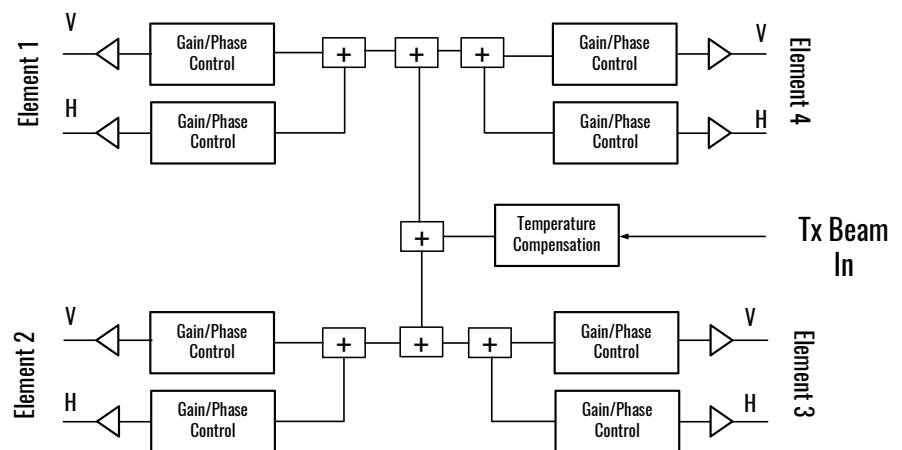


## Product Features

- 27.5 - 30.0 GHz operation
- Supports 4 dual pol radiating elements
- Flexible polarization (RHCP, LHCP, linear)
- 22 dB gain per channel
- +12 dBm output power per port
- 5 bit phase control (LSB=11.25°)
- 5 bit gain control (LSB=0.5 dB, DR=15.5 dB)
- Temperature sense
- Tx output power sense
- 6x6 mm QFN
- +1.8 V operation
- 0.9 W DC Tx power quiescent
- 1.35 W DC Tx power at P1dB

## Block Diagram



## Applications

Satellite communications terminals

## General Description

The AWMF-0109 is a highly integrated silicon quad core IC intended for satellite communications transmit applications. The device supports four dual polarization radiating elements with full programmable polarization flexibility. The device provides 22 dB of gain per channel with an output power of +12 dBm per element per polarization. Additional features include gain compensation over temperature, temperature reporting, and Tx output power telemetry. The chip features ESD protection on all pins, operates from a +1.8 V supply, and is packaged in a 48 lead 6x6 mm QFN for easy installation in planar phased array antennas.



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San Diego, CA 92130

Rev. V4P

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## Ka-Band Silicon SATCOM Tx Quad Core IC

### AWMF-0109

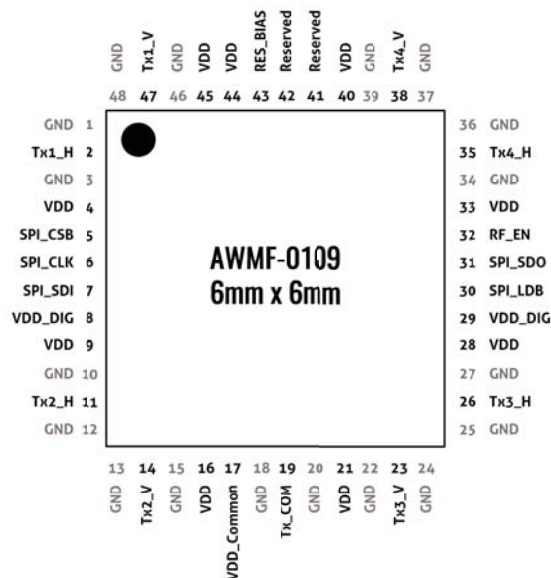
## Product Overview

## Specifications

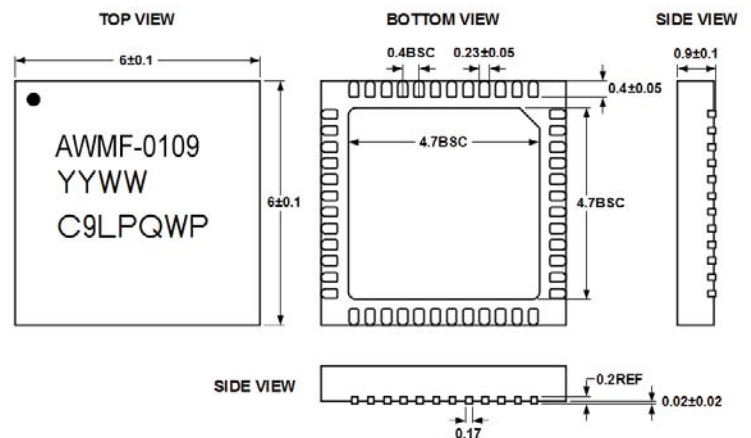
Parameter	Nominal Performance	Units
<b>General</b>		
Frequency	27.5 - 30.0	GHz
# Elements	4 dual pol	-
<b>Beam Steering</b>		
Phase Bits	5	
Phase LSB	11.25	degrees
RMS Phase Error	5	deg RMS
Amplitude Bits	5	-
Amplitude LSB	0.5	dB
Amplitude Dynamic Range	15.5	dB
RMS Amplitude Error	0.5	dB RMS

Parameter	Nominal Performance	Units
<b>Transmit Mode</b>		
Channel Gain	+22	dB
Tx Output P1dB	+12	dBm
<b>Other</b>		
Supply Voltage	+1.8	V
Telemetry	Temperature, Tx output power	-
DC Power	0.9 (quiescent) 1.35 (at P1dB)	W
Operating Range	-40 to +85	°C
Package Size	48 lead 6x6 (PQFN)	mm
Additional Features	ESD Protection on all pins	-

## Package and Pin Out

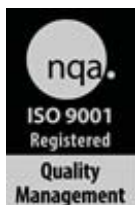


SPI<sub>xx</sub> -Serial command and telemetry reporting



1. All dimensions are in millimeters
2. Die pad 4.8 x 4.8 mm has 4.7 x 4.7 mm exposed pad size
3. JEDEC STANDARD MO-220
4. This part is lead free and is compliant with the RoHS directive

This part is lead-free and is compliant with the RoHS directive



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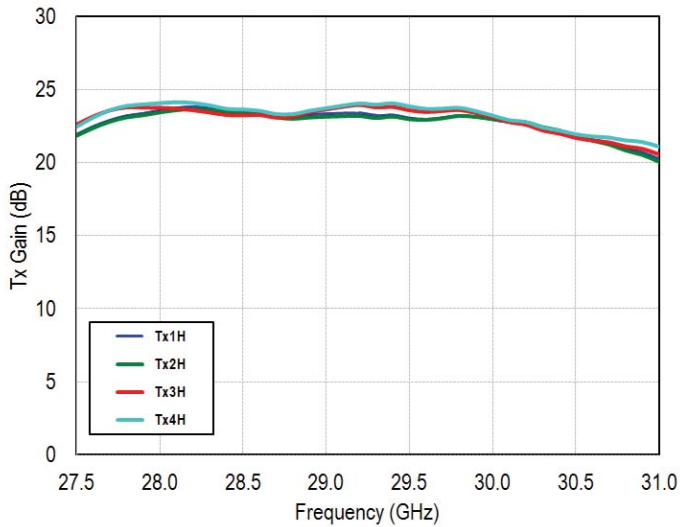
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## Product Overview

### Data

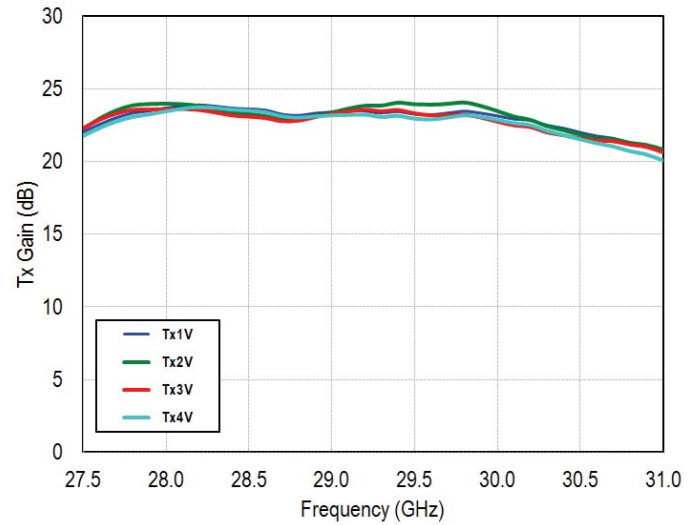
#### Tx Horizontal Gain vs. Frequency

Temp = +25°C, Vs = +1.8V



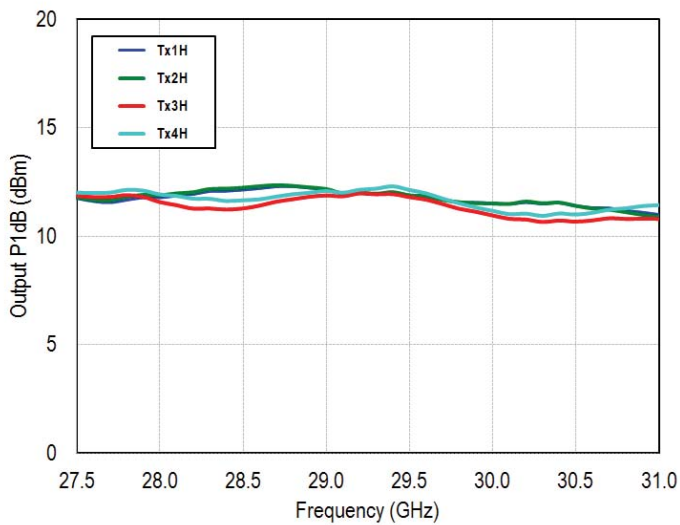
#### Tx Vertical Gain vs. Frequency

Temp = +25°C, Vs = +1.8V



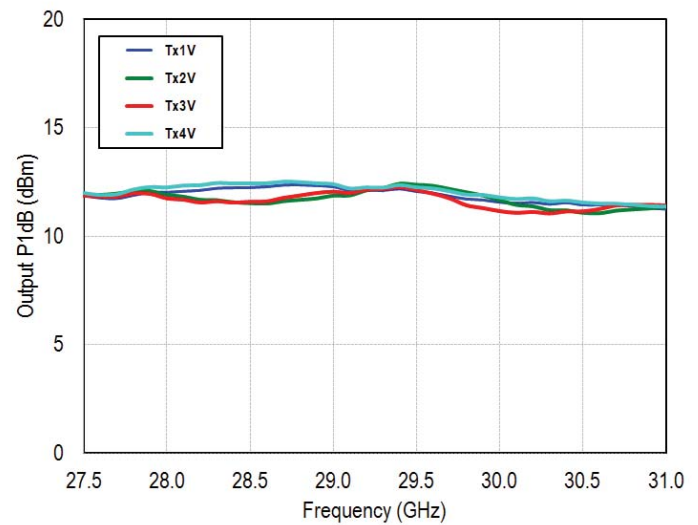
#### Tx Horizontal Output P1dB vs. Frequency

Temp = +25°C, Vs = +1.8V



#### Tx Vertical Output P1dB vs. Frequency

Temp = +25°C, Vs = +1.8V



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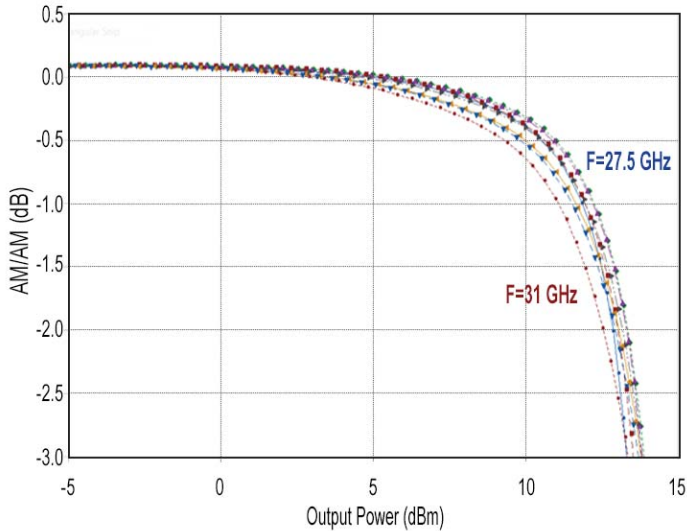
# Ka-Band Silicon SATCOM Tx Quad Core IC

## AWMF-0109

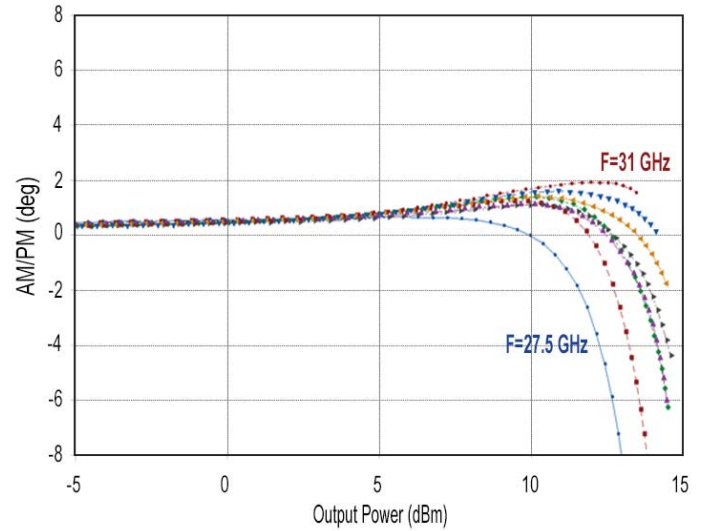
### Product Overview

### Data

**AM/AM Gain Rel to Gss (dB)**  
Temp = +25°C, Vs = +1.8V



**AM/PM Gain Rel to Gss (deg)**  
Temp = +25°C, Vs = +1.8V



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