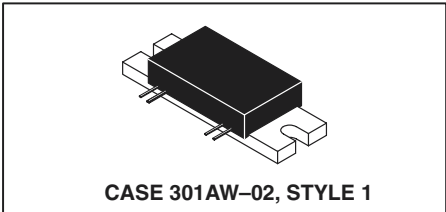


# The RF Line PCS Band RF Power LDMOS Amplifiers

**MHW1810-1  
 MHW1810-2**

**1805–1880 MHz, 10 W  
 RF POWER LDMOS AMPLIFIERS**



- Specified 26 Volts, 1805–1880 MHz, Class AB Characteristics  
 Output Power = 16 Watts CW Typ  
 Power Gain = 26 dB Typ @ 10 Watts (MHW1810-1)  
 Power Gain = 34 dB Typ @ 10 Watts (MHW1810-2)  
 Efficiency = 34% Min @ 10 Watts
- 50 Ω Input/Output System
- Designed for GSM Linearity Requirements

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## MAXIMUM RATINGS

Rating	Symbol	Value	Unit
DC Supply Voltage	$V_S$	28	Vdc
DC Bias Voltage	$V_{bias}$	28	Vdc
RF Input Power	$P_{in}$	MHW1810-1: 21 MHW1810-2: 16	dBm
RF Output Power	$P_{out}$	20	W
Operating Case Temperature Range	$T_C$	-10 to +90	°C
Storage Temperature Range	$T_{stg}$	-30 to +100	°C

## ELECTRICAL CHARACTERISTICS ( $T_C = +25^\circ\text{C}$ , $V_S = 26\text{ Vdc}$ ; $V_{bias} = 5\text{ Vdc}$ ; 50 Ω system, unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Frequency Range	BW	1805	—	1880	MHz
Quiescent Current ( $P_{in} = 0\text{ mW}$ )	$I_{DQ}$	100	—	150	mA
Bias Current	$I_{bias}$	—	—	2	mA
Output Power at 1 dB Compression	$P_{1dB}$	10	14	—	W
Power Gain ( $P_{out} = 10\text{ W}$ ) ( $P_{out} = 10\text{ W}$ )	$G_p$	MHW1810-1: 24 MHW1810-2: 32	26 34	28 36	dB
Efficiency ( $P_{out} = 10\text{ W}$ )	$\eta$	34	—	—	%
Input VSWR ( $P_{out} = 10\text{ W}$ )	$VSWR_{in}$	—	—	1.8:1	—
Harmonics at $2f_o$ ( $P_{out} = 10\text{ W}$ )	$H_2$	—	—	-35	dBc
Harmonics at $3f_o$ ( $P_{out} = 10\text{ W}$ )	$H_3$	—	—	-45	dBc
Reverse IMD; $P_{out} = 10\text{ W}$ ; Preverse = -40 dBc ( $F1 = F0 \pm 200\text{ kHz}$ @ -40 dBc)	$IMD_r$	—	—	-50	dBc
Load Mismatch Stress Load VSWR = 5:1, All Phase Angles	$\psi$	No Degradation in Output Power			
Stability ( $P_{out} = 10\text{ mW}$ to 10 W, $V_S \leq 26\text{ Vdc}$ ) Load VSWR = 5:1, All Phase Angles	—	All Spurious Outputs More Than 60 dB Below Desired Signal			

NOTE – **CAUTION** – MOS devices are susceptible to damage from electrostatic charge. Reasonable precautions in handling and packaging MOS devices should be observed.

**EXTREME CASE ELECTRICAL CHARACTERISTICS** ( $T_C = -10$  to  $+85^\circ\text{C}$ ,  $V_S = 23.5$  to  $26$  Vdc,  $V_{\text{bias}} = 3$  to  $26$  Vdc,  $50\ \Omega$  system, unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Frequency Range	BW	1805	—	1880	MHz
Quiescent Current ( $P_{\text{in}} = 0$ mW)	$I_{\text{DQ}}$	100	—	160	mA
Bias Current	$I_{\text{bias}}$	—	—	2	mA
Output Power at 1 dB Compression	$P_{1\text{dB}}$	8	—	—	W
Power Gain Variation for a Given Part ( $P_{\text{out}} = 10$ W)	$G_p$	—	5	6.5	dB
Efficiency ( $P_{\text{out}} = 10$ W)	$\eta$	32	—	—	%
Input VSWR	$\text{VSWR}_{\text{in}}$	—	—	2:1	—
Harmonics at $2f_o$	$H_2$	—	—	-35	dBc
Harmonics at $3f_o$	$H_3$	—	—	-45	dBc
Reverse IMD; $P_{\text{out}} = 10$ W; Preverse = -40 dBc ( $F1 = F0 \pm 200$ kHz @ -40 dBc)	$\text{IMD}_r$	—	—	-50	dBc
Load Mismatch Stress Load VSWR = 5:1, All Phase Angles	$\psi$	No Degradation in Output Power			
Stability ( $P_{\text{out}} = 10$ mW to $10$ W, $V_S \leq 26$ Vdc) Load VSWR = 5:1, All Phase Angles	—	All Spurious Outputs More Than 60 dB Below Desired Signal			

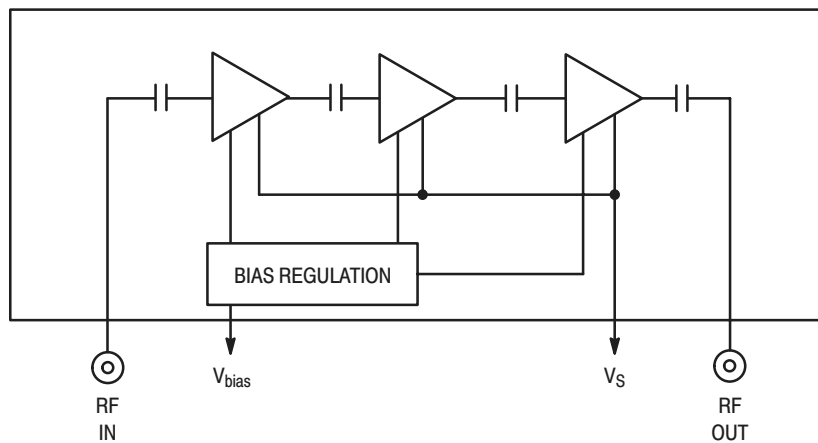
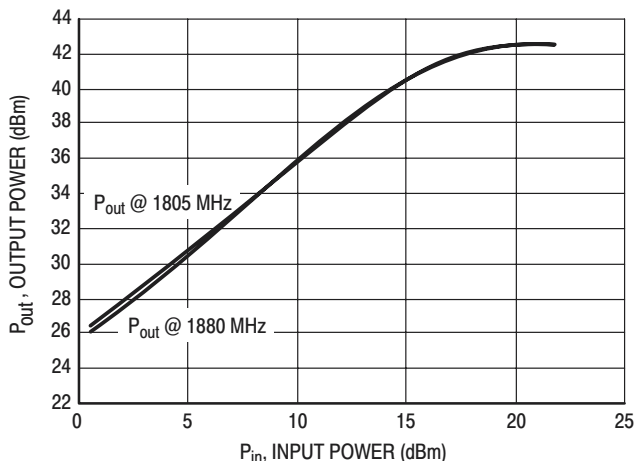
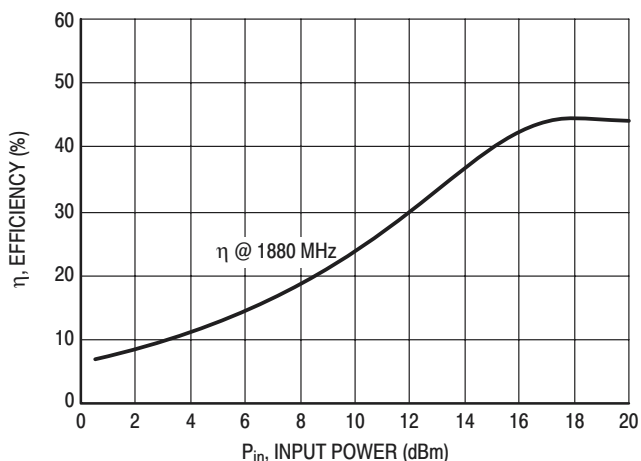


Figure 1. Internal Diagram

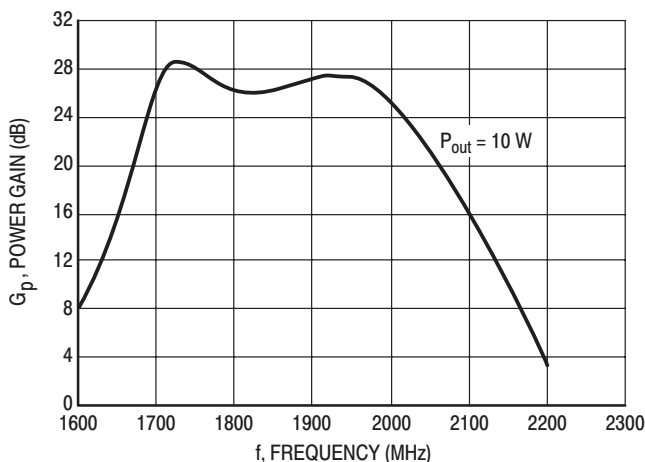
## TYPICAL CHARACTERISTICS MHW1810-1



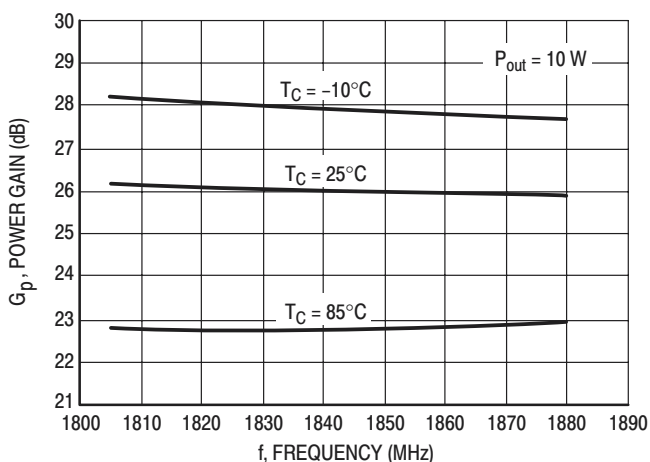
**Figure 2. Output Power versus Input Power**



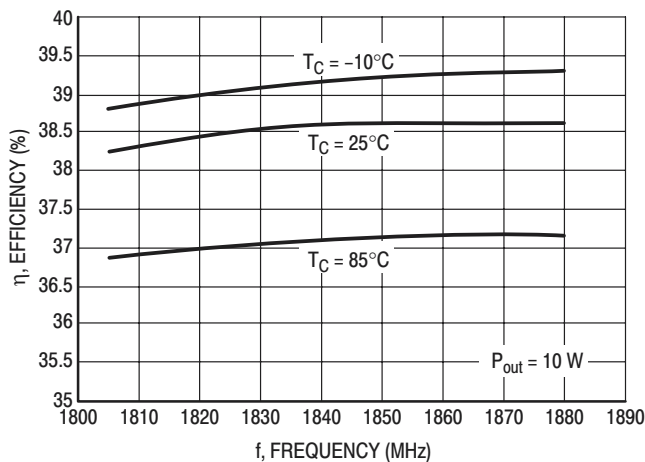
**Figure 3. Efficiency versus Input Power**



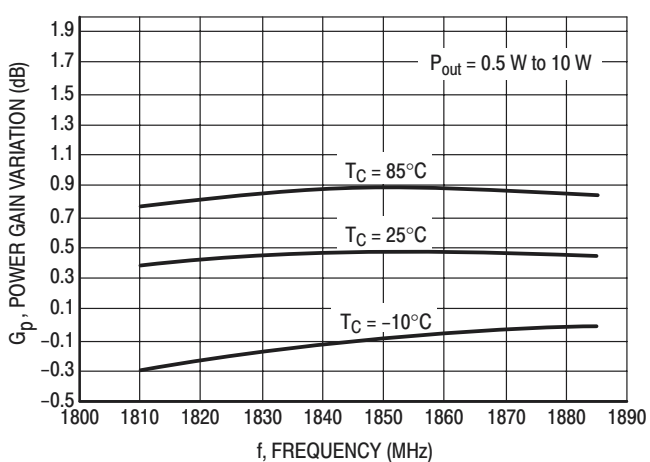
**Figure 4. Power Gain versus Frequency**



**Figure 5. Gain versus Frequency**



**Figure 6. Efficiency versus Frequency**



**Figure 7. Power Gain Variation versus Frequency**

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TYPICAL CHARACTERISTICS  
MHW1810-1

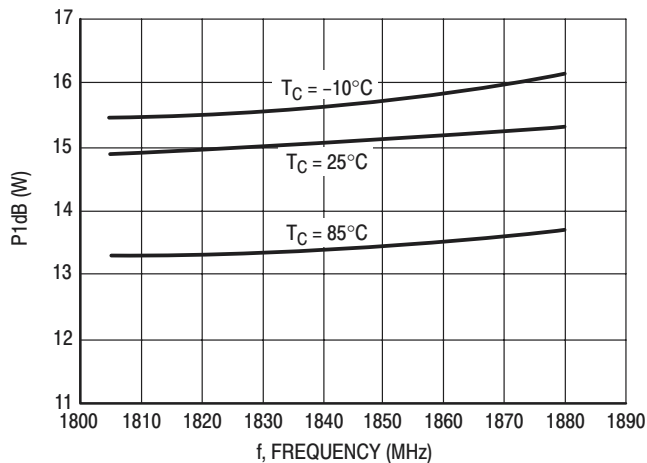


Figure 8. P1dB versus Frequency

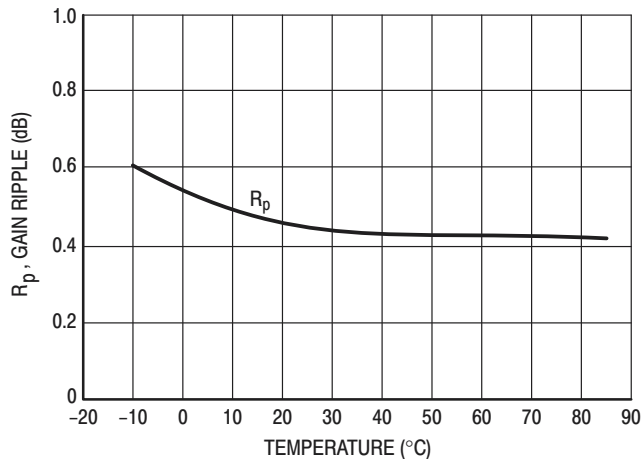


Figure 9. Gain Ripple versus Temperature

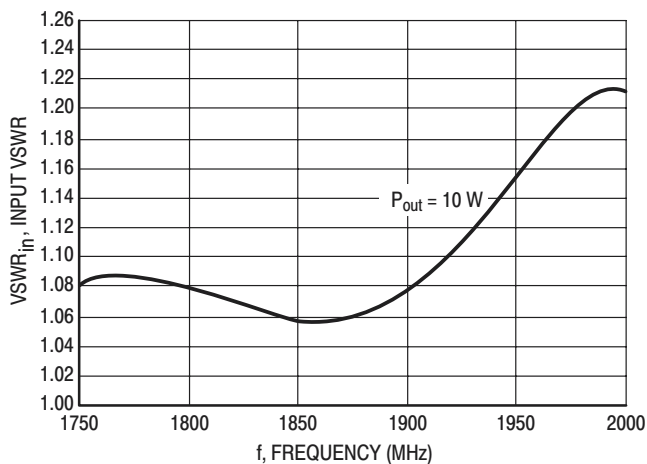


Figure 10. Input VSWR

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### TYPICAL CHARACTERISTICS MHW1810-2

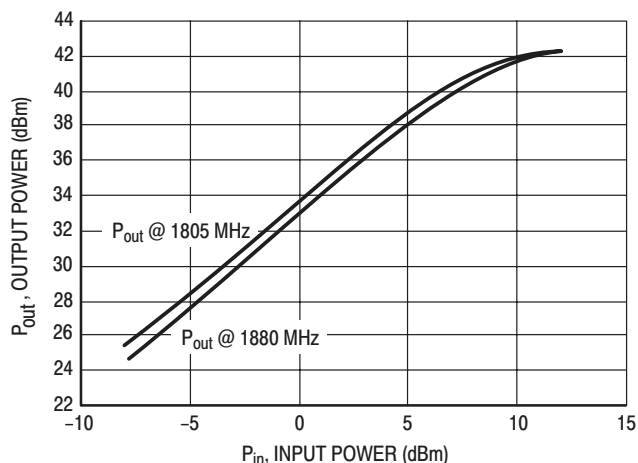


Figure 11. Output Power versus Input Power

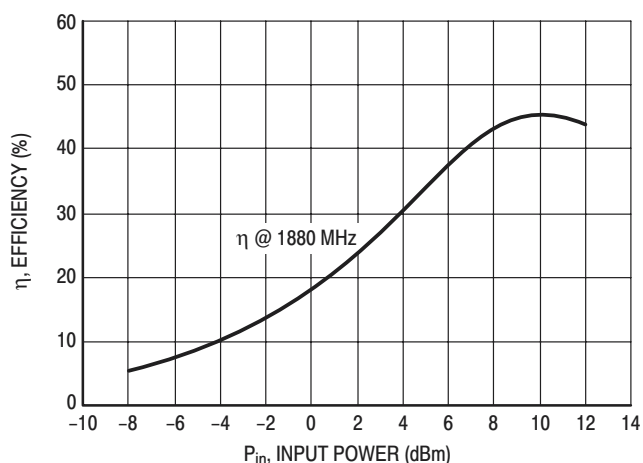


Figure 12. Efficiency versus Input Power

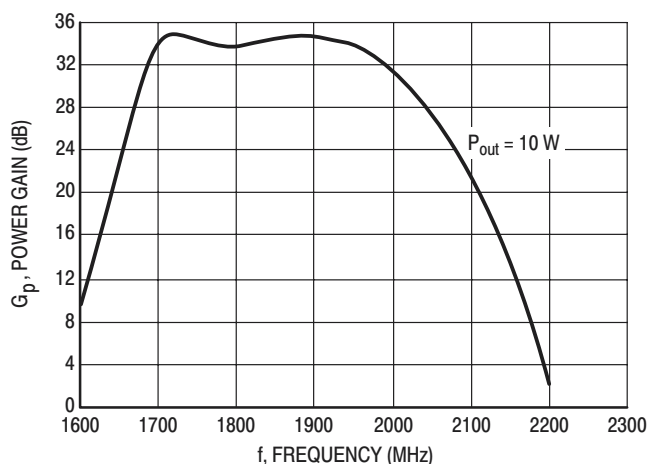


Figure 13. Power Gain versus Frequency

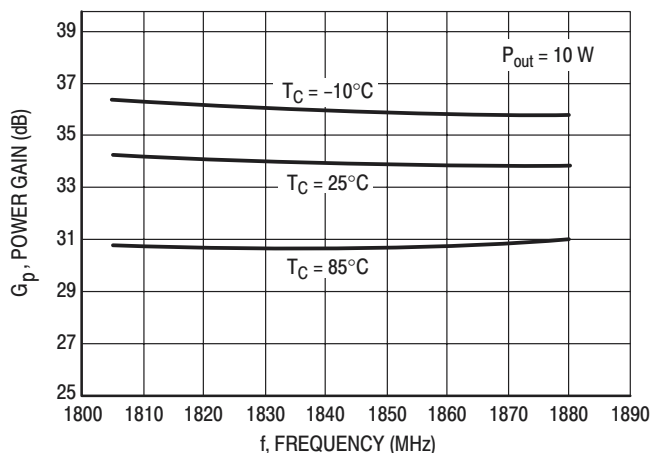


Figure 14. Gain versus Frequency

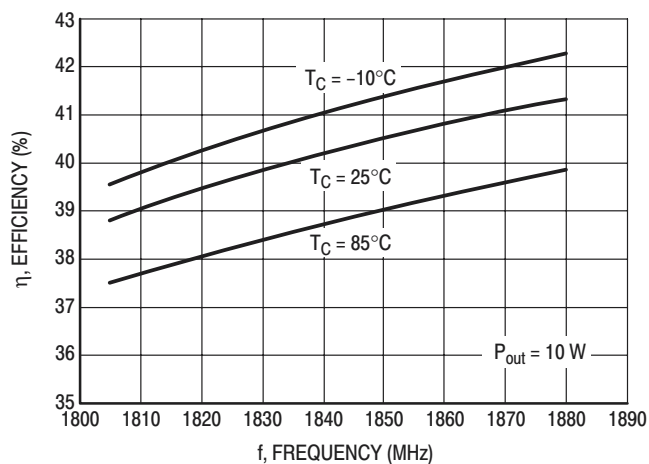


Figure 15. Efficiency versus Frequency

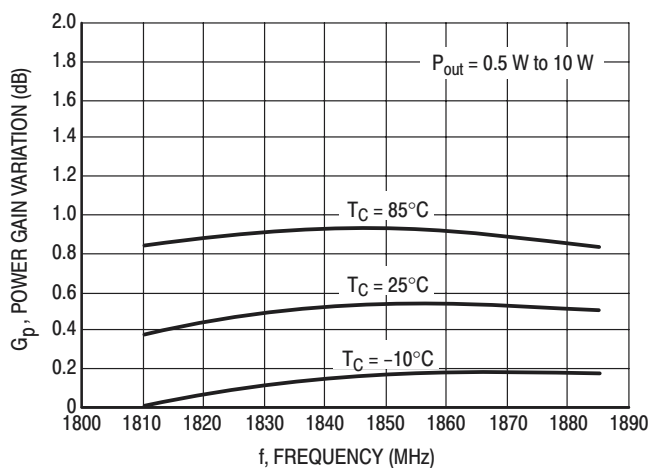


Figure 16. Power Gain Variation versus Frequency

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TYPICAL CHARACTERISTICS  
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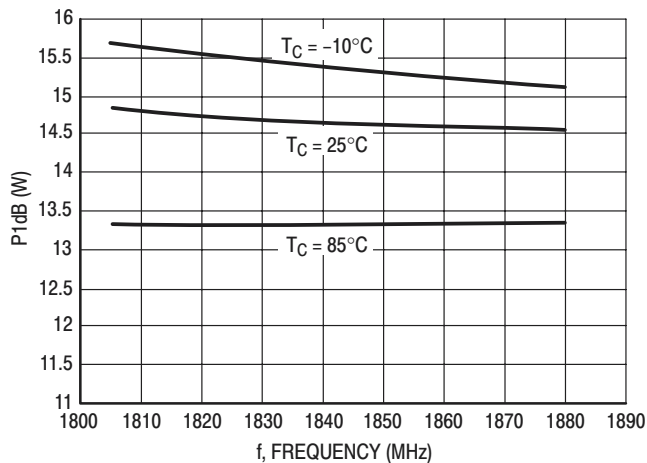


Figure 17. P1dB versus Frequency

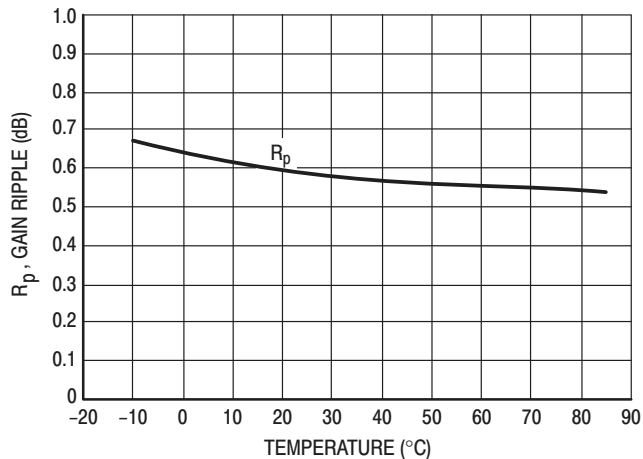


Figure 18. Gain Ripple versus Temperature

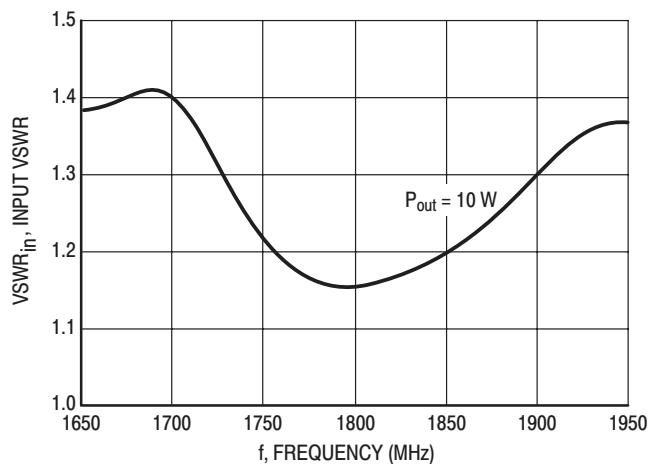


Figure 19. Input VSWR

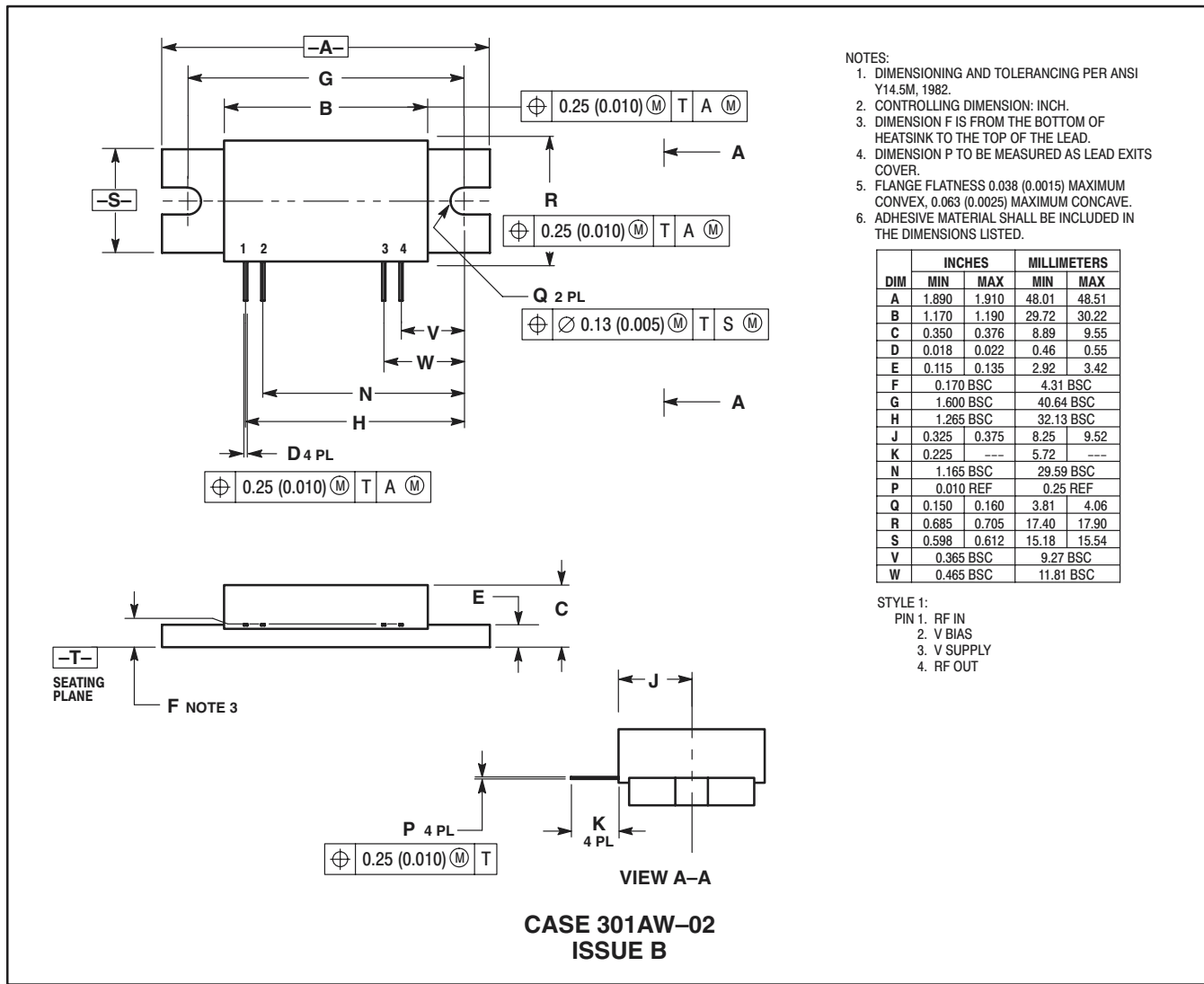
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# NOTES

## PACKAGE DIMENSIONS



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. DIMENSION F IS FROM THE BOTTOM OF HEATSINK TO THE TOP OF THE LEAD.
  4. DIMENSION P TO BE MEASURED AS LEAD EXITS COVER.
  5. FLANGE FLATNESS 0.038 (0.0015) MAXIMUM CONVEX, 0.063 (0.0025) MAXIMUM CONCAVE.
  6. ADHESIVE MATERIAL SHALL BE INCLUDED IN THE DIMENSIONS LISTED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.890	1.910	48.01	48.51
B	1.170	1.190	29.72	30.22
C	0.350	0.376	8.89	9.55
D	0.018	0.022	0.46	0.55
E	0.115	0.135	2.92	3.42
F	0.170 BSC		4.31 BSC	
G	1.600 BSC		40.64 BSC	
H	1.265 BSC		32.13 BSC	
J	0.325	0.375	8.25	9.52
K	0.225	---	5.72	---
N	1.165 BSC		29.59 BSC	
P	0.010 REF		0.25 REF	
Q	0.150	0.160	3.81	4.06
R	0.685	0.705	17.40	17.90
S	0.598	0.612	15.18	15.54
V	0.365 BSC		9.27 BSC	
W	0.465 BSC		11.81 BSC	

- STYLE 1:  
 PIN 1: RF IN  
 2: V BIAS  
 3: V SUPPLY  
 4: RF OUT

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