

Low Distortion Internally Matched Power GaAs FETs (C-Band)

Features

- Low intermodulation distortion
 - $IM_3 = -44$ dBc at $P_o = 28$ dBm,
 - Single carrier level
- High power
 - $P_{1dB} = 39$ dBm at 7.7 GHz to 8.5 GHz
- High gain
 - $G_{1dB} = 5.0$ dB at 7.7 GHz to 8.5 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}	$V_{DS} = 10V$ $f = 7.7 \sim 8.5 \text{ GHz}$	dBm	38.0	39.0	—
Power Gain at 1dB Compression Point	G_{1dB}		dB	4.0	5.0	—
Drain Current	I_{DS1}		A	—	2.3	2.8
Gain Flatness	ΔG		dB	—	—	± 0.6
Power Added Efficiency	η_{add}		%	—	24	—
3rd Order Intermodulation Distortion	IM_3	Note 1	dBc	-41	-44	—
Drain Current	I_{DS2}		A	—	2.3	2.8
Channel-Temperature Rise	ΔT_{ch}	$V_{DS} \times I_{DS} \times R_{th}(c-c)$	$^\circ\text{C}$	—	—	80

Electrical Characteristics ($T_a = 25^\circ \text{C}$)

Characteristic	Symbol	Condition	Unit	Min.	Typ.	Max
Trans-conductance	gm	$V_{DS} = 3V$ $I_{DS} = 3.0A$	mS	—	1800	—
Pinch-off Voltage	V_{GSoff}	$V_{DS} = 3V$ $I_{DS} = 40mA$	V	-2	-3.5	-5.0
Saturated Drain Current	I_{DSS}	$V_{DS} = 3V$ $V_{GS} = 0V$	A	—	5.8	7.5
Gate-Source Breakdown Voltage	V_{GSO}	$I_{GS} = -120\mu A$	V	-5	—	—
Thermal Resistance	$R_{th}(c-c)$	Channel to case	$^\circ\text{C/W}$	—	2.3	3.5

Note 1: 2 tone Test Pout = 28dBm Single Carrier Level.

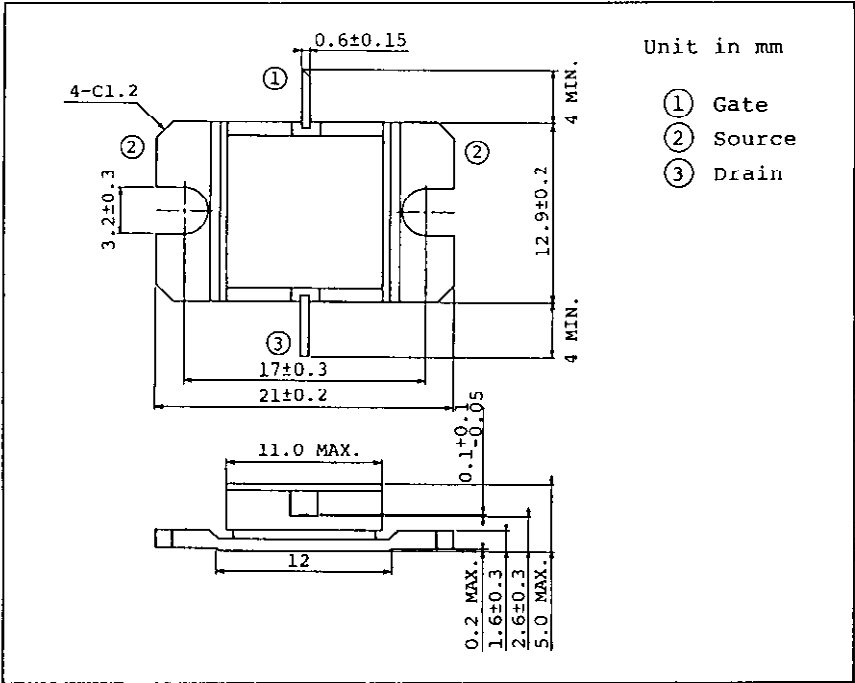
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Absolute Maximum Ratings (Ta = 25° C)

Characteristic	Symbol	Unit	Rating
Drain-Source Voltage	V_{DS}	V	15
Gate-Source Voltage	V_{GS}	V	-5
Drain Current	I_{DS}	A	8
Total Power Dissipation ($T_c = 25^{\circ}C$)	P_T	W	37.5
Channel Temperature	T_{ch}	°C	175
Storage Temperature	T_{stg}	°C	-65~175

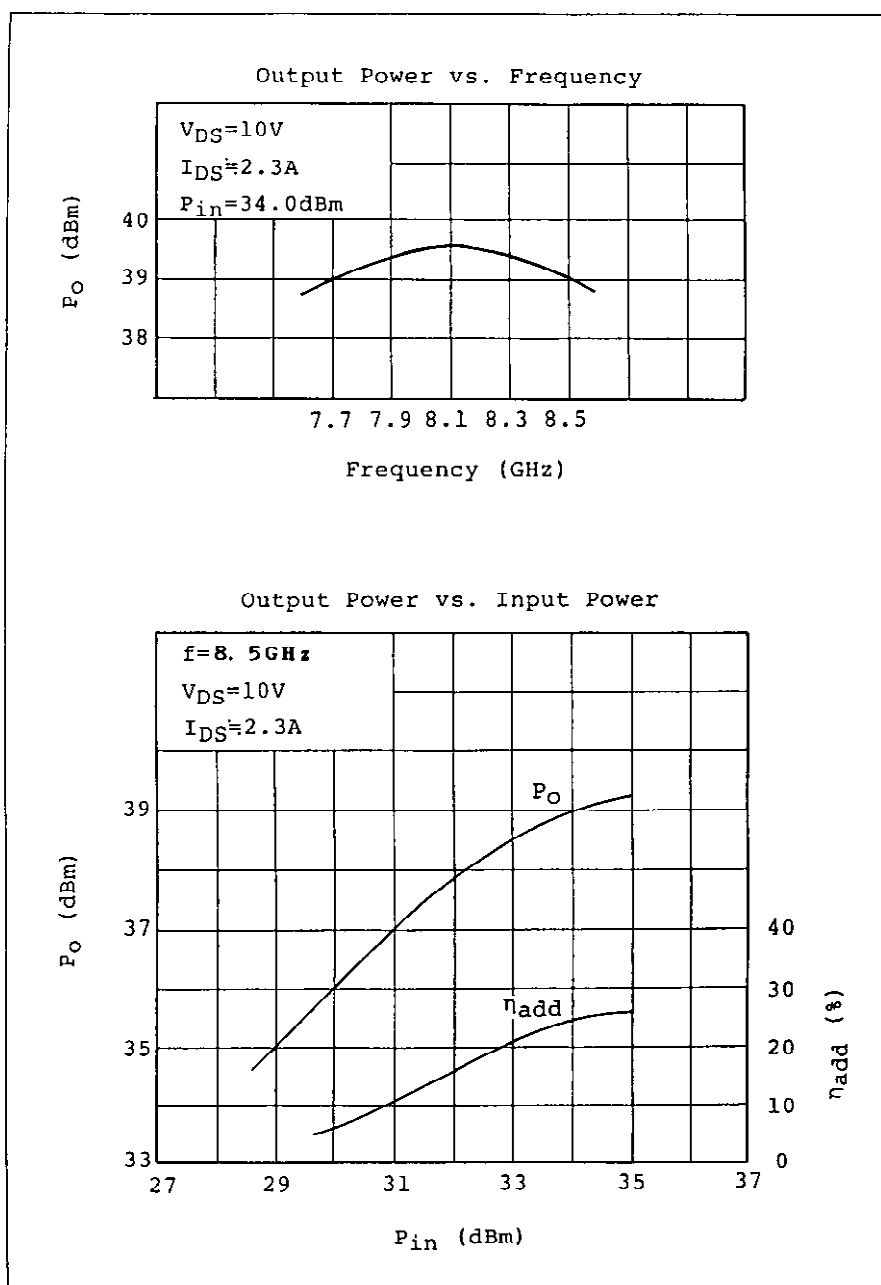
Package Outline (2-11D1B)



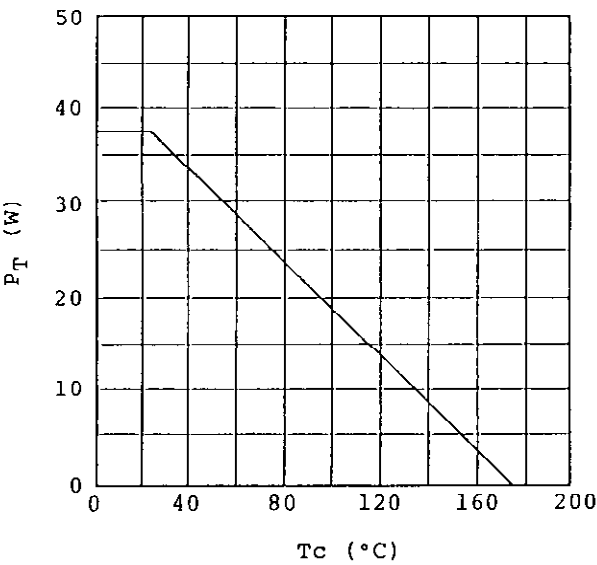
Handling Precautions for Packaged Type

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

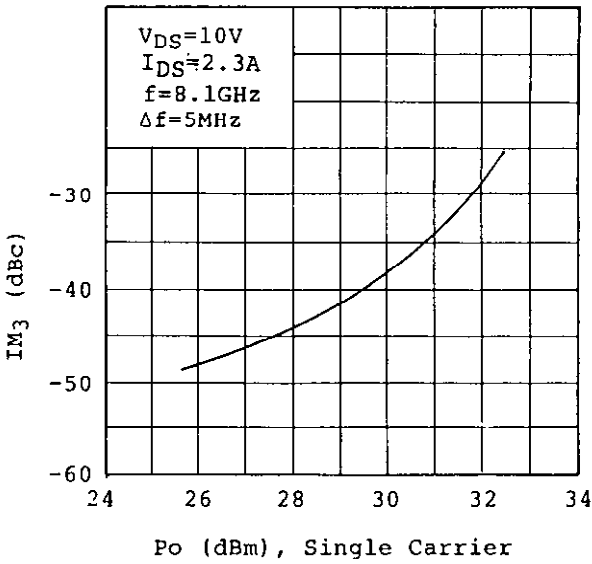
RF Performances



Power Dissipation vs. Case Temperature



IM_3 vs. Output Power Characteristics



**TIM7785-8L S-Parameters
(MAGN. and ANGLES)**

$V_{DS}=10V$, $I_{DS}=2.0A$

