TOSHIBA

MICROWAVE SEMICONDUCTOR

TECHNICAL DATA

MICROWAVE POWER GaAs FET

TIM7785-35SL

FEATURES

- **LOW INTERMODULATION DISTORTION**
  IM3=-45 dBc at Po= 35.0dBm,
  Single Carrier Level
- **HIGH POWER**
  P1dB=45.5dBm at 7.7GHz to 8.5GHz
- **HIGH GAIN**
  G1dB=6.0dB at 7.7GHz to 8.5GHz
- **BROAD BAND INTERNALLY MATCHED FET**
- **HERMETICALLY SEALED PACKAGE**

RF PERFORMANCE SPECIFICATIONS (Ta= 25°C)

CHARACTERISTICS	SYMBOL	CONDITIONS	UNIT	MIN.	TYP.	MAX.
Output Power at 1dB Gain Compression Point	P_{1dB}	V_{DS}=10V f = 7.7 to 8.5GHz	dBm	45.0	45.5	—
Power Gain at 1dB Gain Compression Point	G_{1dB}		dB	5.0	6.0	—
Drain Current	I_{DS1}		A	—	8.0	9.0
Gain Flatness	ΔG		dB	—	—	±0.8
Power Added Efficiency	η_{add}		%	—	33	—
3rd Order Intermodulation Distortion	IM_3	Two-Tone Test Po=35.0dBm (Single Carrier Level)	dBc	-42	-45	—
Drain Current	I_{DS2}		A	—	8.0	9.0
Channel Temperature Rise	ΔT_{ch}	V_{DS} X I_{DS} X $R_{th(c-c)}$	°C	—	—	100

Recommended Gate Resistance(Rg): 28 Ω (Max.)

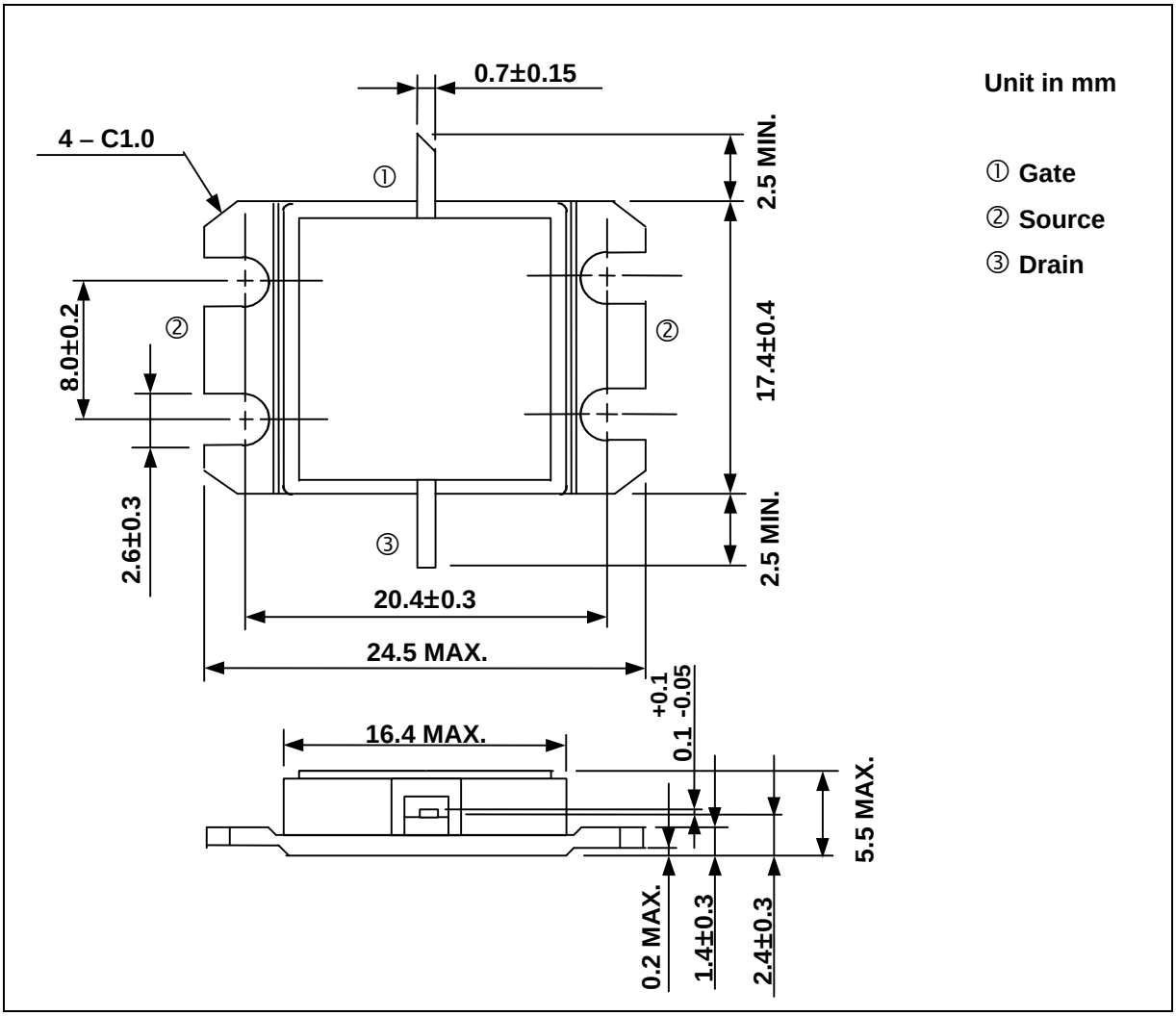
ELECTRICAL CHARACTERISTICS (Ta= 25°C)

CHARACTERISTICS	SYMBOL	CONDITIONS	UNIT	MIN.	TYP.	MAX.
Transconductance	gm	V_{DS}= 3V I_{DS}= 10.5A	mS	—	6500	—
Pinch-off Voltage	V_{GSoff}	V_{DS}= 3V I_{DS}= 140mA	V	-1.0	-2.5	-4.0
Saturated Drain Current	I_{DSS}	V_{DS}= 3V V_{GS}= 0V	A	—	20	26
Gate-Source Breakdown Voltage	V_{GSO}	I_{GS}= -420μA	V	-5	—	—
Thermal Resistance	$R_{th(c-c)}$	Channel to Case	°C/W	—	1.0	1.3

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	26
Total Power Dissipation (Tc= 25 °C)	P_T	W	115
Channel Temperature	T_{ch}	°C	175
Storage	T_{stg}	°C	-65 to +175

PACKAGE OUTLINE (2-16G1B)

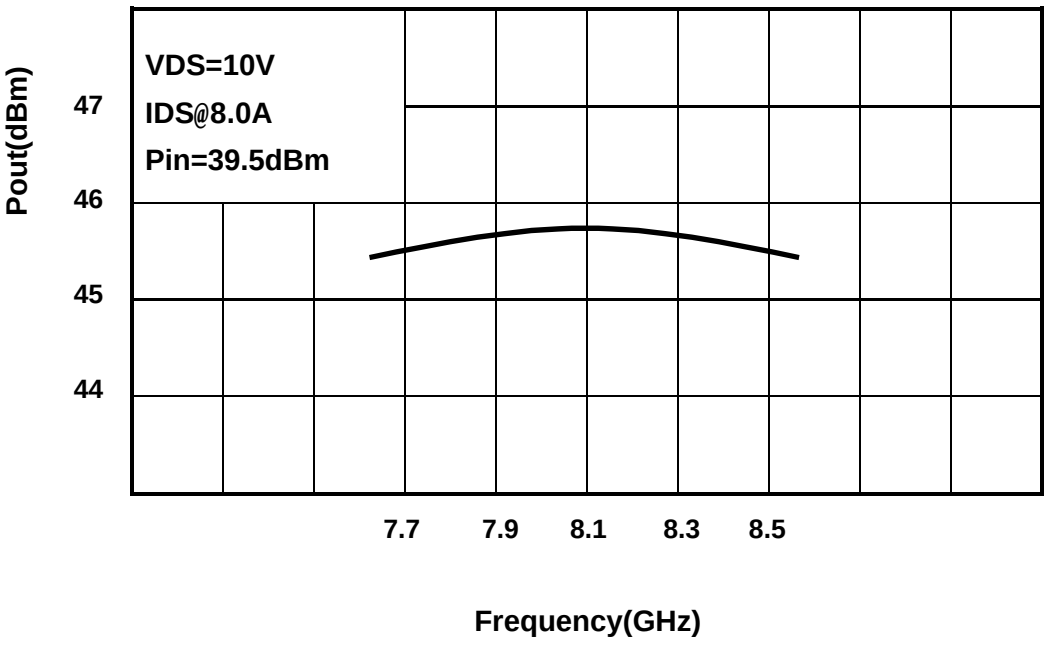


HANDLING PRECAUTIONS FOR PACKAGE MODEL

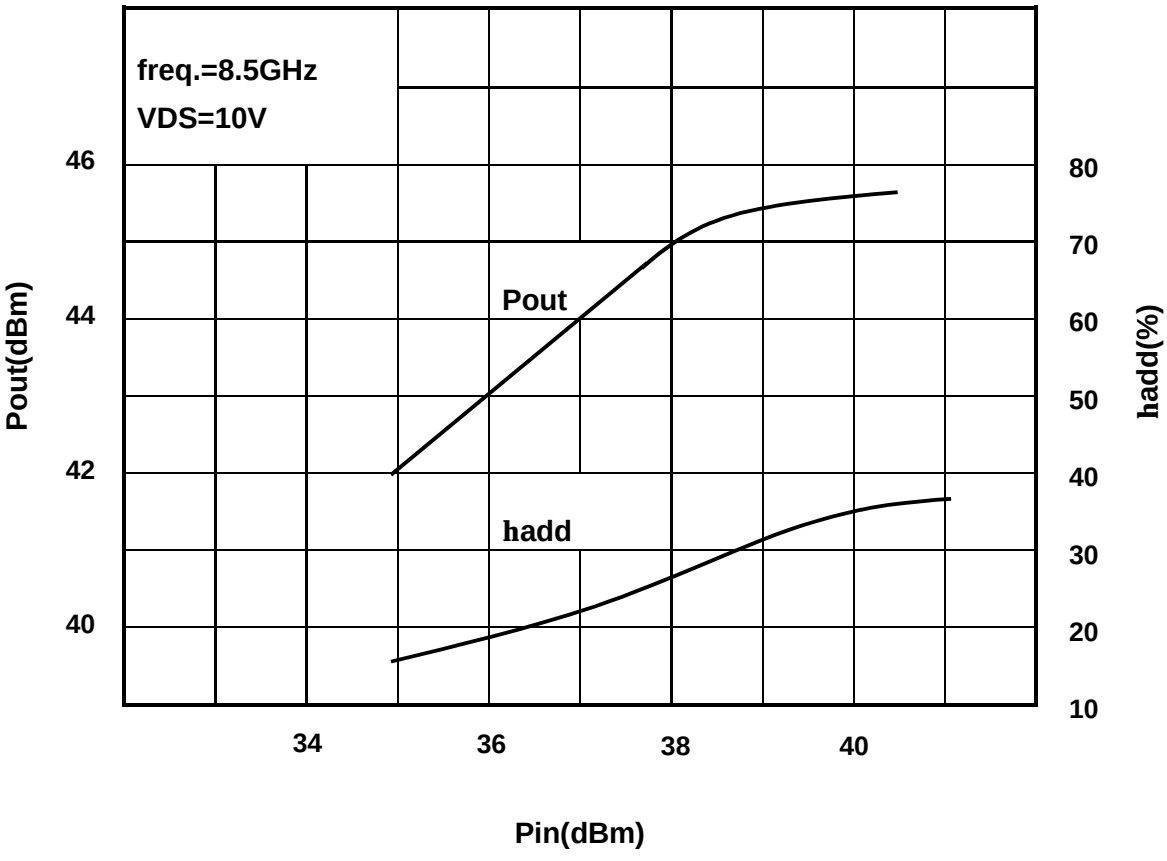
Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C.

RF PERFORMANCE

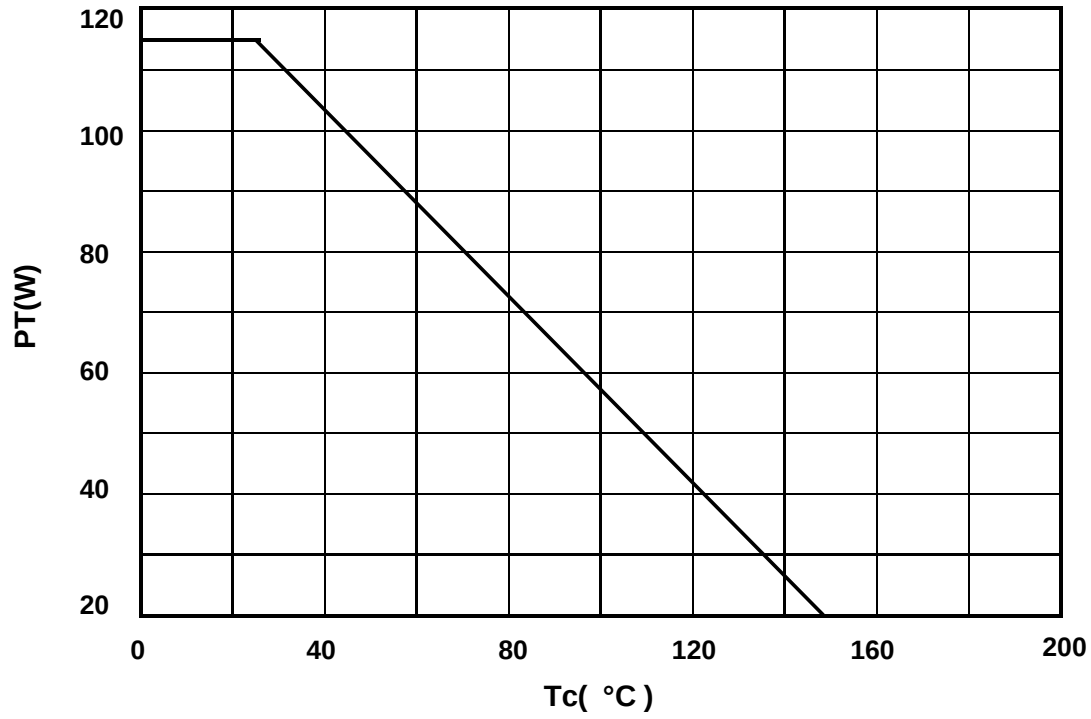
Output Power (Pout) vs. Frequency



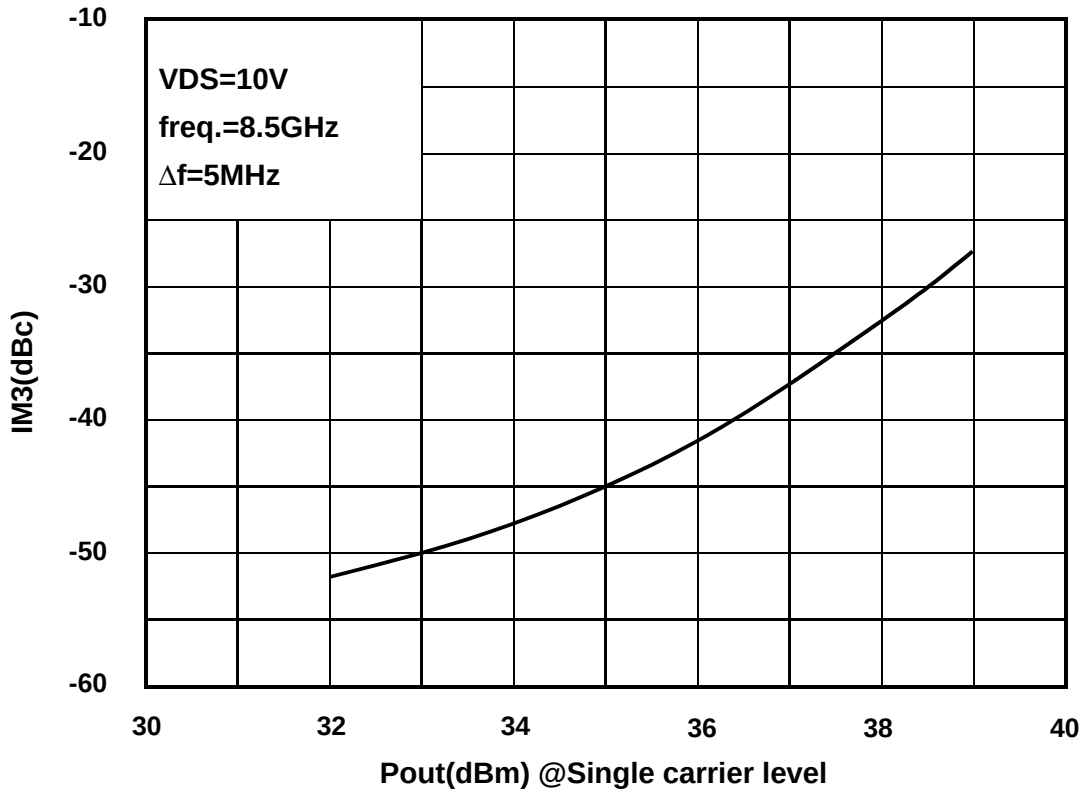
Output Power(Pout) vs. Input Power(Pin)



Power Dissipation(PT) vs. Case Temperature(Tc)



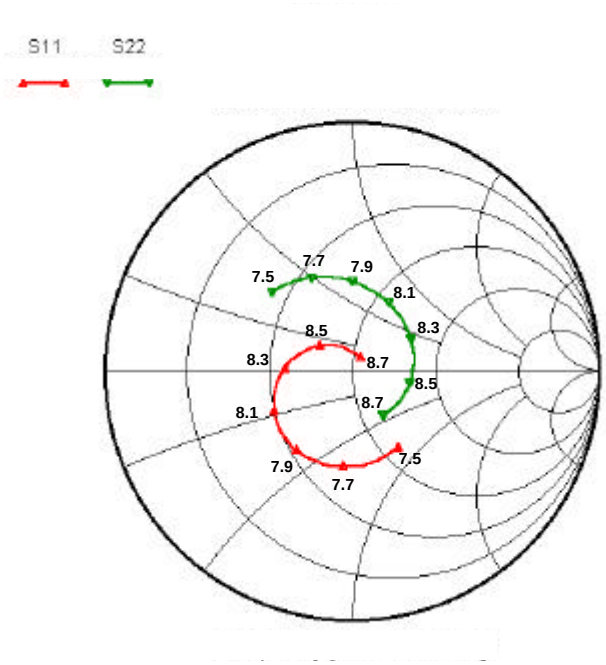
IM3 vs. Output Power Characteristics



TIM7785-35SL S-PARAMETERS
(MAGN. and ANGLES)

V_{DS}=10V, I_{DS}=8.0A

f=7.5 to 8.7 GHz



FREQUENCY	S11		S12		S21		S22	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
7.50	-8.9814	-58.883	7.7466	-132.94	-26.718	-157.88	-6.814	135.77
7.70	-8.3276	-95.847	7.6201	178.84	-26.03	153.1	-7.7217	113.8
7.00	-8.2456	-125.79	7.5867	131.47	-25.415	105.53	-8.8479	90.07
8.10	-9.079	-153.45	7.6876	83.846	-24.785	58.534	-10.106	62.308
8.30	-11.201	177.35	7.8387	35.074	-24.184	10.528	-11.394	28.383
8.50	-15.55	141.44	7.9431	-15.135	-23.802	-38.853	-12.511	-11.132
8.70	-23.587	61.355	7.8793	-66.763	-23.776	-89.791	-13.44	-55.383