

IGX-SACF1-9379a3-BT

»»» 802.11ac Dual-Band 2Tx2R
WiFi + Bluetooth v4.2 SDIO
Module



This module is a single-die Wireless Local Area Network (WLAN) and Bluetooth (BT) combo solution to support the 2x2 MIMO with two spatial streams IEEE 802.11 a/b/g/n/ac WLAN standards and BT v4.2+HS. It is also enabling seamless integration of WLAN/BT and Low Energy technology.

KEY FEATURES

- IEEE Standards Support, 802.11a, 802.11b, 802.11g, 802.11n, and 802.11ac.
- Supports channel widths 20/40MHz at 2.4GHz and 20/40/80MHz at 5GHz.
- Supports SDIO interface for WLAN and UART interface for BT.
- Supports BT version: 4.2+HS, BLE, ANT+ and backward compatible with the BT versions of 1.1, 1.2, 2.0, 2.1, 3.0+HS and 4.0LE.
- Supports Class1 BT power level transmissions.
- Dual-stream IEEE 802.11n support for 20 and 40MHz channels provide the PHY layer rates up to 300Mbps.
- Dual-stream IEEE 802.11ac support for 80MHz channels provide the PHY layer rates up to 867Mbps.
- Supports Wi-Fi Direct for Linux and Android OS.
- Supports MU-MIMO.
- Supports Adaptive Frequency Hopping (AFH), Secure Simple Pairing (SSP) and Extended Inquiry Response (EIR) function.
- Scatter net operation with up to four active piconets with background scan and support for the scatter mode.
- Low power consumption to meet worldwide energy standards.
- Fully compliance with the SDIO v3.0 specification.
- Supporting OS: **Linux and Android**

Datasheet

IGX QCA9379

Hardware Module - IGX-SACF1-9379a3-BT



SPECIFICATIONS

1. Software Specifications

Standards	IEEE 802.11ac; 802.11a; 802.11b; 802.11g; 802.11n; 802.11h, WMM, DFS & TPC
Driver Support	Linux, Android
Security	64/128-bits WEP, WPA, WPA2, IEEE 802.1x, EAP-FAST, PEAPv1/EAP-GTC, PEAPv0/EAP-MSCHAPv2, PEAP-TLS, LEAP, EAP-TLS, EAP-TTLS

2. Bluetooth Function

Main Chipset	Qualcomm Atheros QCA9379-3
Standard	BT v4.2 LE
Bus Interface	UART
Data Rate	1Mbps, 2Mbps and up to 3.2Mbps
Modulation Scheme	GFSK, $\pi/4$ -DQPSK, and 8-DPSK
Frequency Range	2.402 ~ 2.480GHz
Transmit Output Power	+4 ≤ Output Power ≤ +10dBm; Class 1 Device
Receiver Sensitivity	< 0.1% BER at -94dBm

Datasheet

IGX QCA9379

Hardware Module - IGX-SACF1-9379a3-BT



3. Wi-Fi Function

Main Chipset	Qualcomm Atheros QCA9379-3
Standard	IEEE 802.11a; 802.11b; 802.11g; 802.11n; 802.11ac
Bus Interface	SDIO 3.0
Data Rate	802.11a: 54, 48, 36, 24, 18, 12, 9, 6Mbps 802.11b: 11, 5.5, 2, 1Mbps 802.11g: 54, 48, 36, 24, 18, 12, 9, 6Mbps 802.11n: MCS 0 to 15 for HT20MHz MCS 0 to 15 for HT40MHz 802.11ac: MCS 0 to 8 for HT20MHz MCS 0 to 9 for HT40MHz MCS 0 to 9 for HT80MHz
Media Access Control	CSMA/CA with ACK
Modulation Technique	802.11a: 64QAM, 16QAM, QPSK, BPSK 802.11b: CCK, DQPSK, DBPSK 802.11g: 64QAM, 16QAM, QPSK, BPSK 802.11n: 64QAM, 16QAM, QPSK, BPSK 802.11ac: 256QAM, 64QAM, 16QAM, QPSK, BPSK
Network Architecture	Infrastructure mode
Operation Channel	2.4GHz:- 11: (Ch. 1-11) – United States 13: (Ch. 1-13) – Europe 14: (Ch. 1-14) – Japan 5GHz:- 21: USA 19: EU 8: Japan
Frequency Range	802.11bg: 2.400 ~ 2.4835GHz 802.11a: 5.15 ~ 5.85GHz

Datasheet

IGX QCA9379

Hardware Module - IGX-SACF1-9379a3-BT



**Transmit Output
Power - single chain
@ant;Tolerance:**

$\pm 2\text{dBm}$ @ 2.4GHz; $\pm 2.5\text{dBm}$ @ 5GHz

2.4GHz:

802.11b	1Mbps	2Mbps	5.5Mbps	11Mbps
Tgtpwr (dBm)	14.5	14.5	14.5	14.5

802.11g	6~24Mbps	36Mbps	48Mbps	54Mbps
Tgtpwr (dBm)	16.5	16	15	13.5

802.11n HT20	MCS0	MCS1	MCS2	MCS3	MCS4
Tgtpwr (dBm)	16.5	16.5	16.5	16	16
	MCS5	MCS6	MCS7	MCS8	MCS9
	15	14	13.5	11.5	
802.11n HT40	MCS0	MCS1	MCS2	MCS3	MCS4
Tgtpwr (dBm)	15.5	15.5	15.5	15	15
	MCS5	MCS6	MCS7	MCS8	MCS9
	14	13	12.5	11.5	10.5

5GHz:

802.11a	6~24Mbps	36Mbps	48Mbps	54Mbps
Tgtpwr (dBm)	15.5	14	13	12

802.11n HT20	MCS0	MCS1	MCS2	MCS3	MCS4
Tgtpwr (dBm)	15.5	15.5	15.5	15	15
	MCS5	MCS6	MCS7	MCS8	MCS9
	14	13	12.5	11	

Datasheet

IGX QCA9379

Hardware Module - IGX-SACF1-9379a3-BT



Receiver Sensitivity	802.11n HT40	MCS0	MCS1	MCS2	MCS3	MCS4
		14.5	14.5	14.5	14	14
		MCS5	MCS6	MCS7	MCS8	MCS9
		13	12	11	10	9
	802.11ac VHT80	MCS0	MCS1	MCS2	MCS3	MCS4
		13.5	13.5	13.5	13	13
		MCS5	MCS6	MCS7	MCS8	MCS9
		12	11	10	9	8
	2.4G	Frequency Band	Rate	Condition	1x1(1SS) (dBm)	2x2(1SS) (dBm)
		11b-1M		PER < 8%	-95	-97
		11b-11M		PER < 8%	-87	-87
		11g-6M		PER < 10%	-90	-92
		11g-54M		PER < 10%	-73	-75
		11ac-VHT20MCS0		PER < 10%	-89.5	-91.5
		11ac-VHT20MCS7		PER < 10%	-73	-75
		11ac-VHT20MCS8		PER < 10%	-68	-70
		11ac-VHT40MCS0		PER < 10%	-87	-89
		11ac-VHT40MCS7		PER < 10%	-69.5	-71.5
		11ac-VHT40MCS8		PER < 10%	-66.5	-68.5
		11ac-VHT40MCS9		PER < 10%	-63	-66
	5G	11a-6M		PER < 10%	-87.5	-89.5
		11a-54M		PER < 10%	-71	-73
		11ac-VHT20MCS0		PER < 10%	-87.5	-89.5
		11ac-VHT20MCS7		PER < 10%	-70	-73
		11ac-VHT20MCS8		PER < 10%	-66	-69
		11ac-VHT40MCS0		PER < 10%	-84.5	-86.5
		11ac-VHT40MCS7		PER < 10%	-67	-69
		11ac-VHT40MCS9		PER < 10%	-61	-64
		11ac-VHT80MCS0		PER < 10%	-81.5	-83.5
		11ac-VHT80MCS7		PER < 10%	-65	-67
		11ac-VHT80MCS9		PER < 10%	-57	-60

Datasheet

IGX QCA9379

Hardware Module - IGX-SACF1-9379a3-BT



Security

WPS, WPA, WPA2, WEP 64bit & 128bit, IEEE 802.1X, IEEE 802.11i

4. Common Function

Operating Voltage	3.3 V ± 5% I/O supply voltage				
Power Consumption	Mode	Average		Peak	
		2.4GHz	5GHz	2.4GHz	5GHz
	TX				
	RX				
Antenna Type	Triple MHF4 Antenna connectors for the WiFi/BT				

PIN ASSIGNMENT

Pin.	Pin Define	I/O	Description	Status
1	GND	G	Ground	YES
2	AVDD11	I	Analog 1.1V input from Pin#28 of Module (Host no need to connect)	NC
3	GND	G	Ground	YES
4	VDD33_WL_PA1	I	3.3V power for both 2.4/5GHz PA	YES
5	VDD33	I	3.3V power for WLAN	YES
6	GND	G	Ground	YES
7	VDDIO_XTAL	I	Share same voltage of VDDIO_AO_IN	YES
8	BT_UART_CTS	I	UART Clear to Send for BT interface	YES
9	BT_UART_TXD	O	UART Transmit Data for BT interface	YES
10	HOST_WAKEUP_BT#	I	Host wake up BT of QCA9379-3, Low Active	YES
11	BT_UART_RXD	I	UART Receive Data for BT interface	YES
12	BT_PCM_SYN	I	PCM synchronous for BT	YES
13	BT_PCM_OUT	O	PCM Data out for BT	YES
14	BT_UART_RTS	O	UART Ready to Send for BT interface	YES

Datasheet

IGX QCA9379

Hardware Module - IGX-SACF1-9379a3-BT



Pin.	Pin Define	I/O	Description	Status
15	BT_PCM_CLK	I	PCM Clock for BT	YES
16	AVDD11	I	Analog 1.1V input from Pin#28 of Module (Host no need to connect)	NC
17	BT_PCM_IN	I	PCM Data in for BT. 10K PU in the module	YES
18	VDDIO_GPIO1	I	1.8V or 3.3V upon signal interface	YES
19	RESERVED			NC
20	RESERVED			NC
21	VDDIO_GPIO0	I	Can be 1.8V (SDIO 3.0) or 3.3V (SDIO 2.0)	YES
22	SDOI_DATA3	I/O	SDIO Data Line 3 for WLAN	YES
23	WOW#	O	WLAN wake up Host, Low Active	YES
24	SDIO_CLK	I	SDIO Clock for WLAN	YES
25	SDOI_DATA2	I/O	SDIO Data Line 2 for WLAN	YES
26	SDOI_DATA1	I/O	SDIO Data Line 1 for WLAN	YES
27	SDOI_DATA0	I/O	SDIO Data Line 0 for WLAN	YES
28	AVDD11	O	Analog 1.1V output (Host no need to connect)	NC
29	SDIO_CMD	I/O	SDIO Command for WLAN	YES
30	WLAN_EN#	I	Active low to reset WLAN	YES
31	BT_EN#	I	Active low to reset BT	YES
32	VDDIO_AO_IN	I	Can be 1.8V or 3.3V to support always on the circuit of QCA9379-3. This signal must be connected to 1st power ON and last power OFF power rail. The design is a target to connect to the 3.3V.	YES
33	BT_WAKEUP_HOST#O		BT wake up Host. 10K PU in the module, Low Active	YES
34	Debug_UART_TXD	O	Firmware Debug pin, Host can be not connected	NC
35	Debug_UART_RXD	I	Firmware Debug pin, Host can be not connected	NC
36	VDD33_SWREG_VINI		3.3V input to internal SWREG PMU and OTPREG PMU	YES
37	SWREG_GND	G	Ground	YES
38	SWREG_GND	G	Ground	YES
39	VDDIO_GPIO2	I	1.8V or 3.3V upon a signal interface	YES

Datasheet

IGX QCA9379

Hardware Module - IGX-SACF1-9379a3-BT



Pin.	Pin Define	I/O	Description	Status
40	32.768KHz_IN	I	Optional external low-power 32.768KHz input Signal can't be active before VDDIO_GPIO2 is applied	YES
41	AVDD11	I	Analog 1.1V input from Pin#28 of Module (Host no need to connect)	NC
42	GND	G	Ground	YES
43	GND	G	Ground	YES
44	GND	G	Ground	YES
45	GND	G	Ground	YES
46	VDD33	I	3.3V Power for BT PA	YES
47	VDD33	I	3.3V Power for both 2.4/5GHz PA in WLAN Chain 0	YES
48	GND	G	Ground	YES
49	AVDD11	I	Analog 1.1V input from Pin#28 of Module (Host no need to connect)	NC
50~66	GND	G	Ground	YES

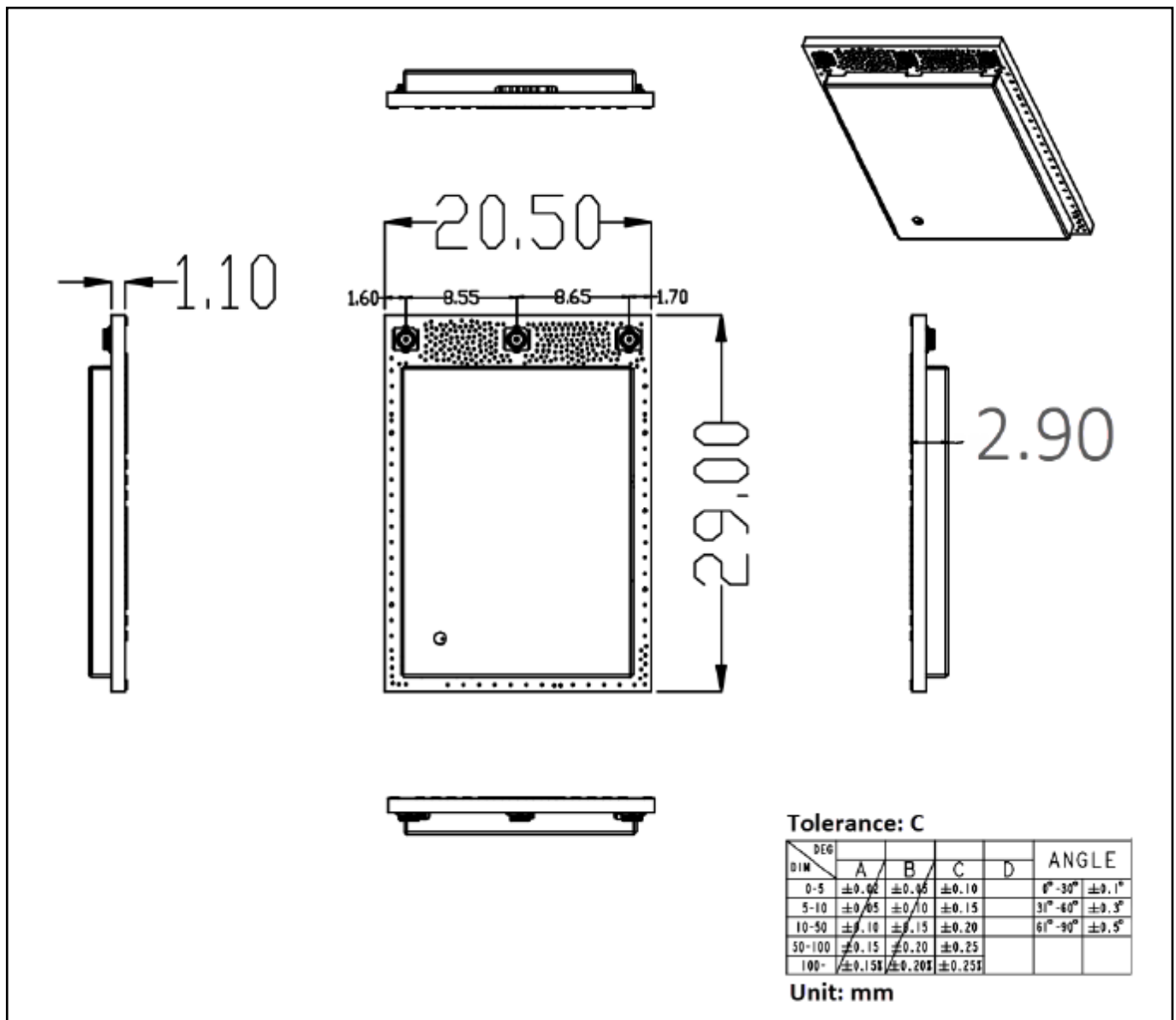
Datasheet

IGX QCA9379

Hardware Module - IGX-SACF1-9379a3-BT

MODULE 2D-DESIGN

1. Mechanical Top View

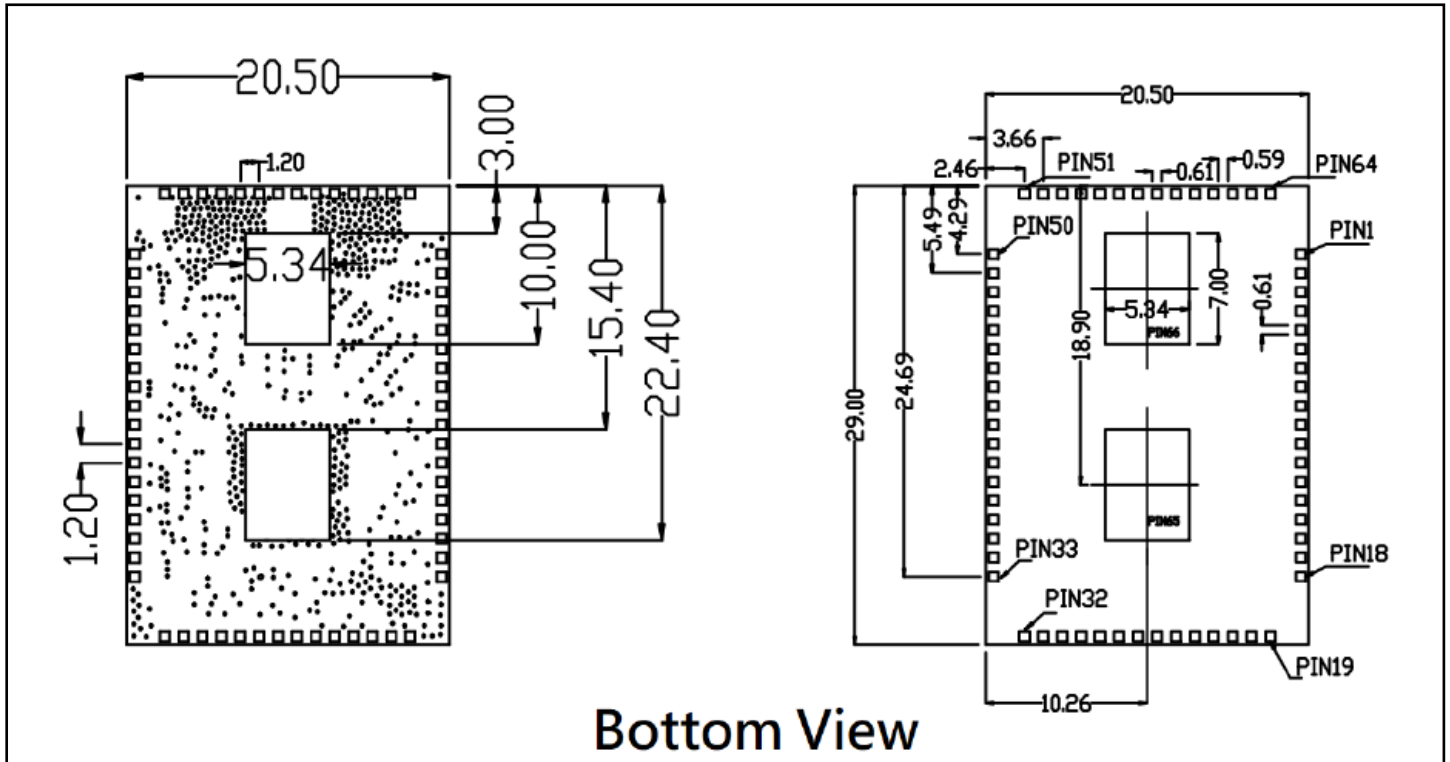


Datasheet

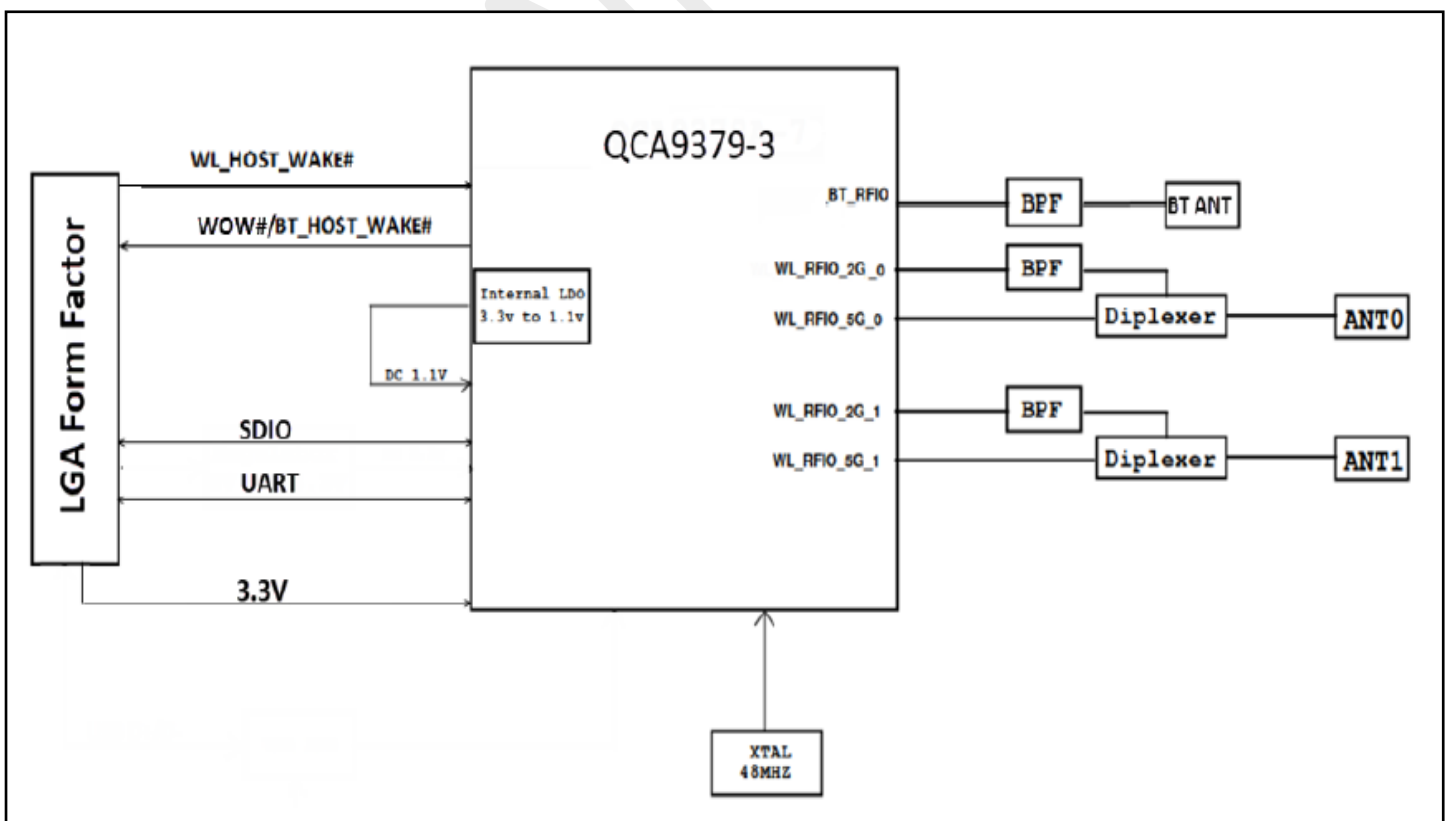
IGX QCA9379

Hardware Module - IGX-SACF1-9379a3-BT

2. FoodPrint Bottom View



3. Block Diagram



Datasheet

IGX QCA9379

Hardware Module - IGX-SACF1-9379a3-BT



4. Module Pinout

		64	63	62	61	60	59	58	57	56	55	54	53	52	51		
		GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND		
1	GND															GND	50
2	AVDD11_RF1															AVDD11	49
3	GND															GND	48
4	VDD33_WL_PA1															VDD33	47
5	VDD33															VDD33	46
6	GND															GND	45
7	VDDIO_XTAL															GND	44
8	BT_UART_CTS															GND	43
9	BT_UART_TXD															GND	42
10	HOST_WAKEUP_BT															AVDD11	41
11	BT_UART_RXD															32.768KHz_IN	40
12	BT_PCM_SYN															VDDIO_GPIO2	39
13	BT_PCM_OUT															GND	38
14	BT_UART_RTS															GND	37
15	BT_PCM_CLK															VDD33 for SWREG_IN	36
16	AVDD11															Debug_UART_RXD	35
17	BT_PCM_IN															Debug_UART_TXD	34
18	VDDIO_GPIO1															BT_WAKEUP_HOST	33
		RESERVED	RESERVED	VDDIO_GPIO0	SDIO_DATA3	WoW	SDIO_CLK	SDIO_DATA2	SDIO_DATA1	SDIO_DATA0	AVDD11	SDIO_CMD	WLAN_EN#	BT_EN#	VDDIO_AO_IN		
		19	20	21	22	23	24	25	26	27	28	29	30	31	32		

TOP View