

# 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 = 7.7~8.5 GHz	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>GSO</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.



TOSHIBA CORPORATION

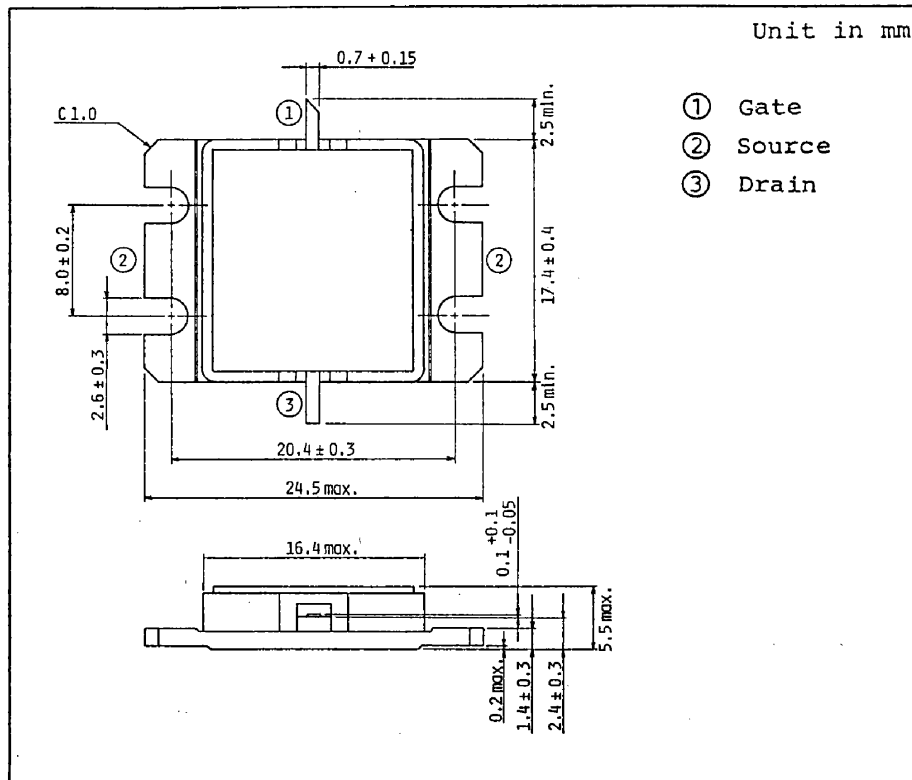
Revised Sept., 1991

# TIM7785-16

## 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

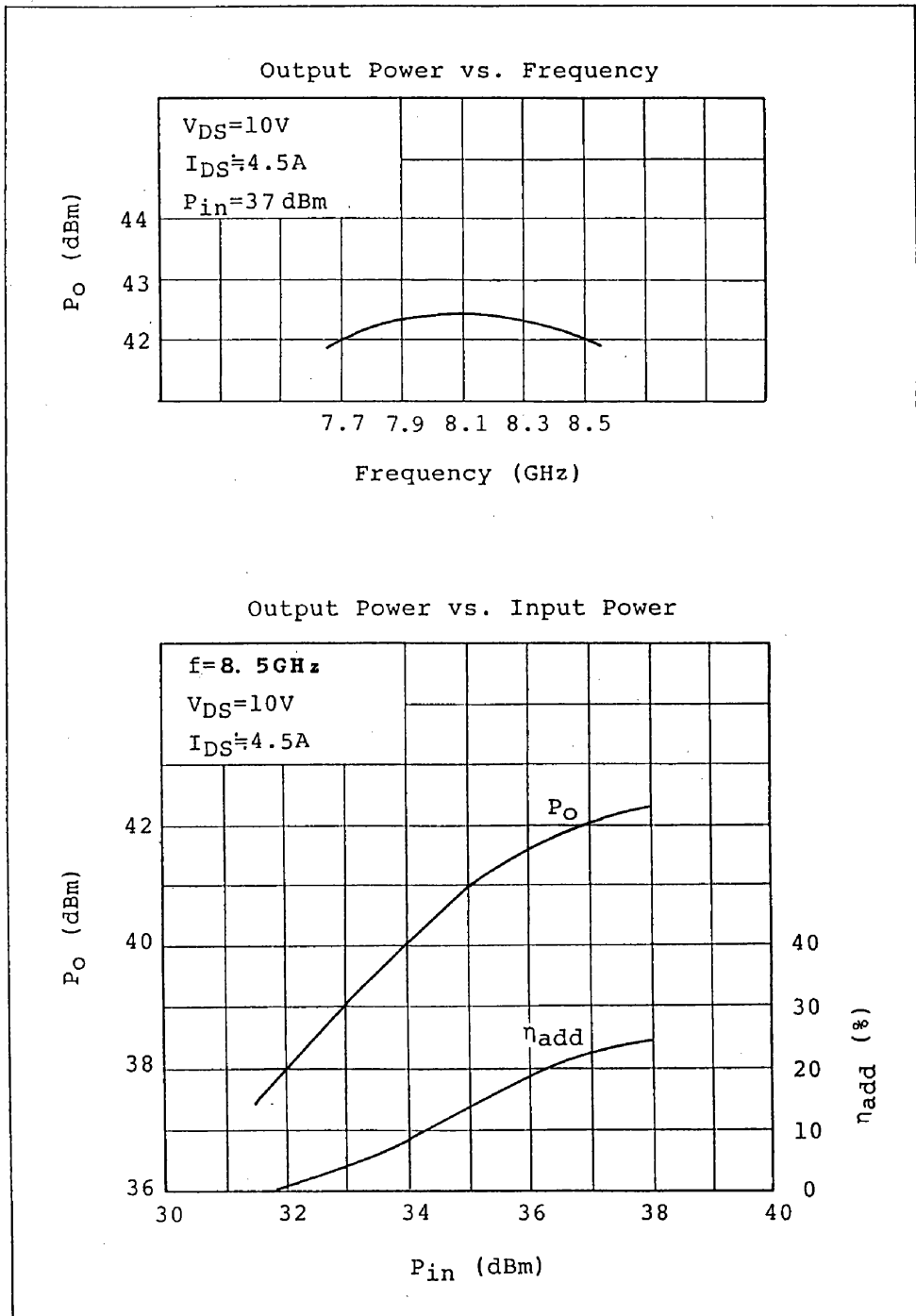
## PACKAGE OUTLINE (2-16G1B)



### HANDLING PRECAUTIONS FOR PACKAGED TYPE

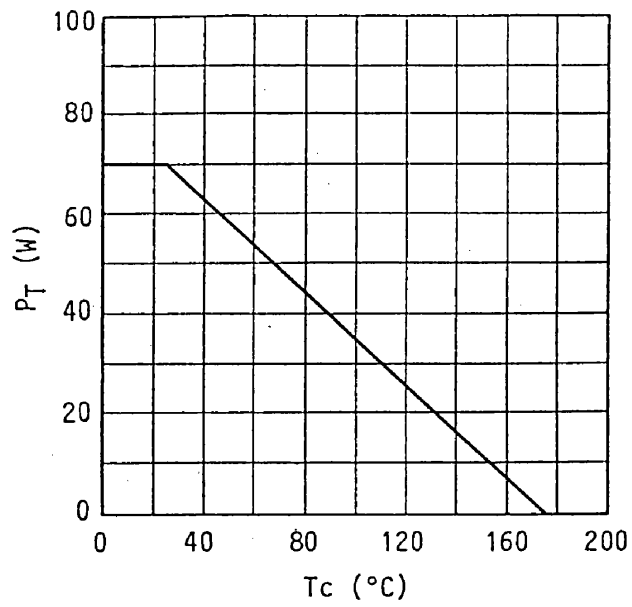
Soldering iron should be grounded and the operating time should not exceed 10 seconds at  $260^\circ\text{C}$ .

RF PERFORMANCES



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## POWER DISSIPATION VS. CASE TEMPERATURE

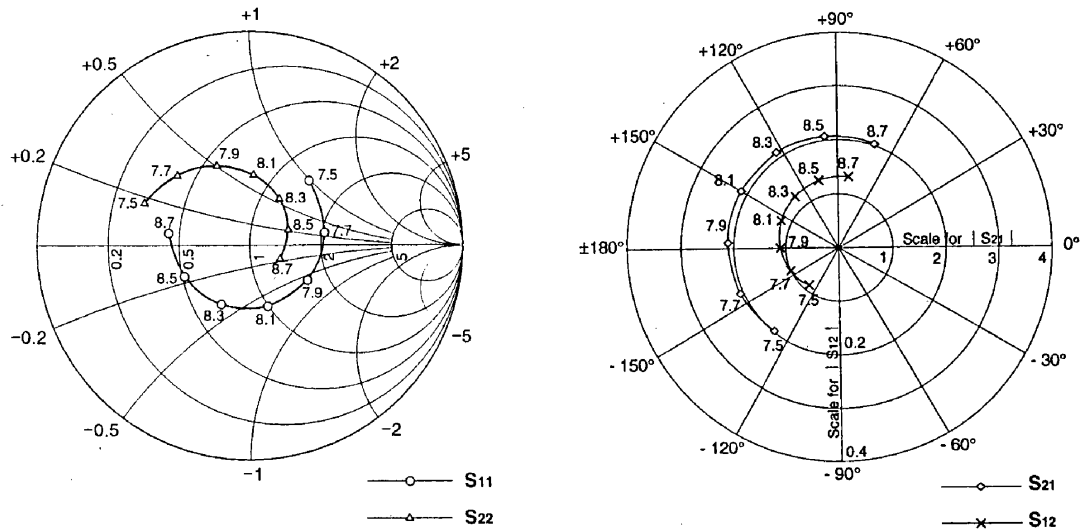


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## TIM7785-16 S-PARAMETERS (MAGN. and ANGLES)

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

$f = 7.5 \sim 8.7GHz$



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