Application Note

AWM6423 Reduced Leakage Current in Off State

Revision 0

RELEVANT PRODUCTS

- AWM6423

OVERVIEW

The ANADIGICS AWM6423 WiMAX Power Amplifier is a high performance device that delivers exceptional linearity and efficiency at high levels of output power. The device can be shut down without disconnecting it from the main power supply (nominally +2.9 V to +4.2 V) by dropping its bias voltage (Pin 4) below +0.7 V. Using the application circuit detailed in the AWM6423 product data sheet, in this "shut down" or "off" state, the device will draw about 1 to 1.5 mA of current from Pin 5, and negligible current from Pins 1 and 12. For applications in which the power supply is a battery source and minimal power consumption in the off state is critical, the AWM6423 application circuit can be re-configured such that the off state current draw becomes less than 100 μA altogether.

LOW OFF STATE LEAKAGE CURRENT APPLICATION CIRCUIT

By connecting Pin 5 of the AWM6423 to the bias voltage input (Pin 4), instead of to the main power supply, the circuitry that draws current from Pin 5 is effectively shut down, and the total leakage current from the AWM6423 is reduced to less than 100 μA (see Figure 1). In this configuration, the typical current consumption from the +2.85 V bias voltage (for Pins 4 and 5 combined) is approximately 8 mA, using a +3.3 V main supply.

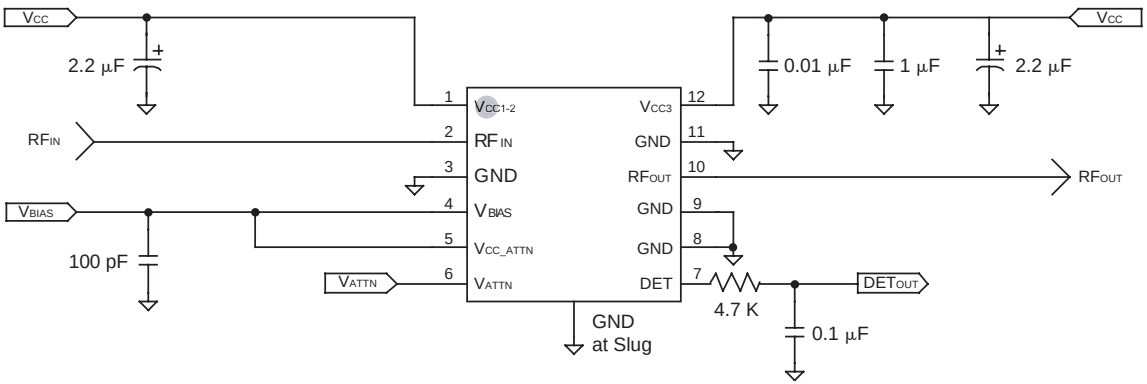


Figure 1: AWM6423 Low Leakage Current Application Circuit

AWM6423 Reduced Leakage Current in Off State

Figures 2 through 5 illustrate AWM6423 performance when Pin 5 in connected to Pin 4 directly, as in the Figure 1 application circuit:

Figure 2: Gain vs. Output Power (T_C = 25°C, V_{CC} = +3.3 V, V_{BIAS} = +2.85 V, 54 Mbps OFDM Modulation, Pin 5 Connected to Pin 4)

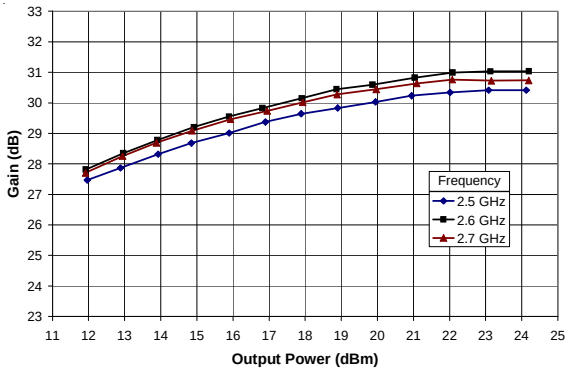


Figure 3: Uncorrected EVM vs. Output Power (T_C = 25°C, V_{CC} = +3.3 V, V_{BIAS} = +2.85 V, 54 Mbps OFDM Modulation, system EVM approx. 0.8 %, Pin 5 Connected to Pin 4)

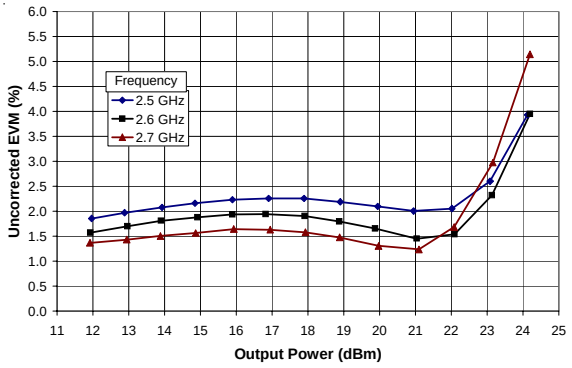


Figure 4: Supply Current vs. Output Power (T_C = 25°C, V_{CC} = +3.3 V, V_{BIAS} = +2.85 V, 54 Mbps OFDM Modulation, Pin 5 Connected to Pin 4)

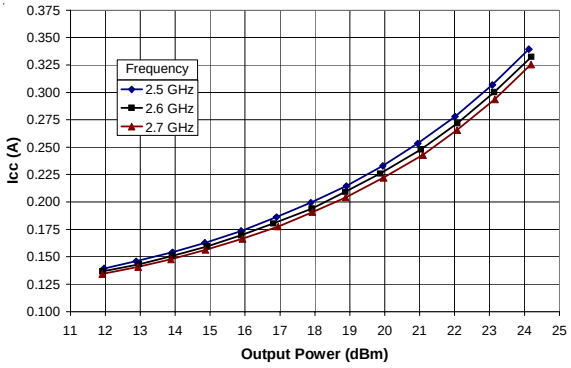
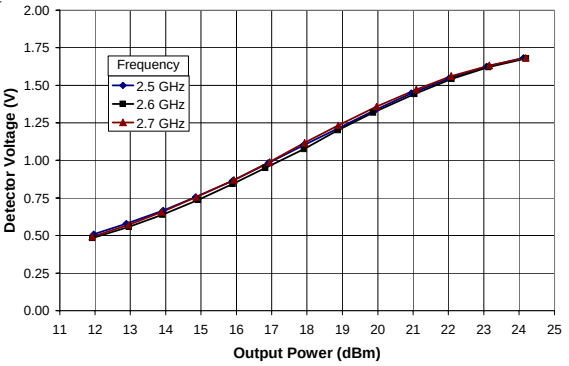


Figure 5: Detector Voltage vs. Output Power (T_C = 25°C, V_{CC} = +3.3 V, V_{BIAS} = +2.85 V, 54 Mbps OFDM Modulation, Pin 5 Connected to Pin 4)



ADDITIONAL CONSIDERATION

Reducing the on state voltage to Pin 5 of the AWM6423 to +2.85 V (because it is now connected to the bias voltage rather than to the main supply) limits the output voltage range of the integrated output power detector, and at higher output power levels affects the relationship between the detector output voltage and the PA output power. For details regarding typical detector voltage variation versus main supply voltage, please refer to the AWM6423 data sheet.

NOTES

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