

TIM1213-15L

FEATURES :

- LOW INTERMODULATION DISTORTION
 $IM_3 = -45 \text{ dBc}$ at $P_o = 30.0 \text{ dBm}$,
 Single Carrier Level
- HIGH GAIN
 $G_{1dB} = 6.0 \text{ dB}$ at 12.7 GHz to 13.2 GHz
- BROAD BAND INTERNALLY MATCHED
- HIGH POWER
 $P_{1dB} = 42.0 \text{ dBm}$ at 12.7 GHz to 13.2 GHz
- HERMETICALLY SEALED PACKAGE

RF PERFORMANCE SPECIFICATIONS ($T_a = 25^\circ\text{C}$)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Output Power at 1dB Compression Point	P_{1dB}	$V_{DS} = 9 \text{ V}$, $f = 12.7 - 13.2 \text{ GHz}$	dBm	41.0	42.0	—
Power Gain at 1dB Compression Point	G_{1dB}		dB	5.0	6.0	—
Drain Current	I_{DS1}		A	—	4.5	5.5
Gain Flatness	ΔG		dB	—	—	± 0.8
Power Added Efficiency	η_{add}		%	—	29	—
3rd Order Intermodulation Distortion	IM_3	Note 1	dBc	-42	-45	—
Drain Current	I_{DS2}		A	—	4.5	5.5
Channel-Temperature Rise	ΔT_{ch}	$V_{DS} \times I_{DS} \times R_{th} (c-c)$	$^\circ\text{C}$	—	—	100

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Transconductance	g_m	$V_{DS} = 3 \text{ V}$ $I_{DS} = 4.8 \text{ A}$	mS	—	3000	—
Pinch-off Voltage	V_{GSoff}	$V_{DS} = 3 \text{ V}$ $I_{DS} = 145 \text{ mA}$	V	-1.5	-3.0	-4.5
Saturated Drain Current	I_{DSS}	$V_{DS} = 3 \text{ V}$ $V_{GS} = 0 \text{ V}$	A	—	10.0	11.5
Gate-Source Breakdown Voltage	V_{GSO}	$I_{GS} = -145 \mu\text{A}$	V	-5	—	—
Thermal Resistance	$R_{th} (c-c)$	Channel to Case	$^\circ\text{C/W}$	—	2.0	2.5

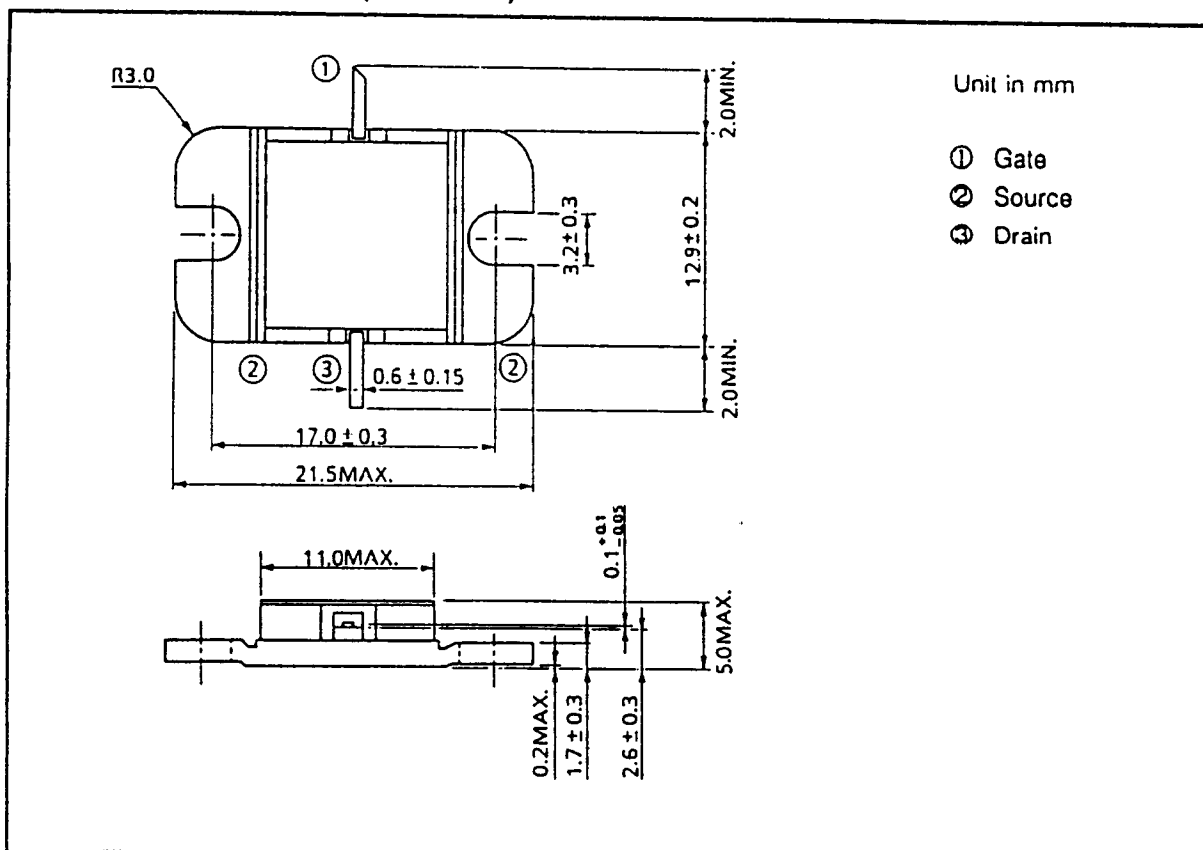
Note 1 : 2 tone Test Pout = 30.0 dBm Single Carrier Level.

Recommended Gate Resistance(R_g) : $R_g = R_{g1}(50 \Omega) + R_{g2}(50 \Omega) = 100 \Omega$ (MAX.)

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	11.5
Total Power Dissipation ($T_C = 25^\circ\text{C}$)	P_T	W	60
Channel Temperature	T_{ch}	$^\circ\text{C}$	175
Storage Temperature	T_{slg}	$^\circ\text{C}$	-65~175

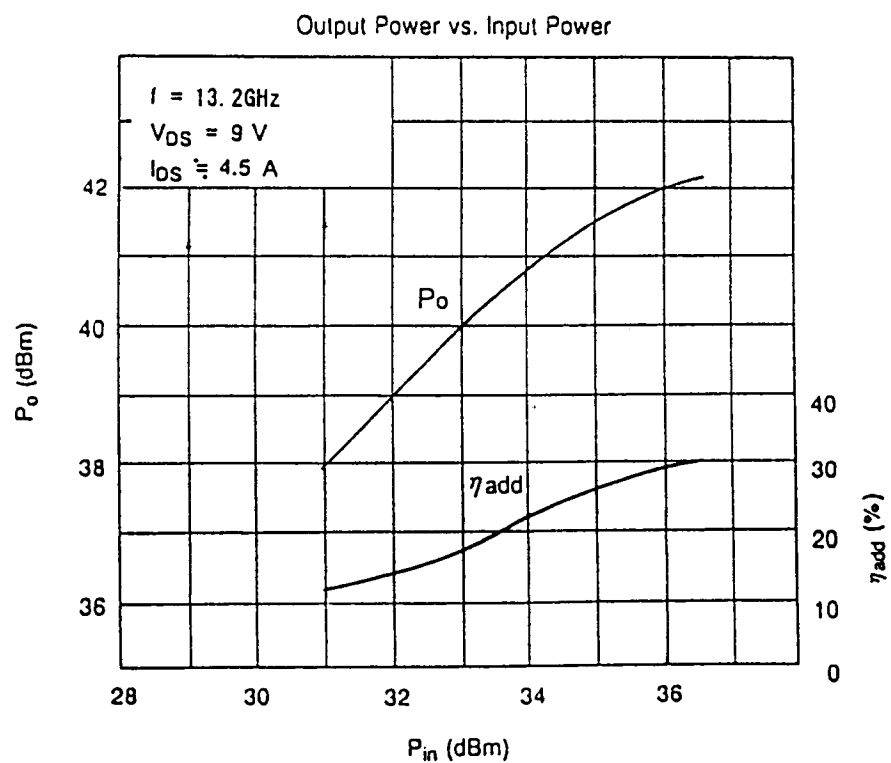
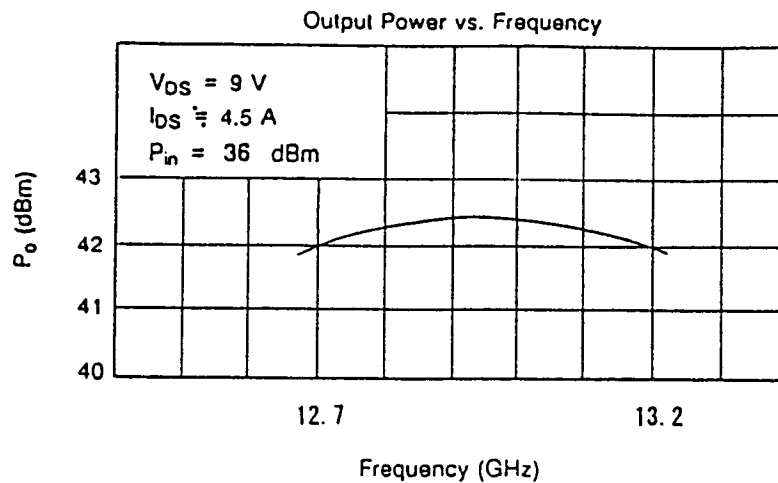
PACKAGE OUTLINE (2-11C1B)

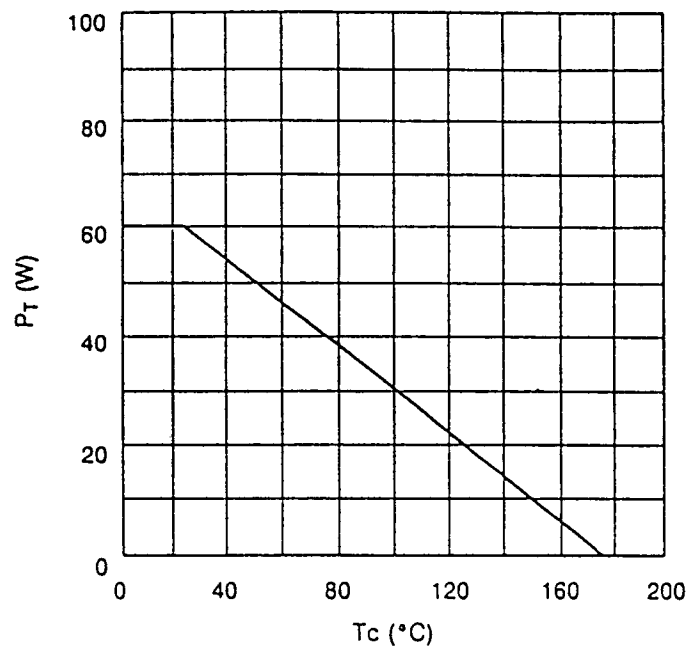
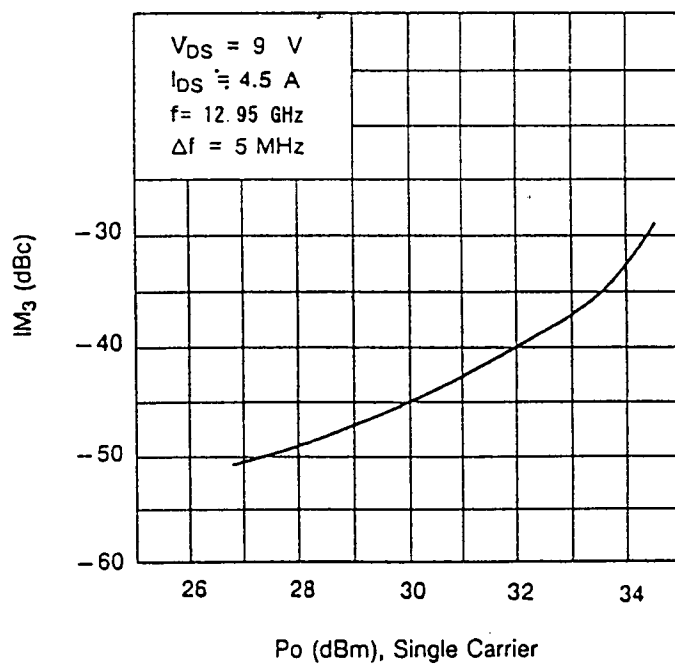


HANDLING PRECAUTIONS FOR PACKAGED TYPE

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

RF PERFORMANCES



POWER DISSIPATION VS. CASE TEMPERATUREIM₃ VS. OUTPUT POWER CHARACTERISTICS

FEATURES :

- LOW INTERMODULATION DISTORTION
 $IM_3 = -45 \text{ dBc}$ at $P_o = 30.0 \text{ dBm}$,
 Single Carrier Level
- HIGH POWER
 $P_{1dB} = 42.0 \text{ dBm}$ at 12.7 GHz to 13.2 GHz
- HIGH GAIN
 $G_{1dB} = 6.0 \text{ dB}$ at 12.7 GHz to 13.2 GHz
- BROAD BAND INTERNALLY MATCHED
- HERMETICALLY SEALED PACKAGE

RF PERFORMANCE SPECIFICATIONS ($T_a = 25^\circ\text{C}$)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Output Power at 1dB Compression Point	P_{1dB}	$V_{DS} = 9 \text{ V}$, $f = 12.7 - 13.2 \text{ GHz}$	dBm	41.0	42.0	—
Power Gain at 1dB Compression Point	G_{1dB}		dB	5.0	6.0	—
Drain Current	I_{DS1}		A	—	4.5	5.5
Gain Flatness	ΔG		dB	—	—	± 0.8
Power Added Efficiency	η_{add}		%	—	29	—
3rd Order Intermodulation Distortion	IM_3	Note 1	dBc	-42	-45	—
Drain Current	I_{DS2}		A	—	4.5	5.5
Channel-Temperature Rise	ΔT_{ch}	$V_{DS} \times I_{DS} \times R_{th} (c-c)$	$^\circ\text{C}$	—	—	100

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Transconductance	g_m	$V_{DS} = 3 \text{ V}$ $I_{DS} = 4.8 \text{ A}$	mS	—	3000	—
Pinch-off Voltage	V_{GSoff}	$V_{DS} = 3 \text{ V}$ $I_{DS} = 145 \text{ mA}$	V	-1.5	-3.0	-4.5
Saturated Drain Current	I_{DSS}	$V_{DS} = 3 \text{ V}$ $V_{GS} = 0 \text{ V}$	A	—	10.0	11.5
Gate-Source Breakdown Voltage	V_{GSO}	$I_{GS} = -145 \mu\text{A}$	V	-5	—	—
Thermal Resistance	$R_{th} (c-c)$	Channel to Case	$^\circ\text{C/W}$	—	2.0	2.5

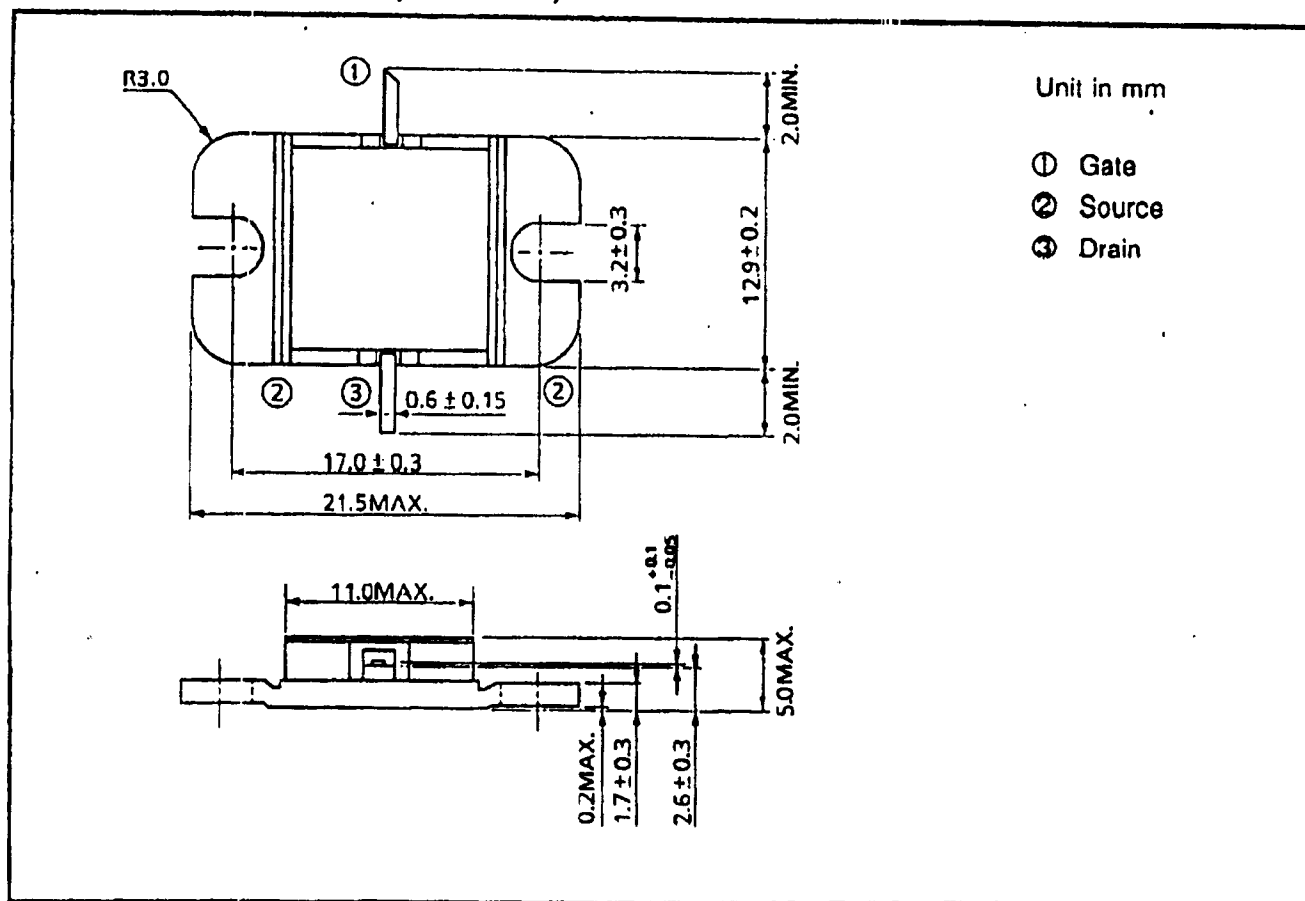
Note 1 : 2 tone Test Pout = 30.0 dBm Single Carrier Level.

- ★ The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of TOSHIBA or others.
- ★ 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.

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	11.5
Total Power Dissipation ($T_C = 25^\circ\text{C}$)	P_T	W	60
Channel Temperature	T_{ch}	$^\circ\text{C}$	175
Storage Temperature	T_{sig}	$^\circ\text{C}$	-65~175

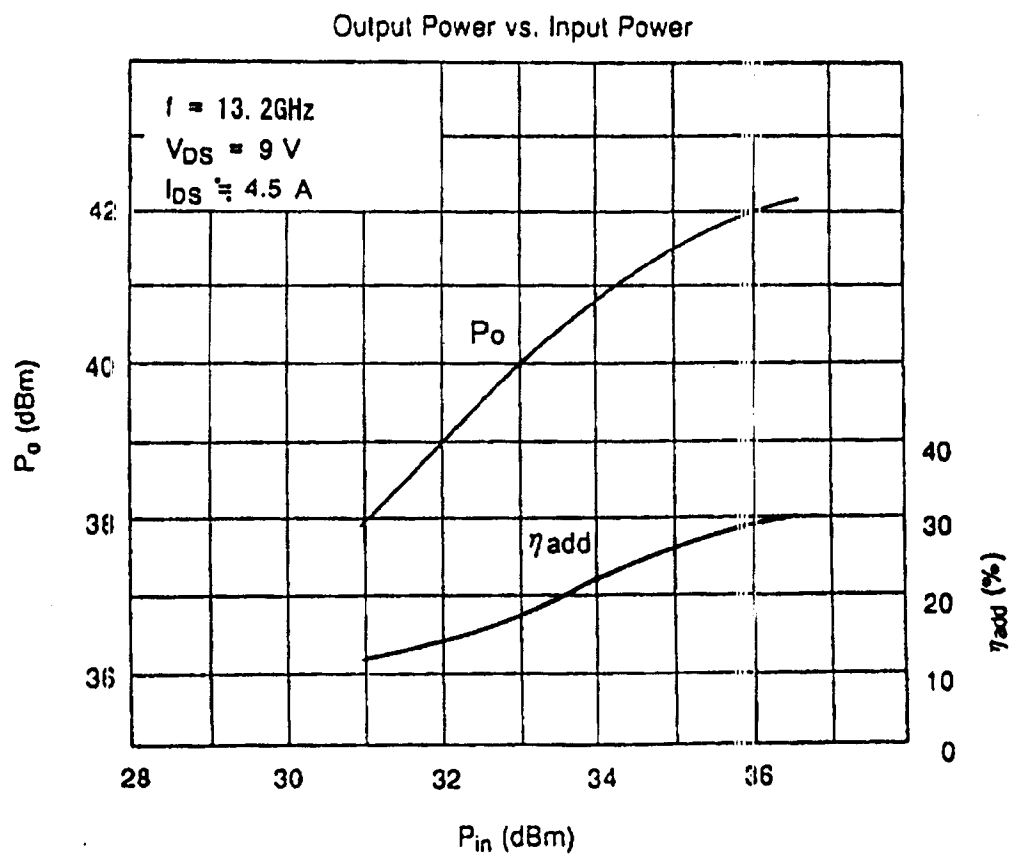
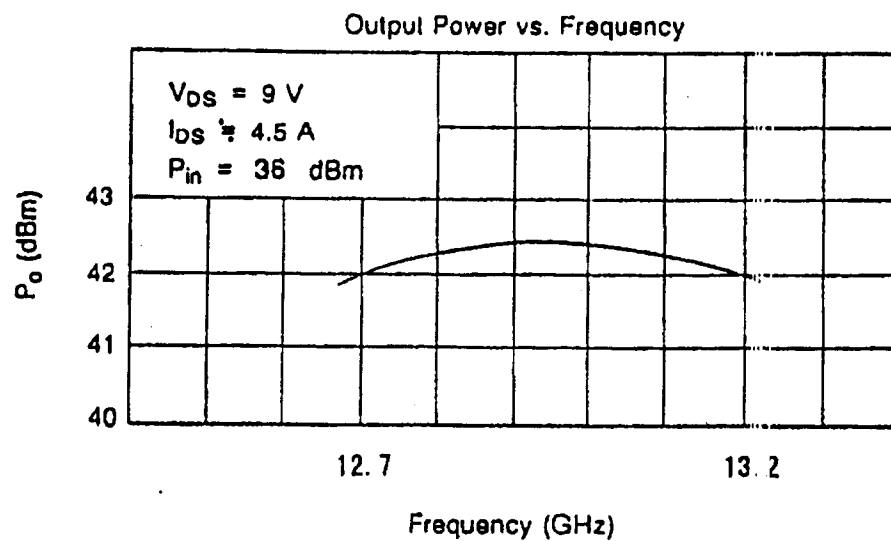
PACKAGE OUTLINE (2-11C1B)



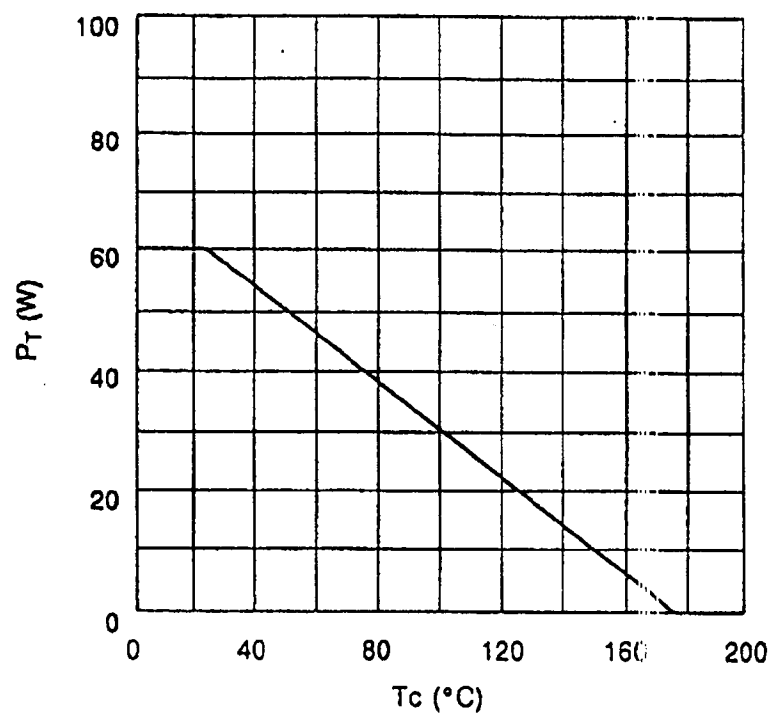
HANDLING PRECAUTIONS FOR PACKAGED TYPE

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

RF PERFORMANCES



POWER DISSIPATION VS. CASE TEMPERATURE



IM₃ VS. OUTPUT POWER CHARACTERISTICS

