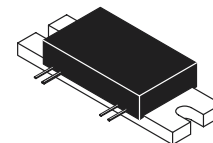


The RF Line
PCS Band
RF Power LDMOS Amplifiers

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



CASE 301AW-02, STYLE 1

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 ($P_{out} = 10\text{ W}$)	η	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	ψ	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_{DQ}	100	—	160	mA
Bias Current	I_{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)	η	32	—	—	%
Input VSWR	VSWR_{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)	IMD_r	—	—	-50	dBc
Load Mismatch Stress Load VSWR = 5:1, All Phase Angles	ψ	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			

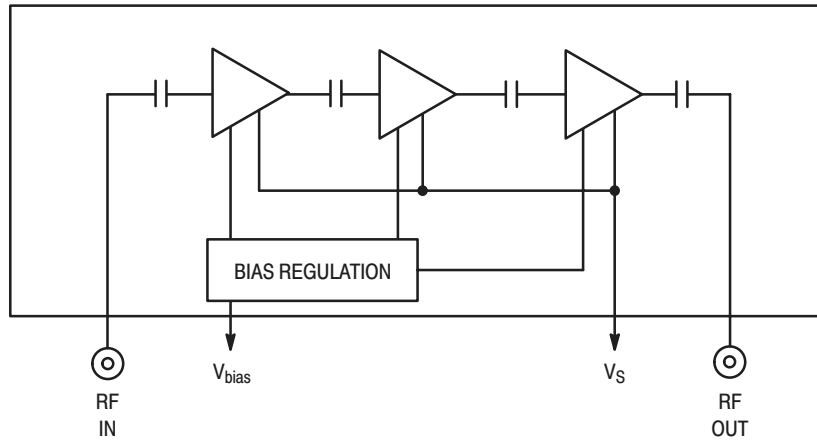


Figure 1. Internal Diagram

TYPICAL CHARACTERISTICS
MHW1810-1

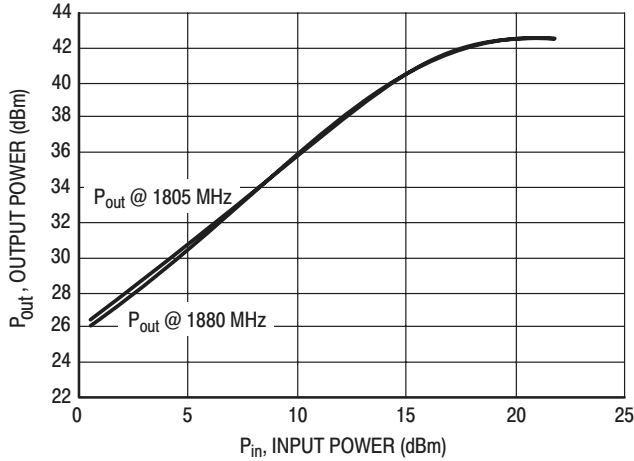


Figure 2. Output Power versus Input Power

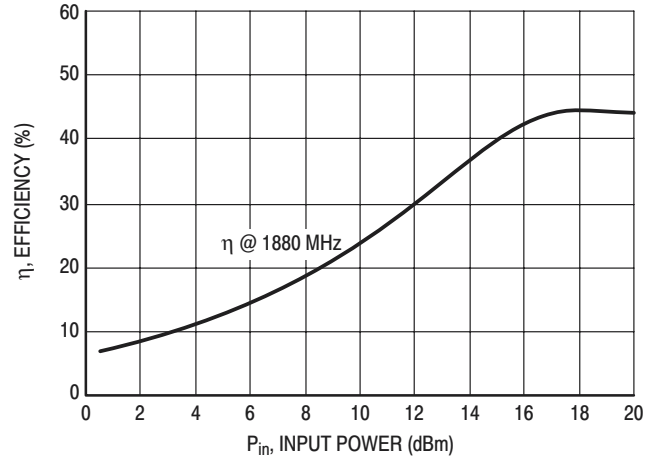


Figure 3. Efficiency versus Input Power

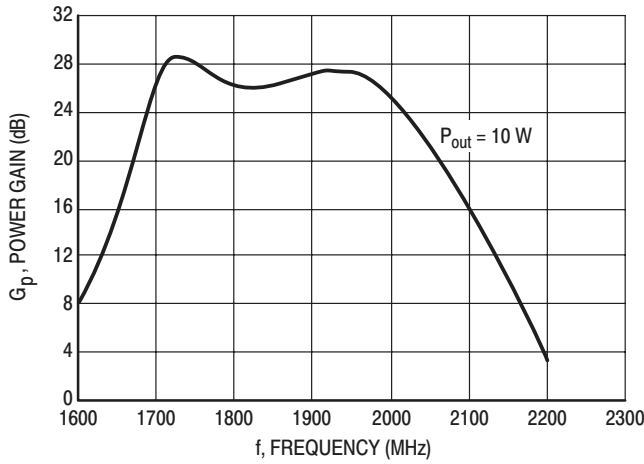


Figure 4. Power Gain versus Frequency

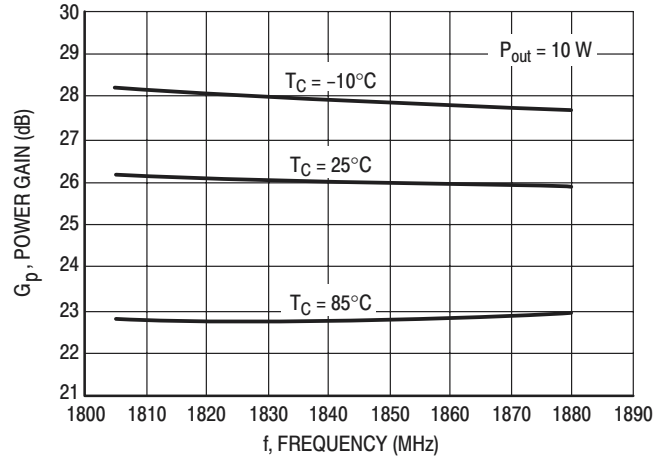


Figure 5. Gain versus Frequency

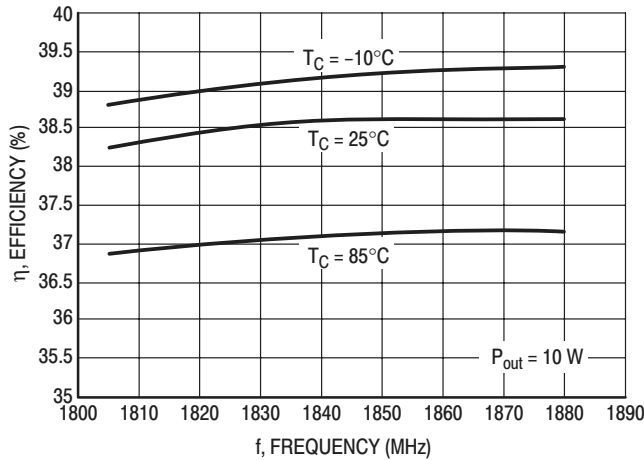


Figure 6. Efficiency versus Frequency

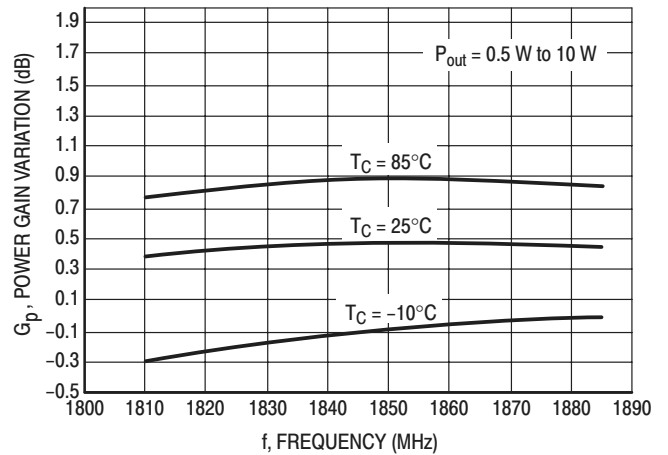


Figure 7. Power Gain Variation versus Frequency

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TYPICAL CHARACTERISTICS
MHW1810-1

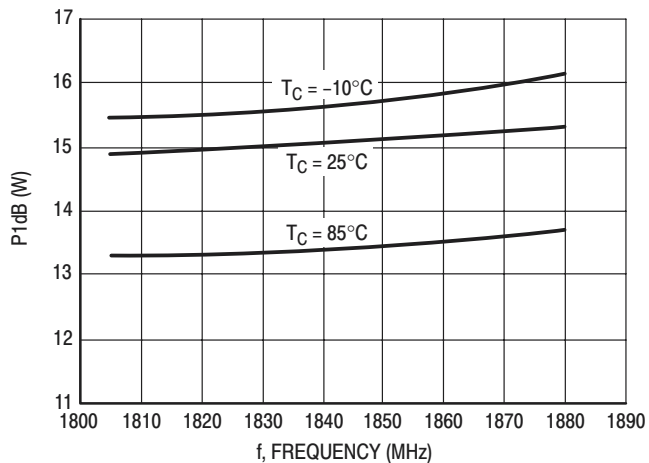


Figure 8. P1dB versus Frequency

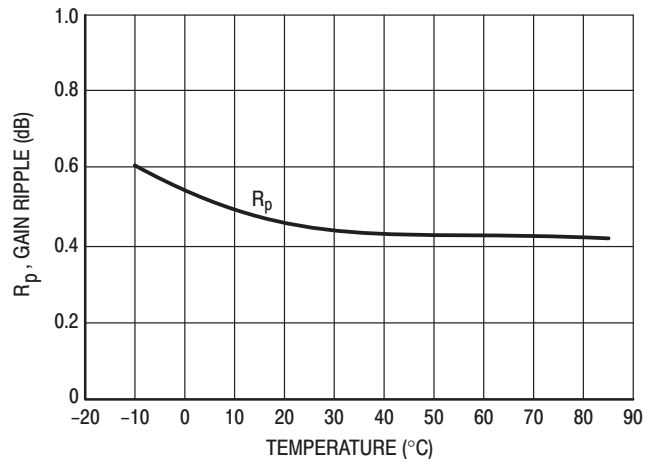


Figure 9. Gain Ripple versus Temperature

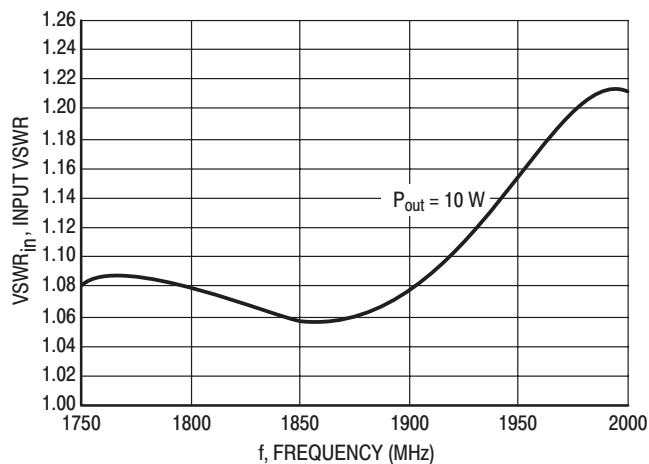


Figure 10. Input VSWR

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TYPICAL CHARACTERISTICS
MHW1810-2

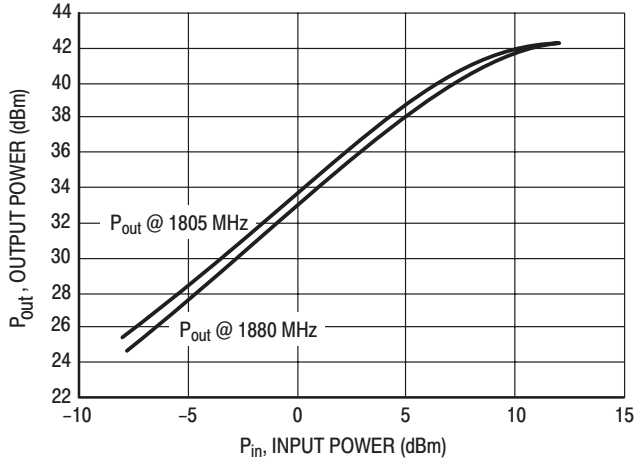


Figure 11. Output Power versus Input Power

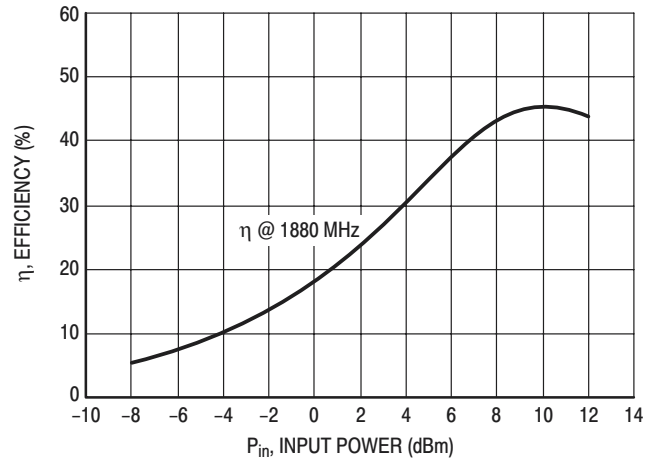


Figure 12. Efficiency versus Input Power

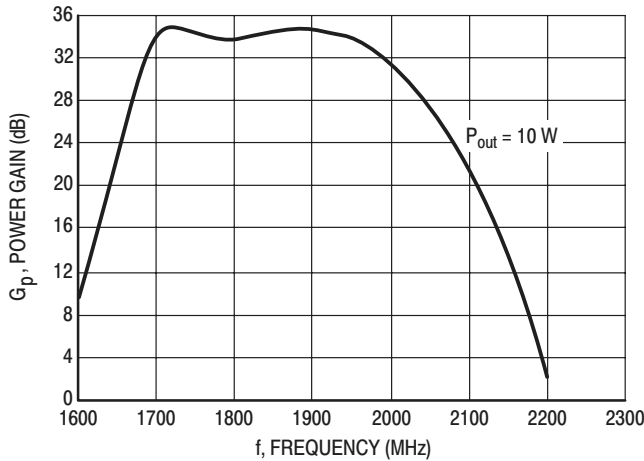


Figure 13. Power Gain versus Frequency

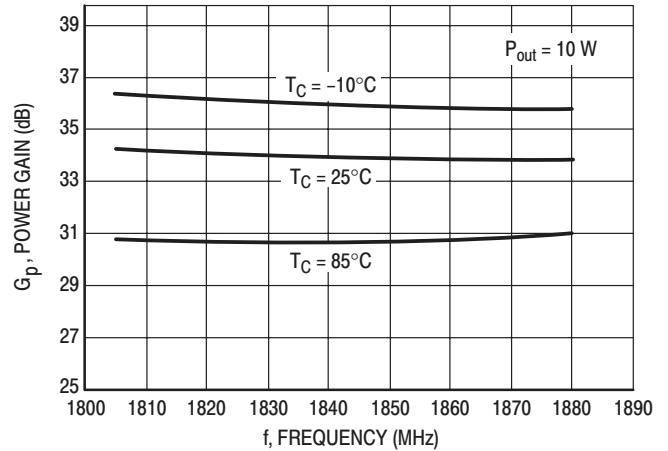


Figure 14. Gain versus Frequency

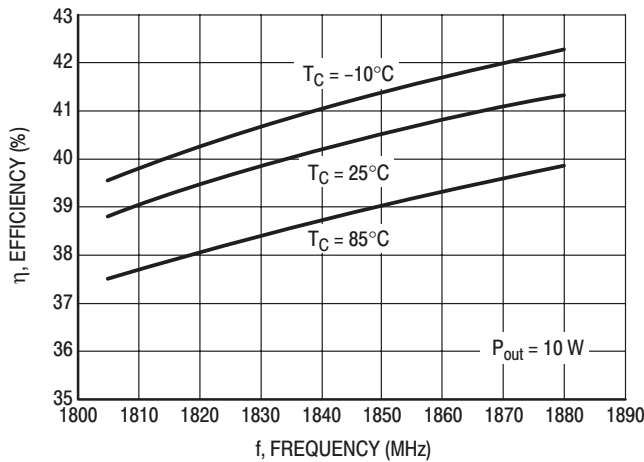


Figure 15. Efficiency versus Frequency

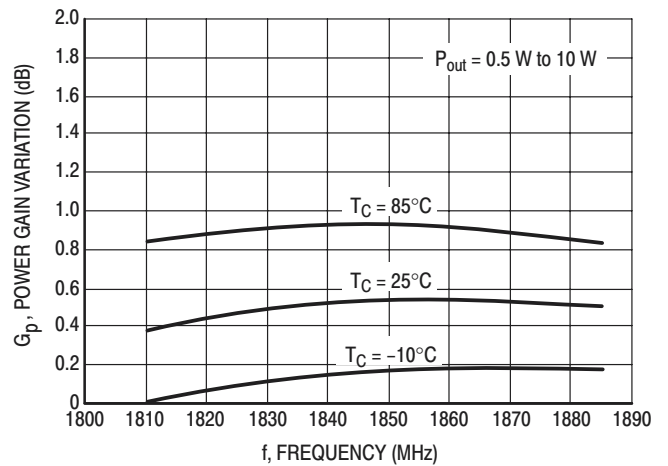


Figure 16. Power Gain Variation versus Frequency

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TYPICAL CHARACTERISTICS
MHW1810-2

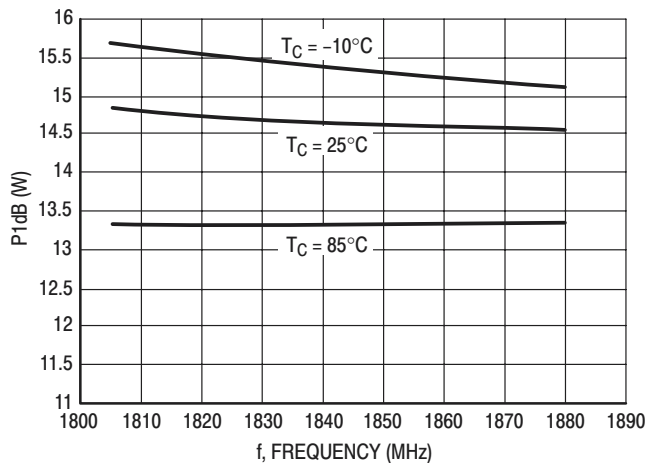


Figure 17. P1dB versus Frequency

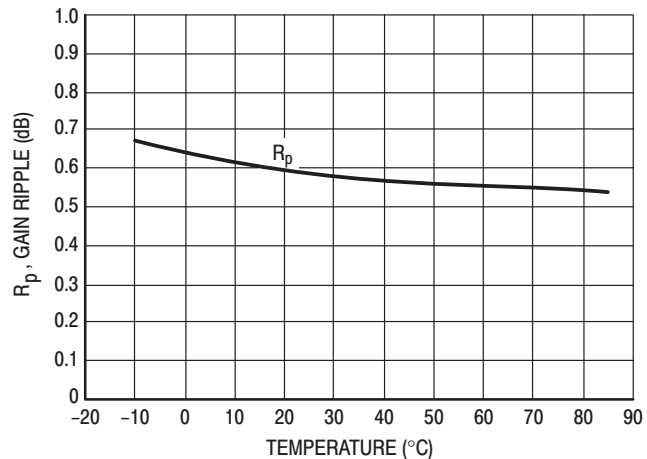


Figure 18. Gain Ripple versus Temperature

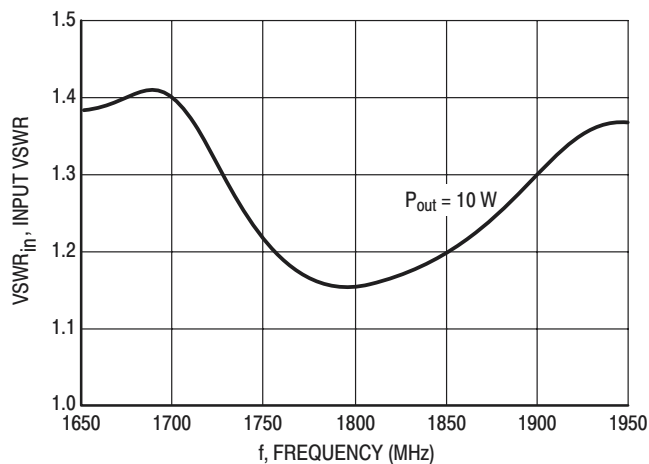


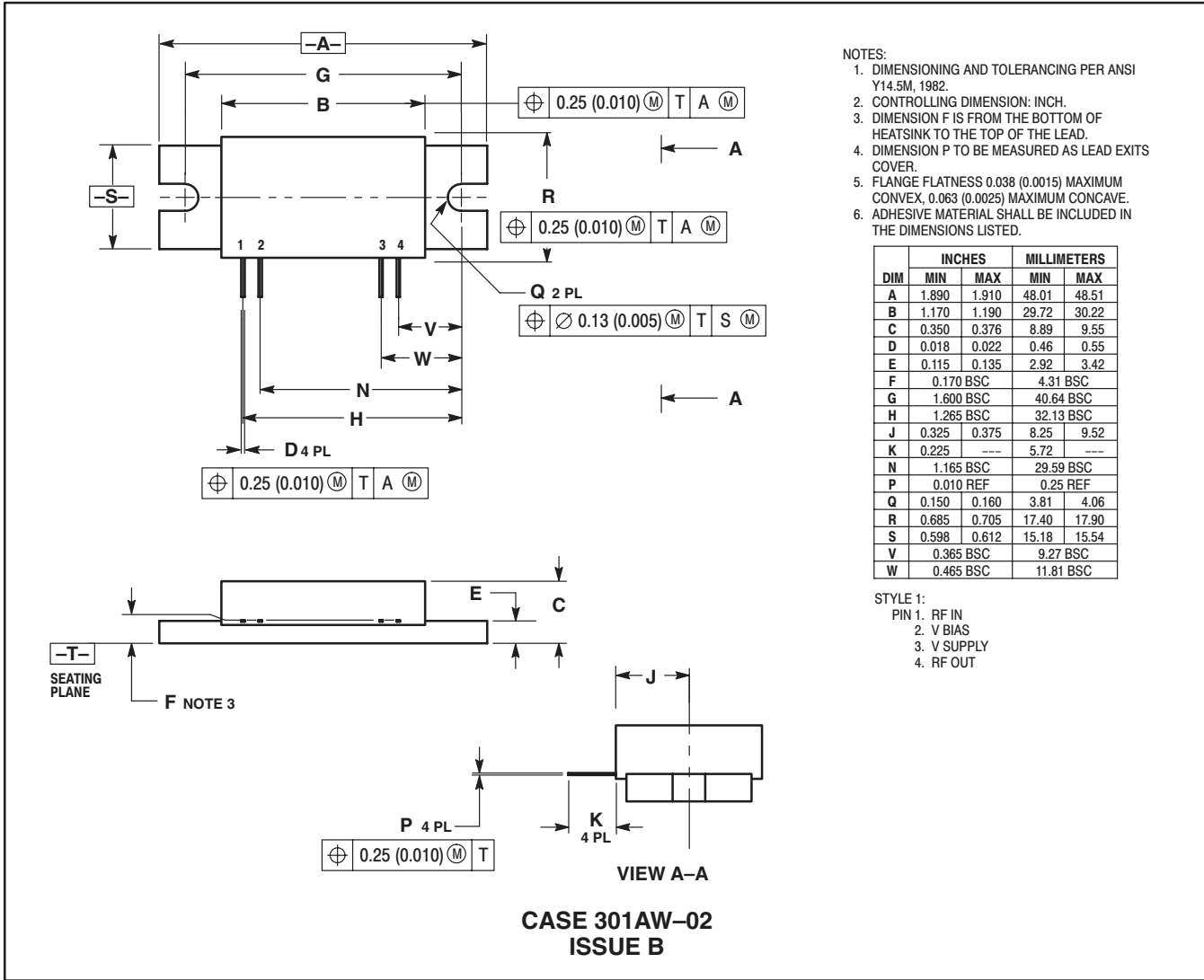
Figure 19. Input VSWR

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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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