TOSHIBA

MICROWAVE SEMICONDUCTOR

TECHNICAL DATA

MICROWAVE POWER GaAs FET

TPM2323-14

FEATURES :

- HIGH POWER
  P_{1dB} = 42.0 dBm at 2.3 GHz
- HIGH GAIN
  G_{1dB} = 12.0 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	41.0	42.0	–
Power Gain at 1dB Compression Point	G_{1dB}		dB	11.0	12.0	–
Drain Current	I_{DS}		A	–	4.0	5.0
Power Added Efficiency	η_{add}		%	–	37	–
Channel-Temperature Rise	ΔTch	NOTE 1	°C	–	–	80

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Transconductance	gm	V_{DS} = 3 V I_{DS} = 3.5 A	mS	–	3200	–
Pinch-off Voltage	V_{GSoff}	V_{DS} = 3 V I_{DS} = 70 mA	V	–1.0	–3.0	–4.0
Saturated Drain Current	I_{DSS}	V_{DS} = 3 V V_{GS} = 0 V	A	–	10	13
Gate-Source Breakdown Voltage	V_{GSO}	I_{GS} = –210 μA	V	–5	–	–
Thermal Resistance	$R_{th\ (c-c)}$	Channel to Case	°C/W	–	1.9	2.5

NOTE 1 : $\Delta Tch = (V_{DS} \times I_{DS} + Pin - P_{1dB}) \times R_{th\ (c-c)}$

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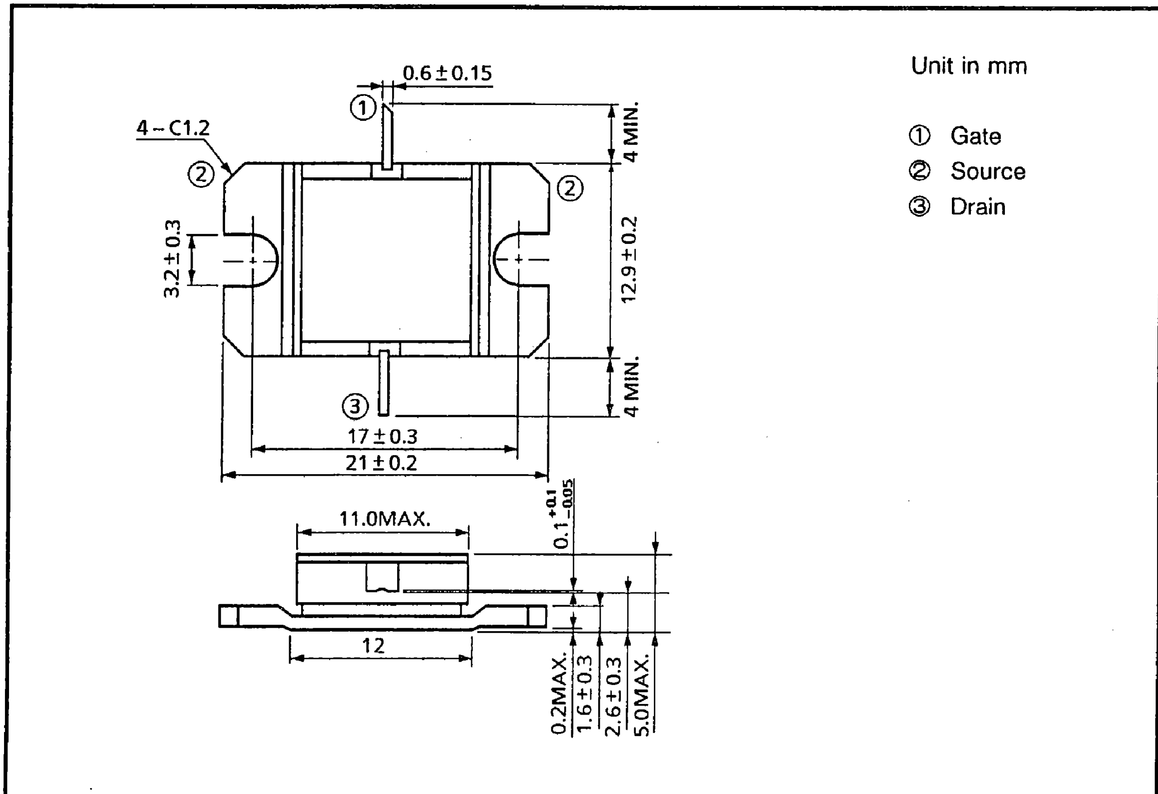
ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTICS	SYMBOL	UNIT	RATING
Drain-Source Voltage	V_{DS}	V	15
Gate-Source Voltage	V_{GS}	V	−5
Drain Current	I_{DS}	A	13
Total Power Dissipation (T_C = 25°C)	P_T	W	60
Channel Temperature	T_{ch}	°C	175
Storage Temperature	T_{stg}	°C	−65~175

PACKAGE OUTLINE (2-11D1B)



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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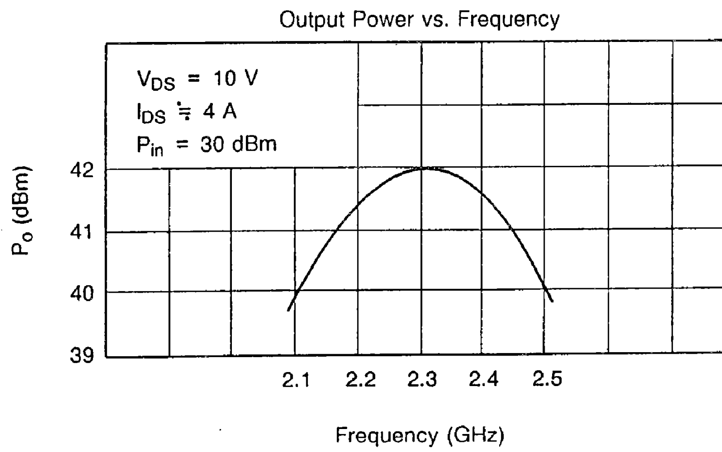
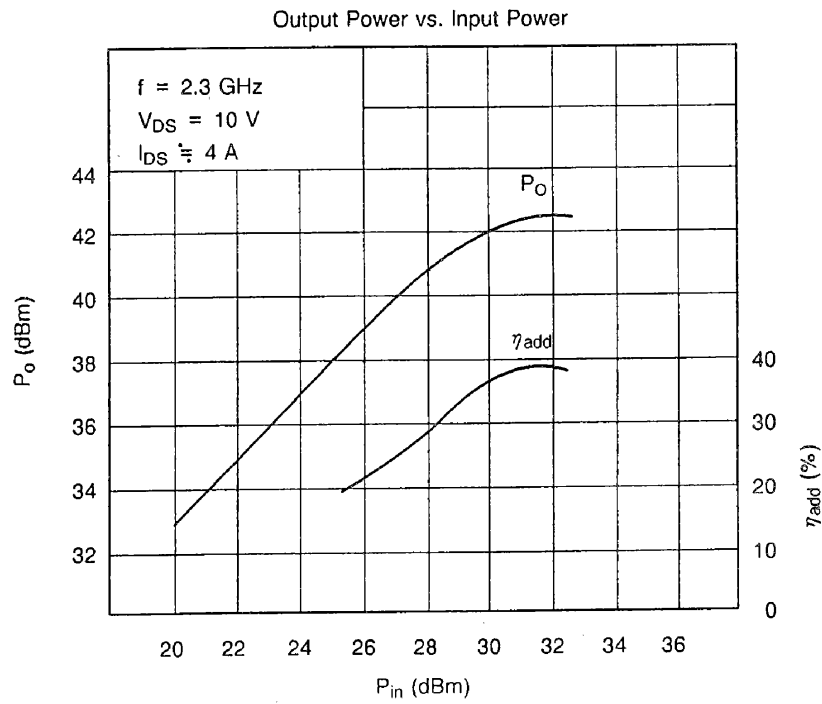
RF PERFORMANCES





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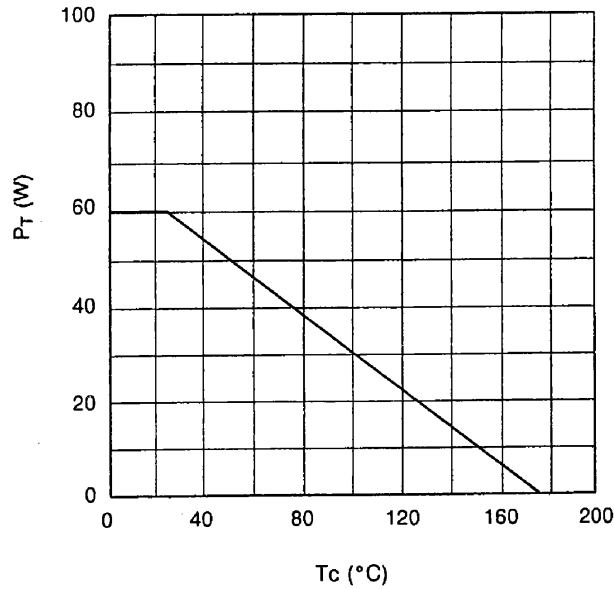
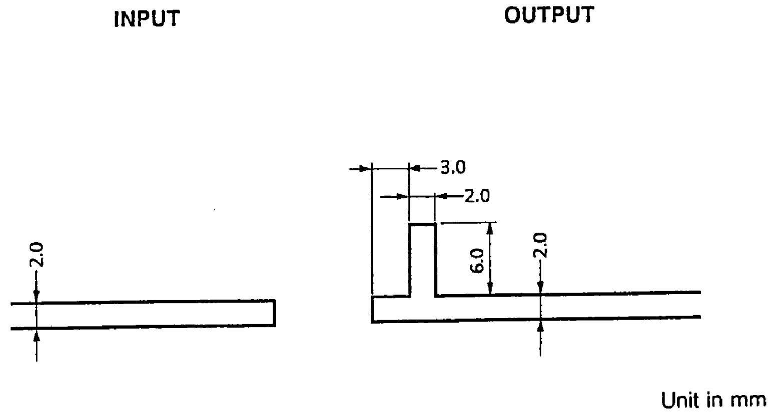
POWER DISSIPATION VS. CASE TEMPERATURE



DRAWING OF MATCHING NETWORK

INPUT

OUTPUT



Unit in mm

Substrate Material : Teflon (εr = 2.8)
Thickness : 0.76 mm

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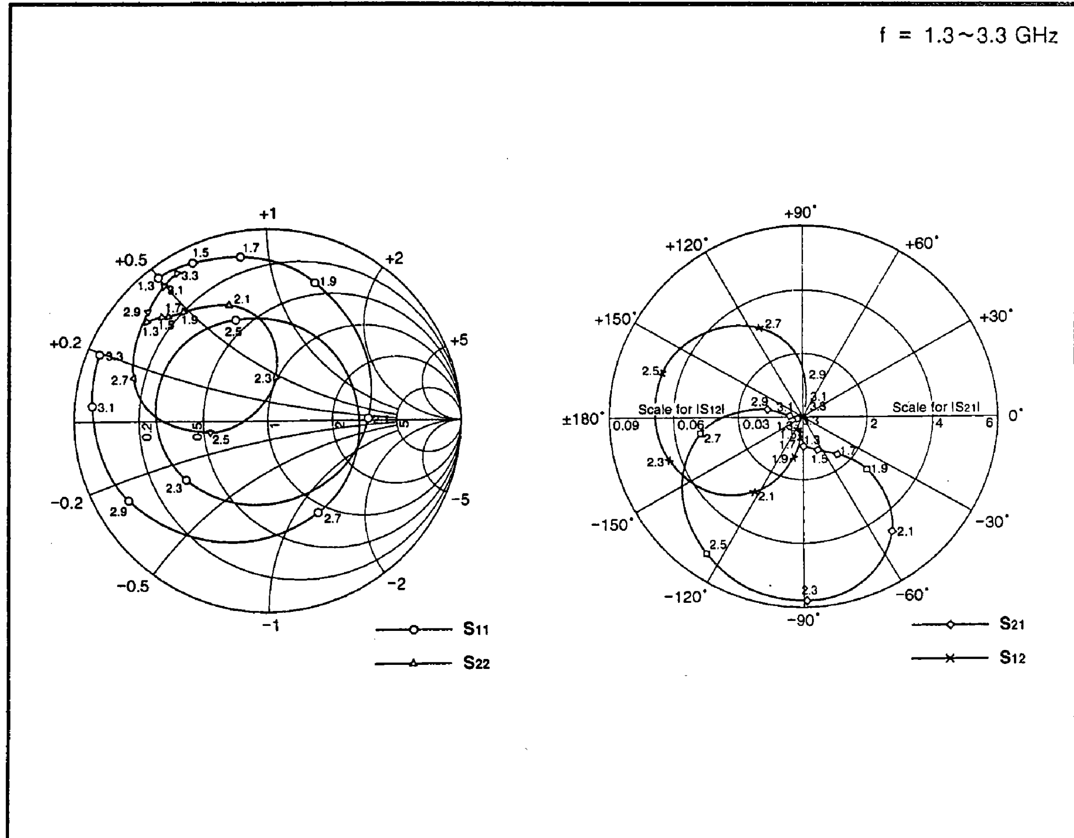
TPM2323-14 S-PARAMETERS
(MAGN. and ANGLES)

V_{DS} = 10 V, I_{DS} = 4 A



FREQ. (GHz)	S11 MAG	S11 ANG.	S21 MAG	S21 ANG.	S12 MAG	S12 ANG.	S22 MAG	S22 ANG.
1.30	0.94	127	0.93	-89	0.006	-114	0.81	140
1.50	0.91	115	1.14	-66	0.007	-101	0.78	136
1.70	0.87	99	1.60	-48	0.100	-97	0.75	133
1.90	0.76	71	2.59	-40	0.020	-103	0.72	127
2.10	0.52	1	4.56	-53	0.043	-123	0.64	108
2.30	0.53	-144	5.80	-89	0.066	-162	0.23	80
2.50	0.56	107	5.24	-125	0.069	162	0.30	-169
2.70	0.55	-62	3.22	-171	0.047	115	0.73	162
2.90	0.83	-150	1.12	168	0.018	86	0.85	137
3.10	0.91	175	0.41	176	0.008	77	0.87	127
3.30	0.94	158	0.18	-162	0.005	76	0.89	121

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