

TOSHIBA

MICROWAVE SEMICONDUCTOR

TECHNICAL DATA

MICROWAVE POWER GaAs FET

TIM7785-30SL

FEATURES:

- LOW INTERMODULATION DISTORTION
IM₃ = -45 dBc at P_o = 34.5 dBm,
Single Carrier Level
- HIGH POWER
P_{1dB} = 45 dBm at 7.7 GHz to 8.5 GHz
- HIGH EFFICIENCY
 η_{add} = 34 % at 7.7 GHz to 8.5 GHz
- HIGH GAIN
G_{1dB} = 6.0dB at 7.7 GHz to 8.5 GHz
- BROAD BAND INTERNALLY MATCHED
- HERMETICALLY SEALED PACKAGE

RF PERFORMANCE SPECIFICATIONS (Ta = 25°C)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Output Power at 1 dB Compression Point	P _{1dB}	V _{DS} = 10V f = 7.7~8.5GHz	dBm	44.0	45.0	-
Power Gain at 1 dB Compression Point	G _{1dB}		dB	5.0	6.0	-
Drain Current	I _{DS}		A	-	7.0	8.0
Power Added Efficiency	η_{add}		%	-	34	-
3rd Order Intermodulation Distortion	IM ₃	Note 1	dBc	-42	-45	-
Channel Temperature Rise	ΔT_{ch}	V _{DS} × I _{DS} × R _{th(c-c)}	°C	-	-	100

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Trans-conductance	gm	V _{DS} = 3V I _{DS} = 10A	mS	-	6300	-
Pinch-off Voltage	V _{GSoff}	V _{DS} = 3V I _{DS} = 100mA	V	-1.0	-2.5	-4.0
Saturated Drain Current	I _{DSS}	V _{DS} = 3V V _{GS} = 0V	A	-	18	22
Gate-Source Breakdown Voltage	V _{GSO}	I _{GS} = -350 μ A	V	-5	-	-
Thermal Resistance	R _{th(c-c)}	Channel to Case	°C/W	-	1.0	1.3

Note 1: 2 tone Test Pout = 34.5dBm Single Carrier Level.
Recommended Gate Resistance(R_g) : R_g = R_{g1}(10 Ω) + R_{g2}(18 Ω) = 28 Ω (MAX.)

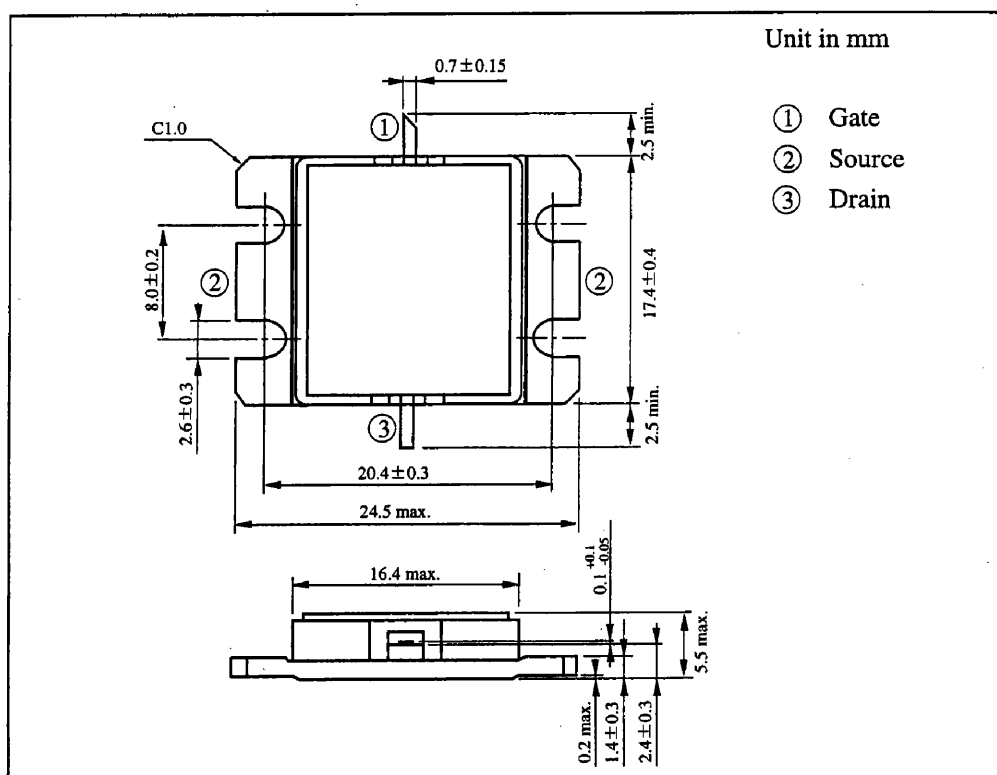
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ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	UNIT	RATING
Drain-Source Voltage	V _{DS}	V	15
Gate-Source Voltage	V _{GS}	V	-5
Drain Current	I _{DS}	A	22
Total Power Dissipation (Tc=25°C)	P _T	W	115
Channel Temperature	T _{ch}	°C	175
Storage Temperature	T _{stg}	°C	-65~175

PACKAGE OUTLINE (2-16G1B)

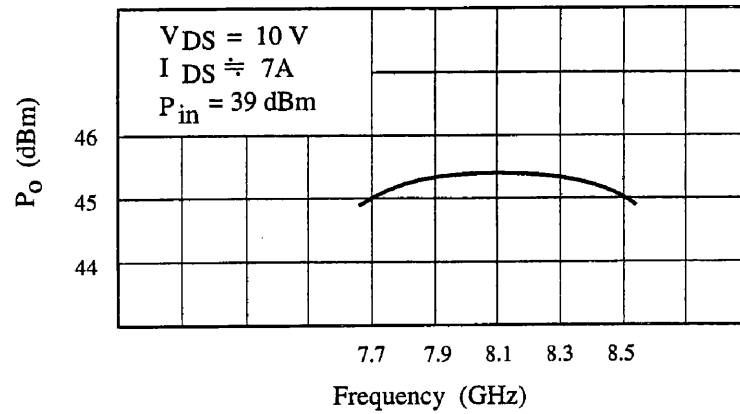


HANDLING PRECAUTIONS FOR PACKAGED TYPE

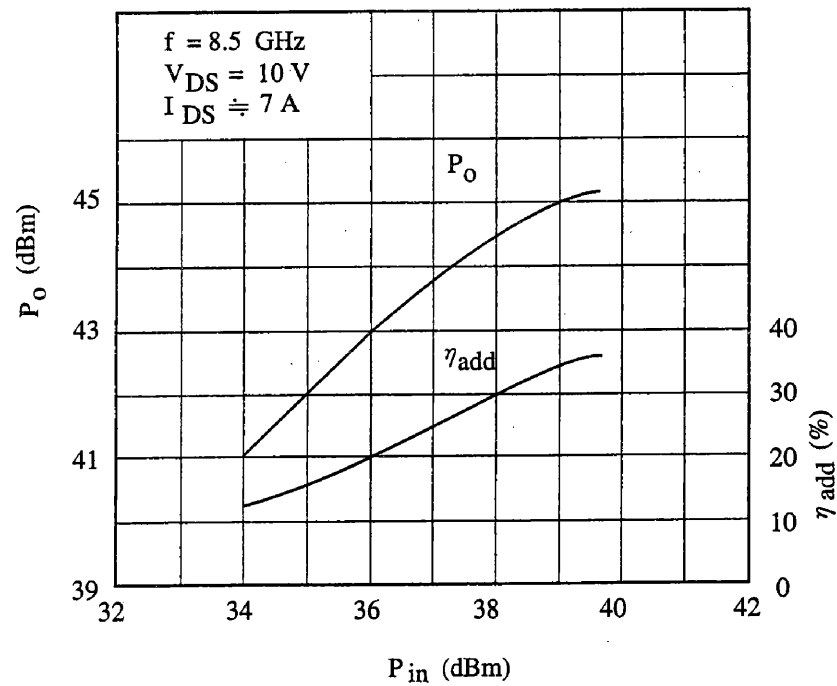
Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C.

RF PERFORMANCES

Output Power vs. Frequency

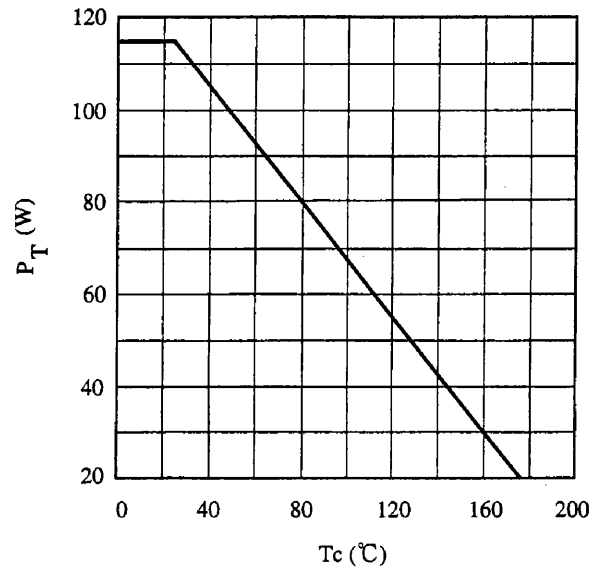


Output Power vs. Input Power

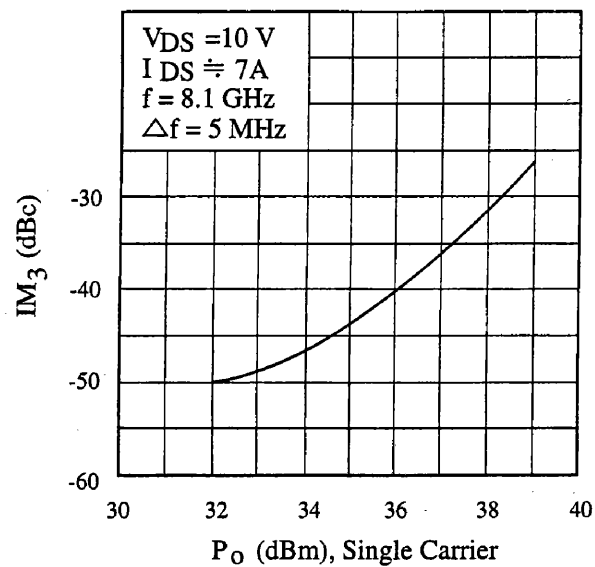


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POWER DISSIPATION VS. CASE TEMPERATURE



IM₃ VS. OUTPUT POWER CHARACTERISTICS

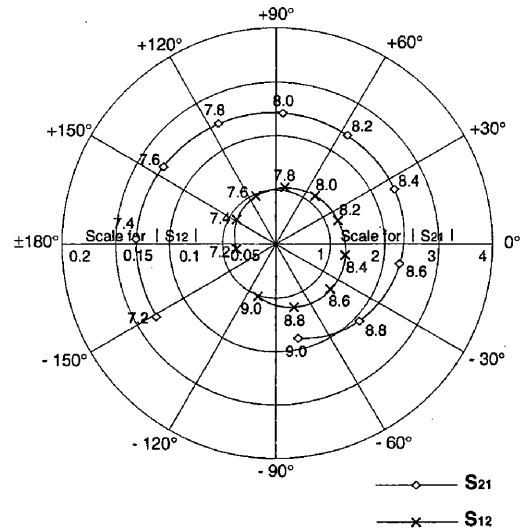
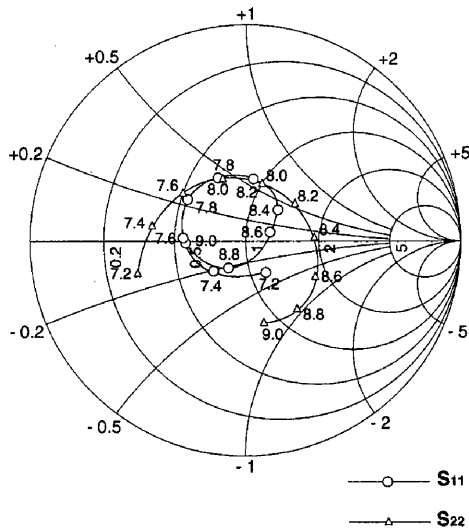


TIM7785-30L

TIM7785-30SL S-PARAMETERS (MAGN.and ANGLES)

$V_{DS} = 10V, I_{DS} = 7.0A$

$f = 7.2 \sim 9.0GHz$



FREQUENCY (GHz)	S_{11}		S_{21}		S_{12}		S_{22}	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
7.2	0.17	-57	2.61	-149	0.037	-173	0.52	-164
7.4	0.20	-138	2.62	178	0.043	148	0.44	170
7.6	0.29	177	2.55	146	0.048	113	0.37	142
7.8	0.33	144	2.47	116	0.053	81	0.31	110
8.0	0.32	114	2.41	87	0.057	51	0.28	74
8.2	0.29	83	2.39	57	0.061	21	0.29	38
8.4	0.21	44	2.39	25	0.064	-9	0.32	4
8.6	0.12	21	2.29	-9	0.065	-40	0.36	-26
8.8	0.15	-123	2.09	-43	0.061	-74	0.39	-52
9.0	0.28	-179	1.79	-77	0.051	-109	0.38	-77