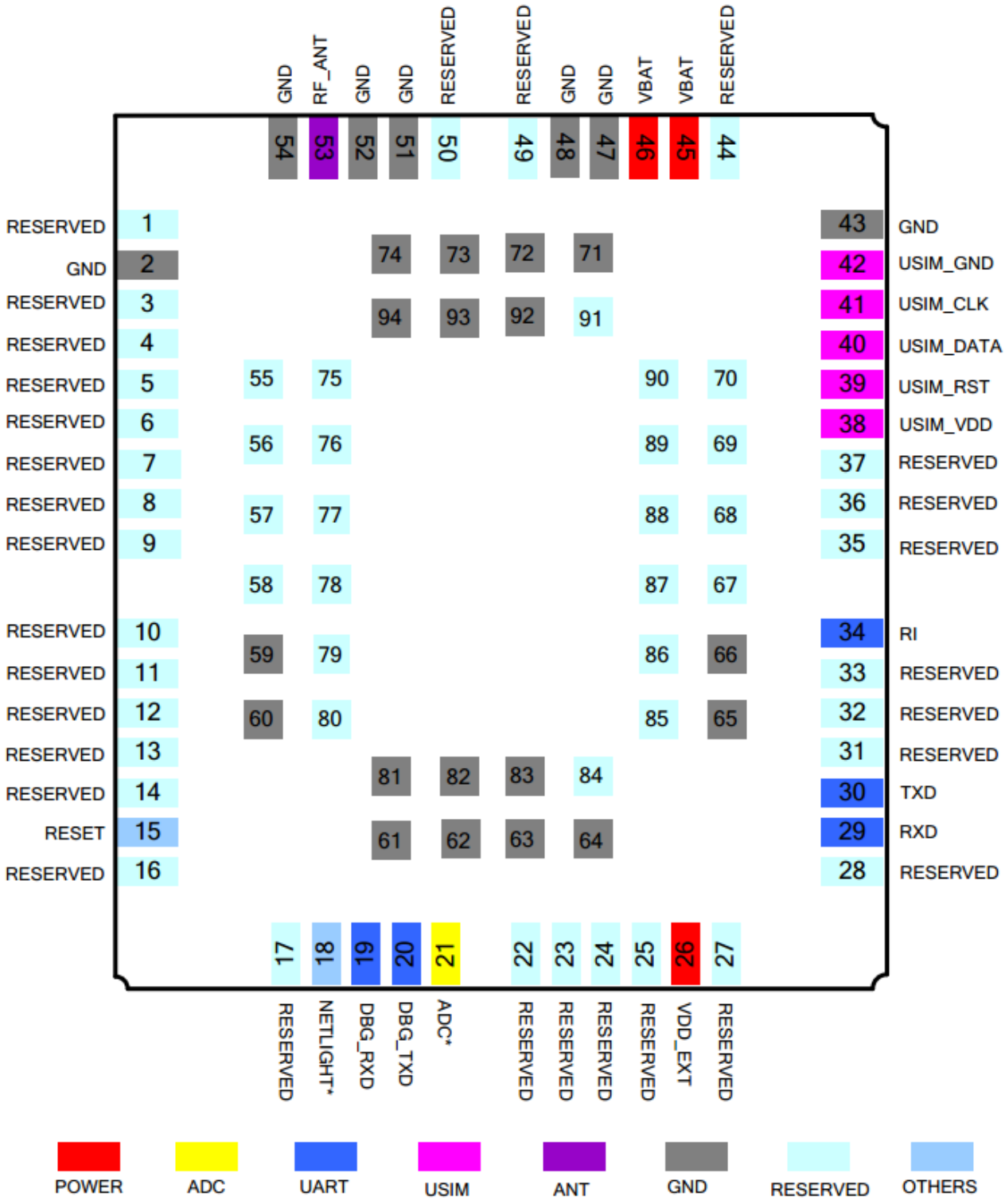
# BC95


GND 54
RF_ANT 53
GND 52
GND 51
RESERVED 50
RESERVED 49
GND 48
GND 47
VBAT 46
VBAT 45
RESERVED 44
RESERVED 1
GND 2
RESERVED 3
RESERVED 4
RESERVED 5
RESERVED 6
RESERVED 7
RESERVED 8
RESERVED 9
RESERVED 10
RESERVED 11
RESERVED 12
RESERVED 13
RESERVED 14
RESET 15
RESERVED 16
43 GND
42 USIM_GND
41 USIM_CLK
40 USIM_DATA
39 USIM_RST
38 USIM_VDD
37 RESERVED
36 RESERVED
35 RESERVED
34 RI
33 RESERVED
32 RESERVED
31 RESERVED
30 TXD
29 RXD
28 RESERVED
74 73 72 71
94 93 92 91
55 75 90 70
56 76 89 69
57 77 88 68
58 78 87 67
59 79 86 66
60 80 85 65
81 82 83 84
61 62 63 64
17 RESERVED
18 NETLIGHT*
19 DBG_RXD
20 DBG_TXD
21 ADC*
22 RESERVED
23 RESERVED
24 RESERVED
25 RESERVED
26 VDD_EXT
27 RESERVED
POWER
ADC
UART
USIM
ANT
GND
RESERVED
OTHERS

| Power Supply | | | | | |
|---|---|---|---|---|---|
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| VBAT | 45, 46 | PI | Main power supply of the module: VBAT=3.1V~4.2V | Vmax=4.2V<br>Vmin=3.1V<br>Vnorm=3.6V | The power supply must be able to provide sufficient current up to 0.5A. |
| VDD_EXT | 26 | PO | Supply 3.0V voltage for external circuit | Vnorm=3.0V<br>$I_O$max=20mA | If unused, keep this pin open.<br>Recommend to add a 2.2~4.7uF bypass capacitor when using this pin for power supply. |
| GND | 2, 43, 47, 48, 51, 52, 54, 59~66, 71~74, 81~83, 92~94 | | Ground | | |

| | | | | | |
|---|---|---|---|---|---|
| DBG_TXD | 20 | DO | Transmit data | $V_{OL}$max=0.4V<br>$V_{OH}$min=2.4V | If unused, keep these pins open. |
| **USIM Interface** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| USIM_VDD | 38 | DO | Power supply for USIM card | Vnorm=3.0V | All signals of USIM interface should be protected against ESD with a TVS diode array.<br>Maximum trace length from the module pad to USIM card connector is 200mm. |
| USIM_RST | 39 | DO | USIM card reset | $V_{OL}$max=0.4V<br>$V_{OH}$min=2.4V | |
| USIM_DATA | 40 | IO | USIM card data | $V_{OL}$max=0.4V<br>$V_{OH}$min=2.4V<br>$V_{IL}$min=-0.3V<br>$V_{IL}$max=0.6V<br>$V_{IH}$min=2.1V<br>$V_{IH}$max=3.3V | |
| USIM_CLK | 41 | DO | USIM card clock | $V_{OL}$max=0.4V<br>$V_{OH}$min=2.4V | |
| USIM_GND | 42 | | USIM card ground | | |
| **RF Interface** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| RF_ANT | 53 | IO | RF antenna pad | Impedance of 50Ω | |
| **RESERVED Pins** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| RESERVED | 1, 3~14, 16, 17, 22, 23, 24, 25, 27, 28, 31~33, 35~37, 44, 49, 50, 55~58, 67~70, 75~80, 84~91 | | Reserved | | Keep these pins unconnected. |

| **Reset Interface** | | | | | |
|---|---|---|---|---|---|
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| RESET | 15 | DI | Reset the module | $R_{PU}$≈78kΩ<br>$V_{IH}$max=3.3V<br>$V_{IH}$min=2.1V<br>$V_{IL}$max=0.6V | Pull up internally. Active low. |
| **Network Status Indicator** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| NETLIGHT* | 18 | DO | Network status indication | $V_{OL}$max=0.4V<br>$V_{OH}$min=2.4V | If unused, keep this pin open. |
| **ADC Interface** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| ADC* | 21 | AI | General purpose analog to digital converter interface | Input voltage range: 0V to 4.0V | The maximum input voltage should be lower than the VBAT voltage.<br>If unused, keep this pin open. |
| **UART Port** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| RXD | 29 | DI | Receive data | $V_{IL}$max=0.6V<br>$V_{IH}$min=2.1V<br>$V_{IH}$max=3.3V | 3.0V power domain. |
| TXD | 30 | DO | Transmit data | $V_{OL}$max=0.4V<br>$V_{OH}$min=2.4V | 3.0V power domain. |
| RI | 34 | DO | Ring indicator | $V_{OL}$max=0.4V<br>$V_{OH}$min=2.4V | 3.0V power domain.<br>If unused, keep this pin open. |
| **Debug Port** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| DBG_RXD | 19 | DI | Receive data | $V_{IL}$max=0.6V<br>$V_{IH}$min=2.1V<br>$V_{IH}$max=3.3V | If unused, keep these pins open. |

# BC66

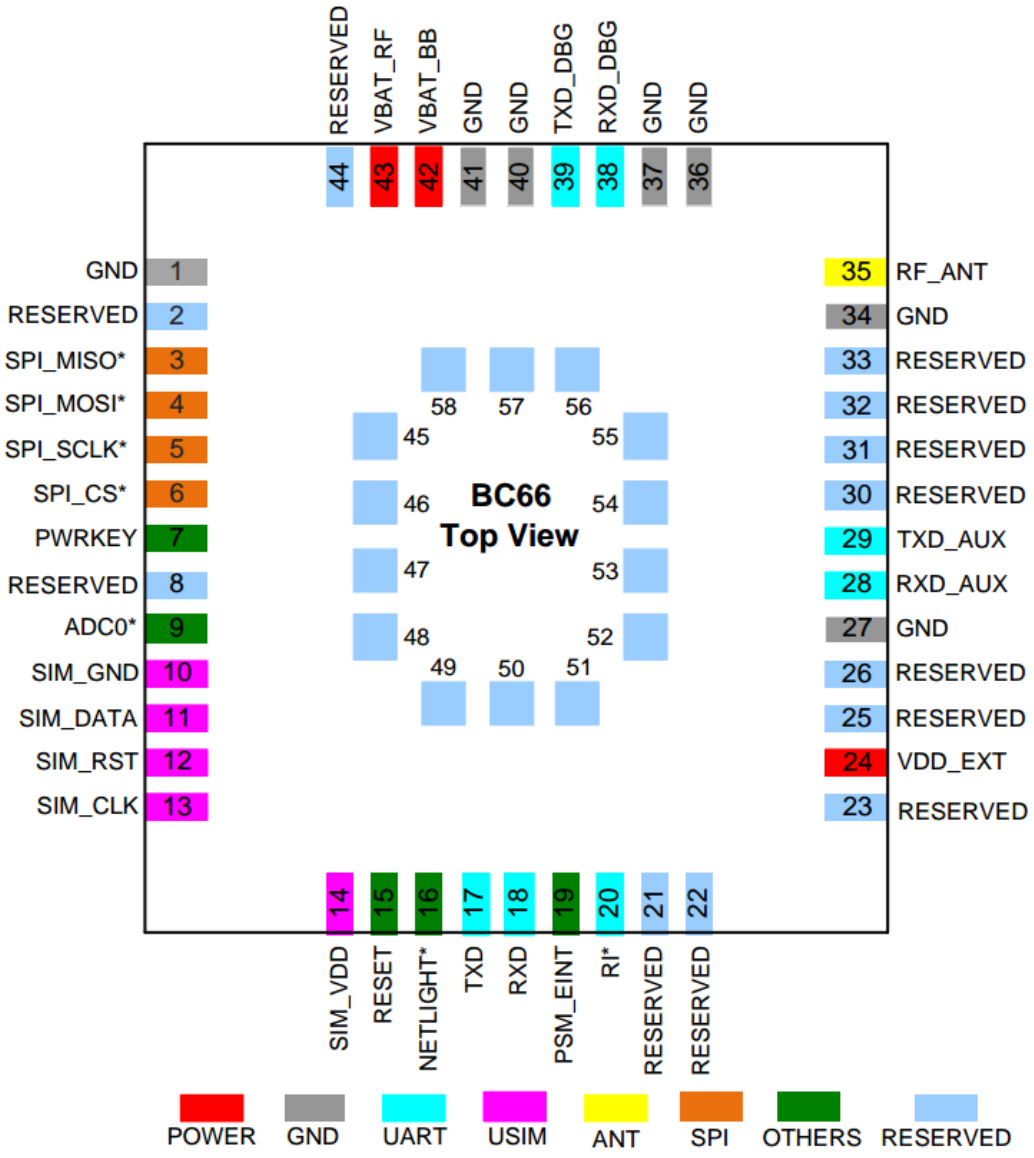

RESERVED 44
VBAT_RF 43
VBAT_BB 42
GND 41
GND 40
TXD_DBG 39
RXD_DBG 38
GND 37
GND 36
GND 1
RESERVED 2
SPI_MISO* 3
SPI_MOSI* 4
SPI_SCLK* 5
SPI_CS* 6
PWRKEY 7
RESERVED 8
ADC0* 9
SIM_GND 10
SIM_DATA 11
SIM_RST 12
SIM_CLK 13
35 RF_ANT
34 GND
33 RESERVED
32 RESERVED
31 RESERVED
30 RESERVED
29 TXD_AUX
28 RXD_AUX
27 GND
26 RESERVED
25 RESERVED
24 VDD_EXT
23 RESERVED
58 57 56
45 55
46 54
47 53
48 52
49 50 51
BC66
Top View
SIM_VDD 14
RESET 15
NETLIGHT* 16
TXD 17
RXD 18
PSM_EINT 19
RI* 20
RESERVED 21
RESERVED 22
POWER
GND
UART
USIM
ANT
SPI
OTHERS
RESERVED

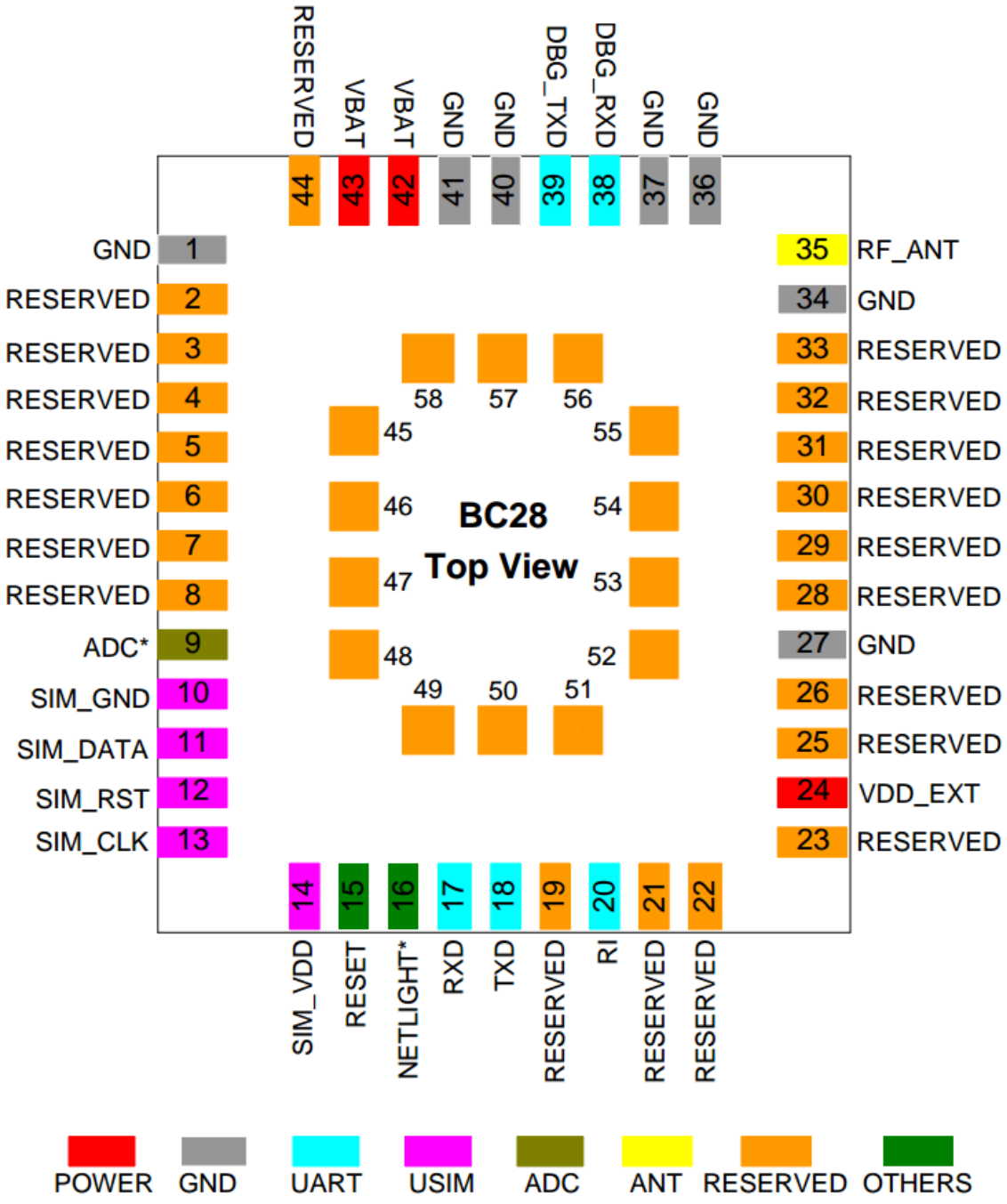
**Table 4: Pin Description**

| Power Supply | | | | | |
|---|---|---|---|---|---|
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| VBAT_BB | 42 | PI | Power supply for the module's baseband part | Vmax=3.63V<br>Vmin=2.1V<br>Vnorm=3.3V | |
| VBAT_RF | 43 | PI | Power supply for the module's RF part | Vmax=3.63V<br>Vmin=2.1V<br>Vnorm=3.3V | |
| VDD_EXT | 24 | PO | 1.8V output power supply | Vnorm=1.8V | No voltage output in PSM mode.<br>It is intended to supply power for the module's pull-up circuits, and is thus not recommended to be used as the power supply for external circuits. |
| GND | 1, 27, 34, 36, 37, 40, 41 | | GND | | |

| Power Key Interface | | | | | |
|---|---|---|---|---|---|
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| PWRKEY | 7 | DI | Pull down PWRKEY to turn on the module | $V_{IL}$max=0.3*VBAT<br>$V_{IH}$min=0.7*VBAT | |
| **Reset Interface** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| RESET | 15 | DI | Reset the module | | Active low. |
| **PSM_EINT Interface** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| PSM_EINT | 19 | DI | Dedicated external interrupt pin.<br>Used to wake up the module from PSM. | | |
| **Network Status Indication** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| NETLIGHT* | 16 | DO | Network status indication | | |
| **ADC Interface** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| ADC0* | 9 | AI | General purpose analog to digital converter | Voltage range: 0V~1.4V | |

| | | | | | |
|---|---|---|---|---|---|
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| RXD_AUX | 28 | DI | Receive data | | 1.8V power domain. |
| TXD_AUX | 29 | DO | Transmit data | | |
| **Debug UART Port** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| RXD_DBG | 38 | DI | Receive data | | 1.8V power domain. |
| TXD_DBG | 39 | DO | Transmit data | | |
| **Ringing Signal** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| RI* | 20 | | | | |
| **USIM Interface** | | | | | |
| **Pin Name** | **Pin No.** | | | | |
| SIM_VDD | 14 | | | | |
| SIM_RST | 12 | | | | |
| SIM_DATA | 11 | | | | |
| SIM_CLK | 13 | | | | |
| SIM_GND | 10 | | | | |
| **Antenna Interface** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| RF_ANT | 35 | IO | RF antenna interface | | 50Ω characteristic impedance |
| **SPI Interface** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| SPI_MISO* | 3 | DI | Master input slave output of SPI interface | | 1.8V power domain. |
| SPI_MOSI* | 4 | DO | Master output slave input of SPI interface | | |
| SPI_SCLK* | 5 | DO | Serial clock signal of SPI interface | | |
| SPI_CS* | 6 | DO | Chip select of SPI interface | | |
| **Reserved Pins** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| RESERVED | 2, 8, 21~23, 25~26, 30~33, 44~58 | | | | Keep these pins unconnected. |

BC28


GND 1
RESERVED 2
RESERVED 3
RESERVED 4
RESERVED 5
RESERVED 6
RESERVED 7
RESERVED 8
ADC* 9
SIM_GND 10
SIM_DATA 11
SIM_RST 12
SIM_CLK 13
RESERVED 44
VBAT 43
VBAT 42
GND 41
GND 40
DBG_TXD 39
DBG_RXD 38
GND 37
GND 36
35 RF_ANT
34 GND
33 RESERVED
32 RESERVED
31 RESERVED
30 RESERVED
29 RESERVED
28 RESERVED
27 GND
26 RESERVED
25 RESERVED
24 VDD_EXT
23 RESERVED
58 57 56
45 55
46 54
47 53
48 52
49 50 51
BC28
Top View
SIM_VDD 14
RESET 15
NETLIGHT* 16
RXD 17
TXD 18
RESERVED 19
RI 20
RESERVED 21
RESERVED 22
POWER
GND
UART
USIM
ADC
ANT
RESERVED
OTHERS

| 电源 | | | | | |
|---|---|---|---|---|---|
| **引脚名** | **引脚号** | **I/O** | **描述** | **DC 特性** | **备注** |
| VBAT | 42，43 | PI | 模块电源：<br>VBAT=3.1V~4.2V | Vmax=4.2V<br>Vmin=3.1V<br>Vnorm=3.6V | 电源必须能够提供 0.5A 的电流。 |
| VDD_EXT | 24 | PO | 3.0V 输出电源 | Vnorm=3.0V<br>$I_O$max=1mA（PSM 模式） | 建议用于外部 I/O 端口弱上拉，并建议并联一个 2.2uF~4.7uF 的旁路电容。<br>不用则悬空。 |
| GND | 1，27，34，36，37，40，41 | | 地 | | |

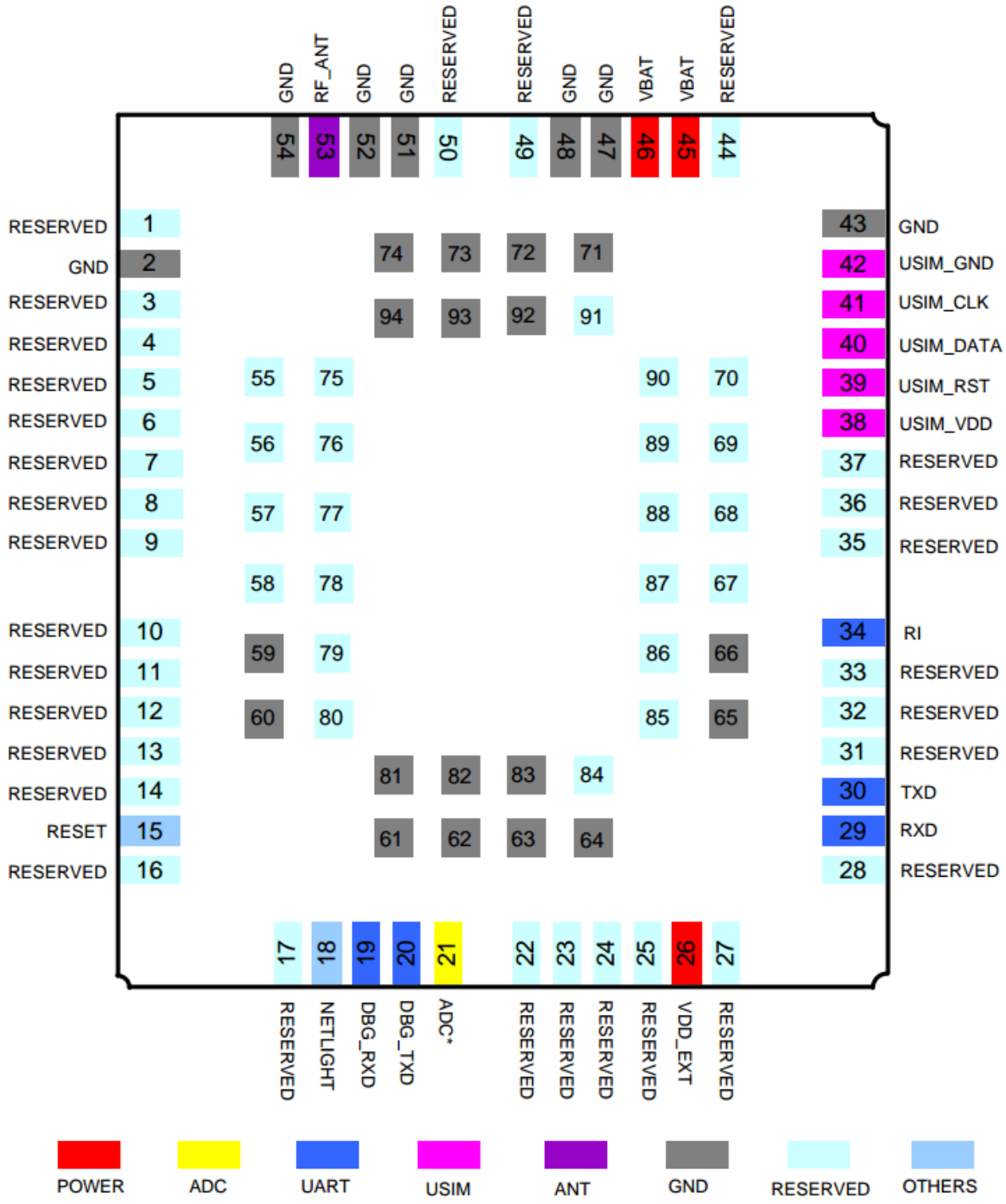
| 开关机 | | | | | |
|---|---|---|---|---|---|
| **引脚名** | **引脚号** | **I/O** | **描述** | **DC 特性** | **备注** |
| RESET | 15 | DI | 复位模块 | $R_{PU}$≈78kΩ<br>$V_{IH}$max=3.3V | 内部上拉。<br>低电平有效。 |

| | | | | | |
|---|---|---|---|---|---|
| | | | | $V_{IH}$min=2.1V<br>$V_{IL}$max=0.6V | |
| **模块状态指示** | | | | | |
| **引脚名** | **引脚号** | **I/O** | **描述** | **DC 特性** | **备注** |
| NETLIGHT* | 16 | DO | 网络状态指示 | $V_{OL}$max=0.3V<br>$V_{OH}$min=2.4V | 3.0V 电源域。<br>不用则悬空。 |
| **ADC 接口** | | | | | |
| **引脚名** | **引脚号** | **I/O** | **描述** | **DC 特性** | **备注** |
| ADC* | 9 | AI | 通用模数转换接口 | 电压范围：<br>0V~4.0V | ADC 检测最大电压应小于电源输入电压。<br>不用则悬空。 |
| **主串口** | | | | | |
| **引脚名** | **引脚号** | **I/O** | **描述** | **DC 特性** | **备注** |
| RXD | 17 | DI | 模块接收数据 | $V_{IL}$max=0.6V<br>$V_{IH}$min=2.1V<br>$V_{IH}$max=3.3V | 3.0V 电源域。 |
| TXD | 18 | DO | 模块发送数据 | $V_{OL}$max=0.3V<br>$V_{OH}$min=2.4V | 3.0V 电源域。 |
| RI | 20 | DO | 模块输出振铃提示 | $V_{OL}$max=0.3V<br>$V_{OH}$min=2.4V | 3.0V 电源域。<br>不用则悬空。 |
| **调试串口** | | | | | |
| **引脚名** | **引脚号** | **I/O** | **描述** | **DC 特性** | **备注** |
| DBG_RXD | 38 | DI | 模块接收数据 | $V_{IL}$max=0.6V<br>$V_{IH}$min=2.1V<br>$V_{IH}$max=3.3V | 不用则悬空。 |
| DBG_TXD | 39 | DO | 模块发送数据 | $V_{OL}$max=0.3V<br>$V_{OH}$min=2.4V | 不用则悬空。 |
| **USIM 接口** | | | | | |
| **引脚名** | **引脚号** | **I/O** | **描述** | **DC 特性** | **备注** |
| USIM_VDD | 14 | DO | 外部USIM卡供电电压 | Vnorm=1.8/3.0V | 外部USIM卡接口建议使用 TVS 管进行 ESD 保护；外部 USIM 卡座到模块的布线最长不要超过 200mm。 |
| USIM_RST | 12 | DO | 外部USIM卡复位信号 | $V_{OL}$max=0.1×USIM_VDD<br>$V_{OH}$min=0.8×USIM_VDD | |
| USIM_DATA | 11 | IO | 外部USIM卡数据信号 | $V_{OL}$max=0.1×USIM_VDD<br>$V_{OH}$min=0.8×USIM_VDD | |
| | | | | $V_{IL}$min=-0.1×USIM_VDD<br>$V_{IL}$max=0.2×USIM_VDD<br>$V_{IH}$min=0.7×USIM_VDD<br>$V_{IH}$max=1.1×USIM_VDD | |
| SIM_CLK | 13 | DO | 外部USIM卡时钟信号 | $V_{OL}$max=0.1×USIM_VDD<br>$V_{OH}$min=0.8×USIM_VDD | |
| USIM_GND | 10 | | 外部USIM卡专用地 | | |
| **射频接口** | | | | | |
| **引脚名** | **引脚号** | **I/O** | **描述** | **DC 特性** | **备注** |
| RF_ANT | 35 | IO | 射频天线焊盘 | 50 欧姆特性阻抗 | |
| **预留引脚** | | | | | |
| **引脚名** | **引脚号** | **I/O** | **描述** | **DC 特性** | **备注** |
| RESERVED | 2~8，19，21-23，25，26，28-33，44-58 | | | | 保持悬空。 |

**备注**

"*" 表示正在开发中。

# BC35-G


GND 54
RF_ANT 53
GND 52
GND 51
RESERVED 50
RESERVED 49
GND 48
GND 47
VBAT 46
VBAT 45
RESERVED 44
RESERVED 1
GND 2
RESERVED 3
RESERVED 4
RESERVED 5
RESERVED 6
RESERVED 7
RESERVED 8
RESERVED 9
RESERVED 10
RESERVED 11
RESERVED 12
RESERVED 13
RESERVED 14
RESET 15
RESERVED 16
43 GND
42 USIM_GND
41 USIM_CLK
40 USIM_DATA
39 USIM_RST
38 USIM_VDD
37 RESERVED
36 RESERVED
35 RESERVED
34 RI
33 RESERVED
32 RESERVED
31 RESERVED
30 TXD
29 RXD
28 RESERVED
74 73 72 71
94 93 92 91
55 75 90 70
56 76 89 69
57 77 88 68
58 78 87 67
59 79 86 66
60 80 85 65
81 82 83 84
61 62 63 64
17 RESERVED
18 NETLIGHT
19 DBG_RXD
20 DBG_TXD
21 ADC*
22 RESERVED
23 RESERVED
24 RESERVED
25 RESERVED
26 VDD_EXT
27 RESERVED
POWER
ADC
UART
USIM
ANT
GND
RESERVED
OTHERS

| 电源 | | | | | |
|---|---|---|---|---|---|
| **引脚名** | **引脚号** | **I/O** | **描述** | **DC 特性** | **备注** |
| VBAT | 45、46 | PI | 模块电源<br>VBAT=3.1V~4.2V | Vmax=4.2V<br>Vmin=3.1V<br>Vnorm=3.6V | 电源必须能够提供 0.5A 的电流。 |
| VDD_EXT | 26 | PO | 3.0V 输出电源 | Vnorm=3.0V<br>Iomax=20mA（PSM 模式下为 1mA） | 建议用于外部 IO 端口弱上拉，并建议并联一个 2.2uF~4.7uF 的旁路电容。不用则悬空。 |
| GND | 2、43、47、48、51、52、54、59~66、71~74、81~83、92~94 | | 地 | | |

| 外部 USIM 接口 | | | | | |
|---|---|---|---|---|---|
| **引脚名** | **引脚号** | **I/O** | **描述** | **DC 特性** | **备注** |
| USIM_VDD | 38 | DO | 外部 USIM 卡供电电压 | Vnorm=1.8/3.0V | 外部 USIM 卡接口建议使用 TVS 管进行 ESD 保护；外部 USIM 卡座到模块的布线最长不要超过 200mm。 |
| USIM_RST | 39 | DO | 外部 USIM 卡复位信号 | $V_{OL}$max=0.1V×USIM_VDD<br>$V_{OH}$min=0.8V×USIM_VDD | |
| USIM_DATA | 40 | IO | 外部 USIM 卡数据信号 | $V_{OL}$max=0.1V×USIM_VDD<br>$V_{OH}$min=0.8V×USIM_VDD<br>$V_{IL}$min=-0.1V×USIM_VDD<br>$V_{IL}$max=0.2V×USIM_VDD<br>$V_{IH}$min=0.7V×USIM_VDD<br>$V_{IH}$max=1.1V×USIM_VDD | |
| SIM_CLK | 41 | DO | 外部 USIM 卡时钟信号 | $V_{OL}$max=0.1V×USIM_VDD<br>$V_{OH}$min=0.8V×USIM_VDD | |
| USIM_GND | 42 | | 外部 USIM 卡专用地 | | |

| 射频接口 | | | | | |
|---|---|---|---|---|---|
| **引脚名** | **引脚号** | **I/O** | **描述** | **DC 特性** | **备注** |
| RF_ANT | 53 | IO | 射频天线焊盘 | | 50Ω 特性阻抗 |

| 预留引脚 | | | | | |
|---|---|---|---|---|---|
| **引脚名** | **引脚号** | **I/O** | **描述** | **DC 特性** | **备注** |
| RESERVED | 1、3~14、16、17、22~25、27、28、31-33、35~37、44、49、50、55~58、67~70、75~80、84~91 | | | | 保持悬空。 |

| 开关机 | | | | | |
|---|---|---|---|---|---|
| **引脚名** | **引脚号** | **I/O** | **描述** | **DC 特性** | **备注** |
| RESET | 15 | DI | 复位模块 | $R_{PU}$≈78kΩ<br>$V_{IH}$max=3.3V<br>$V_{IH}$min=2.1V<br>$V_{IL}$max=0.6V | 内部上拉。<br>低电平有效。 |

| 模块状态指示 | | | | | |
|---|---|---|---|---|---|
| **引脚名** | **引脚号** | **I/O** | **描述** | **DC 特性** | **备注** |
| NETLIGHT | 18 | DO | 网络状态指示 | $V_{OL}$max=0.3V<br>$V_{OH}$min=2.4V | 3.0V 电源域。<br>不用则悬空。 |

| ADC 接口 | | | | | |
|---|---|---|---|---|---|
| **引脚名** | **引脚号** | **I/O** | **描述** | **DC 特性** | **备注** |
| ADC* | 21 | AI | 通用模数转换接口 | 电压范围：<br>0V~4.0V | 不用则悬空。<br>ADC 检测最大电压应小于电源输入电压。 |

| 主串口 | | | | | |
|---|---|---|---|---|---|
| **引脚名** | **引脚号** | **I/O** | **描述** | **DC 特性** | **备注** |
| RXD | 29 | DI | 从 DTE 设备 TXD 端接收数据 | $V_{IL}$max=0.6V<br>$V_{IH}$min=2.1V<br>$V_{IH}$max=3.3V | 3.0V 电压域。<br>外接 2MΩ 上拉电阻到 VDD_EXT。 |
| TXD | 30 | DO | 发送数据到 DTE 设备的 RXD 端 | $V_{OL}$max=0.3V<br>$V_{OH}$min=2.4V | 3.0V 电压域。 |
| RI | 34 | DO | 振铃提示（DCE 有 URC 输出或者短消息接收时会发送信号通知 DTE） | $V_{OL}$max=0.3V<br>$V_{OH}$min=2.4V | 3.0V 电压域。<br>不用则悬空。 |

| 调试串口 | | | | | |
|---|---|---|---|---|---|
| **引脚名** | **引脚号** | **I/O** | **描述** | **DC 特性** | **备注** |
| DBG_RXD | 19 | DI | 模块调试串口接收数据 | $V_{IL}$max=0.6V<br>$V_{IH}$min=2.1V<br>$V_{IH}$max=3.3V | 不用则悬空。 |
| DBG_TXD | 20 | DO | 模块调试串口发送数据 | $V_{OL}$max=0.3V<br>$V_{OH}$min=2.4V | 不用则悬空。 |

uBlox SARA-R4-N4

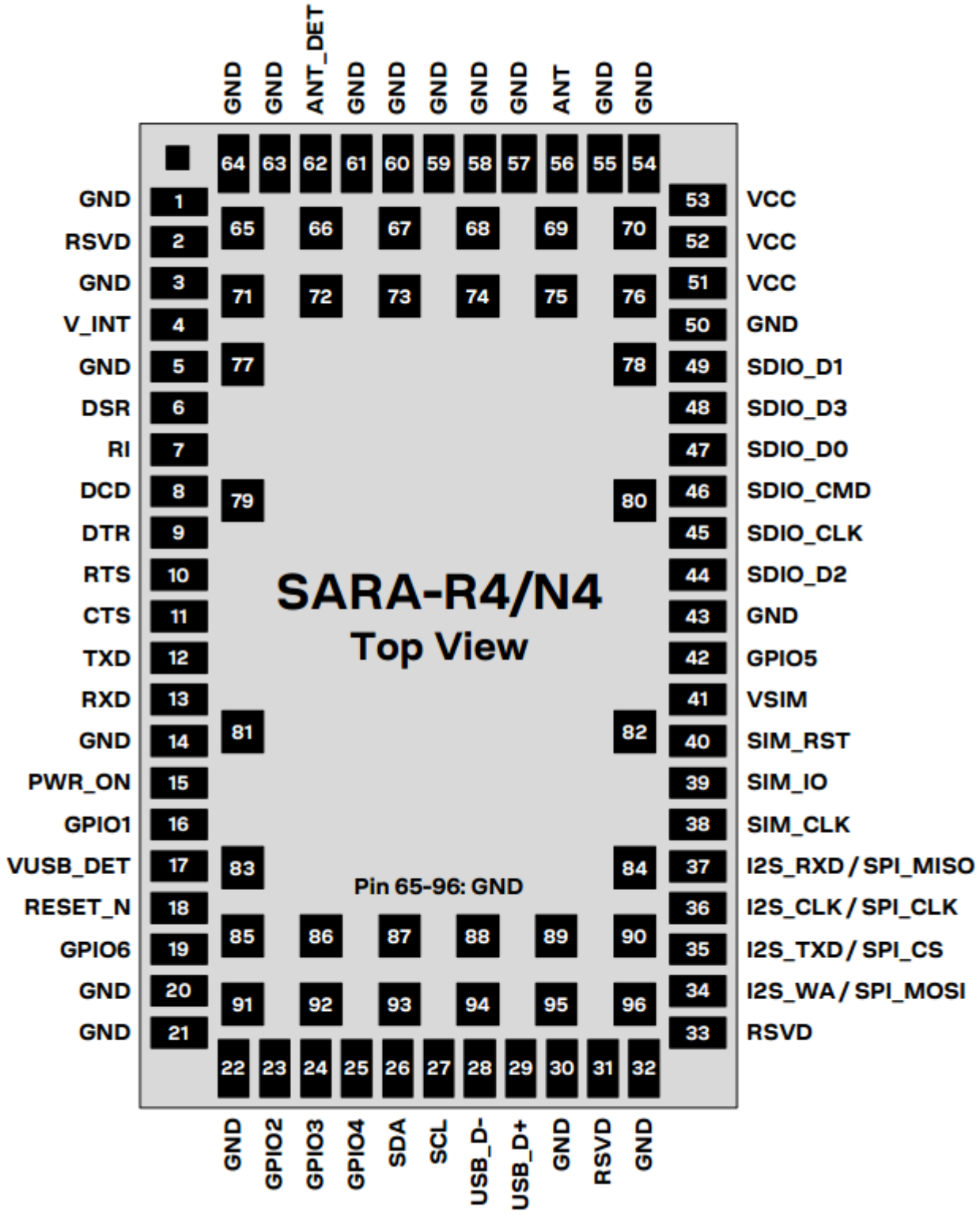


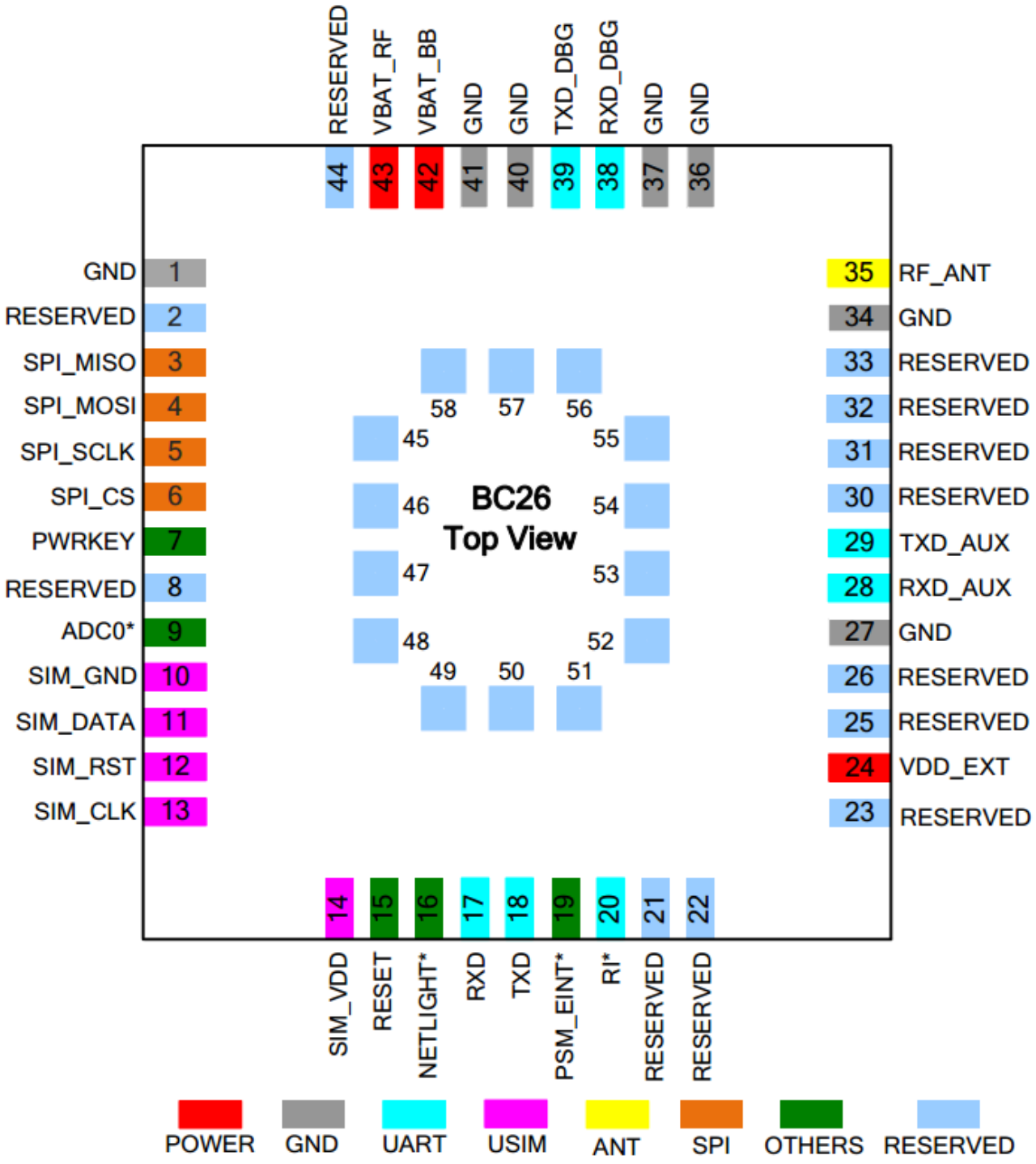

Figure 2: SARA-R4/N4 series pin assignment (top view)

| No | Name | Power domain | I/O | Description | Remarks |
|---|---|---|---|---|---|
| 1 | GND | - | N/A | Ground | All the GND pins must be connected to ground |
| 2 | RSVD | - | N/A | RESERVED pin | Leave unconnected. |
| 3 | GND | - | N/A | Ground | All the GND pins must be connected to ground |
| 4 | V_INT | - | O | Generic Digital Interfaces supply output | V_INT = 1.8 V (typical) generated by the module when is switched on, outside low power PSM deep sleep mode.<br>See section 4.2.3 for detailed electrical specs.<br>Provide test point for diagnostic purposes. |
| 5 | GND | - | N/A | Ground | All the GND pins must be connected to ground |
| 6 | DSR | GDI | O | UART data set ready | Circuit 107 (DSR) in ITU-T V.24.<br>See section 4.2.12 for detailed electrical specs. |
| 7 | RI | GDI | O | UART ring indicator | Circuit 125 (RI) in ITU-T V.24.<br>See section 4.2.12 for detailed electrical specs. |
| 8 | DCD | GDI | O | UART data carrier detect | Circuit 109 (DCD) in ITU-T V.24.<br>See section 4.2.12 for detailed electrical specs. |
| 9 | DTR | GDI | I | UART data terminal ready | Circuit 108/2 (DTR) in ITU-T V. 24.<br>Internal active pull-up to V_INT.<br>See section 4.2.12 for detailed electrical specs. |
| 10 | RTS | GDI | I | UART ready to send | Circuit 105 (RTS) in ITU-T V.24.<br>Internal active pull-up to V_INT.<br>Flow control is not supported by the “00”, “01” and SARA-R410M-02B product versions<br>See section 4.2.12 for detailed electrical specs. |
| 11 | CTS | GDI | O | UART clear to send | Circuit 106 (CTS) in ITU-T V.24.<br>Flow control is not supported by the “00”, “01” and SARA-R410M-02B product versions<br>See section 4.2.12 for detailed electrical specs. |
| 12 | TXD | GDI | I | UART data input | Circuit 103 (TxD) in ITU-T V.24.<br>Internal active pull-down to GND on “00”, “02” versions<br>Internal active pull-up to V_INT on “01” versions<br>See section 4.2.12 for detailed electrical specs. |
| 13 | RXD | GDI | O | UART data output | Circuit 104 (RxD) in ITU-T V.24.<br>See section 4.2.12 for detailed electrical specs. |
| 14 | GND | - | N/A | Ground | All the GND pins must be connected to ground |
| 15 | PWR_ON | POS | I | Power-on / power-off input | Internal 200 kΩ pull-up resistor.<br>See section 4.2.8 for detailed electrical specs.<br>Provide test point for diagnostic purposes. |
| 16 | GPIO1 | GDI | I/O | GPIO | Configurable GPIO (see section 2.7).<br>See section 4.2.12 for detailed electrical specs. |
| 17 | VUSB_DET | USB | I | USB detect input | Input for VBUS (5 V typical) USB supply sense.<br>See section 4.2.11 for detailed electrical specs.<br>Provide test point for diagnostic purposes. |
| 18 | RESET_N | ERS | I | External reset input | Internal 37 kΩ pull-up resistor to V_INT.<br>See section 4.2.9 for detailed electrical specs.<br>Provide test point for diagnostic purposes. |
| 19 | GPIO6 | GDI | I/O | GPIO | Configurable GPIO (see section 2.7).<br>See section 4.2.12 for detailed electrical specs. |
| 20 | GND | - | N/A | Ground | All the GND pins must be connected to ground |
| 21 | GND | - | N/A | Ground | All the GND pins must be connected to ground |
| 22 | GND | - | N/A | Ground | All the GND pins must be connected to ground |

| | | | | | |
|---|---|---|---|---|---|
| 23 | GPIO2 | GDI | I/O | GPIO | Configurable GPIO (see section 2.7).<br>See section 4.2.12 for detailed electrical specs. |
| 24 | GPIO3 | GDI | I/O | GPIO | Configurable GPIO (see section 2.7).<br>See section 4.2.12 for detailed electrical specs. |
| 25 | GPIO4 | GDI | I/O | GPIO | Configurable GPIO (see section 2.7).<br>See section 4.2.12 for detailed electrical specs. |
| 26 | SDA | DDC | I/O | I²C bus data line | Fixed open drain.<br>Internal 2.2 kΩ pull-up resistor to V_INT.<br>Not supported by "00" and "01" product versions<br>See section 4.2.13 for detailed electrical specs. |
| 27 | SCL | DDC | O | I²C bus clock line | Fixed open drain.<br>Internal 2.2 kΩ pull-up resistor to V_INT.<br>Not supported by "00" and "01" product versions<br>See section 4.2.13 for detailed electrical specs. |
| 28 | USB_D- | USB | I/O | USB Data Line D- | 90 Ω nominal differential impedance.<br>Pull-up, pull-down and series resistors, as required by the USB 2.0 specifications [10], are part of the USB pin driver and shall not be provided externally.<br>See section 4.2.11 for detailed electrical specs.<br>Provide test point for diagnostic purposes. |
| 29 | USB_D+ | USB | I/O | USB Data Line D+ | 90 Ω nominal differential impedance.<br>Pull-up, pull-down and series resistors, as required by USB 2.0 specifications [10], are part of the USB pin driver and shall not be provided externally.<br>See section 4.2.11 for detailed electrical specs.<br>Provide test point for diagnostic purposes. |
| 30 | GND | - | N/A | Ground | All the GND pins must be connected to ground |
| 31 | RSVD | - | N/A | RESERVED pin | Leave unconnected. |
| 32 | GND | - | N/A | Ground | All the GND pins must be connected to ground |
| 33 | RSVD | - | N/A | RESERVED pin | This pin can be connected to GND. |
| 34 | I2S_WA /<br>SPI_MOSI | GDI | O /<br>O | I²S word alignment /<br>SPI Master Output Slave Input | I²S word alignment, alternatively configurable as SPI Master Output Slave Input<br>Not supported by "00", "01" and "02" product versions<br>See section 4.2.12 for detailed electrical specs. |
| 35 | I2S_TXD /<br>SPI_CS | GDI | O /<br>O | I²S transmit data /<br>SPI Chip Select | I²S transmit data out, alternatively configurable as SPI Chip Select<br>Not supported by "00", "01" and "02" product versions<br>See section 4.2.12 for detailed electrical specs. |
| 36 | I2S_CLK /<br>SPI_CLK | GDI | O /<br>O | I²S clock /<br>SPI clock | I²S clock, alternatively configurable as SPI clock<br>Not supported by "00", "01" and "02" product versions<br>See section 4.2.12 for detailed electrical specs. |
| 37 | I2S_RXD /<br>SPI_MISO | GDI | I /<br>I | I²S receive data /<br>SPI Master Input Slave Output | I²S receive data input, alternatively configurable as SPI Master Input Slave Output<br>Not supported by "00", "01" and "02" product versions<br>See section 4.2.12 for detailed electrical specs. |
| 38 | SIM_CLK | SIM | O | SIM clock | See section 4.2.10 for detailed electrical specs. |
| 39 | SIM_IO | SIM | I/O | SIM data | Internal 4.7 kΩ pull-up resistor to VSIM.<br>See section 4.2.10 for detailed electrical specs. |
| 40 | SIM_RST | SIM | O | SIM reset | See section 4.2.10 for detailed electrical specs. |

| | | | | | |
|---|---|---|---|---|---|
| 41 | VSIM | - | O | SIM supply output | VSIM = 1.80 V typical or 2.95 V typical generated by the module according to the external SIM card type.<br>See section 4.2.3 for detailed electrical specs. |
| 42 | GPIO5 | GDI | I | SIM detection | SIM card presence detection input, alternatively configurable as GPIO (see section 2.7).<br>See section 4.2.12 for detailed electrical specs. |
| 43 | GND | - | N/A | Ground | All the GND pins must be connected to ground |
| 44 | SDIO_D2 | GDI | I/O | SDIO serial data [2] | Not supported by “00”, “01” and “02” product versions<br>See section 4.2.12 for detailed electrical specs. |
| 45 | SDIO_CLK | GDI | O | SDIO serial clock | Not supported by “00”, “01” and “02” product versions<br>See section 4.2.12 for detailed electrical specs. |
| 46 | SDIO_CMD | GDI | I/O | SDIO command | Not supported by “00”, “01” and “02” product versions<br>See section 4.2.12 for detailed electrical specs. |
| 47 | SDIO_D0 | GDI | I/O | SDIO serial data [0] | Not supported by “00”, “01” and “02” product versions<br>See section 4.2.12 for detailed electrical specs. |
| 48 | SDIO_D3 | GDI | I/O | SDIO serial data [3] | Not supported by “00”, “01” and “02” product versions<br>See section 4.2.12 for detailed electrical specs. |
| 49 | SDIO_D1 | GDI | I/O | SDIO serial data [1] | Not supported by “00”, “01” and “02” product versions<br>See section 4.2.12 for detailed electrical specs. |
| 50 | GND | - | N/A | Ground | All the GND pins must be connected to ground |
| 51 | VCC | - | I | Module supply input | All VCC pins must be connected to external supply.<br>SARA-R404M, SARA-R410M and SARA-N410: supply input for all internal parts.<br>SARA-R412M: supply input for internal BB PMU.<br>See section 4.2.3 and 4.2.4 for detailed specs. |
| 52 | VCC | - | I | Module supply input | All VCC pins must be connected to external supply.<br>SARA-R404M, SARA-R410M and SARA-N410: supply input for all internal parts.<br>SARA-R412M: supply input for internal RF PA.<br>See section 4.2.3 and 4.2.4 for detailed specs. |
| 53 | VCC | - | I | Module supply input | All VCC pins must be connected to external supply.<br>SARA-R404M, SARA-R410M and SARA-N410: supply input for all internal parts.<br>SARA-R412M: supply input for internal RF PA.<br>See section 4.2.3 and 4.2.4 for detailed specs. |
| 54 | GND | - | N/A | Ground | All the GND pins must be connected to ground |
| 55 | GND | - | N/A | Ground | All the GND pins must be connected to ground |
| 56 | ANT | - | I/O | RF input/output | 50 Ω nominal impedance.<br>See section 4.2.5 for detailed electrical specs. |
| 57 | GND | - | N/A | Ground | All the GND pins must be connected to ground |
| 58 | GND | - | N/A | Ground | All the GND pins must be connected to ground |
| 59 | GND | - | N/A | Ground | All the GND pins must be connected to ground |
| 60 | GND | - | N/A | Ground | All the GND pins must be connected to ground |
| 61 | GND | - | N/A | Ground | All the GND pins must be connected to ground |
| 62 | ANT_DET | ADC | I | Antenna detection | Antenna presence detection function.<br>See section 4.2.7 for detailed electrical specs. |
| 63 | GND | - | N/A | Ground | All the GND pins must be connected to ground |
| 64 | GND | - | N/A | Ground | All the GND pins must be connected to ground |
| 65-96 | GND | - | N/A | Ground | All the GND pins must be connected to ground |

BC26


BC26
Top View
1 GND
2 RESERVED
3 SPI_MISO
4 SPI_MOSI
5 SPI_SCLK
6 SPI_CS
7 PWRKEY
8 RESERVED
9 ADC0*
10 SIM_GND
11 SIM_DATA
12 SIM_RST
13 SIM_CLK
14 SIM_VDD
15 RESET
16 NETLIGHT*
17 RXD
18 TXD
19 PSM_EINT*
20 RI*
21 RESERVED
22 RESERVED
23 RESERVED
24 VDD_EXT
25 RESERVED
26 RESERVED
27 GND
28 RXD_AUX
29 TXD_AUX
30 RESERVED
31 RESERVED
32 RESERVED
33 RESERVED
34 GND
35 RF_ANT
36 GND
37 GND
38 RXD_DBG
39 TXD_DBG
40 GND
41 GND
42 VBAT_BB
43 VBAT_RF
44 RESERVED
45
46
47
48
49
50
51
52
53
54
55
56
57
58
POWER
GND
UART
USIM
ANT
SPI
OTHERS
RESERVED

| 电源 | | | | | |
|---|---|---|---|---|---|
| 引脚名 | 引脚号 | I/O | 描述 | DC 特性 | 备注 |
| VBAT_BB | 42 | PI | 模块基带电源 | Vmax=3.63V<br>Vmin=2.1V<br>Vnorm=3.3V | |
| VBAT_RF | 43 | PI | 模块射频电源 | Vmax=3.63V<br>Vmin=2.1V<br>Vnorm=3.3V | |
| VDD_EXT | 24 | PO | 1.8V 输出电源 | Vmin=1.53V<br>Vnorm=1.8V | PSM 模式下无电压输出。<br>可为模块的上拉电路供电；不建议用于外部电路供电。 |
| GND | 1，27，34，36，37，40，41 | | GND | | |

| 辅助串口 | | | | | |
|---|---|---|---|---|---|
| 引脚名 | 引脚号 | I/O | 描述 | DC 特性 | 备注 |
| RXD_AUX | 28 | DI | 接收数据 | | 1.8V 电源域。 |
| TXD_AUX | 29 | DO | 发送数据 | | |
| RXD_DBG | 38 | DI | 接收数据 | | 1.8V 电源域。 |
| TXD_DBG | 39 | DO | 发送数据 | | |

| 振铃信号 | | | | | |
|---|---|---|---|---|---|
| 引脚名 | 引脚号 | I/O | 描述 | DC 特性 | 备注 |
| RI* | 20 | DO | 振铃指示器 | | 1.8V 电源域 |

| USIM 接口 | | | | | |
|---|---|---|---|---|---|
| 引脚名 | 引脚号 | I/O | 描述 | DC 特性 | 备注 |
| SIM_VDD | 14 | DO | USIM 卡电源 | Vnorm=1.8V | |
| SIM_RST | 12 | DO | USIM 卡复位信号 | $V_{OL}$max=0.15×SIM_VDD<br>$V_{OH}$min=0.85×SIM_VDD | |
| SIM_DATA | 11 | IO | USIM 卡数据信号 | $V_{IL}$max=0.25×SIM_VDD<br>$V_{IH}$min=0.75×SIM_VDD<br>$V_{OL}$max=0.15×SIM_VDD<br>$V_{OH}$min=0.85×SIM_VDD | |
| SIM_SCLK | 13 | DO | USIM 卡时钟信号 | $V_{OL}$max=0.15×SIM_VDD<br>$V_{OH}$min=0.85×SIM_VDD | |
| SIM_GND | 10 | GND | USIM 卡专用地 | | |

| 天线接口 | | | | | |
|---|---|---|---|---|---|
| 引脚名 | 引脚号 | I/O | 描述 | DC 特性 | 备注 |
| RF_ANT | 35 | IO | RF 天线接口 | 50Ω 特性阻抗 | |

| SPI 接口 | | | | | |
|---|---|---|---|---|---|
| 引脚名 | 引脚号 | I/O | 描述 | DC 特性 | 备注 |
| SPI_MISO | 3 | DI | 主机输入从机输出信号 | | 1.8V 电源域。 |
| SPI_MOSI | 4 | DO | 主机输出从机输入信号 | | |
| SPI_SCLK | 5 | DO | 串行时钟信号 | | |
| SPI_CS | 6 | DO | 片选信号 | | |

| | | | | | |
|---|---|---|---|---|---|
| 引脚名 | 引脚号 | I/O | 描述 | DC 特性 | 备注 |
| PWRKEY | 7 | DI | 拉低 PWRKEY 使模块开机 | $V_{IL}$max=0.3*VBAT<br>$V_{IH}$min=0.7*VBAT | |

| 复位接口 | | | | | |
|---|---|---|---|---|---|
| 引脚名 | 引脚号 | I/O | 描述 | DC 特性 | 备注 |
| RESET | 15 | DI | 复位模块 | | 低电平有效。 |

| PSM_EINT 接口 | | | | | |
|---|---|---|---|---|---|
| 引脚名 | 引脚号 | I/O | 描述 | DC 特性 | 备注 |
| PSM_EINT* | 19 | DI | 外部中断引脚。<br>从 PSM 唤醒模块。 | | |

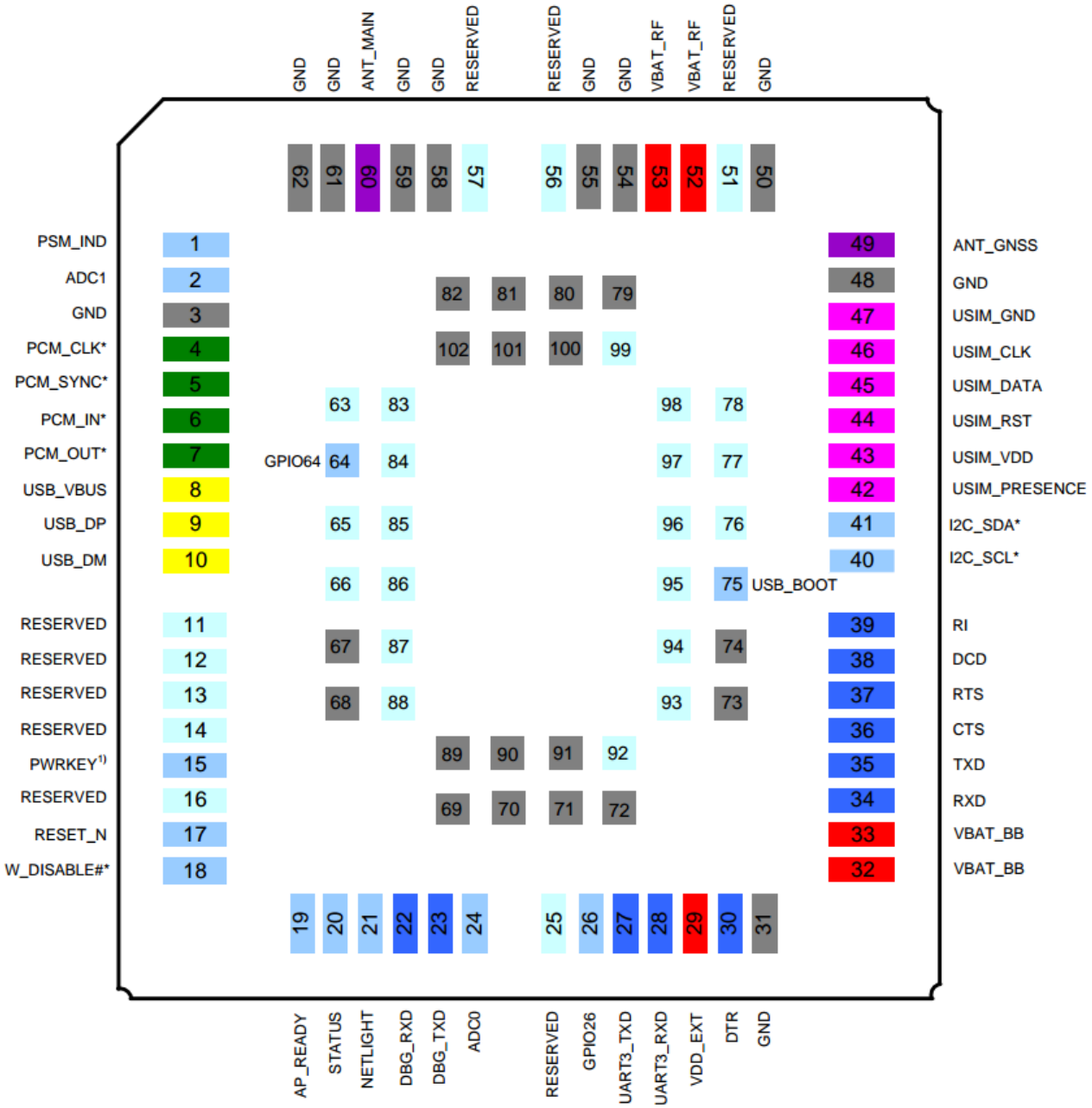
| 网络状态指示 | | | | | |
|---|---|---|---|---|---|
| 引脚名 | 引脚号 | I/O | 描述 | DC 特性 | 备注 |
| NETLIGHT* | 16 | DO | 网络状态指示 | | |

| ADC 接口 | | | | | |
|---|---|---|---|---|---|
| 引脚名 | 引脚号 | I/O | 描述 | DC 特性 | 备注 |
| ADC0* | 9 | AI | 通用模数转换接口 | 采集的电压范围：<br>0V~1.4V | |

| 主串口 | | | | | |
|---|---|---|---|---|---|
| 引脚名 | 引脚号 | I/O | 描述 | DC 特性 | 备注 |
| RXD | 17 | DI | 接收数据 | | 1.8V 电源域。 |
| TXD | 18 | DO | 发送数据 | | |

| | | | | | |
|---|---|---|---|---|---|
| RESERVED | 2，8，21~23，25~26，30~33，44~58 | | | | 保持悬空。 |

# BG96


GND
GND
ANT_MAIN
GND
GND
RESERVED
RESERVED
GND
GND
VBAT_RF
VBAT_RF
RESERVED
GND
62
61
60
59
58
57
56
55
54
53
52
51
50
PSM_IND
ADC1
GND
PCM_CLK*
PCM_SYNC*
PCM_IN*
PCM_OUT*
USB_VBUS
USB_DP
USB_DM
1
2
3
4
5
6
7
8
9
10
GPIO64
63
64
65
66
67
68
82
81
80
79
102
101
100
99
83
84
85
86
87
88
98
97
96
95
94
93
78
77
76
75
74
73
USB_BOOT
49
48
47
46
45
44
43
42
41
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38
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36
35
34
33
32
ANT_GNSS
GND
USIM_GND
USIM_CLK
USIM_DATA
USIM_RST
USIM_VDD
USIM_PRESENCE
I2C_SDA*
I2C_SCL*
RESERVED
RESERVED
RESERVED
RESERVED
PWRKEY[1)]
RESERVED
RESET_N
W_DISABLE#*
11
12
13
14
15
16
17
18
89
90
91
92
69
70
71
72
RI
DCD
RTS
CTS
TXD
RXD
VBAT_BB
VBAT_BB
19
20
21
22
23
24
25
26
27
28
29
30
31
AP_READY
STATUS
NETLIGHT
DBG_RXD
DBG_TXD
ADC0
RESERVED
GPIO26
UART3_TXD
UART3_RXD
VDD_EXT
DTR
GND

**Table 4: Pin Description**

| Power Supply | | | | | |
|---|---|---|---|---|---|
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| VBAT_BB | 32, 33 | PI | Power supply for the module's baseband part | Vmax=4.3V<br>Vmin=3.3V<br>Vnorm=3.8V | |
| VBAT_RF | 52, 53 | PI | Power supply for the module's RF part | Vmax=4.3V<br>Vmin=3.3V<br>Vnorm=3.8V | |
| VDD_EXT | 29 | PO | Provide 1.8V for external circuit | Vnorm=1.8V<br>$I_O$max=50mA | Power supply for external GPIO's pull-up circuits. |
| GND | 3, 31, 48, 50, 54, 55, 58, 59, 61, 62, 67~74, 79~82, 89~91, 100~102 | | Ground | | |
| **Turn on/off** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| PWRKEY | 15 | DI | Turn on/off the module | $V_{IH}$max=2.1V<br>$V_{IH}$min=1.3V<br>$V_{IL}$max=0.5V | The output voltage is 0.8V because of the diode drop in the Qualcomm chipset. |
| RESET_N | 17 | DI | Reset the module | $V_{IH}$max=2.1V<br>$V_{IH}$min=1.3V<br>$V_{IL}$max=0.5V | If unused, keep this pin open. |
| **Status Indication** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| STATUS | 20 | DO | Indicate the module's operation status | $V_{OH}$min=1.35V<br>$V_{OL}$max=0.45V | 1.8V power domain.<br>If unused, keep this pin open. |
| NETLIGHT | 21 | DO | Indicate the module's network activity status | $V_{OH}$min=1.35V<br>$V_{OL}$max=0.45V | 1.8V power domain.<br>If unused, keep this pin open. |
| **USB Interface** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| USB_VBUS | 8 | PI | USB detection | Vmax=5.25V<br>Vmin=3.0V<br>Vnorm=5.0V | |
| USB_DP | 9 | IO | USB differential data bus (+) | Compliant with USB 2.0 standard specification. | Require differential impedance of 90Ω. |
| USB_DM | 10 | IO | USB differential data bus (-) | Compliant with USB 2.0 standard specification. | Require differential impedance of 90Ω. |
| **(U)SIM Interface** | | | | | |
| **Pin Name** | **Pin No.** | **I/O** | **Description** | **DC Characteristics** | **Comment** |
| USIM_PRESENCE | 42 | DI | (U)SIM card insertion detection | $V_{IL}$min=-0.3V<br>$V_{IL}$max=0.6V<br>$V_{IH}$min=1.2V<br>$V_{IH}$max=2.0V | 1.8V power domain.<br>If unused, keep this pin open. |
| USIM_VDD | 43 | PO | Power supply for (U)SIM card | **For 1.8V (U)SIM:**<br>Vmax=1.9V<br>Vmin=1.7V<br>**For 3.0V (U)SIM:**<br>Vmax=3.05V<br>Vmin=2.7V<br>$I_O$max=50mA | Either 1.8V or 3.0V is supported by the module automatically. |
| USIM_RST | 44 | DO | Reset signal of (U)SIM card | **For 1.8V (U)SIM:**<br>$V_{OL}$max=0.45V<br>$V_{OH}$min=1.35V<br>**For 3.0V (U)SIM:**<br>$V_{OL}$max=0.45V<br>$V_{OH}$min=2.55V | |
| USIM_DATA | 45 | IO | Data signal of (U)SIM card | **For 1.8V (U)SIM:**<br>$V_{IL}$max=0.6V<br>$V_{IH}$min=1.2V<br>$V_{OL}$max=0.45V<br>$V_{OH}$min=1.35V<br>**For 3.0V (U)SIM:**<br>$V_{IL}$max=1.0V<br>$V_{IH}$min=1.95V<br>$V_{OL}$max=0.45V<br>$V_{OH}$min=2.55V | |
| USIM_CLK | 46 | DO | Clock signal of (U)SIM card | **For 1.8V (U)SIM:**<br>$V_{OL}$max=0.45V<br>$V_{OH}$min=1.35V | |

| | | | | | |
|---|---|---|---|---|---|
| | | | | **For 3.0V (U)SIM:**<br>$V_{OL}$max=0.45V<br>$V_{OH}$min=2.55V | |
| USIM_GND | 47 | | Specified ground for (U)SIM card | | |

**UART1 Interface**

| Pin Name | Pin No. | I/O | Description | DC Characteristics | Comment |
|---|---|---|---|---|---|
| DTR | 30 | DI | Data terminal ready(sleep mode control) | $V_{IL}$min=-0.3V<br>$V_{IL}$max=0.6V<br>$V_{IH}$min=1.2V<br>$V_{IH}$max=2.0V | 1.8V power domain.<br>If unused, keep this pin open. |
| RXD | 34 | DI | Receive data | $V_{IL}$min=-0.3V<br>$V_{IL}$max=0.6V<br>$V_{IH}$min=1.2V<br>$V_{IH}$max=2.0V | 1.8V power domain.<br>If unused, keep this pin open. |
| TXD | 35 | DO | Transmit data | $V_{OL}$max=0.45V<br>$V_{OH}$min=1.35V | 1.8V power domain.<br>If unused, keep this pin open. |
| CTS | 36 | DO | Clear to send | $V_{OL}$max=0.45V<br>$V_{OH}$min=1.35V | 1.8V power domain.<br>If unused, keep this pin open. |
| RTS | 37 | DI | Request to send | $V_{IL}$min=-0.3V<br>$V_{IL}$max=0.6V<br>$V_{IH}$min=1.2V<br>$V_{IH}$max=2.0V | 1.8V power domain.<br>If unused, keep this pin open. |
| DCD | 38 | DO | Data carrier detection | $V_{OL}$max=0.45V<br>$V_{OH}$min=1.35V | 1.8V power domain.<br>If unused, keep this pin open. |
| RI | 39 | DO | Ring indicator | $V_{OL}$max=0.45V<br>$V_{OH}$min=1.35V | 1.8V power domain.<br>If unused, keep this pin open. |

**UART2 Interface**

| Pin Name | Pin No. | I/O | Description | DC Characteristics | Comment |
|---|---|---|---|---|---|
| DBG_RXD | 22 | DI | Receive data | $V_{IL}$min=-0.3V<br>$V_{IL}$max=0.6V<br>$V_{IH}$min=1.2V<br>$V_{IH}$max=2.0V | 1.8V power domain.<br>If unused, keep this pin open. |
| DBG_TXD | 23 | DO | Transmit data | $V_{OL}$max=0.45V | 1.8V power domain. |

| Pin Name | Pin No. | I/O | Description | DC Characteristics | Comment |
|---|---|---|---|---|---|
| ANT_MAIN | 60 | IO | Main antenna interface | 50Ω impedance | |
| ANT_GNSS | 49 | AI | GNSS antenna interface | 50Ω impedance | If unused, keep this pin open. |

**Other Pins**

| Pin Name | Pin No. | I/O | Description | DC Characteristics | Comment |
|---|---|---|---|---|---|
| PSM_IND | 1 | DO | Power saving mode indicator | $V_{OL}$max=0.45V<br>$V_{OH}$min=1.35V | 1.8V power domain.<br>If unused, keep this pin open. |
| W_DISABLE#* | 18 | DI | Airplane mode control | $V_{IL}$min=-0.3V<br>$V_{IL}$max=0.6V<br>$V_{IH}$min=1.2V<br>$V_{IH}$max=2.0V | 1.8V power domain.<br>Pull-up by default.<br>In low voltage level, the module can enter into airplane mode.<br>If unused, keep this pin open. |
| AP_READY | 19 | DI | Application processor sleep state detection | $V_{IL}$min=-0.3V<br>$V_{IL}$max=0.6V<br>$V_{IH}$min=1.2V<br>$V_{IH}$max=2.0V | 1.8V power domain.<br>If unused, keep this pin open. |
| USB_BOOT | 75 | DI | Force the module to enter into emergency download mode | $V_{IL}$min=-0.3V<br>$V_{IL}$max=0.6V<br>$V_{IH}$min=1.2V<br>$V_{IH}$max=2.0V | 1.8V power domain.<br>If unused, keep this pin open. |
| GPIO26 | 26 | IO | General-purpose input/ output interface | $V_{OL}$max=0.45V<br>$V_{OH}$min=1.35V<br>$V_{IL}$min=-0.3V<br>$V_{IL}$max=0.6V<br>$V_{IH}$min=1.2V<br>$V_{IH}$max=2.0V | 1.8V power domain.<br>If unused, keep this pin open. |
| GPIO64 | 64 | IO | General-purpose input/ output interface | $V_{OL}$max=0.45V<br>$V_{OH}$min=1.35V<br>$V_{IL}$min=-0.3V<br>$V_{IL}$max=0.6V<br>$V_{IH}$min=1.2V<br>$V_{IH}$max=2.0V | 1.8V power domain.<br>If unused, keep this pin open. |
| | | | | $V_{OH}$min=1.35V | If unused, keep this pin open. |

**UART3 Interface**

| Pin Name | Pin No. | I/O | Description | DC Characteristics | Comment |
|---|---|---|---|---|---|
| UART3_TXD | 27 | DO | Transmit data | $V_{OL}$max=0.45V<br>$V_{OH}$min=1.35V | 1.8V power domain.<br>If unused, keep this pin open. |
| UART3_RXD | 28 | DI | Receive data | $V_{IL}$min=-0.3V<br>$V_{IL}$max=0.6V<br>$V_{IH}$min=1.2V<br>$V_{IH}$max=2.0V | 1.8V power domain.<br>If unused, keep this pin open. |

**PCM* Interface**

| Pin Name | Pin No. | I/O | Description | DC Characteristics | Comment |
|---|---|---|---|---|---|
| PCM_CLK* | 4 | DO | PCM clock output | $V_{OL}$max=0.45V<br>$V_{OH}$min=1.35V | 1.8V power domain.<br>If unused, keep this pin open. |
| PCM_SYNC* | 5 | DO | PCM frame synchronization output | $V_{OL}$max=0.45V<br>$V_{OH}$min=1.35V | 1.8V power domain.<br>If unused, keep this pin open. |
| PCM_IN* | 6 | DI | PCM data input | $V_{IL}$min=-0.3V<br>$V_{IL}$max=0.6V<br>$V_{IH}$min=1.2V<br>$V_{IH}$max=2.0V | 1.8V power domain.<br>If unused, keep this pin open. |
| PCM_OUT* | 7 | DO | PCM data output | $V_{OL}$max=0.45V<br>$V_{OH}$min=1.35V | 1.8V power domain.<br>If unused, keep this pin open. |

**I2C* Interface**

| Pin Name | Pin No. | I/O | Description | DC Characteristics | Comment |
|---|---|---|---|---|---|
| I2C_SCL* | 40 | OD | I2C serial clock. Used for external codec. | | External pull-up resistor is required.<br>1.8V only. If unused, keep this pin open. |
| I2C_SDA* | 41 | OD | I2C serial data. Used for external codec. | | External pull-up resistor is required.<br>1.8V only. If unused, keep this pin open. |

**Antenna Interfaces**

| Pin Name | Pin No. | I/O | Description | DC Characteristics | Comment |
|---|---|---|---|---|---|
| ADC1 | 2 | AI | General purpose analog to digital converter interface | Voltage range: 0.3V to 1.8V | If unused, keep this pin open. |
| ADC0 | 24 | AI | General purpose analog to digital converter interface | Voltage range: 0.3V to 1.8V | If unused, keep this pin open. |

**RESERVED Pins**

| Pin Name | Pin No. | I/O | Description | DC Characteristics | Comment |
|---|---|---|---|---|---|
| RESERVED | 11~14, 16, 25, 51, 56, 57, 63, 65, 66, 76~78, 83~88, 92~99 | | Reserved | | Keep these pins open. |