

TOSHIBA

MICROWAVE SEMICONDUCTOR

TECHNICAL DATA

MICROWAVE POWER GaAs FET

TIM7785-16

FEATURES:

- HIGH POWER
P_{1dB} = 42.5 dBm at 7.7 GHz to 8.5 GHz
- BROAD BAND INTERNALLY MATCHED
- HIGH GAIN
G_{1dB} = 5.0 dB at 7.7 GHz to 8.5 GHz
- HERMETICALLY SEALED PACKAGE

RF PERFORMANCE SPECIFICATIONS (T_a = 25°C)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Output Power at 1 dB Compression Point	P _{1dB}	V _{DS} = 10 V f = 7.7~8.5GHz	dBm	41.0	42.0	-
Power Gain at 1 dB Compression Point	G _{1dB}		dB	4.0	5.0	-
Drain Current	I _{DS}		A	-	4.5	5.5
Power Added Efficiency	η _{add}		%	-	24	-
Channel-Temperature Rise	ΔT _{ch}	V _{DS} × I _{DS} × R _{th(c-c)}	°C	-	-	80

ELECTRICAL CHARACTERISTICS (T_a = 25°C)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Trans-conductance	g _m	V _{DS} = 3 V I _{DS} = 6.0 A	mS	-	3600	-
Pinch-off Voltage	V _{GSoff}	V _{DS} = 3 V I _{DS} = 80 mA	V	-2	-3.5	-5
Saturated Drain Current	I _{DSS}	V _{DS} = 3 V V _{GS} = 0 V	A	-	11.6	15.0
Gate-Source Breakdown Voltage	V _{GS0}	I _{GS} = -240 μA	V	-5	-	-
Thermal Resistance	R _{th(c-c)}	Channel to Case	°C/W	-	1.4	1.8

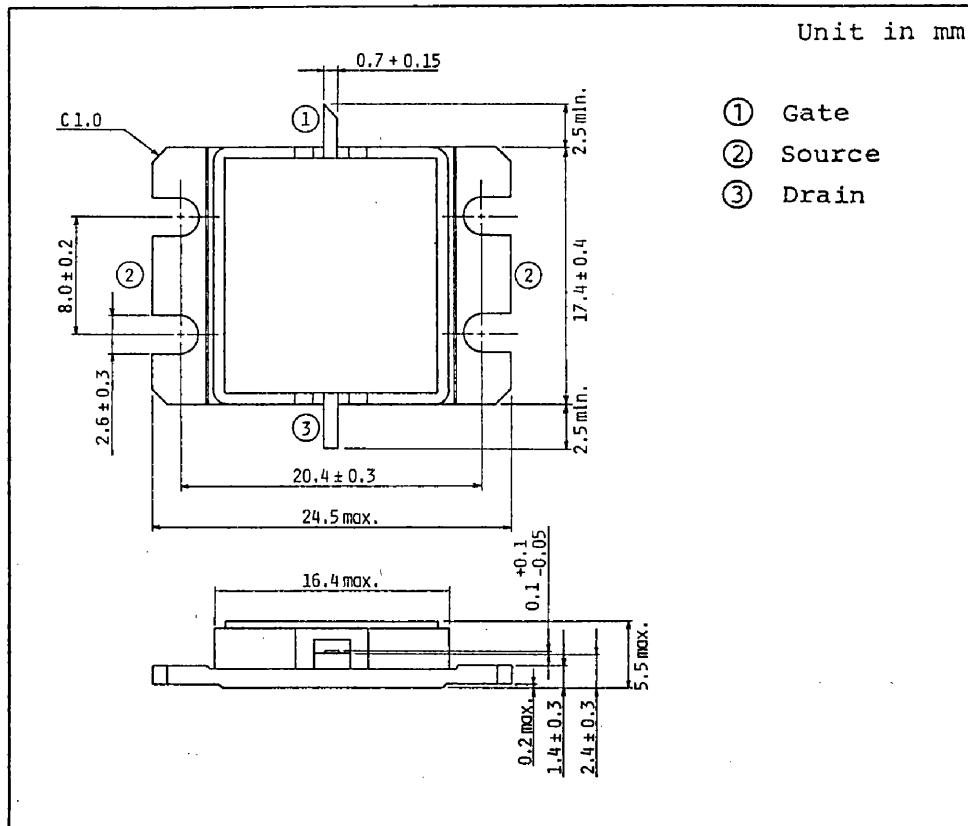
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ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	UNIT	RATING
Drain-Source Voltage	V_{DS}	V	15
Gate-Source Voltage	V_{GS}	V	-5
Drain Current	I_{DS}	A	16
Total Power Dissipation ($T_c = 25^\circ\text{C}$)	P_T	W	70
Channel Temperature	T_{ch}	$^\circ\text{C}$	175
Storage Temperature	T_{stg}	$^\circ\text{C}$	-65-175

PACKAGE OUTLINE (2-16G1B)

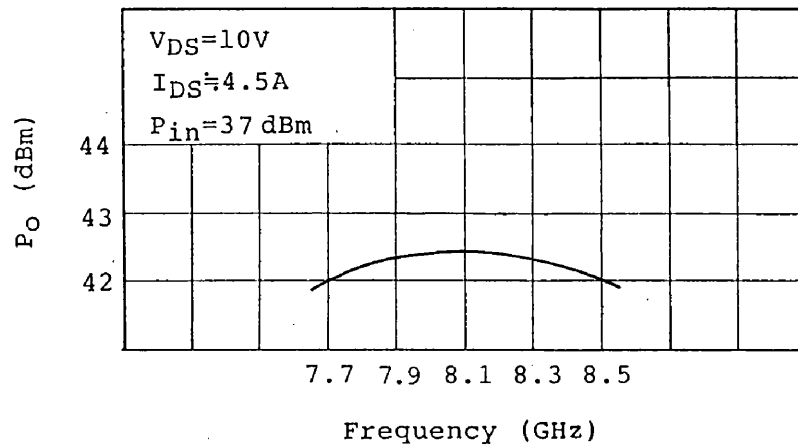


HANDLING PRECAUTIONS FOR PACKAGED TYPE

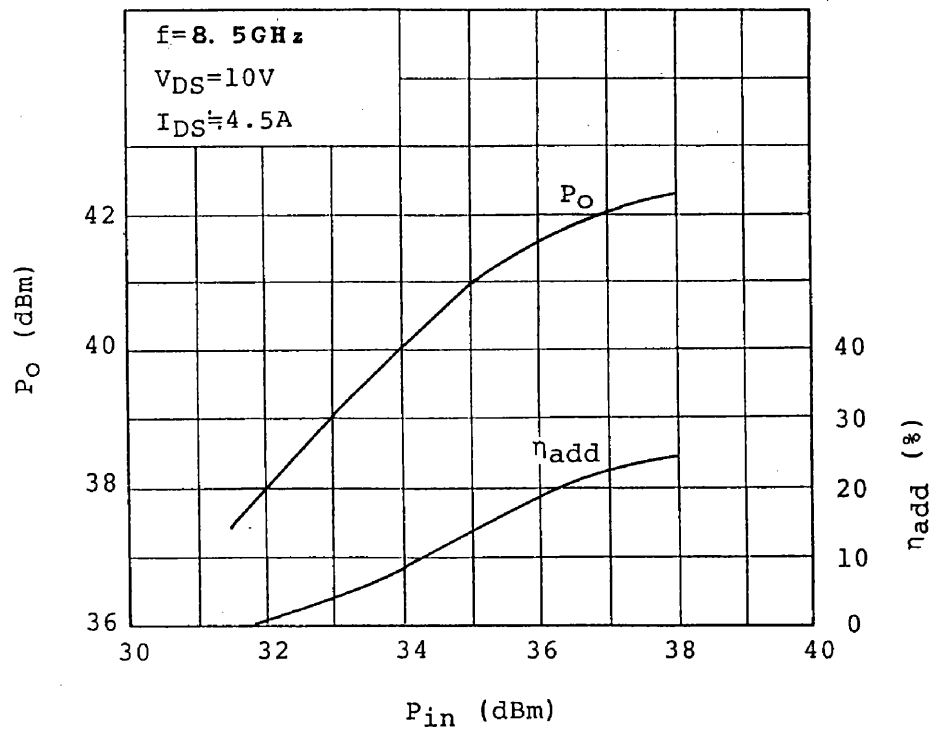
Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C .

RF PERFORMANCES

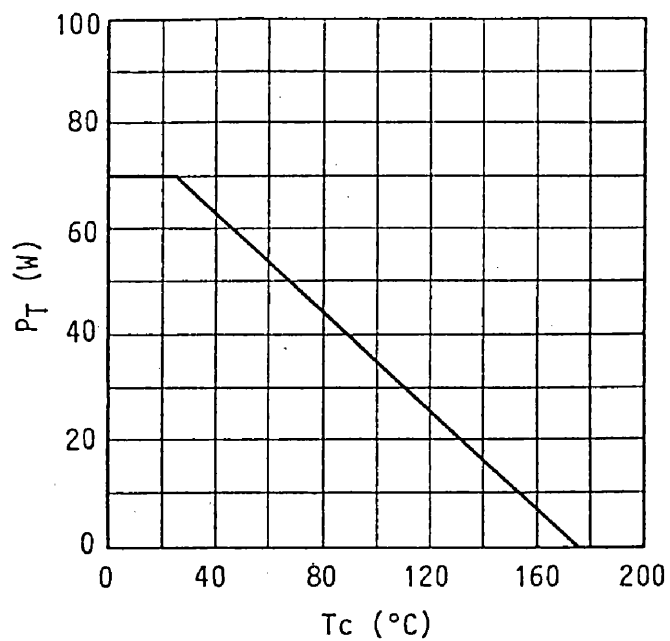
Output Power vs. Frequency



Output Power vs. Input Power



POWER DISSIPATION VS. CASE TEMPERATURE

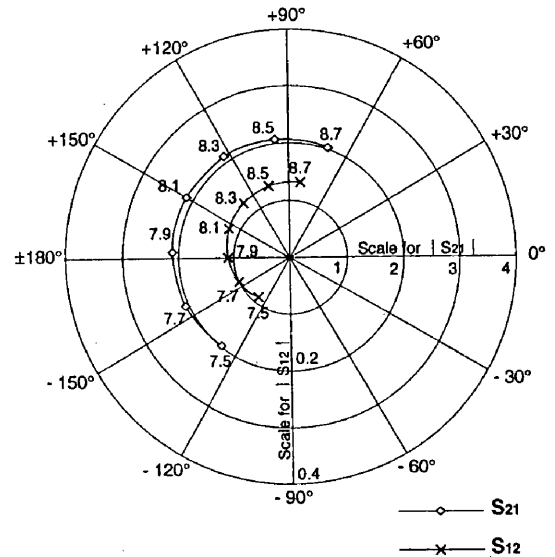
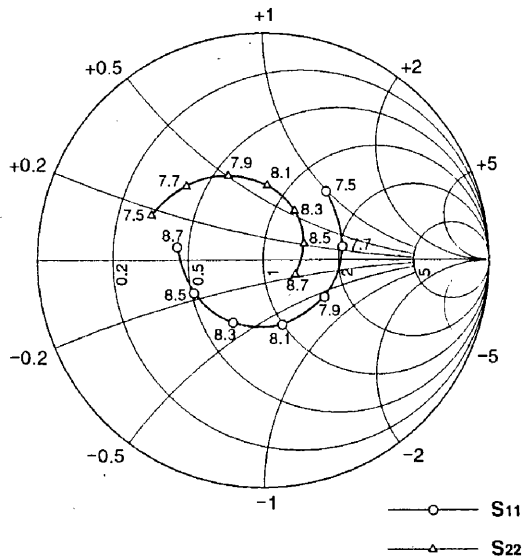


TIM7785-16

TIM7785-16 S-PARAMETERS (MAGN. and ANGLES)

$V_{DS} = 10V$, $I_{DS} = 4.0A$

$f = 7.5 \sim 8.7GHz$



FREQUENCY (GHz)	S ₁₁		S ₁₂		S ₂₁		S ₂₂	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
7.50	0.410	47.1	0.089	-129.2	1.975	-128.9	0.533	158.3
7.70	0.356	9.7	0.100	-155.1	2.062	-155.9	0.470	136.3
7.90	0.315	-30.8	0.110	179.5	2.112	177.0	0.400	112.5
8.10	0.295	-73.5	0.119	154.5	2.126	149.9	0.328	86.7
8.30	0.304	-116.2	0.125	130.0	2.113	123.1	0.257	57.1
8.50	0.339	-155.0	0.130	105.8	2.077	96.6	0.195	21.8
8.70	0.389	171.4	0.133	81.6	2.024	70.3	0.155	-23.9