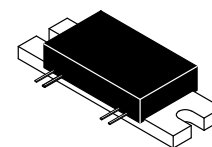


The RF MOSFET Line  
**RF Power Field Effect Amplifier**  
N-Channel Enhancement-Mode Lateral MOSFET

**MHW1910-1**

- Specified 26 Volts, 1930–1990 MHz, Class AB Characteristics  
Output Power = 14 Watts CW Typ  
Power Gain = 26 dB Typ @ 10 Watts  
Efficiency = 34% Min @ 10 Watts
- 50  $\Omega$  Input/Output System
- Designed for GSM Linearity Requirements

**10 W, 1930–1990 MHz  
RF POWER AMPLIFIER**



**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	$P_{in}$	21	dBm
RF Output Power	$P_{out}$	20	W
Operating Case Temperature Range	$T_C$	- 10 to +90	$^{\circ}C$
Storage Temperature Range	$T_{stg}$	- 30 to +100	$^{\circ}C$

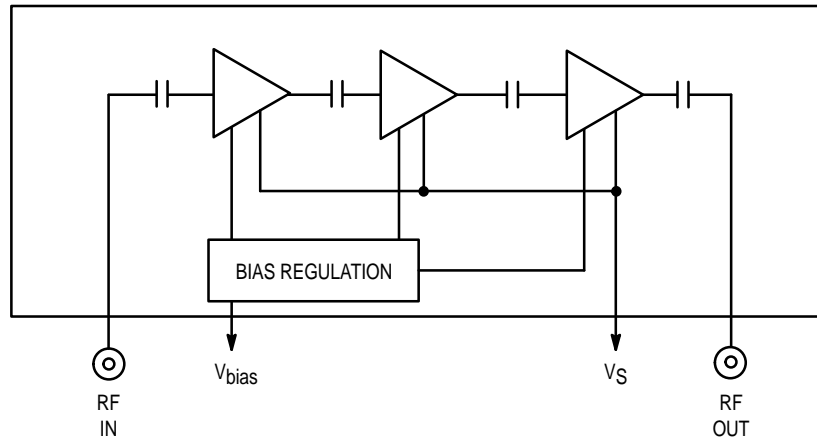
**ELECTRICAL CHARACTERISTICS** ( $T_C = +25^{\circ}C$ ,  $V_S = 26$  Vdc;  $V_{bias} = 5$  Vdc; 50  $\Omega$  system, unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Frequency Range	BW	1930	—	1990	MHz
Quiescent Current ( $P_{in} = 0$ 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 ( $P_{out} = 10$ W)	$G_P$	24	26	28	dB
Efficiency ( $P_{out} = 10$ W)	$\eta$	34	—	—	%
Input VSWR	$VSWR_{in}$	—	—	1.8:1	—
Harmonics at $2f_0$	$H_2$	—	—	- 35	dBc
Harmonics at $3f_0$	$H_3$	—	—	- 45	dBc
Reverse IMD; $P_{out} = 10$ W; Preverse = -40 dBc ( $F_1 = F_0 \pm 200$ kHz @ -40 dBc)	$IMD_r$	—	—	- 50	dBc
Load Mismatch Stress Load VSWR = 5:1, All Phase Angles	$\psi$	No Degradation in Output Power			
Stability ( $P_{out} = 10$ 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			

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

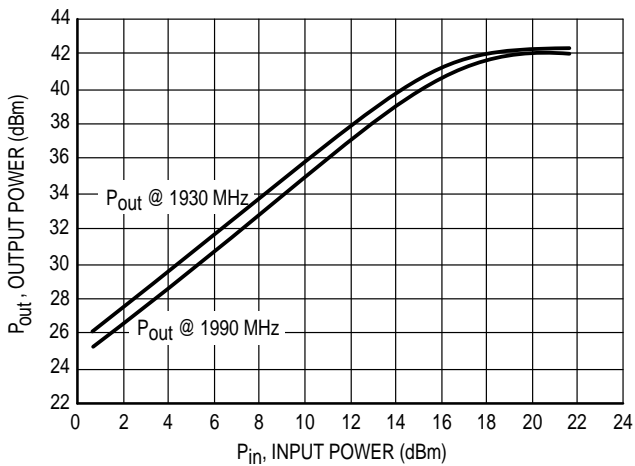
**EXTREME CASE ELECTRICAL CHARACTERISTICS** ( $T_C = -10$  to  $+85^\circ\text{C}$ ,  $V_S = 23.5$  to  $26$  Vdc,  $V_{\text{bias}} = 3$  to  $26$  Vdc,  $50\ \Omega$  system, unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Frequency Range	BW	1930	—	1990	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 $2f_0$	$H_2$	—	—	-35	dBc
Harmonics at $3f_0$	$H_3$	—	—	-45	dBc
Reverse IMD; $P_{\text{out}} = 10$ W; Preverse = -40 dBc ( $F_1 = F_0 \pm 200$ kHz @ -40 dBc)	$\text{IMD}_r$	—	—	-46	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			

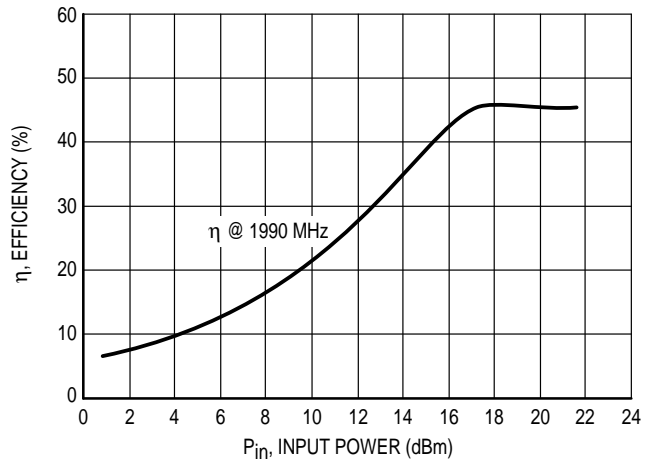


**Figure 1. Internal Diagram**

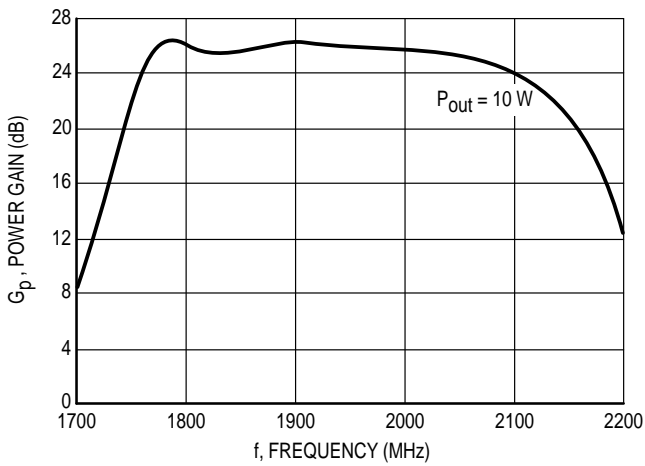
## TYPICAL CHARACTERISTICS



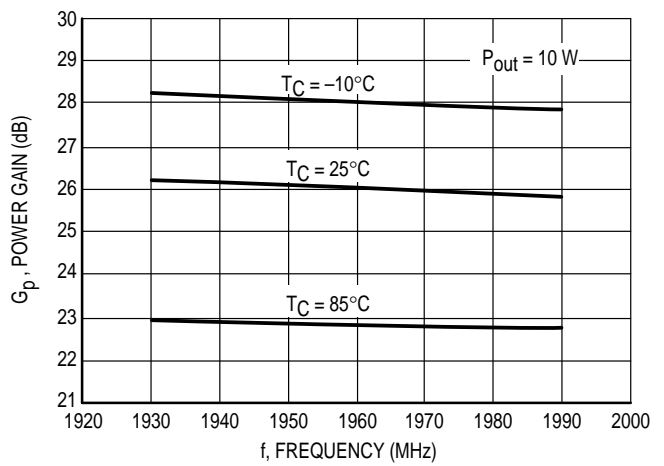
**Figure 2. Output Power versus Input Power**



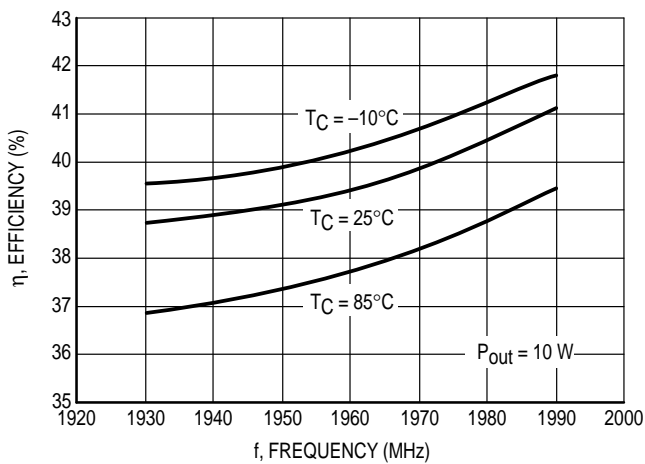
**Figure 3. Efficiency versus Input Power**



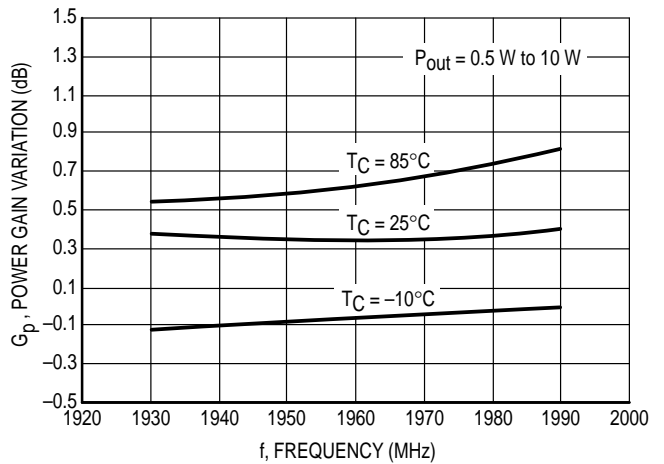
**Figure 4. Power Gain versus Frequency**



**Figure 5. Gain versus Frequency**



**Figure 6. Efficiency versus Frequency**



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

## TYPICAL CHARACTERISTICS

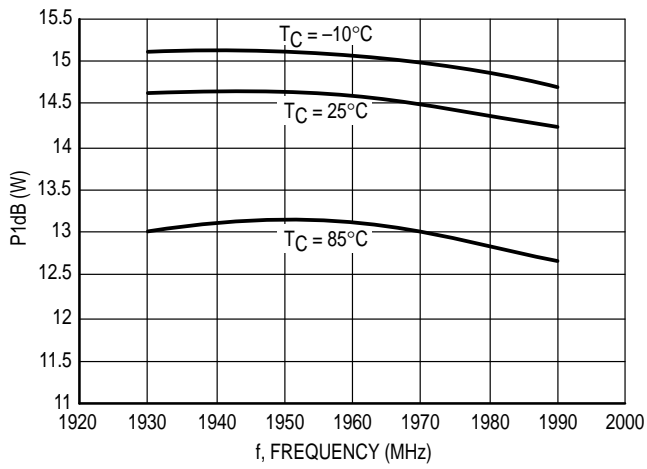


Figure 8. P1dB versus Frequency

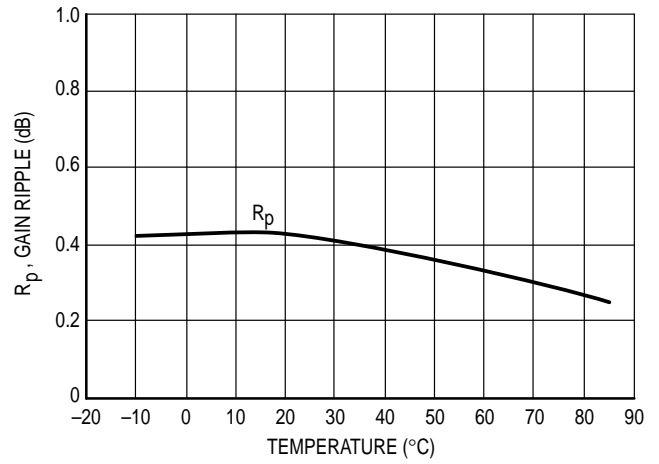


Figure 9. Gain Ripple versus Temperature

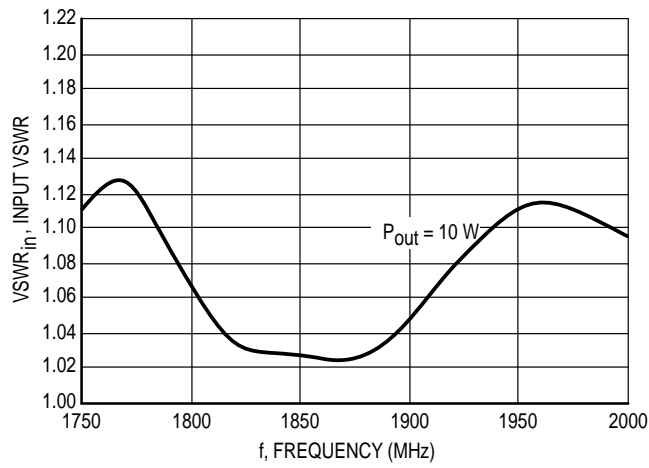
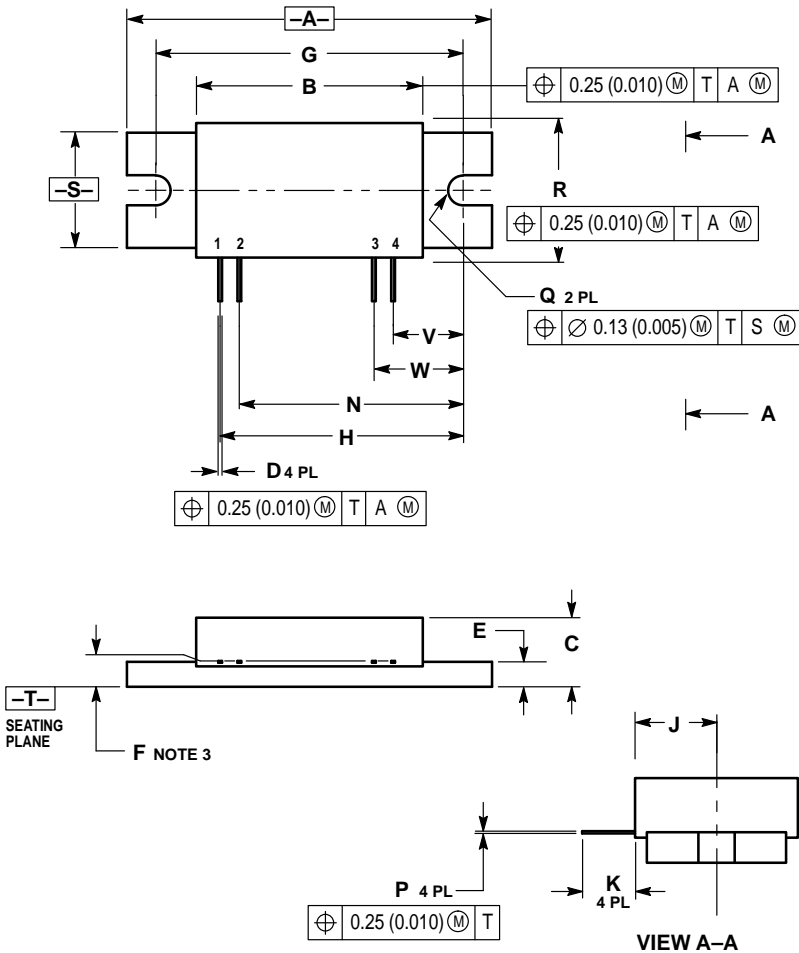


Figure 10. Input VSWR

# 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:
1. PIN 1. RF IN
  2. V BIAS
  3. V SUPPLY
  4. RF OUT

## CASE 301AW-02 ISSUE B

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