![intersil logo]

QHx220 Hardware User Guide

Table of Contents

QHx220 System Overview

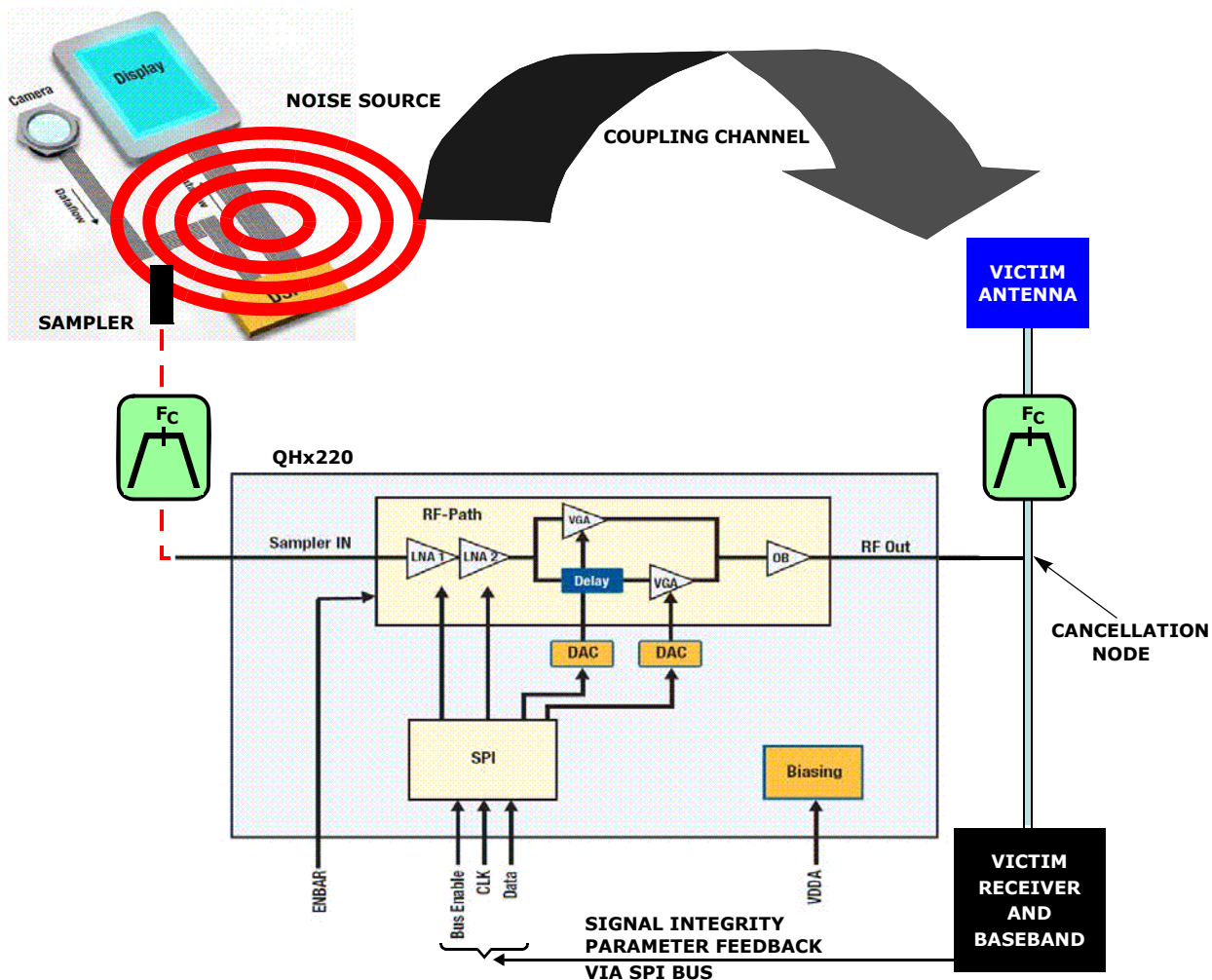## General Application System Block Diagram for QHx220

FIGURE 1. TYPICAL APPLICATION DIAGRAM

Description of QHx220 System Block Diagram

The block diagram shown in Figure 1 illustrates the typical system architecture for the implementation of the QHx220 noise canceller. The QHx220 integrates the LNA gain stages in the sampler path as well as the DACs which control the I and Q (or ultimately the gain and phase) of the device. The LNA gain stages and the I and Q are controlled via the SPI bus interface. The GUI software supplied with the evaluation board provides a means to manually tune all of these parameters.

A known noise source is sampled by a variety of tapping methods depending on the accessibility of sampling the noise source. The sampled noise is then filtered by a bandpass filter that has the same bandwidth as the victim receive band. It may be possible to eliminate this filter stage. However, this is dependent on the characteristics of the aggressor source, the sampling methodology and the location of the cancellation node

within the receiver chain. The QHx220 has internal LNA gain stages that can be set to pre-amplify the sampled input noise if necessary. The amount of pre-amplification required (if any) depends on coupling factors between the noise source and the victim antenna as well as the level of the sampled noise at the input of the QHx220. Since the dynamic range of the QHx220 is typically 50dB, the noise level at the input of the QHx220 should be approximately 25dB higher than the noise level present at the victim receiver (when using the minimum gain setting). Higher gain settings should be used when it is not possible to find a strong enough tapping point of the noise source. Setting this level correctly will allow for a maximum tuning range when using the QHx220 tuning control. This characterization will determine the amount of pre-amplification necessary for any given application. It is important to remember not to exceed the -45dBm maximum input power of the QHx220 device. The QHx220 has a high output impedance which only introduces, on the order of tenths of a dB, insertion loss

to the victim receiver path. It taps the victim receive path directly.

The QHx220 evaluation platform is an open loop system, meaning that the optimization is performed manually. With the addition of a microcontroller and some kind of signal quality parameter fed back from the victim receiver such as C/N, BER, RSSI, etc., the system can operate closed loop. A simple algorithm can be coded to optimize the gain and phase of the cancellation signal based on the previous state of the quality parameter provided by the victim receiver. Seed values can also be used to improve the initial starting point state for the optimization algorithm. Thus minimizing the number of iterations required to achieve convergence. A look-up table could also be implemented for systems operating on multiple channel frequencies, but this may not be necessary for extremely narrow band applications.

Essential Factors to Integrating the QHx220 Device into Your System

The purpose of this section is to provide some design guidelines to ensure the successful integration of the QHx220 into your system.

1. DO NOT exceed approximately -45dBm (exact limits are specified within the datasheet depending on frequency band) maximum input power of the QHx220 device.

2. The sampled noise must be the same noise (correlated with) as the noise that aggresses the victim antenna. The amount of correlation is proportional to the amount of cancellation that can be achieved using the QHx220 device. It is often necessary to try multiple tapping points and tapping methods in order to achieve the best possible correlation to the noise present in the victim antenna.

3. Be sure to choose the correct level of pre-amplification as described in the previous sections. If this is not set correctly, it will limit the tuning range of the QHx220 device and hence limit the amount of cancellation that it is possible to achieve.

4. The delay from the noise source to the cancellation node (via the coupling channel) should be matched with the delay of noise source to the cancellation node (via the sampler path). The main source of mismatched delay is often due to the filter in the receiver path. Using the same filter in the sampler path is often a simple means of achieving sufficient matching of the delay of both paths. One could also move the cancellation node to precede the filter in the receive path and eliminate the filter in the sampler path. This could have drawbacks in some applications depending on the out-of-band noise characteristics and the noise sampling method used.

5. The high impedance RF output of the QHx220 devices must be placed <5mm from the cancellation node (the tapping point of the victim receiver), otherwise resonances can occur that will attenuate the cancellation signal. Figure 2 shows the effect of varying the distance "L" between the QHx220 output and the tapping point of the victim receiver.
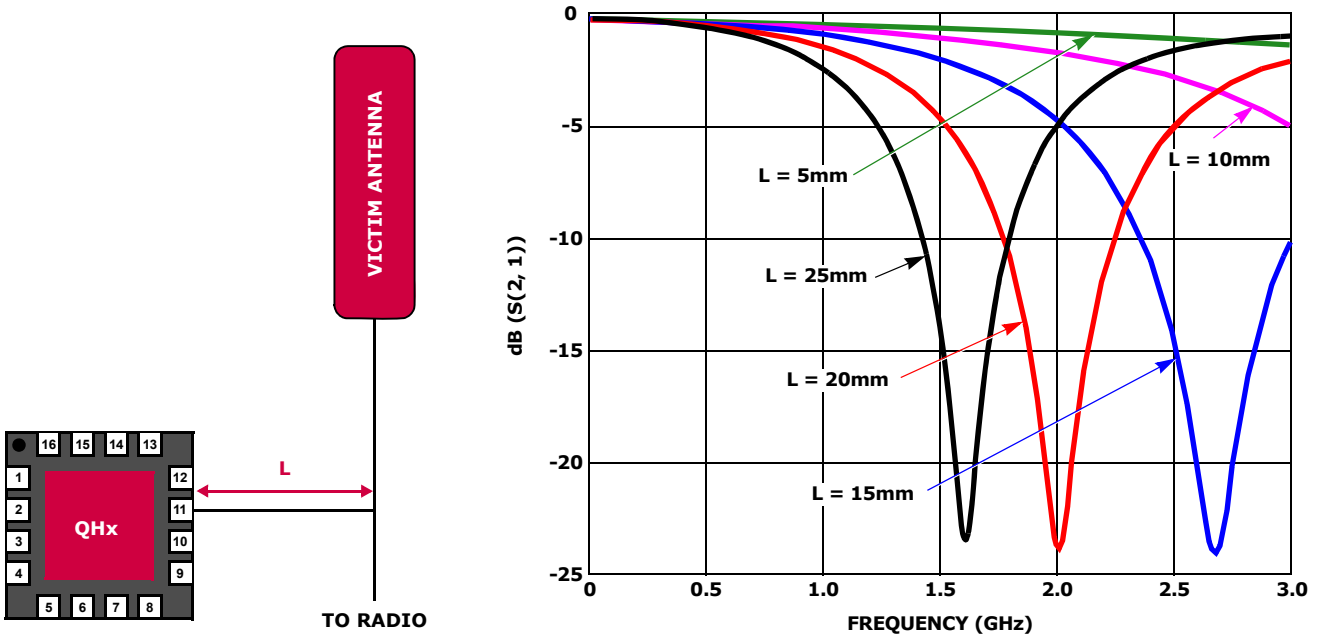

FIGURE 2. DISTANCE FROM CANCELLATION NODE vs FREQUENCY

Connecting the QHx220 Evaluation Board to a PC for Manual Control

The Basic I-Q Control Software User Guide (AN1563) provides a detailed description of how to install the software GUI program that is used to manually control the QHx220 evaluation board. The software should be installed prior to connecting the hardware to the PC. The Basic I-Q Control Software User Guide (AN1563) also provides detailed instruction on how to configure all the software settings required to control the frequency band, gain, and gain and phase of the device. Please note that the evaluation boards are populated to operate in a specific frequency band. A tank circuit and matching components are specifically chosen for each desired band of operation. If a different frequency band is chosen via the software GUI, then the QHx220 board should be reconfigured accordingly. The correct BOM for MTV, GPS, and WLAN frequency bands can be found in the subsequent sections of this user guide.

A USB controller board plugs into the USB port of the PC and is used to control the SPI bus interface of the QHx220 device. The USB controller board also has a 1.8V regulated supply that is used to power the QHx220 device. The user may alternatively power the device with an external power supply if so desired. A custom cable is also provided which is keyed so that it plugs into the USB controller board in the correct orientation. Figure 3 shows the USB controller board and cable connection.

The opposite end of the cable plugs into the QHx220 evaluation board to provide the 1.8V power supply voltage and SPI connection to control the device. These connectors are not "keyed" so please be sure that they are oriented correctly. There are markings on the socket and plug of each connector to identify the correct orientation. Figure 4 shows these markings and the orientation of the cable connections.

Three Hirose to SMA cables are provided for all of the RF connections (Noise Sampler Input and Rx Input/Output).
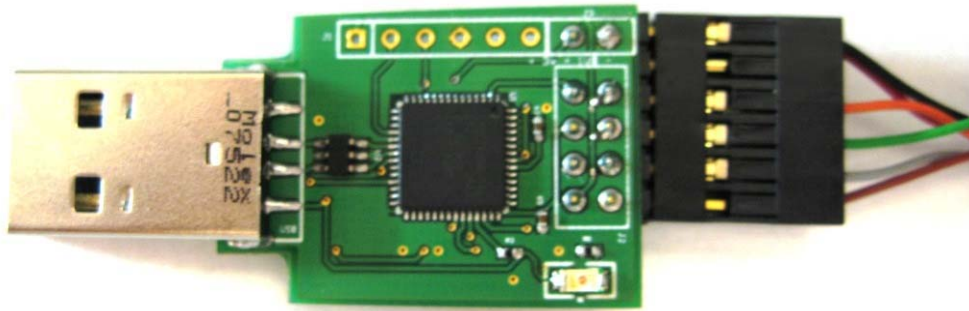

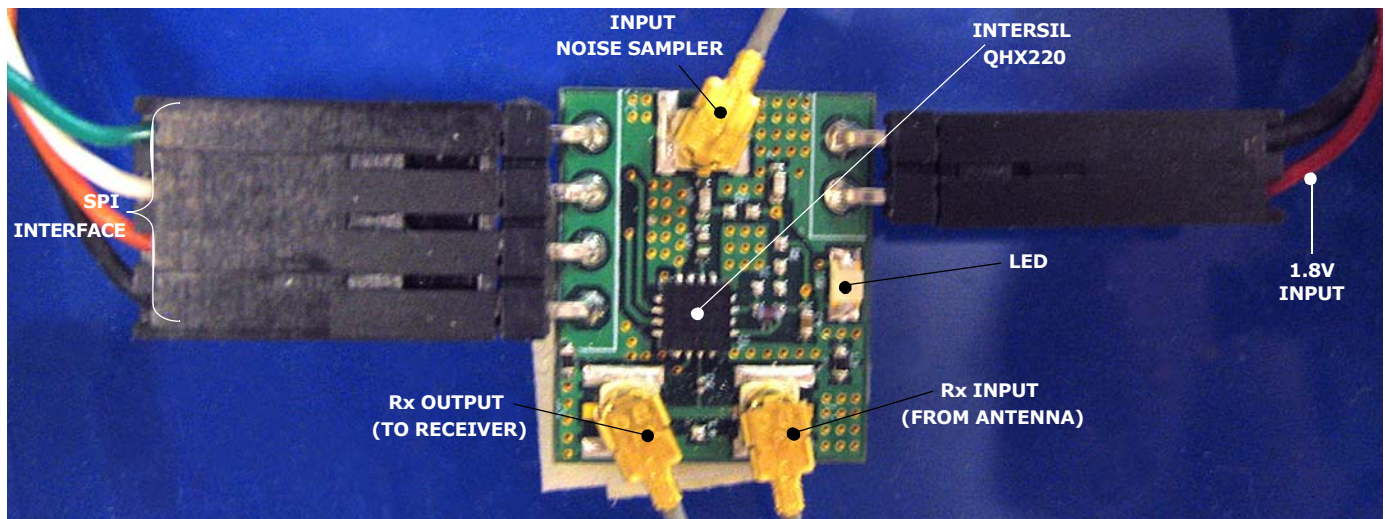**FIGURE 3. THE QHx220 USB CONTROLLER BOARD**

FIGURE 4. QHx220 USB CONTROLLER BOARD WITH PARTS LABELED

MTV Product Application

The following is a general overview on how the QHx220 can be applied for use in Mobile TV product applications.
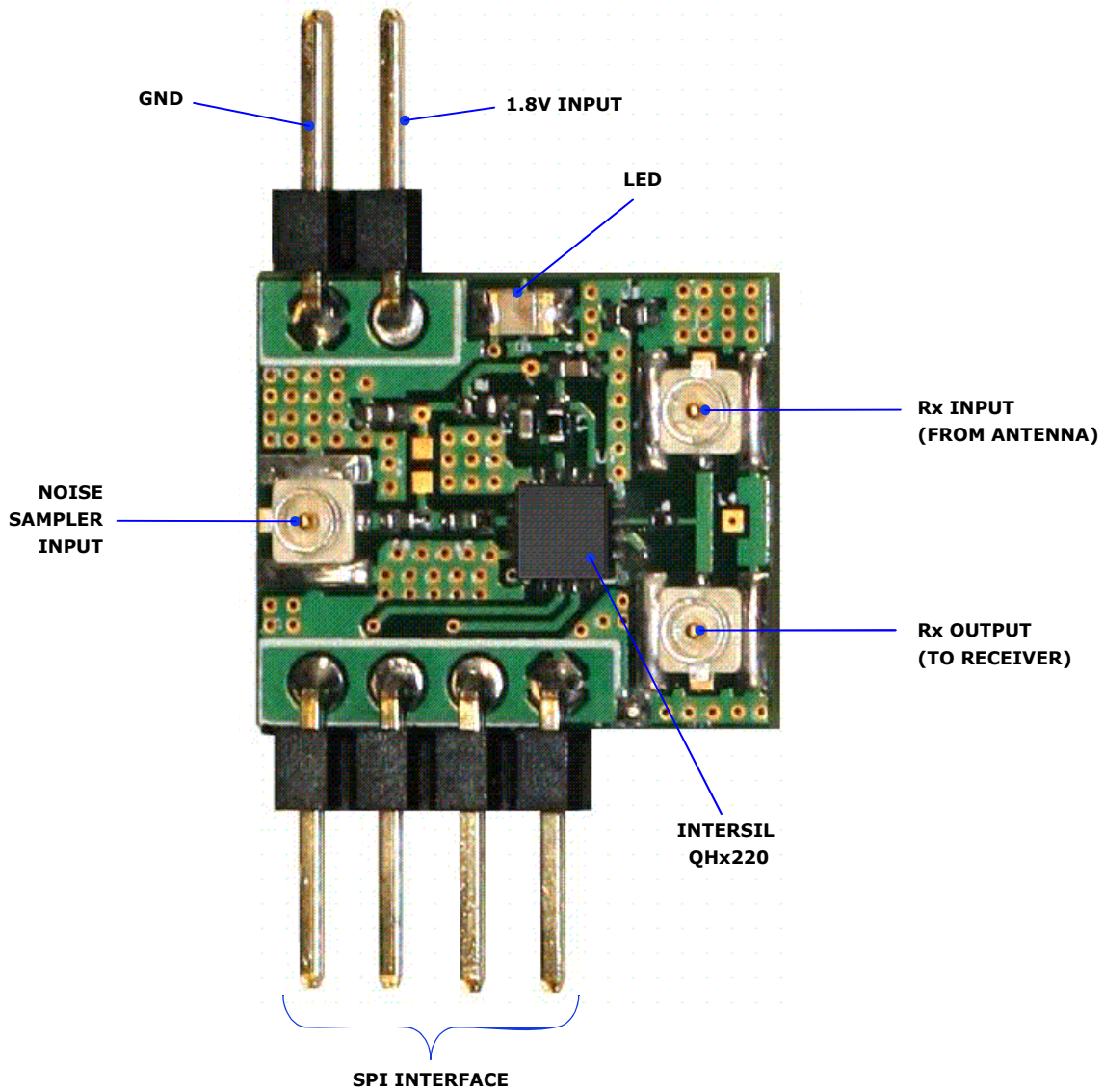
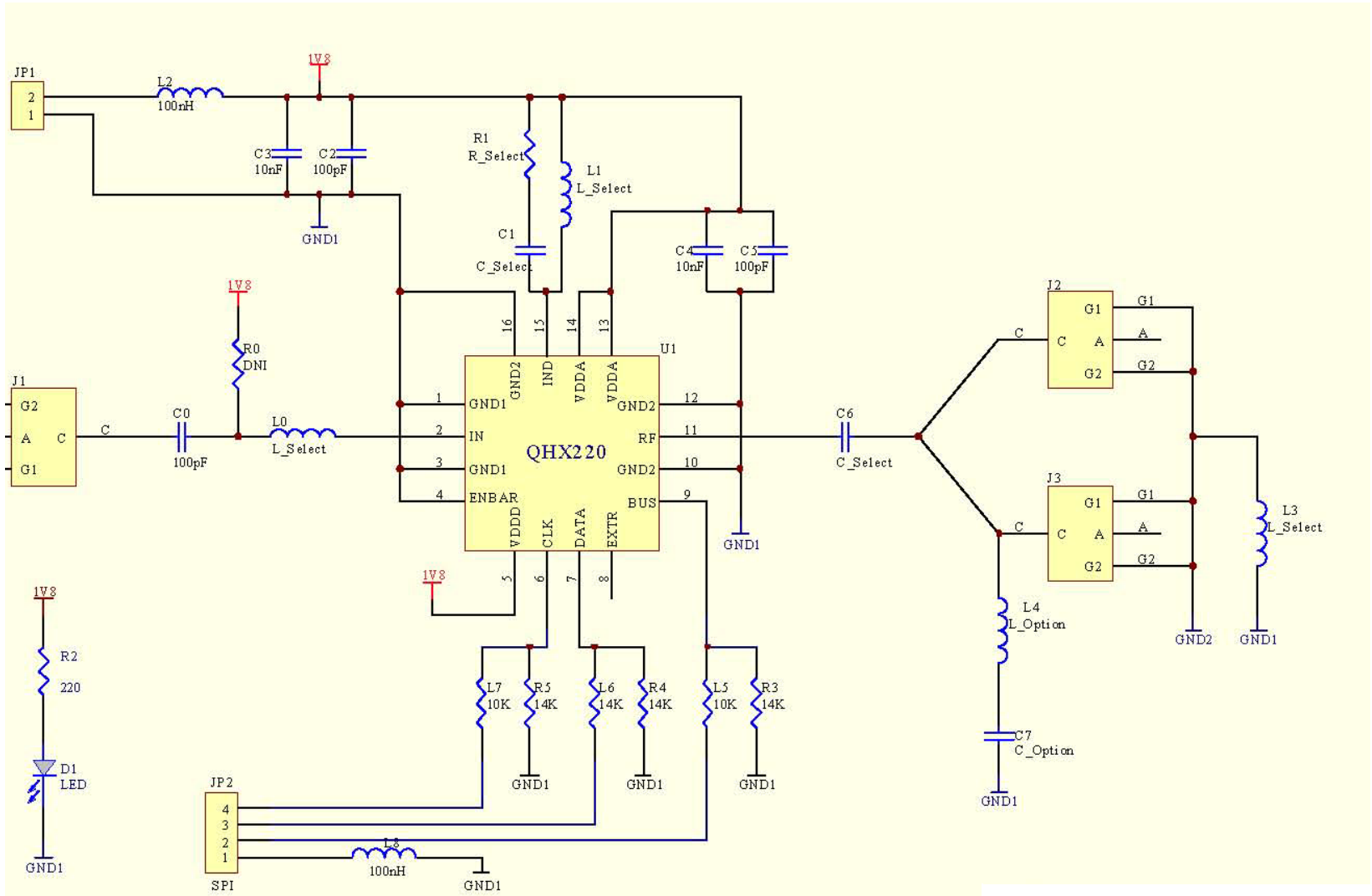## QHx220 Board Layout

FIGURE 5. QHx220 EVALUATION BOARD LAYOUT (MTV)

FIGURE 6. SCHEMATIC OF QHx220 EVALUATION BOARD (MTV)

QHx220 Board Bill of Materials (for MTV)

TABLE 1. QHx220 MTV-SPECIFIC EVALUATION BOARD BILL OF MATERIALS

ITEM	QTY	REFERENCE	PART	VENDOR	VENDOR PART #	DISTRIBUTOR
1	3	C0, C2, C5	100pF	KEMET	C0402C101J3GACTU	Digikey_399_1022_1_ND
2	2	C3, C4	10nF	KEMET	C0402C103K3RACTU	Digikey_399_1278_1_ND
3	2	C1	2pF	Panasonic	ECJ-0EC1H020C	Digikey_PCC020CQCT
4	1	C6	22pF	Murata	GRM0335C1E220JD01D	Digikey_490-1253-1-ND
5	1	C7	DNP			
6	1	L0	39nH	Panasonic	ELJ-RE39NJF2	Digikey_PCD1158CT
7	1	L1	22nH	Panasonic	ELJ-RE22NJF2	Digikey_PCD1155CT
8	1	L3	10nH	Panasonic	ELJ-RE10NJF2	Digikey_PCD1151CT
9	2	L2, L8	100nH	Panasonic	ELJ-RER10JF3	Digikey_PCD1201CT-ND
10	1	L4	DNP			
11	2	L5, L7 (L or R)	10kΩ	Yageo	9C04021A1001FLHF3	Digikey_311-1.00KLCT-ND
12	1	L6 (L or R)	14kΩ	Yageo	RC0402FR-0714KL	Digikey_311-14KLRCT
13	1	D1	LED	Lumex	SML_LXT0805GW	Digikey_67_1553_1_ND
14	1	JP1	HD1x4	Waldom	87758_0416	Digikey_WM18833_ND
15	1	JP2	HD1x2	Waldom	22_28_4040	Digikey_WM6404_ND
16	3	J1, J2, J3	Hirose			Digikey_H9161-ND
17	1	R0	DNP			
18	1	R1	10Ω	Yageo	9C04021A10RFLHF3	Digikey_311-10.0LCT-ND
19	1	R2	220Ω	ROHM	RC04022FR-07220RL	Digikey_311-220LRCT-ND
20	3	R3, R4, R5	14kΩ	ROHM	RC04022FR-0714KL	
21	1	U1	QNX220	Intersil	QNX220	

MTV Optimization Setup (Static Coupling Channel)

The following sections explain how to set up a static coupling channel which is used to perform self cancellation. The test setup in the following section is a useful environment to become familiar with tuning the device to the desired frequency the user would like to cancel in the final application. It will also provide an intuitive means of obtaining the starting I and Q values for achieving cancellation in the MTV Application setup.

A network analyzer is used to show the frequency response of the QHx220 while performing the optimization to achieve cancellation. It is suggested to perform the following setup of the network analyzer before connecting it to the rest of the test setup.

1. Set the desired frequency bandwidth for the application.
2. Change the output power to -45dBm. This provides some margin for the -45dBm maximum input requirement of the QHx220 since there is an additional 6dB loss from the power splitter. However, if pre-amplification is used (operating in high gain or boost mode) then the power should be reduced an additional 10dB to 15dB per gain stage.

3. Perform a 2-port calibration of the network analyzer.

4. Select the S21 measurement mode.

The power splitter connected to the output of the network analyzer is used to divide the aggressor signal into two separate paths. One path goes to the sampler input of the QHx220 which samples the aggressor signal. The other path is fed to what will later be used as part of the receive path for the MTV receiver. An attenuator pad is used in this path to set the coupling losses. This loss represents the coupling loss between the aggressor source and the MTV victim antenna. For the purpose of this evaluation the attenuator should be roughly 10dB to 20dB for a typical coupling factor. Keep in mind that the second power splitter adds an additional 6dB to the coupling factor. Since the QHx220 has ~50dB dynamic range, this range of attenuation should set the aggressor power in the middle of the tuning range of the QHx220 when using the lowest gain setting of the QHx220. Higher gain settings can be used for stronger coupling factors or weaker noise sampling or tapping methods.

It is important to set the power level of the network analyzer to -45dBm. This will ensure that the sampler input maximum power level is not exceeded. The

measurement of interest is S21 in order to optimize the MTV aggressor cancellation. Once the "MTV Optimization Setup (Static Coupling Channel)" is ready, use the software provided to configure the device as previously described.

1. Select the MTV frequency band of operation.
2. Start with the lowest gain setting.

3. Then adjust the I and Q (or gain and phase) until the maximum attenuation is achieved at the desired frequency.

Figure 8 is an example of the type of cancellation that should be achieved when the I and Q values have been optimized.

Once the cancellation has been optimized, record the I and Q values for the optimization of the setup used.
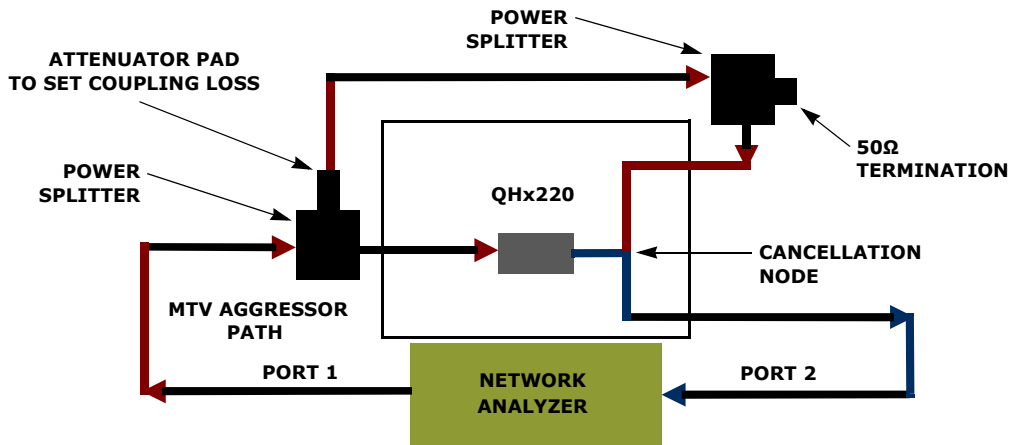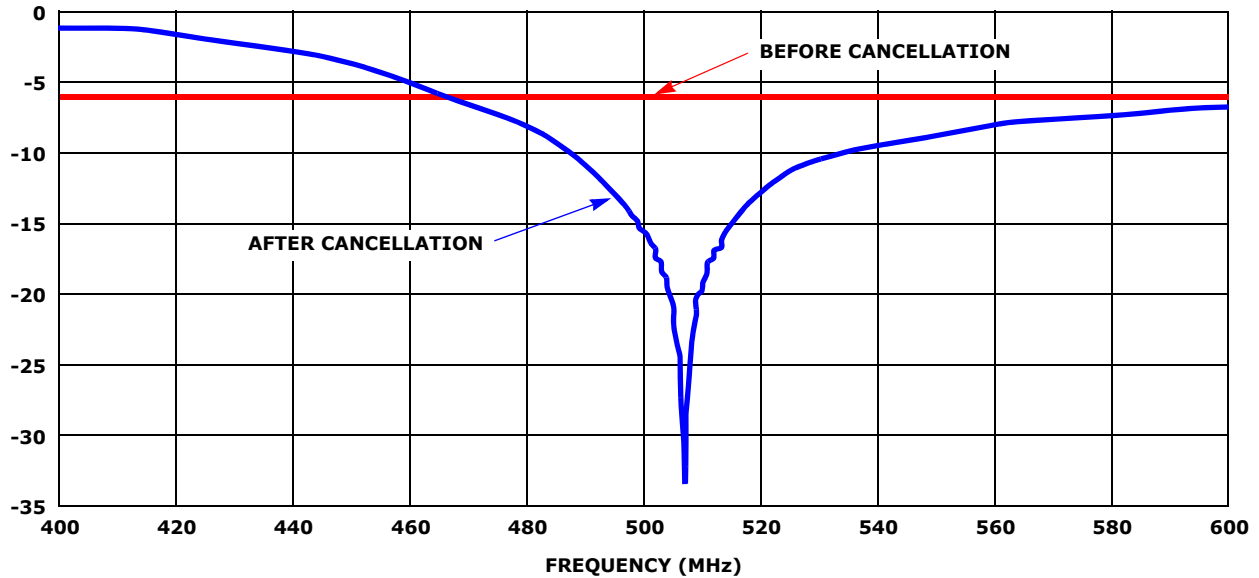

FIGURE 7. MTV OPTIMIZATION SETUP DIAGRAM

FIGURE 8. EXAMPLE OF OPTIMUM CANCELLATION (MTV)

intersil

MTV Application Setup

The following setup should be used for testing QHx220 noise cancellation ability for a MTV application. It is important to maintain the identical core setup used in the "MTV Optimization Setup (Static Coupling Channel)" section on page 7. Otherwise, the optimization values will not be valid.

Begin with the aggressor source (signal generator) and QHx220 board powered off. Turn on the MTV generator and MTV tuner and record the receiver's signal quality parameters (C/N, BER, etc.) once a channel synch is achieved. Find the weakest MTV generator level that will still enable the tuner to maintain synchronization. Next, set the aggressor signal generator to the same channel frequency and set the power level to roughly 10dB above the peak of the broadcast MTV signal. The aggressor signal needs to be high enough to show degradation of the receive signal strength reported by the MTV receiver. Remember not to exceed ~ -45dBm at the input of the

QHx220. Once an aggressor power level is found that degrades the receive signal strength reported by the MTV receiver, turn on the QHx220 board and set the optimized I and Q values that were determined in the "MTV Optimization Setup (Static Coupling Channel)" section on page 7. This should result in a <15dB recovery of the receive signal strength power reported by the MTV receiver if the board was optimized correctly. However, since the setup was slightly modified from the original optimization setup, it should be possible to fine tune the QHx220 to improve the in-band noise cancellation. Please note that any changes to the cable lengths or slight impedance changes will slightly impact the optimal gain and phase of the QHx220. Therefore, in the MTV application setup, adjust the gain and/or phase one step at a time and monitor the MTV receiver sensitivity (or any other signal quality parameter (i.e. C/N, BER, etc.). Continue to adjust the gain and phase one step at a time until no further improvement to the receiver sensitivity can be achieved.
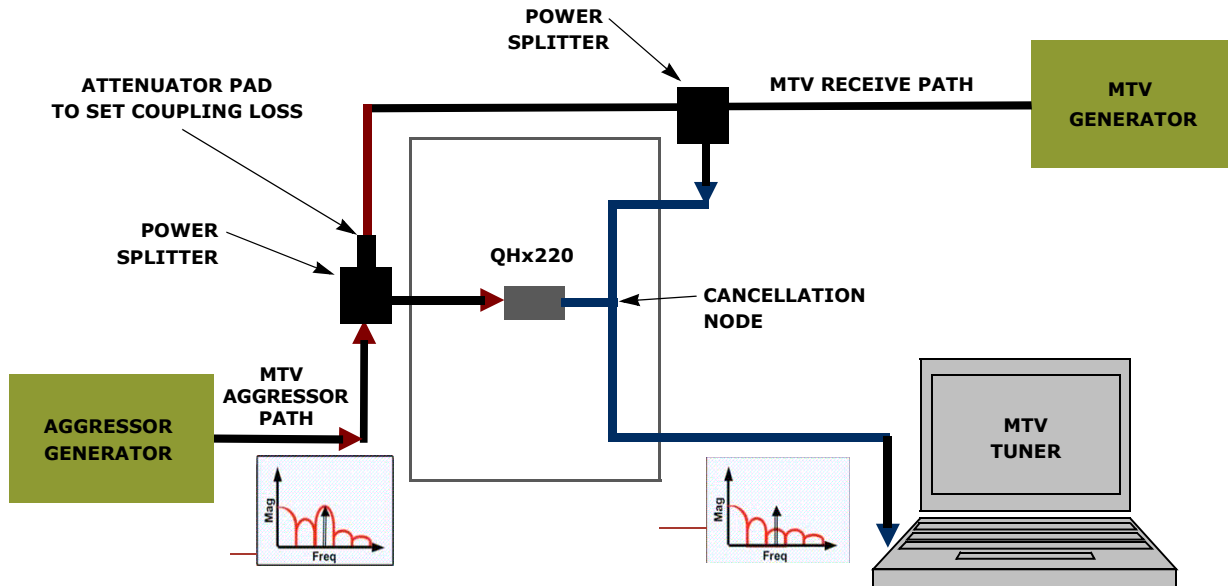

FIGURE 9. MTV TESTING SETUP DIAGRAM

GPS Product Application

The following is a general overview on how the QHx220 can be applied for use in GPS product applications.
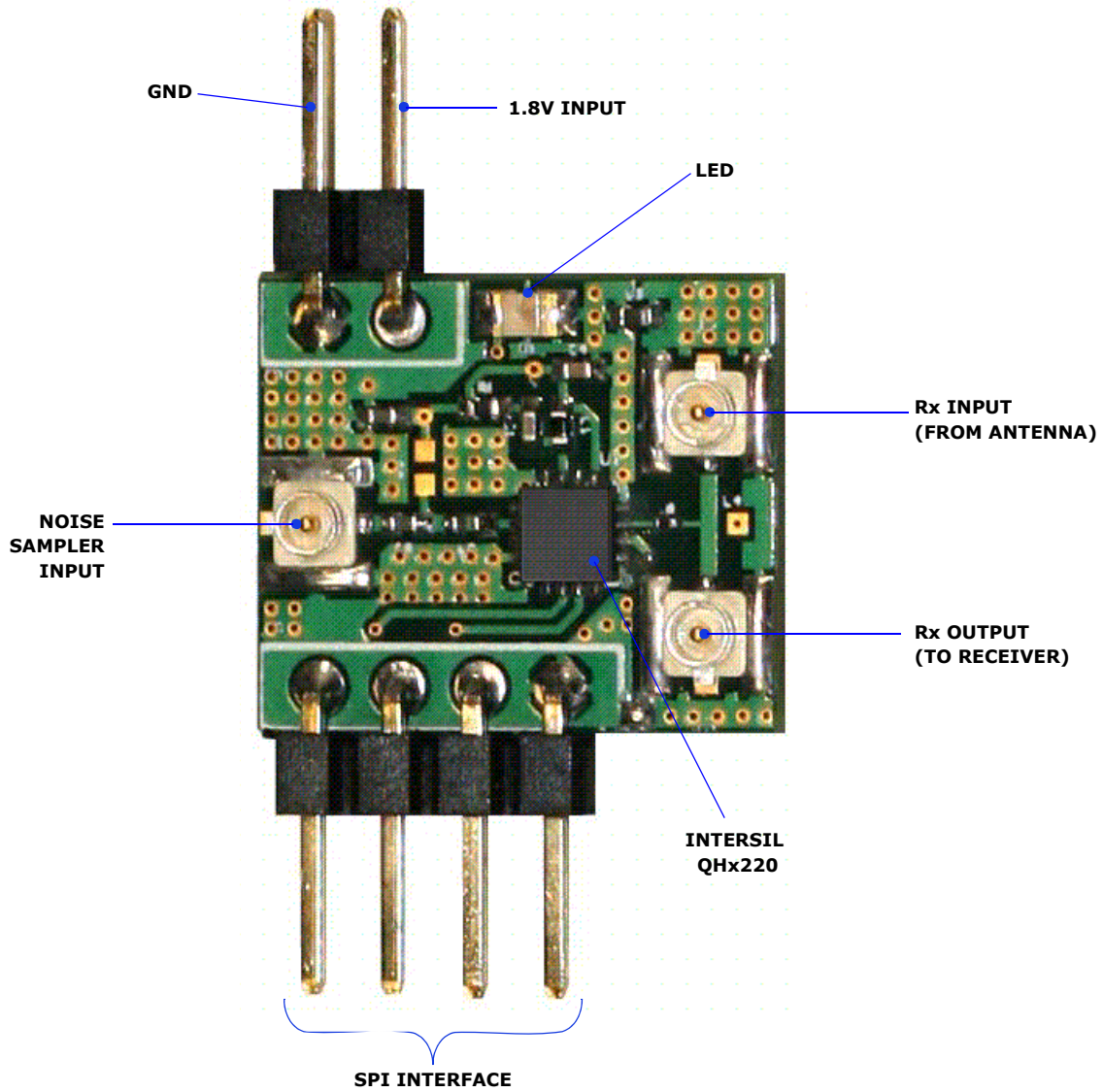
QHx220 Board Layout

FIGURE 10. QHx220 EVALUATION BOARD LAYOUT (GPS)
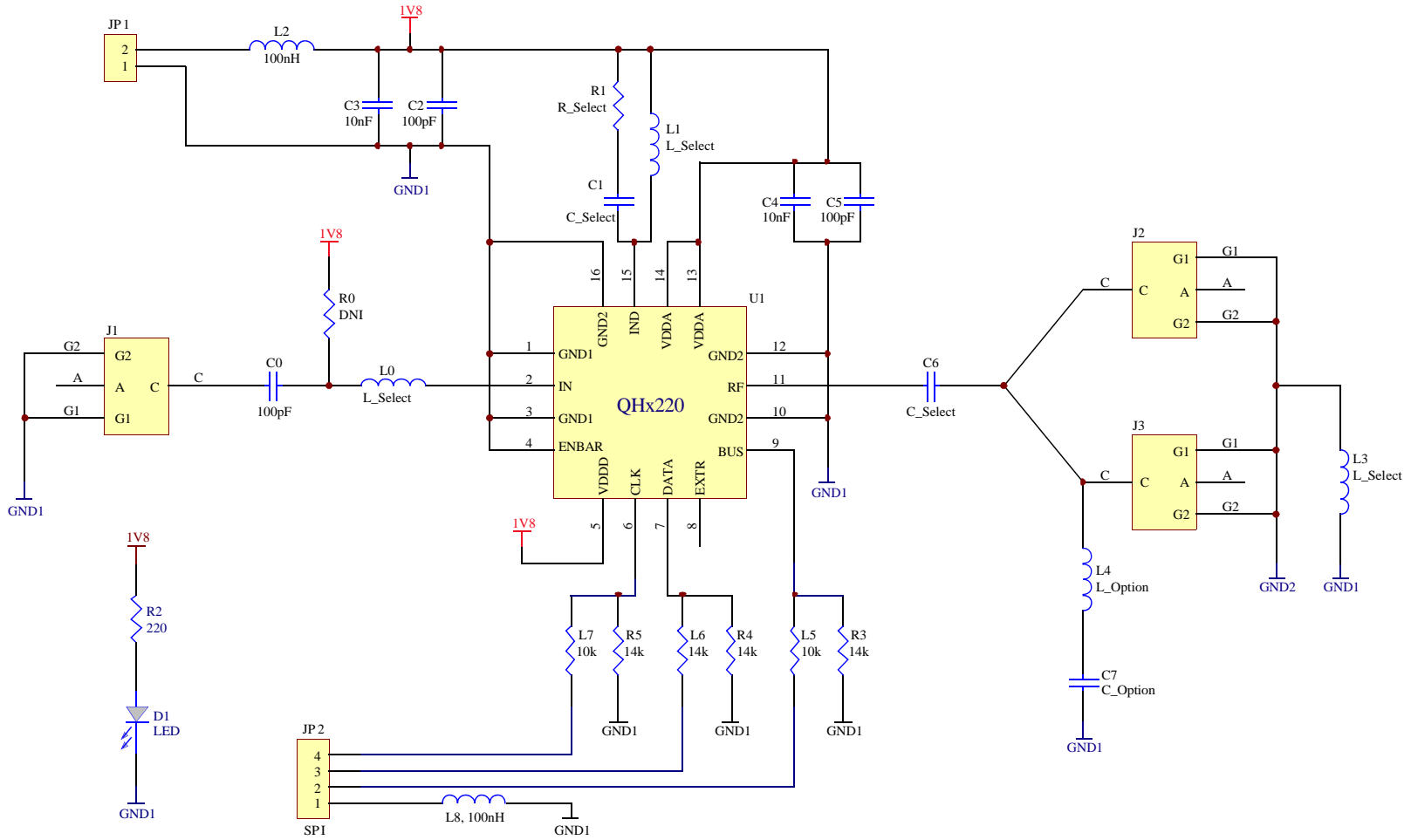
QHx220 Board Schematics (for GPS)

FIGURE 11. SCHEMATIC OF QHx220 EVALUATION BOARD (GPS)

QHx220 Board Bill of Materials (for GPS)

TABLE 2. QHx220 GPS-SPECIFIC EVALUATION BOARD BILL OF MATERIALS

ITEM	QTY	REFERENCE	PART	VENDOR	VENDOR PART #	DISTRIBUTOR
1	3	C0, C2, C5	100pF	KEMET	C0402C101J3GACTU	Digikey_399_1022_1_ND
2	2	C3, C4	10nF	KEMET	C0402C103K3RACTU	Digikey_399_1278_1_ND
3	1	C1	DNP			
4	1	C6	22pF	Murata	GRM0335C1E220JD01D	Digikey_490-1253-1-ND
5	1	C7	DNP			
6	1	L0	6.2nH	MURATA	LQG15HS6N2SO2D	Digikey_490-2620-1
7	1	L1	5.6nH	Panasonic	ELJ-RE5N6JF2	Digikey_PCD1148CT
8	1	L3	0.0Ω	ROHM	MCR01MZPJ000	Digikey_rhm0.0JCT-ND
9	2	L2, L8	100nH	Panasonic	ELJ-RER10JF3	Digikey_PCD1201CT-ND
10	1	L4	DNP			
11	2	L5, L7 (L or R)	10kΩ	Yageo	9C04021A1001FLHF3	Digikey_311-1.00KLCT-ND
12	1	L6 (L or R)	14kΩ	Yageo	RC0402FR-0714KL	Digikey_311-14KLRCT
13	1	D1	LED	Lumex	SML_LXT0805GW	Digikey_67_1553_1_ND
14	1	JP1	HD1x4	Waldom	87758_0416	Digikey_WM18833_ND
15	1	JP2	HD1x2	Waldom	22_28_4040	Digikey_WM6404_ND
16	3	J1, J2, J3	Hirose			Digikey_H9161-ND
17	1	R0	DNP			
18	1	R1	DNP			
19	1	R2	220Ω	ROHM	RC04022FR-07220RL	Digikey_311-220LRCT-ND
20	3	R3, R4, R5	14kΩ	ROHM	RC04022FR-0714KL	Digikey_311-14.0KLRCT
21	1	U1	QNX220	Intersil	QNX220	

GPS Optimization Setup (Static Coupling Channel)

The following sections explain how to set up a static coupling channel which is used to perform self cancellation. The test setup in the following section is a useful environment to become familiar with tuning the device to the desired frequency the user would like to cancel in the final application. It will also provide an intuitive means of obtaining the starting I and Q values for achieving cancellation in the GPS Application setup.

A network analyzer is used to show the frequency response of the QHx220 while performing the optimization to achieve cancellation. It is suggested to perform the following setup of the network analyzer before connecting it to the rest of the test setup.

1. Set the desired frequency bandwidth for the application.
2. Change the output power to -45dBm. This provides some margin for the -45dBm maximum input requirement of the QHx220 since there is an additional 6dB loss from the power splitter. However, if pre-amplification is used (operating in high gain or boost mode) then the power should be reduced an additional 10dB to 15dB per gain stage.

3. Perform a 2 port calibration of the network analyzer.
4. Select the S21 measurement mode.

The power splitter connected to the output of the network analyzer is used to divide the aggressor signal into two separate paths. One path goes to the sampler input of the QHx220 which samples the aggressor signal. The other path is fed to what will later be used as part of the receive path for the GPS receiver. An attenuator pad is used in this path to set the coupling losses. This loss represents the coupling loss between the aggressor source and the GPS victim antenna. For the purpose of this evaluation the attenuator should be roughly 10dB to 20dB for a typical coupling factor. Keep in mind that the second power splitter adds an additional 6dB to the coupling factor. Since the QHx220 has ~50dB dynamic range, this range of attenuation should set the aggressor power in the middle of the tuning range of the QHx220 when using the lowest gain setting of the QHx220. Higher gain settings can be used for stronger coupling factors or weaker noise sampling or tapping methods.

It is important to set the power level of the network analyzer to -45dBm. This will ensure that the sampler input maximum power level is not exceeded. The measurement of interest is S21 in order to optimize the

GPS aggressor cancellation. Once the "GPS Optimization Setup (Static Coupling Channel)" is ready, use the software provided to configure the device as previously described.

1. Select the GPS frequency band of operation.
2. Start with the lowest gain setting.

3. Then adjust the I and Q (or gain and phase) until the maximum attenuation is achieved at the desired frequency.

Figure 13 is an example of the type of cancellation that should be achieved when the I and Q values have been optimized.

Once the cancellation has been optimized, record the I and Q values for the optimization of the setup used.
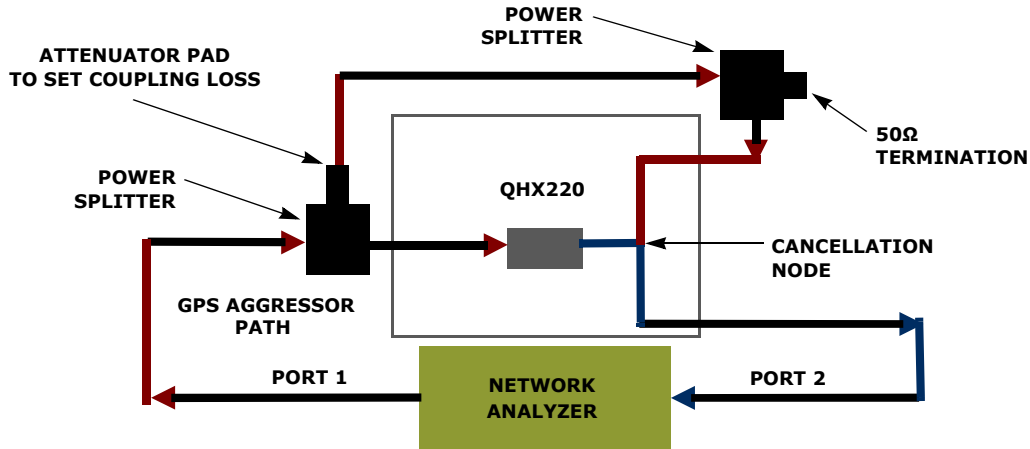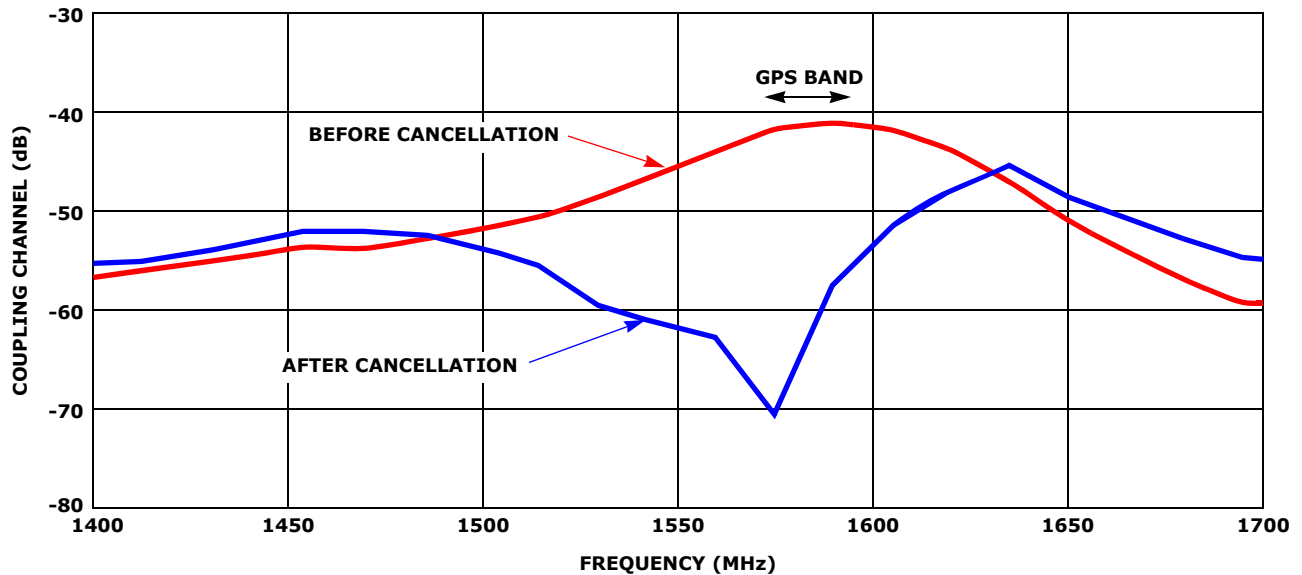
FIGURE 12. GPS OPTIMIZATION SETUP DIAGRAM

FIGURE 13. EXAMPLE OF OPTIMUM CANCELLATION (GPS)

GPS Application Setup

The following setup should be used for testing QHx220 noise cancellation ability for a GPS application. It is important to maintain the identical core setup used in the "GPS Optimization Setup (Static Coupling Channel)" section on page 12. Otherwise, the optimization values will not be valid.

Begin with the aggressor source (signal generator) and QHx220 board powered off. Turn on the GPS simulator and GPS receiver and record the receiver's signal quality parameters (C/N, etc.) once a satellite lock is achieved. Find the weakest GPS signal power level that will still maintain a lock. Next, set the aggressor signal generator to the same GPS frequency and set the power level to roughly 10dB above the peak of the broadcast GPS signal. The aggressor signal needs to be high enough to show degradation of the receive signal strength reported by the GPS receiver. Remember not to exceed ~ -45dBm at the input of the QHx220. Once an aggressor power

level is found that degrades the receive signal strength reported by the GPS receiver, turn on the QHx220 board and set the optimized I and Q values that were determined in the "GPS Optimization Setup (Static Coupling Channel)" section on page 12. This should result in a <15dB recovery of the receive signal strength power reported by the GPS receiver if the board was optimized correctly. However, since the setup was slightly modified from the original optimization setup, it should be possible to fine tune the QHx220 to improve the in-band noise cancellation. Please note that any changes to the cable lengths or slight impedance changes will slightly impact the optimal gain and phase of the QHx220. Therefore, in the GPS application setup, adjust the gain and/or phase one step at a time and monitor the GPS receiver sensitivity (or any other signal quality parameter (i.e. C/N, etc.). Continue to adjust the gain and phase one step at a time until no further improvement to the receiver sensitivity can be achieved.
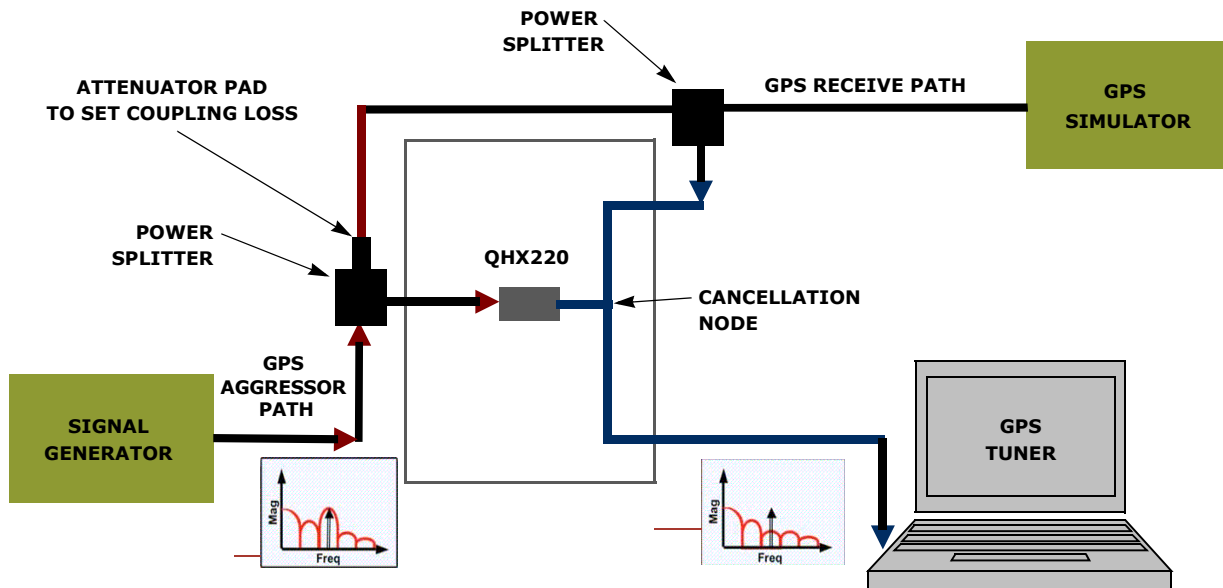

FIGURE 14. GPS TESTING SETUP DIAGRAM

WLAN Product Application

The following is a general overview on how the QHx220 can be applied for use in WLAN product applications.
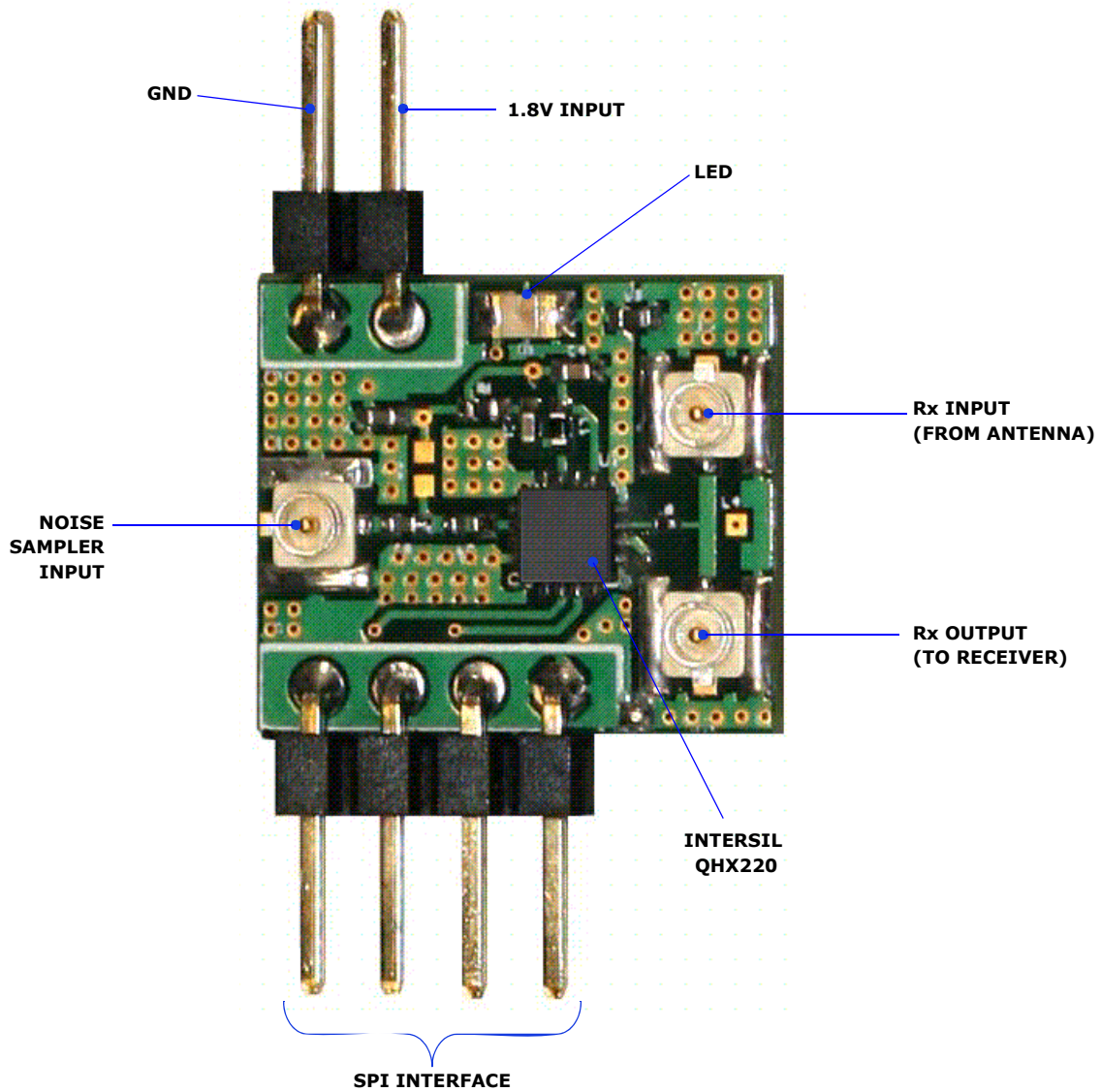
QHx220 Board Layout
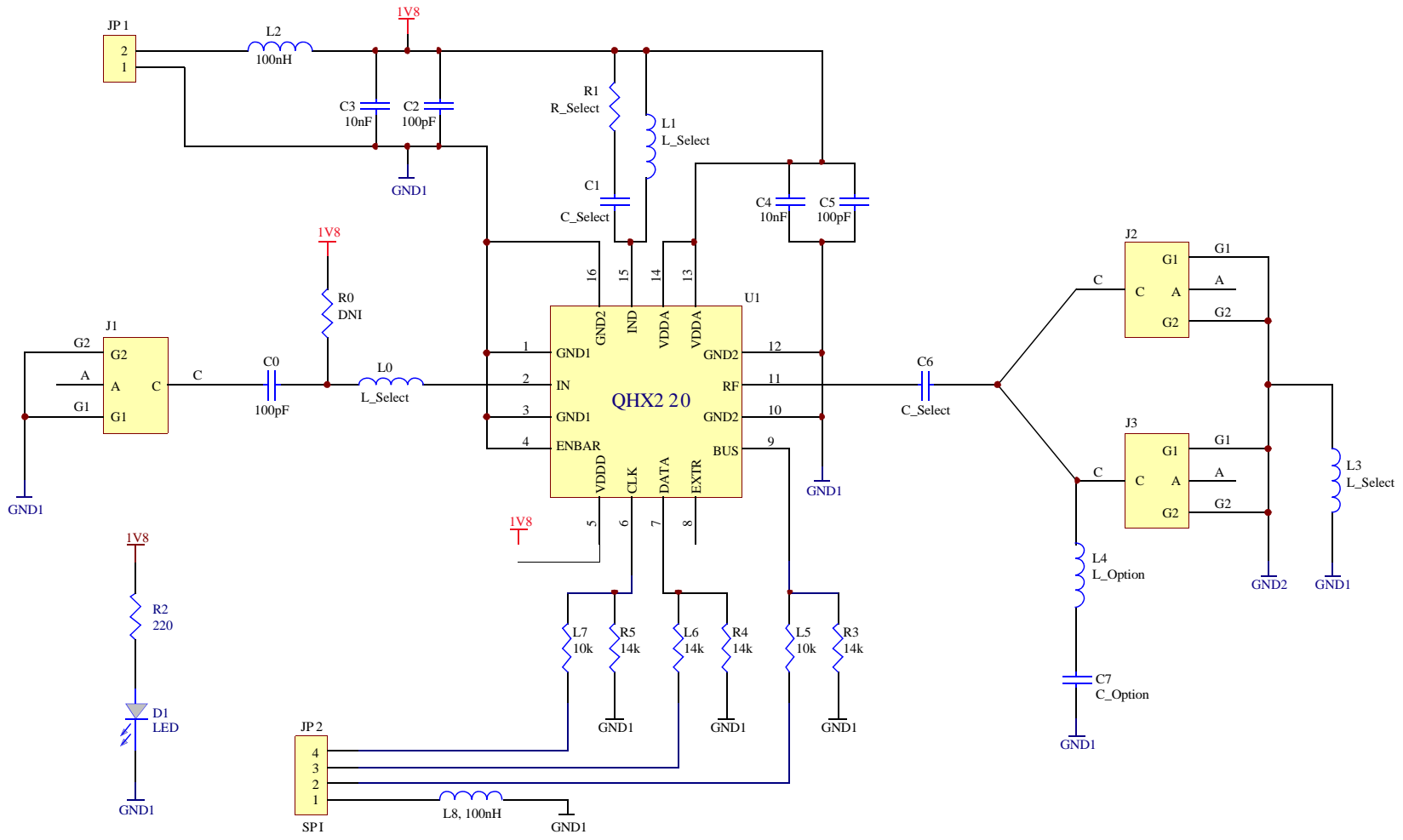
FIGURE 15. QHx220 EVALUATION BOARD LAYOUT (WLAN)

intersil

FIGURE 16. SCHEMATIC OF QHx220 EVALUATION BOARD (WLAN)

QHx220 Board Bill of Materials (for WLAN)

TABLE 3. QHx220 WLAN-SPECIFIC EVALUATION BOARD BILL OF MATERIALS

ITEM	QTY	REFERENCE	PART	VENDOR	VENDOR PART #	DISTRIBUTOR
1	3	C0, C2, C5	100pF	KEMET	C0402C101J3GACTU	Digikey_399_1022_1_ND
2	2	C3, C4	10nF	KEMET	C0402C103K3RACTU	Digikey_399_1278_1_ND
3	1	C1	DNP			
4	1	C6	0.0Ω	Panasonic	ERJ-1GE0R00C	Digikey_P0.0AGCT-ND
5	1	C7	DNP			
6	1	L0	3.3nH	Panasonic	ELJ-RE3N3DF2	Digikey_PCD1145CT
7	1	L1	1.5nH	Panasonic	ELJ-RE1N5DF2	Digikey_PCD1196CT
8	1	L3	0.0Ω	ROHM	MCR01MZPJ000	Digikey_RHM0.0JCT_ND
9	2	L2, L8	100nH	Panasonic	ELJ-RER10JF3	Digikey_PCD1201CT-ND
10	1	L4	DNP			
11	2	L5, L7 (L or R)	10kΩ	Yageo	9C04021A1001FLHF3	Digikey_311-1.00KLCT-ND
12	1	L6 (L or R)	14kΩ	Yageo	RC0402FR-0714KL	Digikey_311-14KLRCT
13	1	D1	LED	Lumex	SML_LXT0805GW	Digikey_67_1553_1_ND
14	1	JP1	HD1x4	Waldom	87758_0416	Digikey_WM18833_ND
15	1	JP2	HD1x2	Waldom	22_28_4040	Digikey_WM6404_ND
16	3	J1, J2, J3	Hirose			Digikey_H9161-ND
17	1	R0	DNP			
18	1	R1	DNP			
19	1	R2	220Ω	ROHM	RC04022FR-07220RL	Digikey_311-220LRCT-ND
20	3	R3, R4, R5	14kΩ	ROHM	RC04022FR-0714KL	Digikey_311-14.0KLRCT
21	1	U1	QNX220	Intersil	QNX220	

WLAN Optimization Setup (Static Coupling Channel)

The following sections explain how to set up a static coupling channel which is used to perform self cancellation. The test setup in the following section is a useful environment to become familiar with tuning the device to the desired frequency the user would like to cancel in the final application. It will also provide an intuitive means of obtaining the starting I and Q values for achieving cancellation in the WLAN Application setup.

A network analyzer is used to show the frequency response of the QHx220 while performing the optimization to achieve cancellation. It is suggested to perform the following setup of the network analyzer before connecting it to the rest of the test setup.

1. Set the desired frequency bandwidth for the application.
2. Change the output power to -45dBm. This provides some margin for the -45dBm maximum input requirement of the QHx220 since there is an additional 6dB loss from the power splitter. However if pre-amplification is used (operating in high gain or boost mode) then the power should be reduced an additional 10dB to 15dB per gain stage.

3. Perform a 2 port calibration of the network analyzer.
4. Select the S21 measurement mode.

The power splitter connected to the output of the network analyzer is used to divide the aggressor signal into two separate paths. One path goes to the sampler input of the QHx220 which samples the aggressor signal. The other path is fed to what will later be used as part of the receive path for the WLAN receiver. An attenuator pad is used in this path to set the coupling losses. This loss represents the coupling loss between the aggressor source and the WLAN victim antenna. For the purpose of this evaluation the attenuator should be roughly 10dB to 20dB for a typical coupling factor. Keep in mind that the second power splitter adds an additional 6dB to the coupling factor. Since the QHx220 has ~50dB dynamic range, this range of attenuation should set the aggressor power in the middle of the tuning range of the QHx220 when using the lowest gain setting of the QHx220. Higher gain settings can be used for stronger coupling factors or weaker noise sampling or tapping methods.

It is important to set the power level of the network analyzer to -45dBm. This will ensure that the sampler input maximum power level is not exceeded. The measurement of interest is S21 in order to optimize the

WLAN aggressor cancellation. Once the "WLAN Optimization Setup (Static Coupling Channel)" is ready, use the software provided to configure the device as previously described:

1. Select the WLAN frequency band of operation.

2. Start with the lowest gain setting.

3. Then adjust the I and Q (or gain and phase) until the maximum attenuation is achieved at the desired frequency.

Figure 18 is an example of the type of cancellation that should be achieved when the I and Q values have been optimized.
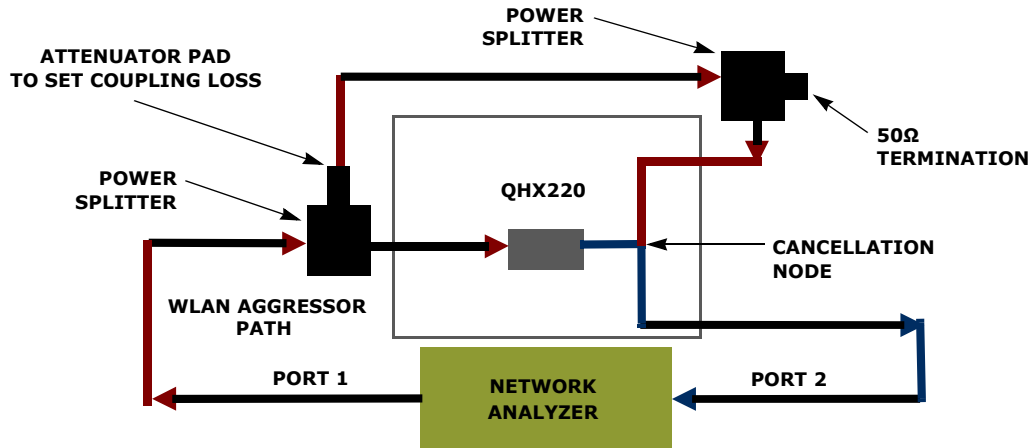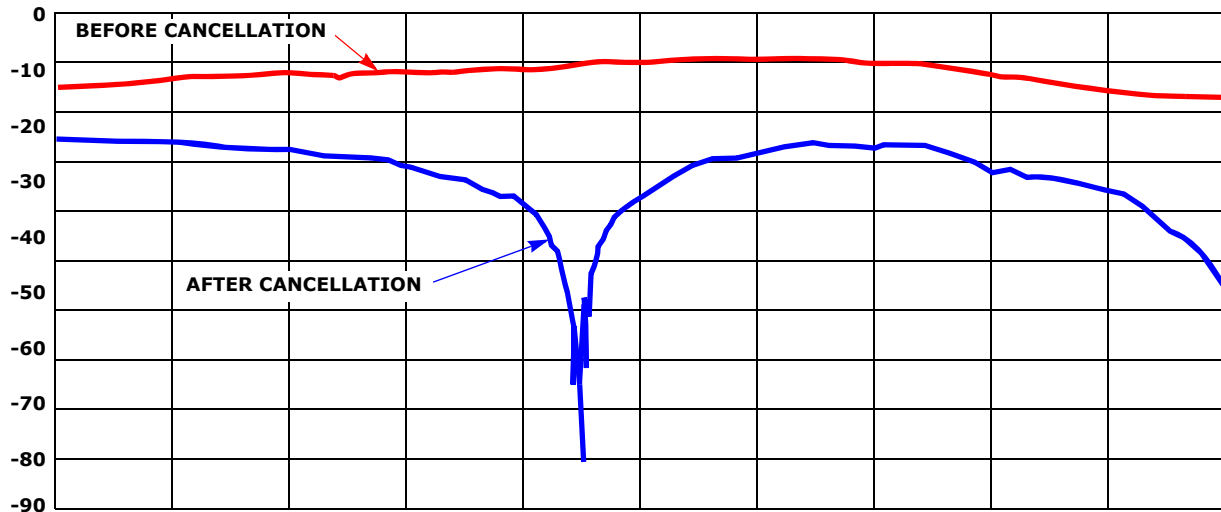
FIGURE 17. WLAN OPTIMIZATION SETUP DIAGRAM

FIGURE 18. EXAMPLE OF OPTIMUM CANCELLATION (WLAN)

WLAN Application Setup

The following setup should be used for testing QHx220 noise cancellation ability for a WLAN application. It is important to maintain the identical core setup used in the "WLAN Optimization Setup (Static Coupling Channel)" section on page 17. Otherwise, the optimization values will not be valid.

Begin with the aggressor source (signal generator) and QHx220 board powered off. Turn on the WLAN simulator and WLAN receiver and record the receiver's signal quality parameters (C/N, etc.). Find the weakest WLAN signal power level that will still maintain a WLAN link. Next set the aggressor signal generator to the same WLAN frequency and set the power level to roughly 10dB above the peak of the broadcast WLAN signal. The aggressor signal needs to be high enough to show degradation of the receive signal strength reported by the WLAN receiver. Remember not to exceed ~ -45dBm at the input of the QHx220. Once an aggressor power level is found that degrades the receive signal strength reported by the WLAN receiver, turn on the QHx220 board and set the optimized I and Q values that were determined in the "WLAN Optimization Setup (Static Coupling Channel)" section on page 17. This should result in a <15dB recovery of the receive signal strength power reported by the WLAN receiver if the board was

optimized correctly. However, since the setup was slightly modified from the original optimization setup, it should be possible to fine tune the QHx220 to improve the in-band noise cancellation. Please note that any changes to the cable lengths or slight impedance changes will slightly impact the optimal gain and phase of the QHx220. Therefore, in the WLAN application setup, adjust the gain and/or phase one step at a time and monitor the WLAN receiver sensitivity (or any other signal quality parameter (i.e. C/N, etc.). Continue to adjust the gain and phase one step at a time until no further improvement to the receiver sensitivity can be achieved.

Q:ACTIVE

Q:ACTIVE Technology is behind Intersil's ability to insert its ICs inside radios, automotive infotainment systems, satellite broadcast equipment, and various consumer electronic devices such as GPS units, cell phones, and portable gaming systems. By doing so, Intersil achieves the ability to reduce electromagnetic interference by as much as 30dB. This breakthrough in radio sensitivity allows for several signals to run simultaneously and enables new technologies such as mobile TV on hand held games, cell phones, and in automotive systems.
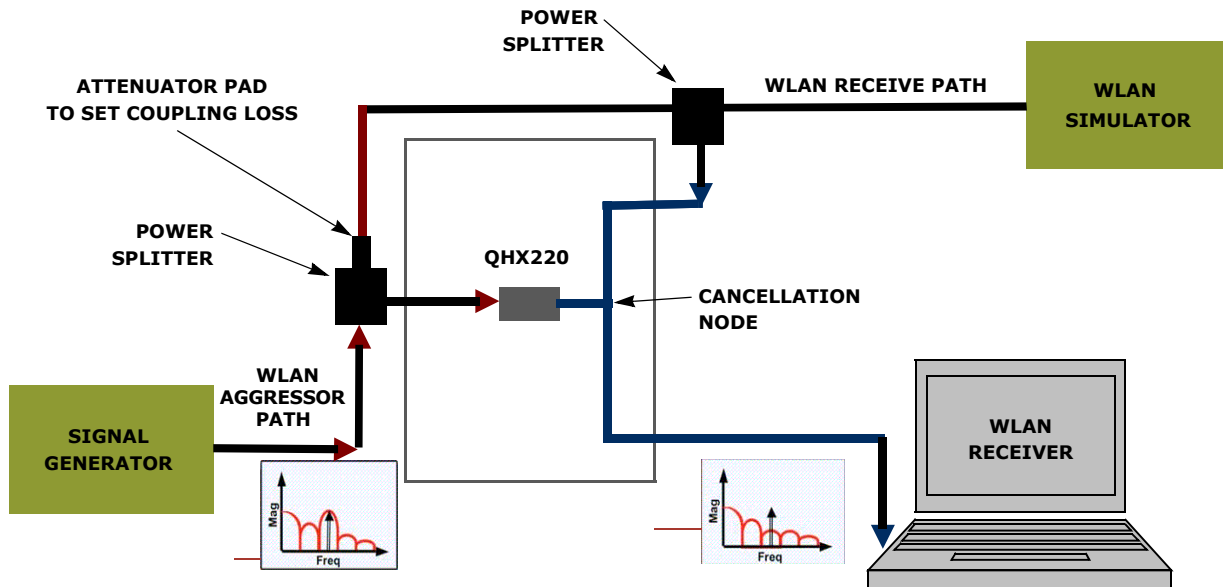

FIGURE 19. WLAN TESTING SETUP DIAGRAM

For information regarding Intersil Corporation and its products, see www.intersil.com