TOSHIBA

MICROWAVE SEMICONDUCTOR

TECHNICAL DATA

MICROWAVE POWER GaAs FET

TIM7785-30SL

FEATURES:

- LOW INTERMODULATION DISTORTION
  IM_3 = -45 dBc at Po = 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 TNTERNALLY MATCHED
- HERMETICALLY SEALED PACKAGE

RF PERFORMANCE SPECIFICATIONS (Ta = 25℃)

CHARACTERISITCS	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	$\triangle T_{ch}$	$V_{DS} \times I_{DS} \times R_{th(c-c)}$	℃	-	-	100

ELECTRICAL CHARACTERISTICS (Ta = 25℃)

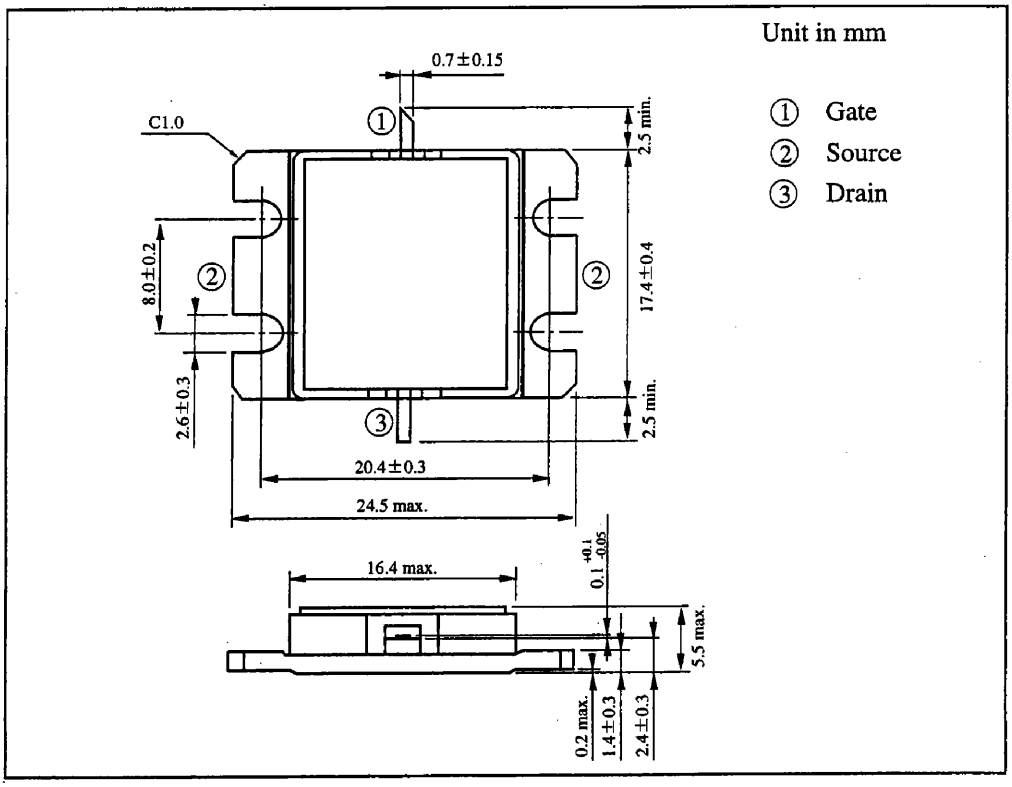
CHARACTERISITCS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Trans-conductance	gm	V_{DS} = 3V I_{DS} = 10A	mS	-	6300	-
Pinch-off Voltage	VGSoff	V_{DS} = 3V I_{DS} = 100mA	V	-1.0	-2.5	-4.0
Saturated Drain Current	I_{DSS}	V_{DS} = 3V V_{GS} = 0V	A	-	18	22
Gate-Source Breakdown Voltage	V_{GSO}	I_{GS} = -350μA	V	-5	-	-
Thermal Resistance	$R_{th(c-c)}$	Channel to Case	℃/W	-	1.0	1.3

Note 1: 2 tone Test Pout = 34.5dBm Single Carrier Level.
Recommended Gate Resistance(Rg) : Rg = Rg1(10 Ω) + Rg2(18 Ω) = 28 Ω (MAX.)

ABSOLUTE MAXIMUM RATINGS (Ta = 25℃)

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℃)	P_T	W	115
Channel Temperature	T_{ch}	℃	175
Storage Temperature	T_{stg}	℃	-65~175

PACKAGE OUTLINE (2-16G1B)

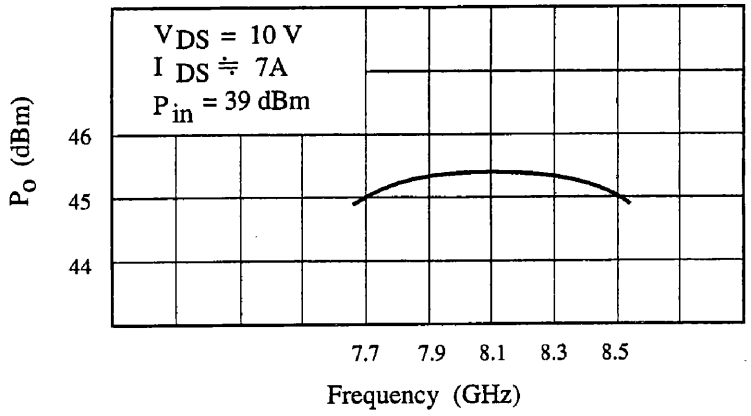


HANDLING PRECAUTIONS FOR PACKAGED TYPE

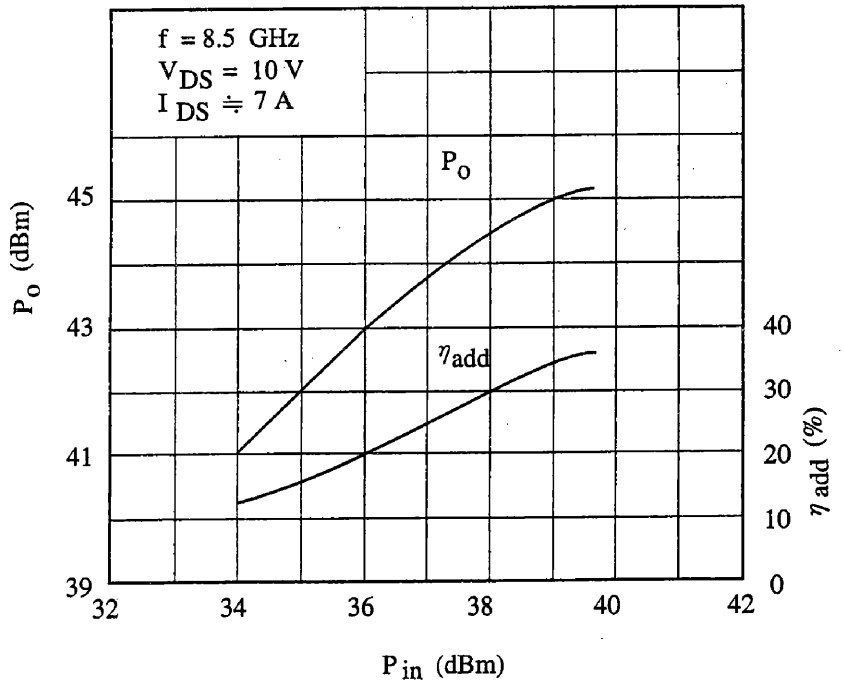
Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260℃.

RF PERFORMANCES

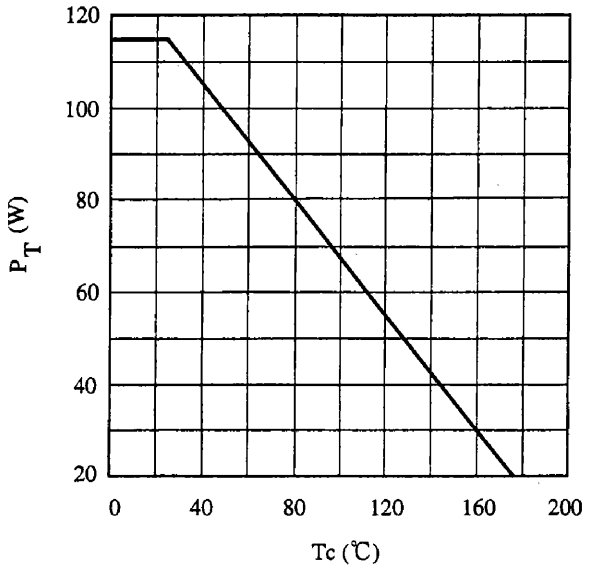
Output Power vs. Frequency



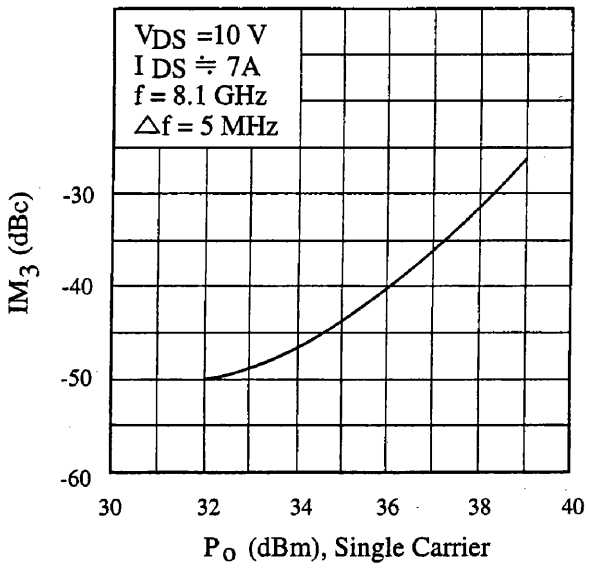
Output Power vs. Input Power



POWER DISSIPATION VS. CASE TEMPERATURE



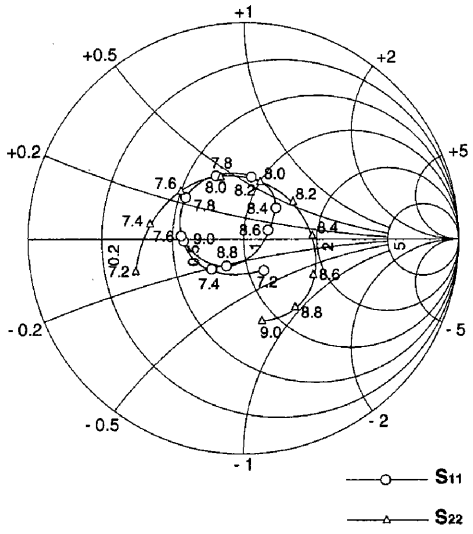
IM_3 VS. OUTPUT POWER CHARACTERISTICS

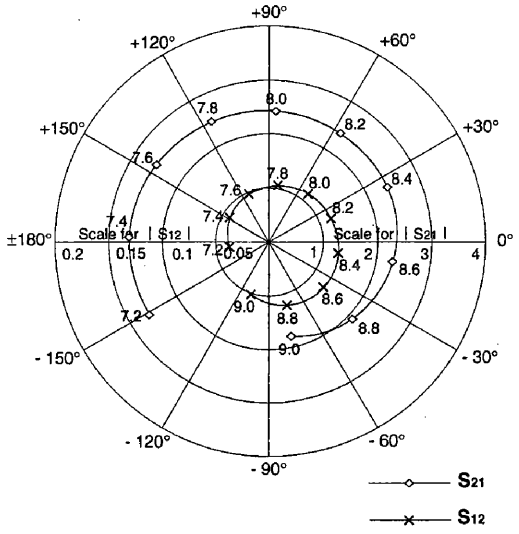


TIM7785-30SL S-PARAMETERS
(MAGN.and ANGLES)

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

f =7.2~9.0GHz





FREQUENCY (GHz)	S11 MAG	S11 ANG	S21 MAG	S21 ANG	S12 MAG	S12 ANG	S22 MAG	S22 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