TOSHIBA

MICROWAVE SEMICONDUCTOR

TECHNICAL DATA

MICROWAVE POWER GaAs FET

TIM3742-16SL

FEATURES :

- LOW INTERMODULATION DISTORTION
  IM_3 = −45 dBc at Po = 31.5 dBm, Single Carrier Level
- HIGH POWER
  P_{1dB} = 42.5 dBm at 3.7GHz to 4.2GHz
- HIGH GAIN
  G_{1dB} = 9.5 dB at 3.7 GHz to 4.2 GHz
- BROAD BAND INTERNALLY MATCHED
- HERMETICALLY SEALED PACKAGE

RF PERFORMANCE SPECIFICATIONS (Ta = 25°C)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Output Power at 1 dB Compression Point	P_{1dB}	V_{DS} = 10 V f = 3.7 ~ 4.2GHz	dBm	41.5	42.5	–
Power Gain at 1 dB Compression Point	G_{1dB}		dB	8.5	9.5	–
Drain Current	I_{DS}		A	–	4.4	5.0
Gain Flatness	ΔG		dB	–	–	±0.8
Power Added Efficiency	η_{add}		%	–	36	–
3rd Order Intermodulation Distortion	IM_3	Note 1	dBc	−42	−45	–
Channel-Temperature Rise	ΔTch	$V_{DS} \times I_{DS} \times R_{th}$ (c−c)	°C	–	–	80

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Transconductance	gm	V_{DS} = 3 V I_{DS} = 6.0 A	mS	–	3600	–
Pinch-off Voltage	V_{GSoff}	V_{DS} = 3 V I_{DS} = 60 mA	V	−1	−2.5	−4.0
Saturated Drain Current	I_{DSS}	V_{DS} = 3 V V_{GS} = 0 V	A	–	10.5	14.0
Gate-Source Breakdown Voltage	V_{GSO}	I_{GS} = − 200 μA	V	−5	–	–
Thermal Resistance	$R_{th\ (c-c)}$	Channel to Case	°C/W	–	1.5	2.0

Note 1 : 2 tone Test Pout = 31.5 dBm Single Carrier Level.

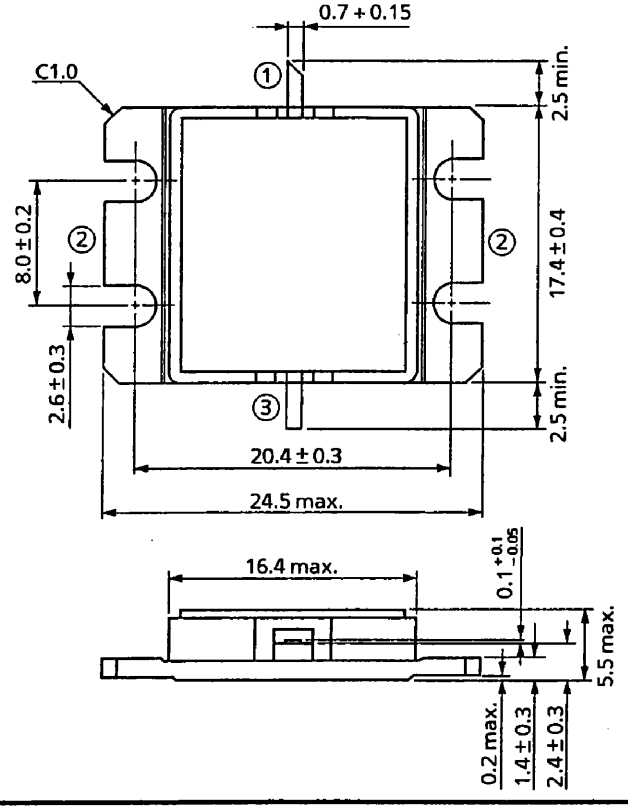
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ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTICS	SYMBOL	UNIT	RATING
Drain-Source Voltage	V_{DS}	V	15
Gate-Source Voltage	V_{GS}	V	−5
Drain Current	I_{DS}	A	14
Total Power Dissipation (T_C = 25°C)	P_T	W	75
Channel Temperature	T_{ch}	°C	175
Storage Temperature	T_{stg}	°C	−65~175

PACKAGE OUTLINE (2-16G1B)



Unit in mm

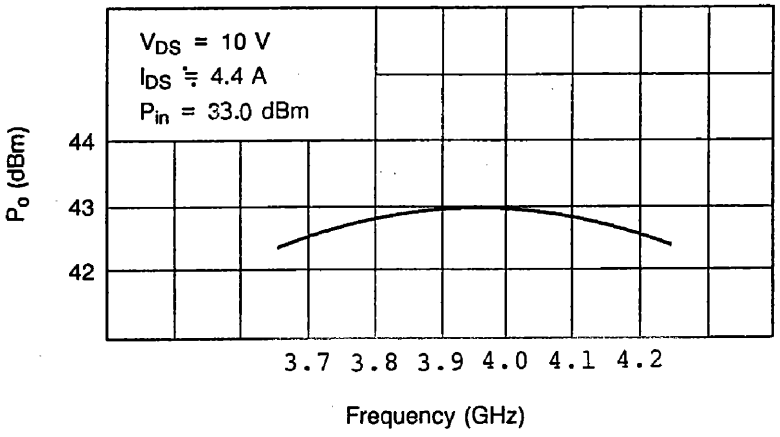
① Gate
② Source
③ Drain

HANDLING PRECAUTIONS FOR PACKAGED TYPE

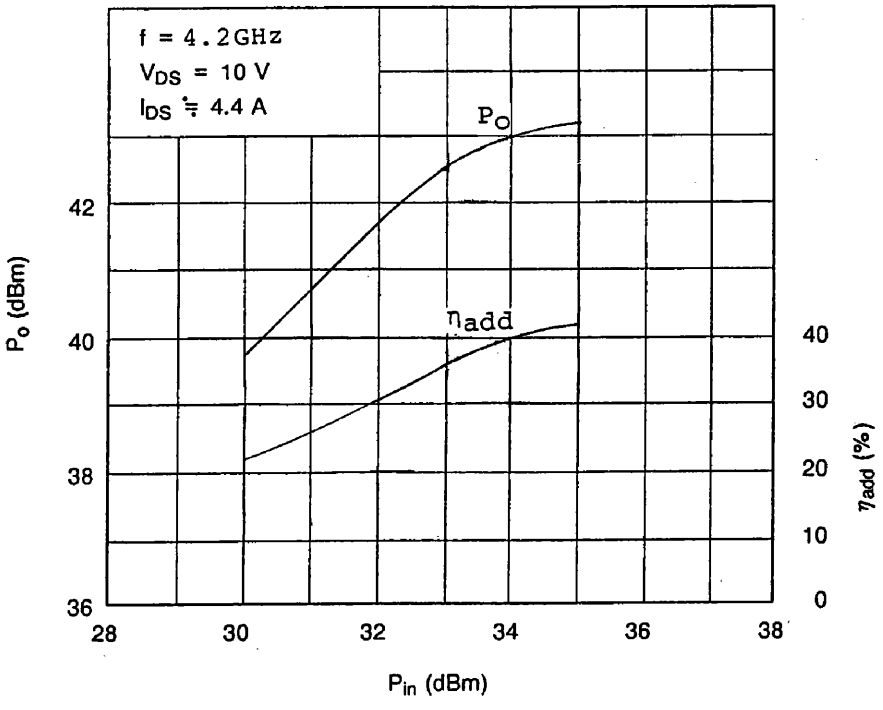
Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C.

RF PERFORMANCES

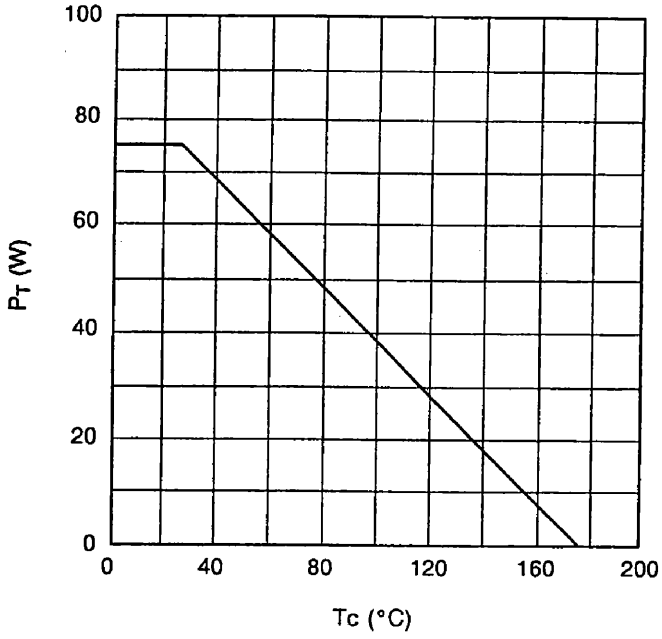
Output Power vs. Frequency



Output Power vs. Input Power



POWER DISSIPATION VS. CASE TEMPERATURE



IM_3 VS. OUTPUT POWER CHARACTERISTICS

