SHFi4GM6_Cat6

Technical Specification

V1.0

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1. Product Introduction

SHFi4GM6_Cat6 is a multimode(LTE&UMTS&GSM) cat6 wireless Router, supporting laptops and other equipments with Wi-Fi interface(both 2.4G and 5G). SHFi4GM6_Cat6 supports data, SMS and Wi-Fi Disk functions.

Model	Band	Remark
SHFi4GM6_Cat6	LTE FDD: B1,B3,B7,B20 LTE-TDD: B40 UMTS:B1,B8 GSM:B3,B8 Support 2H+2M+2L	Support Following Channel Bandwidths for LTE: 1.4/3/5/10/15/20 MHz

2. Acronyms

Acronyms	Full Description
LTE	Long Term Evolution
4G	The 4th Generation Mobile Communication Technology
FDD	Frequency Division Duplex
TDD	Time Division Duplex
WCDMA	Wideband Code Division Multiple Access
HSDPA	High Speed Downlink Packet Access
HSUPA	High Speed Uplink Packet Access
GSM	Global System for Mobile Communication
3GPP	3rd Generation Partnership Project
ESD	Electronic Static Discharge
EMC	Electro Magnetic Compatibility
EMI	Electro Magnetic Interference
TP	Touch Panel
USB	Universal Serial Bus

3. Mechanical Description

Item	Description	Remark
Appearance		black
Dimension	106mmX65mmX14mm(H)	
Weight	120g	

4. Hardware Description

Item		Description	Remark
Chipset		Qualcomm MDM9340	
FLASH/Memory		4Gb/2Gb	
Display	Specification	0.96inch, OLED	
	Color	black	
	Size	26.7×15.4×1.38mm	
	Resolution ratio	128*64 dot	
Interface	Micro USB	For charging, debug and OTG(discharging)	
	UIM slot	UIM card adapter	
	Micro SD	T-Flash adapter	
Button	Power Key	Power On/Off	
	Reset	Factory Default Settings	
	WPS	Activate WPS Function	
Battery	Capacity	3250mAH	
	Charging time	3 hours and 50 minutes with 5V/1A power adapter	
	Standby time	27 hours 55minutes	
	working time	15 hours with single user	

5. Software Feature

5.1. OS compatibility

Item	Description	Remark
Windows	XP Vista Win7（32bit and 64bit） Win8（32bit and 64bit） Win10（32bit and 64bit）	
Mac	MAC 10.6+	
Linux	Fedora / Linux Mint / Opens USE /Ubuntu	

5.2. Data

Item	Description	Remark
Access mode indication	Support	
Network rate indication	Support	
Network flux indication	Support	
Network flux statistic	Support	

5.3. Special functions

Item	Description	Remark
Plug and play	Support	
OTG Charging other devices	Support 0.8A output current	
Receiver diversity	Support	

6. Wi-Fi

General	
Chipset	QCA6174A-1
Transfer rate	2.4GHz 300Mbps/5GHz 866Mbps with PHY data rate
User Interface Languages Support	English, customized by customer
Browser	Support Chrome/Firefox4+/IE9+
Wi-Fi Connectivity Function	
Wi-Fi Network Mode	802.11 a/ b/g/n/ac
Pre-configurable security	Support 64, 128, WEP encryption, 802.1x and WPA/WPA2 authentication
SSID	Support
Standard Channel	Support
SSID Broadcast	Support
Management	
Web Setup Wizard	Support
Web Access (HTTP)	Support
Web Access Utility via Wireless	Support
Antenna	
Wi-Fi Antenna	Internal antenna for Wi-Fi

7. Wireless Technical Specification

7.1. Technical indices

Item	Description
Access mode	LTE-FDD/TDD UMTS(HSPA+, HSUPA, HSDPA, WCDMA R99) EDGE/GPRS/GSM
Data rate	LTE-FDD: DL 300Mbps / UL 50Mbps HSPA+: DL 42Mbps / UL 5.76Mbps HSPA+: DL 14.4Mbps / UL 5.76Mbps HSPA: DL 14.4Mbps / UL 5.76Mbps HSPA DC: DL 42Mbps / UL 21Mbps WCDMA CS: DL 64kbps / UL 64kbps WCDMA PS: DL 384kbps / UL 384kbps EDGE: DL 384kbps / UL 384kbps GPRS: DL 171.2kbps / UL 171.2kbps GSM: DL 9.6kbps / UL 9.6kbps
Band	LTE-FDD: B1,B3,B7,B20 LTE-TDD: B40 UMTS: B1,B8 GSM:B3,B8
2DL CA support	CA: 1A_3A,1A_7A,1A_20A,3A_7A, 3A_20A,3A_40A,7A_7A,7A_20A,40A_40A Requested by carrier

7.2. RF Receiver

Table 1. RF Receiver (FDD B1)

Item	Description
Frequency range	2110MHz ~ 2170MHz

Receiver Sensitivity	BW 5 MHz ≤ -99.3 dBm; BW 10 MHz ≤ -96.3dBm BW 15 MHz ≤ -94.5 dBm; BW 20 MHz ≤ -93.3dBm (Throughput ≥ 95%)
Maximum Input Level	≤ -25.7 dBm (Throughput ≥ 95%)
Adjacent Channel Selectivity	BW 1.4 MHz ≥ 33 dB; BW 3 MHz ≥ 33 dB; BW 5 MHz ≥ 33 dB; BW 10 MHz ≥ 33 dB; BW 15 MHz ≥ 30 dB; BW 20 MHz ≥ 27 dB (Throughput ≥ 95%)
In-band blocking	Conform to 3GPP TS 36.101 Specification
Out-of-band blocking	Conform to 3GPP TS 36.101 Specification
Wide band intermodulation	Conform to 3GPP TS 36.101 Specification

Table 2. RF Receiver (FDD B3)

Item	Description
Frequency range	1805MHz ~ 1880MHz
Receiver Sensitivity	BW 1.4 MHz ≤ -101 dBm; BW 3 MHz ≤ -98 dBm; BW 5 MHz ≤ -96.3 dBm; BW 10 MHz ≤ -93.3dBm BW 15 MHz ≤ -91.5 dBm; BW 20 MHz ≤ -90.3dBm (Throughput ≥ 95%)
Maximum Input Level	≤ -25.7 dBm (Throughput ≥ 95%)
Adjacent Channel Selectivity	BW 1.4 MHz ≥ 33 dB; BW 3 MHz ≥ 33 dB; BW 5 MHz ≥ 33 dB; BW 10 MHz ≥ 33 dB; BW 15 MHz ≥ 30 dB; BW 20 MHz ≥ 27 dB (Throughput ≥ 95%)
In-band blocking	Conform to 3GPP TS 36.101 Specification
Out-of-band blocking	Conform to 3GPP TS 36.101 Specification
Wide band intermodulation	Conform to 3GPP TS 36.101 Specification

Table 3. RF Receiver (FDD B7)

Item	Description
Frequency range	2620MHz ~ 2690MHz
Receiver Sensitivity	BW 5 MHz ≤ -97.3 dBm; BW 10 MHz ≤ -94.3dBm BW 15 MHz ≤ -92.5 dBm; BW 20 MHz ≤ -91.3dBm (Throughput ≥ 95%)
Maximum Input Level	≤ -25.7 dBm (Throughput ≥ 95%)

Adjacent Channel Selectivity	BW 5 MHz ≥ 33 dB; BW 10 MHz ≥ 33 dB; BW 15 MHz ≥ 30 dB; BW 20 MHz ≥ 27 dB (Throughput ≥ 95%)
In-band blocking	Conform to 3GPP TS 36.101 Specification
Out-of-band blocking	Conform to 3GPP TS 36.101 Specification
Wide band intermodulation	Conform to 3GPP TS 36.101 Specification

Table 4. RF Receiver (FDD B20)

Item	Description
Frequency range	791MHz ~ 821MHz
Receiver Sensitivity	BW 5 MHz ≤ -99.3 dBm; BW 10 MHz ≤ -96.3 dBm BW 15 MHz ≤ -94.5 dBm; BW 20 MHz ≤ -93.3 dBm (Throughput ≥ 95%)
Maximum Input Level	≤ -25.7 dBm (Throughput ≥ 95%)
Adjacent Channel Selectivity	BW 5 MHz ≥ 33 dB; BW 10 MHz ≥ 33 dB; BW 15 MHz ≥ 30 dB; BW 20 MHz ≥ 27 dB (Throughput ≥ 95%)
In-band blocking	Conform to 3GPP TS 36.101 Specification
Out-of-band blocking	Conform to 3GPP TS 36.101 Specification
Wide band intermodulation	Conform to 3GPP TS 36.101 Specification

Table 5. RF Receiver (TDD B40)

Item	Description
Frequency range	2300MHz ~ 2400MHz
Receiver Sensitivity	BW 5 MHz ≤ -99.3 dBm; BW 10 MHz ≤ -96.3 dBm BW 15 MHz ≤ -94.5 dBm; BW 20 MHz ≤ -93.3 dBm (Throughput ≥ 95%)
Maximum Input Level	≤ -25.7 dBm (Throughput ≥ 95%)

Adjacent Channel Selectivity	BW 5 MHz ≥ 33 dB; BW 10 MHz ≥ 33 dB; BW 15 MHz ≥ 30 dB; BW 20 MHz ≥ 27 dB (Throughput ≥ 95%)
In-band blocking	Conform to 3GPP TS 36.101 Specification
Out-of-band blocking	Conform to 3GPP TS 36.101 Specification
Wide band intermodulation	Conform to 3GPP TS 36.101 Specification

Table 6. RF Receiver (UMTS B1)

Item	Description
Frequency range	2110MHz ~ 2170MHz
Reference Sensitivity Level	≤ -106.7 dBm/3.84 MHz
Maximum Input Level	BER < 0.1% (-25dBm/3.84Mhz @TX power 20dBm)
Spurious Emissions	< -60dBm (791 MHz ≤ f ≤ 821 MHz) < -60dBm (1475.9 MHz ≤ f ≤ 1510.9 MHz) < -60dBm (1844.9 MHz ≤ f ≤ 1879.9 MHz) < -60dBm (1 920 MHz ≤ f ≤ 1 980 MHz) < -60dBm (2 110 MHz ≤ f ≤ 2 170 MHz) < -60dBm (2585 MHz ≤ f ≤ 2690 MHz)

Table 7. RF Receiver (UMTS B8)

Item	Description
Frequency range	925MHz ~ 960MHz
Reference Sensitivity Level	≤ -106.7 dBm/3.84 MHz
Maximum Input Level	BER < 0.1% (-25dBm/3.84Mhz @TX power 20dBm)
Spurious Emissions	< -60dBm (791 MHz ≤ f ≤ 821 MHz) < -60dBm (1475.9 MHz ≤ f ≤ 1510.9 MHz) < -60dBm (1844.9 MHz ≤ f ≤ 1879.9 MHz) < -60dBm (1 920 MHz ≤ f ≤ 1 980 MHz) < -60dBm (2 110 MHz ≤ f ≤ 2 170 MHz) < -60dBm (2585 MHz ≤ f ≤ 2690 MHz)

Table 8. RF Receiver (EDGE/GPRS/GSM 900 MHz)

Item	Description
Frequency range	925MHz ~ 960MHz
Reference sensitivity	≤ -102 dBm (RBER ≤ 2.439%)
Usable receiver input level range	< 0.012% (Static <=73 dBμVemf; Minimum No. of samples >1640000)

Co-channel rejection	< 24*α% (TCH/FS FER; TUlow/No FH; Minimum No. of samples > 25000) < 2.091/α% (TCH/FS Class Ib RBER; TUlow/No FH; Minimum No. of samples > 3300000) < 4.3% (TCH/FS Class II RBER; TUlow/No FH; Minimum No. of samples > 2000000) < 3.371*α% (TCH/FS FER; TUhigh/FH; Minimum No. of samples >17800) < 0.215/α% (TCH/FS Class Ib RBER; TUhigh/FH; Minimum No. of samples > 2000000) < 8.333% (TCH/FS Class II RBER; TUhigh/FH; Minimum No. of samples > 1200000) 1≤α≤1.6

Table 9. RF Receiver (EDGE/GPRS/GSM 1800MHz)

Item	Description
Frequency range	1805MHz ~ 1880MHz
Reference sensitivity	≤ -102 dBm (RBER ≤ 2.439%)
Usable receiver input level range	< 0.012% (Static <=73 dBμVemf; Minimum No. of samples >1640000)
Co-channel rejection	< 24*α% (TCH/FS FER; TUlow/No FH; Minimum No. of samples > 25000) < 2.091/α% (TCH/FS Class Ib RBER; TUlow/No FH; Minimum No. of samples > 3300000) < 4.3% (TCH/FS Class II RBER; TUlow/No FH; Minimum No. of samples > 2000000) < 3.371*α% (TCH/FS FER; TUhigh/FH; Minimum No. of samples >17800) < 0.215/α% (TCH/FS Class Ib RBER; TUhigh/FH; Minimum No. of samples > 2000000) < 8.333% (TCH/FS Class II RBER; TUhigh/FH; Minimum No. of samples > 1200000) 1≤α≤1.6

7.3. **RF Transmitter**

Table 10. RF Transmitter (FDD B1)

Item	Description
Frequency Range	1920 MHz ~ 1980 MHz
UE Maximum Output Power	20.3 dBm ~ 25.7 dBm
Minimum Output Power	≤ -39dBm

Absolute Power Tolerance	Normal: -10.0 dB ~ +10.0 dB		
	Extreme: -13.0 dB ~ +13.0 dB		
Relative Power Tolerance	ΔP < 2 dB	-2.5 dB ~ +2.5 dB	
	2 dB ≤ ΔP < 3 dB	-3.0 dB ~ +3.0 dB	
	3 dB ≤ ΔP < 4 dB	-3.5 dB ~ +3.5 dB	
	4 dB ≤ ΔP ≤ 10 dB	-4.0 dB ~ +4.0 dB	
	10 dB ≤ ΔP < 15 dB	-5.0 dB ~ +5.0 dB	
	15 dB ≤ ΔP	-6.0 dB ~ +6.0 dB	
Aggregate Power Control Tolerance	PUCCH: -2.5 dB ~ +2.5 dB (within 21 ms)		
	PUSCH: -3.5 dB ~ +3.5 dB (within 21 ms)		
Frequency Error	-0.1 PPM ~ +0.1 PPM		
Error Vector Magnitude	QPSK or BPSK: < 17.5% (≥ -40 dBm)		
	16QAM: < 12.5% (≥ -40 dBm)		
Carrier Leakage	f ≤ 3.0GHz: 3.2 dBm ±3.2dB	≤ -24.2 dBc	
	f ≤ 3.0GHz: -26.8 dBm ±3.2dB	≤ -19.2 dBc	
	f ≤ 3.0GHz: -36.8dBm±3.2dB	≤ -9.2 dBc	
In-band Emissions	Conform to 3GPP TS 36.101 Specification		
EVM Equalizer Spectrum Flatness	normal conditions	Range 1	≤ 5.4 dB (p-p)
		Range 2	≤ 9.4 dB (p-p)
	extreme conditions	Range 1	≤ 5.4 dB (p-p)
		Range 2	≤ 13.4 dB (p-p)
Occupied Bandwidth	Occupied channel bandwidth ≤ Channel bandwidth		
Spectrum Emission Mask	Conform to 3GPP TS 36.101 Specification		
Additional Spectrum Emission Mask	Conform to 3GPP TS 36.101 Specification		
Adjacent Channel Leakage Ratio	E-UTRA$_{ACLR1}$ ≥ 29.2 dB		
	UTRA$_{ACLR1}$ ≥ 32.2 dB, UTRA$_{ACLR2}$ ≥ 35.2 dB		
Spurious Emissions	9 kHz ≤ f < 150 kHz	≤ -36 dBm (1 kHz)	
	150 kHz ≤ f < 30 MHz	≤ -36 dBm (10 kHz)	
	30 MHz ≤ f < 1000 MHz	≤ -36 dBm (100 kHz)	
	1 GHz ≤ f < 12.75 GHz	≤ -30 dBm (1 MHz)	

Table 11. RF Transmitter (FDD B3)

Item	Description

Frequency Range	1710 MHz ~ 1785 MHz		
UE Maximum Output Power	20.3 dBm ~ 25.7 dBm		
Minimum Output Power	≤ -39dBm		
Absolute Power Tolerance	Normal: -10.0 dB ~ +10.0 dB		
	Extreme: -13.0 dB ~ +13.0 dB		
Relative Power Tolerance	ΔP < 2 dB	-2.5 dB ~ +2.5 dB	
	2 dB ≤ ΔP < 3 dB	-3.0 dB ~ +3.0 dB	
	3 dB ≤ ΔP < 4 dB	-3.5 dB ~ +3.5 dB	
	4 dB ≤ ΔP ≤ 10 dB	-4.0 dB ~ +4.0 dB	
	10 dB ≤ ΔP < 15 dB	-5.0 dB ~ +5.0 dB	
	15 dB ≤ ΔP	-6.0 dB ~ +6.0 dB	
Aggregate Power Control Tolerance	PUCCH: -2.5 dB ~ +2.5 dB (within 21 ms)		
	PUSCH: -3.5 dB ~ +3.5 dB (within 21 ms)		
Frequency Error	-0.1 PPM ~ +0.1 PPM		
Error Vector Magnitude	QPSK or BPSK: < 17.5% (≥ -40 dBm)		
	16QAM: < 12.5% (≥ -40 dBm)		
Carrier Leakage	f ≤ 3.0GHz: 3.2 dBm ±3.2dB	≤ -24.2 dBc	
	f ≤ 3.0GHz: -26.8 dBm ±3.2dB	≤ -19.2 dBc	
	f ≤ 3.0GHz: -36.8dBm±3.2dB	≤ -9.2 dBc	
In-band Emissions	Conform to 3GPP TS 36.101 Specification		
EVM Equalizer Spectrum Flatness	normal conditions	Range 1	≤ 5.4 dB (p-p)
		Range 2	≤ 9.4 dB (p-p)
	extreme conditions	Range 1	≤ 5.4 dB (p-p)
		Range 2	≤ 13.4 dB (p-p)
Occupied Bandwidth	Occupied channel bandwidth ≤ Channel bandwidth		
Spectrum Emission Mask	Conform to 3GPP TS 36.101 Specification		
Additional Spectrum Emission Mask	Conform to 3GPP TS 36.101 Specification		
Adjacent Channel Leakage Ratio	$E\text{-}UTRA_{ACLR1} \geq 29.2$ dB		
	$UTRA_{ACLR1} \geq 32.2$ dB, $UTRA_{ACLR2} \geq 35.2$ dB		
Spurious Emissions	9 kHz ≤ f < 150 kHz	≤ -36 dBm (1 kHz)	
	150 kHz ≤ f < 30 MHz	≤ -36 dBm (10 kHz)	
	30 MHz ≤ f < 1000 MHz	≤ -36 dBm (100 kHz)	

	1 GHz ≤ f < 12.75 GHz	≤ -30 dBm (1 MHz)

Table 12. RF Transmitter (FDD B7)

Item	Description		
Frequency Range	2500MHz ~ 2570MHz		
UE Maximum Output Power	20.3dBm ~ 25.7dBm		
Minimum Output Power	≤ -39dBm		
Absolute Power Tolerance	Normal: -10.0 dB ~ +10.0 dB		
	Extreme: -13.0 dB ~ +13.0 dB		
Relative Power Tolerance	ΔP < 2 dB	-2.5 dB ~ +2.5 dB	
	2 dB ≤ ΔP < 3 dB	-3.0 dB ~ +3.0 dB	
	3 dB ≤ ΔP < 4 dB	-3.5 dB ~ +3.5 dB	
	4 dB ≤ ΔP ≤ 10 dB	-4.0 dB ~ +4.0 dB	
	10 dB ≤ ΔP < 15 dB	-5.0 dB ~ +5.0 dB	
	15 dB ≤ ΔP	-6.0 dB ~ +6.0 dB	
Aggregate Power Control Tolerance	PUCCH: -2.5 dB ~ +2.5 dB (within 21 ms)		
	PUSCH: -3.5 dB ~ +3.5 dB (within 21 ms)		
Frequency Error	-0.1 PPM ~ +0.1 PPM		
Error Vector Magnitude	QPSK or BPSK: < 17.5% (≥ -40 dBm)		
	16QAM: < 12.5% (≥ -40 dBm)		
Carrier Leakage	f ≤ 3.0GHz: 3.2 dBm ±3.2dB	≤ -24.2 dBc	
	f ≤ 3.0GHz: -26.8 dBm ±3.2dB	≤ -19.2 dBc	
	f ≤ 3.0GHz: -36.8dBm±3.2dB	≤ -9.2 dBc	
In-band Emissions	Conform to 3GPP TS 36.101 Specification		
EVM Equalizer Spectrum Flatness	normal conditions	Range 1	≤ 5.4 dB (p-p)
		Range 2	≤ 9.4 dB (p-p)
	extreme conditions	Range 1	≤ 5.4 dB (p-p)
		Range 2	≤ 13.4 dB (p-p)
Occupied Bandwidth	Occupied channel bandwidth ≤ Channel bandwidth		
Spectrum Emission Mask	Conform to 3GPP TS 36.101 Specification		
Additional Spectrum Emission Mask	Conform to 3GPP TS 36.101 Specification		
Adjacent Channel Leakage	E-UTRA$_{ACLR1}$ ≥ 29.2 dB		

Ratio	$UTRA_{ACLR1}$ ≥ 32.2 dB, $UTRA_{ACLR2}$ ≥ 35.2 dB	
Spurious Emissions	9 kHz ≤ f < 150 kHz	≤ -36 dBm (1 kHz)
	150 kHz ≤ f < 30 MHz	≤ -36 dBm (10 kHz)
	30 MHz ≤ f < 1000 MHz	≤ -36 dBm (100 kHz)
	1 GHz ≤ f < 12.75 GHz	≤ -30 dBm (1 MHz)

Table 13. RF Transmitter (FDD B20)

Item	Description		
Frequency Range	832 MHz ~ 862 MHz		
UE Maximum Output Power	20.3 dBm ~ 25.7 dBm		
Minimum Output Power	≤ -39 dBm		
Absolute Power Tolerance	Normal: -10.0 dB ~ +10.0 dB		
	Extreme: -13.0 dB ~ +13.0 dB		
Relative Power Tolerance	ΔP < 2 dB	-2.5 dB ~ +2.5 dB	
	2 dB ≤ ΔP < 3 dB	-3.0 dB ~ +3.0 dB	
	3 dB ≤ ΔP < 4 dB	-3.5 dB ~ +3.5 dB	
	4 dB ≤ ΔP ≤ 10 dB	-4.0 dB ~ +4.0 dB	
	10 dB ≤ ΔP < 15 dB	-5.0 dB ~ +5.0 dB	
	15 dB ≤ ΔP	-6.0 dB ~ +6.0 dB	
Aggregate Power Control Tolerance	PUCCH: -2.5 dB ~ +2.5 dB (within 21 ms)		
	PUSCH: -3.5 dB ~ +3.5 dB (within 21 ms)		
Frequency Error	-0.1 PPM ~ +0.1 PPM		
Error Vector Magnitude	QPSK or BPSK: < 17.5% (≥ -40 dBm)		
	16QAM: < 12.5% (≥ -40 dBm)		
Carrier Leakage	f ≤ 3.0GHz: 3.2 dBm ±3.2dB	≤ -24.2 dBc	
	f ≤ 3.0GHz: -26.8 dBm ±3.2dB	≤ -19.2 dBc	
	f ≤ 3.0GHz: -36.8dBm±3.2dB	≤ -9.2 dBc	
In-band Emissions	Conform to 3GPP TS 36.101 Specification		
EVM Equalizer Spectrum Flatness	normal conditions	Range 1	≤ 5.4 dB (p-p)
		Range 2	≤ 9.4 dB (p-p)
	extreme conditions	Range 1	≤ 5.4 dB (p-p)
		Range 2	≤ 13.4 dB (p-p)
Occupied Bandwidth	Occupied channel bandwidth ≤ Channel bandwidth		

Spectrum Emission Mask	Conform to 3GPP TS 36.101 Specification	
Additional Spectrum Emission Mask	Conform to 3GPP TS 36.101 Specification	
Adjacent Channel Leakage Ratio	E-UTRA$_{ACLR1}$ ≥ 29.2 dB	
	UTRA$_{ACLR1}$ ≥ 32.2 dB, UTRA$_{ACLR2}$ ≥ 35.2 dB	
Spurious Emissions	9 kHz ≤ f < 150 kHz	≤ -36 dBm (1 kHz)
	150 kHz ≤ f < 30 MHz	≤ -36 dBm (10 kHz)
	30 MHz ≤ f < 1000 MHz	≤ -36 dBm (100 kHz)
	1 GHz ≤ f < 12.75 GHz	≤ -30 dBm (1 MHz)

Table 14. RF Transmitter (TDD B40)

Item	Description		
Frequency Range	2300 MHz ~ 2400 MHz		
UE Maximum Output Power	20.3 dBm ~ 25.7 dBm		
Minimum Output Power	≤ -39 dBm		
Absolute Power Tolerance	Normal: -10.0 dB ~ +10.0 dB		
	Extreme: -13.0 dB ~ +13.0 dB		
Relative Power Tolerance	ΔP < 2 dB	-2.5 dB ~ +2.5 dB	
	2 dB ≤ ΔP < 3 dB	-3.0 dB ~ +3.0 dB	
	3 dB ≤ ΔP < 4 dB	-3.5 dB ~ +3.5 dB	
	4 dB ≤ ΔP ≤ 10 dB	-4.0 dB ~ +4.0 dB	
	10 dB ≤ ΔP < 15 dB	-5.0 dB ~ +5.0 dB	
	15 dB ≤ ΔP	-6.0 dB ~ +6.0 dB	
Aggregate Power Control Tolerance	PUCCH: -2.5 dB ~ +2.5 dB (within 21 ms)		
	PUSCH: -3.5 dB ~ +3.5 dB (within 21 ms)		
Frequency Error	-0.1 PPM ~ +0.1 PPM		
Error Vector Magnitude	QPSK or BPSK: < 17.5% (≥ -40 dBm)		
	16QAM: < 12.5% (≥ -40 dBm)		
Carrier Leakage	f ≤ 3.0GHz: 3.2 dBm ±3.2dB	≤ -24.2 dBc	
	f ≤ 3.0GHz: -26.8 dBm ±3.2dB	≤ -19.2 dBc	
	f ≤ 3.0GHz: -36.8dBm±3.2dB	≤ -9.2 dBc	
In-band Emissions	Conform to 3GPP TS 36.101 Specification		
EVM Equalizer Spectrum Flatness	normal conditions	Range 1	≤ 5.4 dB (p-p)
		Range 2	≤ 9.4 dB (p-p)

	extreme conditions	Range 1	≤ 5.4 dB (p-p)
		Range 2	≤ 13.4 dB (p-p)
Occupied Bandwidth	Occupied channel bandwidth ≤ Channel bandwidth		
Spectrum Emission Mask	Conform to 3GPP TS 36.101 Specification		
Additional Spectrum Emission Mask	Conform to 3GPP TS 36.101 Specification		
Adjacent Channel Leakage Ratio	$E\text{-}UTRA_{ACLR1} \geq 29.2$ dB		
	$UTRA_{ACLR1} \geq 32.2$ dB, $UTRA_{ACLR2} \geq 35.2$ dB		
Spurious Emissions	9 kHz ≤ f < 150 kHz	≤ -36 dBm (1 kHz)	
	150 kHz ≤ f < 30 MHz	≤ -36 dBm (10 kHz)	
	30 MHz ≤ f < 1000 MHz	≤ -36 dBm (100 kHz)	
	1 GHz ≤ f < 12.75 GHz	≤ -30 dBm (1 MHz)	

Table 15. RF Transmitter (UMTS B1)

Item	Description
Frequency Range	1920 MHz ~ 1980 MHz
Maximum Output Power	24dBm (power class 3 tolerances +1/-3 dBm)
Frequency Error	-0.1ppm ~ +0.1ppm
Minimum Output Power	< -50dBm
Adjacent Channel Leakage Power Ratio(ALCR)	≤ -33 dB (UE channel +5 MHz or –5 MHz) ≤ -43 dB (UE channel +10 MHz or –10 MHz)
Error Vector Magnitude (EVM)	< 17.5 % (Output power ≥–20 dBm Power control step size 1dB)

Table 16. RF Transmitter (UMTS B8)

Item	Description
Frequency Range	880 MHz ~ 915 MHz
Maximum Output Power	24dBm (power class 3 tolerances +1/-3 dBm)
Frequency Error	-0.1ppm ~ +0.1ppm
Minimum Output Power	< -50dBm
Adjacent Channel Leakage Power Ratio(ALCR)	≤ -33 dB (UE channel +5 MHz or –5 MHz) ≤ -43 dB (UE channel +10 MHz or –10 MHz)
Error Vector Magnitude (EVM)	< 17.5 % (Output power ≥–20 dBm Power control step size 1dB)

Table 17. RF Receiver (EDGE/GPRS/GSM 900 MHz)

Item	Description
Frequency range	925MHz ~ 960MHz
Reference sensitivity	≤ -102 dBm (RBER ≤ 2.439%)

Usable receiver input level range	< 0.012% (Static <=73 dBμVemf; Minimum No. of samples >1640000)
Co-channel rejection	< 24*α% (TCH/FS FER; TUlow/No FH; Minimum No. of samples > 25000) < 2.091/α% (TCH/FS Class Ib RBER; TUlow/No FH; Minimum No. of samples > 3300000) < 4.3% (TCH/FS Class II RBER; TUlow/No FH; Minimum No. of samples > 2000000) < 3.371*α% (TCH/FS FER; TUhigh/FH; Minimum No. of samples >17800) < 0.215/α% (TCH/FS Class Ib RBER; TUhigh/FH; Minimum No. of samples > 2000000) < 8.333% (TCH/FS Class II RBER; TUhigh/FH; Minimum No. of samples > 1200000) 1≤α≤1.6

Table 18. RF Receiver (EDGE/GPRS/GSM 1800MHz)

Item	Description
Frequency range	1805MHz ~ 1880MHz
Reference sensitivity	≤ -102 dBm (RBER ≤ 2.439%)
Usable receiver input level range	< 0.012% (Static <=73 dBμVemf; Minimum No. of samples >1640000)
Co-channel rejection	< 24*α% (TCH/FS FER; TUlow/No FH; Minimum No. of samples > 25000) < 2.091/α% (TCH/FS Class Ib RBER; TUlow/No FH; Minimum No. of samples > 3300000) < 4.3% (TCH/FS Class II RBER; TUlow/No FH; Minimum No. of samples > 2000000) < 3.371*α% (TCH/FS FER; TUhigh/FH; Minimum No. of samples >17800) < 0.215/α% (TCH/FS Class Ib RBER; TUhigh/FH; Minimum No. of samples > 2000000) < 8.333% (TCH/FS Class II RBER; TUhigh/FH; Minimum No. of samples > 1200000) 1≤α≤1.6

7.4. **Antenna**

Item	Description

Frequency bandwidth		TX: 832 MHz ~ 2620 MHz RX: 791 MHz ~ 2690 MHz Wi-Fi 2.4G: 2400 MHz ~ 2490MHz Wi-Fi 5G: 5100 MHz ~ 5900MHz
VSWR	LTE	PRA < 2, DIV < 3
	WIFI	2.4G: <1.5, 5G: < 2.5
Gain	LTE	Low Band < 1.0dBi, High Band < 2.5dBi
	WIFI	2.4G: <2dBi, 5G: < 3.5dBi
Input/output resistance		50ohm
Polarization form		Vertical polarization
MIMO		LTE: Support 1x4 MIMO in the downlink.
		Wi-Fi:Support 2x2 MIMO in both 2.4G and 5G

8. Work Condition

Working temperature: 0℃~+40℃
Storage temperature: -20℃~+60℃
Humidity: <95%