

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

Features

- Low intermodulation distortion
 - $IM_3 = -44$ dBc at $P_o = 31.5$ dBm,
 - Single carrier level
- High power
 - $P_{1dB} = 42.5$ dBm at 3.7 GHz to 4.2 GHz
- High gain
 - $G_{1dB} = 9.0$ 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}	$V_{DS} = 10V$ $f = 3.7 \sim 4.2 \text{ GHz}$	dBm	41.5	42.5	—
Power Gain at 1dB Compression Point	G_{1dB}		dB	8.0	9.0	—
Drain Current	I_{DS1}		A	—	4.8	5.5
Gain Flatness	ΔG		dB	—	—	± 0.8
Power Added Efficiency	η_{add}		%	—	32	—
3rd Order Intermodulation Distortion	IM_3	Note 1	dBc	-41	-44	—
Drain Current	I_{DS2}		A	—	4.8	5.5
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	$V_{DS} = 3V$ $I_{DS} = 6.0A$	mS	—	3600	—
Pinch-off Voltage	V_{GSoff}	$V_{DS} = 3V$ $I_{DS} = 80mA$	V	-2	-3.5	-5.0
Saturated Drain Current	I_{DSS}	$V_{DS} = 3V$ $V_{GS} = 0V$	A	—	11.6	15.0
Gate-Source Breakdown Voltage	V_{GSO}	$I_{GS} = -240\mu A$	V	-5	—	—
Thermal Resistance	$R_{th}(c-c)$	Channel to case	$^\circ\text{C/W}$	—	1.4	1.8

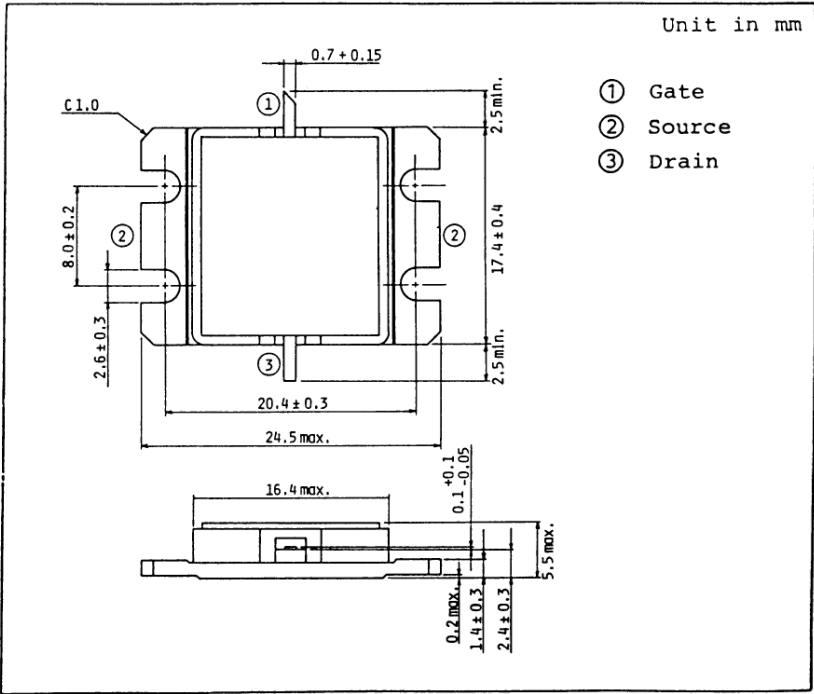
Note 1: 2 tone Test Pout = 31.5dBm Single Carrier Level.

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 (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	16
Total Power Dissipation ($T_c = 25^{\circ}C$)	P_T	W	70
Channel Temperature	T_{ch}	°C	175
Storage Temperature	T_{stg}	°C	-65~175

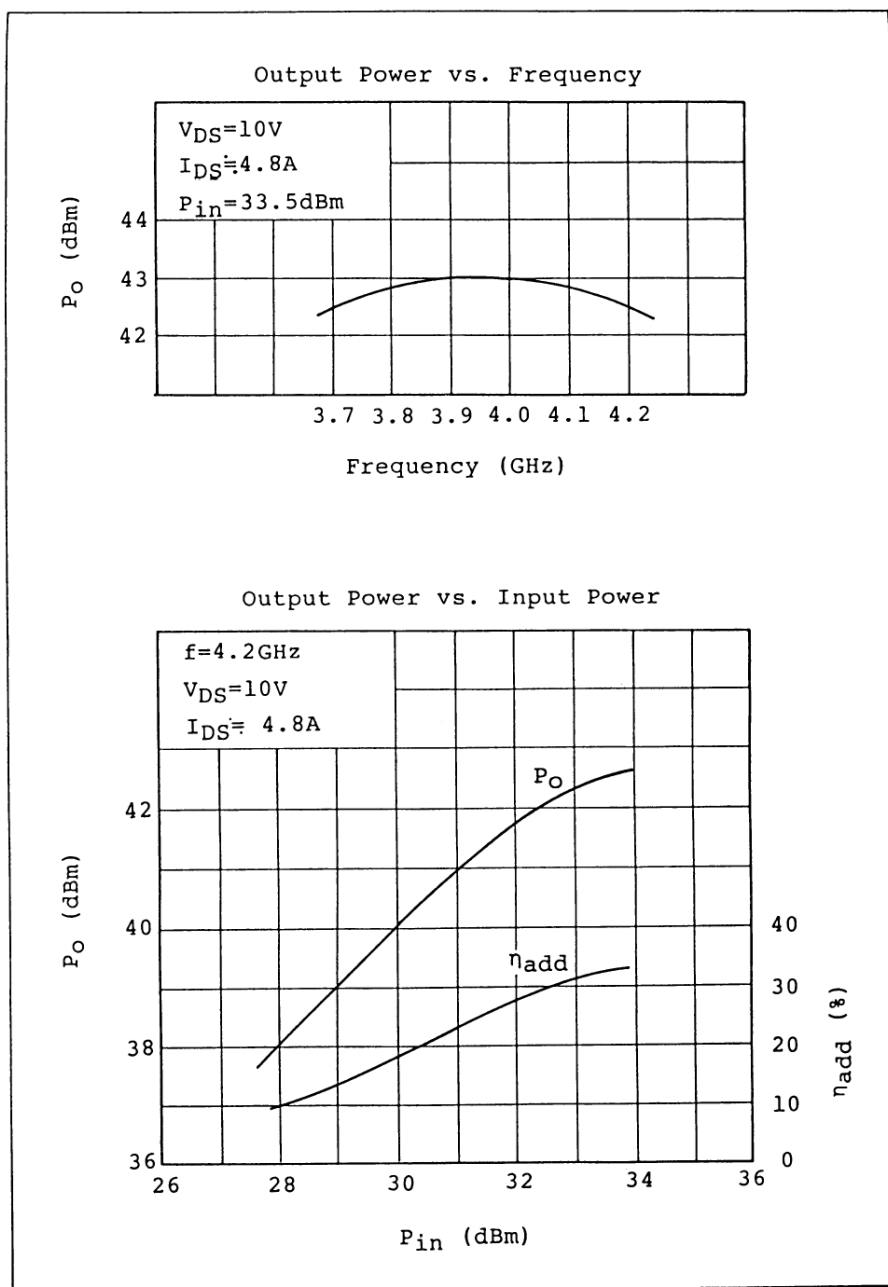
Package Outline (2-16G1B)



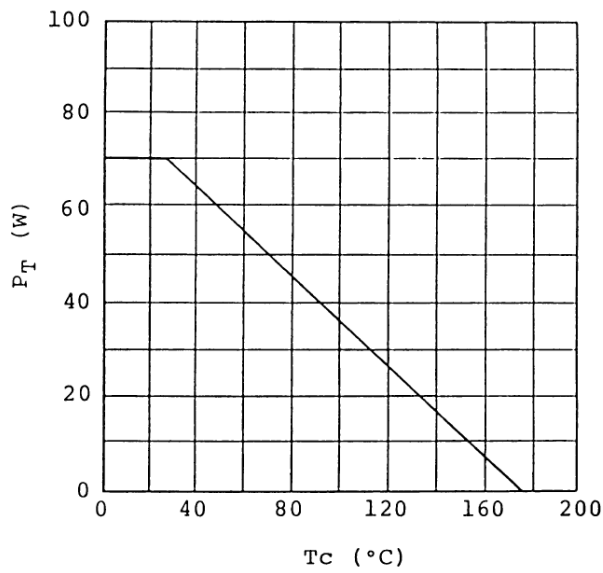
Handling Precautions for Packaged Type

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

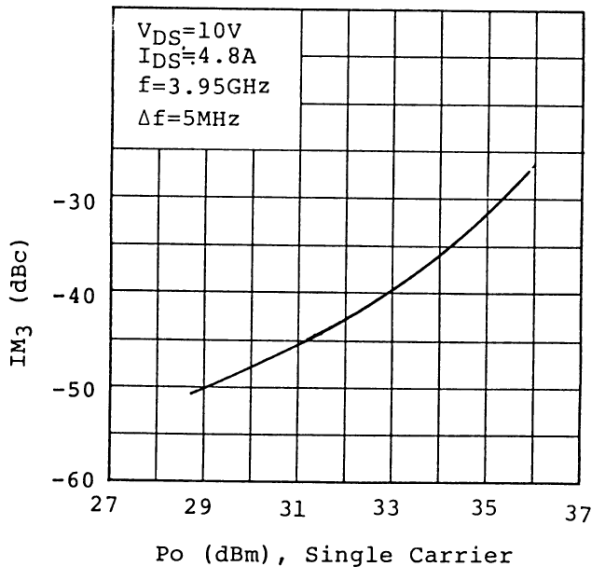
RF Performances



Power Dissipation vs. Case Temperature



IM₃ vs. Output Power Characteristics



**TIM3742-16L S-Parameters
(MAGN. and ANGLES)**

$V_{DS}=10V$, $I_{DS}=4.0A$

