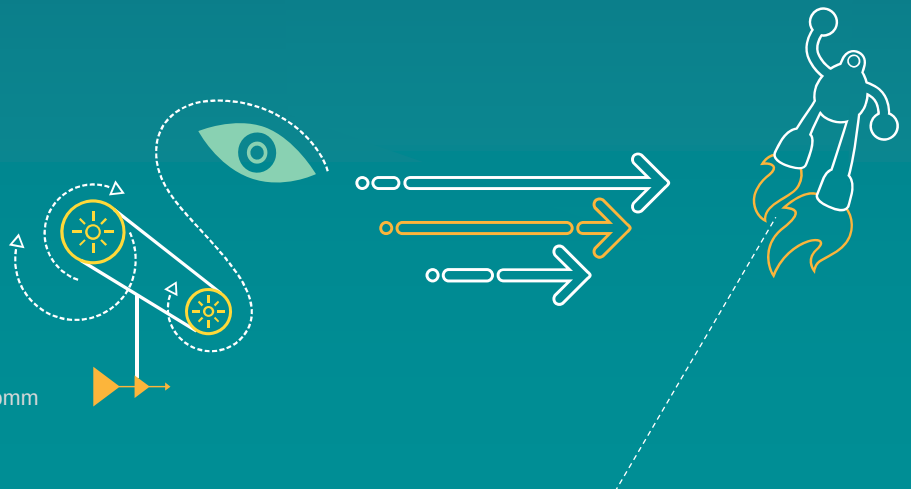
Training Slides

MSM8916 Chipset Introduction

Qualcomm Technologies, Inc.



80-NK807-21 Rev. B

Qualcomm Technologies, Inc.
5775 Morehouse Drive
San Diego, CA 92121
U.S.A.

Revision History

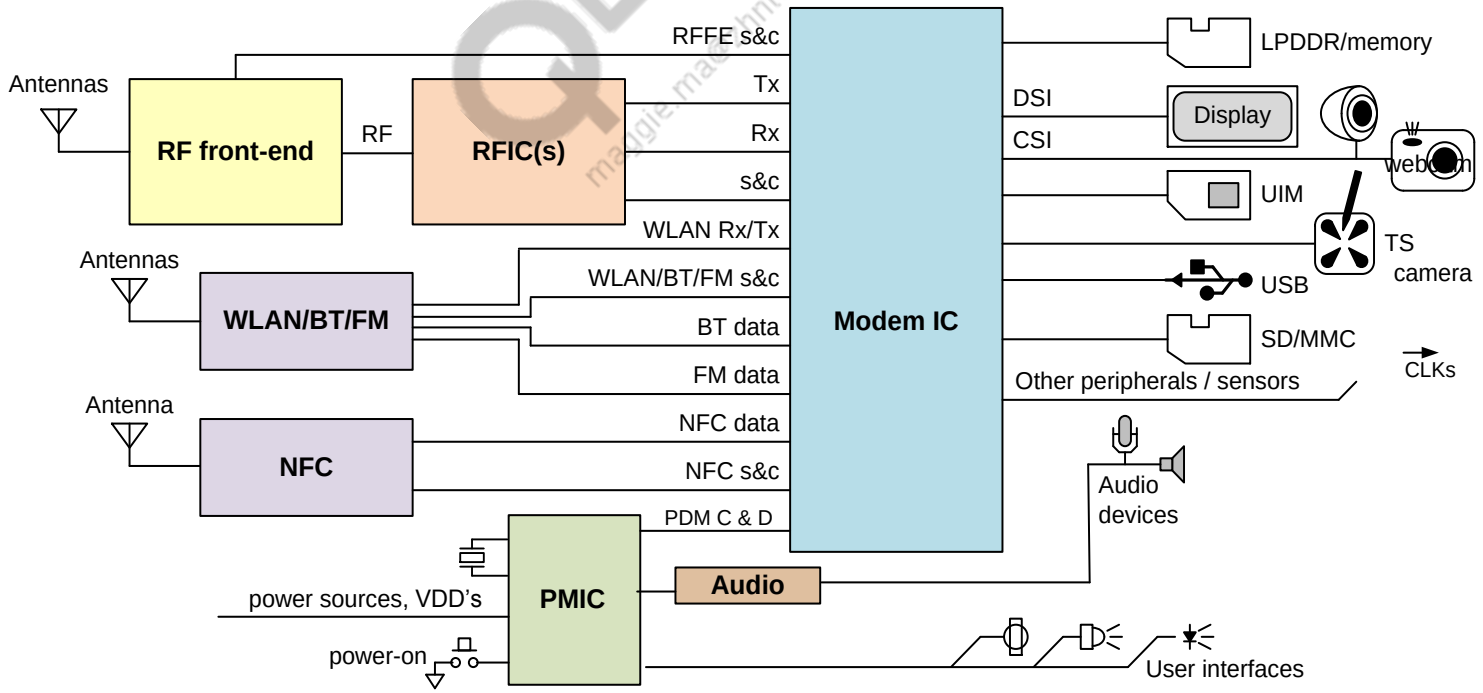
Revision	Date	Description
A	December 2013	Initial release
B	May 2014	• Global change: Added WTR4905 and WCN3660B chipsets and block diagrams (slide 8, 10) • Updated ES and CS timelines of MSM8916 chipset in slide 7 • Added reference document for WTR4905/WTR2605 reference schematic in slide 21

Agenda

Chipset Introduction

Chipset Combinations

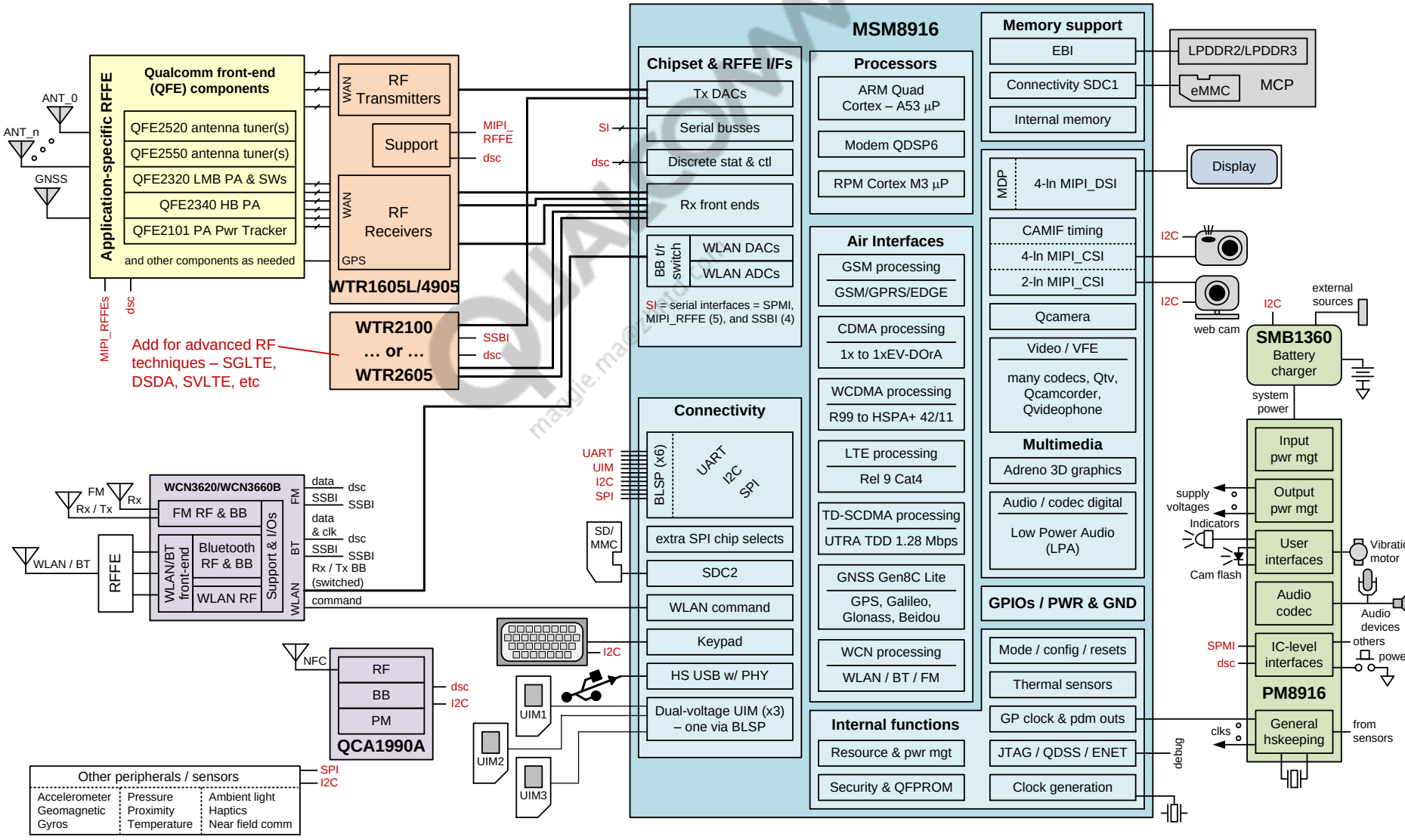
Modem IC & Non-PoP memory	PMIC	RFIC(s)	Audio	WLAN/BT/ FM radio	NFC	RFFE
MSM8916	PM8916	WTR1605L/ WTR4905 + WTR2605/ WTR2100	MSM+PMIC	WCN3660B/ WCN3620	QCA1990	QFE2320/QFE3320/QFE2340 (QPA) QFE2101 (APT) QFE2520/QFE2550 (Tuner)



MSM8916 Chipset CS schedules

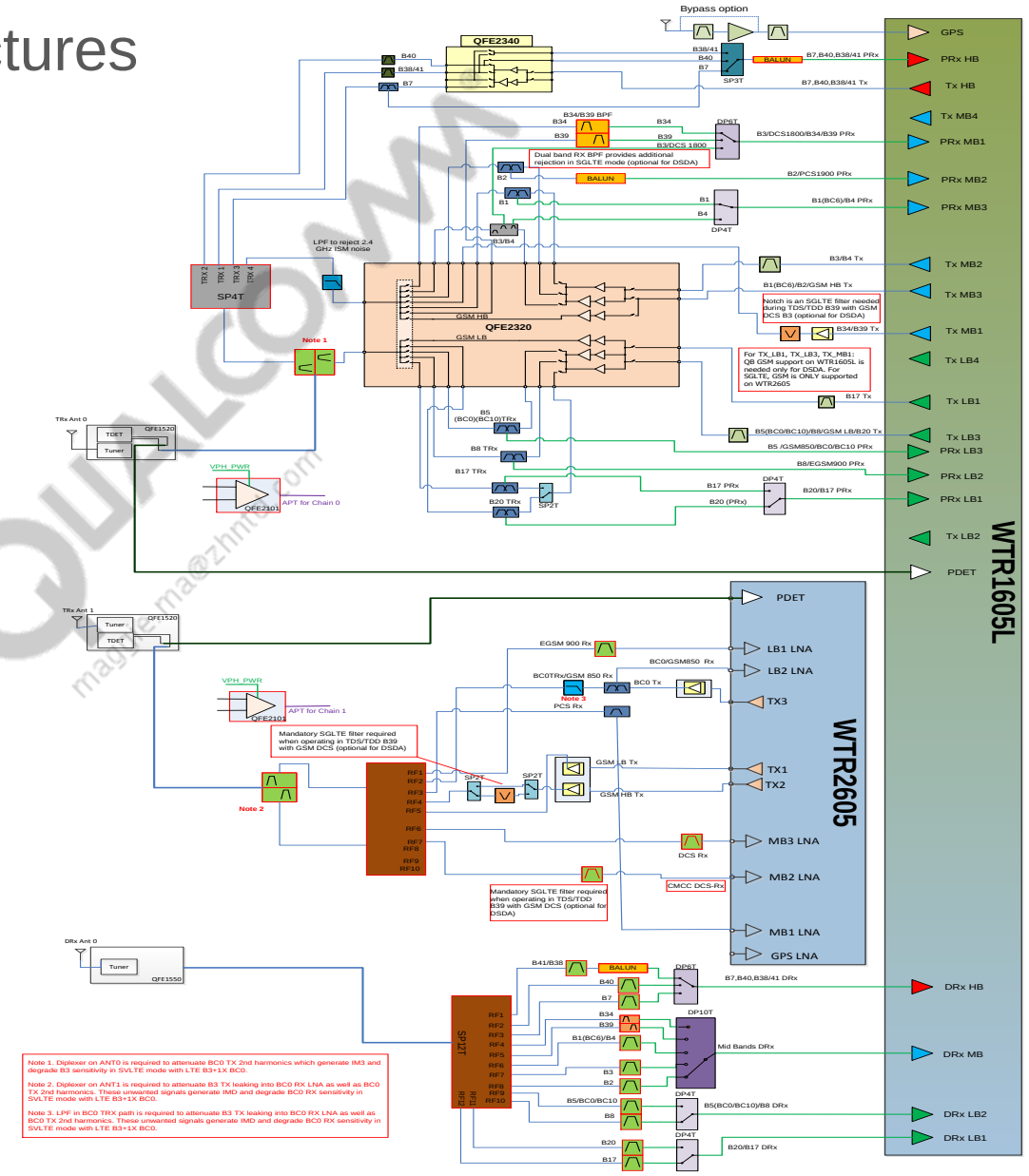
June 2014	MSM8916	PM8916	WTR1605L/ WTR2605/ WTR2100/	QFE 2320	QFE 2340	QFE 2101	QFE 2520	QFE 2550	SMB 1360	QCA1990	WCN3620/ WCN3660B
Oct 2014	MSM8916	PM8916	WTR4905/ WTR2605	QFE3320/ QFE2320	QFE 2340	QFE 2101	QFE 2520	QFE 2550	SMB 1360	QCA1990	WCN3620/ WCN3660B

MSM8916 Functional Block Diagram and Example Application



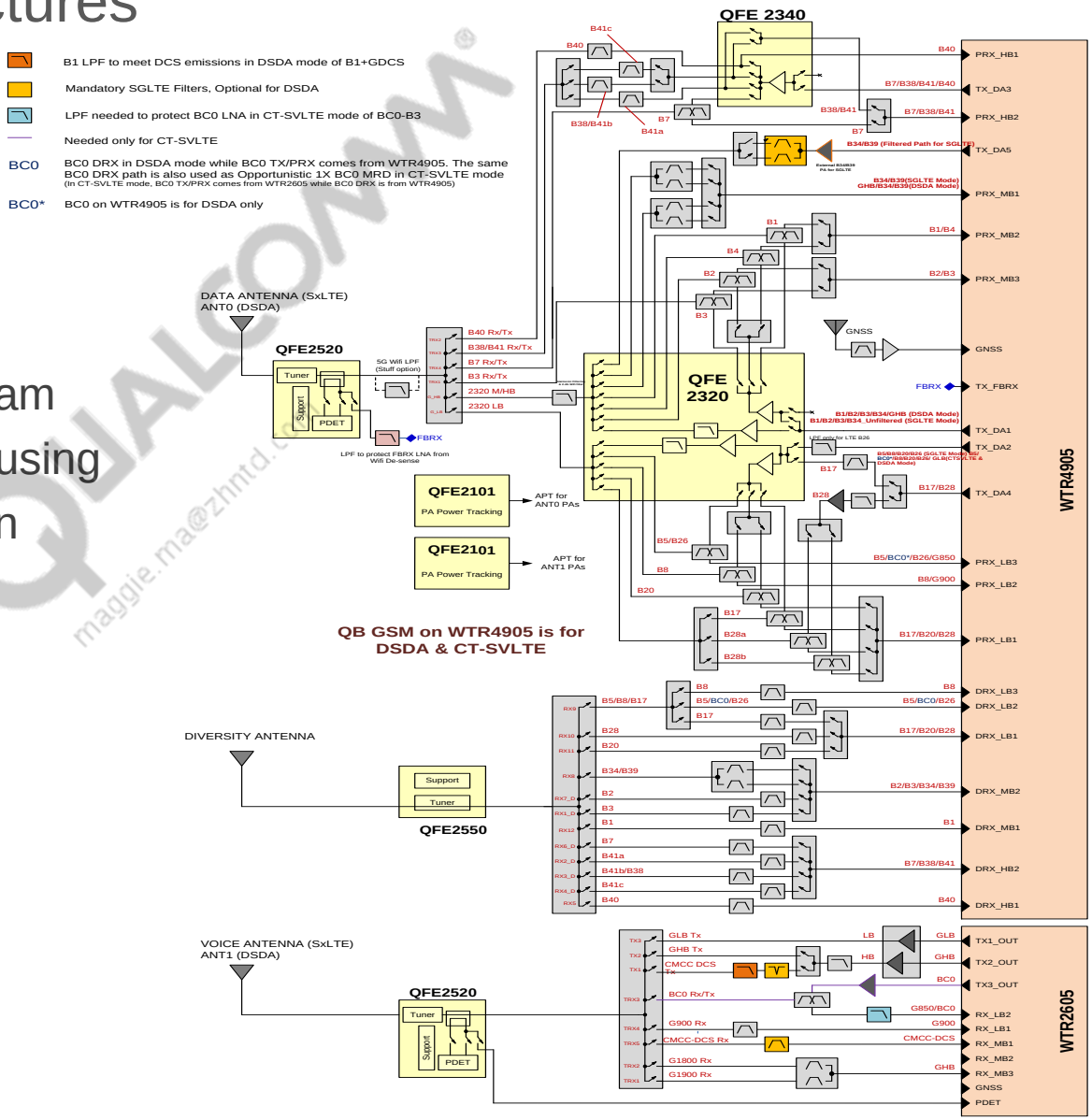
Supported RF Architectures

- 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

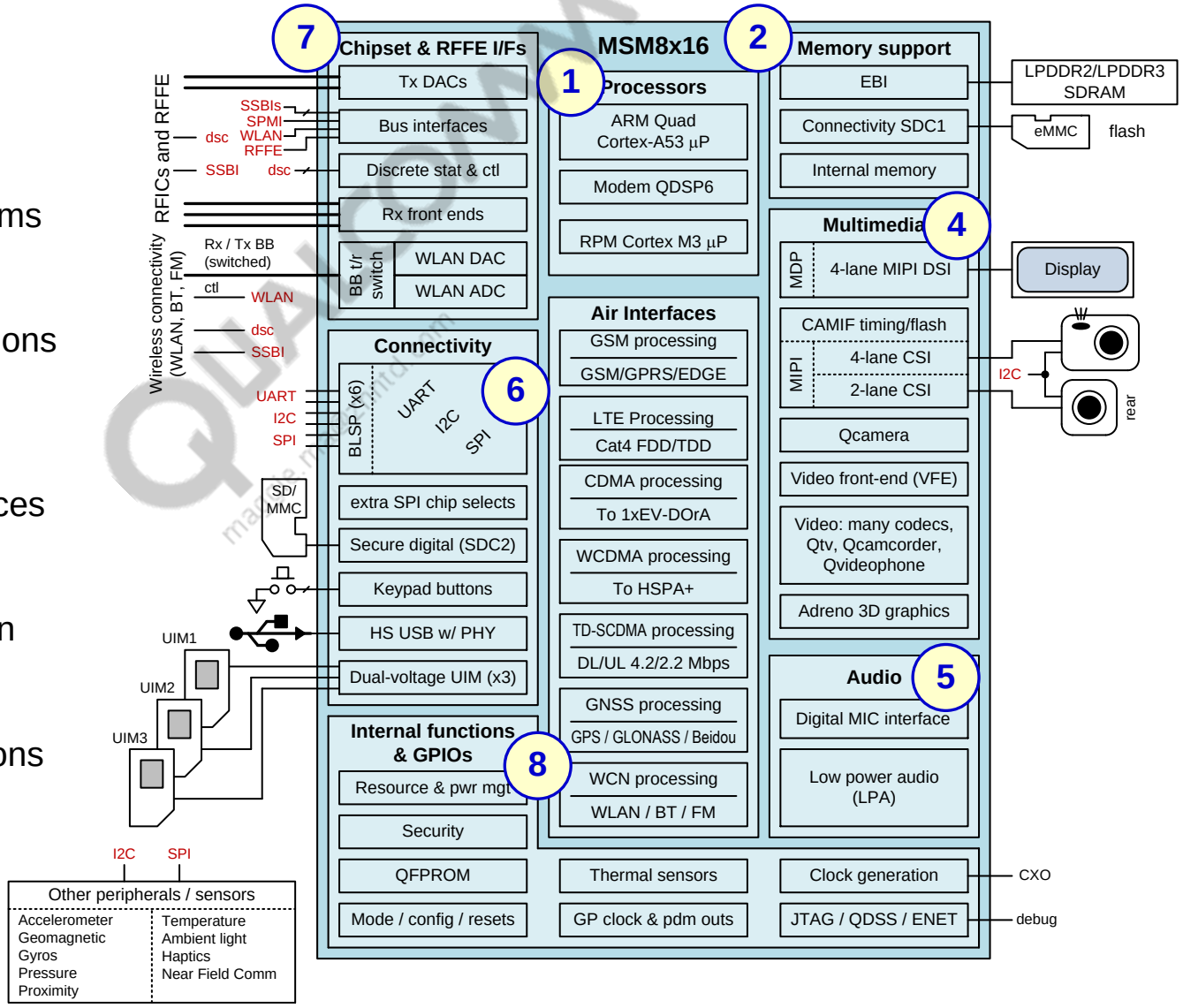


IC Introduction

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

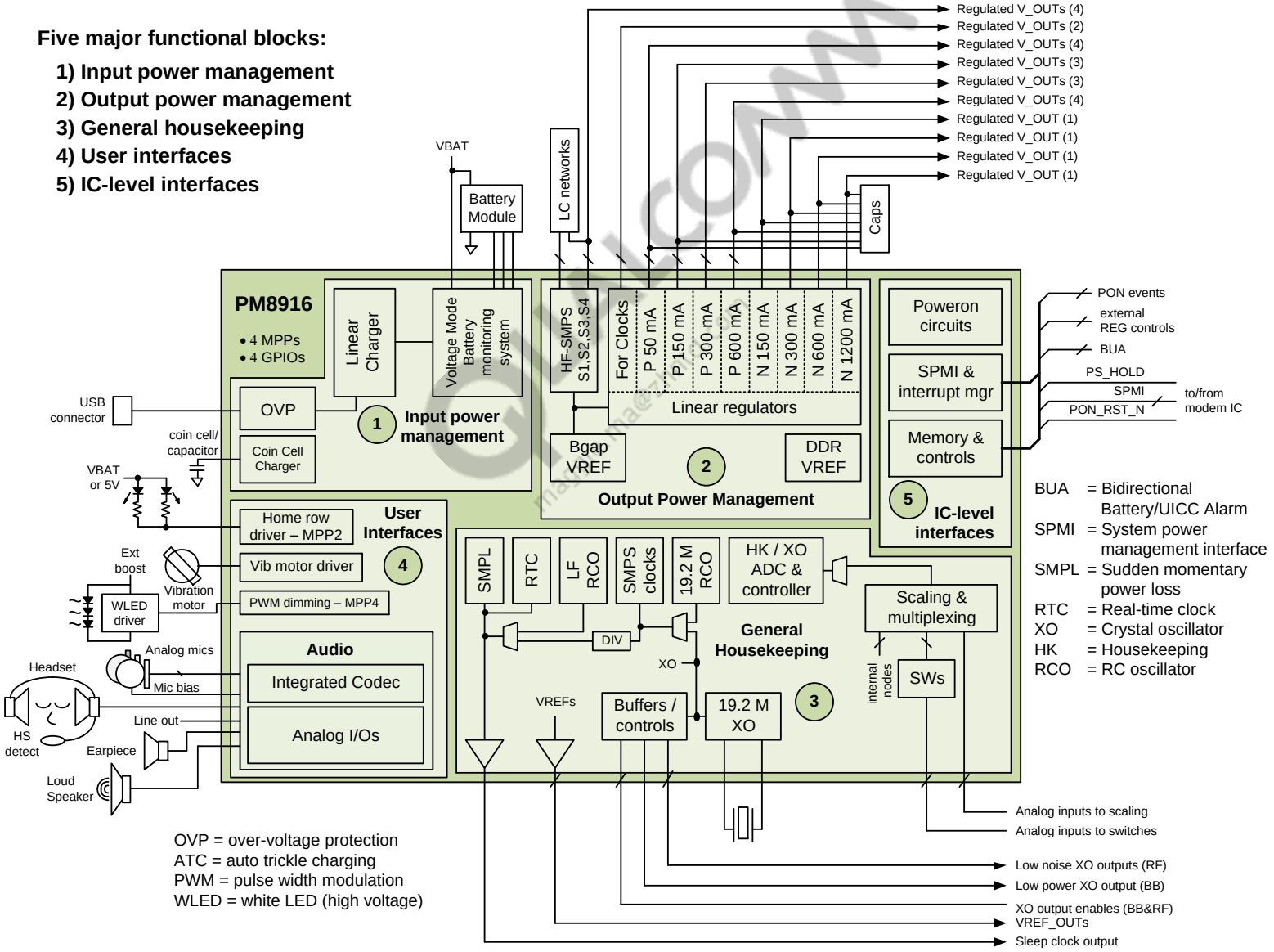


PMICs

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**

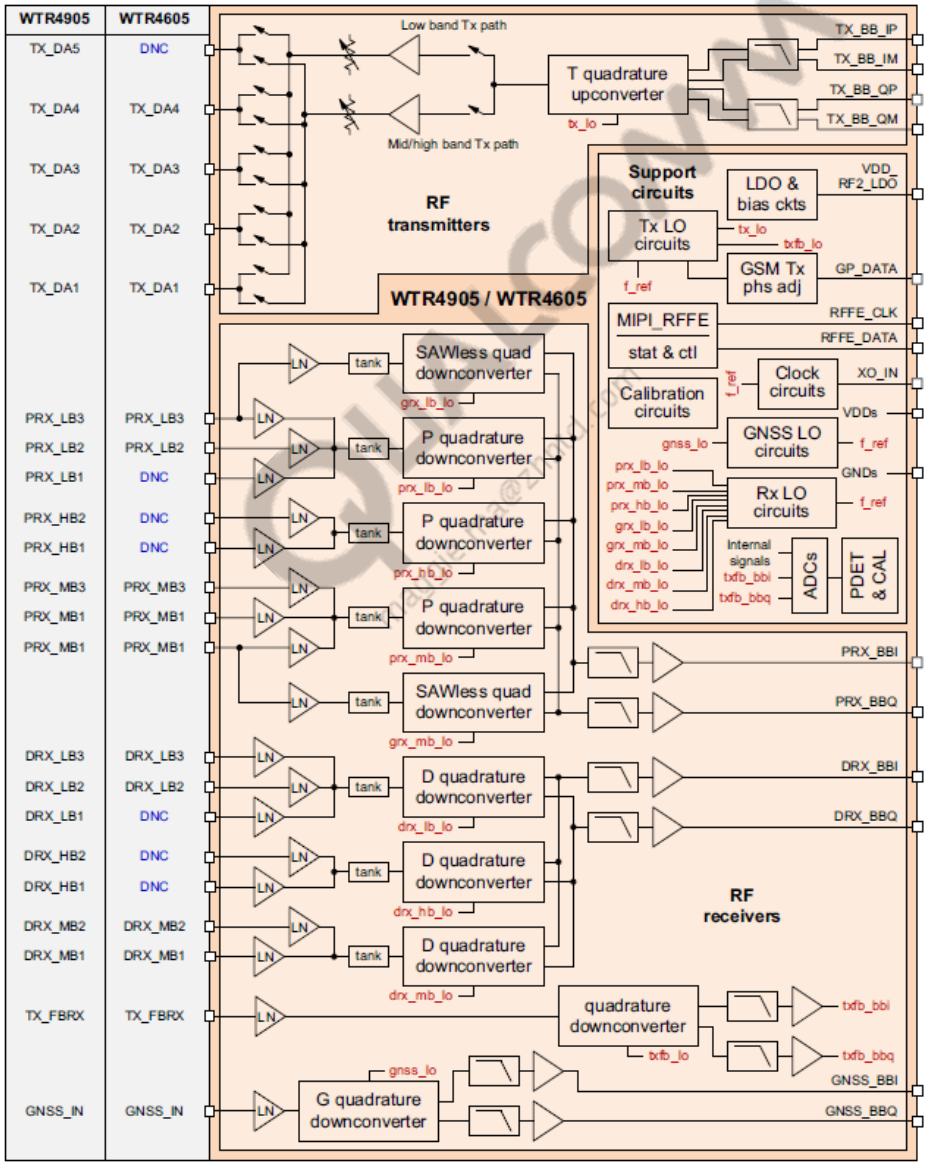


BUA = Bidirectional Battery/UICC Alarm
SPMI = System power management interface
SMPL = Sudden momentary power loss
RTC = Real-time clock
XO = Crystal oscillator
HK = Housekeeping
RCO = RC oscillator

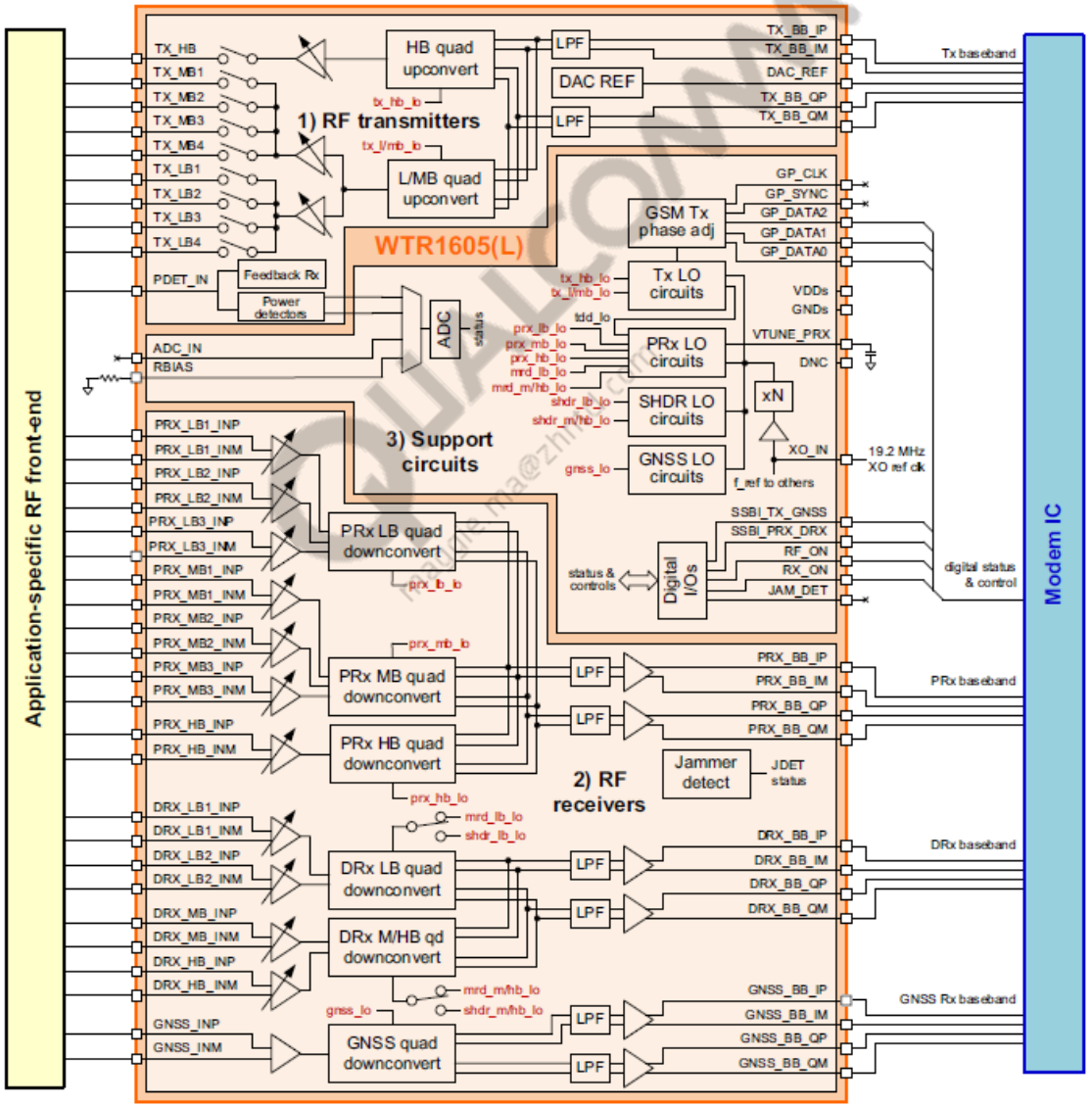
OVP = over-voltage protection
ATC = auto trickle charging
PWM = pulse width modulation
WLED = white LED (high voltage)

RFICs

WTR4905 Block Diagram

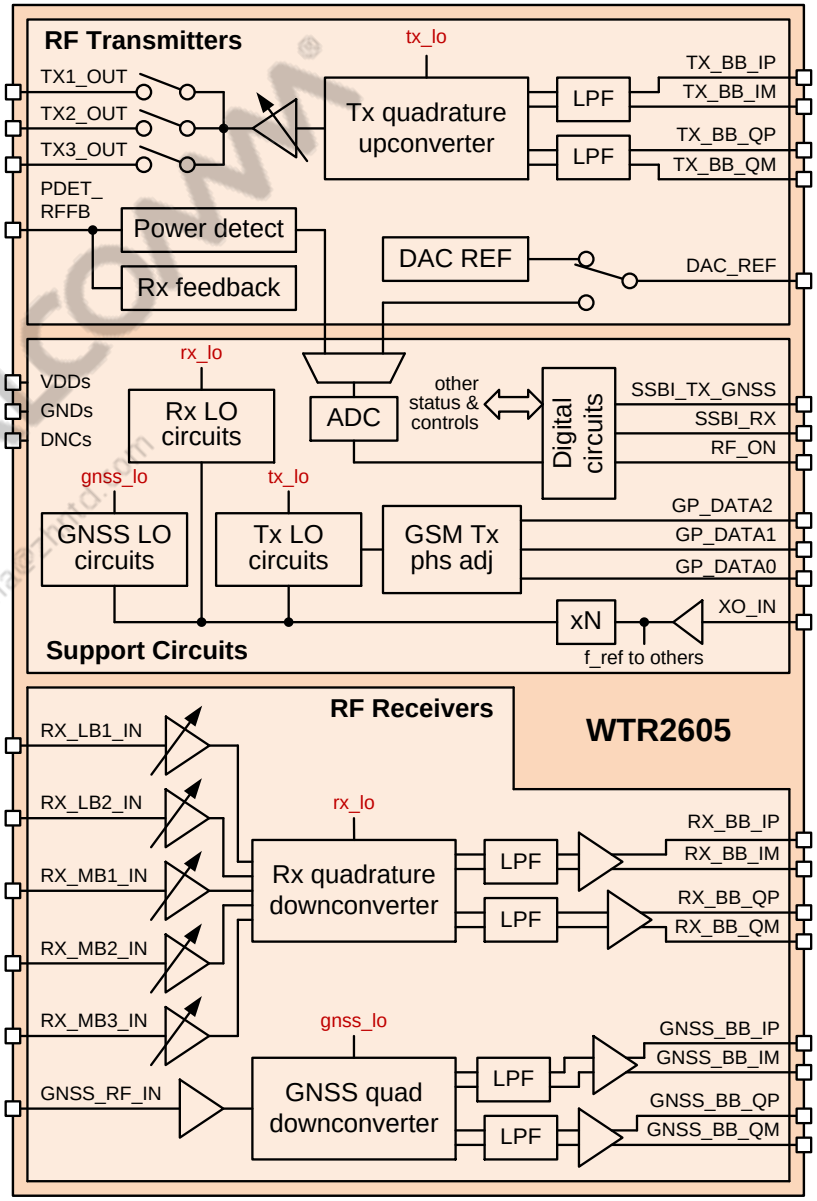


WTR1605L Block Diagram

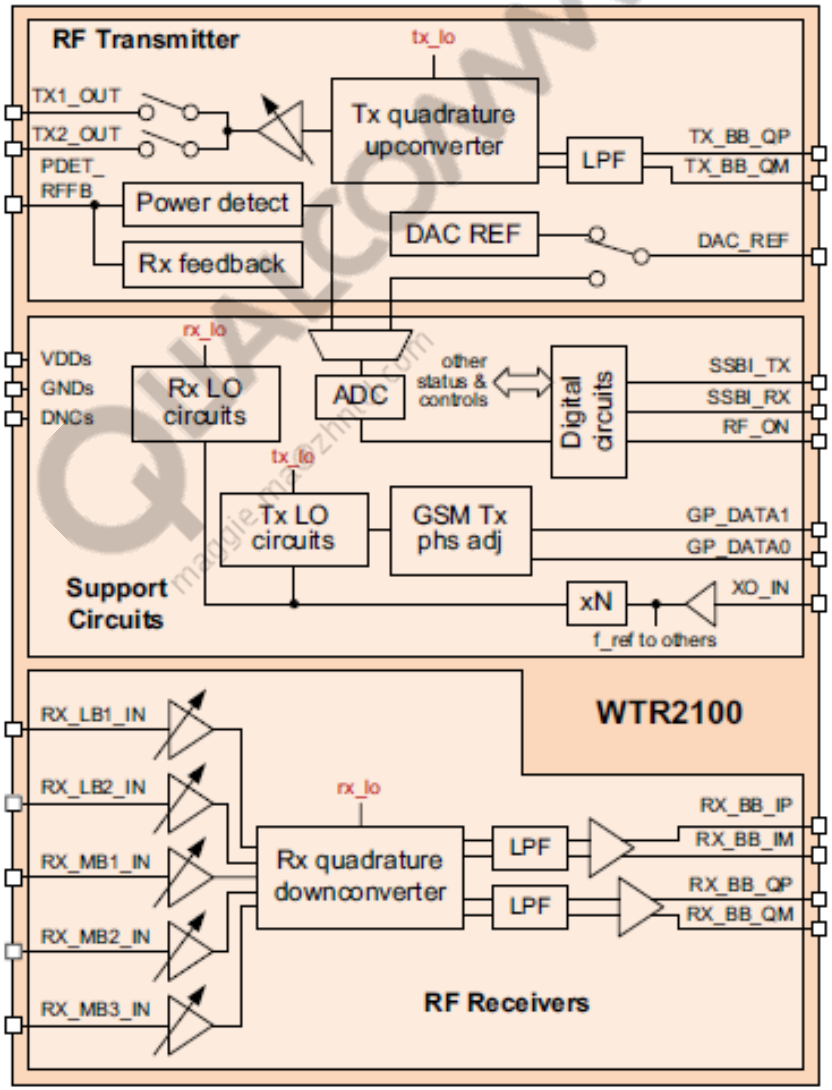


WTR2605 Block Diagram

Note: GNSS is supported only on WTR1605L



WTR2100 Block Diagram

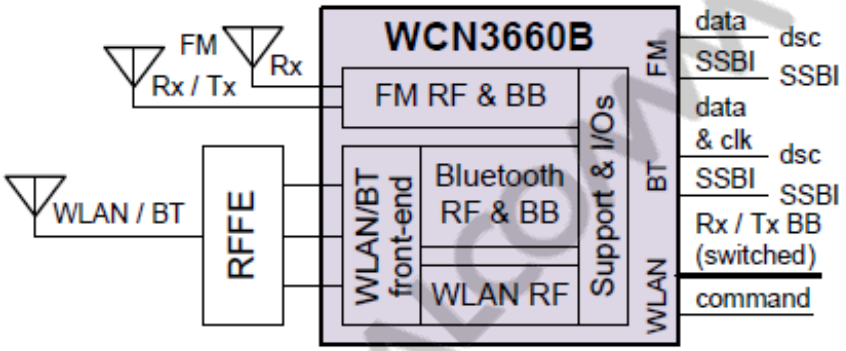


Band Support

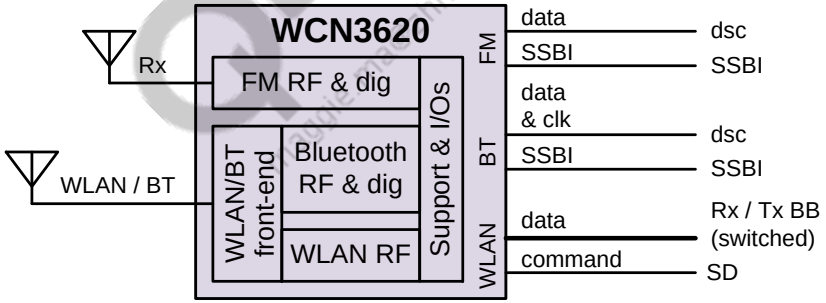
- Refer to *SGLTE/DSDA/CT-SVLTE Reference Schematic Using WTR1605L/WTR2605 and Qualcomm RF360 for MSM8916* (80-NK807-51)
- Refer to *WTR4905/WTR2605 + Qualcomm RF360 Based SXLTE/DSDA RF Preliminary Reference Schematic* (80-NL713-44)

Wireless Connectivity ICs

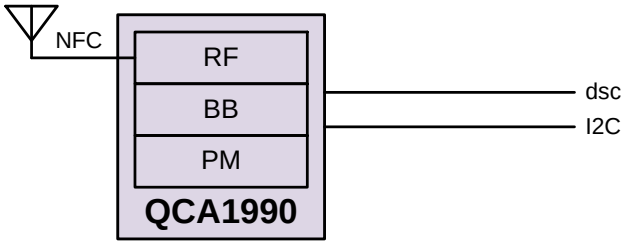
Wireless Connectivity IC Overviews – WCN3620/WCN3660B and QCA1990



WLAN, Bluetooth, and FM radio

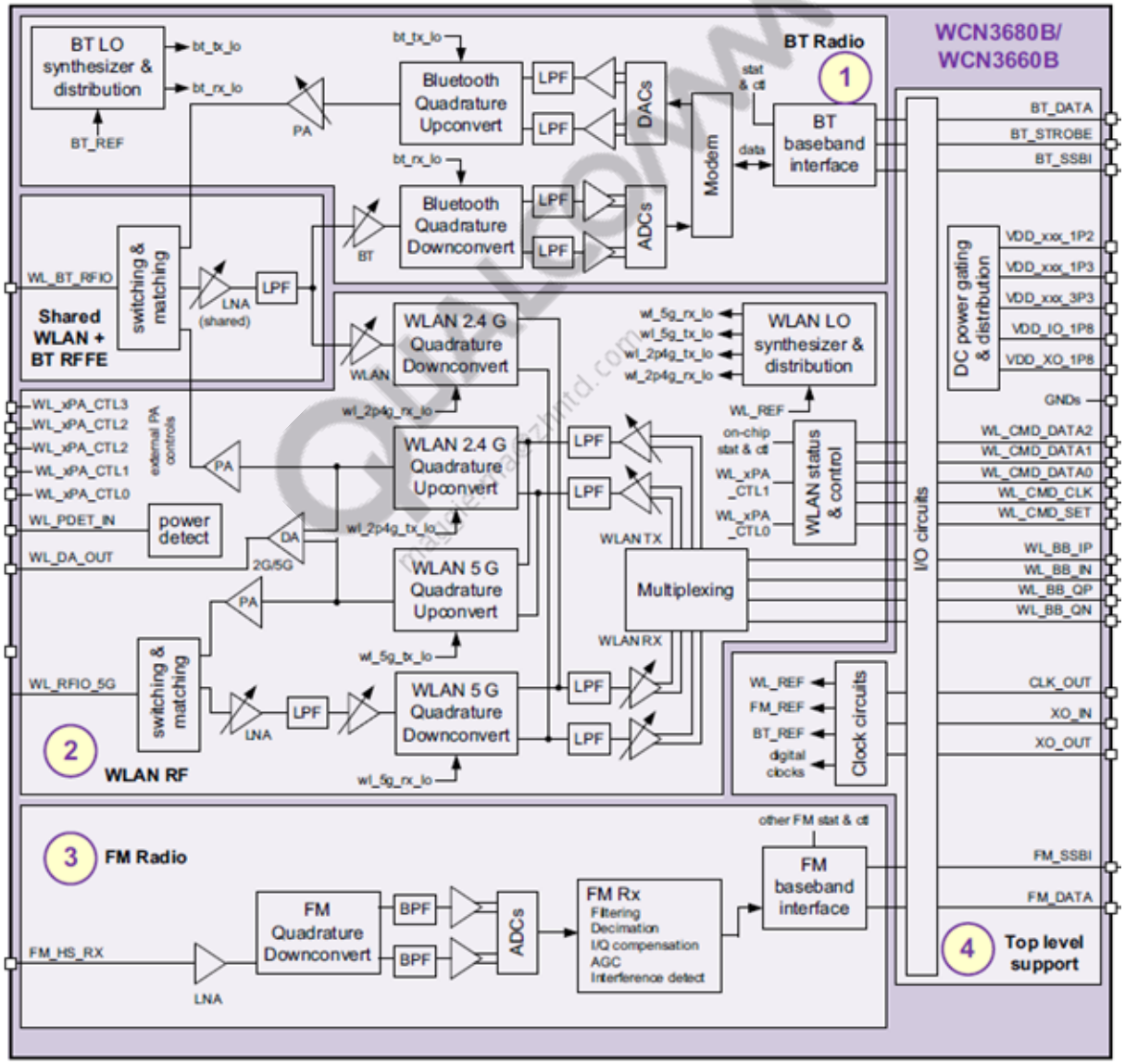


Near Field Communicator



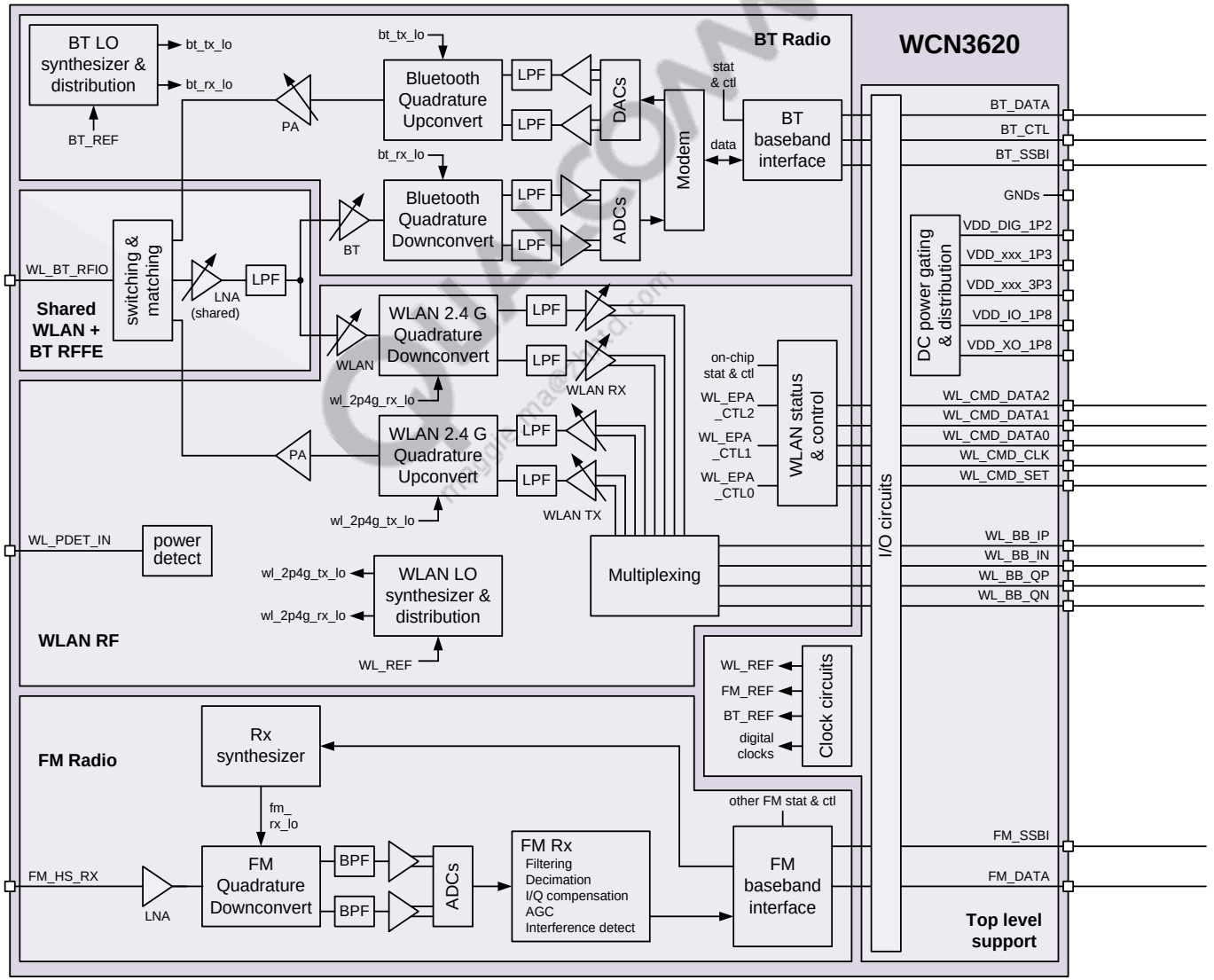
Modem IC

WCN3660B Block Diagram



WCN3620 Block Diagram

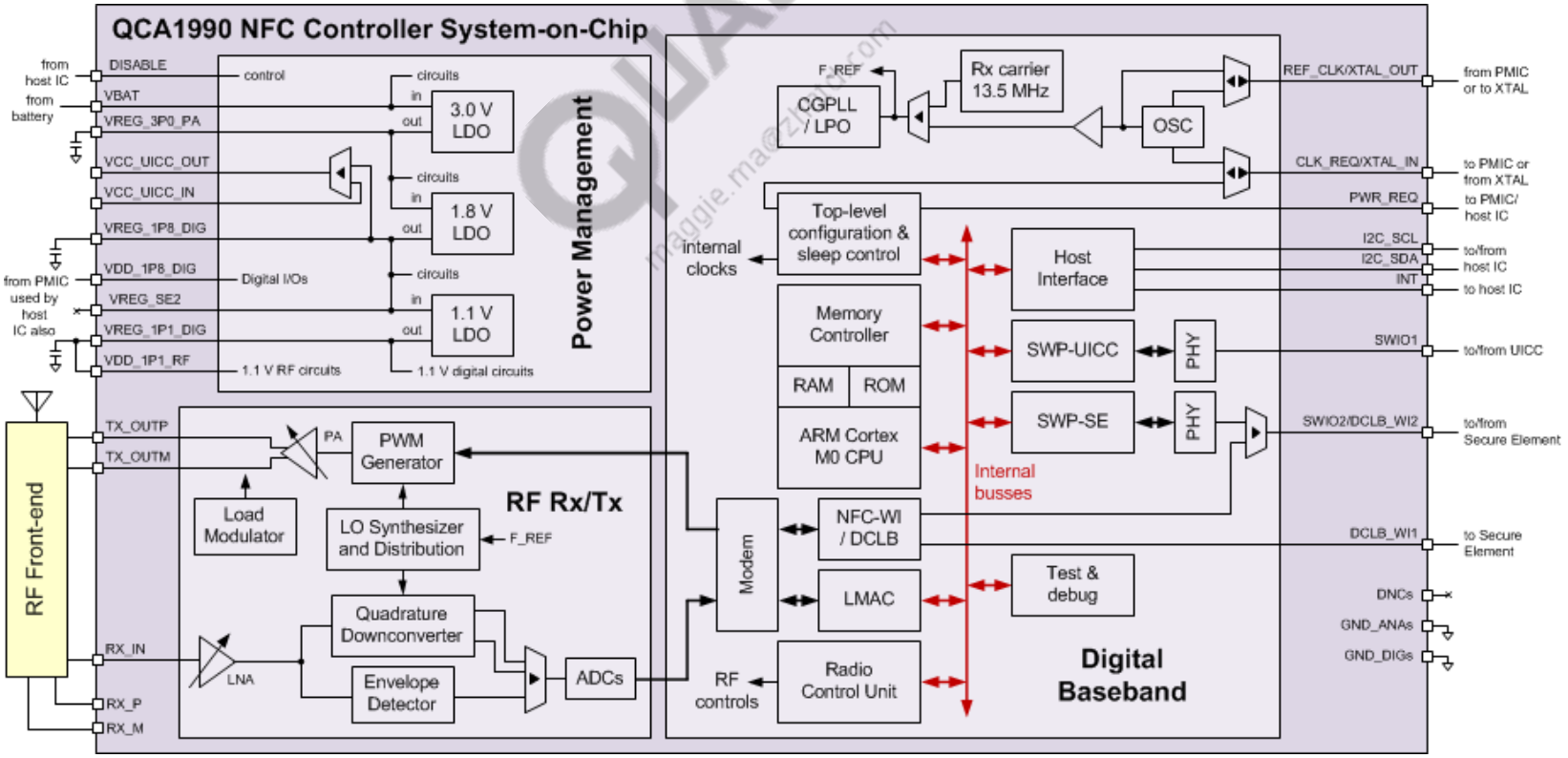
Three major subsystems – WLAN, Bluetooth, and FM radio (split between two ICs) plus top-level support circuits



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

QCA1990 Block Diagram

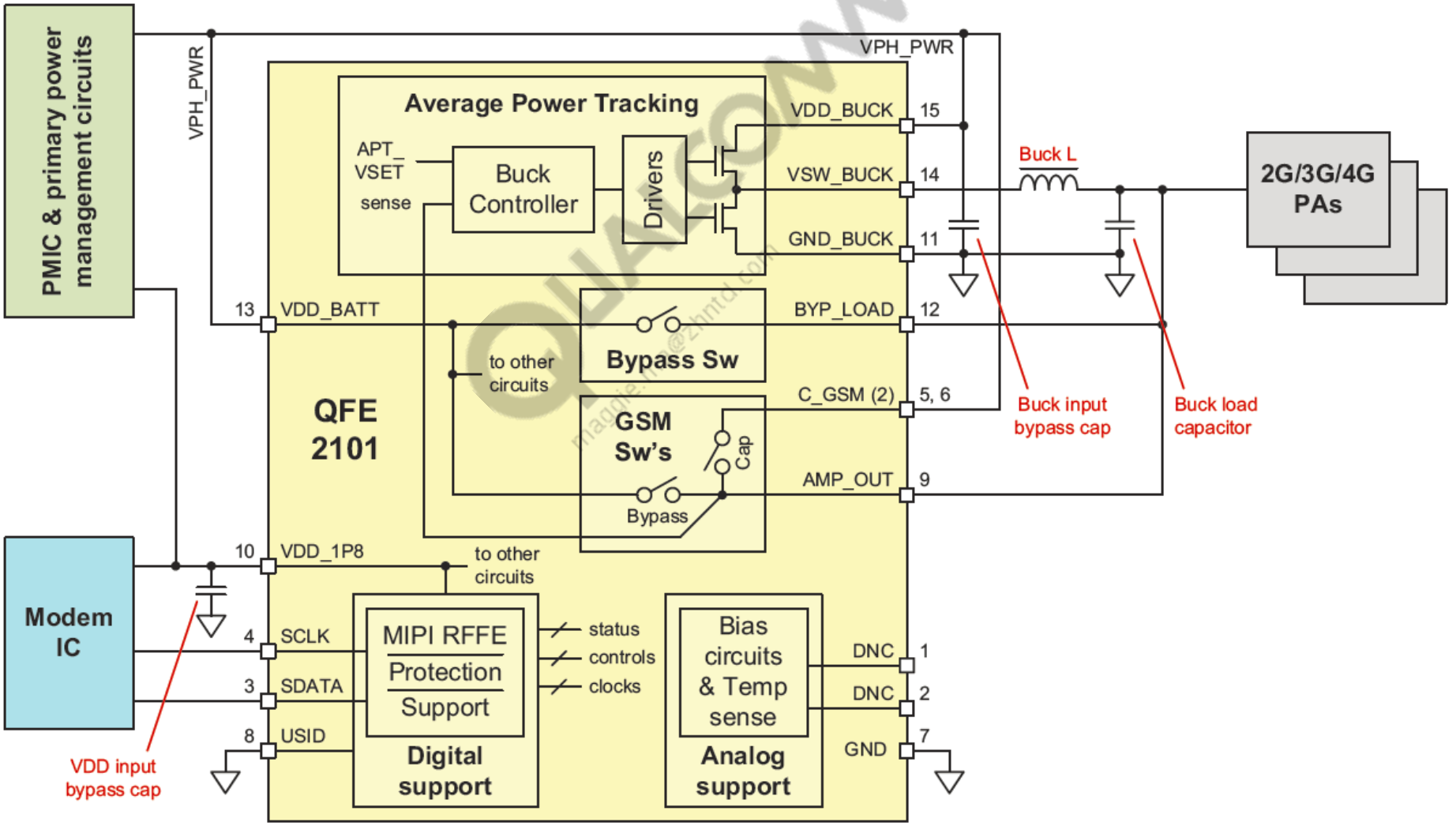
- There are three major functional blocks:
  - RF receiver/transmitter
  - Digital baseband (including clock circuits)
  - Power management



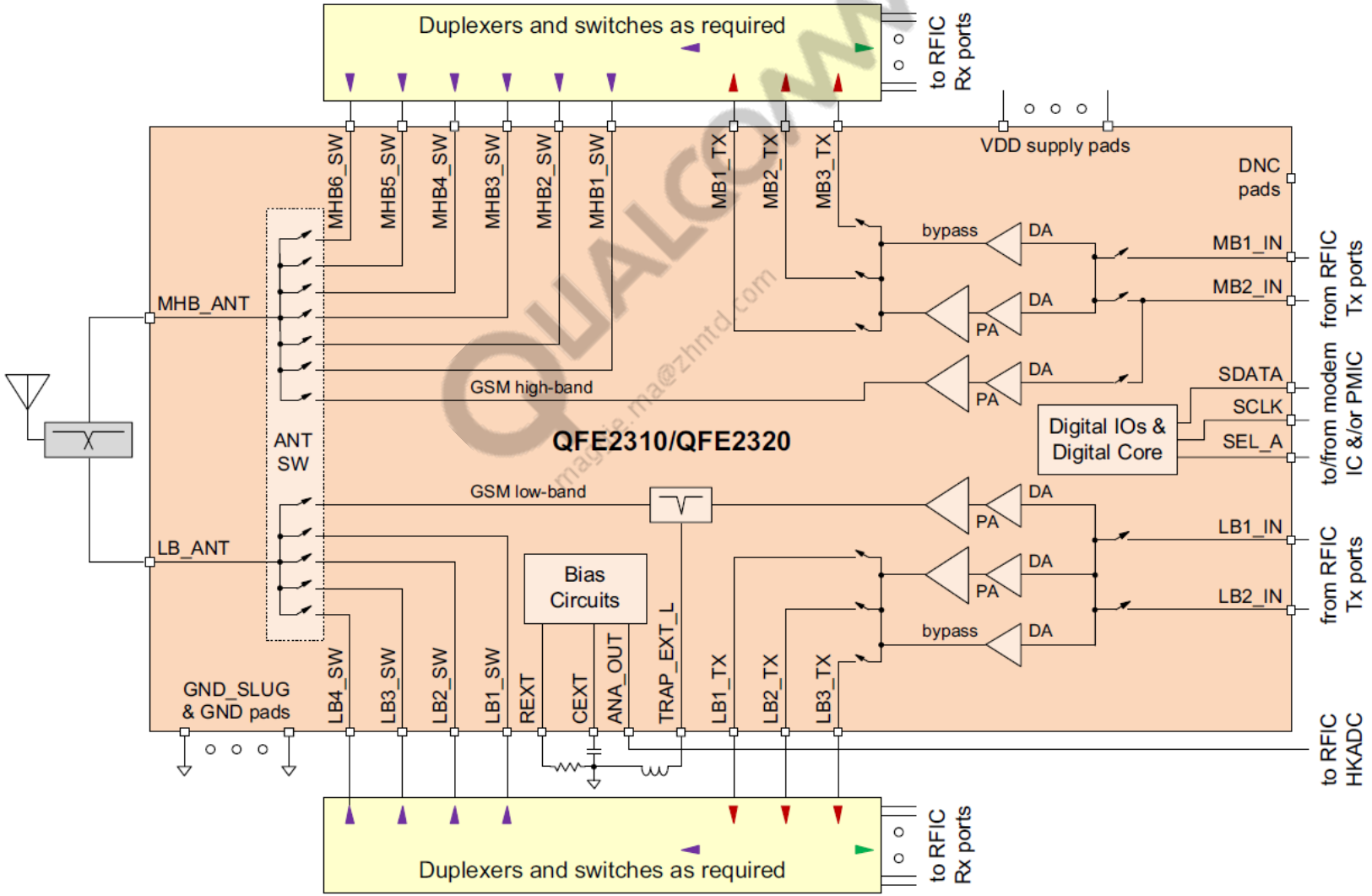
RX_P and RX_M are for energy harvesting feature.

QTI’s Front-end ICs

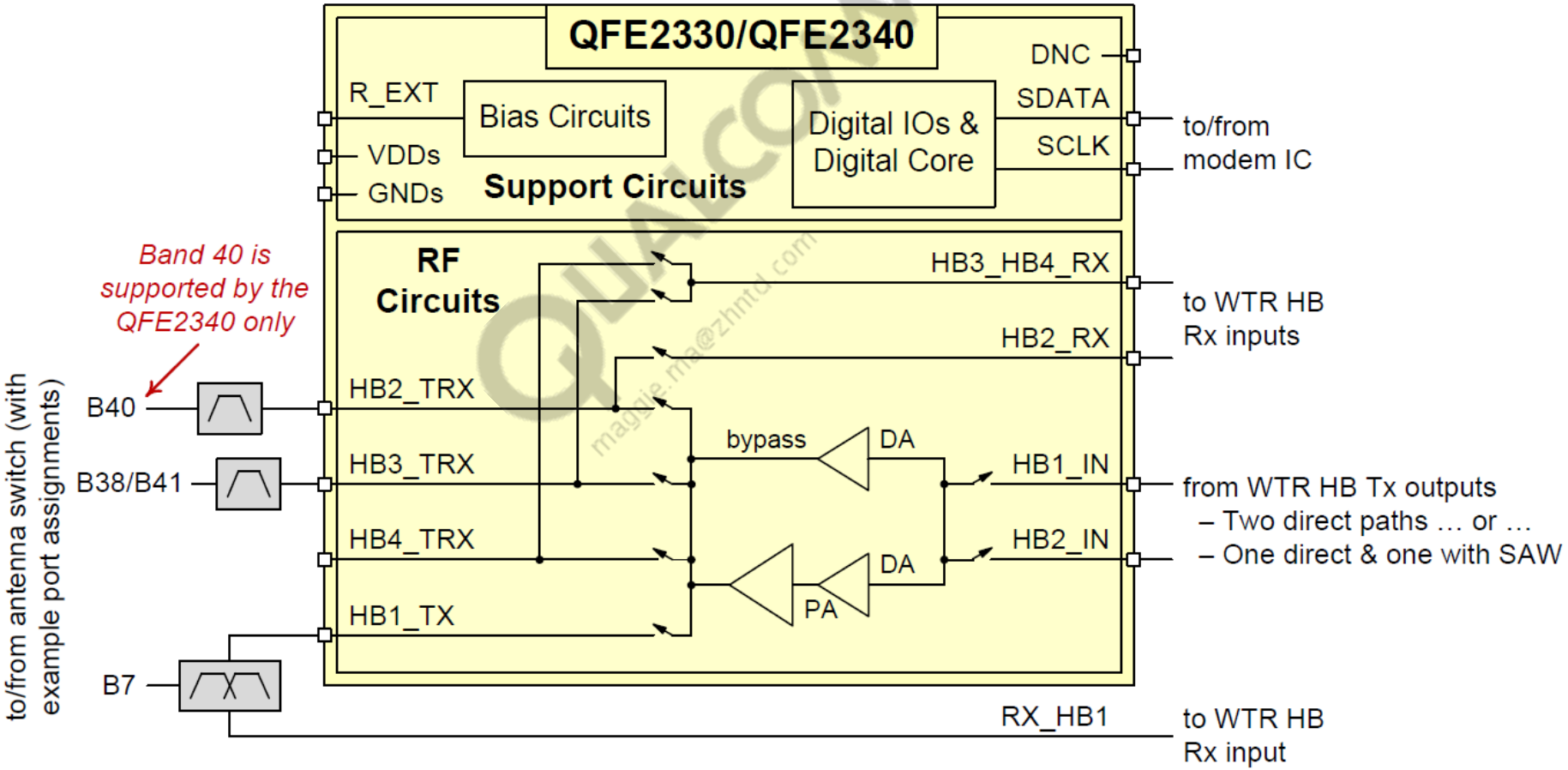
PA Power Management IC – QFE2101 (APT only; no ET support)



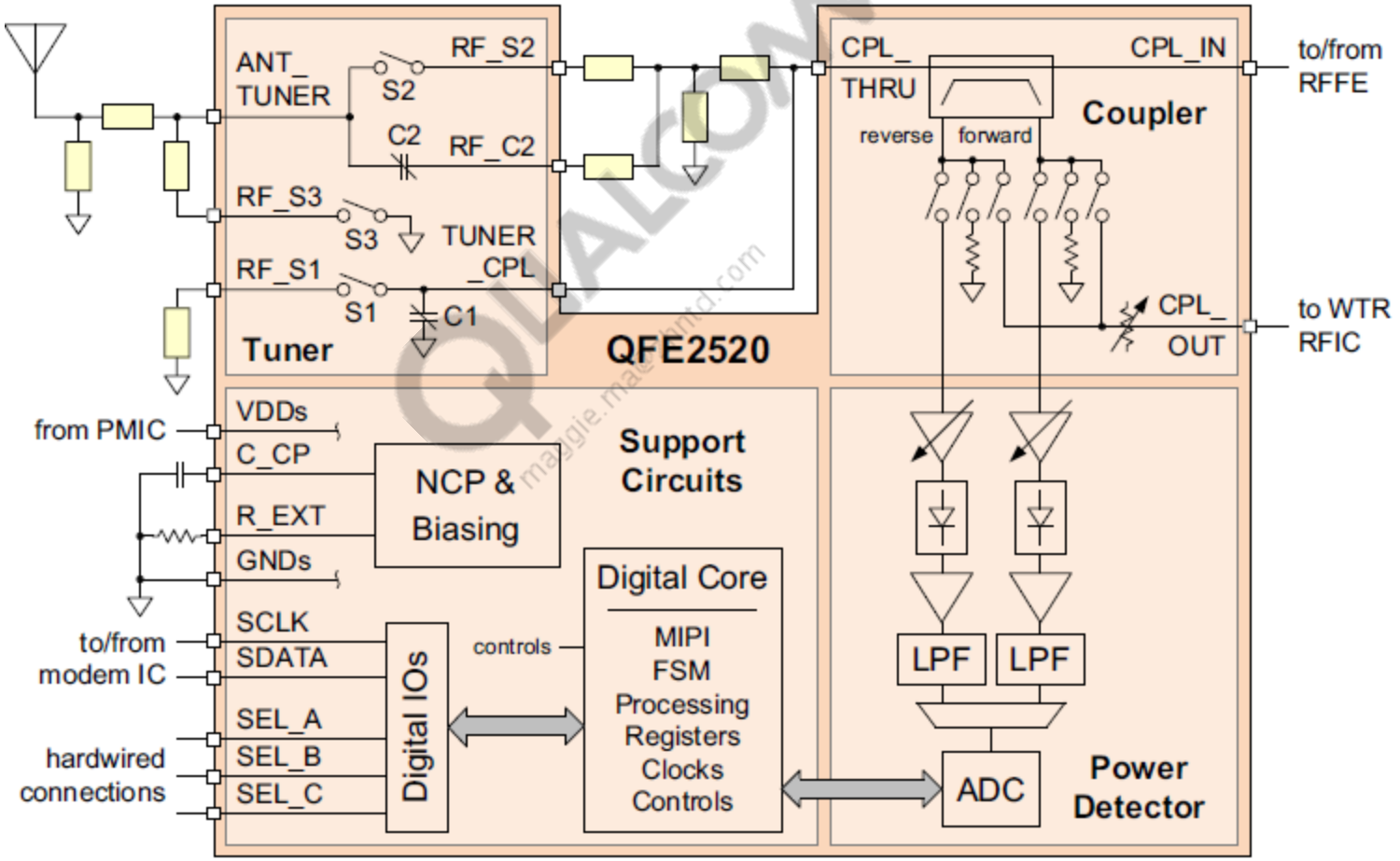
Multimode PA + Switch IC – QFE2320



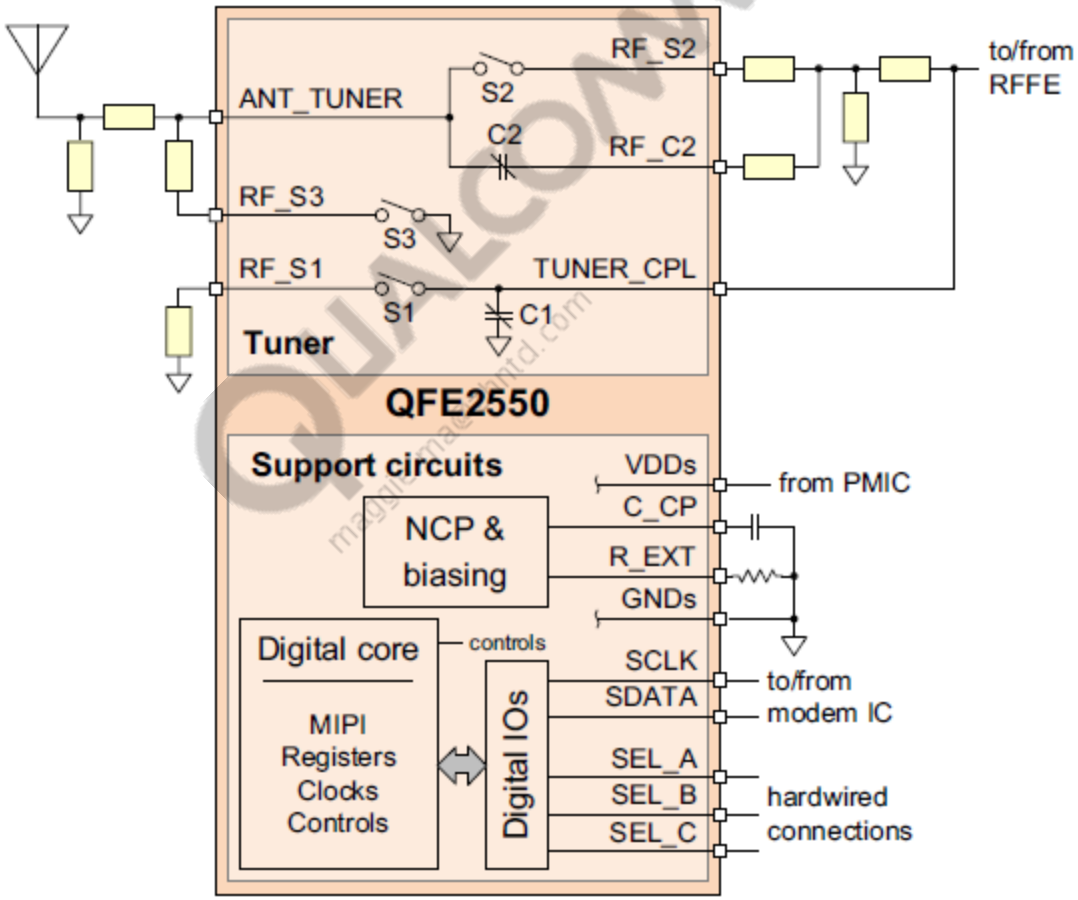
Multimode HB PA + Switch IC – QFE2340



Antenna Tuner IC – QFE2520



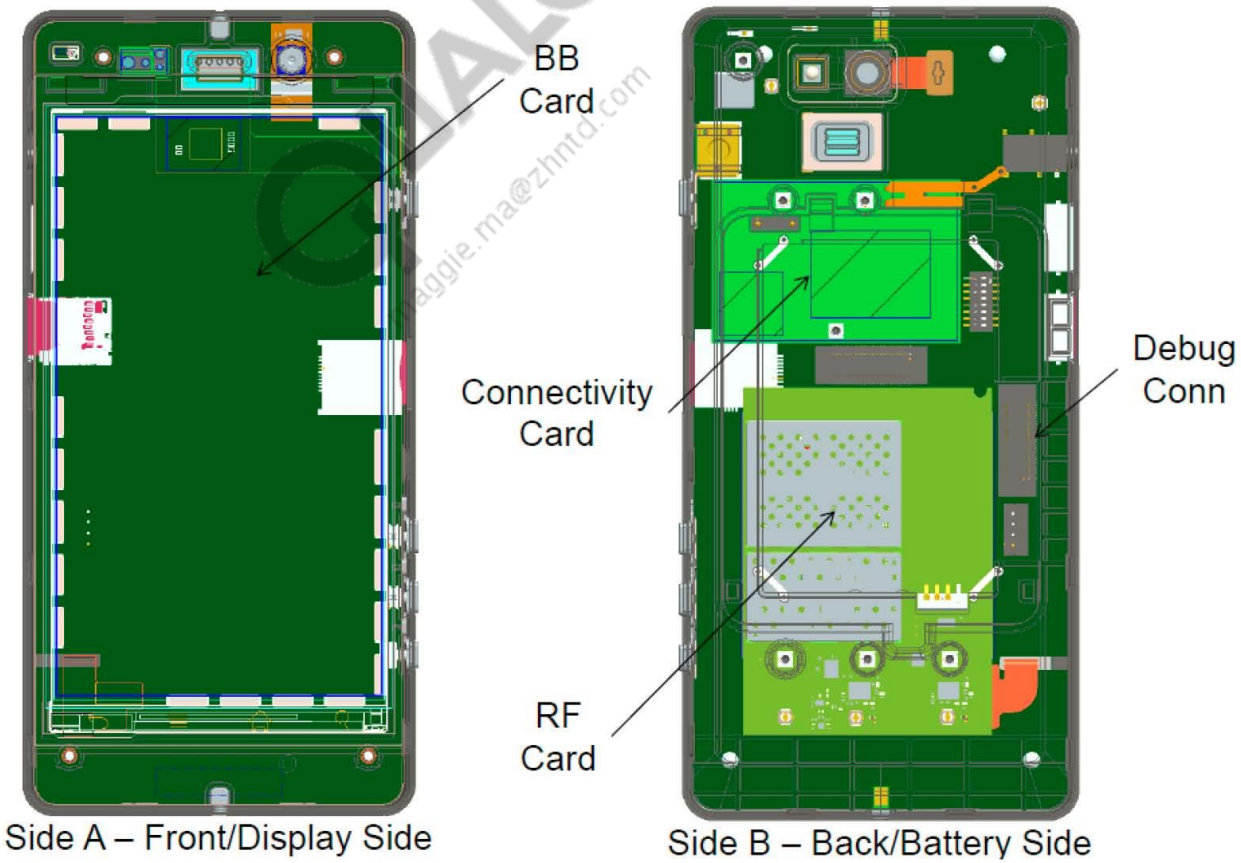
Antenna Tuner IC – QFE2550



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

Reference Documents (2 of 3)

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

Reference Documents (3 of 3)

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

Questions?

https://support.cdmatech.com