

## PRELIMINARY

## Features

- Low intermodulation distortion
  - $IM_3 = -45$  dBc at  $P_o = 30.0$  dBm, Single Carrier Level
- High power
  - $P_{1dB} = 42.0$  dBm at 14.0 GHz to 14.5 GHz
- High gain
  - $G_{1dB} = 6.0$  dB at 14.0 GHz to 14.5 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	$P_{1dB}$	$V_{DS} = 9V$ $f = 14.0 \sim 14.5$ GHz	dBm	41.0	42.0	-
Power Gain at 1dB Compression Point	$G_{1dB}$		dB	5.0	6.0	-
Drain Current	$I_{DS1}$		A	-	4.5	5.5
Gain Flatness	$\Delta G$		dB	-	-	$\pm 0.8$
Power Added Efficiency	$\eta_{add}$		%	-	29	-
3rd Order Intermodulation Distortion	$IM_3$	Note 1	dBc	-42	-45	-
Drain Current	$I_{DS2}$		A	-	4.5	5.5
Channel-Temperature Rise	$\Delta T_{ch}$	$V_{DS} \times I_{DS} \times R_{th(c-c)}$	$^\circ\text{C}$	-	-	100

Note 1: 2-tone Test Pout,  $P_o = 30.0$  dBm Single Carrier Level.

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

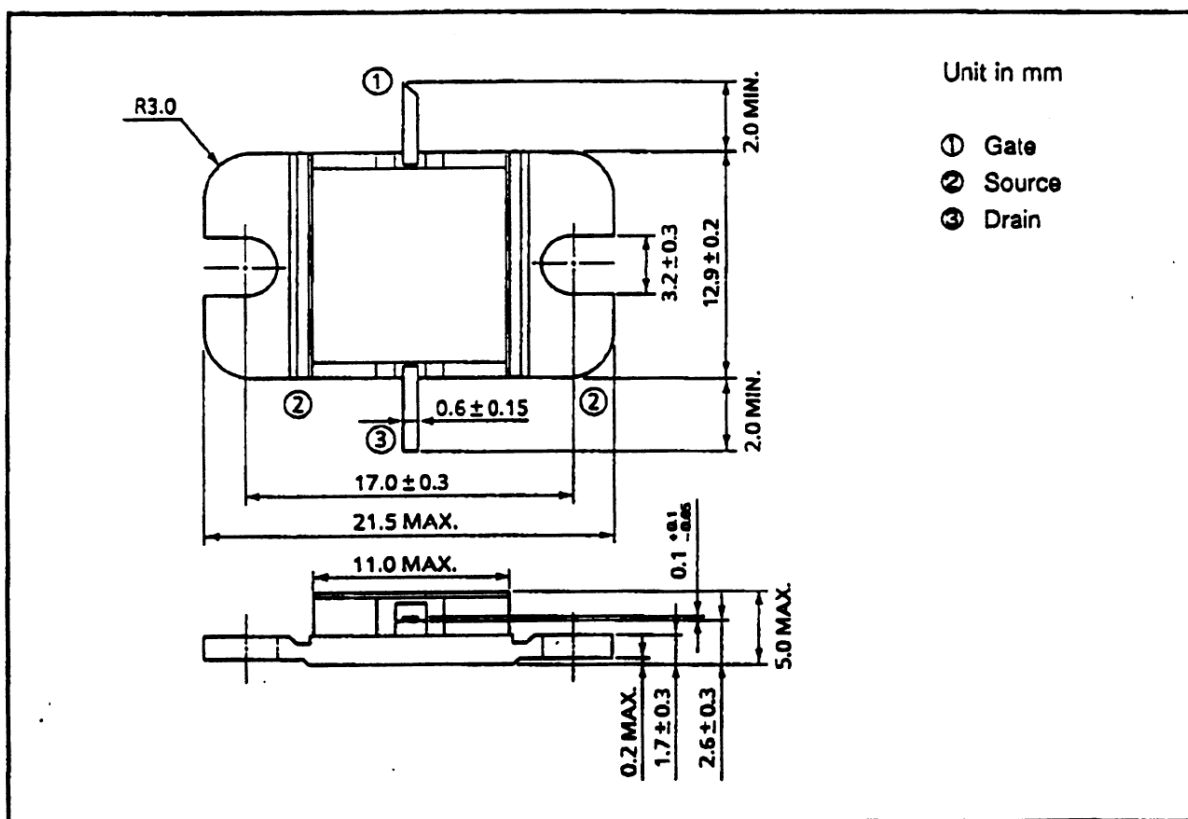
Characteristic	Symbol	Condition	Unit	Min.	Typ.	Max.
Transconductance	gm	$V_{DS} = 3V$ $I_{DS} = 4.8A$	mS	-	3000	-
Pinch-off Voltage	$V_{GSoff}$	$V_{DS} = 3V$ $I_{DS} = 145$ mA	V	-1.5	-3.0	-4.5
Saturated Drain Current	$I_{DSS}$	$V_{DS} = 3V$ $V_{GS} = 0V$	A	-	10.0	11.5
Gate-Source Breakdown Voltage	$V_{GSO}$	$I_{GS} = -145$ $\mu\text{A}$	V	-5	-	-
Thermal Resistance	$R_{th(c-c)}$	Channel to Case	$^\circ\text{C/W}$	-	2.0	2.5

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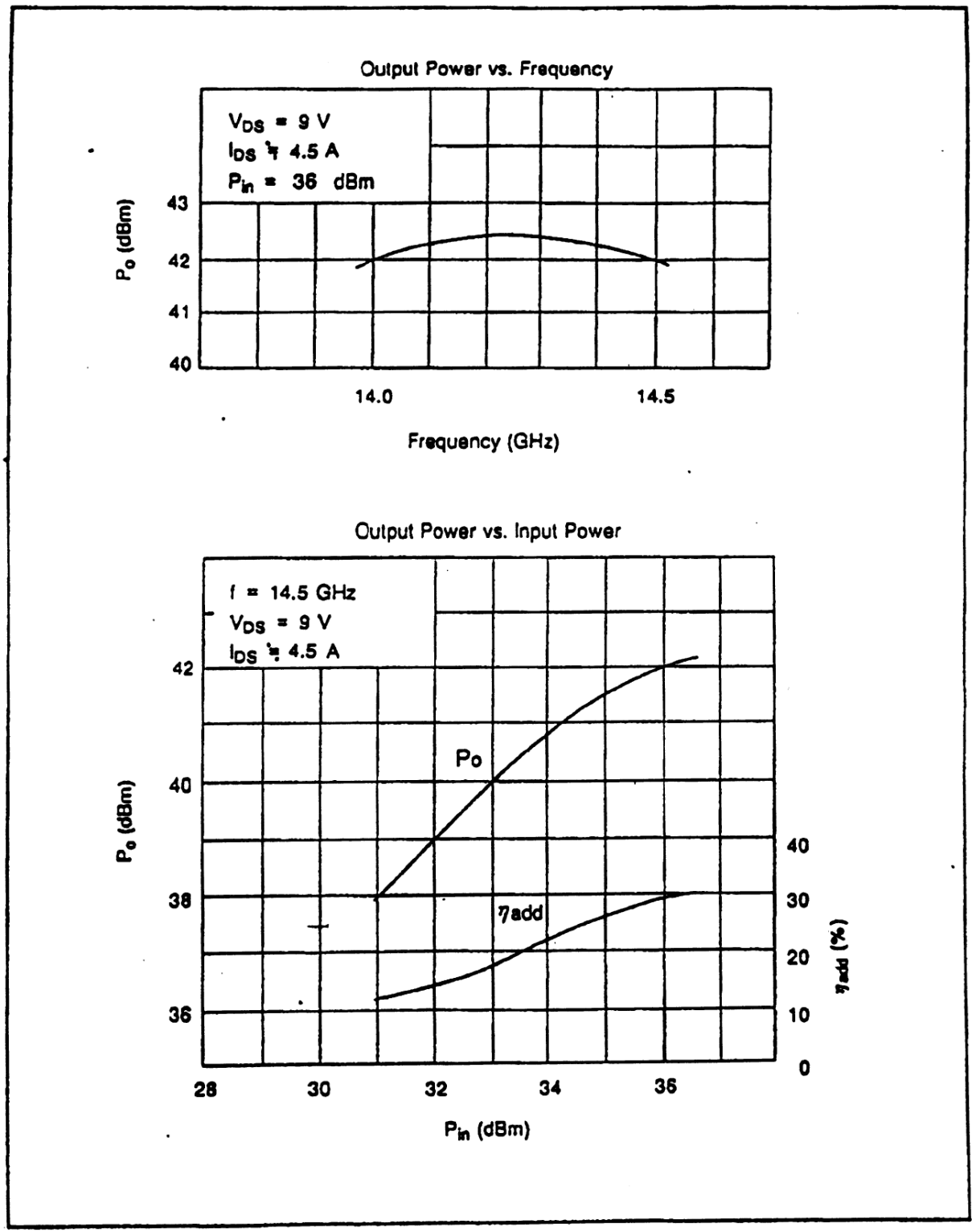
**TIM1414-15L****Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )**

Characteristic	Symbol	Unit	Rating
Drain-Source Voltage	$V_{DS}$	V	15
Gate-Source Voltage	$V_{GS}$	V	-5
Drain Current	$I_{DS}$	A	11.5
Total Power Dissipation ( $T_c = 25^\circ\text{C}$ )	$P_T$	W	60
Channel Temperature	$T_{ch}$	$^\circ\text{C}$	175
Storage Temperature	$T_{stg}$	$^\circ\text{C}$	-65 ~ 175

**Package Outline (2-11C1B)****Handling Precautions for Packaged Type**

Soldering iron should be grounded and the operating time should not exceed 10 seconds at  $260^\circ\text{C}$ .

RF Performances

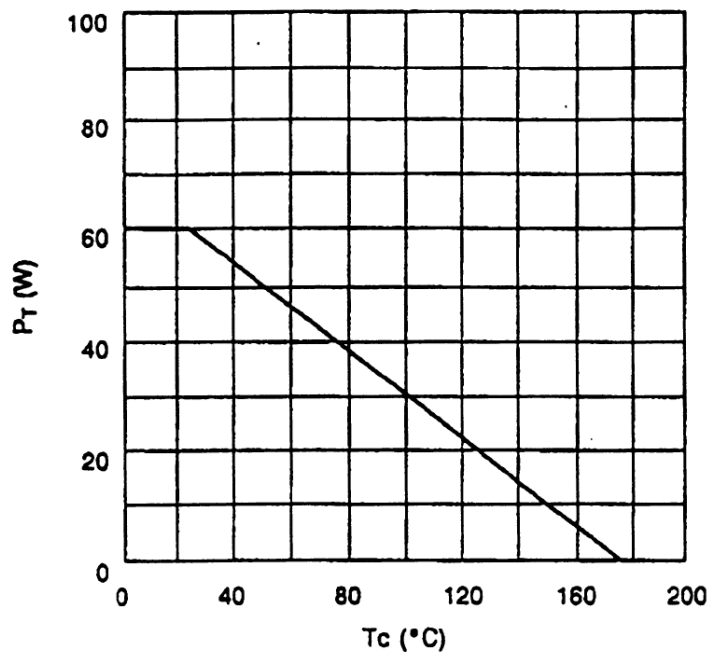


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# TIM1414-15L

## Power Dissipation vs. Case Temperature

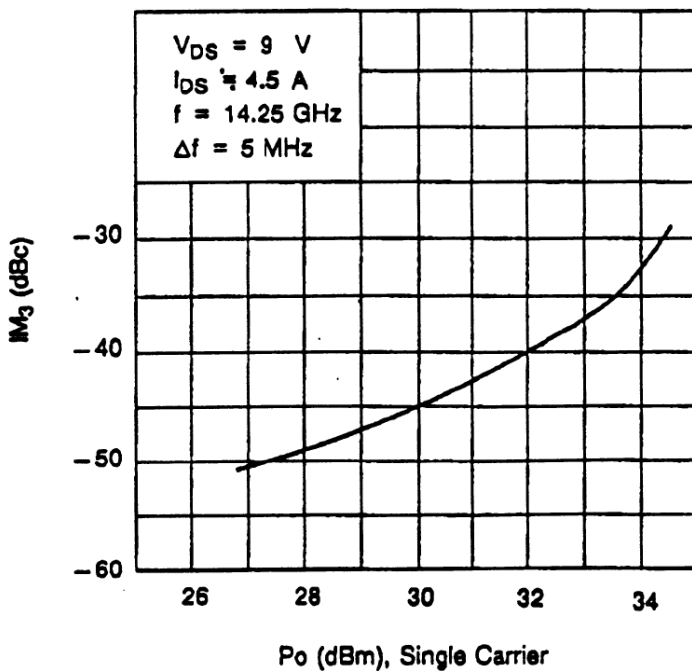


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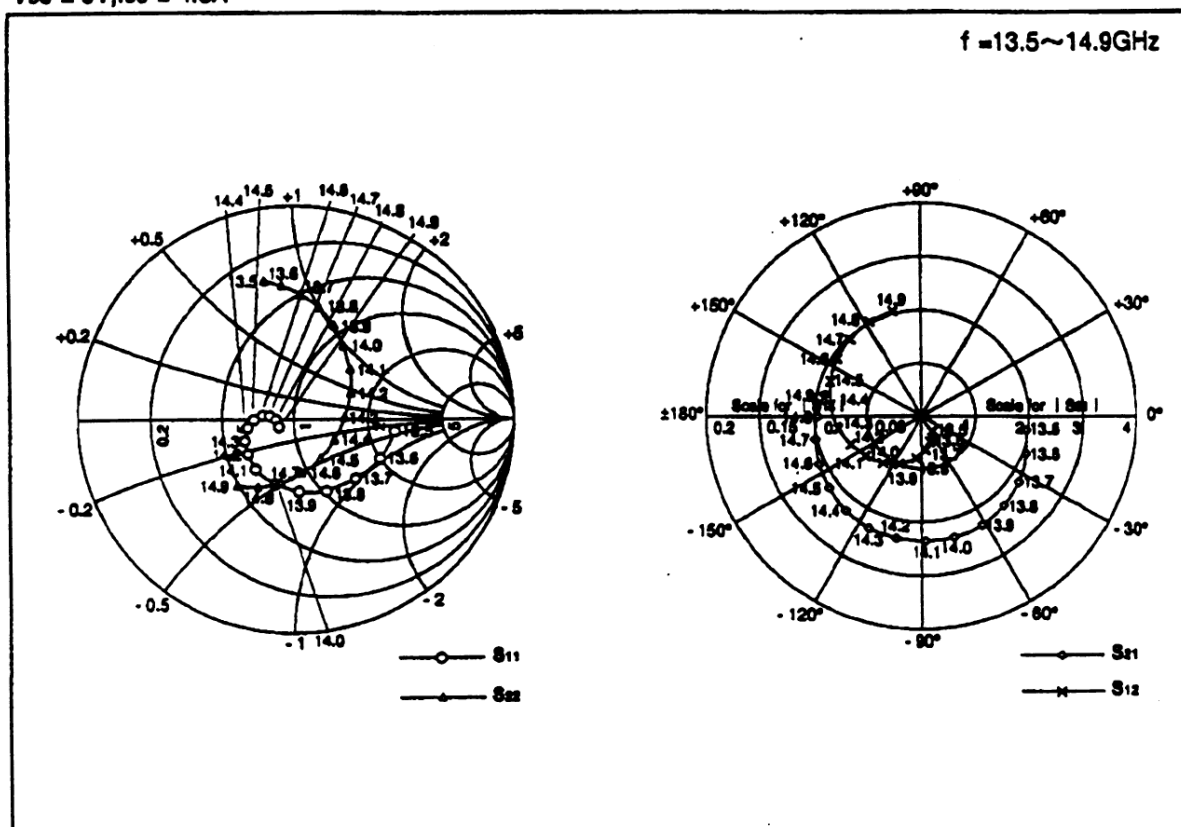
## IM<sub>3</sub> vs. Output Power Characteristics



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## TIM1414-15L S-Parameters (Magn. and Angles)

 $V_{DS} = 9V, I_{DS} = 4.5A$ 

FREQUENCY (MHz)	$S_{11}$		$S_{12}$		$S_{21}$		$S_{22}$	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
13.5	0.475	-6.2	0.017	-56.5	1.962	-7.6	0.669	102.1
13.6	0.435	-24.8	0.024	-71.9	2.070	-20.5	0.634	94.7
13.7	0.397	-44.8	0.031	-86.9	2.172	-33.9	0.592	86.8
13.8	0.364	-65.6	0.039	-101.7	2.247	-47.5	0.541	78.1
13.9	0.335	-86.5	0.048	-116.5	2.298	-61.3	0.482	68.3
14.0	0.310	-107.0	0.056	-131.3	2.325	-75.1	0.419	57.0
14.1	0.289	-126.1	0.064	-145.7	2.329	-88.9	0.355	43.5
14.2	0.267	-143.3	0.072	-159.8	2.316	-102.3	0.293	26.8
14.3	0.243	-158.5	0.079	-173.9	2.285	-115.8	0.241	4.6
14.4	0.215	-171.2	0.086	172.3	2.245	-129.1	0.212	-24.1
14.5	0.183	178.1	0.092	158.6	2.190	-142.3	0.216	-55.1
14.6	0.147	171.3	0.096	145.0	2.123	-155.3	0.249	-81.5
14.7	0.112	169.9	0.100	131.7	2.046	-168.1	0.299	-102.0
14.8	0.084	178.9	0.102	118.8	1.963	179.5	0.353	-117.9
14.9	0.074	-181.1	0.103	106.2	1.875	167.2	0.404	-130.7