

MSM8916 Chipset Introduction

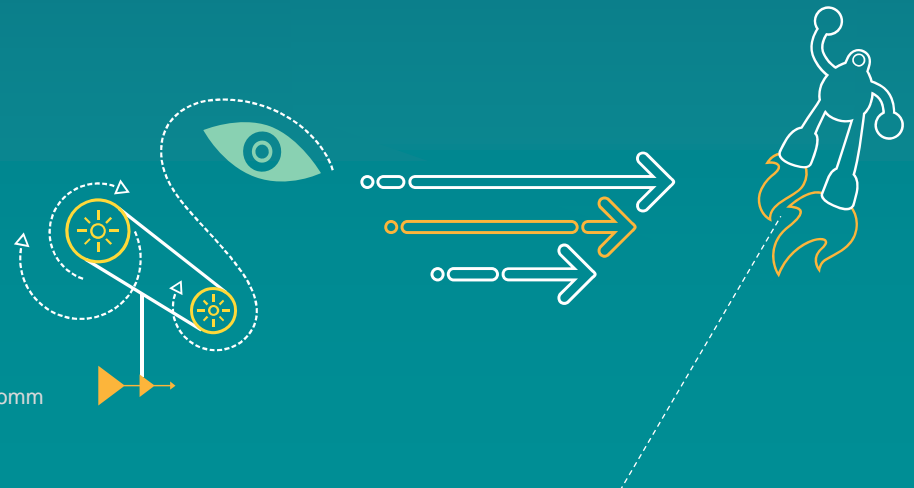


Qualcomm Technologies, Inc.

80-NK807-21 Rev. B

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Revision History

Revision	Date	Description
A	December 2013	Initial release
B	May 2014	<ul style="list-style-type: none">• Global change: Added WTR4905 and WCN3660B chipsets and block diagrams (slide 8, 10)• Updated ES and CS timelines of MSM8916 chipset in slide 7• Added reference document for WTR4905/WTR2605 reference schematic in slide 21

Agenda

Chipset Introduction

Chipset Combinations

MSM8916 Chipset CS schedules

MSM8916 Functional Block Diagram and Example Application

Supported RF Architectures

Supported RF Architectures

IC Introduction

Modem IC Overviews – MSM8916

PMIC Overviews – PM8916

WTR4905 Block Diagram

WTR1605L Block Diagram

WTR2605 Block Diagram

WTR2100 Block Diagram

Band Support

Wireless Connectivity IC Overviews – WCN3620/WCN3660B and QCA1990

WCN3660B Block Diagram

WCN3620 Block Diagram

QCA1990 Block Diagram

PA Power Management IC – QFE2101 (APT only; no ET support)

Multimode PA + Switch IC – QFE2320

Multimode HB PA + Switch IC – QFE2340

Antenna Tuner IC – QFE2520

Antenna Tuner IC – QFE2550

Evaluation Platform

Evaluation/Reference Platform – Introduction

Reference Material and QTI Support

Reference Documents (1 of 3)

Reference Documents (2 of 3)

Reference Documents (3 of 3)

[5](#)

[6](#)

[7](#)

[8](#)

[9](#)

[10](#)

[11](#)

[13](#)

[15](#)

[17](#)

[18](#)

[19](#)

[20](#)

[21](#)

[23](#)

[24](#)

[25](#)

[26](#)

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[32](#)

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[34](#)

[35](#)

[36](#)

[37](#)

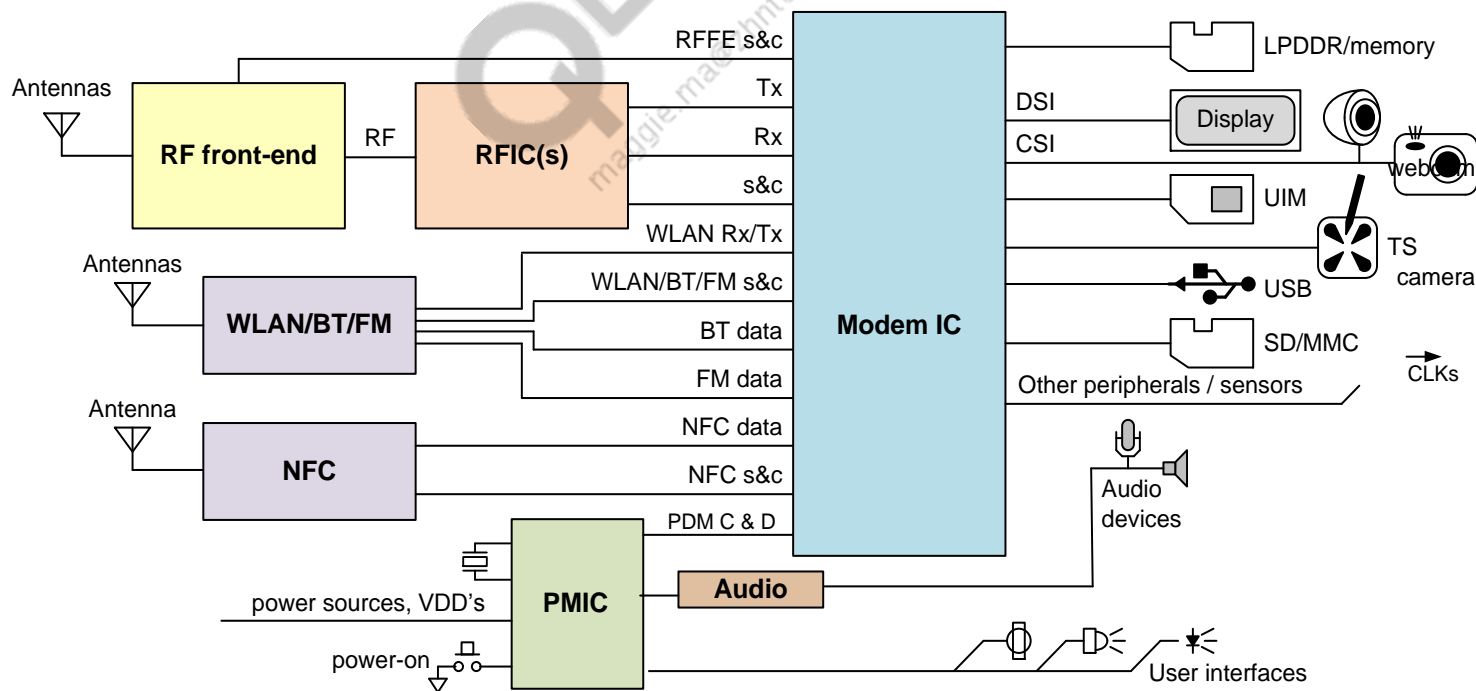
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Chipset Introduction

Chipset Combinations

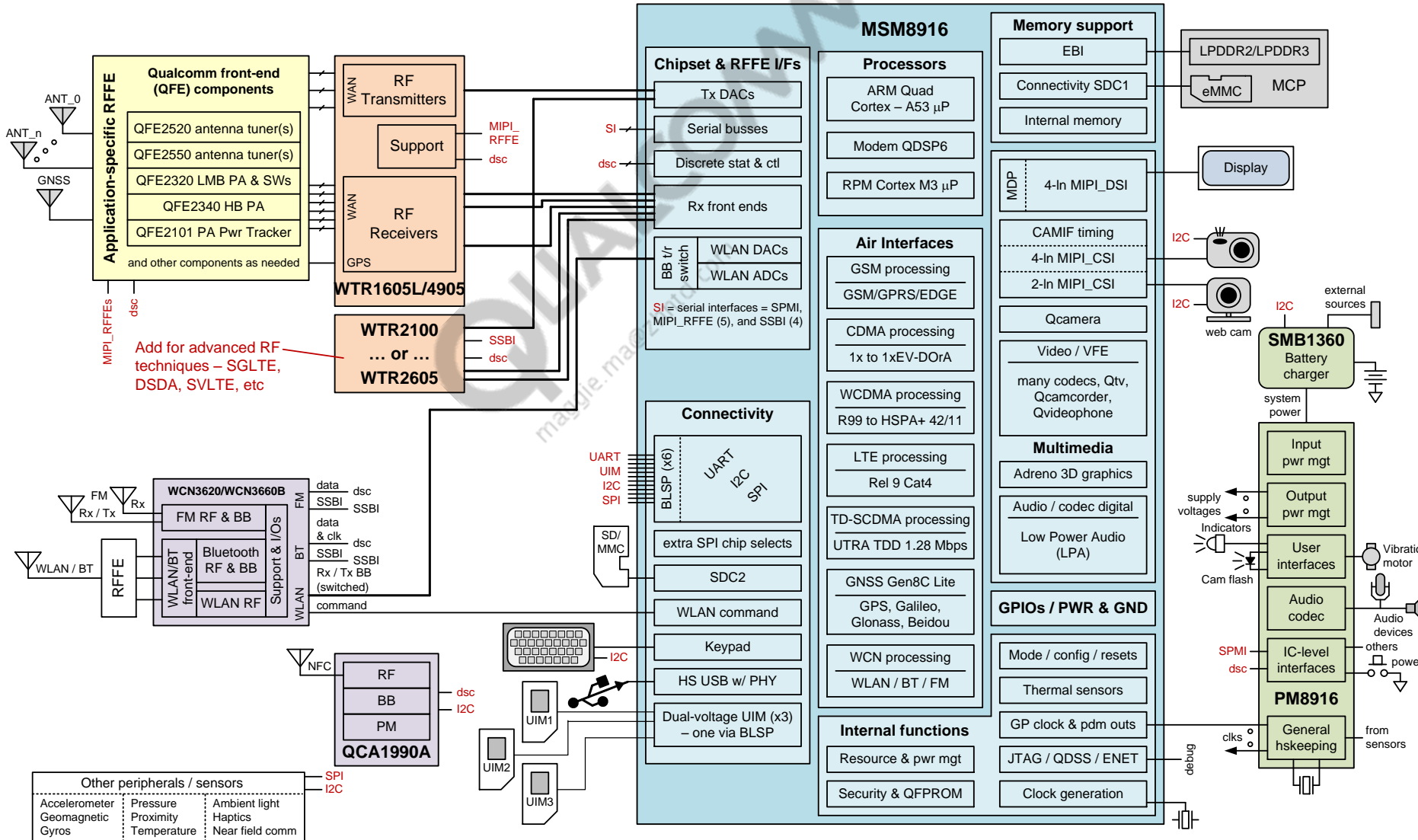
Modem IC & Non-PoP memory	PMIC	RFIC(s)	Audio	WLAN/BT/FM radio	NFC	RFFE
MSM8916	PM8916	WTR1605L/ WTR4905 + WTR2605/ WTR2100	MSM+PMIC	WCN3660B/ WCN3620	QCA1990	QFE2320/QFE3320/QFE2340 (QPA) QFE2101 (APT) QFE2520/QFE2550 (Tuner)



MSM8916 Chipset CS schedules

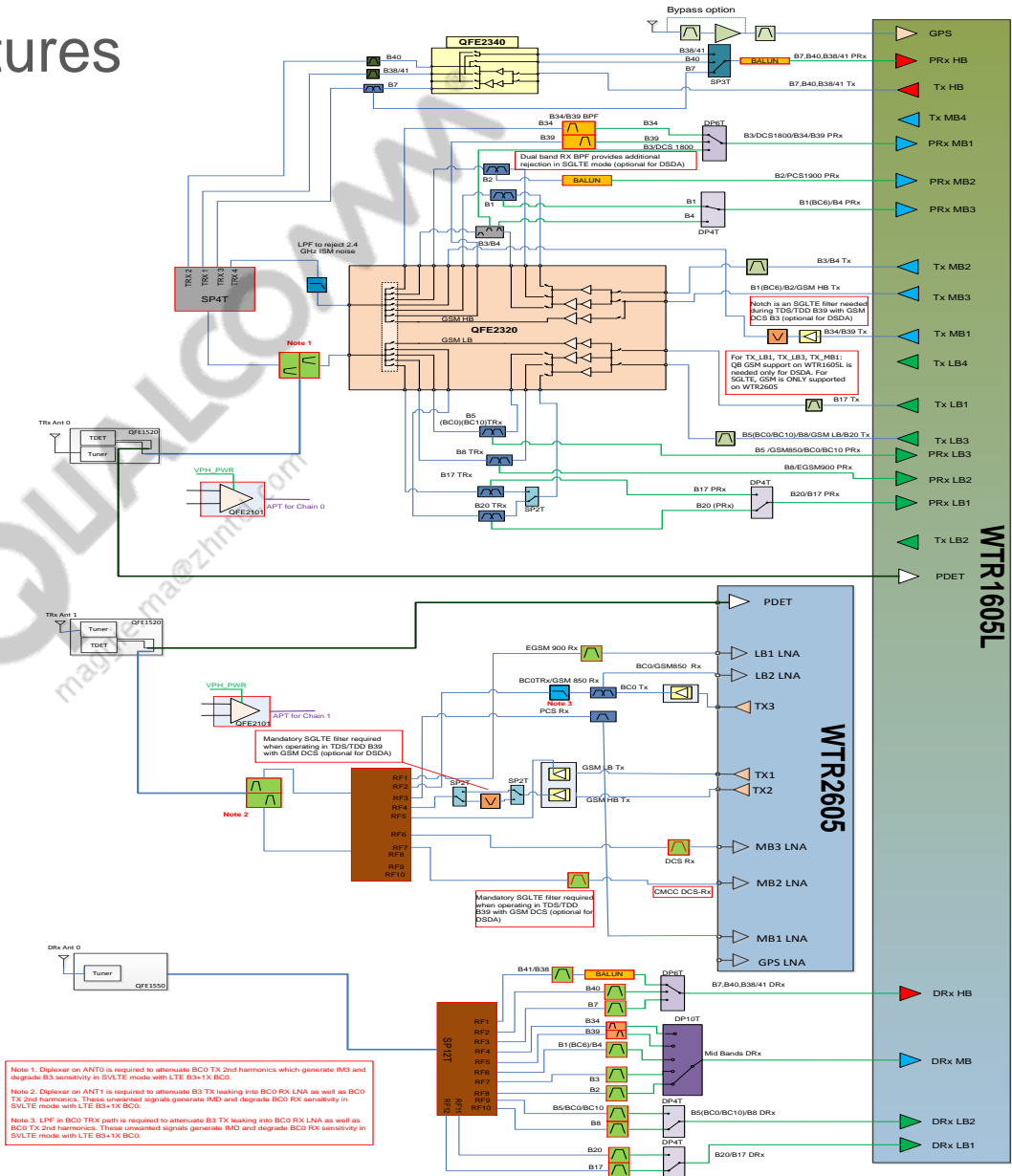
June 2014	MSM8916	PM8916	WTR1605L/ WTR2605/ WTR2100/	QFE 2320	QFE 2340	QFE 2101	QFE 2520	QFE 2550	SMB 1360	QCA1990	WCN3620/ WCN3660B
Oct 2014	MSM8916	PM8916	WTR4905/ WTR2605	QFE3320/ QFE2320	QFE 2340	QFE 2101	QFE 2520	QFE 2550	SMB 1360	QCA1990	WCN3620/ WCN3660B

17







Supported RF Architectures

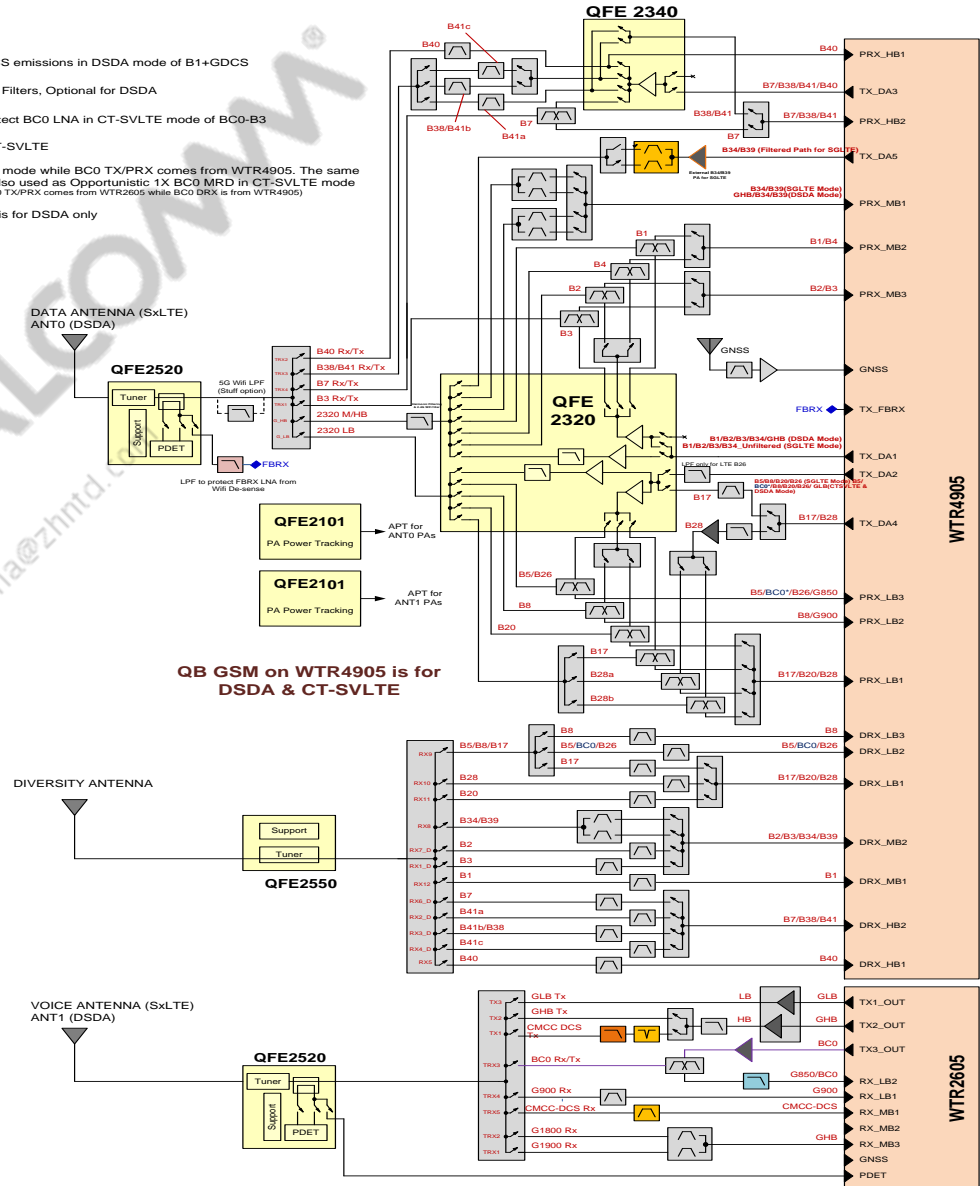
- SGLTE/DSDA/CT-SVLTE
 preliminary RF block
 diagram with
 WTR1605L/WTR2605 using
 Qualcomm® RF360™ –
 design example



Supported RF Architectures

- SGLTE/DSDA/CT-SVLTE preliminary RF block diagram with WTR4905/WTR2605 using Qualcomm RF360 – design example

-  B1 LPF to meet DCS emissions in DSDA mode of B1+GDCS
-  Mandatory SGLTE Filters, Optional for DSDA
-  LPF needed to protect BC0 LNA in CT-SVLTE mode of BC0-B3
-  Needed only for CT-SVLTE
- BC0** BC0 DRX in DSDA mode while BC0 TX/PRX comes from WTR4905. The same BC0 DRX path is also used as Opportunistic 1X BC0 MRD in CT-SVLTE mode (in CT-SVLTE mode, BC0 TX/PRX comes from WTR2605 while BC0 DRX is from WTR4905)
- BC0*** BC0 on WTR4905 is for DSDA only





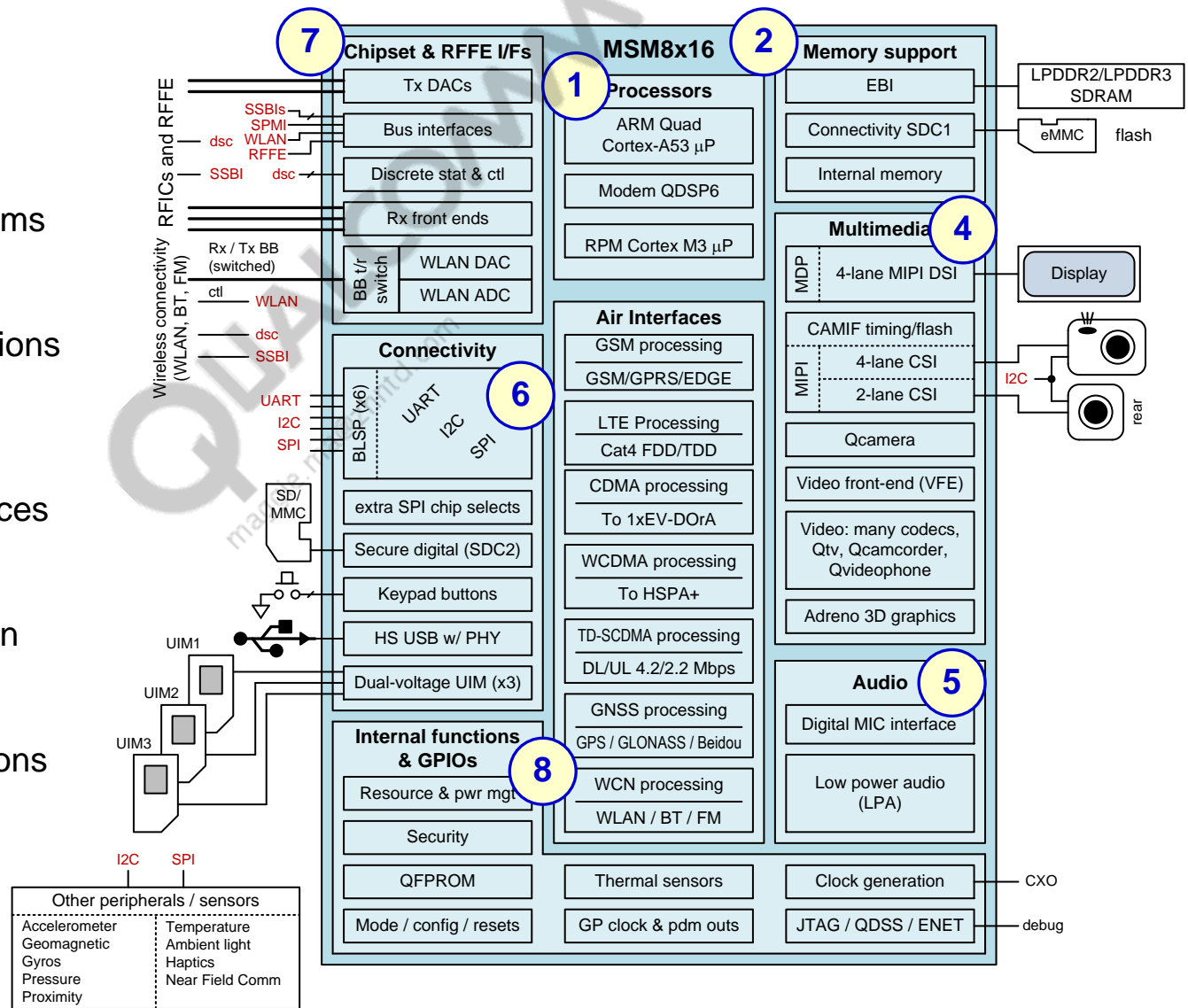
IC Introduction



Modem ICs

Modem IC Overviews – MSM8916

- 1) Memory support
- 2) Overall IC architecture
 - Processors
 - Systems & subsystems
 - Bus systems
 - Air interfaces
- 3) Other key internal functions
- 4) Multimedia
- 5) Audio
- 6) Connectivity
- 7) Chipset & RFFE interfaces
- 8) Top-level topics
 - Parts placement
 - DC power distribution
 - Grounds
 - Unused pins
 - Thermal considerations



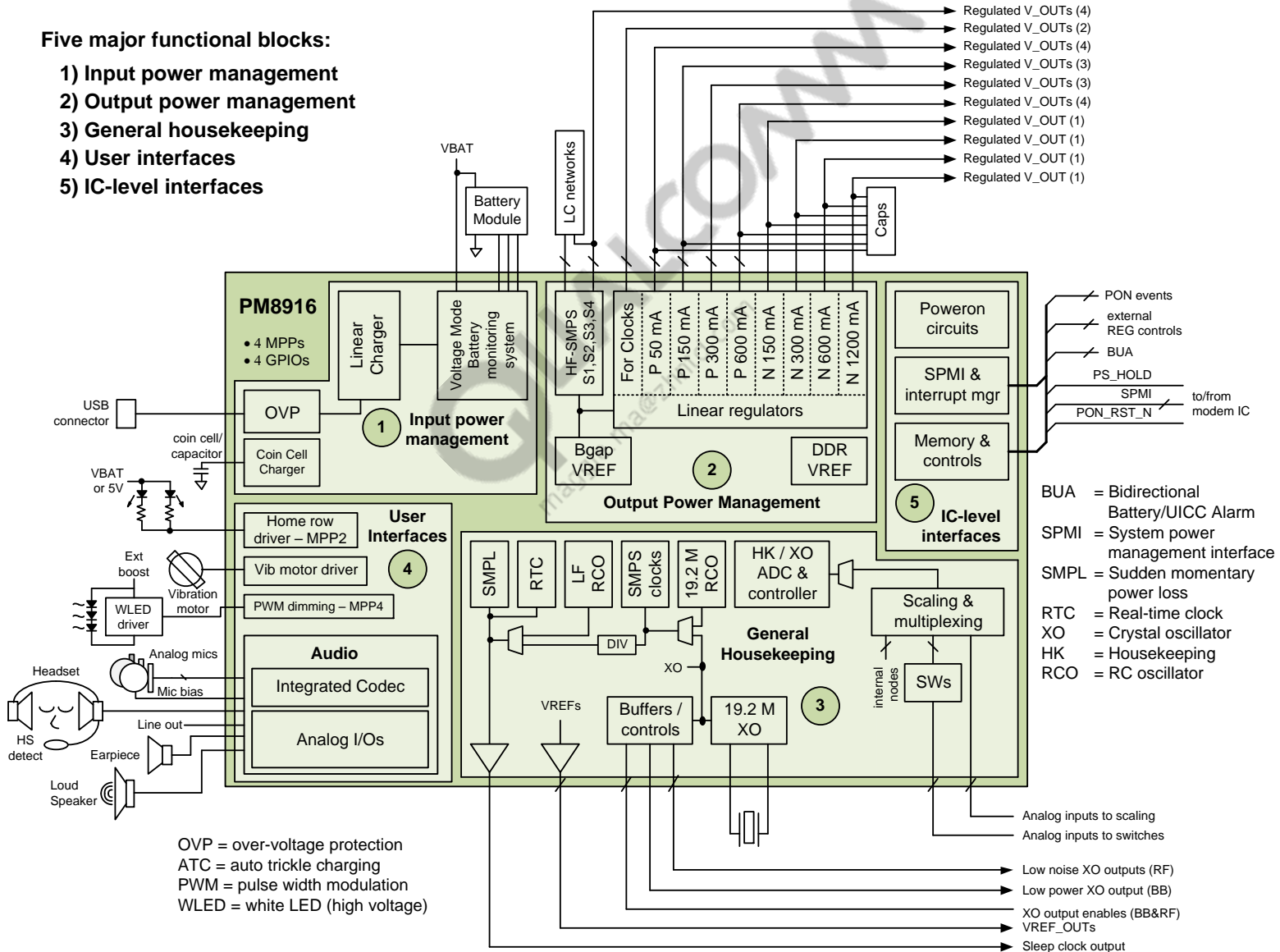


PMICs

PMIC Overviews – PM8916

Five major functional blocks:

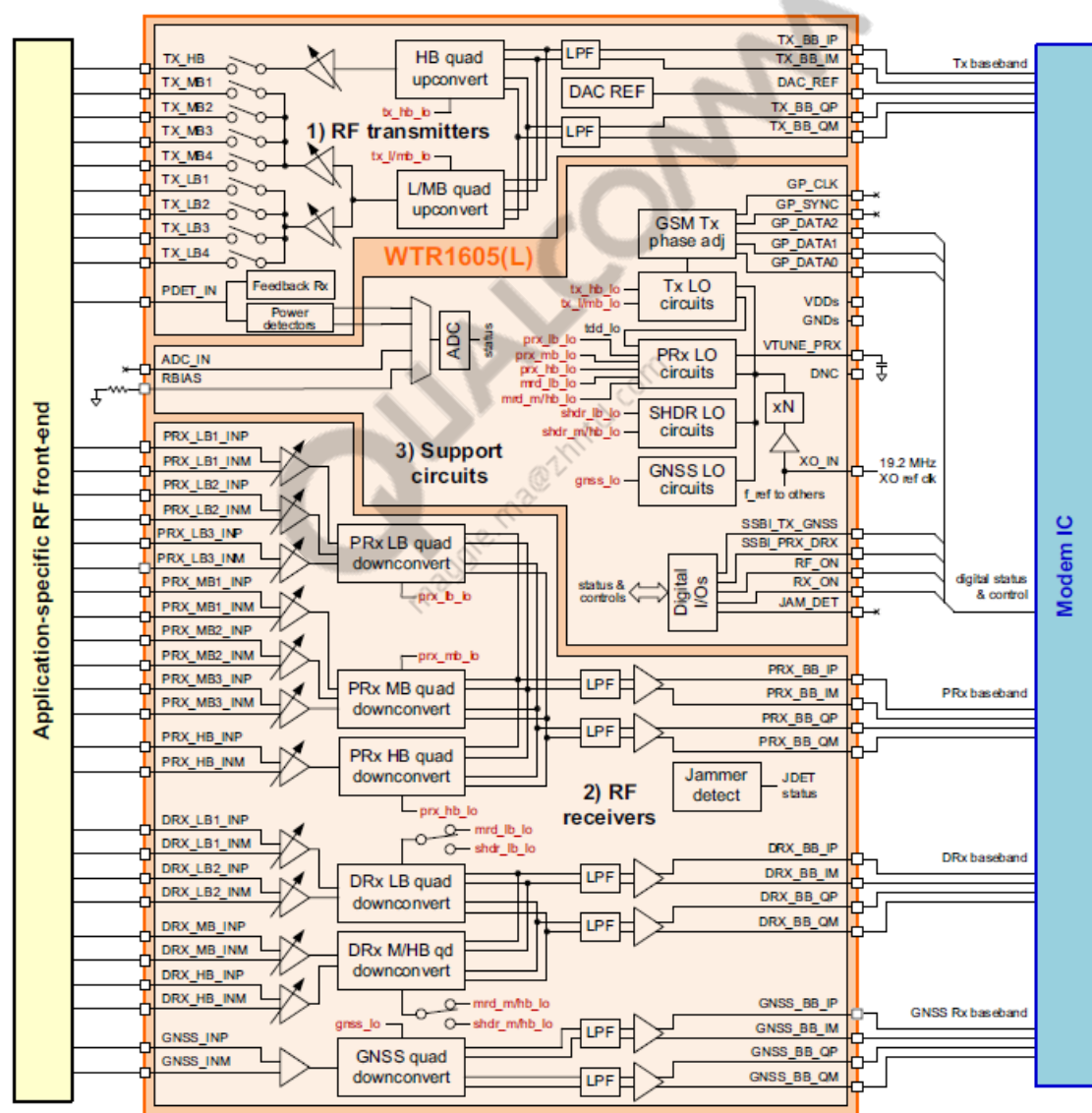
- 1) Input power management
- 2) Output power management
- 3) General housekeeping
- 4) User interfaces
- 5) IC-level interfaces





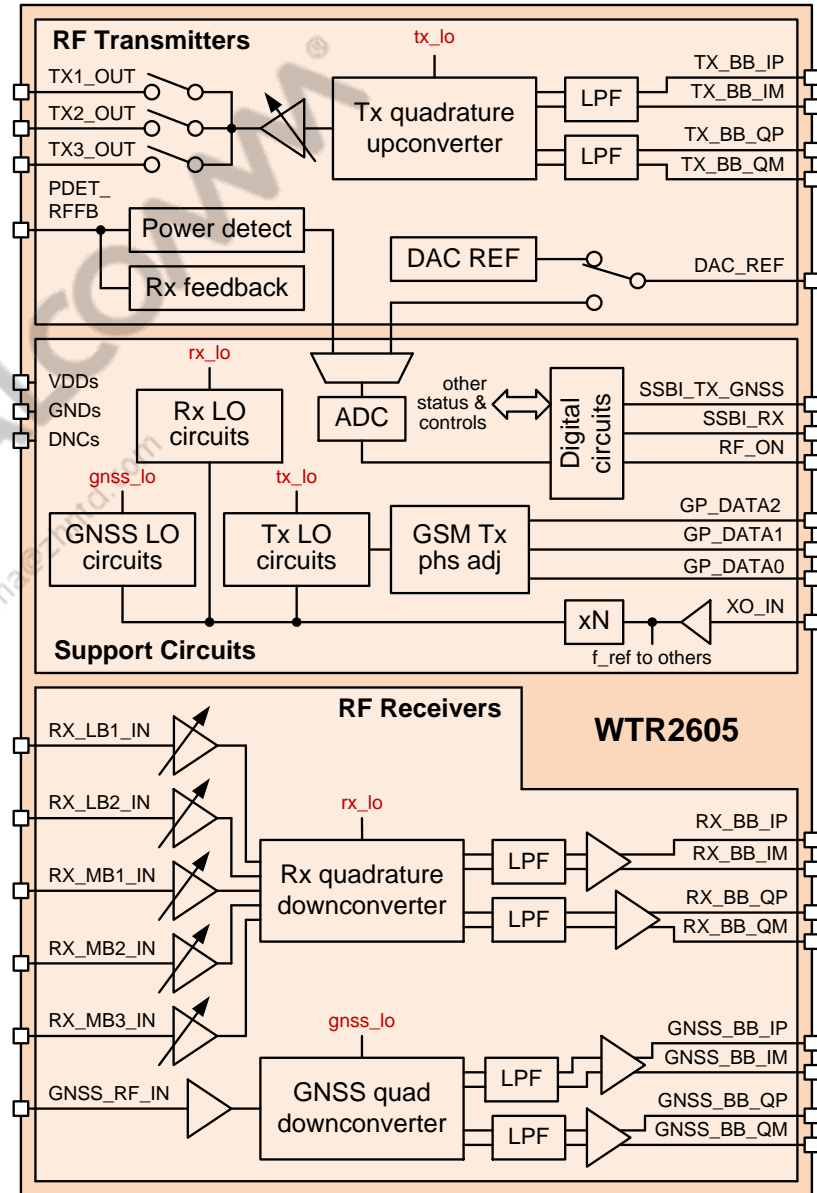
RFICs

WTR1605L Block Diagram

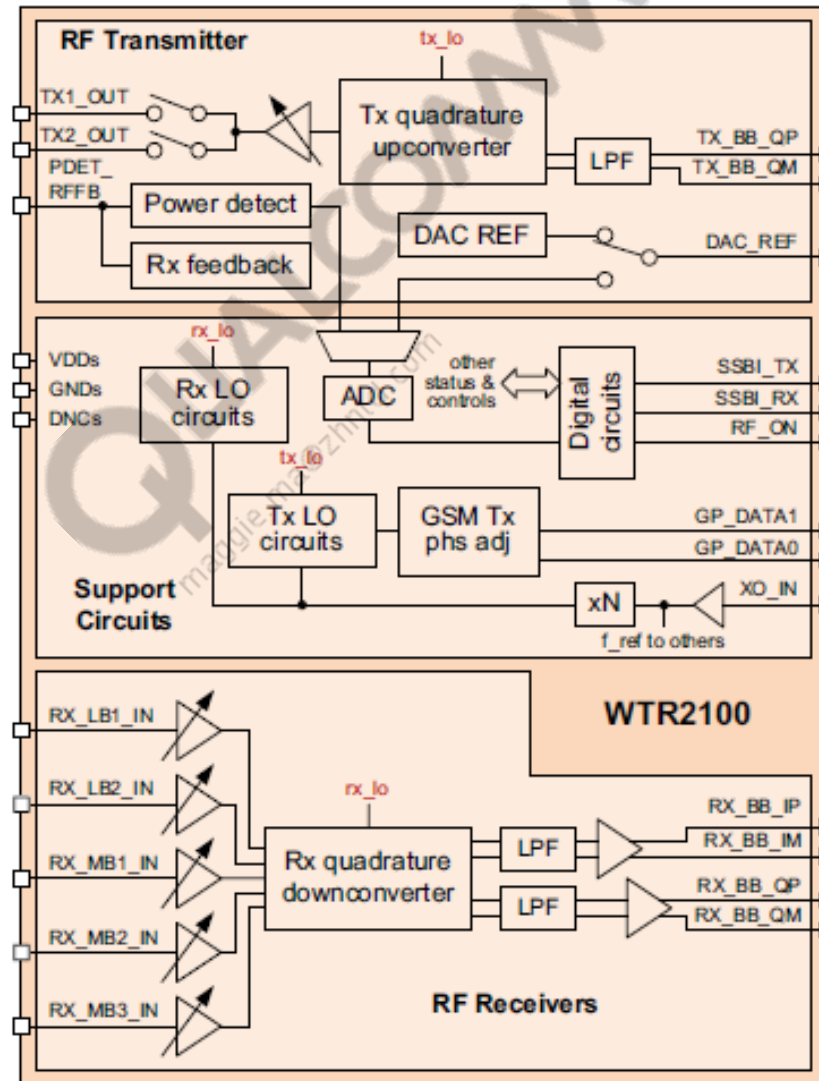


WTR2605 Block Diagram

**Note: GNSS is supported only
on WTR1605L**



WTR2100 Block Diagram



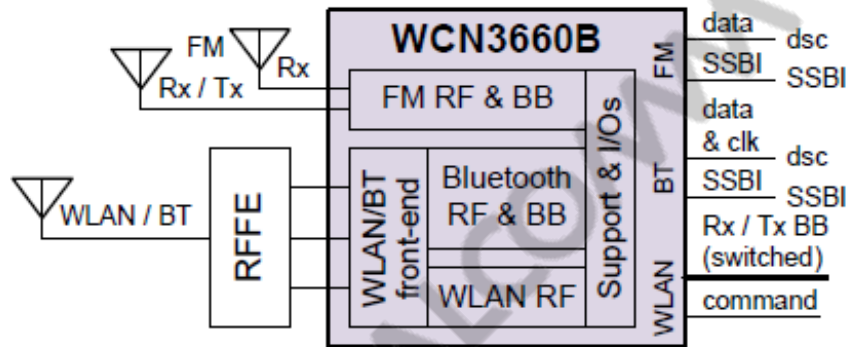
Band Support

- Refer to *SGLTE/DSDA/CT-SVLTE Reference Schematic Using WTR1605L/WTR2605 and Qualcomm RF360 for MSM8916* (80-NK807-51)
- Refer to *WTR4905/WTR2605 + Qualcomm RF360 Based SXLTE/DSDA RF Preliminary Reference Schematic* (80-NL713-44)

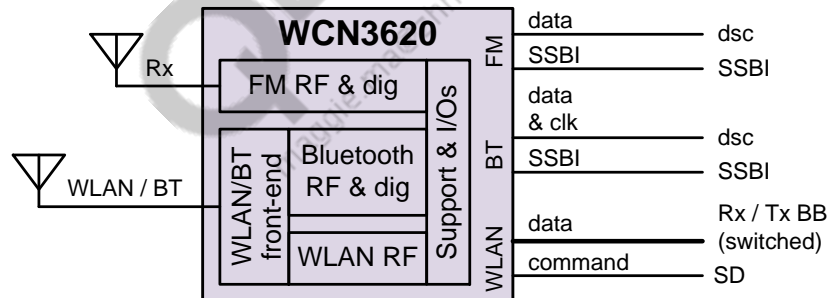


Wireless Connectivity ICs

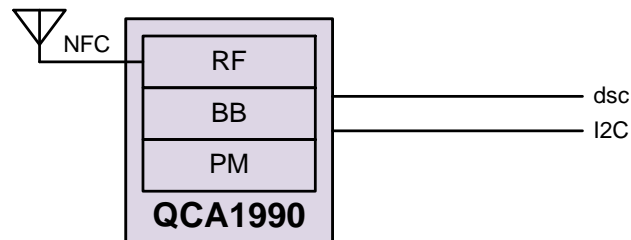
Wireless Connectivity IC Overviews – WCN3620/WCN3660B and QCA1990



WLAN, Bluetooth, and FM radio

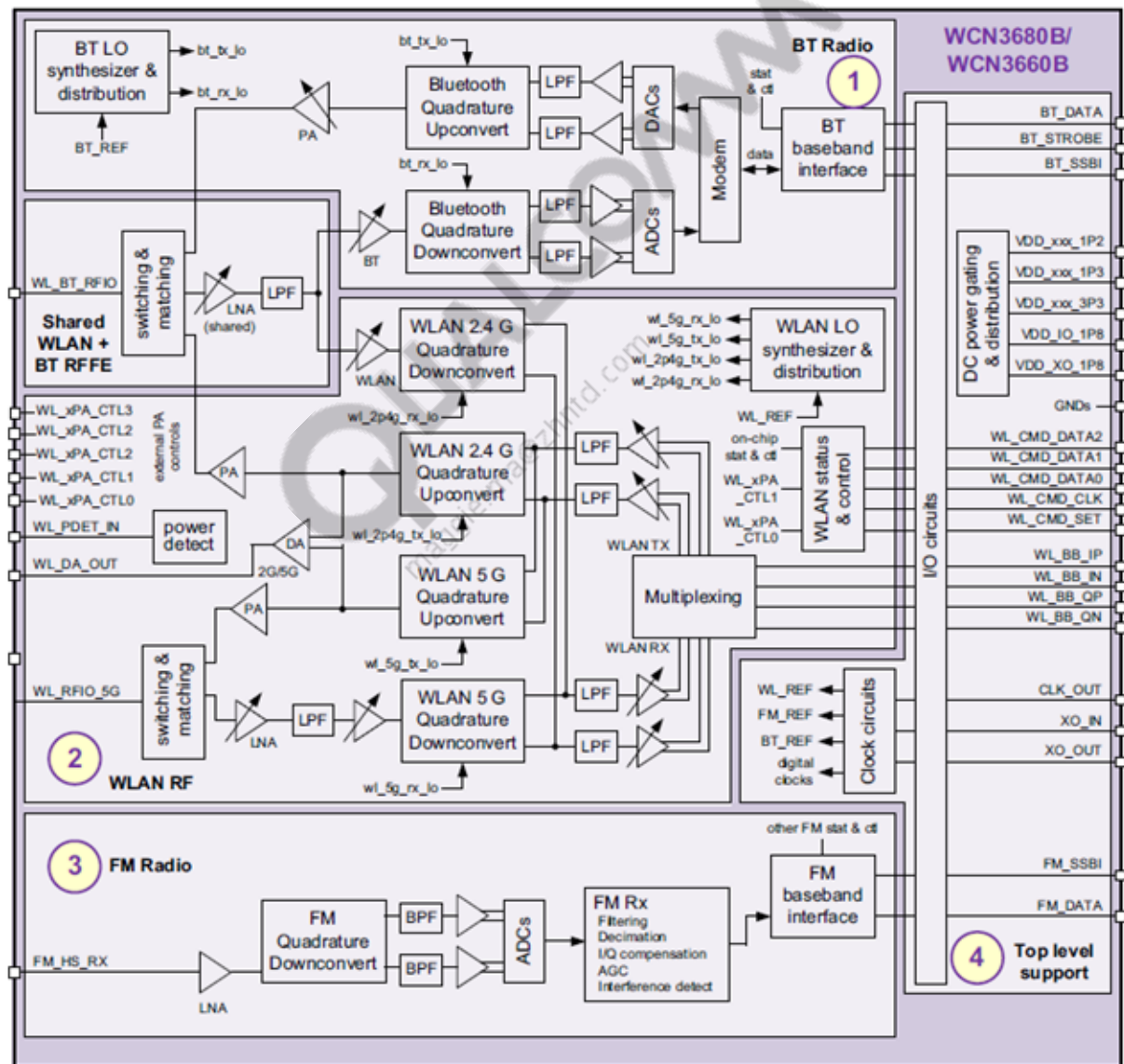


Near Field Communicator



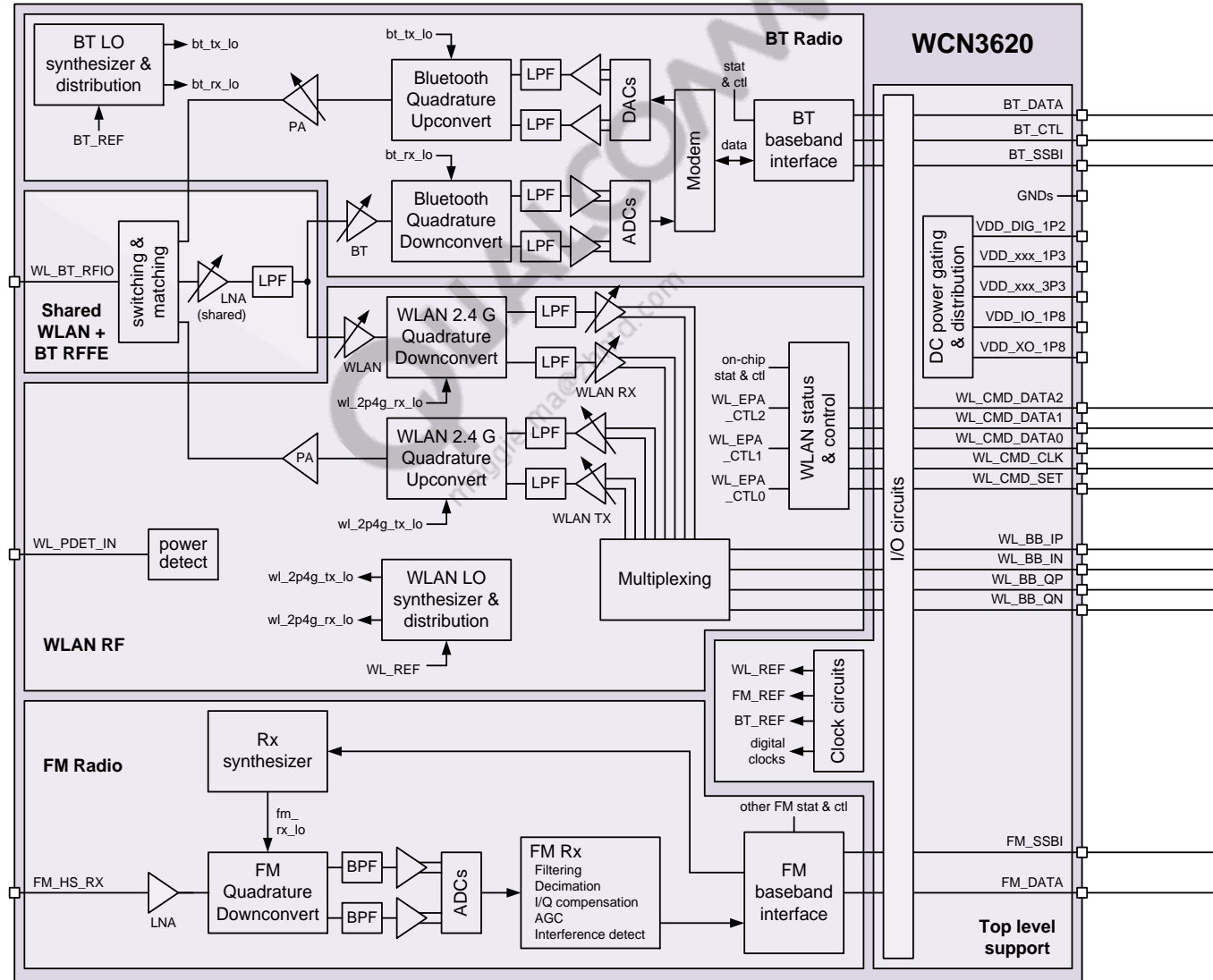
Modem IC

WCN3660B Block Diagram



WCN3620 Block Diagram

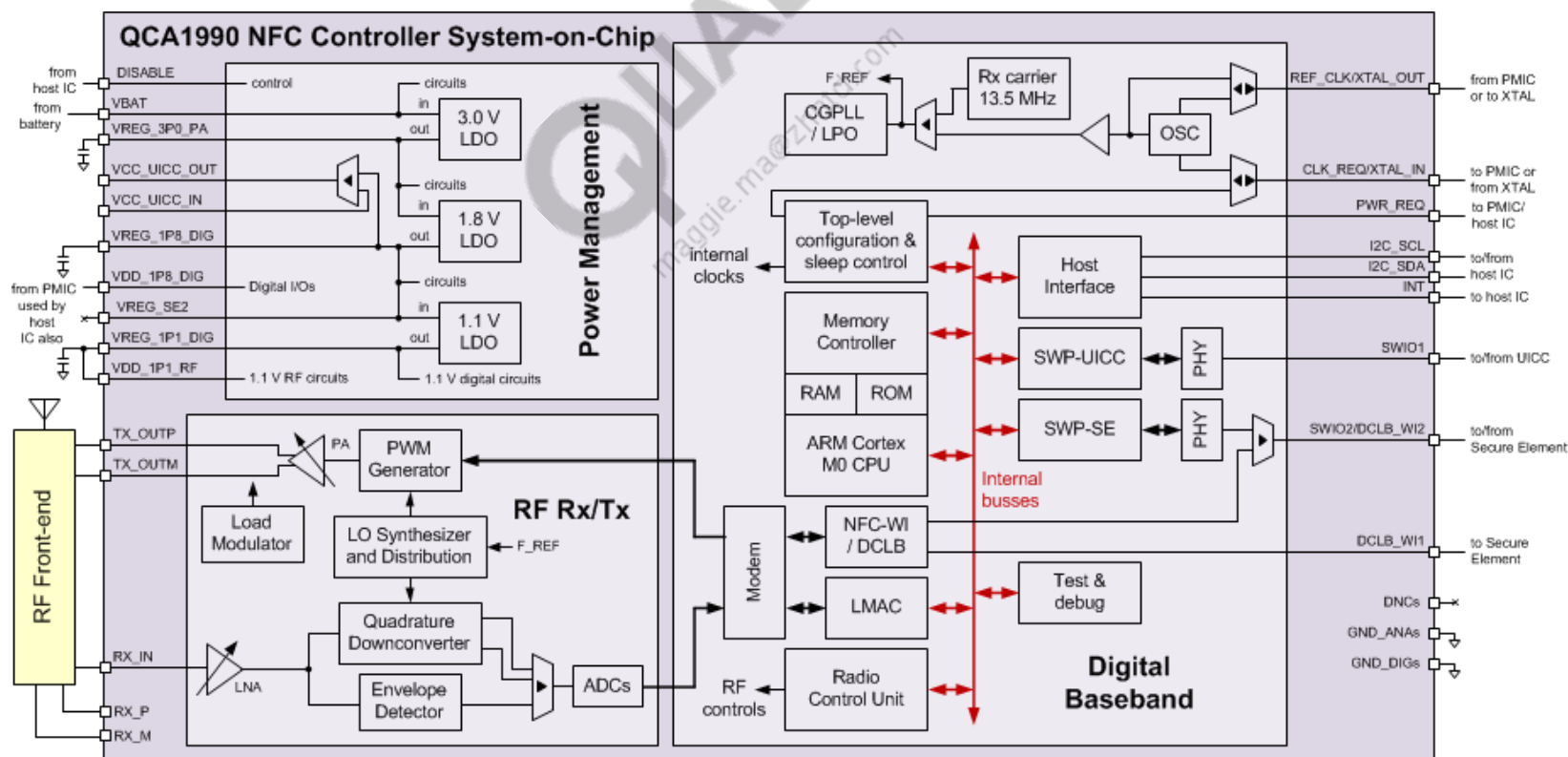
Three major subsystems – WLAN, Bluetooth, and FM radio (split between two ICs) plus top-level support circuits



Key functions are integrated within the modem IC's wireless connectivity subsystem (WCSS) – including ARM9

QCA1990 Block Diagram

- There are three major functional blocks:
 - RF receiver/transmitter
 - Digital baseband (including clock circuits)
 - Power management

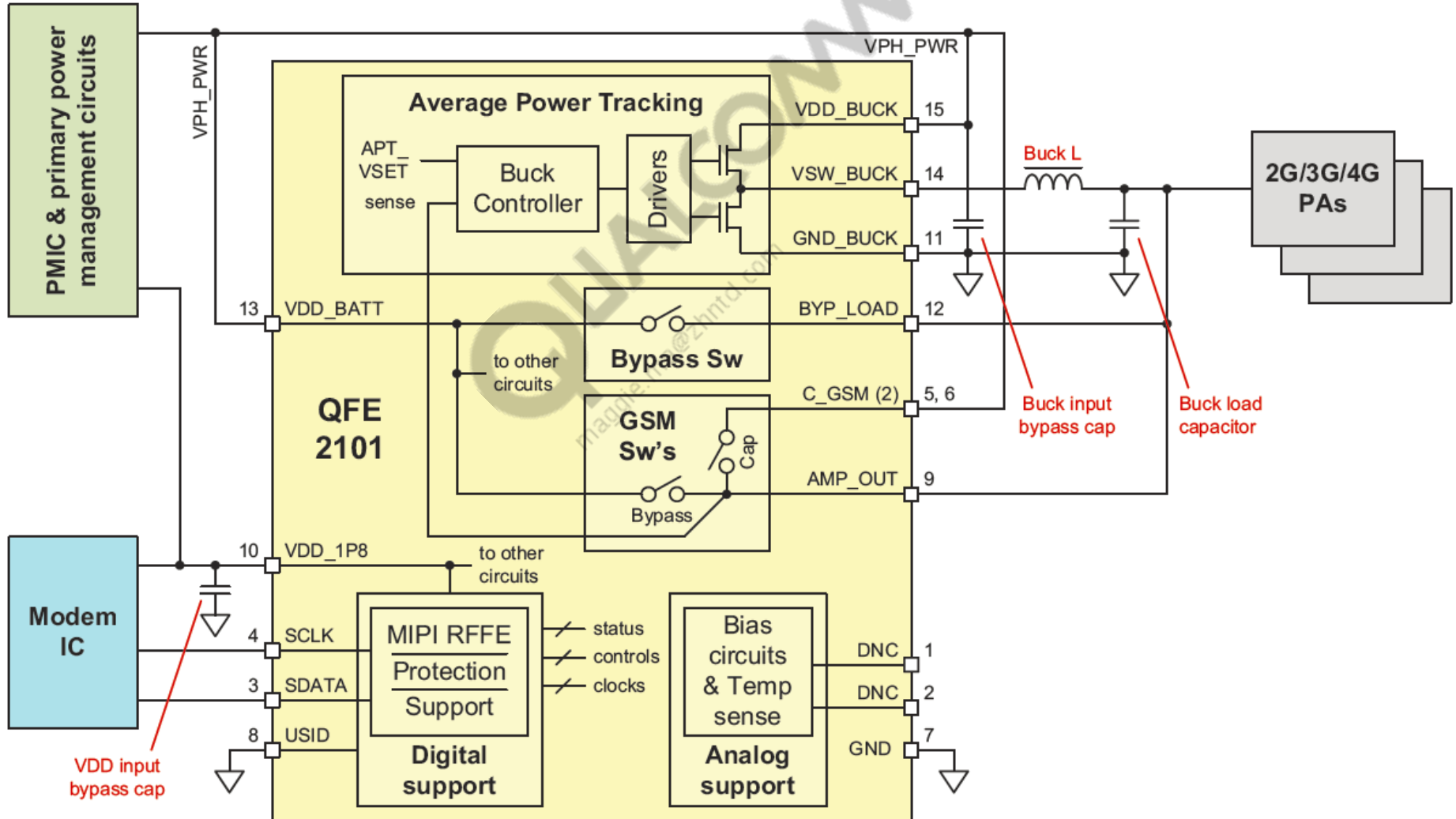


RX_P and RX_M are for energy harvesting feature.

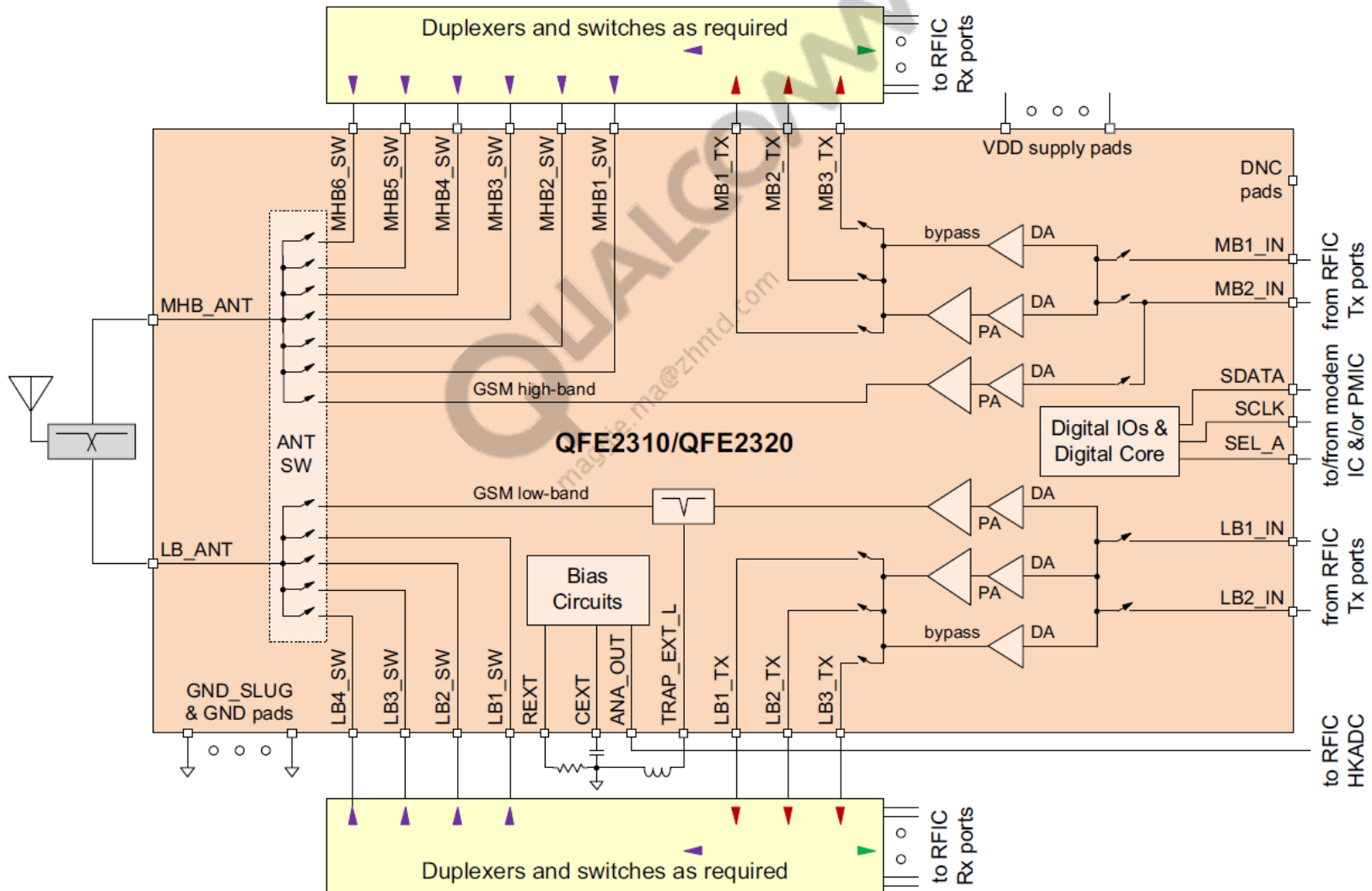


QTI's Front-end ICs

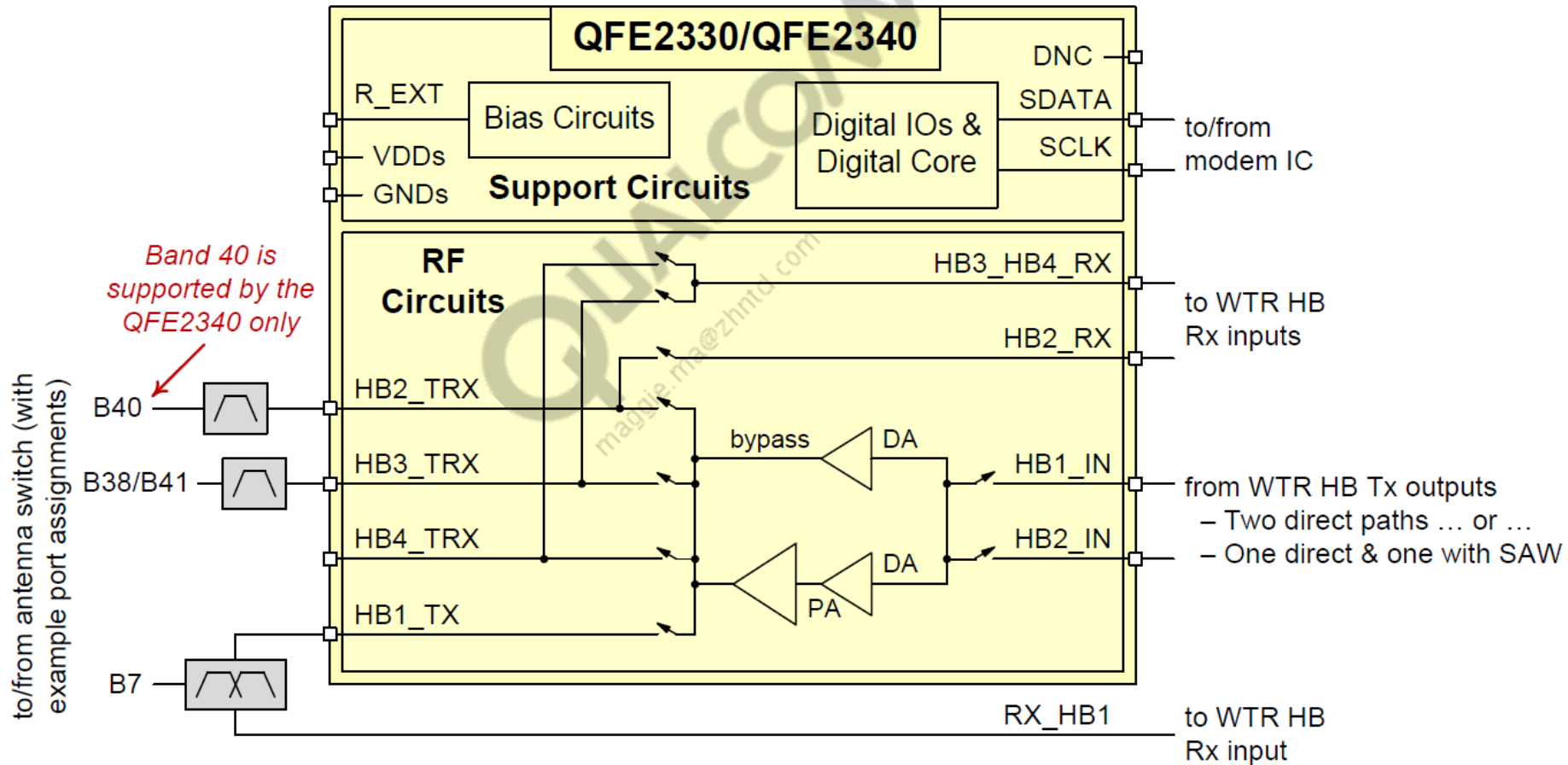
PA Power Management IC – QFE2101 (APT only; no ET support)



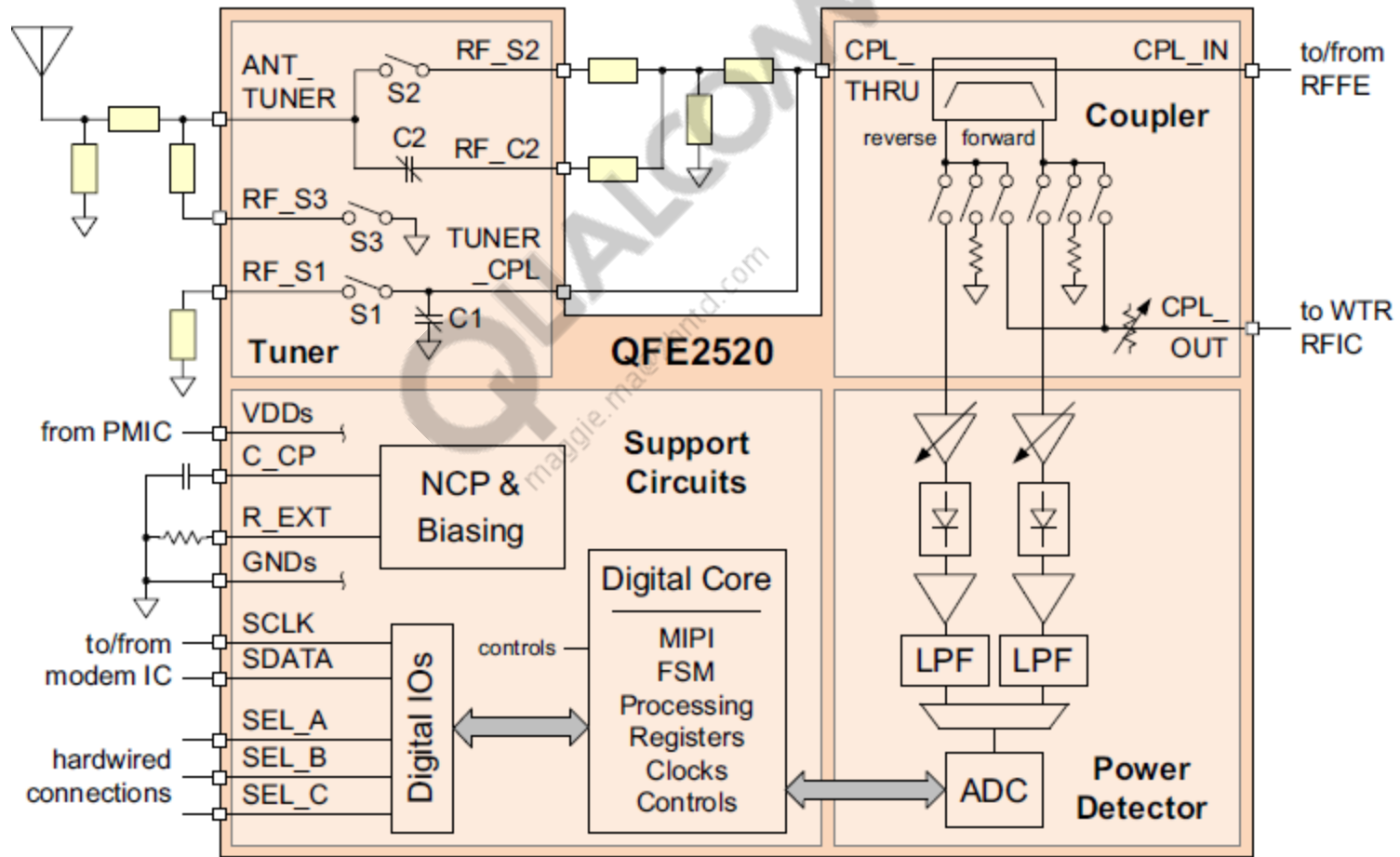
Multimode PA + Switch IC – QFE2320



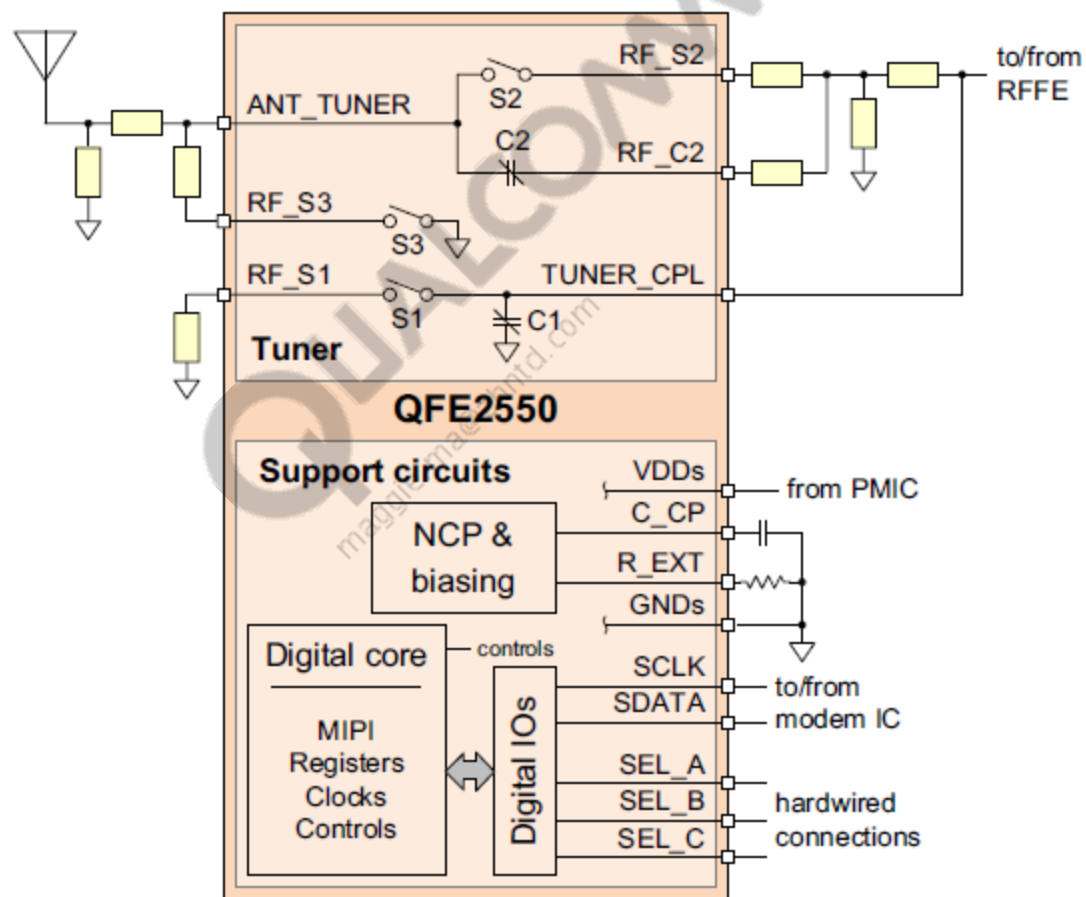
Multimode HB PA + Switch IC – QFE2340



Antenna Tuner IC – QFE2520



Antenna Tuner IC – QFE2550

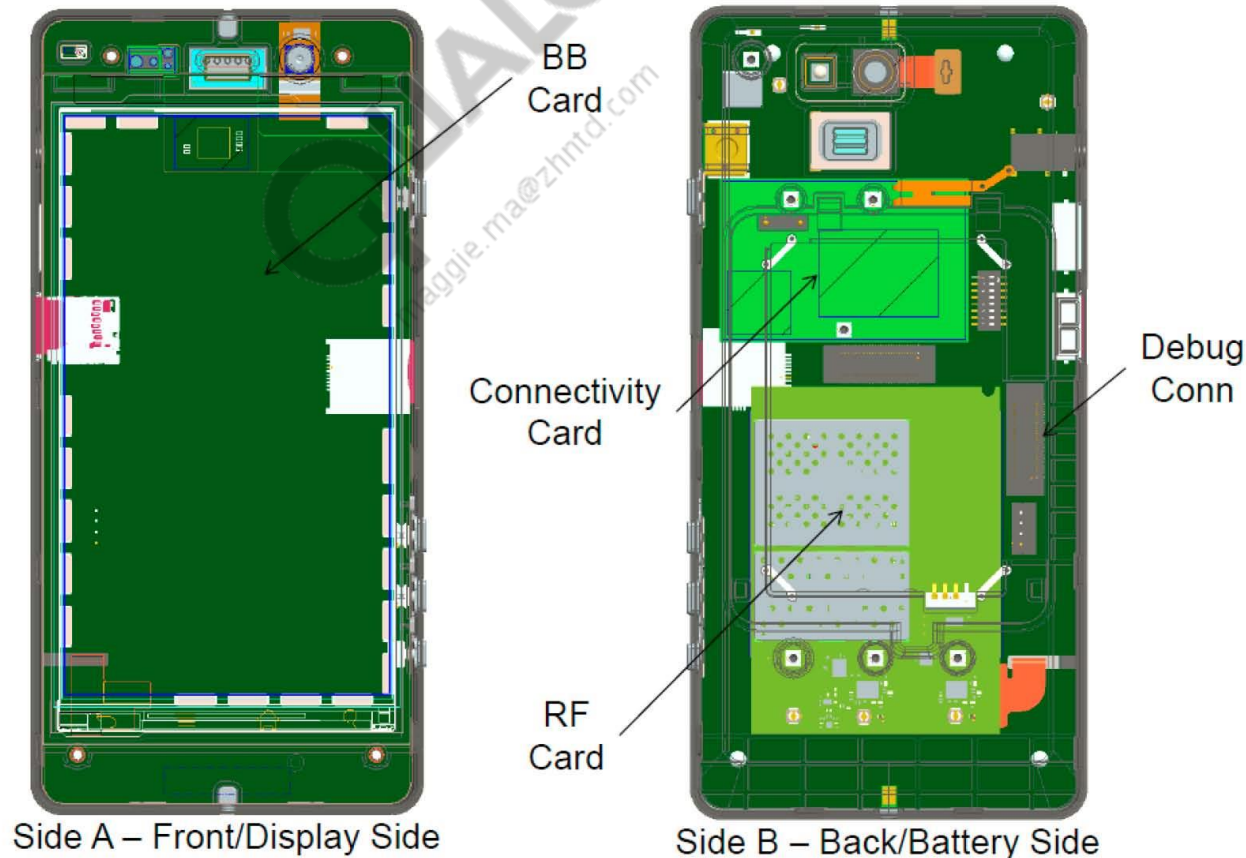




Evaluation Platform

Evaluation/Reference Platform – Introduction

- Modem test platform (MTP)
 - New name for the FFA for chipset validation platform that is focused on best in class RF and modem performance.
 - Multi-board solution that includes separate RF and connectivity cards
 - Modularity provides flexibility to support different RF/carrier configurations and alternate connectivity solutions.





Reference Material and QTI Support

Reference Documents (1 of 3)

Released documents are posted at <https://support.cdmatech.com> (CDMA Tech Support website) and are available for download.

DCN	Document title
Modem/processor documents	
80-NK807-1	<i>MSM8916 Device Specification</i>
80-NK807-2x	<i>MSM8916 Software Interface Manual</i>
80-NK807-4	<i>MSM8916 Device Revision Guide</i>
RF transceiver documents	
80-NL713-1	<i>WTR4905 Device Specification</i>
80-NL713-4	<i>WTR4905 Device Revision Guide</i>
80-N5420-1	<i>WTR1605L Device Specification</i>
80-N5420-4	<i>WTR1605L Device Revision Guide</i>
80-N9978-1	<i>WTR2605/WTR2100 Device Specification</i>
80-N9978-4	<i>WTR2605/WTR2100 Device Revision Guide</i>
Power management documents	
80-NK808-1	<i>PM8916 Device Specification</i>
80-NK808-4	<i>PM8916 Device Revision Guide</i>
QTI front-end documents	
80-NL893-1	<i>QFE2101 Device Specification</i>
80-NL893-4	<i>QFE2101 Device Revision Guide</i>
80-NL732-1	<i>QFE2520 Reconfigurable Impedance Matching IC Device Specification</i>
80-NL732-4	<i>QFE2520 Reconfigurable Impedance Matching IC Device Revision Guide</i>

Reference Documents (2 of 3)

DCN	Document title
80-NL733-1	<i>QFE2550 Reconfigurable Impedance Matching IC Device Specification</i>
80-NL733-4	<i>QFE2550 Reconfigurable Impedance Matching IC Device Revision Guide</i>
80-NC515-1	<i>QFE2310/QFE2320 Device Specification</i>
80-NC515-4	<i>QFE2310/QFE2320 Device Revision Guide</i>
80-NF232-1	<i>QFE2330/QFE2340 High-band Multimode Power Amplifier Device Specification</i>
80-NF232-4	<i>QFE2330/QFE2340 Device Revision Guide</i>
Wireless connectivity documents	
80-WL006-1	<i>WCN3620 Device Specification</i>
80-WL006-4	<i>WCN3620 Device Revision Guide</i>
80-WL007-1	<i>WCN3660B Device Specification</i>
80-WL007-4	<i>WCN3660B Device Revision Guide</i>
80-Y0597-1	<i>QCA1990 Device Specification</i>
80-Y0597-4	<i>QCA1990 Device Revision Guide</i>
Audio documents	
80-NK808-23	<i>MSM8916 & PM8916 Audio Codec Training Slides</i>
Reference schematics	
80-NK807-42	<i>MSM8916 + PM8916 Preliminary Reference Schematic</i>
80-NK807-41	<i>MSM8916 + PM8916 Design Example</i>
80-NK807-51	<i>SGLTE/DSDA/CT-SVLTE Reference Schematic Using WTR1605L/WTR2605 And RF360 For MSM8916</i>
80-WL006-44	<i>WCN3620 Reference Schematic</i>
80-Y0597-41	<i>QCA1990 Reference Schematic</i>

Reference Documents (3 of 3)

DCN	Document title
<i>Chipset design guidelines/training slides</i>	
80-NK807-21	<i>MSM8916 Chipset – Introduction Training Slides</i>
80-NK807-22	<i>MSM8916 Digital Baseband Training Slides</i>
80-NK808-21	<i>PM8916 Training slides</i>
80-N9978-5A	<i>WTR2605/WTR2100 Transceiver and WFR2600 Receiver Design Guidelines/Training Slides</i>
80-NL713-5	<i>WTR4905/WTR4605 RF Transceiver Design Guidelines/Training Slides</i>
80-N9978-5B	<i>Single-modem DSDA RF Solutions</i>
80-WL006-5	<i>WCN3620 Wireless Connectivity</i>
80-WL006-21	<i>WCN3620 Layout Guideline</i>
80-Y0597-5	<i>QCA1990 Near Field Communicator</i>
80-NL893-5	<i>QFE2101 PA Power Management</i>
80-NL732-5	<i>QFE2520 Reconfigurable Impedance Matching IC Design Guidelines/Training Slides</i>
80-NL733-5	<i>QFE2550 Reconfigurable Impedance Matching Ice Design Guidelines/Training Slides</i>
80-NF232-5	<i>QFE2330/QFE2340 High-band Multimode Power Amplifier With Mode Switches Design Guidelines</i>

Questions?

<https://support.cdmatech.com>

