6. Connect the waveform-generator output between TP6 (TXIN) and TP2 (GND).
7. Connect the oscilloscope channel 1 to TP6 (TXIN).
8. Connect the oscilloscope channel 2 to TP17 (TXOUT).
9. Connect the oscilloscope channel 3 to JU4, pin2 (RES).
10. Example waveforms for a 115.2kbps setting are shown in Figure 4.

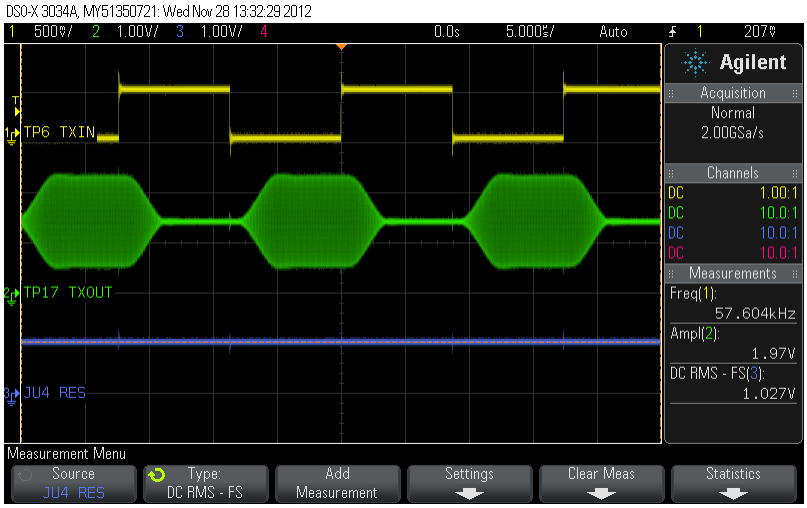

Figure 4. Time Domain Waveforms for 115.2kbps Transmission

11. Now look at the output spectrum of the transmitter by connecting a spectrum analyzer to J1. Example output spectrum up to 30MHz for 115.2kbps setting is shown in Figure 5.

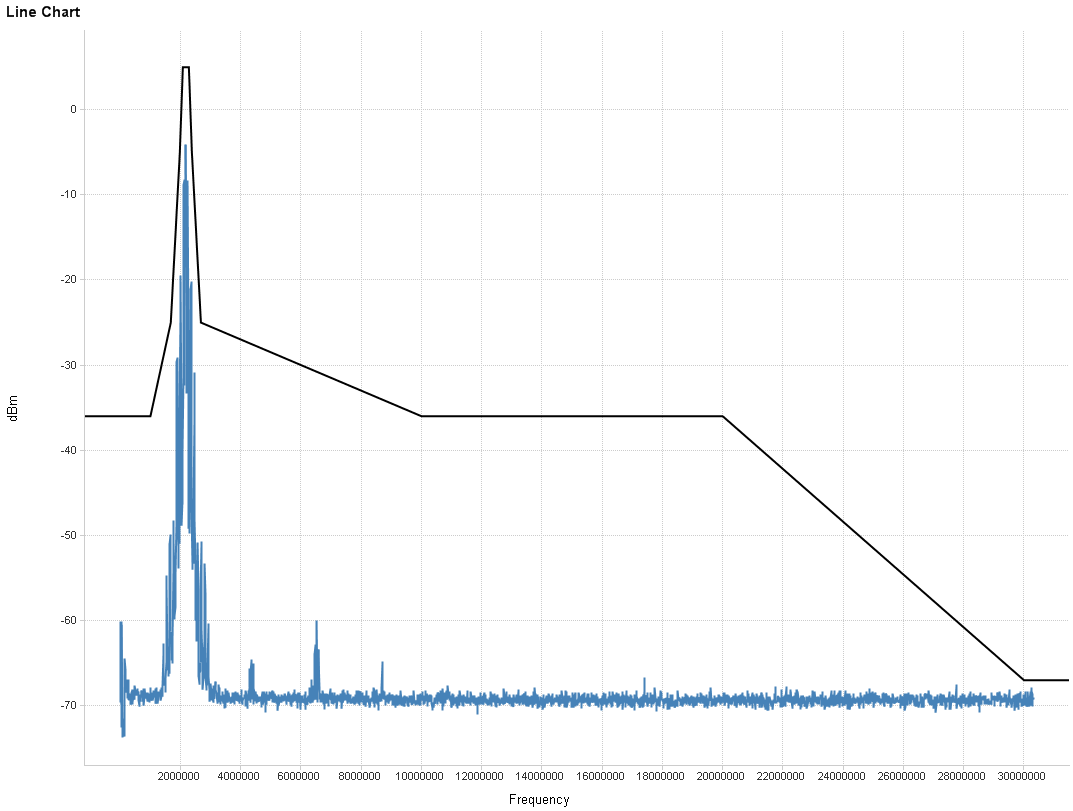

Figure 5. Emission Spectrum for 115.2kbps Transmission: up to 30MHz

12. A spectrum for higher frequency ranges can be checked. If the signal is captured then the dynamic range of the spectrum analyzer will limit the noise floor performance. To improve the measurement a high pass filter has been used to remove the signal content while leaving the emissions content unaffected in the emission spectrum plot from 30MHz to 400MHz shown in Figure 6.

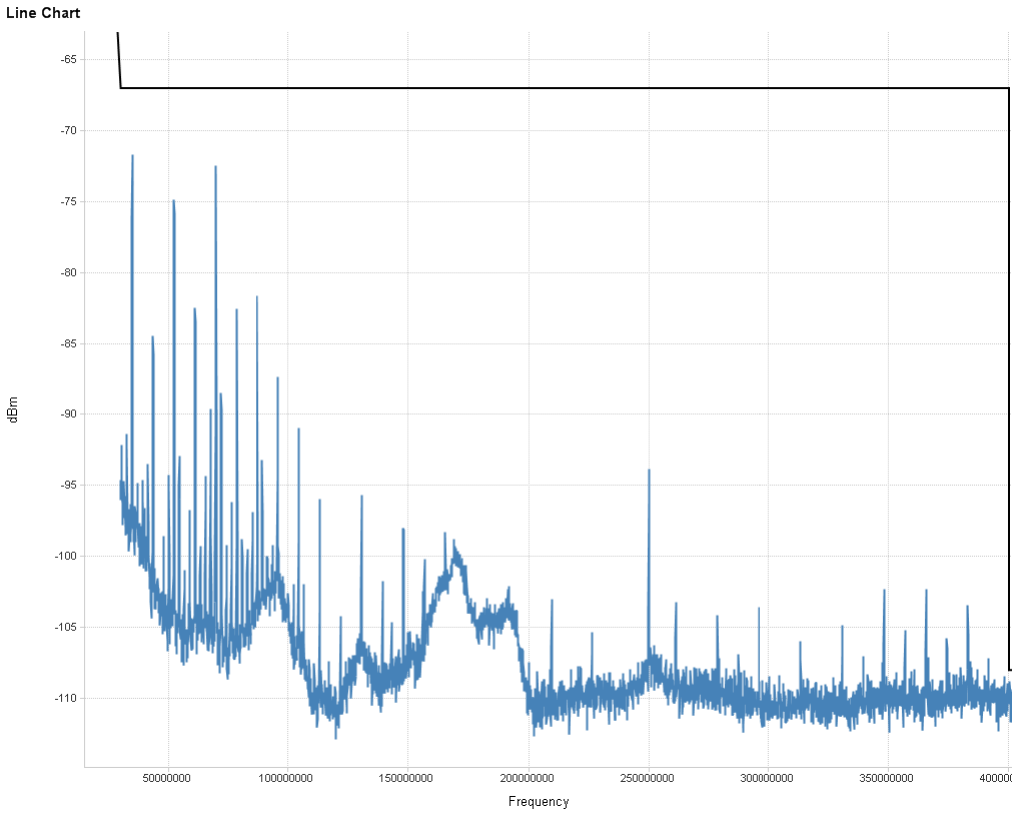

Figure 6. Emission Spectrum for 115.2kbps Transmission: 30MHz to 400MHz

13. To evaluate the effect of the voltage on the RES pin on the Tx output power, change the jumper JU4 default setting and short pins 2 and 3.
14. Change the VR1 setting to apply between 0.7V and 1.5V on the RES pin and observe the oscilloscope and spectrum analyzer plots.

3.2.2 Rx Channel Evaluation

1. From the default jumper positions as described in Table 2, open Jumper JU13 for standalone evaluation of either U1 or U2.
2. Set the DC power supply to source 5V with 80mA current limit and connect it between TP1 (U1_VCC) and TP2 (GND).
3. Since JU1 is shorted by default, this means that VL supply will also get 5V. If a different supply is required for V_L, open JU1 and connect the second supply between TP3 (U1_VL) and TP4 (GND).
4. Leave TP6 (TXIN) floating or short it to TP3 (VL).
5. Set the waveform generator to output a 160mV p-p sine wave into a 50-Ω load with common mode of 1.5V.
6. Connect the waveform generator to J1.
7. Connect the oscilloscope channel 1 to JU13 pin on U1 side (RXIN).
8. Connect the oscilloscope channel 2 to TP7 (RXOUT).
9. Connect the oscilloscope channel 3 to TP8 (DIR).
10. Example waveforms with a 160mVpp sine wave input at J1 are shown in Figure 7. RXOUT is low and DIR is high indicating that the device is in Receive mode.

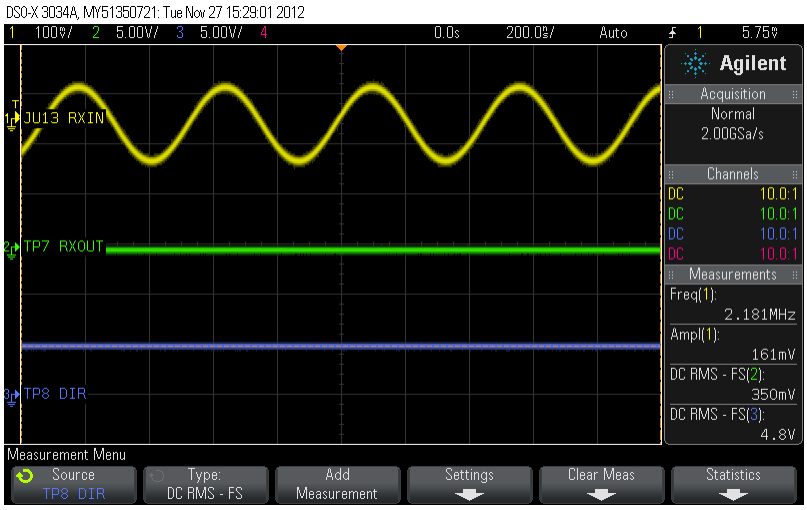

Figure 7. Rx Channel Evaluation: 160mVpp input at RXIN

11. Change the input amplitude to 80mVpp.
12. Example waveforms with an 80mVpp sine wave input at J1 are shown in Figure 8. RXOUT is high and DIR is low indicating the device is not in Receive mode.

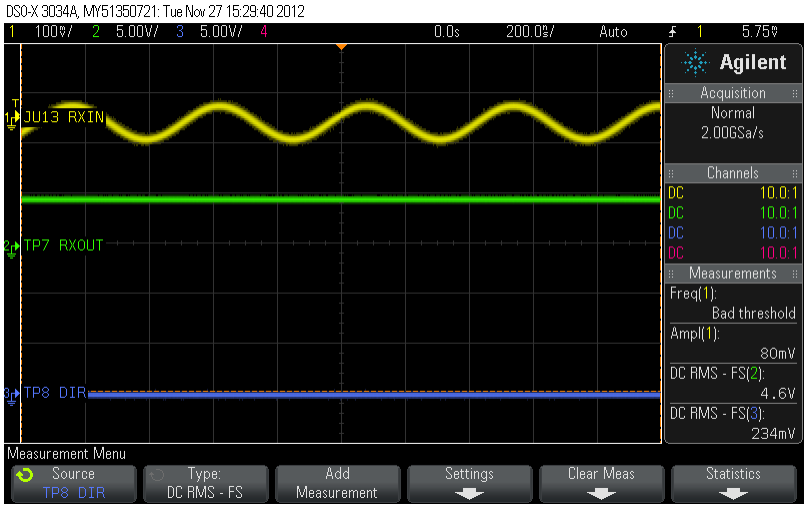

Figure 8. Rx Channel Evaluation: 80mVpp input at RXIN

3.3 System Evaluation

This section covers the board configuration required to evaluate U1 and U2 in communication with one another. Figure 9 illustrates the device configuration in this mode.

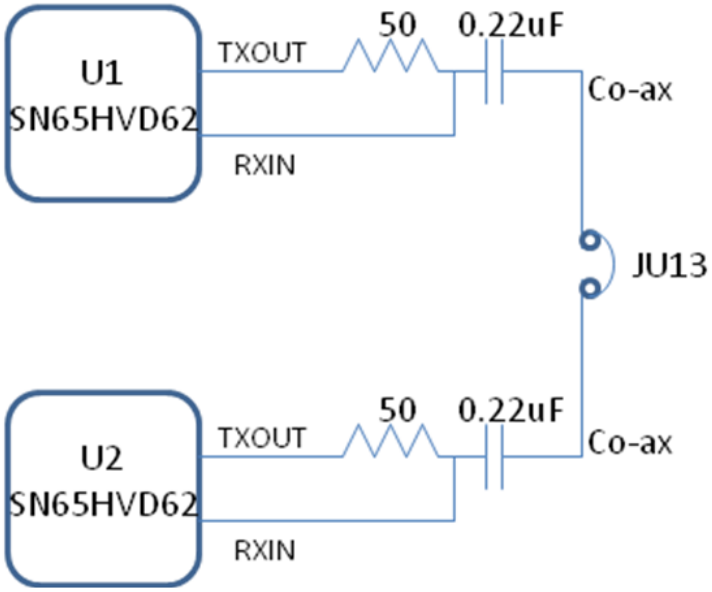

Figure 9. EVM System Evaluation Block Diagram

1. Retain the default jumper settings as described in Table 2.
2. Set the DC power supply to source 5V with 80mA current limit and connect it between TP1 (U1_VCC) and TP2 (GND).
3. Since jumpers E1 and E2 are shorted by default, both U1 and U2 will get powered up.
4. Since jumpers JU14, E3 and E4 are shorted by default, the board has a common ground plane.
5. Since JU1 and JU7 are shorted by default, this means that V_L supplies will also get 5V. If different supply is required for V_L, open JU1 and connect the second supply between TP3 (U1_VL) and TP4 (GND) and also between TP11 (U2_VL) and TP12 (GND).
6. Jumpers JU2 and JU3 for U1 and jumpers JU8 and JU9 for U2 are by default set to 115.2kbps data rate settings (see Table 4).
7. Set the waveform generator to output a square wave. Set the high and low levels to 5V (= V_L) and 0V respectively into a high-impedance load, with frequency 6.4kHz and duty-cycle 94.44%. This corresponds to 1-bit on period and 17-bit off period for a 115.2kbps data-rate.
8. To use U1 and transmitter and U2 as receiver, leave TP14 (U2 TXIN) floating connect the waveform-generator output between TP6 (U1 TXIN) and TP2 (GND).
9. Since JU13 is shorted by default, the TXOUT from U1 is received by the RXIN of U2.
10. Connect the oscilloscope channel 1 to TP6 (U1 TXIN).
11. Connect the oscilloscope channel 2 to TP5 (U1 SYNCOUT).
12. Connect the oscilloscope channel 3 to TP15 (U2 RXOUT).
13. Connect the oscilloscope channel 4 to TP16 (U2 DIR).
14. Example waveforms for U1 acting as transmitter and U2 acting as receiver at 115.2kbps data transmission rate are shown in Figure 10.

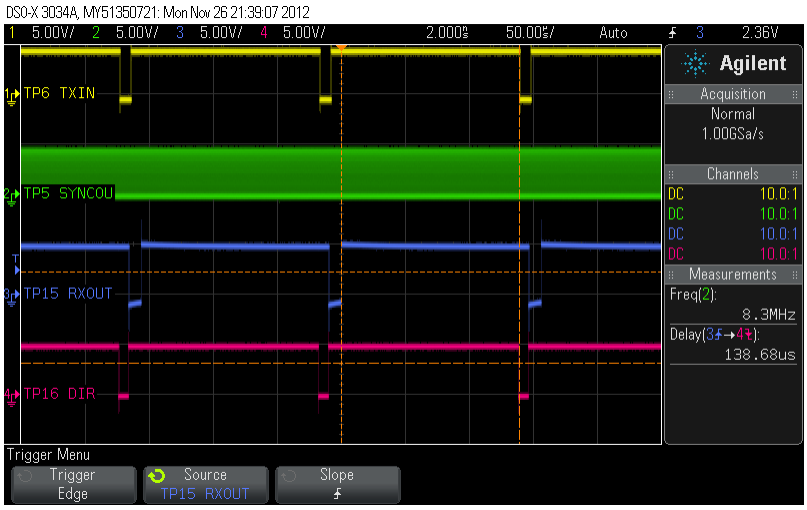

Figure 10. System Evaluation with U1 as Transmitter and U2 as Receiver at 115.2kbps

3.4 External Clock Input

The default setting for the clock source at the XTAL1 pin of U1 and U2 is the on-board crystal, Y1 and Y2 respectively. The SN65HVD62EVM also provides an option to use an external clock source on the XTAL1 pin. The following steps must be followed to enable this option for U1. Corresponding jumpers need to be used to enable this option for U2.

1. Short pins 2 and 3 of jumper JU5.
2. Short jumper JU6 to connect the XTAL2 pin to GND.
3. Apply an external clock source of 8.704MHz at the SMA connector J2.

3.5 Standby Mode

Table 4 describes settings for putting the device into “stand-by” mode by making DIRSET1 = DIRSET2 = 1.

In this mode, the Transmit channel of the device is disabled and it acts as a pure receiver. With the device in stand-by mode, the current consumption is significantly reduced. If a logic low is applied at the TXIN pin of the device in this mode, the device will not transmit since the transmit channel is disabled.

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