	I _{DSS}	V _{DS} = 3 V V _{GS} = 0 V	A	—	20	26
Gate-Source Breakdown Voltage	V _{GS0}	I _{GS} = -420 μA	V	-5	—	—
Thermal Resistance	R _{th(c-c)}	Channel to Case	°C/W	—	1.1	1.4

NOTE 1: ΔT_{ch} = (V_{DS} × I_{DS} + Pin - P_{1dB}) × R_{th(c-c)}

Recommended Gate Resistance(R_g) : 30 Ω (MAX.)

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★ The information contained herein may be changed without prior notice. It is therefore advisable to contact TOSHIBA before proceeding with the design of equipment incorporating this product.

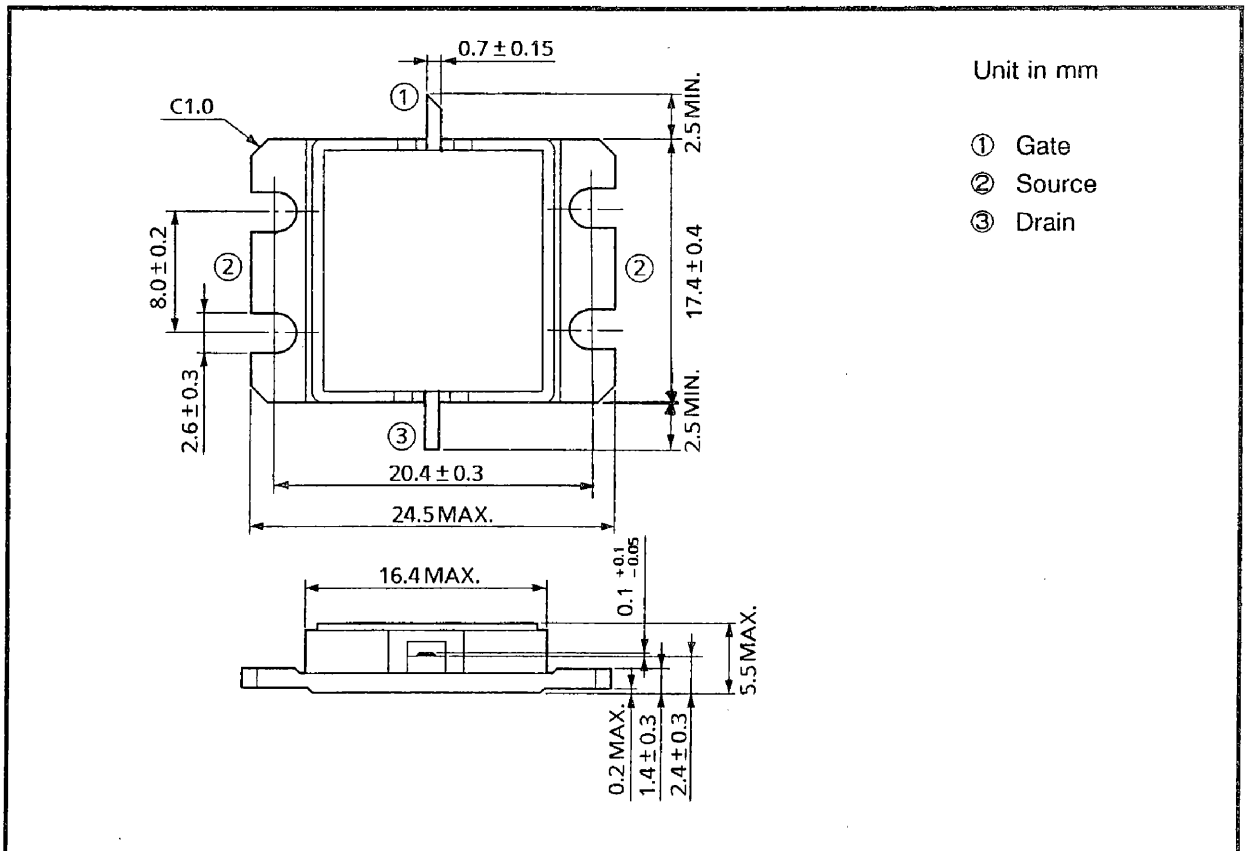


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ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTICS	SYMBOL	UNIT	RATING
Drain-Source Voltage	V _{DS}	V	15
Gate-Source Voltage	V _{GS}	V	-5
Drain Current	I _{DS}	A	26
Total Power Dissipation (T _C = 25°C)	P _T	W	100
Channel Temperature	T _{ch}	°C	175
Storage Temperature	T _{stg}	°C	-65~175

PACKAGE OUTLINE (2-16G1B)

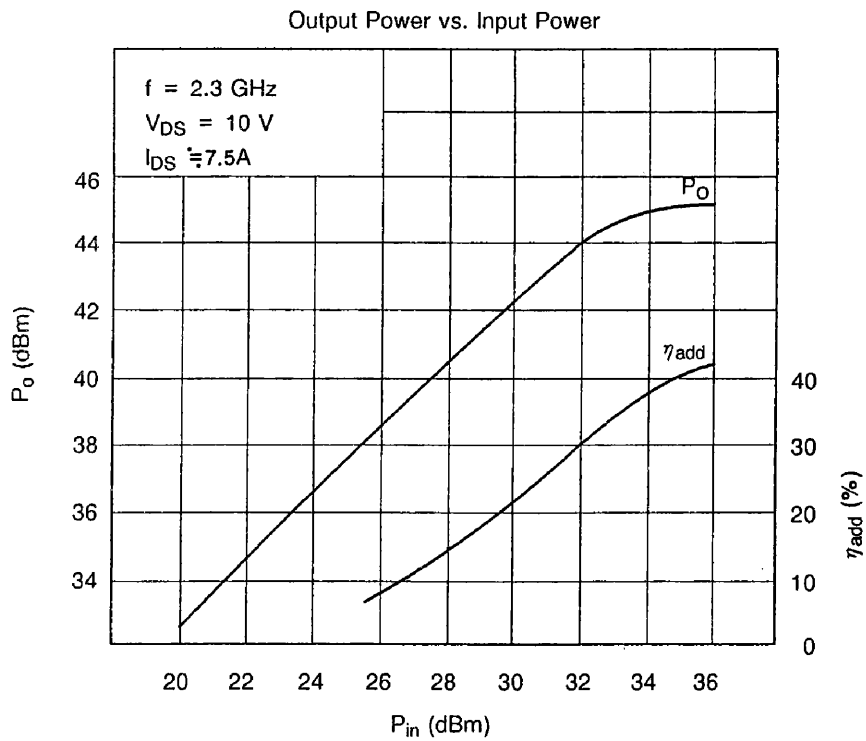
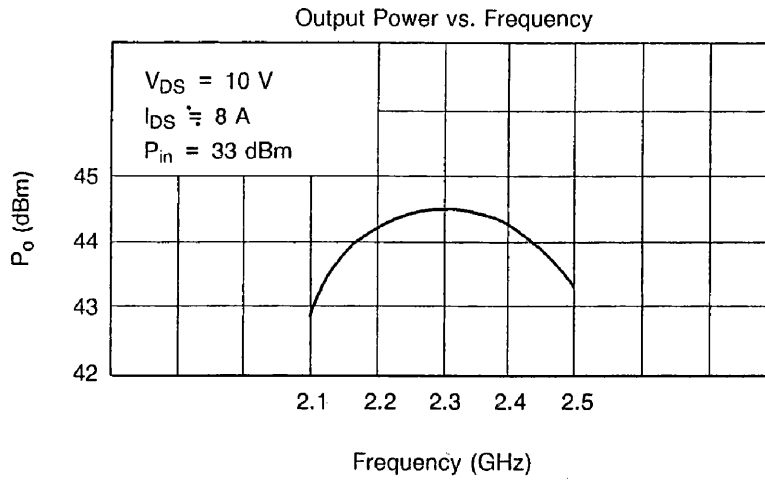


HANDLING PRECAUTIONS FOR PACKAGED TYPE

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

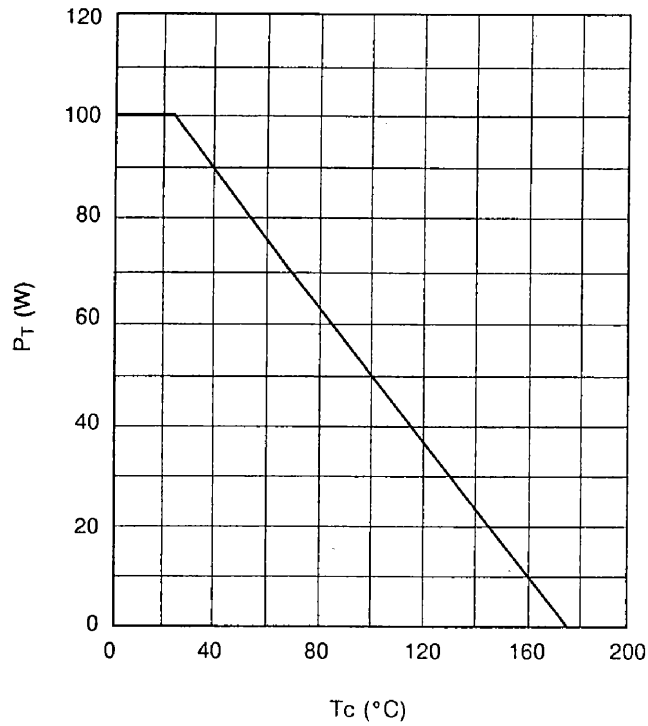
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RF PERFORMANCES



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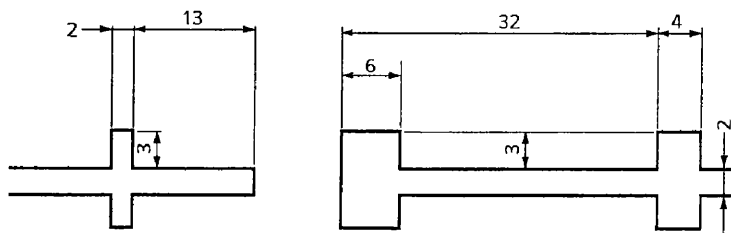
POWER DISSIPATION VS. CASE TEMPERATURE



DRAWING OF MATCHING NETWORK

INPUT

OUTPUT



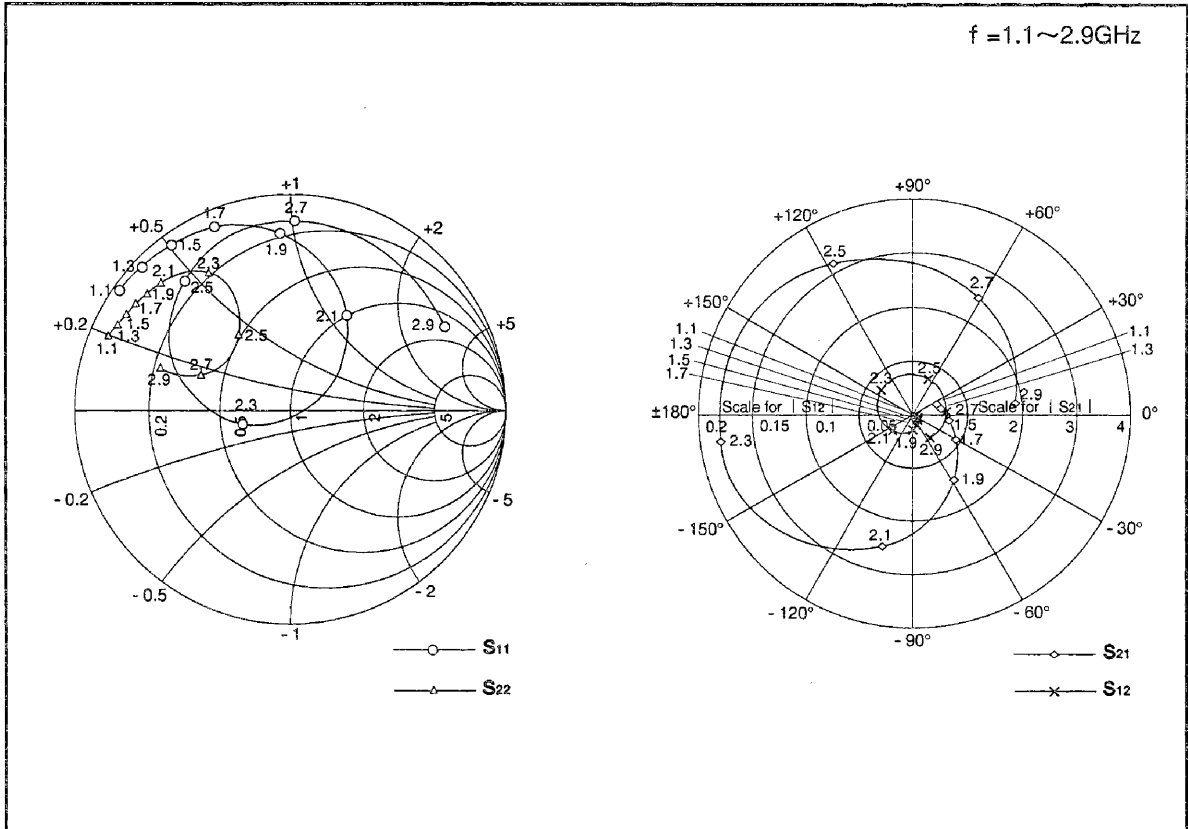
Substrate Material : Teflon ($\epsilon_r = 2.8$)

Thickness : 0.76 mm

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TPM2323-30 S-PARAMETERS (MAG. and ANGLES)

$V_{DS} = 10V, I_{DS} = 8.0A$



FREQUENCY (GHz)	S_{11}		S_{12}		S_{21}		S_{22}	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.1	0.976	145.2	0.003	-8.8	0.478	22.8	0.920	157.1
1.3	0.965	136.4	0.004	-20.0	0.535	8.0	0.908	153.0
1.5	0.949	126.3	0.006	-35.9	0.660	-9.0	0.892	148.9
1.7	0.913	113.1	0.008	-57.9	0.913	-29.8	0.870	145.0
1.9	0.817	93.7	0.013	-90.8	1.441	-58.3	0.850	141.2
2.1	0.513	59.0	0.024	-141.4	2.534	-102.9	0.849	135.5
2.3	0.228	-164.4	0.037	142.0	3.634	-172.5	0.741	120.6
2.5	0.755	135.3	0.036	66.6	3.189	118.2	0.432	124.4
2.7	0.868	88.5	0.031	5.2	2.461	61.2	0.452	157.5
2.9	0.817	28.3	0.026	-52.7	1.889	6.4	0.645	161.4