

Internally Matched Power GaAs FETs (C-Band)

Features

- High power
 - $P_{1dB} = 42.5$ 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	41.0	42.0	—
Power Gain at 1dB Compression Point	G_{1dB}		dB	4.0	5.0	—
Drain Current	I_{DS}		A	—	4.5	5.5
Power Added Efficiency	η_{add}		%	—	24	—
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	$V_{DS} = 3V$ $I_{DS} = 6.0 \text{ A}$	mS	—	3600	—
Pinch-off Voltage	V_{GSoff}	$V_{DS} = 3V$ $I_{DS} = 80\text{mA}$	V	-2	-3.5	-5
Saturated Drain Current	I_{DSS}	$V_{DS} = 3V$ $V_{GS} = 0V$	A	—	11.6	15.0
Gate to Source Breakdown Voltage	V_{GSO}	$I_{GS} = -240 \mu\text{A}$	V	-5	—	—
Thermal Resistance	$R_{th(c-c)}$	Channel to case	$^\circ\text{C/W}$	—	1.4	1.8

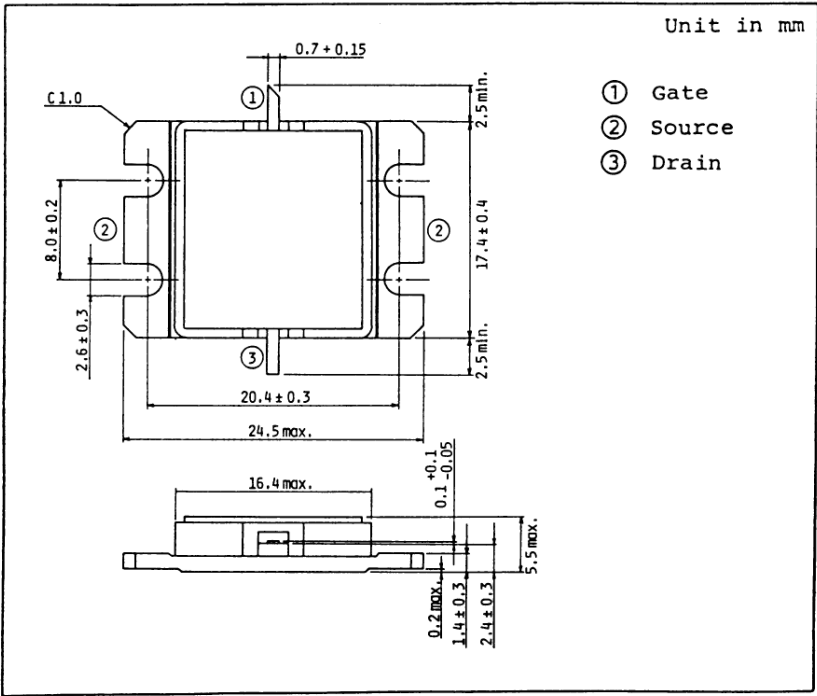
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Absolute Maximum Ratings (T_a = 25° C)

Characteristic	Symbol	Unit	Rating
Drain Source Voltage	V _{DS}	V	15
Gate Source Voltage	V _{GS}	V	-5
Drain Current	I _D	A	16
Total Power Dissipation (T _c = 25°C)	P _T	W	70
Channel Temperature	T _{ch}	°C	175
Storage Temperature	T _{stg}	°C	-65~175

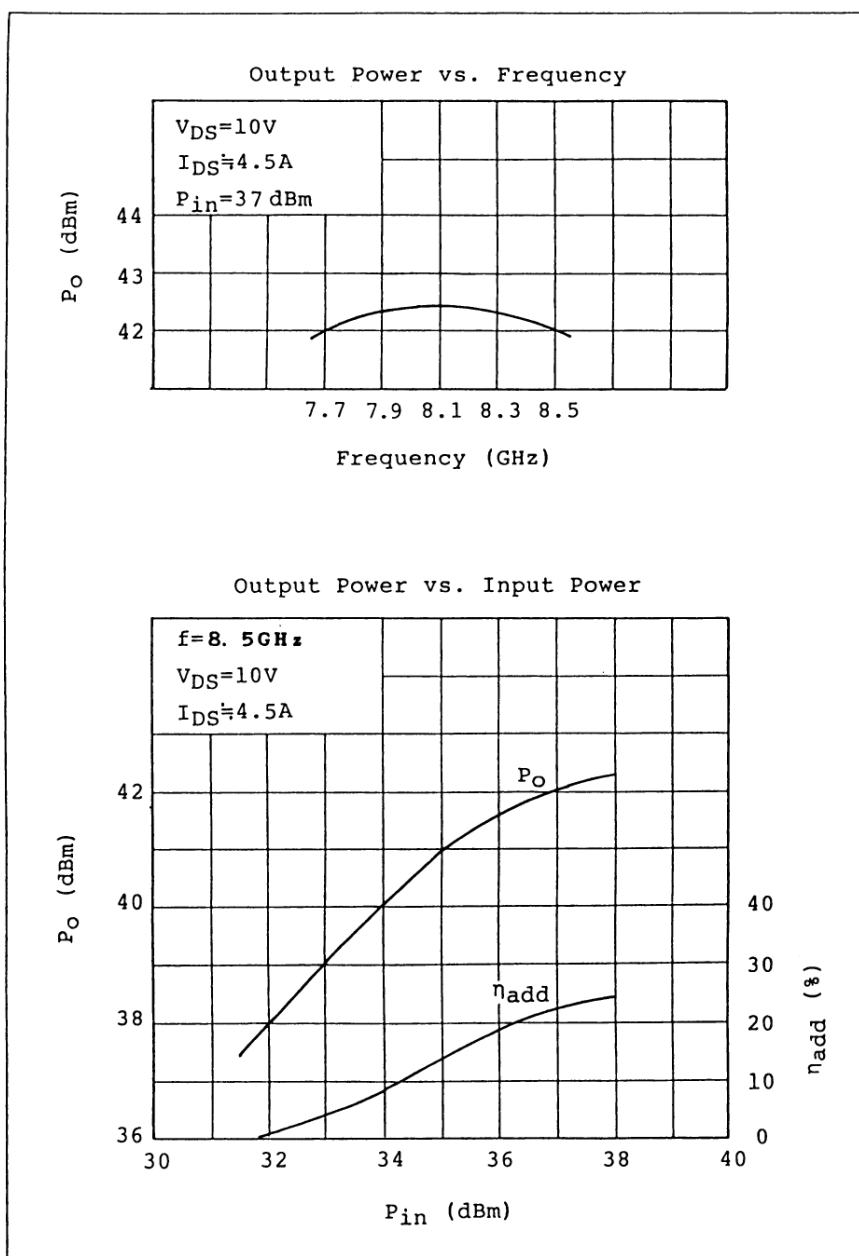
Package Outline (2-16G1B)



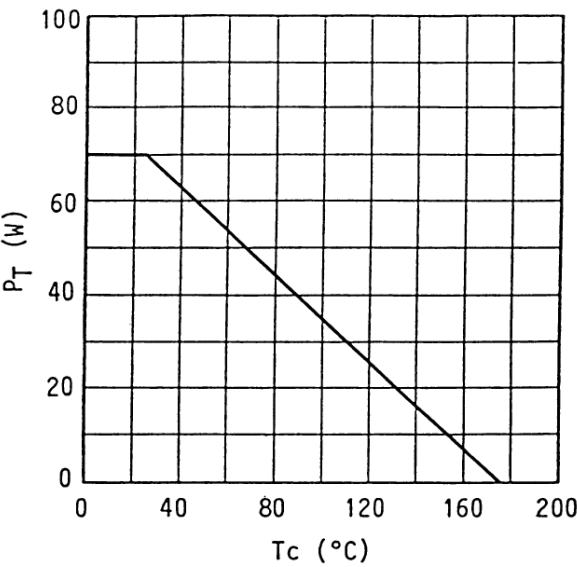
Handling Precautions for Packaged Type

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

RF Performances



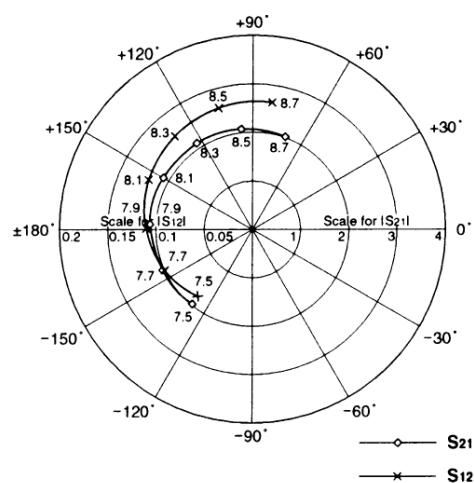
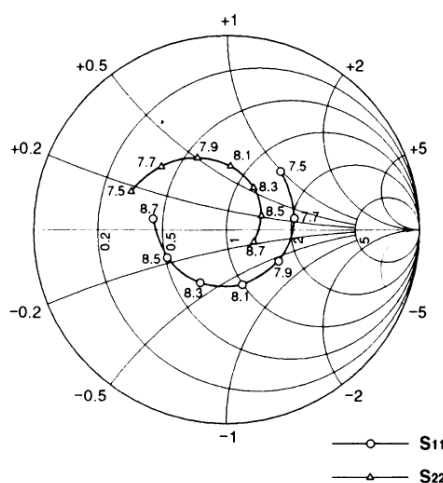
Power Dissipation vs. Case Temperature



TIM7785-16 S-Parameters (MAGN. and ANGLES)

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

$f = 7.5 \sim 8.7GHz$



FREQUENCY (GHz)	S ₁₁		S ₁₂		S ₂₁		S ₂₂	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
7.50	0.410	47.1	0.089	-129.2	1.975	-128.9	0.533	158.3
7.70	0.356	9.7	0.100	-155.1	2.062	-155.9	0.470	136.3
7.90	0.315	-30.8	0.110	179.5	2.112	177.0	0.400	112.5
8.10	0.295	-73.5	0.119	154.5	2.126	149.9	0.328	86.7
8.30	0.304	-116.2	0.125	130.0	2.113	123.1	0.257	57.1
8.50	0.339	-155.0	0.130	105.8	2.077	96.6	0.195	21.8
8.70	0.389	171.4	0.133	81.6	2.024	70.3	0.155	-23.9