

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

Features

- Low intermodulation distortion
 - $IM_3 = -45$ dBc at $P_o = 28.5$ dBm, Single Carrier Level
- High power
 - $P_{1dB} = 39.5$ dBm at 5.9 GHz to 6.4 GHz
- High gain
 - $G_{1dB} = 8.5$ dB at 5.9 GHz to 6.4 GHz
- Broadband internally matched
- Hermetically sealed package

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

Characteristic	Symbol	Condition	Unit	Min.	Typ.	Max.
Output Power at 1dB Compression Point	P_{1dB}	$V_{DS} = 10V$ $f = 5.9 \sim 6.4$ GHz	dBm	38.5	39.5	–
Power Gain at 1dB Compression Point	G_{1dB}		dB	7.5	8.5	–
Drain Current	I_{DS}		A	–	2.2	2.6
Gain Flatness	ΔG		dB	–	–	± 0.6
Power Added Efficiency	η_{add}		%	–	35	–
3rd Order Intermodulation Distortion	IM_3	Note 1	dBc	-42	-45	–
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.
Transconductance	gm	$V_{DS} = 3V$ $I_{DS} = 3.0A$	mS	–	1800	–
Pinch-off Voltage	V_{GSoff}	$V_{DS} = 3V$ $I_{DS} = 30$ mA	V	-1	-2.5	-4.0
Saturated Drain Current	I_{DSS}	$V_{DS} = 3V$ $V_{GS} = 0V$	A	–	5.2	7.0
Gate-Source Breakdown Voltage	V_{GSO}	$I_{GS} = -100$ μA	V	-5	–	–
Thermal Resistance	$R_{th(c-c)}$	Channel to Case	$^\circ\text{C/W}$	–	2.5	3.8

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

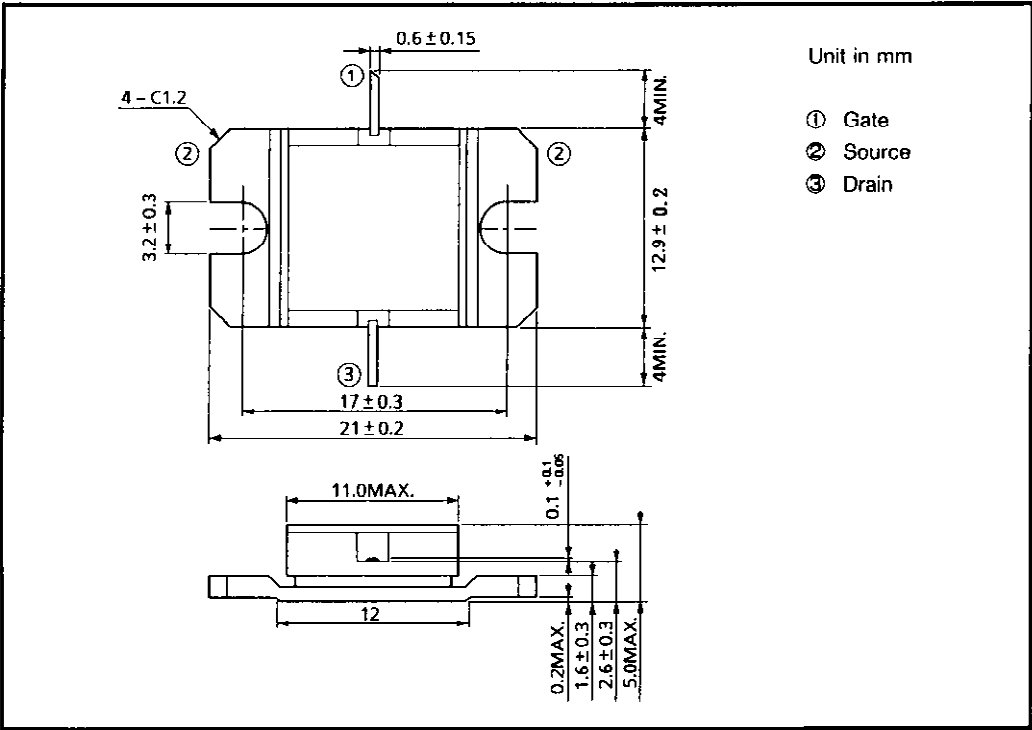
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Absolute Maximum Ratings (T_a = 25°C)

Characteristic	Symbol	Unit	Rating
Drain-Source Voltage	V _{DS}	V	15
Gate-Source Voltage	V _{GS}	V	-5
Drain Current	I _D	A	7.0
Total Power Dissipation (T _C = 25°C)	P _T	W	37.5
Channel Temperature	T _{ch}	°C	175
Storage Temperature	T _{stg}	°C	-65 ~ 175

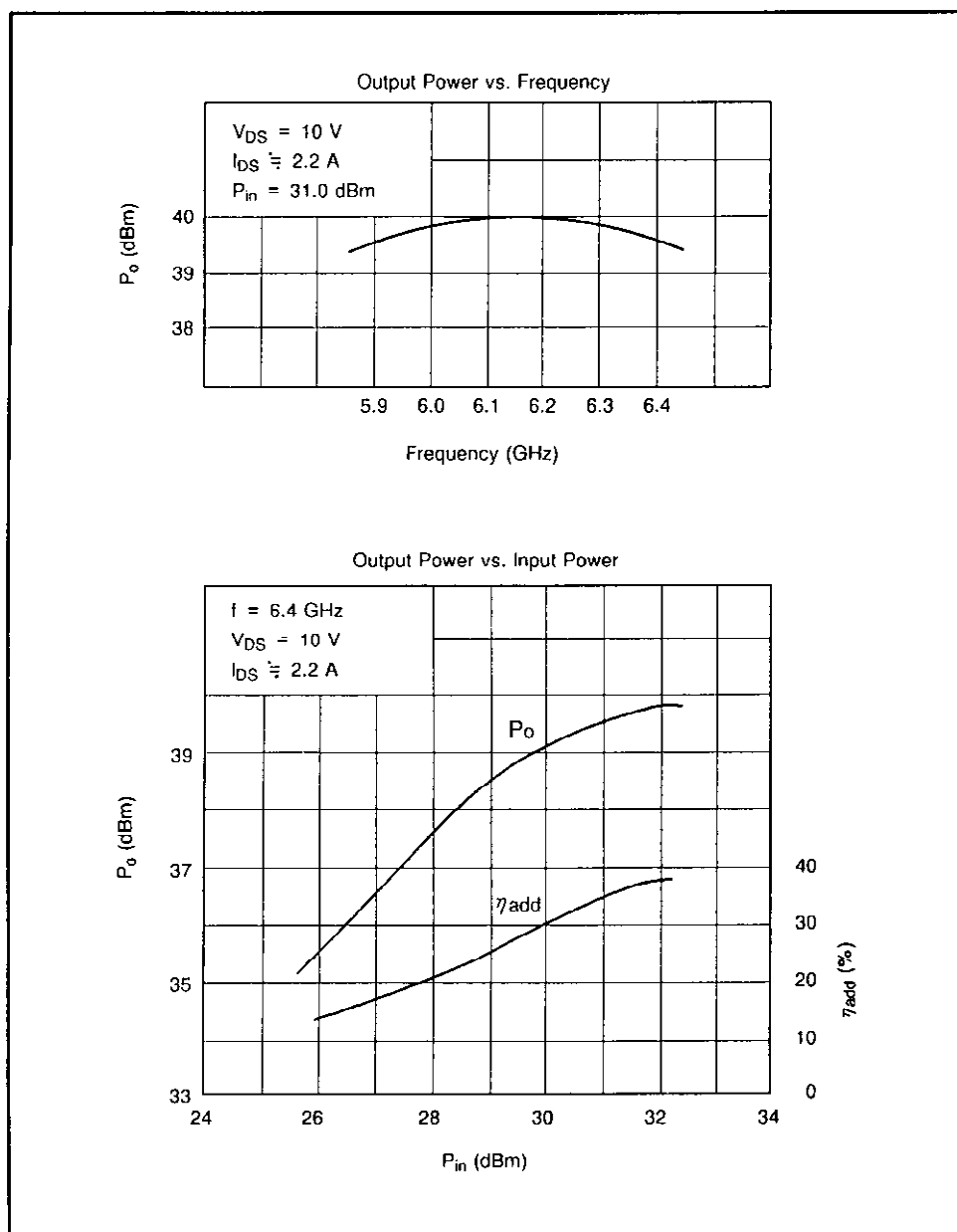
Package Outline (2-11D1B)



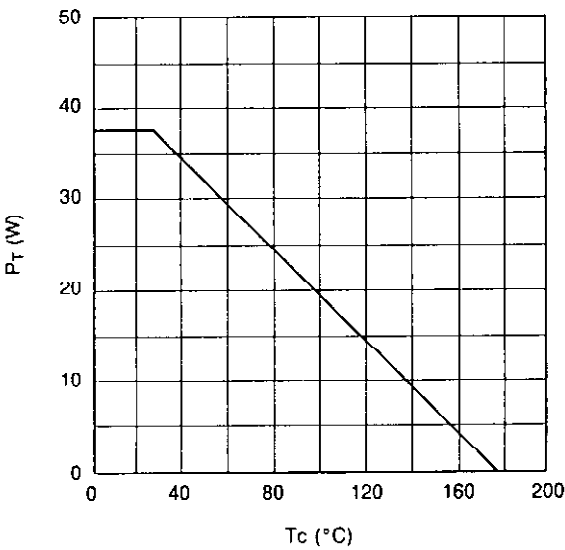
Handling Precautions for Packaged Type

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

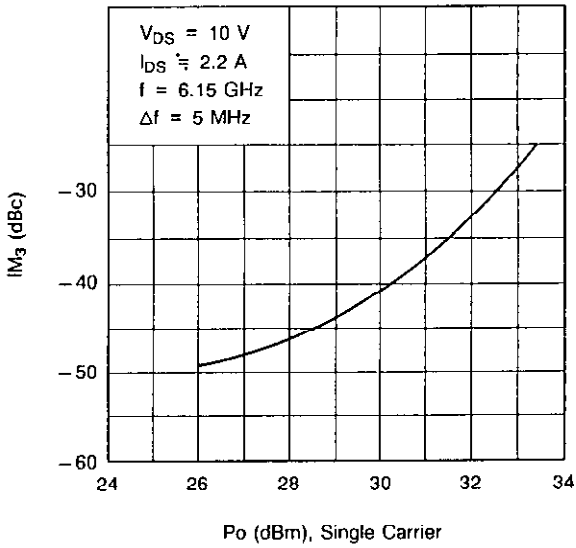
RF Performances



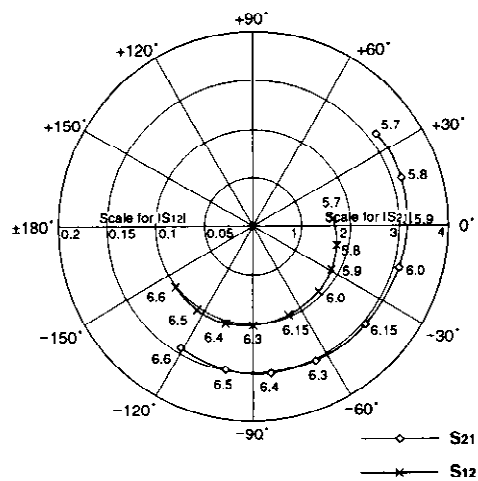
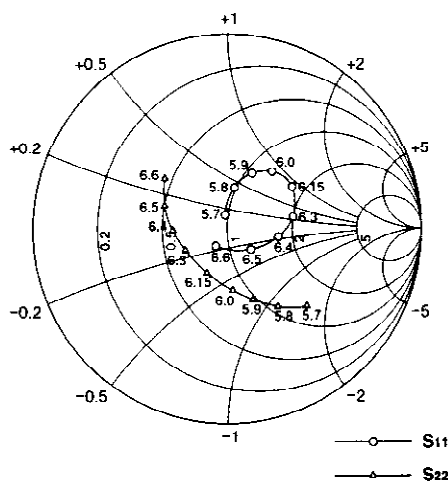
Power Dissipation vs. Case Temperature



IM₃ vs. Output Power Characteristics



TIM5964-8SL S-Parameters (Magn. and Angles)

 $V_{DS} = 10V$, $I_{DS} = 2.0A$ $f = 5.7 \sim 6.6GHz$ 

FREQUENCY (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
5.70	0.077	99	3.162	37	0.082	5	0.569	-44
5.80	0.214	80	3.194	18	0.088	-13	0.475	-57
5.90	0.313	66	3.164	1	0.092	-29	0.387	-70
6.00	0.373	52	3.113	-16	0.095	-45	0.317	-85
6.15	0.397	33	3.058	-41	0.098	-68	0.248	-115
6.30	0.344	10	3.036	-65	0.101	-90	0.242	-153
6.40	0.267	-9	3.026	-83	0.103	-106	0.280	-178
6.50	0.162	-41	2.984	-101	0.103	-124	0.342	160
6.60	0.106	-124	2.884	-121	0.101	-142	0.413	141