



APPLICATION NOTE 1894

## Performance of the MAX2363 Transmitter IC at 2.3GHz with 16-QAM

*Abstract: A MAX2363 evaluation board is tuned to the 2.3GHz WCS band. Performance including output power over VGC, ACPR, EVM, and maximum output power with specified bias settings were measured with 16-QAM modulation.*

Additional Information:

- [Wireless Product Line Page](#)
- [Quick View Data Sheet for the MAX2363](#)
- [Applications Technical Support](#)

The MAX2363 is designed for 1.95GHz wideband code division multiple access (WCDMA) application. It provides excellent performance in the WCDMA band. Much interest has arisen at the 2.3GHz WCS band with 16-QAM (quadrature amplitude modulation). By slightly modifying the matching on the output port, the MAX2363 can achieve very good performance results at 2.3GHz to support WCS requirements.

The MAX2361/63 has a broad-band internal match for the output port. Only a pull-up inductor and a DC blocking capacitor are required. At 2.3GHz, the pull-inductor value changes to 11nH from 15nH to optimize the output power.

In these measurements, 220.38MHz is the intermediate frequency (IF), since it is popular in PCS NCDMA (narrow-band CDMA) applications. {The filter already exists and samples are offered by several vendors.} A 220.38MHz NCDMA IF filter was used between the modulator output and the upconvert-mixer input to filter out the broad band noise. A 16-QAM baseband I/Q signal, with the symbol rate of 500ksps, was injected to the MAX2363. The channel spacing is 625kHz.

The measured MAX2363 data at 2.3GHz band are presented below.

### Pout vs VGC

Test Conditions:

Vcc = 3.0V  
Rbias = 10k  
IF = 220.38  
LO = 2094.62MHz  
RF = 2315MHz  
IF DAC = 110

The measured Pout vs. VGC data is shown in Table 1.

**Table 1. Measured Pout vs. VGC**

| VGC(V) | Pout(dBm) | ACPR1(dBc) | ACPR2(dBc) | Icc(mA) |
|--------|-----------|------------|------------|---------|
| 0.5    | -82.0     | N/A        | N/A        | 66      |
| 1.0    | -60.5     | N/A        | N/A        | 66      |
| 1.5    | -31.6     | -55.3      | -72        | 67      |
| 2.0    | -7.0      | -58        | -78.8      | 73      |
| 2.1    | -2.3      | -60.5      | -79.5      | 89      |
| 2.2    | +2.4      | -61.2      | -83.5      | 104     |
| 2.3    | +4.5      | -60.3      | -83.3      | 115     |
| 2.4    | +5.3      | -59.5      | -82.8      | 120     |

## Typical ACPR Plot

In adjacent channel power ratio (ACPR) measurements, the frequency offsets are 625kHz and 1.3MHz for ACPR1 and ACPR2 respectively, and the measurement bandwidth is 30kHz. A typical ACPR plot of the MAX2363 output at 2.31535GHz is depicted in **Figure 1**.

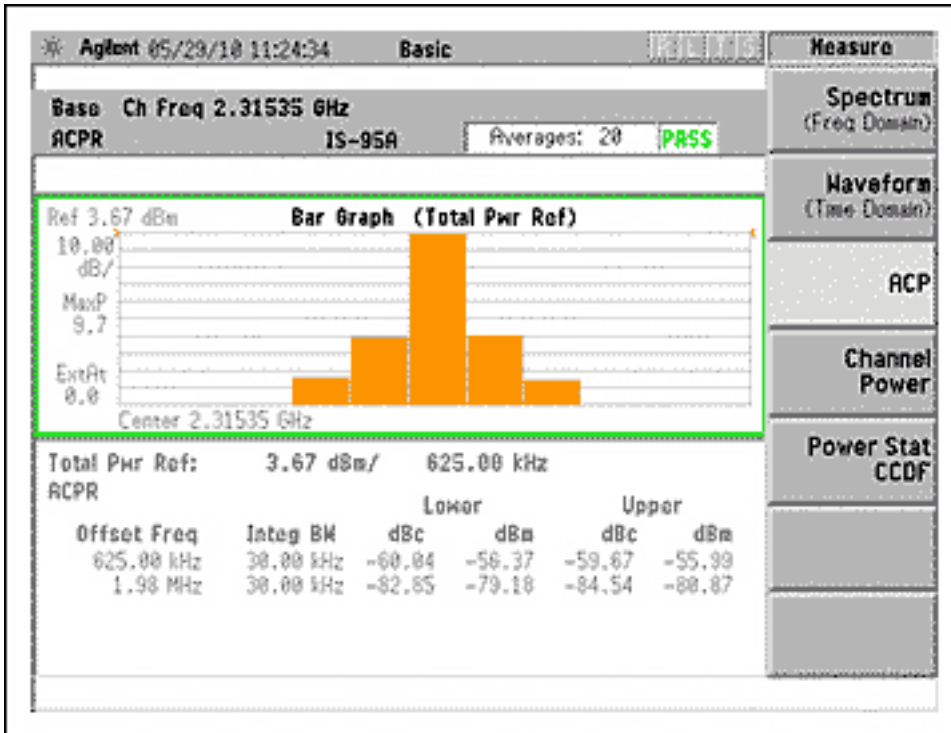


Figure 1. ACPR at Pout = +5.3dBm.

## EVM Reading

The MAX2363 EVM at RF output was measured using the HP89449. **Figure 2** shows a typical reading.

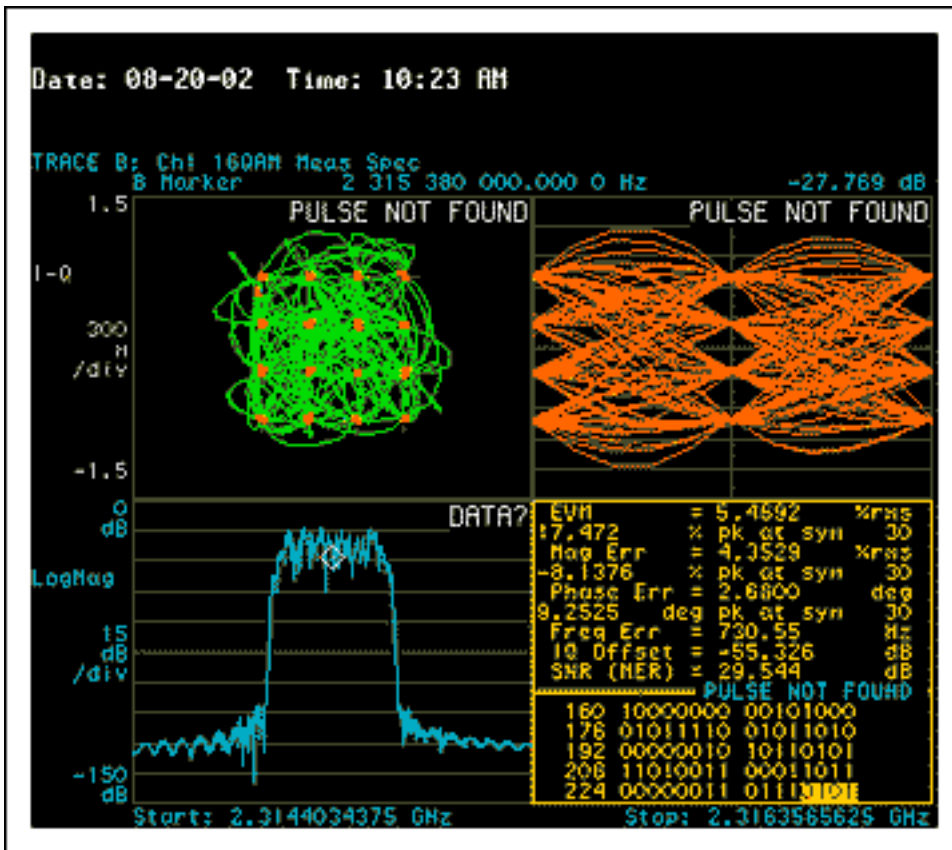


Figure 2. MAX2363 EVM at  $P_{out} = +5.3\text{dBm}$ .

Application Note 1894: <http://www.maxim-ic.com/an1894>

### More Information

For technical questions and support: <http://www.maxim-ic.com/support>

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### Related Parts

MAX2363: [QuickView](#) -- [Full \(PDF\) Data Sheet](#)

AN1894, AN 1894, APP1894, Appnote1894, Appnote 1894

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