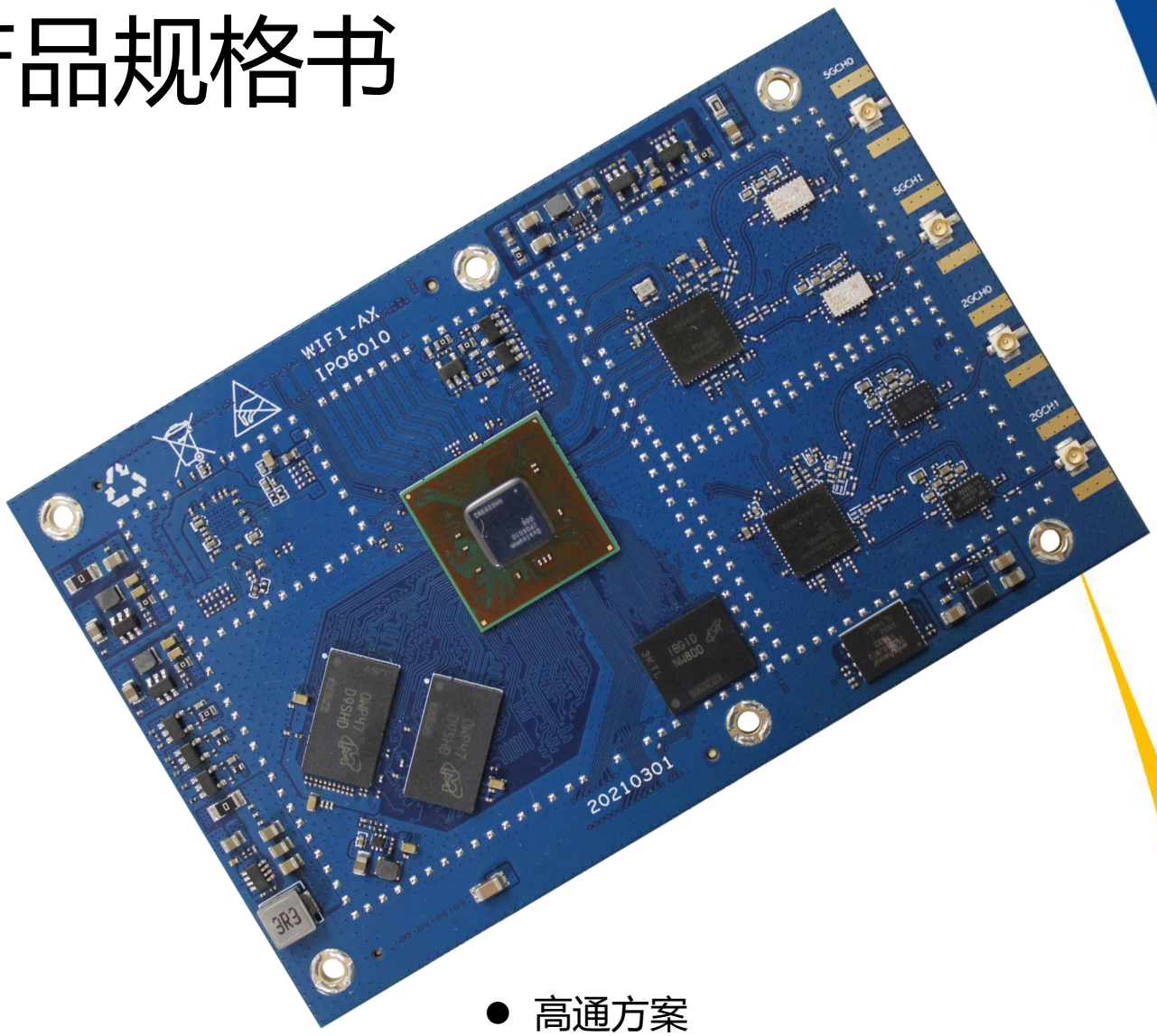
MovingComm
Your Wireless Technology

ComIoT 60

高性能 802.11ax WiFi6 双频无线路由核心模组

产品规格书



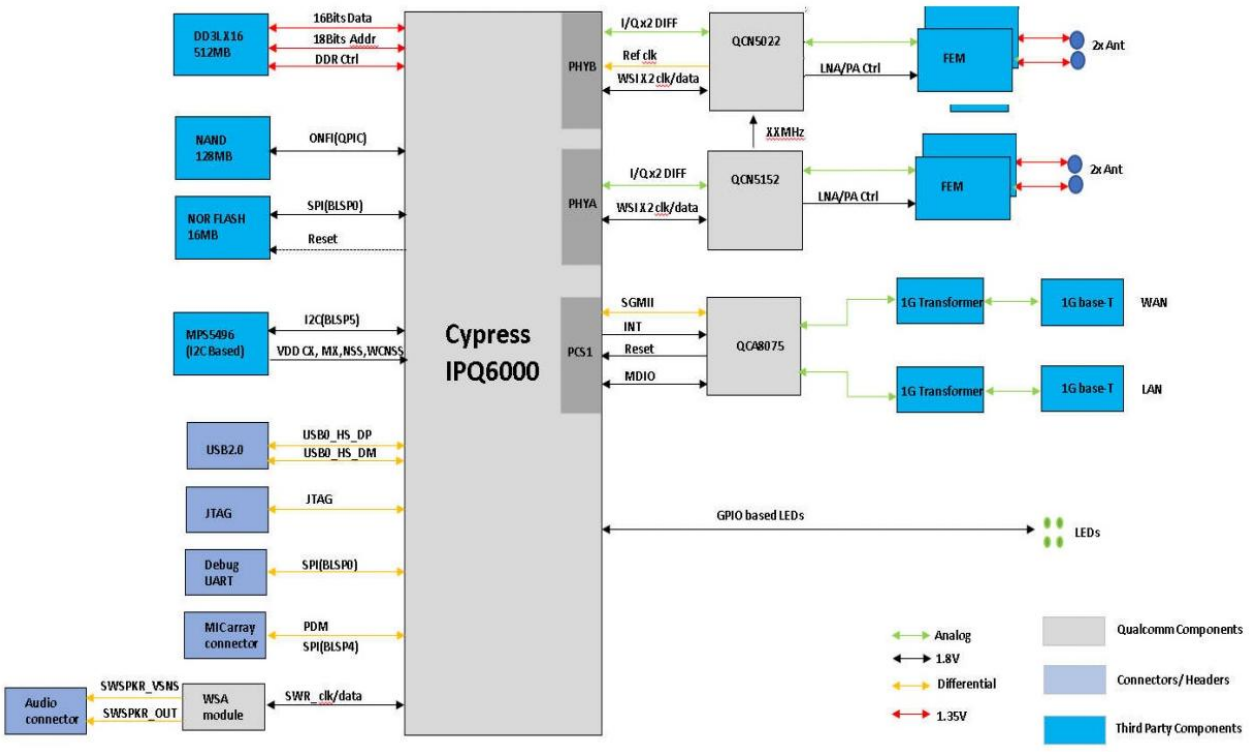
- 高通方案
- 支持 Mesh
- 支持 802.11ax
- 可开放开发资料
- 1800M 无线传输速率
- 支持 USB3.0 及硬件加速

产品描述

ComIoT 60 模块是深圳星恒讯科技有限公司研发生产的一款完整的小型模组。 它支持802.11 a/b/g/n/ac/ax的协议，可以提供wifi6多种场景解决方案。它针对低功耗、低成本、高度集成的WIFI6 AP和路由设备进行了优化，只需要进行简单的外部接口设计即可直接使用。

该模块基于单芯片 IPQ6000进行设计，CPU是四核 ARM Cortex-A7架构，主频高达710MHz。 WIFI支持双频 802.11a/b/g/n/ac/ax 2x2 MIMO，最大带宽可高达 1800 Mbps。模块同时支持AP模式和客户端模式，包含海量业务应用软件，减少客户的研究和设计工作。

硬件架构如下图所示：



功能特点

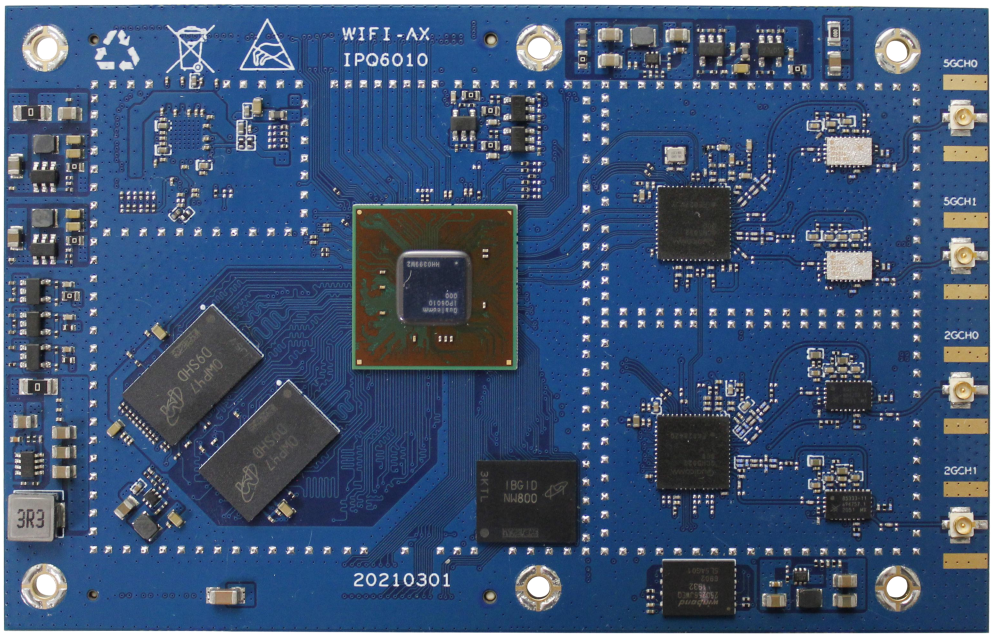
- 使用高通IPQ6000（IPQ6010)方案
- 2.4GHz支持WiFi6，最大速率可达600Mbps
- 5.8GHz 支持WiFi6，最大速率可达1200Mbps
- 支持 Dynamic Frequency Selection (DFS)
- 内存采用DDR3 4 GB
- 支持最大256 Mb SPI NOR Flash
- 支持扩展256MB NAND Flash
- 网口可支持1Gbps/2.5Gbps（可选）
- 支持PCIe v3.0
- 支持USB 2.0/3.0 & MicroSD support
- 支持串口及多路GPIO

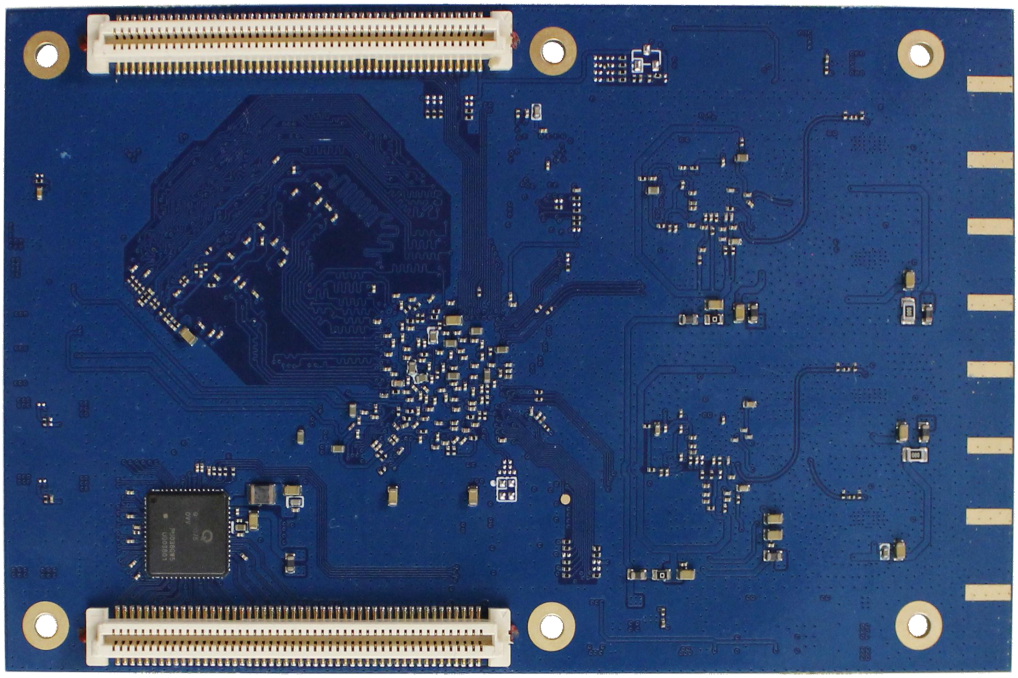
产品规格

主芯片	IPQ6000
射频频率	2.40~2.4835GHz & 5.725~5.850GHz
WiFi 协议	802.11a/b/g/n/ac/ax(2X2)
调制解调	11b: DBPSK, DQPSK and CCK and DSSS 11g: BPSK, QPSK, 16QAM, 64QAM and OFDM 11n: MCS0~15 OFDM 11a:BPSK, QPSK, 16QAM, 64QAM 11ac:BPSK, QPSK, 16QAM, 64QAM, 256QAM,OFDM 11ax:BPSK, QPSK, 16QAM, 64QAM, 256QAM,1024QAM,OFDMA
理论带宽	11b:1, 2, 5.5 and 11Mbps 11g:6, 9, 12, 18, 24, 36, 48 and 54 Mbps 11n: MCS0~5,MIMO up to 300Mbps 11a:6, 9, 12, 18, 24, 36, 48 and 54 Mbps 11ac:wave2,MU-MIMO,up to 867Mbps 11ax:2.4Ghz up to 600Mbps,5.8GHz up to 1200Mbps
封装方式	100Pin 连接器 * 2
主要接口	Ethernet*5, UART*1, USB*1， PCIE*1,
PCB	4 层
尺寸(mm)/重量(克)	110*70*8 / 34
天线	标准 ipex

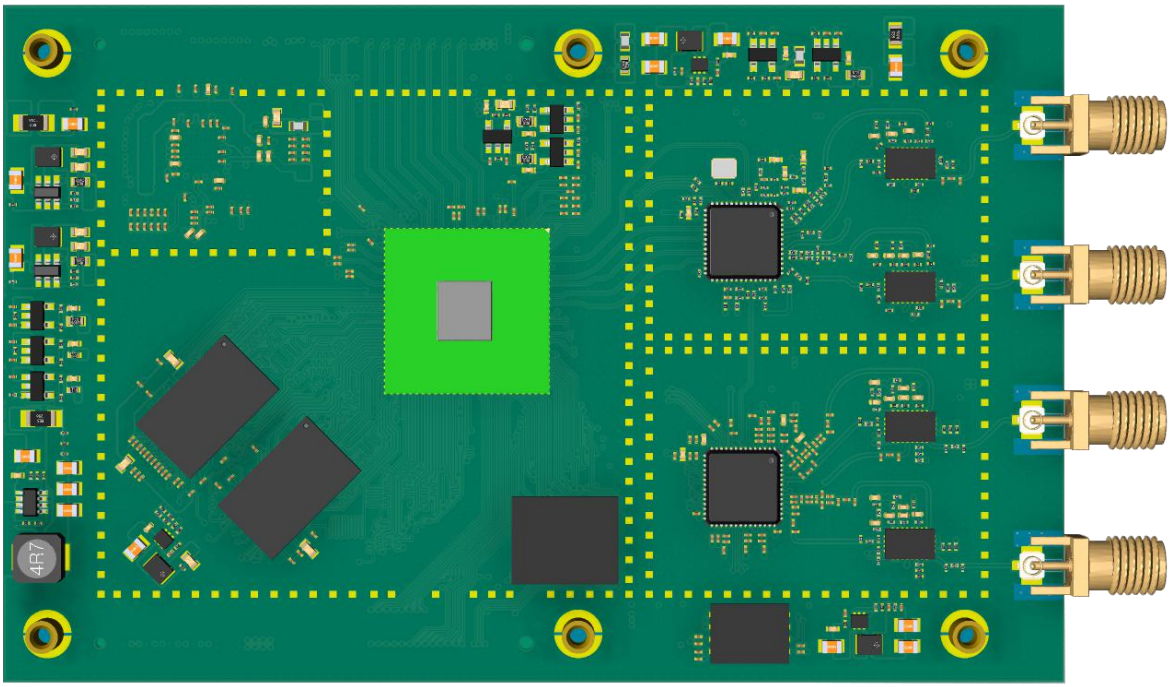
工作温度	-20°C to +70°C
存储温度	-40°C to +90°C
湿度	5% ~ 95%
静电防护	Human Body Model: -2000V ~ +2000V
静电防护	Machine Mode: -200V ~ +200V
工作电压	12V +/-10%
平均功耗	4.5W
散热尺寸（建议）	80 x 56 x 6 **注意：由于 wifi6 的芯片发热较大，为了不影响性能，需要控制模块温度≤70℃**
GPIO 输出电压	1.8 V & 3.3V +/-10%

产品外观



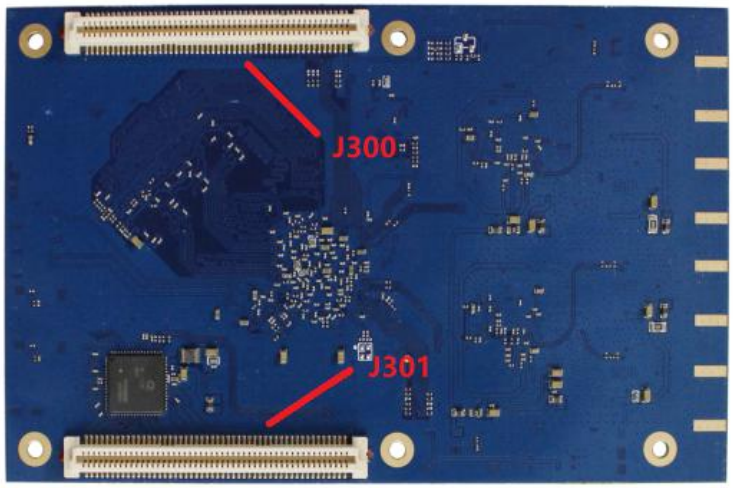


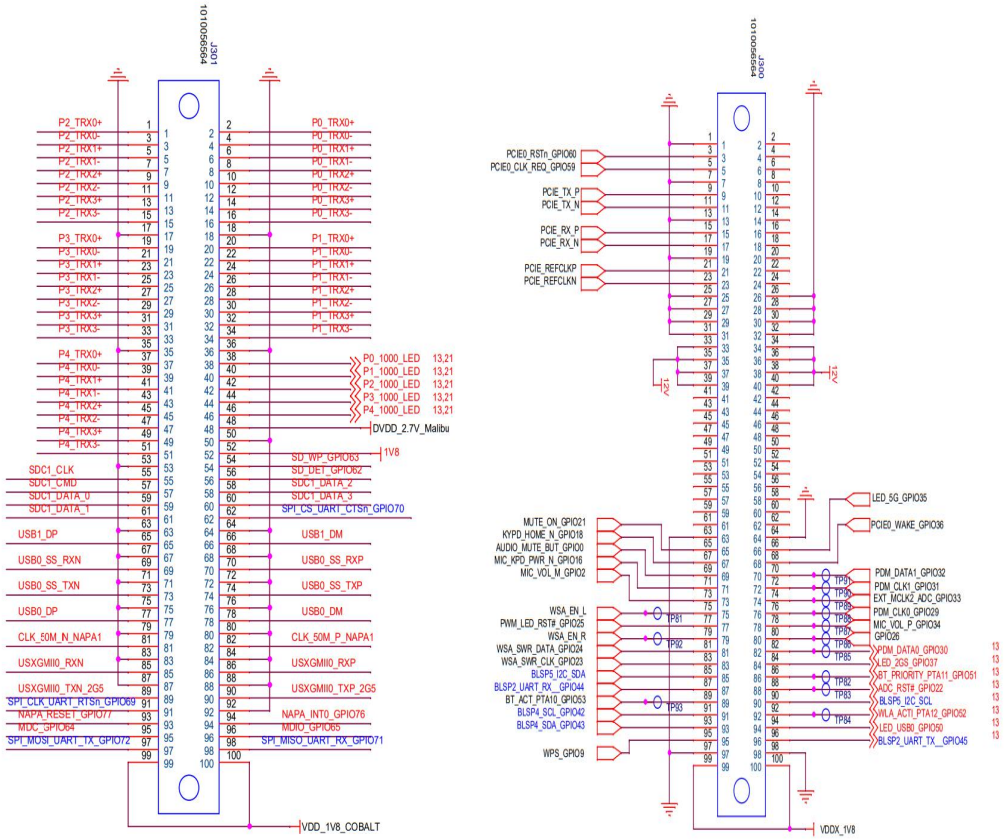
尺寸及定位



MM, ±0.25mm, From Module Top

引脚定义


J300
J301


1010056564
J301
P2_TRX0+
P2_TRX0-
P2_TRX1+
P2_TRX1-
P2_TRX2+
P2_TRX2-
P2_TRX3+
P2_TRX3-
P3_TRX0+
P3_TRX0-
P3_TRX1+
P3_TRX1-
P3_TRX2+
P3_TRX2-
P3_TRX3+
P3_TRX3-
P4_TRX0+
P4_TRX0-
P4_TRX1+
P4_TRX1-
P4_TRX2+
P4_TRX2-
P4_TRX3+
P4_TRX3-
SDC1_CLK
SDC1_CMD
SDC1_DATA_0
SDC1_DATA_1
USB1_DP
USB0_SS_RXN
USB0_SS_TXN
USB0_DP
CLK_50M_N_NAPA1
USXGMII0_RXN
USXGMII0_TXN_2G5
SPI_CLK_UART_RTSn_GPIO69
NAPA_RESET_GPIO77
MDC_GPIO64
SPI_MOSI_UART_TX_GPIO72
P0_TRX0+
P0_TRX0-
P0_TRX1+
P0_TRX1-
P0_TRX2+
P0_TRX2-
P0_TRX3+
P0_TRX3-
P1_TRX0+
P1_TRX0-
P1_TRX1+
P1_TRX1-
P1_TRX2+
P1_TRX2-
P1_TRX3+
P1_TRX3-
P0_1000_LED 13,21
P1_1000_LED 13,21
P2_1000_LED 13,21
P3_1000_LED 13,21
P4_1000_LED 13,21
DVDD_2.7V_Malibu
1V8
SD_WP_GPIO63
SD_DET_GPIO62
SDC1_DATA_2
SDC1_DATA_3
SPI_CS_UART_CTSn_GPIO70
USB1_DM
USB0_SS_RXP
USB0_SS_TXP
USB0_DM
CLK_50M_P_NAPA1
USXGMII0_RXP
USXGMII0_TXP_2G5
NAPA_INT0_GPIO76
MDIO_GPIO65
SPI_MISO_UART_RX_GPIO71
VDD_1V8_COBALT
1010056564
J300
PCIE0_RSTn_GPIO60
PCIE0_CLK_REQ_GPIO59
PCIE_TX_P
PCIE_TX_N
PCIE_RX_P
PCIE_RX_N
PCIE_REFCLKP
PCIE_REFCLKN
12V
MUTE_ON_GPIO21
KYPD_HOME_N_GPIO18
AUDIO_MUTE_BUT_GPIO0
MIC_KPD_PWR_N_GPIO16
MIC_VOL_M_GPIO2
WSA_EN_L
PWM_LED_RST#_GPIO25
WSA_EN_R
WSA_SWR_DATA_GPIO24
WSA_SWR_CLK_GPIO23
BLSP5_I2C_SDA
BLSP2_UART_RX__GPIO44
BT_ACT_PTA10_GPIO53
BLSP4_SCL_GPIO42
BLSP4_SDA_GPIO43
WPS_GPIO9
TP81
TP92
TP93
LED_5G_GPIO35
PCIE0_WAKE_GPIO36
PDM_DATA1_GPIO32
PDM_CLK1_GPIO31
EXT_MCLK2_ADC_GPIO33
PDM_CLK0_GPIO29
MIC_VOL_P_GPIO34
GPIO26
PDM_DATA0_GPIO30
LED_2G5_GPIO37
BT_PRIORITY_PTA11_GPIO51
ADC_RST#_GPIO22
BLSP5_I2C_SCL
WLA_ACTI_PTA12_GPIO52
LED_USB0_GPIO50
BLSP2_UART_TX__GPIO45
TP91
TP90
TP89
TP88
TP87
TP86
TP85
TP82
TP83
TP84
VDDX_1V8

J301 引脚	名称	描述
1	P2_TRX0+	Ethernet port
2	P0_TRX0+	Ethernet port
3	P2_TRX0-	Ethernet port
4	P0_TRX0-	Ethernet port
5	P2_TRX1+	Ethernet port
6	P0_TRX1+	Ethernet port
7	P2_TRX1-	Ethernet port
8	P0_TRX1-	Ethernet port
9	P2_TRX2+	Ethernet port
10	P0_TRX2+	Ethernet port
11	P2_TRX2-	Ethernet port
12	P0_TRX2-	Ethernet port
13	P2_TRX3+	Ethernet port
14	P0_TRX3+	Ethernet port
15	P2_TRX3-	Ethernet port
16	P0_TRX3-	Ethernet port
17	GND	GROUND
18	GND	GROUND
19	P3_TRX0+	Ethernet port
20	P1_TRX0+	Ethernet port
21	P3_TRX0-	Ethernet port
22	P1_TRX0-	Ethernet port

23	P3_TRX1+	Ethernet port
24	P1_TRX1+	Ethernet port
25	P3_TRX1-	Ethernet port
26	P1_TRX1-	Ethernet port
27	P3_TRX2+	Ethernet port
28	P1_TRX2+	Ethernet port
29	P3_TRX2-	Ethernet port
30	P1_TRX2-	Ethernet port
31	P3_TRX3+	Ethernet port
32	P1_TRX3+	Ethernet port
33	P3_TRX3-	Ethernet port
34	P1_TRX3-	Ethernet port
35	GND	GROUND
36	GND	GROUND
37	P4_TRX0+	Ethernet port
38	P0_LED	网口状态指示灯
39	P4_TRX0-	Ethernet port
40	P1_LED	网口状态指示灯
41	P4_TRX1+	Ethernet port
42	P2_LED	网口状态指示灯
43	P4_TRX1-	Ethernet port
44	P3_LED	网口状态指示灯
45	P4_TRX2+	Ethernet port
46	P4_LED	网口状态指示灯
47	P4_TRX2-	Ethernet port

48	DVDD_2.7V_Malibu	VDD_OUT
49	P4_TRX3+	Ethernet port
50	GND	GROUND
51	P4_TRX3-	Ethernet port
52	1.8V	VDD_OUT
53	GND	GROUND
54	SD_WD_GPIO63	
55	SDC1_CLK	
56	SD_DET_GPIO62	
57	SDC1_CMD	
58	SDC1_DATA_2	
59	SDC1_DATA_0	
60	SDC1_DATA_3	
61	SDC1_DATA_1	
62	SPI_CS_UART_CTSn_GPIO70	
63	GND	GROUND
64	GND	GROUND
65	USB1_DM	
66	USB1_DP	
67	GND	GROUND
68	GND	GROUND
69	USB0_SS_RXN	
70	USB0_SS_RXP	
71	GND	GROUND

72	GND	GROUND
73	USB0_SS_TXN	
74	USB0_SS_TXP	
75	GND	GROUND
76	GND	GROUND
77	USB0_DM	
78	USB0_DP	
79	GND	GROUND
80	GND	GROUND
81	CLK_50M_N_NAPA1	
82	CLK_50M_P_NAPA1	
83	GND	GROUND
84	GND	GROUND
85	USXGMII0_RXN	
86	USXGMII0_RXP	
87	GND	GROUND
88	GND	GROUND
89	USXGMII0_TXN_2.5G	
90	USXGMII0_TXP_2.5G	
91	SPI_CLK_UART_RTSn_GPIO69	
92	GND	GROUND
93	NAPA_RESET_GPIO77	
94	NAPA_INT0_GPIO76	

95	MDC_GPIO64	
96	MDC_GPIO65	
97	SPI_MOSI_UART_TX_GPIO72	
98	SPI_MOSI_UART_TX_GPIO71	
99	VDD_1V8_COBALT	电源输出
100	VDD_1V8_COBALT	电源输出

J300 引脚	名称	描述
1	GND	
2	NC	
3	PCIE0_RSTn_GPIO60	
4	NC	
5	PCIE0_RSTn_GPIO60	
6	NC	
7	GND	
8	NC	
9	PCIE_TX_P	
10	NC	
11	PCIE_TX_N	
12	NC	
13	GND	
14	NC	
15	PCIE_RX_P	

16	NC	
17	PCIE_RX_P	
18	NC	
19	GND	
20	NC	
21	PCIE_REFCLK_P	
22	NC	
23	PCIE_REFCLK_N	
24	NC	
25	GND	
26	GND	
27	GND	
28	GND	
29	GND	
30	GND	
31	GND	
32	GND	
33	VCC_IN_12V	12V 供电输入
34	VCC_IN_12V	12V 供电输入
35	VCC_IN_12V	12V 供电输入
36	VCC_IN_12V	12V 供电输入
37	VCC_IN_12V	12V 供电输入
38	VCC_IN_12V	12V 供电输入
39	VCC_IN_12V	12V 供电输入
40	VCC_IN_12V	12V 供电输入

41	NC	
42	NC	
43	NC	
44	NC	
45	NC	
46	NC	
47	NC	
48	NC	
49	NC	
50	NC	
51	NC	
52	NC	
53	NC	
54	NC	
55	NC	
56	NC	
57	NC	
58	NC	
59	NC	
60	NC	
61	NC	
62	NC	
63	GND	
64	GND	

65	MUTE_ON_GPIO21	
66	LED_5G_GPIO35	
67	KYPD_HOME_N_GPIO18	
68	PCIE0_WAKE_GPIO36	
69	AUDIO_MUTE_BUT_GPIO0	
70	PDM_DATA1_GPIO32	
71	MIC_KPD_PWR_N_GPIO16	
72	PDM_CLK1_GPIO31	
73	MIC_VOL_M_GPIO2	
74	EXT_MCLK2_ADC_GPIO33	
75	WSA_EN_L	
76	PDM_CLK0_GPIO29	
77	PWM_LED_RST#_GPIO25	
78	MIC_VOL_P_GPIO34	
79	WSA_EN_R	
80	GPIO26	
81	WSA_SWR_DATA_GPIO24	
82	PDM_DATA0_GPIO30	
83	WSA_SWR_CLK_GPIO23	
84	LED_2GS_GPIO37	
85	BLSP5_I2C_SDA	
86	BT_PRIORITY_PTA11_GPIO51	
87	BLSP2_UART_RX__GPIO44	

88	ADC_RST#_GPIO22	
89	BT_ACT_PTA10_GPIO53	
90	BLSP5_I2C_SCL	
91	BLSP4_SCL_GPIO42	
92	WLA_ACTI_PTA12_GPIO52	
93	BLSP4_SDA_GPIO43	
94	LED_USB0_GPIO50	
95	WPS_GPIO9	
96	BLSP2_UART_TX__GPIO45	
97	GND	
98	GND	
99	VDD_1V8_COBALT	电源输出
100	VDD_1V8_COBALT	电源输出

WiFi射频规格(5V PA)

RF Performance Table for 5GHz

	Data Rate	TX Power (per chain)	TX Power (2 chains)	Tolerance
5GHz 802.11a	6Mbps	20dBm	23dBm	±2dB
	9Mbps	20dBm	23dBm	±2dB
	12Mbps	20dBm	23dBm	±2dB
	18Mbps	20dBm	23dBm	±2dB
	24Mbps	20dBm	23dBm	±2dB
	36Mbps	20dBm	23dBm	±2dB
	48Mbps	20dBm	23dBm	±2dB
	54Mbps	20dBm	23dBm	±2dB
5GHz 802.11n/ac VHT20	MCS 0	20dBm	23dBm	±2dB
	MCS 1	20dBm	23dBm	±2dB
	MCS 2	20dBm	23dBm	±2dB
	MCS 3	20dBm	23dBm	±2dB
	MCS 4	20dBm	23dBm	±2dB
	MCS 5	20dBm	23dBm	±2dB
	MCS 6	20dBm	23dBm	±2dB
	MCS 7	19dBm	22dBm	±2dB
	MCS 8	18dBm	21dBm	±2dB
5GHz 802.11n/ac VHT40	MCS 0	20dBm	23dBm	±2dB
	MCS 1	20dBm	23dBm	±2dB
	MCS 2	20dBm	23dBm	±2dB
	MCS 3	20dBm	23dBm	±2dB
	MCS 4	20dBm	23dBm	±2dB
	MCS 5	20dBm	23dBm	±2dB
	MCS 6	20dBm	23dBm	±2dB
	MCS 7	19dBm	22dBm	±2dB
	MCS 8	18dBm	21dBm	±2dB
	MCS 9	18dBm	21dBm	±2dB
5GHz 802.11ac VHT80	MCS 0	20dBm	23dBm	±2dB
	MCS 1	20dBm	23dBm	±2dB
	MCS 2	20dBm	23dBm	±2dB
	MCS 3	20dBm	23dBm	±2dB
	MCS 4	20dBm	23dBm	±2dB
	MCS 5	20dBm	23dBm	±2dB
	MCS 6	20dBm	23dBm	±2dB
	MCS 7	19dBm	22dBm	±2dB
	MCS 8	18dBm	21dBm	±2dB
	MCS 9	18dBm	21dBm	±2dB
	MCS 9	18dBm	21dBm	±2dB
	MCS 10	16dBm	19dBm	±2dB
	MCS 11	15dBm	18dBm	±2dB
2.4GHz 802.11ax HE40	MCS 0	20dBm	23dBm	±2dB
	MCS 1	20dBm	23dBm	±2dB
	MCS 2	20dBm	23dBm	±2dB
	MCS 3	20dBm	23dBm	±2dB
	MCS 4	20dBm	23dBm	±2dB
	MCS 5	20dBm	23dBm	±2dB
	MCS 6	20dBm	23dBm	±2dB
	MCS 7	19dBm	22dBm	±2dB
	MCS 8	18dBm	21dBm	±2dB
	MCS 9	18dBm	21dBm	±2dB
	MCS 10	16dBm	19dBm	±2dB
	MCS 11	15dBm	18dBm	±2dB

	Data Rate	RX Specifications Sensitivity	Tolerance
5GHz 802.11a	6Mbps	-94	±2dB
	9Mbps	-92	±2dB
	12Mbps	-89	±2dB
	18Mbps	-87	±2dB
	24Mbps	-85	±2dB
	36Mbps	-83	±2dB
	48Mbps	-80	±2dB
	54Mbps	-78	±2dB
5GHz 802.11n/ac VHT20	MCS 0	-94	±2dB
	MCS 1	-92	±2dB
	MCS 2	-89	±2dB
	MCS 3	-87	±2dB
	MCS 4	-85	±2dB
	MCS 5	-83	±2dB
	MCS 6	-80	±2dB
	MCS 7	-77	±2dB
	MCS 8	-75	±2dB
5GHz 802.11n/ac VHT40	MCS 0	-92	±2dB
	MCS 1	-90	±2dB
	MCS 2	-88	±2dB
	MCS 3	-85	±2dB
	MCS 4	-82	±2dB
	MCS 5	-79	±2dB
	MCS 6	-76	±2dB
	MCS 7	-73	±2dB
	MCS 8	-70	±2dB
	MCS 9	-67	±2dB
5GHz 802.11ac VHT80	MCS 0	-87	±2dB
	MCS 1	-85	±2dB
	MCS 2	-83	±2dB
	MCS 3	-80	±2dB
	MCS 4	-78	±2dB
	MCS 5	-75	±2dB
	MCS 6	-73	±2dB
	MCS 7	-70	±2dB
	MCS 8	-67	±2dB
	MCS 9	-64	±2dB
	MCS 9	-72	±2dB
	MCS 10	-69	±2dB
	MCS 11	-66	±2dB
2.4GHz 802.11ax HE40	MCS 0	-95	±2dB
	MCS 1	-93	±2dB
	MCS 2	-90	±2dB
	MCS 3	-87	±2dB
	MCS 4	-84	±2dB
	MCS 5	-81	±2dB
	MCS 6	-78	±2dB
	MCS 7	-75	±2dB
	MCS 8	-72	±2dB
	MCS 9	-69	±2dB
	MCS 10	-66	±2dB
	MCS 11	-64	±2dB

RF Performance Table for 5GHz

	Data Rate	TX Power (per chain)	TX Power (2 chains)	Tolerance
5GHz 802.11ax HE20	MCS 0	20dBm	23dBm	±2dB
	MCS 1	20dBm	23dBm	±2dB
	MCS 2	20dBm	23dBm	±2dB
	MCS 3	20dBm	23dBm	±2dB
	MCS 4	20dBm	23dBm	±2dB
	MCS 5	20dBm	23dBm	±2dB
	MCS 6	20dBm	23dBm	±2dB
	MCS 7	19dBm	22dBm	±2dB
	MCS 8	18dBm	21dBm	±2dB
	MCS 9	18dBm	21dBm	±2dB
	MCS 10	16dBm	19dBm	±2dB
	MCS 11	15dBm	18dBm	±2dB
5GHz 802.11ax HE40	MCS 0	20dBm	23dBm	±2dB
	MCS 1	20dBm	23dBm	±2dB
	MCS 2	20dBm	23dBm	±2dB
	MCS 3	20dBm	23dBm	±2dB
	MCS 4	20dBm	23dBm	±2dB
	MCS 5	20dBm	23dBm	±2dB
	MCS 6	20dBm	23dBm	±2dB
	MCS 7	19dBm	22dBm	±2dB
	MCS 8	18dBm	21dBm	±2dB
	MCS 9	18dBm	21dBm	±2dB
	MCS 10	16dBm	19dBm	±2dB
	MCS 11	15dBm	18dBm	±2dB
5GHz 802.11ax HE80	MCS 0	20dBm	23dBm	±2dB
	MCS 1	20dBm	23dBm	±2dB
	MCS 2	20dBm	23dBm	±2dB
	MCS 3	20dBm	23dBm	±2dB
	MCS 4	20dBm	23dBm	±2dB
	MCS 5	20dBm	23dBm	±2dB
	MCS 6	20dBm	23dBm	±2dB
	MCS 7	19dBm	22dBm	±2dB
	MCS 8	18dBm	21dBm	±2dB
	MCS 9	18dBm	21dBm	±2dB
	MCS 10	16dBm	19dBm	±2dB
	MCS 11	15dBm	18dBm	±2dB

	Data Rate	RX Specifications Sensitivity	Tolerance
5GHz 802.11ax HE20	MCS 0	-94	±2dB
	MCS 1	-92	±2dB
	MCS 2	-89	±2dB
	MCS 3	-86	±2dB
	MCS 4	-83	±2dB
	MCS 5	-80	±2dB
	MCS 6	-77	±2dB
	MCS 7	-74	±2dB
	MCS 8	-71	±2dB
	MCS 9	-68	±2dB
	MCS 10	-65	±2dB
	MCS 11	-62	±2dB
5GHz 802.11ax HE40	MCS 0	-89	±2dB
	MCS 1	-87	±2dB
	MCS 2	-85	±2dB
	MCS 3	-83	±2dB
	MCS 4	-81	±2dB
	MCS 5	-78	±2dB
	MCS 6	-75	±2dB
	MCS 7	-72	±2dB
	MCS 8	-69	±2dB
	MCS 9	-66	±2dB
	MCS 10	-63	±2dB
	MCS 11	-60	±2dB
5GHz 802.11ax HE80	MCS 0	-86	±2dB
	MCS 1	-84	±2dB
	MCS 2	-81	±2dB
	MCS 3	-79	±2dB
	MCS 4	-76	±2dB
	MCS 5	-74	±2dB
	MCS 6	-71	±2dB
	MCS 7	-68	±2dB
	MCS 8	-65	±2dB
	MCS 9	-62	±2dB
	MCS 10	-59	±2dB
	MCS 11	-56	±2dB

订货信息

型号	Nor Flash Size	Nand Flash Size	DDR3 Size
ComIoT 60_V2.0-3200A	256Mb	N/A	4Gb
ComIoT 60_V2.0-161GA	128Mb	1Gb	4Gb

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