

### Internally Matched Power GaAs FETs (C-Band)

#### Features

- High power
  - $P_{1dB} = 39$  dBm at 7.7 GHz to 8.5 GHz
- High gain
  - $G_{1dB} = 5.5$  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	$P_{1dB}$	$V_{DS} = 10V$ $f = 7.7 \sim 8.5$ GHz	dBm	38.0	39.0	–
Power Gain at 1dB Compression Point	$G_{1dB}$		dB	4.5	5.5	–
Drain Current	$I_{DS}$		A	–	2.3	2.8
Power Added Efficiency	$\eta_{add}$		%	–	25	–
Channel-Temperature Rise	$\Delta T_{ch}$	$V_{DS} \times I_{DS} \times R_{th}(c-c)$	$^\circ\text{C}$	–	–	80

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

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

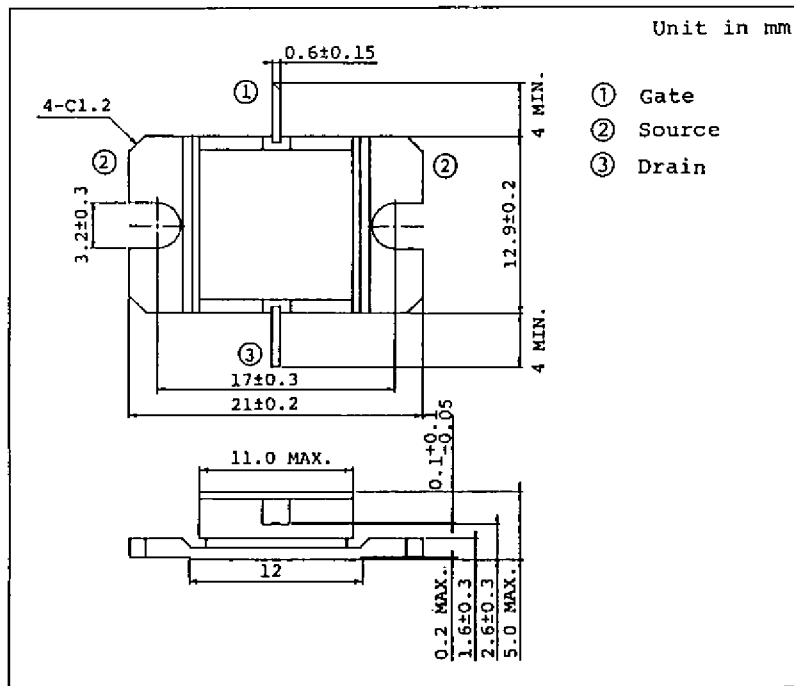
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**Absolute Maximum Ratings (T<sub>a</sub> = 25° C)**

Characteristic	Symbol	Unit	Rating
Drain Source Voltage	V <sub>DS</sub>	V	15
Gate Source Voltage	V <sub>GS</sub>	V	-5
Drain Current	I <sub>D</sub>	A	8
Total Power Dissipation (T <sub>c</sub> = 25°C)	P <sub>T</sub>	W	37.5
Channel Temperature	T <sub>ch</sub>	°C	175
Storage Temperature	T <sub>stg</sub>	°C	-65~175

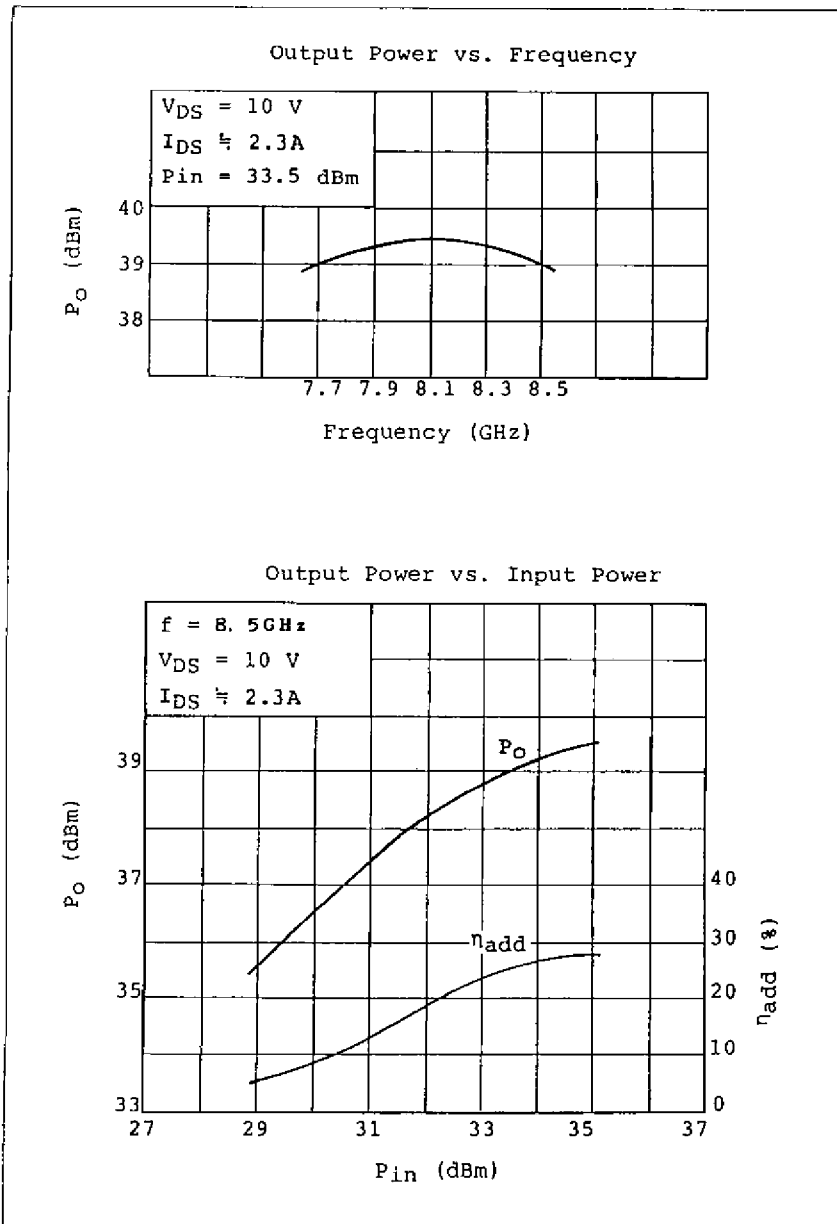
**Package Outline (2-11D1B)**



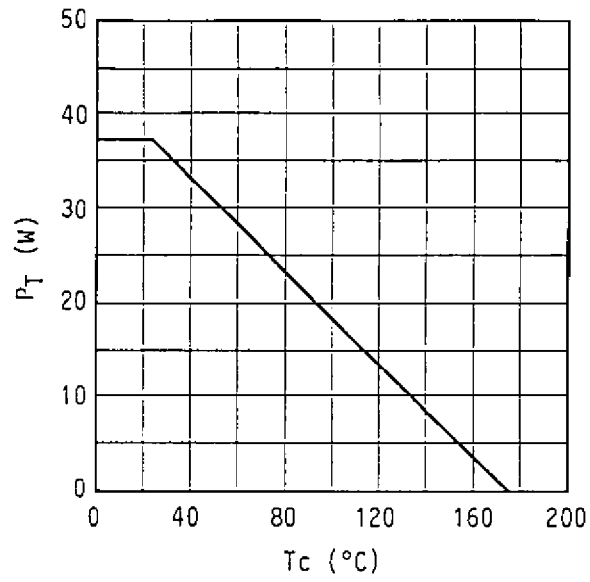
**Handling Precautions for Packaged Type**

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

RF Performances

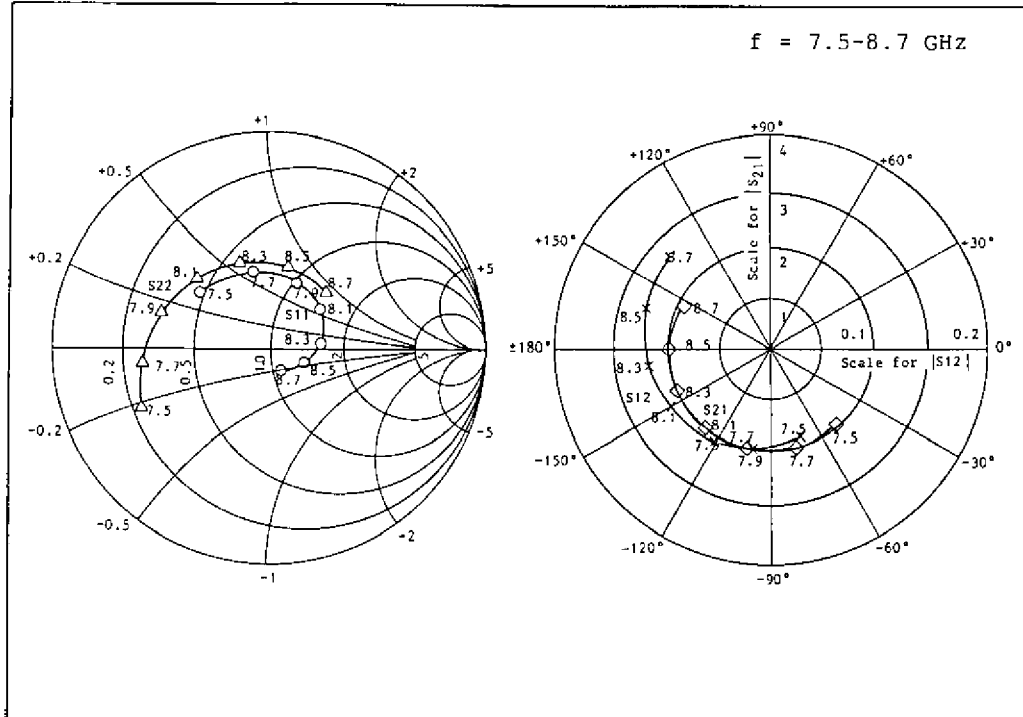


Power Dissipation vs. Case Temperature



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

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



FREQUENCY (GHz)	S11		S12		S21		S22	
7.5	0.41	141	0.091	-73	1.88	-50	0.64	-155
7.7	0.37	102	0.101	-98	1.99	-76	0.58	-174
7.9	0.33	67	0.109	-123	2.05	-103	0.52	162
8.1	0.30	37	0.115	-149	2.07	-129	0.46	135
8.3	0.25	5	0.122	-173	2.02	-156	0.42	108
8.5	0.17	-20	0.126	162	1.95	179	0.39	77
8.7	0.12	-61	0.131	138	1.90	154	0.37	44