

2G/3G Operation Description

Model: QS9719D

Band: GSM850、PCS1900、WCDMA 850

1、Scope

This document shows and provides the basic information about the platform we used. The more detail information about RF section are also included.

QS9719D product is new Pad designed by NTD. The baseband circuit is based on Qualcomm MSM8255 and RF circuit is included Transceiver named Qualcomm QTR8200 ,Avago PA and Triquint PA. It works at three bands, GSM850, PCS1900, WCDMA 850

2、Platform

MSM8255 is based on RF band support WCDMA+GSM+GNSS. The package supports dual-channel LPDDR2 using the PoP package and NAND flash device through EBI2 interface.

- Baseband functions, including multiple hardware cores
- Single platform that provides dedicated support for all market leading codecs and other multimedia formats to support carrier deployments around the world.
- High-quality digital still image camera performance with up to 8-megapixel resolution
- HS-USB core with built-in PHY eliminates additional USB components
- DC power reduction using innovative technique
- Integrates multiple processors
- Supported two high speed memory busses (EBI0 and EBI1)

3、Transceiver QTR8200

- radioOne RF transceiver functions (Rx and Tx, both eliminating their intermediate frequency components)
- WCDMA (Rel'99, HSDPA) and GSM (Rel'99, GPRS and EDGE)
- Gen8 (GPS+GLONASS) is supported
- Wireless connectivity and analog functions-Bluetooth 3.0+EDR, FM radio, audio codec
- RF transmitters: a single analog baseband Tx input from the MSM device is shared by all the QTR transmit paths. Two quadrature upconverters, one translate the WCDMA850 Tx waveform directly to the desired RF band, the other GSM850/1900 transmitters implement the small signal polar configuration.
- RF receivers: supports GSM850/1900, WCDMA850 operation with primary receiver path, using a differential configuration to maximize common-mode rejection, Tx isolation, out-of-band suppression, and second-order intermodulation performance. There are three quadrature downconverters and three separate baseband interfaces to the MSM device.

4、PA

GSM

Triquint 7M5013 U63 is a Multi-State Linear EDGE PAM designed for use with the Qualcomm QTR8200 WEDGE solutions and compact form factor for quad-band cellular handsets comprising GSM850/900, DCS1800, and PCS1900 operation. GSM850/900 has 4 modes-HP, MP, LP, and ULP. DCS1800/PCS1900 has 3 modes-HP, MP, LP.

Operating Parameters

DC Supply	Condition	Min	Typ	Max	Unit
Battery voltage (V _{BATT})		3.0	3.5	4.8	V
V _{MODE0} , V _{MODE1} (digital control)	Low	0		0.5	V
LB_EN, HB_EN	High	1.35		2.6	V
	Current			0.1	mA
Rise Time	From Pout = -30 dBm to Pout = Pmax		0.5		μs
Fall Time	From Pout = -30 dBm to Pout = Pmax		0.5		μs
Operating Case Temperature		-25		+90	°C
LB TX Frequency Range GSM850	Freq	824		849	(MHz)
LB TX Frequency Range GSM900	Freq	880		915	(MHz)
HB TX Frequency Range GSM1800	Freq	1710		1785	(MHz)
HB TX Frequency Range GSM1900	Freq	1880		1910	(MHz)

Modes of Operation

Mode of Operation	LB_EN	HB_EN	V _{Mode0}	V _{mode1}
Powerdown	Low	Low	X	X
Low band – High-power mode	High	Low	Low	Low
Low band – Medium Power mode	High	Low	Low	High
Low band – Low-power mode	High	Low	High	Low
Low band – Ultra-Low-power mode	High	Low	High	High
High band – High-power mode	Low	High	Low	Low
High band – Low-power mode	Low	High	High	Low
High band – Ultra-Low-power mode	Low	High	High	High

WCDMA

Avago ACPM-5005 supports multimode application UMTS Band5 and meets stringent linearity requirements up to 28.25dBm output power for UMTS Rel'99. The PA contains internal DC blocking capacitors for RF input and output ports. The ACPM-5005-TR1 features 5th generation of CoolPAM circuit technology which supports 3 power modes-active bybass, mid power and high power modes. A directional coupler is integrated into the module and both coupling and isolation ports are available externally, supporting daisy chain. The ACPM-5005 has integrated on-chip V_{re} on-module bias switch as the one of the key features of the CoolPAM-5, so an external constant voltage source is not required. All of the digital control inputs pins such as the Ven, V_{mode} and V_{bp} are fully CMOS compatible. The power amplifier is manufactured on an advanced InGap HBT (hetero-junction Bipolar Transistor) MMIC (microwave monolithic integrated circuit) technology.

Recommended Operating Condition

Description	Min.	Typ.	Max.	Unit
DC Supply Voltage (V _{cc1} , V _{cc2})	3.2	3.4	4.2	V
Enable Voltage (Ven)				
Low	0	0	0.5	V
High	1.35	2.6	3.1	V
Mode Control Voltage (V _{mode})				
Low	0	0	0.5	V
High	1.35	2.6	3.1	V
Bypass Control Voltage (V _{bp})				
Low	0	0	0.5	V
High	1.35	2.6	3.1	V
Operating Frequency (f _o)	815		849	MHz
Ambient Temperature (T _a)				
UMTS	-20	25	85	°C
CDMA	-30	25	85	°C

Operating Logic Table

Power Mode	Ven	Vmode	Vbp	Pout (Rel99)	Pout (HSDPA, HSUPA MPR=0dB)
High Power Mode	High	Low	Low	~ 28.25 dBm	~ 27.25 dBm
Mid Power Mode	High	High	Low	~ 17 dBm	~ 16 dBm
Bypass Mode	High	High	High	~ 7 dBm	~ 6 dBm
Shut Down Mode	Low	Low	Low	–	–