

Ka-Band Silicon 5G Quad Core IC

AWMF-0108

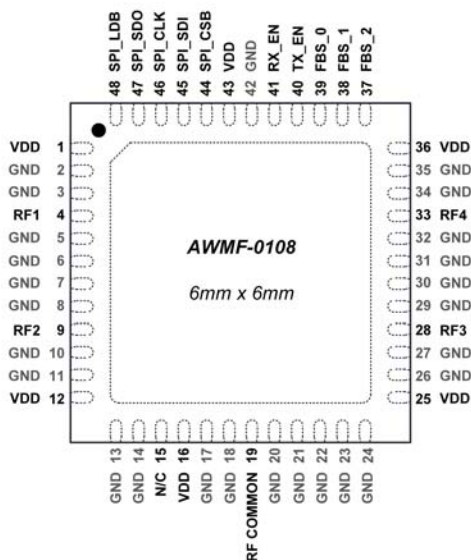
Product Overview

Specifications

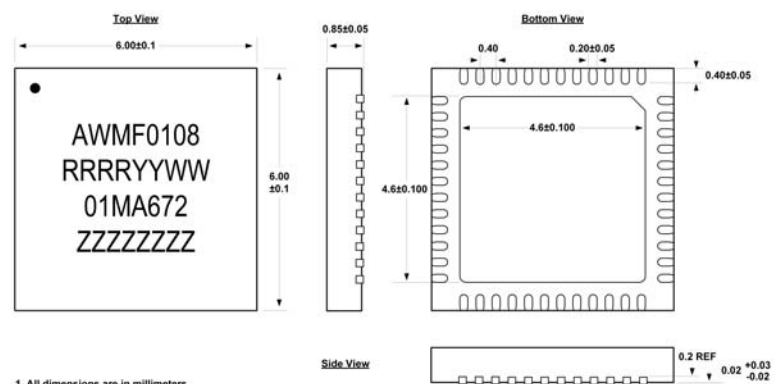
Parameter	Nominal Performance	Units
General		
Frequency Range	26.5 - 29.5	GHz
# Elements	4	-
Tx # Beams	Single	-
Rx # Beams	Single	-
Supply Voltage	+1.8	V
Beam Steering		
Phase Bits	5	
Phase LSB	11.25	degrees
RMS Phase Error	5	deg RMS
Amplitude Bits	5	-
Amplitude LSB	1	dB
Amplitude Dynamic Range	31	dB
RMS Amplitude Error	0.5	dB RMS

Parameter	Nominal Performance	Units
Transmit Mode		
Channel Gain	+26	dB
Tx Output P1dB	+9	dBm
Receive Mode		
Coherent Channel Gain	+28	dB
Noise Figure	5.0	dB
IIP3	-28	dBm
Other		
Telemetry	Temperature, Tx output power	-
DC Power Tx Mode	0.6 (quiescent), 0.8 (at P1dB)	W
DC Power Rx Mode	0.5	W
Operating Range	-40 to +85	°C
Package Size	48 lead 6x6 (PQFN)	mm
ESD Sensitivity, CDM	Class C4 (500V)	
ESD Sensitivity, HBM	Class 1C (1kV)	
Additional Features	Eight beam weight registers for storage for fast beam switching	-

Package and Pin Out



Notes:
 SPI_xxx – Serial command and telemetry reporting
 FBS_x – Fast beam steering address select



1. All dimensions are in millimeters
 2. All dimensions and tolerances conform to ASME Y14.5 - 2009
 3. This part is lead free and is compliant with the RoHS directive

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 11236 El Camino Real
 San Diego, CA 92130

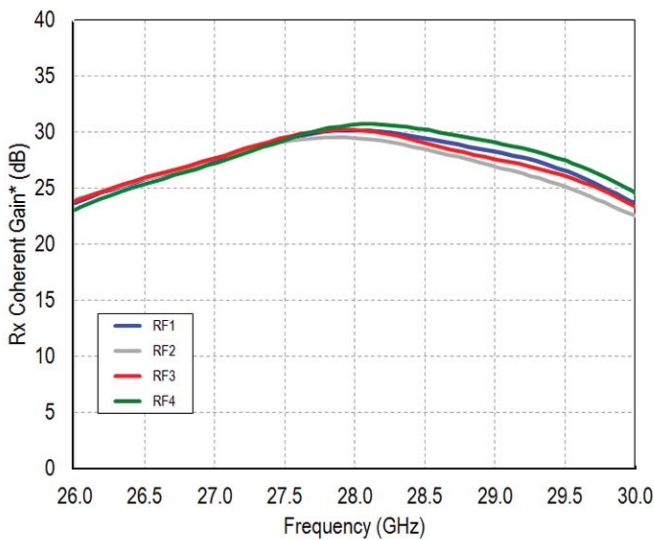
Rev. V8P

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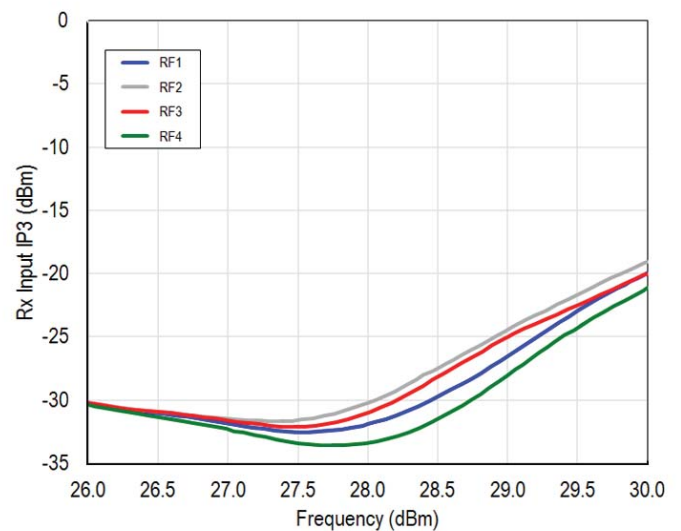
Product Overview

Data

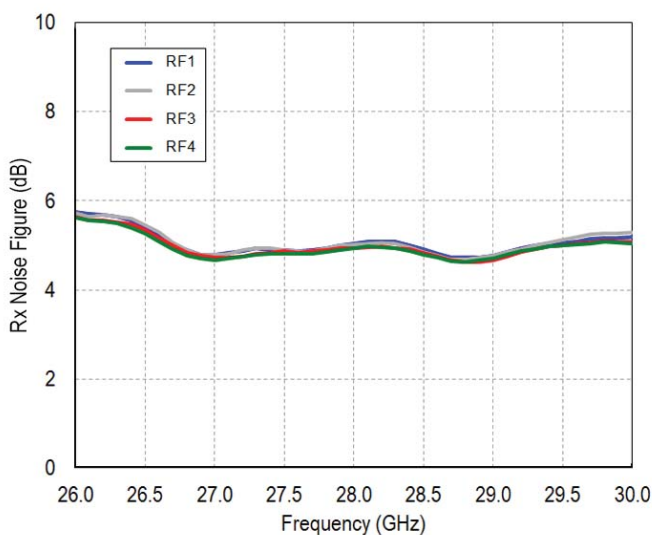
Rx Coherent Gain* vs. Frequency
Temp = +25°C, Vs = +1.8V



Rx Input IP3 vs. Frequency
Temp = +25°C, Vs = +1.8V



Rx Input Noise Figure vs. Frequency
Temp = +25°C, Vs = +1.8V



*NOTE: Coherent gain (CG) is the RF gain with all Rx input ports energized and is most useful for assessing RF power handling in the beam forming network. Electronic gain (EG) is the RF gain exclusive of the 4:1 sum and is most useful for cascaded NF and gain calculation. The total gain of the antenna aperture can be calculated from $EG + 10 \cdot \log(n)$, where n is the number of antenna elements in the array. Single path gain (SPG) is the RF gain with only one input port energized. This is representative of the RF gain measured in a 2 port measurement system, such as with the Developer's Kit. In the coherent gain plot above, 12 dB has been added to the single path gain value from each quadrant.

$$CG = SPG + 12 \text{ dB} = EG + 6 \text{ dB for a quad IC}$$



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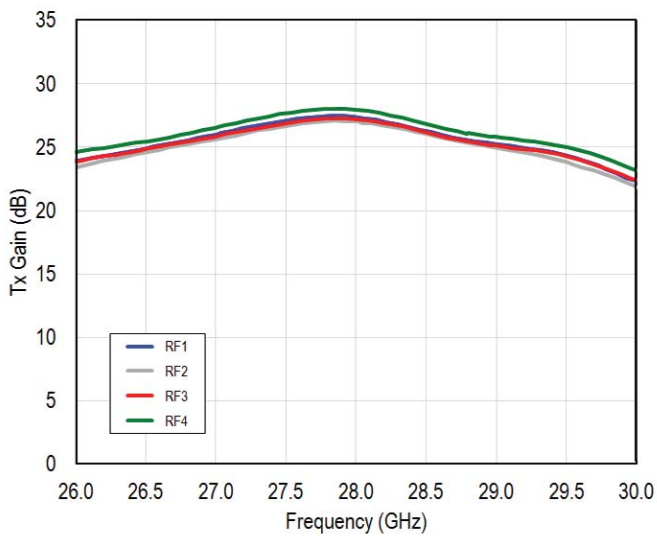
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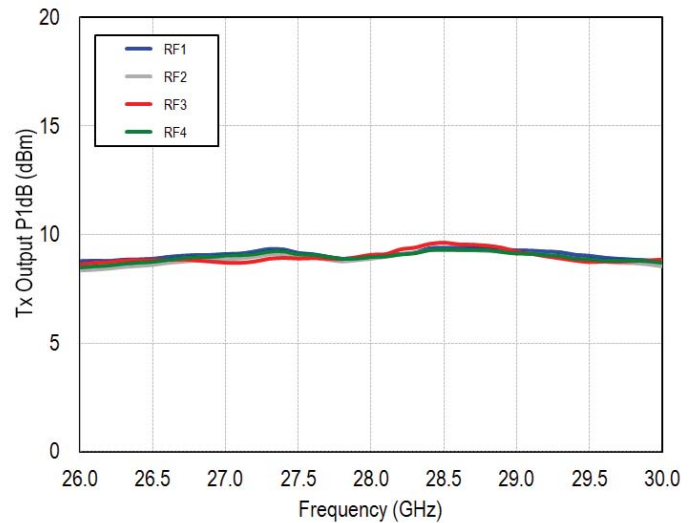
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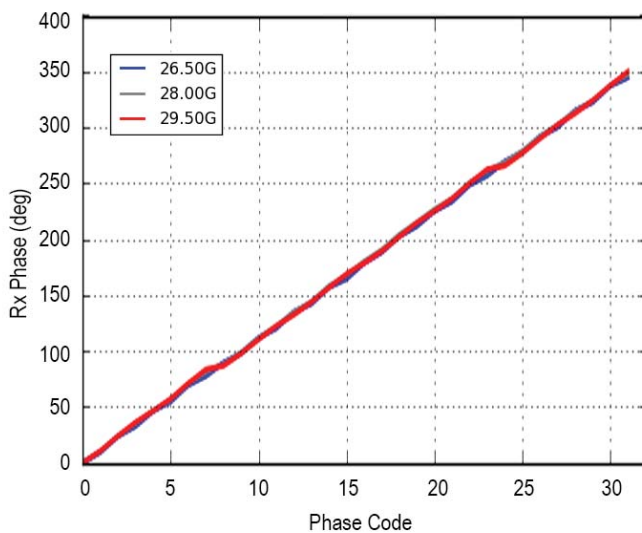
Tx Channel Gain vs. Frequency
Temp = +25°C, Vs = +1.8V



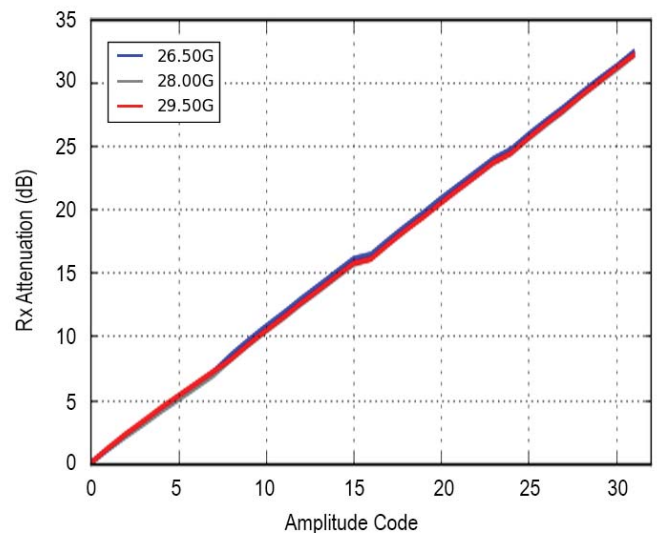
Tx Output P1dB vs. Frequency
Temp = +25°C, Vs = +1.8V



Rx Phase vs. Phase Code
Temp = +25°C, Vs = +1.8V, Freq = 26.5, 28, 29.5 GHz



Rx Attenuation vs. Amplitude Code
Temp = +25°C, Vs = +1.8V, Freq = 26.5, 28, 29.5 GHz



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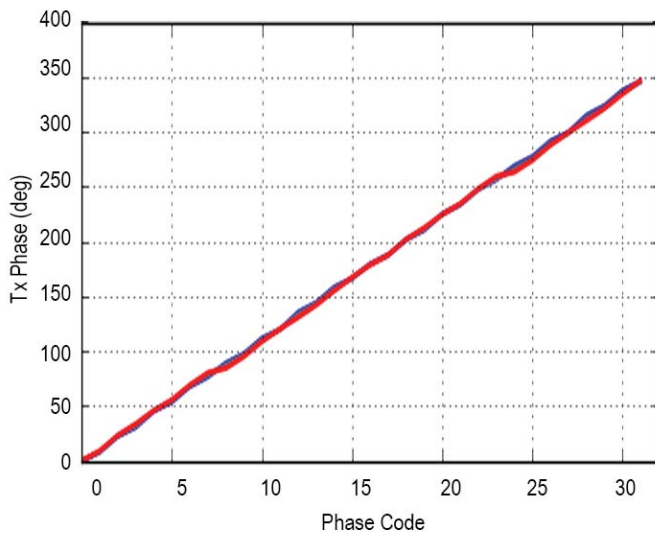
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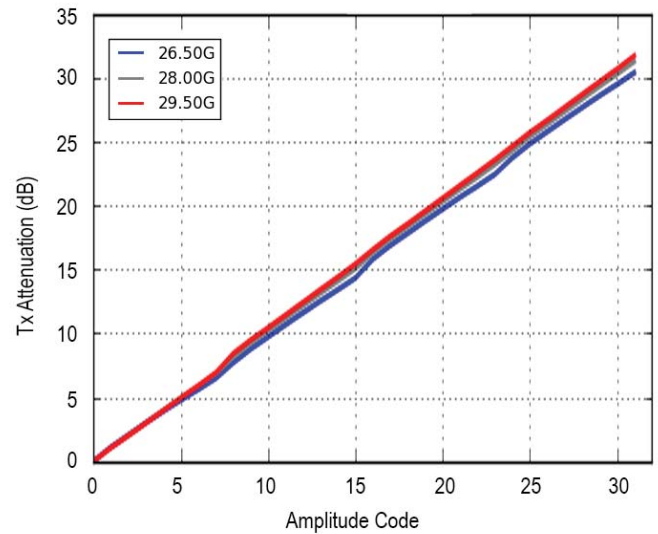
Tx Phase vs. Phase Code

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