

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

Features

- Low intermodulation distortion
 - $IM_3 = -43$ dBc at $P_o = 28.5$ dBm,
 - Single carrier level
- High power
 - $P_{1dB} = 38.5$ dBm at 7.7 GHz to 8.5 GHz
- High gain
 - $G_{1dB} = 7.0$ dB at 7.7 GHz to 8.5 GHz
- Broad band internally matched
- Hermetically sealed package

RF Performance Specifications ($T_a = 25^\circ C$)

Characteristics	Symbol	Condition	Unit	Min.	Typ.	Max
Output Power at 1dB Compression Point	P_{1dB}	$V_{DS} = 10V$ $f = 7.7 \sim 8.5$ GHz	dBm	37.5	38.5	–
Power Gain at 1dB Compression Point	G_{1dB}		dB	6.0	7.0	–
Drain Current	I_{DS1}		A	–	2.1	2.6
Gain Flatness	ΔG		dB	–	–	± 0.6
Power Added Efficiency	η_{add}		%	–	27	–
3rd Order Intermodulation Distortion	IM_3	Note 1	dBc	-40	-43	–
Drain Current	I_{DS2}		A	–	2.1	2.6
Channel-Temperature Rise	ΔT_{ch}	$V_{DS} \times I_{DS} \times R_{th}(c-c)$	$^\circ C$	–	–	80

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

Characteristic	Symbol	Condition	Unit	Min.	Typ.	Max
Trans-conductance	gm	$V_{DS} = 3V$ $I_{DS} = 2.6A$	mS	–	1600	–
Pinch-off Voltage	V_{GSoff}	$V_{DS} = 3V$ $I_{DS} = 35mA$	V	-2	-3.5	-5.0
Saturated Drain Current	I_{DSS}	$V_{DS} = 3V$ $V_{GS} = 0V$	A	–	5.0	6.5
Gate-Source Breakdown Voltage	V_{GSO}	$I_{GS} = -105\mu A$	V	-5	–	–
Thermal Resistance	$R_{th}(c-c)$	Channel to case	$^\circ C/W$	–	3.6	4.8

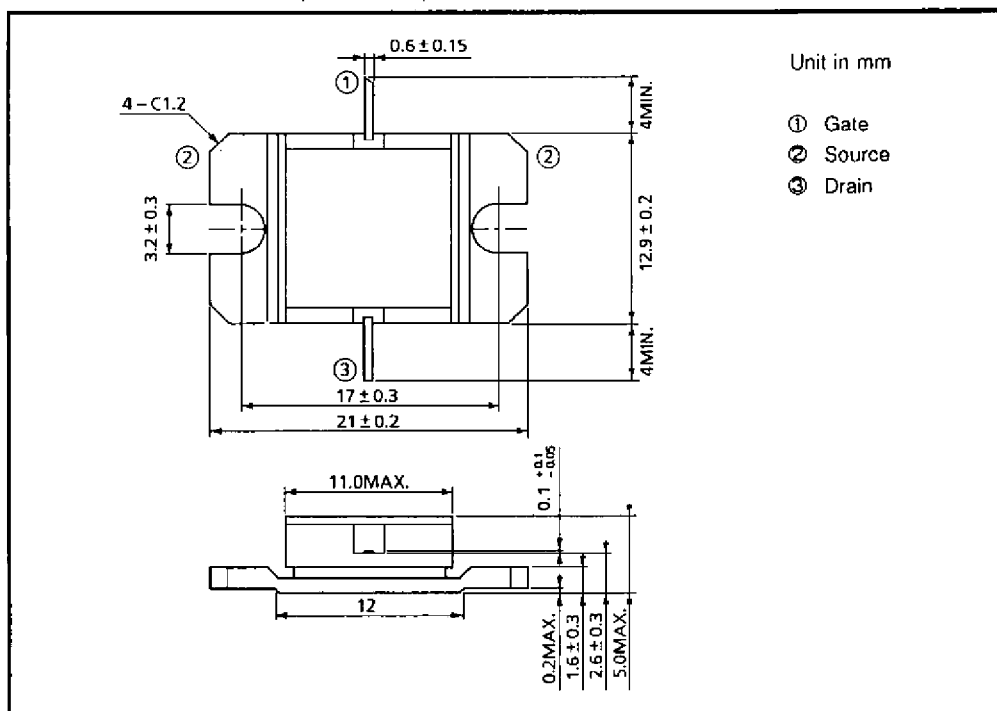
Note 1: 2 tone Test Pout = 28.5dBm Single Carrier Level.

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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	6.5
Total Power Dissipation (T _c = 25°C)	P _T	W	30
Channel Temperature	T _{ch}	°C	175
Storage Temperature	T _{stg}	°C	-65~175

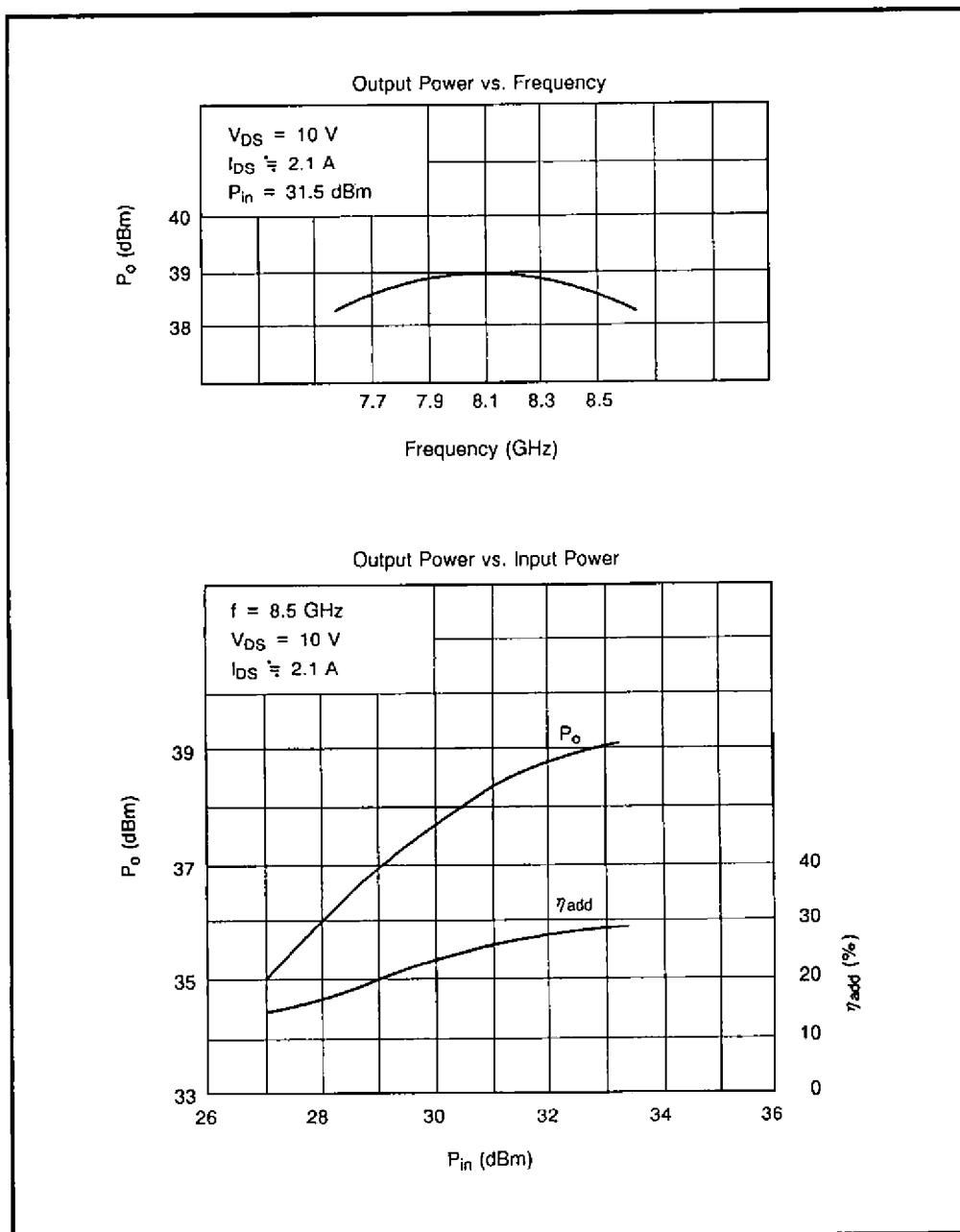
Package Outline (2-11D1B)



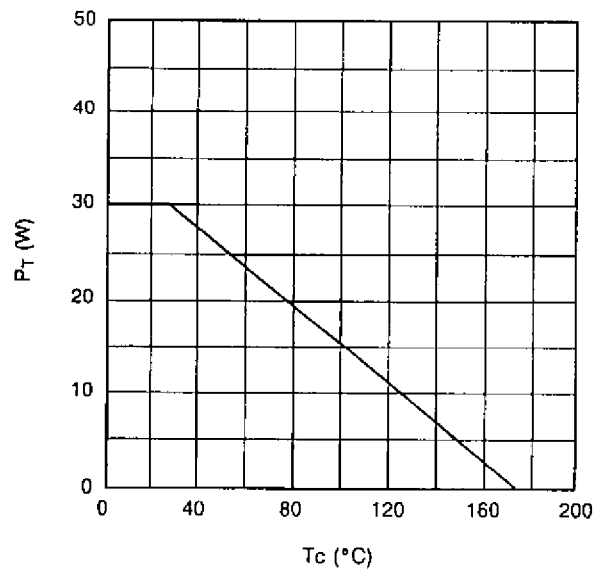
Handling Precautions for Packaged Type

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

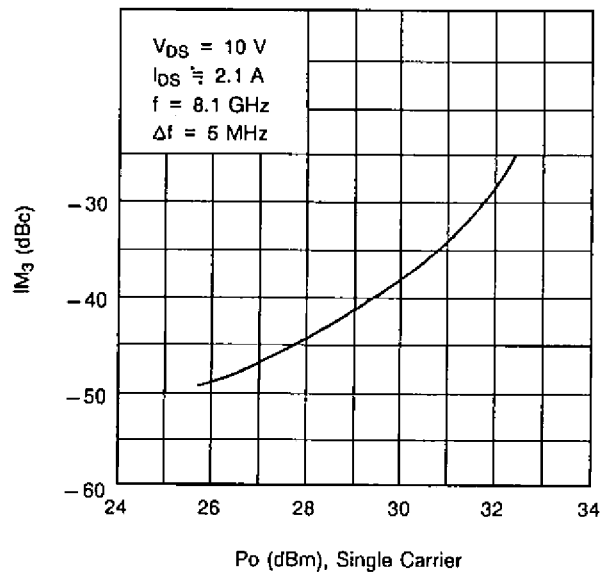
RF Performances



Power Dissipation vs. Case Temperature

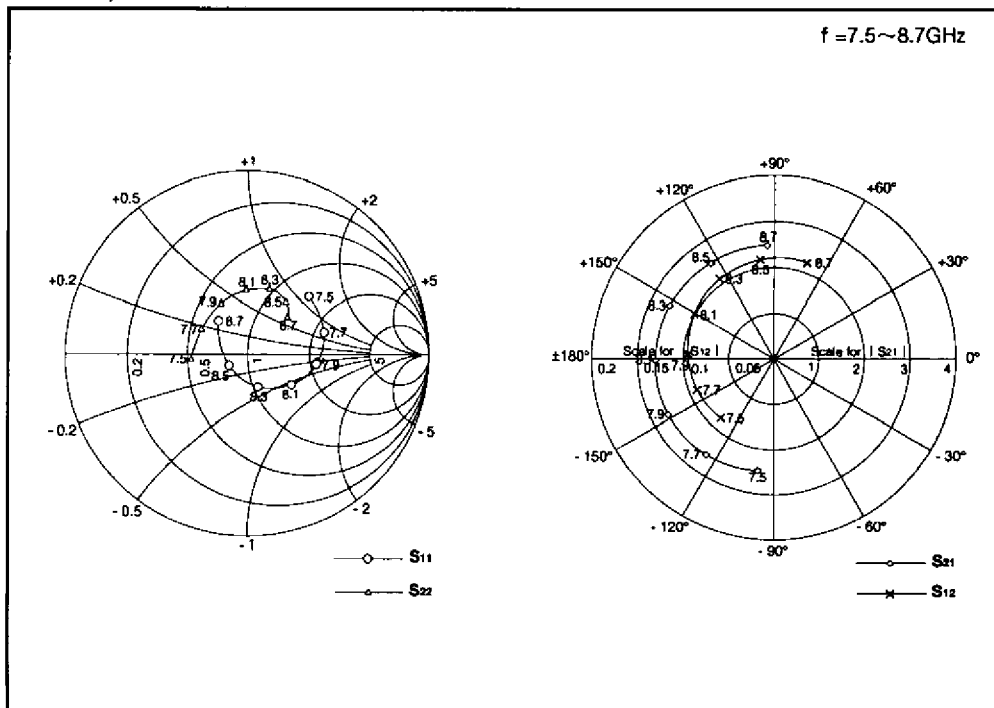


IM_3 vs. Output Power Characteristics



TIM7785-7 S-Parameters
(MAGN. and ANGLES)

V_{DS} = 10V, I_{DS} = 2.1A



FREQUENCY (MHz)	S ₁₁		S ₁₂		S ₂₁		S ₂₂	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
7.5	0.463	43.3	0.087	-132.6	2.463	-98.5	0.308	-175.3
7.7	0.440	16.3	0.091	-158.5	2.584	-125.5	0.289	150.1
7.9	0.387	-8.3	0.096	176.0	2.631	-152.2	0.309	117.3
8.1	0.301	-34.5	0.102	150.8	2.623	-179.1	0.347	91.2
8.3	0.190	-69.9	0.107	125.1	2.579	153.4	0.369	70.4
8.5	0.116	-151.0	0.111	98.4	2.524	124.7	0.357	53.8
8.7	0.243	130.7	0.110	70.5	2.473	94.3	0.302	43.1