

# TOSHIBA

## MICROWAVE SEMICONDUCTOR

### TECHNICAL DATA

MICROWAVE POWER GaAs FET

**TIM7785-16**

#### FEATURES:

- HIGH POWER  
P<sub>1dB</sub> = 42.5 dBm at 7.7 GHz to 8.5 GHz
- BROAD BAND INTERNALLY MATCHED
- HIGH GAIN  
G<sub>1dB</sub> = 5.0 dB at 7.7 GHz to 8.5 GHz
- HERMETICALLY SEALED PACKAGE

#### RF PERFORMANCE SPECIFICATIONS (T<sub>a</sub> = 25°C)

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

#### ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25°C)

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

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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.

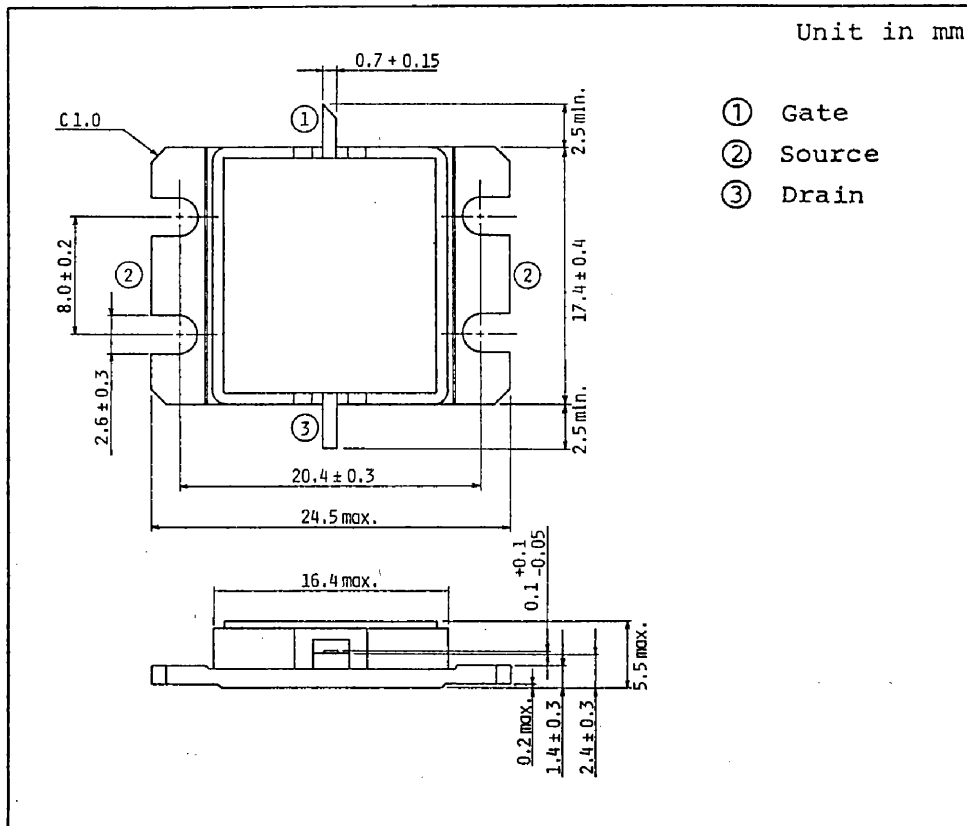


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## ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

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)

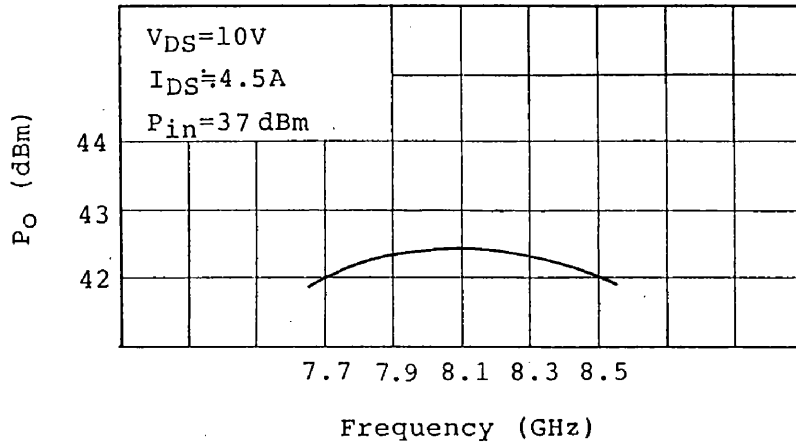


### HANDLING PRECAUTIONS FOR PACKAGED TYPE

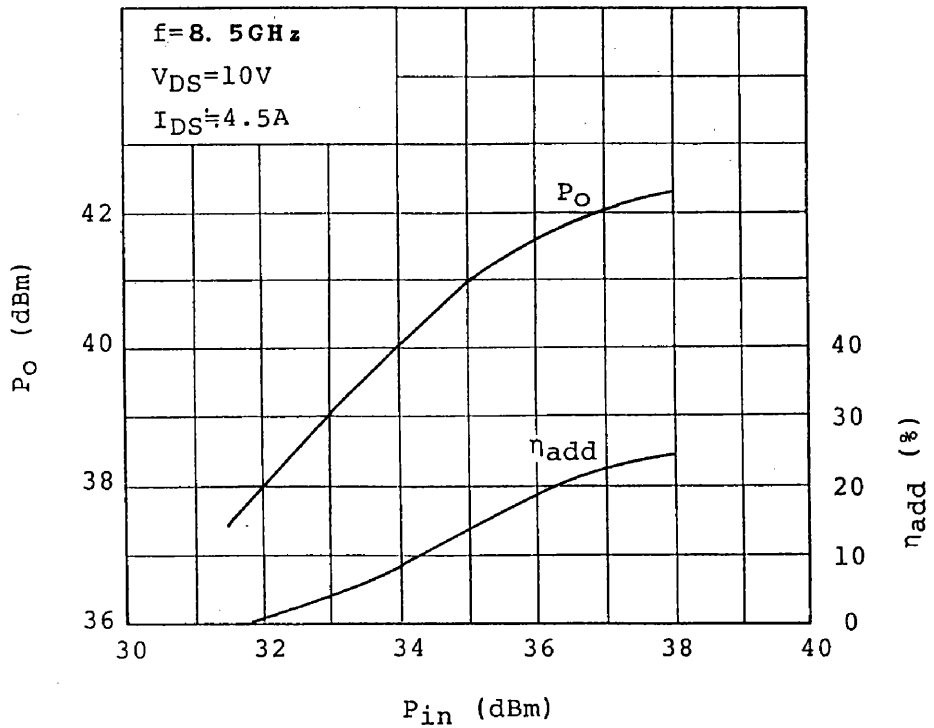
Soldering iron should be grounded and the operating time should not exceed 10 seconds at  $260^\circ\text{C}$ .

RF PERFORMANCES

Output Power vs. Frequency

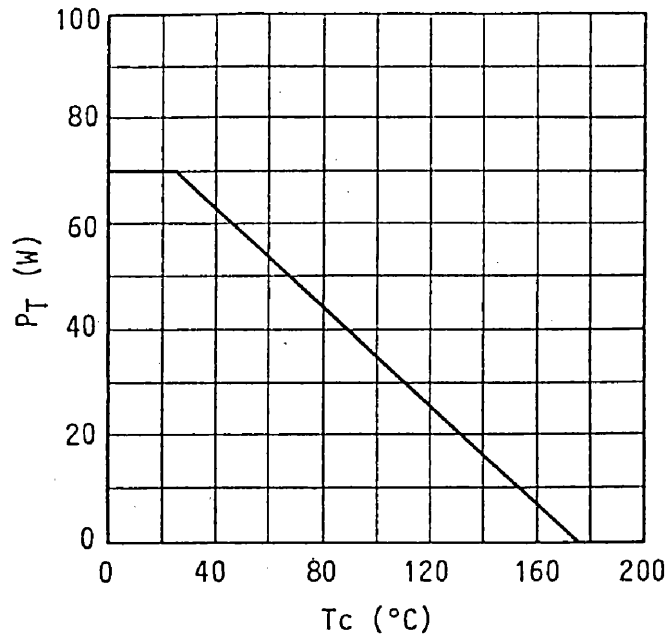


Output Power vs. Input Power



# TIM7785-16

## POWER DISSIPATION VS. CASE TEMPERATURE

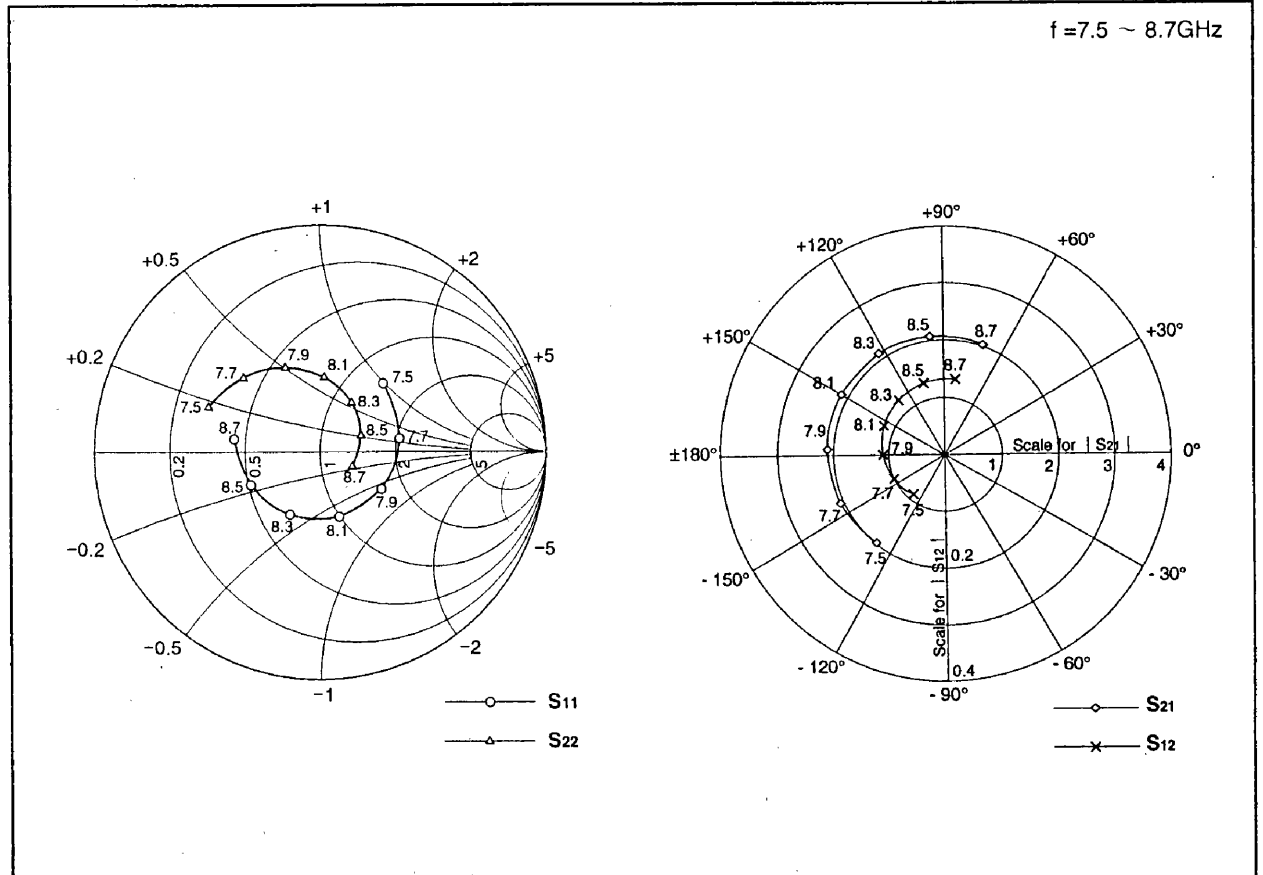


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## TIM7785-16 S-PARAMETERS (MAGN. and ANGLES)

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

$f = 7.5 \sim 8.7GHz$



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