WIFI+BT Audio Module

ModelNo.型号: TWM-A8516+MT6630T

版本 Version：V1.2

公布日期 Release Date: 2017-11-28

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WIFI+BT AudioModule

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版本变更说明 Document Revision History

Revision 版本	Date 日期	Author 作者	Checkedby 审核	Description 描述
V1.0	2017-10-18	Tommy.li	JianliLiang	First release.
V1.1	2017-12-26	Tommy.li	JianliLiang	1.GPIODefine;IOPowerDomain adding. ThesemodifyarelimitedtoA,Dversion PCB.
V1.2	2018-01-10	Tommy.li	JianliLiang	1.USBDM1,DP1,LCMRST,DSITE Delete;2.AD1,AD2,AD3,Mi cbias Portadding; These modifyare limited to DversionPCB.
V1.3	2018-03-29	Tommy.li	JianliLiang	1. Module Pin 46 function modify：GPI0117→GPIO73 2. Pin26,43,42,44Redefine pinname.

目录 Table ofContents

- 直流特性 DC characteristics
- 热特性 Thermal characteristics
- 电流消耗 Current consumption

- 5.射频性能 RF Performance
- 6.认证与法规信息 Certificate& Regulation
- 7.包装与订货说明 Package& Ordering information
- 8.环保声明 GreenPolicy
- 9 推荐过炉温度 RECOMMENDEDTEMPERATURE REFLOWPROFILE
- 10.抗静电保护 ESDProtection

1. 系统概览 System overview

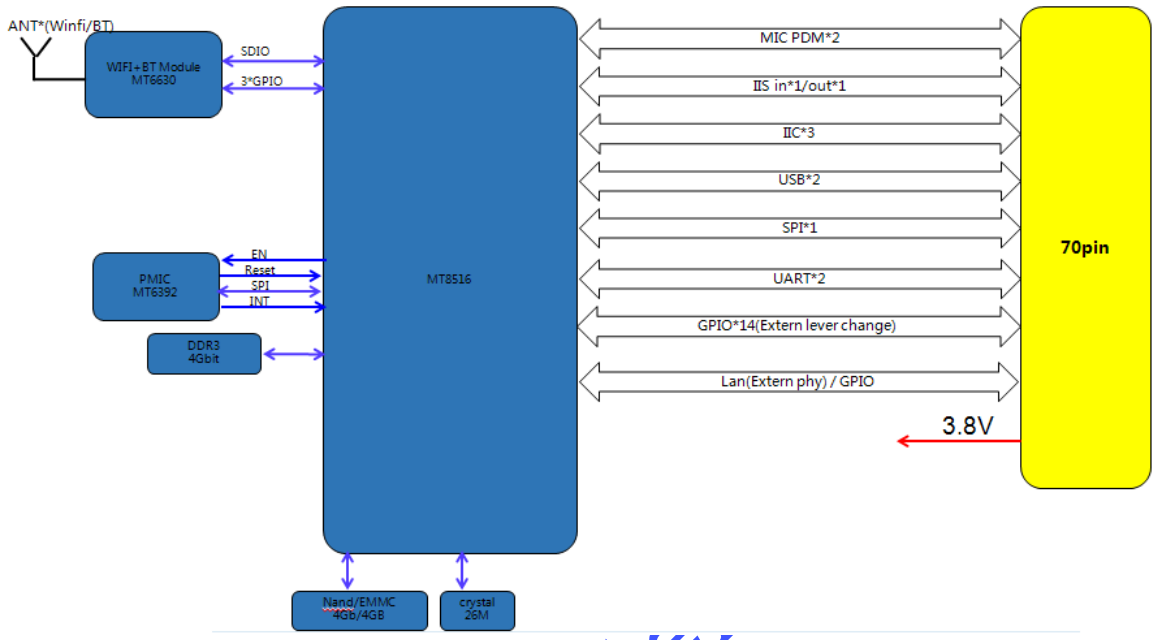
1.1 通用说明 General Descriptions

WIFI+BT Audio Module,The highly integrated module makes the possibilities of web browsing, VoIP, Bluetooth applications.With seamlessroaming capabilities andadvanced security, also could interact with different vendors' 802.11a/b/g/n Access Points inthewirelessLAN.This compact module isa totalsolution fora combinationofWiFi and BluetoothV4.1technologies.

1.2 性能特点 Features

- Supports 20/40MHzat 2.4GHZ and 5GHz
- Supports BluetoothV4.1+HS, BLE and be backwardscompatible with Bluetooth2.1+ enhancedata rate.
- Supports WLAN-Bluetoothcoexistence andISM-LTEcoexistence.
- Supports Bluetoothfor class1 and class2 power level transmissions withoutrequiring an external PA.
- Audio Interfaces: I2S
- support microphone inputs (PDMdigitalmicrophone)
- Serial Interfaces: UART,SPI，I2C,USB
- Integrated PMUsupports multiple low energy States
- Dimension: 56mm(L) × 41mm(W) ×2.54mm(H)

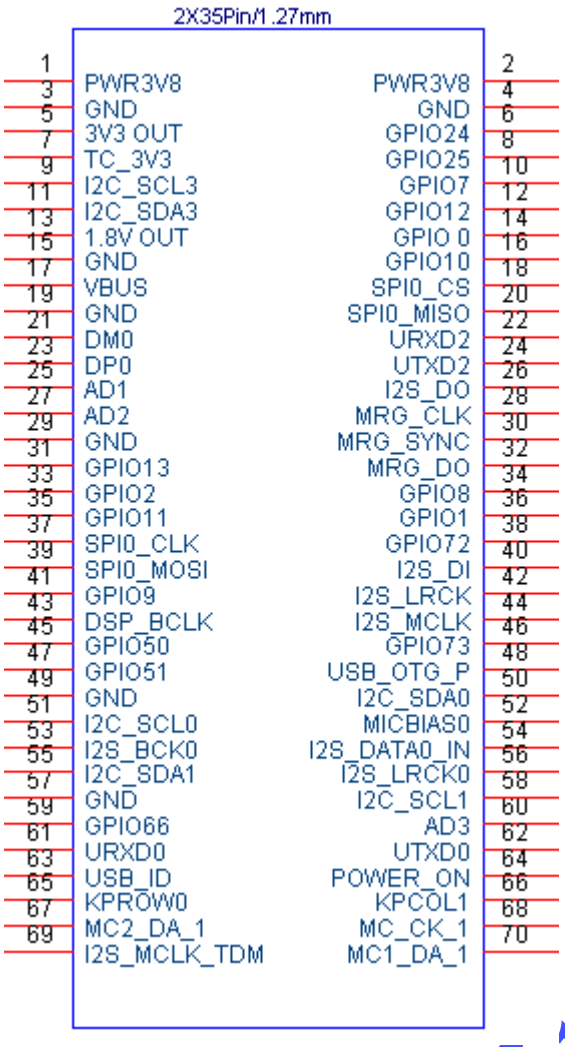
1.3 系统方框图 Module Block Diagram



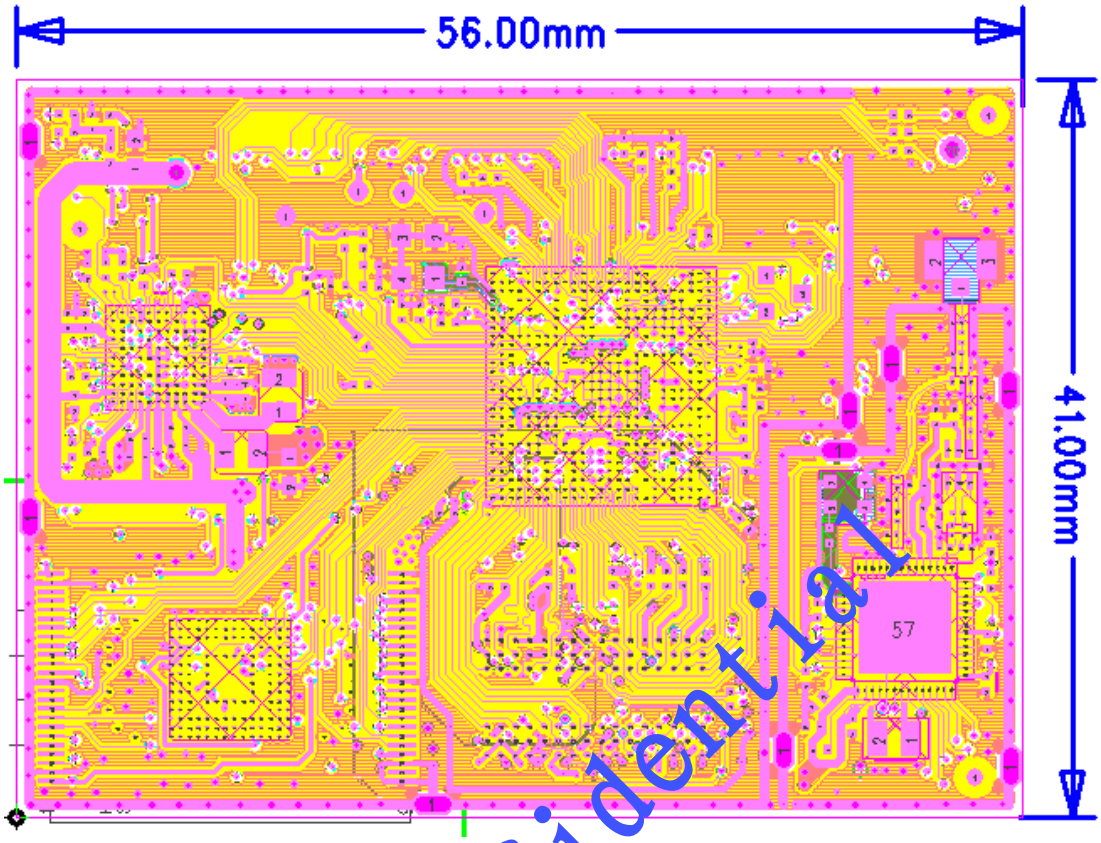
2.产品描述 ProductionDescription

引脚与功能说明 Apperance&PinDescription&PhysicalDimensions

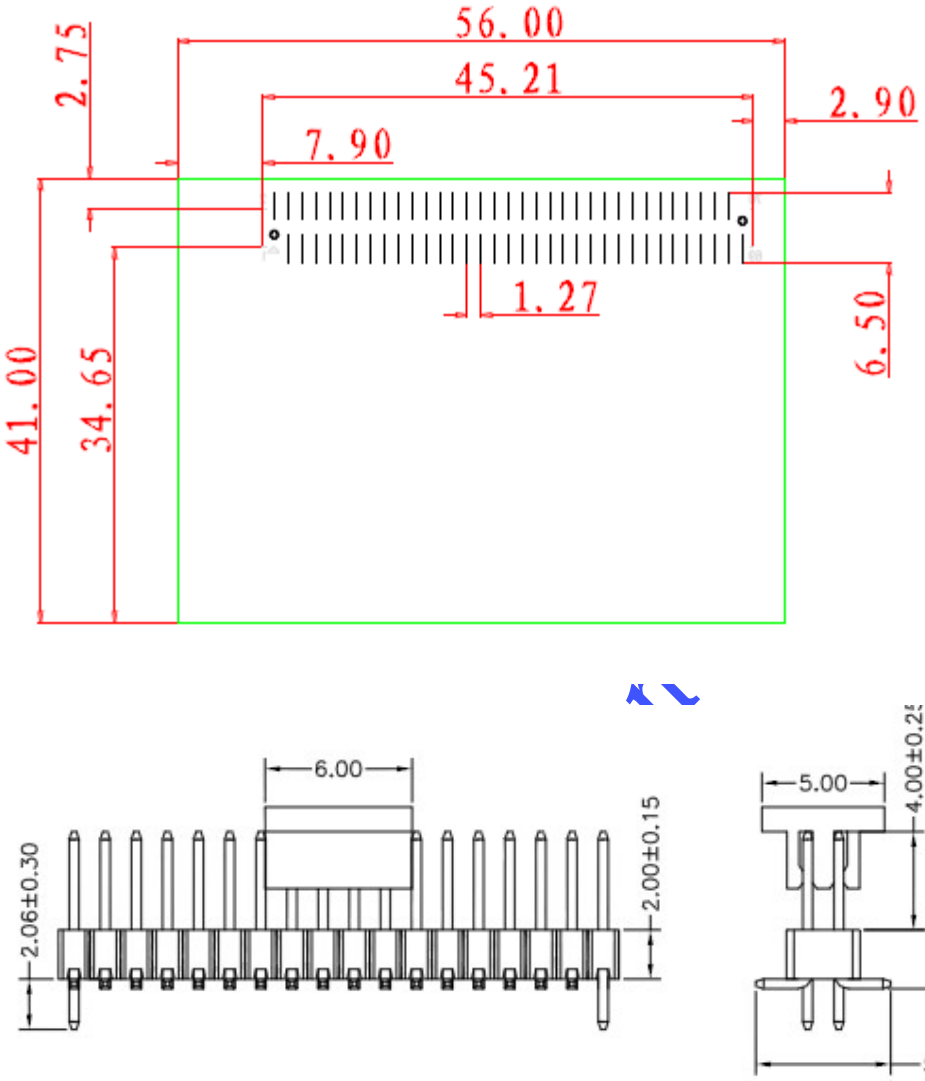
- Description&Apperance:



- Physical Dimensions



Pin headerinformation



Pindescriptions

PIN NO.	Symbol	Description	Function
1	PWR3V8	Power input	VCC input, typical voltage range :3.6V ~4.2V
2	PWR3V8	Power input	VCC input,typical voltage range :3.6V ~4.2V
3	GND	ground	Ground
4	GND	ground	Ground
5	DSP_3V3	Power output	3.3Vpower supply
6	GPIO24	Bi-directional with 3.3V Power domain	◆ **GPIO24** ◆ Func_DPI_20; ◆ Func_DPI_DE

			◆ Func_ANT_SEL1; ◆ Func_UCTS2; ◆ Func_PWM_A; ◆ Func_I2S_MCK; ◆ Func_DBG_Mon-A-O
7	TC_3V3	Power output	3.3Vpower supply
8	GPIO25	Bi-directional with 3.3V Power domain	◆ **FUNC_GPIO25.** ◆ Func_I2S_8CH_MCK; ◆ Func_ I2S_MCK; ◆ Func_DBG_Mon-A-1; ◆ Func_PWM_B; ◆ Func_URTS2; ◆ Func_ANT_SEL0; ◆ Func_DPI_VSYNC;Func_DPI_D19
9	I2C_SCL3	Bi-directional with 1.8V Power domain	◆ **Func_I2C SCL2_0;** ◆ GPIO61. ◆ Func_PWM_C
10	GPIO7	Bi-directional with 3.3V Power domain	◆ **FUNC_GPIO7;** ◆ Func_SQI RST; ◆ Func_DPI_D6; ◆ Func_SDA1_0; ◆ Func_EXT_RXDV; ◆ Func_CONN_MCU_TMS; ◆ FUNC_CON_MCU_AICE_JMSC; ◆ FUNC_DBG_MON_A_13
11	I2C_SDA3	Bi-directional with 1.8V Power domain	◆ **FUNC_SDA2_0** ◆ GPIO60 ◆ FUNC_PWM_B
12	GPIO12	Bi-directional with 3.3V Power domain	◆ **FUNC_GPIO12;** ◆ FUNC_CLKM5;FUNC_PWM_A; ◆ FUNC_SPDIF_OUT; ◆ FUNC_ANT_SEL4; ◆ FUNC_DPI_D11; ◆ FUNC_EXT_TXEN;FUNC_DBG_MON_A_18.
13	1.8V OUT	Power output	1.8Vpower supply
14	GPIO0	Bi-directional with 3.3V Power domain	◆ **FUNC_GPIO 0** ◆ FUNC_PWM_B; ◆ FUNC_DPI_CK;

			◆ FUNC_I2S2_BCK; ◆ FUNC_EXT_TXD0; ◆ FUNC_SQICS; ◆ FUNC_DBG_MON_A_6
15	GND	ground	Ground
16	GPIO10	Bi-directional with 3.3V Power domain	◆ **FUNC_GPIO10** ◆ FUNC_CLKM5 ◆ FUNC_SCL2_0 ◆ FUNC_EXT_FRAME_SYNC ◆ FUNC_EXT_RXD2 ◆ FUNC_ANT_SEL2 ◆ FUNC_DPI_D9 ◆ FUNC_DBG_MON_A_16
17	VBUS	Power input	USB +5V input
18	SPI0_CS	Bi-directional with 3.3V Power domain	◆ **FUNC_SPI_CSB** ◆ FUNC_GPIO5 ◆ FUNC_UCTS2 ◆ FUNC_DPI_D16 ◆ FUNC_EXT_RXER ◆ FUNC_CONN_MCU_TDI ◆ FUNC_CONN_TEST_CK ◆ FUNC_DBG_MON_A_11
19	AGND	ground	Ground
20	SPI0_MISO	Bi-directional with 3.3V Power domain	◆ FUNC_GPIO 3; ◆ FUNC_CLKM1; ◆ FUNC_DPI_D14; ◆ **FUNC_SPI_MI**; ◆ FUNC_EXT_TXD3; ◆ FUNC_CONN_MCU_DBGI_N; ◆ FUNC_SQIWP; ◆ FUNC_DBG_MON_A_9
21	DM0	Bi-directional	USB data minus.
22	URXD2	Bi-directional with 3.3V Power domain	◆ **FUNC_URXD2**; ◆ FUNC_GPIO 34 ◆ FUNC_DPI_D5 ◆ FUNC_UTXD2 ◆ URXD2__FUNC_DBG_SCL ◆ FUNC_I2S2_MCK ◆ FUNC_DBG_MON_B_0
23	DP0	Bi-directional	USB data plus
24	UTXD2	Bi-directional with 3.3V Power domain	◆ **FUNC_UTXD2**; ◆ FUNC_GPIO 35;

			◆ FUNC_DPI_HSYNC； ◆ FUNC_URXD2； ◆ FUNC_DBG_SDA； ◆ FUNC_DPI_D18； ◆ FUNC_I2S3_MCK； ◆ FUNC_DBG_MON_B_1。
25	AD1	Bi-directional	◆ Auxadcexternal input channel2 power levelfull scale is1.45V.
26	I2S_DO	Bi-directional with 3.3V Power domain	◆ FUNC_ GPIO 38； ◆ FUNC_MRG_DI ◆ FUNC_DPI_D1 ◆ FUNC_I2S0_DI ◆ **FUNC_I2S3_DO** ◆ FUNC_PCM0_DI ◆ FUNC_EXT_MDIO ◆ FUNC_DBG_MON_A_4
27	AD2	Bi-directional	◆ Auxadcexternal input channel3 power levelfull scale is1.45V.
28	MRG_CLK	Bi-directional with 3.3V Power domain	◆ **FUNC_MRG_CLK** ◆ FUNC_GPIO36 ◆ FUNC_DPI_D4 ◆ FUNC_I2S0_BCK ◆ FUNC_I2S3_BCK ◆ FUNC_PCM0_CLK ◆ FUNC_IR ◆ FUNC_DBG_MON_A_2
29	GND	ground	Ground
30	MRG_SYNC	Bi-directional with 3.3V Power domain	◆ **FUNC_MRG_SYNC;** ◆ FUNC_GPIO37; ◆ FUNC_DPI_D3; ◆ FUNC_I2S0_LRCK ◆ FUNC_I2S3_LRCK ◆ FUNC_PCM0_SYNC ◆ FUNC_EXT_COL ◆ FUNC_DBG_MON_A_3
31	GPIO13	Bi-directional with 3.3V Power domain	◆ **FUNC_GPIO13** ◆ FUNC_TSF_IN; ◆ FUNC_ANT_SEL5; ◆ FUNC_DPI_D0; ◆ FUNC_SPDIF_IN; ◆ FUNC_DBG_MON_A_19.
32	MRG_DO	Bi-directional with 3.3V Power domain	◆ **FUNC_MRG_DO** ◆ FUNC_GPIO39 ◆ FUNC_DPI_D2

			◆ FUNC_I2S0_MCK ◆ FUNC_I2S3_MCK ◆ FUNC_PCM0_DO ◆ FUNC_EXT_MDC ◆ FUNC_DBG_MON_A_5
33	GPIO2	Bi-directional with 3.3V Power domain	◆ **FUNC_GPIO2** ◆ FUNC_CLKM0; ◆ FUNC_DPI_D13; ◆ FUNC_I2S2_LRCK; ◆ FUNC_EXT_TXD2 ◆ FUNC_CONN_MCU_DBGACK_N; ◆ FUNC_SQISI; ◆ FUNC_DBG_MON_A_8
34	GPIO8	Bi-directional with 3.3V Power domain	◆ **FUNC_GPIO8;** ◆ FUNC_SQICK; ◆ FUNC_CLKM3; ◆ FUNC_SCL1_0; ◆ FUNC_EXT_RXD0; ◆ FUNC_ANT_SEL0; ◆ FUNC_DPI_D7; ◆ FUNC_DBG_MON_A_14.
35	GPIO11	Bi-directional with 3.3V Power domain	◆ **FUNC_ GPIO11;** FUNC_PWM_C; FUNC_ANT_SEL3; FUNC_CLKM4.
36	GPIO1	Bi-directional with 3.3V Power domain	◆ **FUNC_GPIO1**; ◆ FUNC_PWM_C; ◆ FUNC_DPI_D12; ◆ FUNC_I2S2_DI; ◆ FUNC_EXT_TXD1; ◆ FUNC_CONN_MCU_TDO; ◆ FUNC_SQISO; ◆ FUNC_DBG_MON_A_7
37	SPI0_CLK	Bi-directional with 3.3V Powerdomain	◆ **FUNC_SPI0-CLK;** ◆ FUNC_GPIO6. ◆ FUNC_DBG_MON_A_12
38	GPIO72	Bi-directional wit h 3.3V Powerdomain	◆ **FUNC_GPIO72;** ◆ FUNC_MSDC2_DAT2; ◆ FUNC_I2S_8CH_LRCK; ◆ FUNC_DPI_D23; ◆ FUNC_PWM_C;

			◆ FUNC_DBG_MON_B_19
39	SPI0_MOSI	Bi-directional with 3.3V Power domain	◆ **FUNC_SP0_MOSI;** ◆ FUNC_GPIO4.
40	I2S_DI	Bi-directional wit h 3.3V Powerdomain	◆ **FUNC_I2S3_DO;** ◆ FUNC_GPIO70; ◆ FUNC_MSDC2_DAT0; ◆ FUNC_I2S_8CH_DO2; ◆ FUNC_DPI_D22; ◆ FUNC_UTXD0; ◆ FUNC_DBG_MON_B_17
41	GPIO9	Bi-directional with 3.3V Power domain	◆ **FUNC_GPIO9** ◆ FUNC_CLKM4; ◆ FUNC_SDA2_0; ◆ FUNC_EXT_FRAME_SYNC; ◆ FUNC_EXT_RXD1; ◆ FUNC_ANT_SEL1; ◆ FUNC_DPI_D8; ◆ FUNC_DBG_MON_A_15.
42	I2S_LRCK	Bi-directional with 3.3V Power domain	◆ **FUNC_I2S3_LRCK;** ◆ FUNC_GPIO69; ◆ FUNC_MSDC2_CLK; ◆ FUNC_I2S_8CH_DO3; ◆ FUNC_SCL1_0; ◆ FUNC_DPI_D21; ◆ FUNC_USB_SCL; ◆ FUNC_I2S3_LRCK; ◆ FUNC_DBG_MON_B_16
43	I2S_BCLK	Bi-directional with 3.3V Power domain	◆ **FUNC_I2S3_BCK;** ◆ FUNC_GPIO68; ◆ FUNC_MSDC2_CMD; ◆ FUNC_I2S_8CH_DO4; ◆ FUNC_SDA1_0; ◆ FUNC_USB_SDA; ◆ FUNC_I2S3_BCK; ◆ FUNC_DBG_MON_B_15.
44	I2S_MCLK	Bi-directional with 3.3V Power domain	◆ **FUNC_I2S3_MCK;** ◆ FUNC_GPIO71; ◆ FUNC_MSDC2_DAT1; ◆ FUNC_I2S_8CH_DO1; ◆ FUNC_PWM_A; ◆ FUNC_I2S3_MCK; ◆ FUNC_URXD0; ◆ FUNC_PWM_B; ◆ FUNC_DBG_MON_B_18.

45	GPIO50	Bi-directional with 1.8V Power domain	◆ FUNC_SPI_MISO ◆ **FUNC_GPIO50**
46	GPIO73	Bi-directional with 3.3V Power domain	◆ FUNC_I2S_8CH_BCK ◆ **FUNC_GPIO73** ◆ FUNC_PWM_A
47	GPIO51	Bi-directional with 1.8V Power domain	◆ FUNC_SPI_MOSI ◆ **FUNC_GPIO51**
48	USB_OTG_PWR_EN	Bi-directional with 1.8V Power domain	◆ **FUNC_GPIO49For USB_OTG_PWR_EN** ◆ FUNC_SPI_CK
49	GND	ground	Ground
50	I2C_SDA0	Bi-directional with 1.8V Power domain	◆ **FUNC_SDA0_0;** ◆ FUNC_GPIO58.
51	I2C_SCL0	Bi-directional with 1.8V Power domain	◆ **I2C SCL0;** ◆ FUNC_GPIO59.
52	MICBIAS0	Power output	Microphone bias A
53	I2S_BCK0	Bi-directional with 1.8V Power domain	◆ **FUNC_I2S0_BCK;** ◆ FUNC_GPIO57; ◆ FUNC_URTS0; ◆ FUNC_I2S3_BCK; ◆ FUNC_I2S_8CH_BCK; ◆ FUNC_PWM_C; ◆ FUNC_I2S2_LRCK; ◆ FUNC_DBG_MON_A_30
54	I2S_DATA0_IN	Bi-directional with 1.8V Power domain	◆ FUNC_I2S3_DO; ◆ FUNC_GPIO55; ◆ **FUNC_I2S0_DI;** ◆ FUNC_UCTS0; ◆ FUNC_I2S_8CH_DO1; ◆ FUNC_PWM_A; ◆ FUNC_I2S2_BCK; ◆ FUNC_DBG_MON_A_28.
55	I2C_SDA1	Bi-directional with 1.8V Power domain	◆ **FUNC_SDA1_0;** ◆ FUNC_GPIO52.
56	I2S_LRCK0	Bi-directional with 1.8V Power domain	◆ **FUNC_I2S0_LRCK;** ◆ FUNC_GPIO56; ◆ FUNC_I2S3_LRCK; ◆ FUNC_I2S_8CH_LRCK; ◆ FUNC_PWM_B; ◆ FUNC_I2S2_DI; ◆ FUNC_DBG_MON_A_29
57	GND	ground	Ground
58	I2C_SCL1	Bi-directional with 1.8V Power domain	◆ **FUNC_SCL1_0**; ◆ FUNC_GPIO53

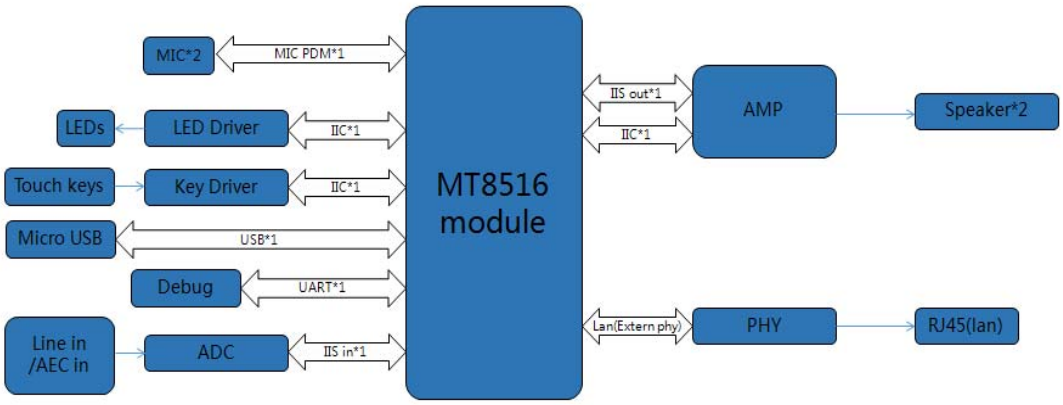
59	GPIO66	Bi-directional with 1.8V Power domain	◆ **FUNC_I2S0_MCK**
60	AD3	Bi-directional	◆ Auxadcexternal input channel3 power levelfull scale is1.45V.
61	URXD0	Bi-directional with 1.8V Power domain	◆ FUNC_GPIO62; ◆ **FUNC_URXD0;** ◆ FUNC_UTXD0.
62	UTXD0	Bi-directional with 1.8V Power domain	◆ FUNC_GPIO63; ◆ **FUNC_UTXD0;** ◆ FUNC_URXD0
63	USB_ID	Bi-directional with 1.8V Power domain	◆ FUNC_GPIO41 ◆ FUNC_KPROW1; ◆ **FUNC_IDDIG;** ◆ FUNC_EXT_FRAME_SYNC; ◆ FUNC_MFG_TEST_CK; ◆ FUNC_DBG_MON_B_5.
64	POWER_ON	PWR	◆ Power Key, active low.
65	KPROW0	Bi-directional with 1.8V Power domain	◆ **FUNC_KPROW0;** ◆ FUNC_GPIO40; ◆ FUNC_IMG_TEST_CK; ◆ FUNC_DBG_MON_B_4.
66	GPIO43	Bi-directional with 1.8V Power domain	◆ **FUNC_GPIO43;** ◆ FUNC_KPCOL1； ◆ FUNC_USB_DRVVBUS； ◆ FUNC_EXT_FRAME_SYNC； ◆ FUNC_TSF_IN； ◆ FUNC_DFD_NTRST_XI； ◆ FUNC_UDI_NTRST_XI； ◆ FUNC_DBG_MON_B_7；
67	MC2_DA_1	PDM digital microphone	Digital microphoneData2
68	MC_CK_1	PDM digital microphone	Digital microphoneClk
69	I2S_MCLK_TDM	Bi-directional with 1.8V Power domain	◆ **FUNC_TDM_RX_MCK;** ◆ FUNC_GPIO100; ◆ FUNC_CMDAT0; ◆ FUNC_CMCSD0; ◆ FUNC_ANT_SEL2; ◆ FUNC_TDM_RX_MCK; ◆ FUNC_DBG_MON_B_21
70	MC1_DA_1	PDM digital microphone	Digital microphoneData1

Remark：Boldness is thedefault function byTonly'ssoftware.

3.应用说明 Application Explanations

■ All portable Smart devices

3.1Application Block Diagram



4. 电气特性 Electrical Characteristics

Base Characteristics

ELECTRICALCHARACTERISTICS	
SupplyVoltage	3.8VDC (Absolute MaximumRatings4.2V)
Working current	RMS 300mA
Sleepcurrent	33mA
WEIGHTAND DIMENSIONS	(unit : mm)
Size (LxWx H)	56mm(L) × 41mm(W)×1.6mm(H)
Weight	~8.5g

Recommended operatingconditions

Recommended operatingconditions	Min	Max	Unit
Operatingtemperature	-10	60	℃
PWR3V8	3.6	4.2	V

5.射频性能 RFPerformance

2.4G WIFI

		DATA rate (Mbps)	Test Item	Unit	TYPE	SPEC
2.4G	TX	All data rates	Freq. error	ppm	+/- 10	<+/-20
		802.11b, 1~11 Mbps DSSS	Power (RMS)	dBm	16	16+/-2
			EVM (Peak)	%	25	<35
		802.11g, 6 ~18Mbps OFDM	Power (RMS)	dBm	15	15+/-2
		802.11g, 24~36 Mbps OFDM	Power (RMS)	dBm	15	15+/-2
		802.11g, 48 ~54Mbps OFDM	Power (RMS)	dBm	14	14+/-2
		802.11n, HT20 MCS0~2	Power (RMS)	dBm	15	15+/-2
		802.11n, HT20 MCS3~4	Power (RMS)	dBm	15	15+/-2
		802.11n, HT20 MCS5~7	Power (RMS)	dBm	14	14+/-2
		802.11n, HT40 MCS0~4	Power (RMS)	dBm	14	14+/-2
		802.11n, HT40 MCS5~7	Power (RMS)	dBm	13	13+/-2
		802.11g, 6 ~18Mbps OFDM	EVM	dB	-15	<-9
		802.11g, 24~36 Mbps OFDM	EVM	dB	-20	<-16
		802.11g, 54Mbps OFDM	EVM	dB	-28	<-25
		802.11n, HT20 MCS0~2	EVM	dB	-15	≤-9
		802.11n, HT20 MCS3~4	EVM	dB	-20	≤-16
		802.11n, HT20 MCS5~7	EVM	dB	-30	≤-27
		802.11n, HT40 MCS0~4	EVM	dB	-19	≤-9
		802.11n, HT40 MCS5~7	EVM	dB	-30	≤-27
	RX	CCK 1M	Sensitivity	dBm	-91	
		CCK 2M			-90	
		CCK 5.5M			-88	
		CCK 11M			-84	
		OFDM 6M			-88	
		OFDM 9M			-85	

		OFDM 12M			-83	
		OFDM 18M			-81	
		OFDM 24M			-79	
		OFDM 48M			-74	
		OFDM 54M			-71	
		HT20 MCS0			-70	
		HT20 MCS1			-85	
		HT20 MCS2			-82	
		HT20 MCS3			-80	
		HT20 MCS4			-77	
		HT20 MCS5			-70	
		HT20 MCS6			-69	
		HT20 MCS7			-68	
		HT40 MCS0			-85	
		HT40 MCS1			-82	
		HT40 MCS2			-80	
		HT40 MCS3			-77	
		HT40 MCS4			-73	
		HT40 MCS5			-69	
		HT40 MCS6			-68	
		HT40 MCS7			-67	

5G WIFI

		DATA rate (Mbps)	**Test Item**	**Unit**	**TYPE**	**SPEC**
5G	**TX**	All data rates	Freq. error	ppm	+/- 10	<+/-20
		802.11a, 6 ~18Mbps OFDM	Power (RMS)	dBm	15	15+/-2
		802.11a,24~36 MbpsOFDM	Power (RMS)	dBm	14	14+/-2
		802.11a,48~54 MbpsOFDM	Power (RMS)	dBm	14	14+/-2
		HT20 HT20 MCS0~2	Power (RMS)	dBm	15	15+/-2
		HT20 HT20 MCS3~4	Power (RMS)	dBm	15	15+/-2
		HT20 MCS5~MCS7	Power (RMS)	dBm	14	14+/-2
		HT40 MCS0~MCS4	Power (RMS)	dBm	15	15+/-2
		HT40 MCS5~MCS7	Power (RMS)	dBm	14	14+/-2
		802.11a, 6 ~18Mbps OFDM	EVM	dB	-15	<-9
		802.11a,24~36	EVM	dB	-20	<-16

		MbpsOFDM				
		802.11a,48~54 MbpsOFDM	EVM	dB	-28	<-25
		HT20 HT20 MCS0~2	EVM	dB	-15	≤-9
		HT20 HT20 MCS3~4	EVM	dB	-20	≤-16
		HT20 MCS5~MCS7	EVM	dB	-30	≤-27
		HT40 MCS0~MCS4	EVM	dB	-19	≤-9
		HT40 MCS5~MCS7	EVM	dB	-30	≤-27
	RX	OFDM 6M	Sensitivity	dBm	-89	
		OFDM 9M			-87	
		OFDM 12M			-87	
		OFDM 18M			-84	
		OFDM 24M			-81	
		OFDM 48M			-77	
		OFDM 54M			-73	
		HT20 MCS0			-72	
		HT20 MCS1			-89	
		HT20 MCS2			-87	
		HT20 MCS3			-83	
		HT20 MCS4			-80	
		HT20 MCS5			-77	
		HT20 MCS6			-72	
		HT20 MCS7			-71	
		HT20 MCS8			-70	
		HT40 MCS0			-86	
		HT40 MCS1			-83	
		HT40 MCS2			-80	
		HT40 MCS3			-77	
		HT40 MCS4			-74	
		HT40 MCS5			-70	
		HT40 MCS6			-68	
		HT40 MCS7			-67	
		HT40 MCS8			-63	
		HT40 MCS9			-61	

2.4G BT

BR				
Parameter	**Description**	**Typ.**	**Unit**	
Output power (RMS)	Atmax poweroutput Level	8	dBm	5.5±4
ICFT	Initial carrier frequency drift	±18	kHz	<±75
Carrier frequency drift	One slotpacket (DH1)	±10	kHz	<±25
	Three slotpacket (DH3)	±10	kHz	<±40
	Five slot packet (DH5)	±10	kHz	<±40
	Max. driftrate	10	kHz/50us	<20
Receiver sensitivity	BER <0.1%	-90	dBm	
EDR				
Parameter	**Description**	**Typ.**	**Unit**	
Output power (RMS)	π/4 DQPSK	5	dBm	2.5±4
	8PSK	5	dBm	2.5±4
Frequency stability	ω0, π/4 DQPSK	±4	kHz	<±10
	ω0, 8PSK	±4	kHz	<±10
	ωi, π/4 DQPSK	±18	kHz	<±75
	ωi, 8PSK	±18	kHz	<±75
	|ω0+ωi|, π/4 DQPSK	±20	kHz	<±75
	|ω0+ωi|,8PSK	±20	kHz	<±75

Modulation accuracy	RMS DEVM,π/4 DQPSK	8	%	<20
	RMS DEVM,8PSK	8	%	<13
	Peak DEVM, π/4 DQPSK	15	%	<35
	Peak DEVM, 8PSK	15	%	<25
Receiver sensitivity	π/4 DQPSK (BER < 0.01%)	-90	dBm	
	8PSK (BER < 0.01%)	-89	dBm	
LE				
Parameter	**Description**	**Typ.**	**Unit**	
Output power(*)	Atmax. power output level	5.5	dBm	5.5±4
Carrier frequency offset and drift	Frequency offset	±10	kHz	<±150
	Frequency drift	±10	kHz	<±50
	Max. driftrate	±10	kHz/us	<±20
Parameter	Description	**Typ.**	**Unit**	
Receiver sensitivity (*)	PER < 30.8%	-90	dBm	

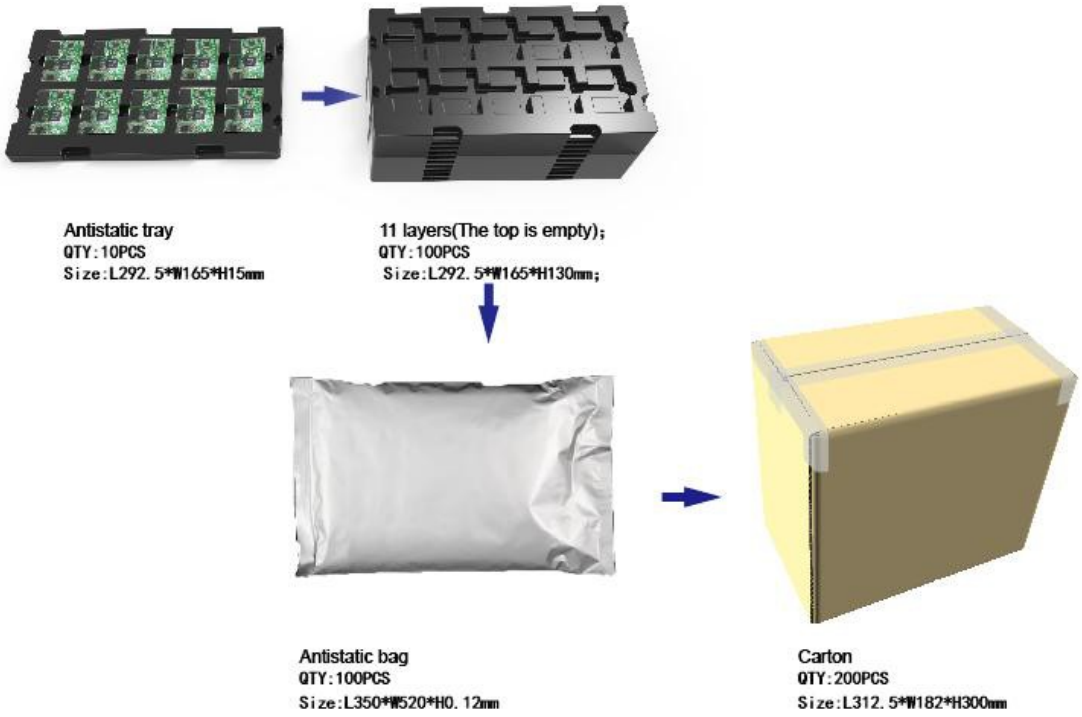
6.认证与法规信息 Certification&Regulation

The Certification：

FCC&ICID、RED、SRRC、MIC PretestOK.

7.包装与订货说明 Package& Ordering Information

AssemblyInformation



8.环保声明 Green Policy

This modulecan meet ROHS&REACH compliance.

9.推荐过炉温度 RECOMMENDEDTEMPERATURE REFLOWPROFILE

NC

10.抗静电保护 ESDProtection

ESD CAUTION

TWM-A8516-MT6330TisESD (electrostaticdischarge)sensitivedeviceandmaybe

damagedwithESDorspikevoltage.AlthoughTWM-A8516-MT6330Tiswith

built-inESDprotectioncircuits,pleasehandlewithcaretoavoidthepermanent

malfunctionortheperformancedegradation.

FCC Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: this equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient of relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit difference from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Important Note:

Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Country Code selection feature to be disabled for products marketed to the US/Canada.

1. The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2. The transmitter module may not be co-located with any other transmitter or antenna.

As long as the three conditions above are met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Important Note:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling:

The final end product must be labeled in a visible area with the following "Contains FCC ID: ZVA10"

Manual Information to the End User:

The OEM integrator has to be aware not provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

Antenna information

The TMW-A8516+MT6630T has been designed to pass certification with the antenna listed below. The required antenna impedance is 50 ohms.

Model	Type	Connector	Peak gain (dBi)				
			2400-2483.5 MHz	5150-5250 MHz	5250-5350 MHz	5470-5725 MHz	5725-5850 MHz
N/A	PIFA	RF-SMA	3.00	6.39	6.39	6.39	6.39

ISED Statement

- English: This device complies with Industry Canada license-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) This device may not cause interference, and
(2) This device must accept any interference, including interference that may cause undesired operation of the device.
The digital apparatus complies with Canadian CAN ICES-3 (B)/NMB-3 (B).

- French: Le présentappareilestconforme aux CNR d'Industrie Canada applicables aux appareils

radio exempts de licence. L'exploitationestautorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brou illage, et
(2) l'utilisateur de l'appareildoit accepter tout brouillageradioélectriquesubi, mêmesi le brouillageest susceptible d'encompro mettre le fonctionnement.
This radio transmitter (ISED certification number: 9976A-10) has been approved by Industry Canada to operate with the maximum permissible gain indicated. Strictly prohibited for use with thisdevice with maximum antenna gain.
Le présentémetteur radio (ISED certification number: 9976A-10) a étéapprouvée par industriecanada pour fonctionner avec le gain maximal indiqué.strictementinterdite pour utilisation avec cedispositif avec le maximum de gain d'antenne.

Antenna information

The TMW-A8516+MT6630T has been designed to pass certification with the antenna listed below. The required antenna impedance is 50 ohms.

Model	Type	Connector	Peak gain (dBi)				
			2400-2483.5 MHz	5150-5250 MHz	5250-5350 MHz	5470-5725 MHz	5725-5850 MHz
N/A	PIFA	RF-SMA	3.0dBi	6.39	6.39	6.39	6.39

Radiation Exposure Statement

This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

Déclarationd'exposition aux radiations

Cetéquipementestconforme Canada limitesd'exposition aux radiations dans un environnement non contrôlé.
Cetéquipementdoitêtreinstallé et utilisé à distance minimum de 20cm entre le radiateur et votre corps.

This device is intended only for OEM integrators under the following condition:
The transmitter module may not be co-located with any other transmitter or antenna.
As long as the condition above is met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.
Cetappareilestconçuuniquement pour les intégrateurs OEM dans les conditions suivantes:
Le module émetteurpeut ne pas êtrecoïmplanté avec unautreémetteurouantenne.
Tant que les 1 condition ci-dessussontremplies, des essaissupplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM esttoujoursresponsable des essais sur son produit final pour toutesexigences de conformitésupplémentairesrequis pour ce module installé.

Important Note:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Canada authorization.

Note Importante:
Dans le casoùces conditions ne peuventêtresatisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autreémetteur), l'autorisation du Canada n'est plus considérécommevalide et l' IC ne peut pas êtreutilisé sur le produit final. Danscescirconstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y comprisl'émetteur) etl'obtentiond'uneautorisationdistincte au Canada.

End Product Labeling
The final end product must be labeled in a visible area with the following: Contains IC:9976A-10.
Plaque signalétique du produit final
Le produit final doitêtreétiquetédansunendroit visible avec l'inscriptionsuivante: Contient des IC:9976A-10.

Manual Information to the End User
The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.
The end user manual shall include all required regulatory information/warning as show in this manual.

Manuel d'information à l'utilisateur final
L'intégrateur OEM doitêtreconscient de ne pas fournir des informations à l'utilisateur final quant à la façond'installerou de supprimerce module RF dans le manuel de l'utilisateur du produit final qui intègrece module.
Le manuel de l'utilisateur final doitincluretoutes les informationsréglementairesrequises et avertissementscommeindiquédanscemanuel.
Caution:
(i) The device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;
(ii) For devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the EIRP limit;
(iii) For devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the EIRP limits specified for point-to-point and non-point-to-point operation as appropriate; and operations in the 5.25-5.35GHz band are restricted to indoor usage only.

Avertissement:
(i) les dispositifsfonctionnantdans la bande de 5150 à 5250MHz sontréservésuniquement pour uneutilisation à l'intérieurafin de réduire les risques de brouillagepréjudiciable aux systèmes de satellites mobiles utilisant les mêmescanaux;
(ii) pour les dispositifsmunisd'antennesamovibles, le gain maximal d'antennepermis pour les dispositifsutilisant les bandes de 5250 à 5350MHz et de 5470 à 5725 MHz doitêtreconforme à la limite de la p.i.r.e;
(iii) pour les dispositifsmunisd'antennesamovibles, le gain maximal d'antennepermis (pour les dispositifsutilisant la bande de 5725 à 5850 MHz) doitêtreconforme à la limite de la p.i.r.e. spécifiée pour l'exploitation point à point et l'exploitation non point à point, selon le cas;Les opérationsdans la bande de 5.25-5.35GHz sontlimités à un usage intérieurseulement.

----------**END**----------