

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

#### Features

- High power
  - $P_{1dB} = 36.0$  dBm at 3.7 GHz to 4.2 GHz
- High gain
  - $G_{1dB} = 10.5$  dB at 3.7 GHz to 4.2 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	$P_{1dB}$	$V_{DS} = 10V$ $f = 3.7 \sim 4.2$ GHz	dBm	35.0	36.0	–
Power Gain at 1dB Compression Point	$G_{1dB}$		dB	9.5	10.5	–
Drain Current	$I_{DS}$		A	–	1.1	1.5
Power Added Efficiency	$\eta_{add}$		%	–	33	–
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	$V_{DS} = 3V$ $I_{DS} = 1.5$ A	mS	–	900	–
Pinch-off Voltage	$V_{GSoff}$	$V_{DS} = 3V$ $I_{DS} = 20$ mA	V	-2	-3.5	-5
Saturated Drain Current	$I_{DSS}$	$V_{DS} = 3V$ $V_{GS} = 0V$	A	–	2.9	3.8
Gate to Source Breakdown Voltage	$V_{GSO}$	$I_{GS} = -60$ $\mu\text{A}$	V	-5	–	–
Thermal Resistance	$R_{th(c-c)}$	Channel to case	$^\circ\text{C/W}$	–	4.0	6.0

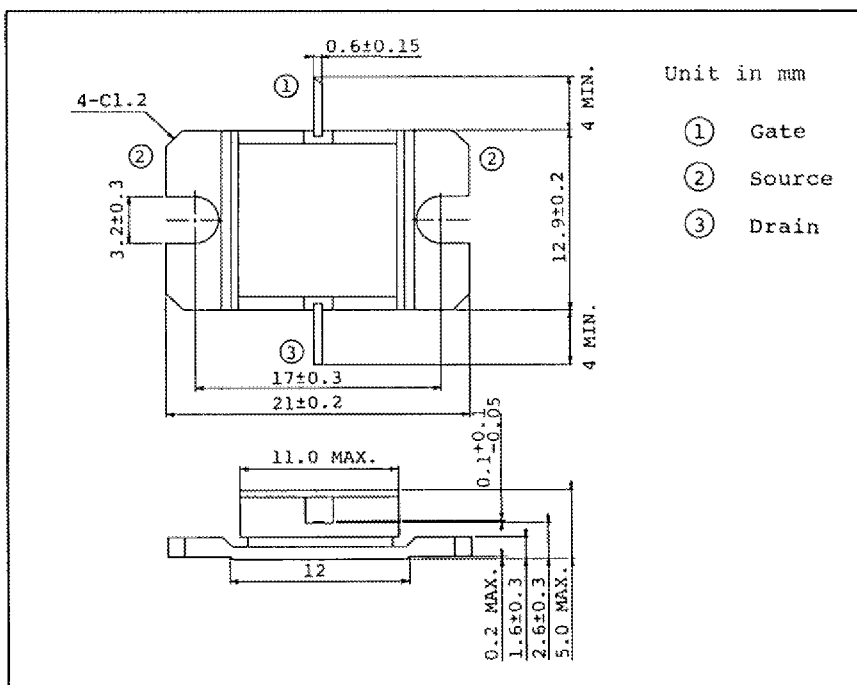
The information contained here is subject to change without notice.

The information contained herein is presented only as 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. These TOSHIBA products are intended for usage in general electronic equipments (office equipment, communication equipment, measuring equipment, domestic electrification, etc.) Please make sure that you consult with us before you use these TOSHIBA products in equipments which require high quality and/or reliability, and in equipments which could have major impact to the welfare of human life (atomic energy control, spaceship, traffic signal, combustion control, all types of safety devices, etc.). TOSHIBA cannot accept liability to any damage which may occur in case these TOSHIBA products were used in the mentioned equipments without prior consultation with TOSHIBA.

**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	4
Total Power Dissipation (T <sub>c</sub> = 25°C)	P <sub>T</sub>	W	20
Channel Temperature	T <sub>ch</sub>	°C	175
Storage Temperature	T <sub>stg</sub>	°C	-65~175

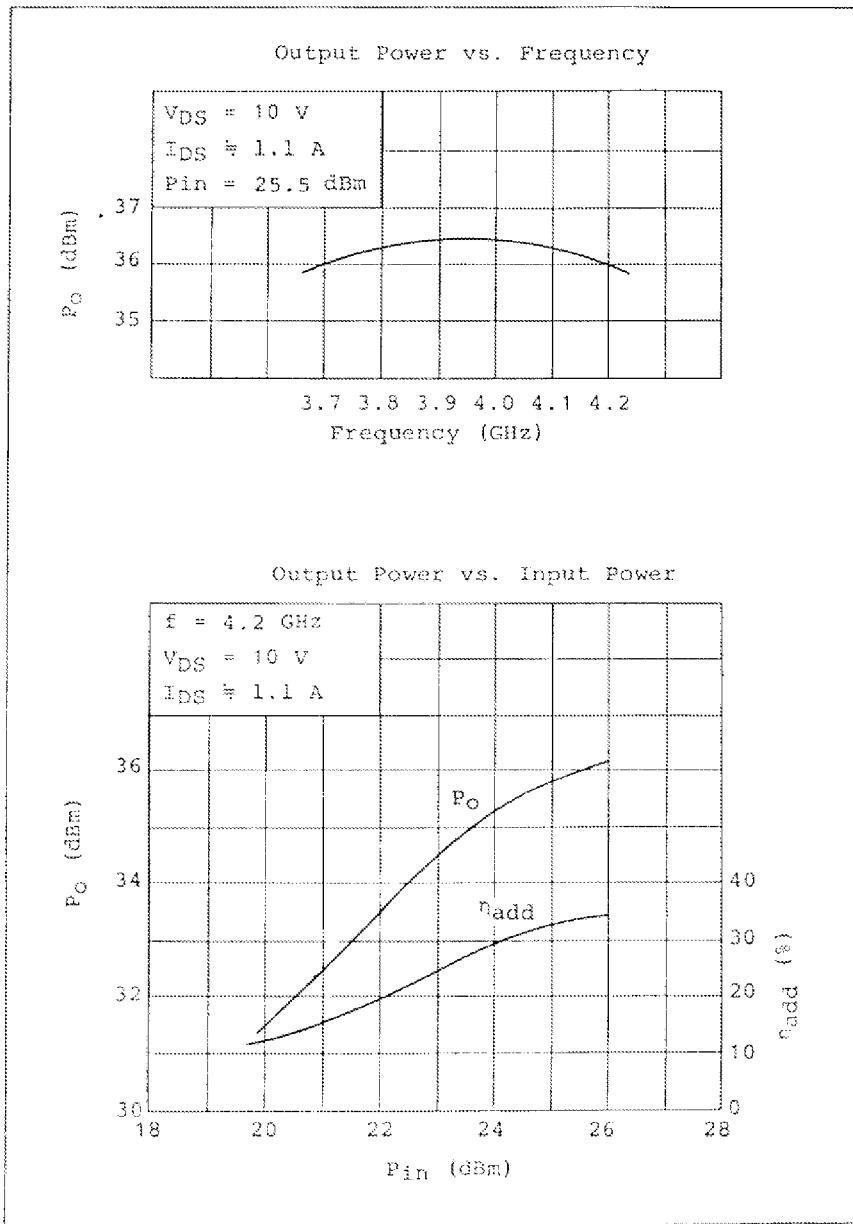
**Package Outline (2-11D1B)**



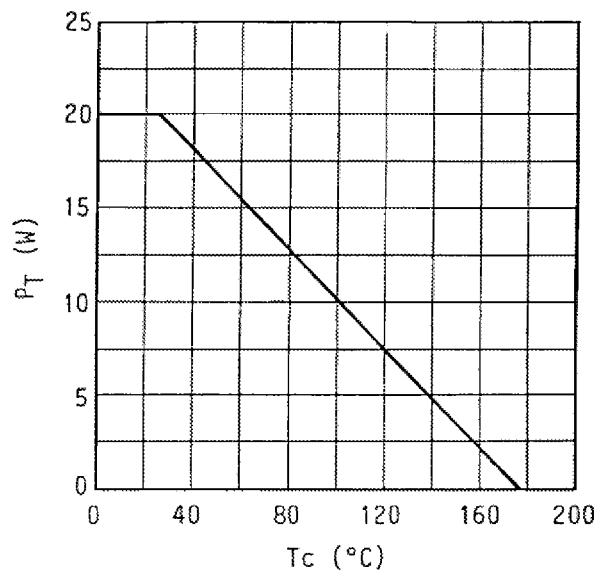
**Handling Precautions for Packaged Type**

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

RF Performances

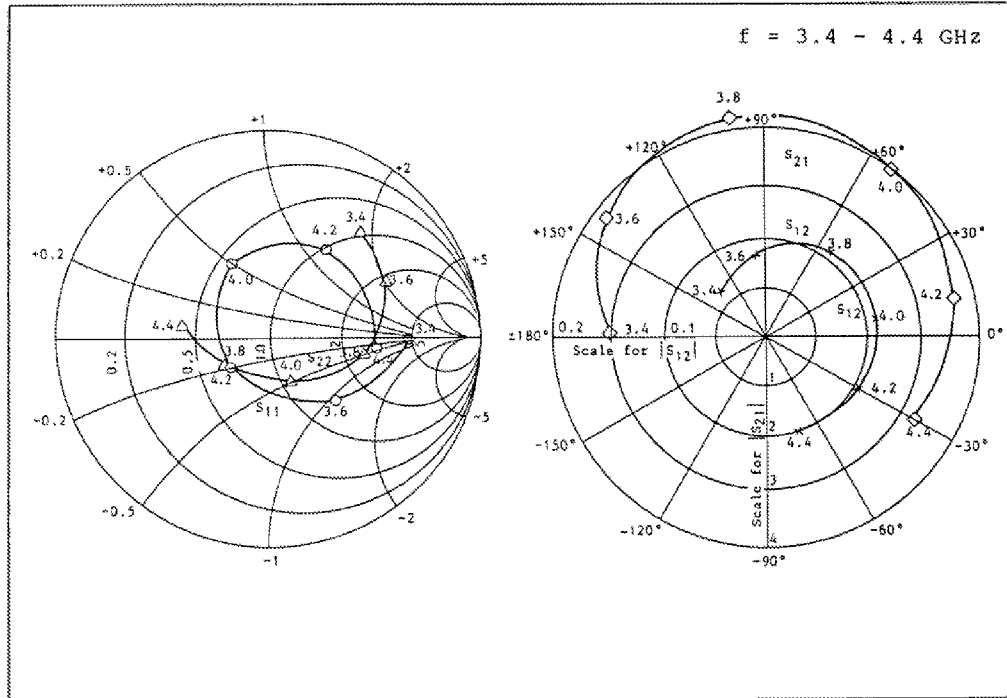


Power Dissipation vs. Case Temperature



TPM3742-4 S-Parameters  
(MAGN. and ANGLES)

$V_{DS} = 10 \text{ V}$ ,  $I_{DS} = 1.0 \text{ A}$



FREQUENCY (GHz)	$S_{11}$		$S_{12}$		$S_{21}$		$S_{22}$	
3.4	0.66	0	0.063	130	2.98	178	0.68	50
3.6	0.43	-44	0.087	96	3.77	143	0.63	26
3.8	0.22	-147	0.107	53	4.28	99	0.46	-10
4.0	0.40	114	0.110	9	4.12	54	0.23	-66
4.2	0.52	58	0.104	-30	3.67	13	0.24	-151
4.4	0.51	-5	0.095	-70	3.18	-29	0.41	170