User Manual

Bluetooth 3.0 HID Module ,Class 2	
Product:	**BT3GMD-B47P**
Module Number:	ID6ZFN-BK0
Brand name:	ZAGG
FCC ID:	QTG-ZKMS

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Section 1:Overview

The BT3GMD-B47P is a Bluetooth Human Interface Device(HID) module based on the Broadcom BCM20730 Bluetooth 3.0 specification basic rate-compliant stand alone baseband processor with an integrated 2.4GHz transceiver.

The module includes EEPROM, crystal, and PCB antenna.

1.1 Applications

- Wireless pointing devices: mice , trackballs , gestural controls
- Wireless keyboards
- 3D glasses
- Game controllers
- Point-of-sale(POS)input devices
- Remote sensors
- Home automation
- Personal health and fitness monitoring

1.2 Features

The BT3GMD-B47P offers the following features:

- On-chip support for common keyboard and mouse interfaces eliminates external processor
- Programmable keyscan matrix interface, up to 8 × 20 key-scanning matrix
- Bluetooth specification 3.0 compatible, includeing enhanced power control
- Bluetooth HID profile version 1.0 compliant
- Bluetooth Device ID profile version 1.3 compliant
- Bluetooth AVRCP-CT profile version 1.3 compliant
- Supports Adaptive Frequency Hopping(AFH)
- On-chip support for serial peripheral interface(SPI)
- Programmable output power control meets Class 2 or Class 3 requirements
- Excellent receiver sensitivity
- Integrated ARM Cortex™-M3 based
- On-chip power-on reset(POR)

1.3 Functional Description

The primary component on the module is the Broadcom BCM20730, which is a Bluetooth 3.0 compliant basic rate single-chip. The baseband and radio have been integrated into a single chip implemented in standard digital CMOS. The block diagram of the module is shown in Figure 1.

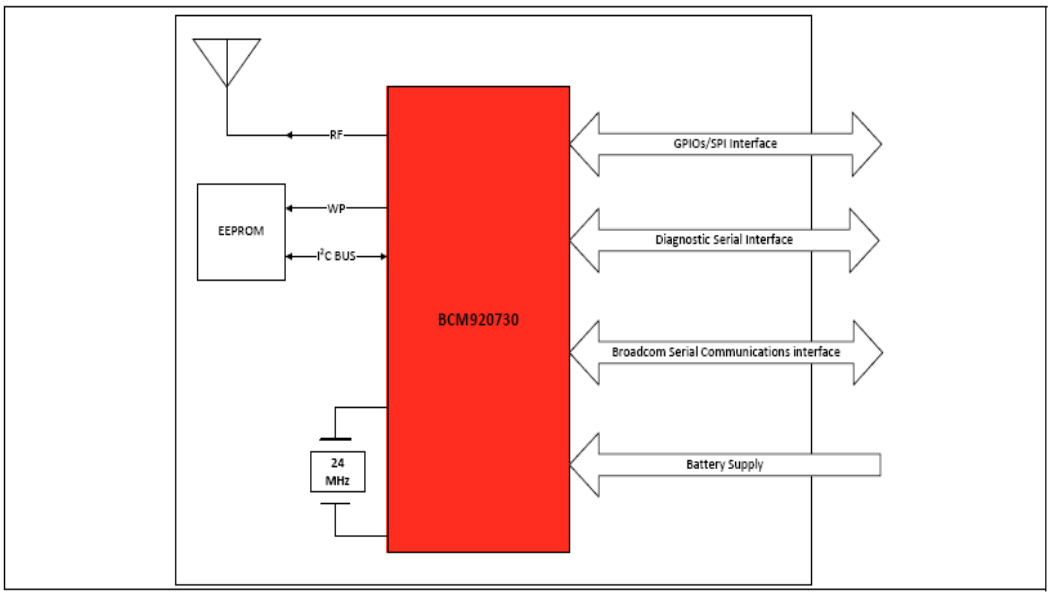


Figure 1: Block Diagram

The BT3GMD-B47P employs an integrated ARM Cortex™-M3 microprocessor core that runs software from the Link Control layer up to the Host Controller Interface (HCI).The baseband portion of the BT3GMD-B47P performs all the time-critical functions required for high-performance Bluetooth operations.

The radio incorporates the complete receive and transmit paths, including PLL, VCO, LNA, PA, upconverter,downconverter, modulator, demodulator, and channel select filtering.

The BT3GMD-B47P on-chip keyboard scanner is designed to autonomously sample keys and store them into buffer registers without requiring host microcontroller intervention. A state machine of three states(Idle, Scan, and Scan-End)controls the keyscan block.

The module has a SPI interface. The interface has a 16-byte transmit buffer and a 16-byte receive buffer .To support more flexibility for user applications. The module acts as an SPI master device that supports 1.8V or 3.3V SPI slaves.

1.4 Physical Description

The BT3GMD-B47P is a 28.5mm×15mm FR4 PCB with 47 pads located around the perimeter. Table 1 shows the pinout diagram of the module.

PIN	Signal	PIN	Signal	PIN	Signal	PIN	Signal	PIN	Signal
1	GND	2	GND	3	P13	4	P8	5	P17
6	P22	7	UP_TX	8	UP_RX	9	P6	10	P0
11	P1	12	P5	13	P4	14	P2	15	P31
16	RESET	17	P3	18	SDA	19	SCL	20	P32
21	P16	22	P18	23	P19	24	P25	25	VDD
26	GND	27	P20	28	P24	29	P21	30	P7
31	P29	32	P28	33	P27	34	P26	35	P36
36	P30	37	P38	38	P37	39	P15	40	P14
41	P12	42	P9	43	P23	44	P11	45	P10
46	GND	47	GND						

Table 1 Pin Location

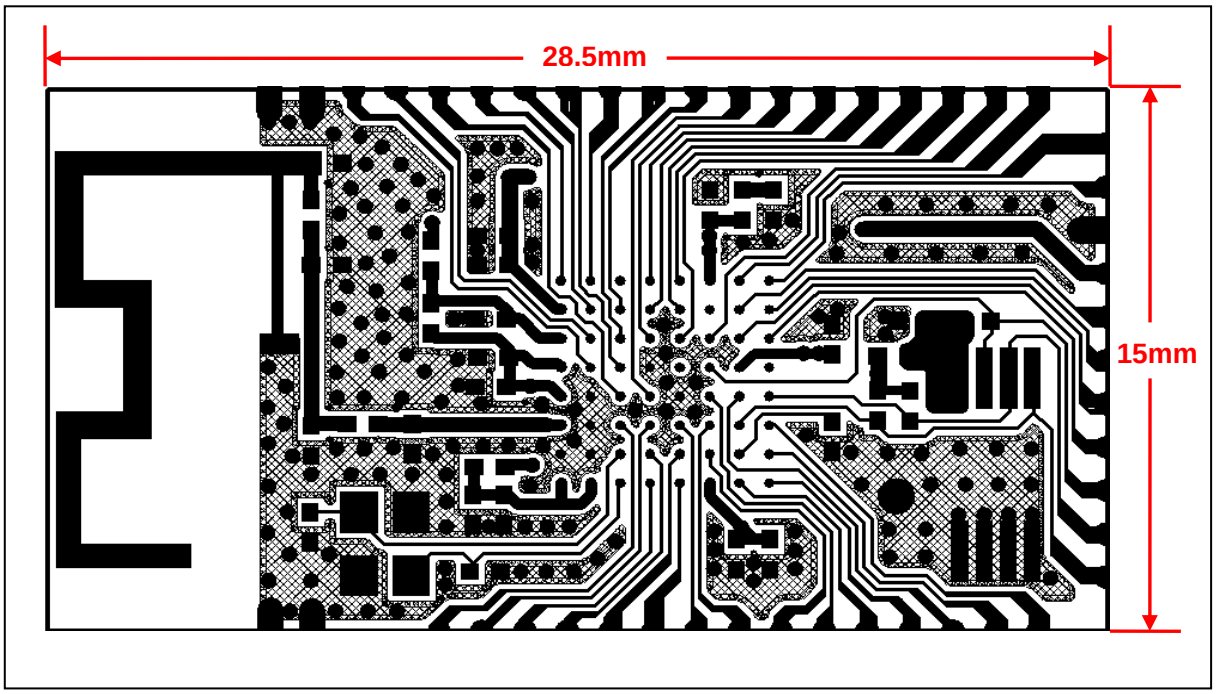


Figure 2: Module PCB Top View

Pin Number	*Pin Name*	*Default Direction*	*POR State*	*Function Description*
1, 2, 26, 46, 47	GND			Ground
25	VDD			Power supply
16	RESET		PU	Active-low system reset with open-drain output & internal pull up resistor
18	SDA	I/O	PU	Data signal for an extern I^2C device
19	SCL	I/O	PU	Clock signal for an extern I^2C device
7	UP_TX	output	PU	UART serial output-serial data output for the HCI UART interface
8	UP_RX	input		UART serial input-serial data output for the HCI UART interface
10	P0	input	Floating	GPIO:P0,Keyboard scan input(row):KSI0
11	P1	input	Floating	GPIO:P1,Keyboard scan input(row):KSI1
14	P2	input	Floating	GPIO:P2,Keyboard scan input(row):KSI2
17	P3	input	Floating	GPIO:P3,Keyboard scan input(row):KSI3
13	P4	input	Floating	GPIO:P4,Keyboard scan input(row):KSI4
12	P5	input	Floating	GPIO:P5,Keyboard scan input(row):KSI5
9	P6	input	Floating	GPIO:P6,Keyboard scan input(row):KSI6
30	P7	input	Floating	GPIO:P7,Keyboard scan input(row):KSI7
4	P8	input	Floating	GPIO:P8,Keyboard scan output(column):KSO0
42	P9	input	Floating	GPIO:P9,Keyboard scan output(column):KSO1
45	P10	input	Floating	GPIO:P10,Keyboard scan output(column):KSO2
44	P11	input	Floating	GPIO:P11,Keyboard scan output(column):KSO3
41	P12	input	Floating	GPIO:P12,Keyboard scan output(column):KSO4
3	P13	input	Floating	GPIO:P13,Keyboard scan output(column):KSO5
40	P14	input	Floating	GPIO:P14,Keyboard scan output(column):KSO6
39	P15	input	Floating	GPIO:P15,Keyboard scan output(column):KSO7
21	P16	input	Floating	GPIO:P16,Keyboard scan output(column):KSO8
5	P17	input	Floating	GPIO:P17,Keyboard scan output(column):KSO9
22	P18	input	Floating	GPIO:P18,Keyboard scan output(column):KSO10
23	P19	input	Floating	GPIO:P19,Keyboard scan output(column):KSO11
27	P20	input	Floating	GPIO:P20,Keyboard scan output(column):KSO12
29	P21	input	Floating	GPIO:P21,Keyboard scan output(column):KSO13
6	P22	input	Floating	GPIO:P22,Keyboard scan output(column):KSO14
43	P23	input	Floating	GPIO:P23,Keyboard scan output(column):KSO15
28	P24	input	Floating	GPIO:P24,Keyboard scan output(column):KSO16
24	P25	input	Floating	GPIO:P25,Keyboard scan output(column):KSO17,SPI MISO (Master mode)
34	P26	input	Floating	GPIO:P26,Current 16 mA @3.3V
33	P27	input	Floating	GPIO:P27,Current 16 mA @3.3V
32	P28	input	Floating	GPIO:P28,Current 16 mA @3.3V
31	P29	input	Floating	GPIO:P29,Current 16 mA @3.3V
36	P30	input	Floating	GPIO:P30,A/D converter input,Default as the battery capacity detection
15	P31	input	Floating	GPIO:P31, A/D converter input,
20	P32	input	PU	GPIO:P32,Default as the EEPROM write protect pin
35	P36	input	Floating	GPIO:P36,SPI CLK(Master mode)
38	P37	input	Floating	GPIO:P37,SPI CS(Master mode)
37	P38	input	Floating	GPIO:P38,SPI MOSI(Master mode)

Table 2 Pin Function Descriptions

Section 2: Supporting Documentions

2.1 Reference Schematic

The most recent schematic , bill of material ,and layout file are available from the ITON Technology Limit. Contact your ITON representative for details.

2.2 Layout Considerations

The BT3GMD-B47P module is placed at the location where the antenna is away from the power supply(i.e.,BT1 Battery contacts)and any digital signal traces. There should be no key matrix membrane under the antenna area and the user's hand should not be over the antenna area when the keyboard is in use. The antenna keep-out area which is 5mm around the parameter of the module region is shown in the red dotted box. PCB material and signal traces should not be placed within the antenna keep-out area to assure optimum antenna performance.

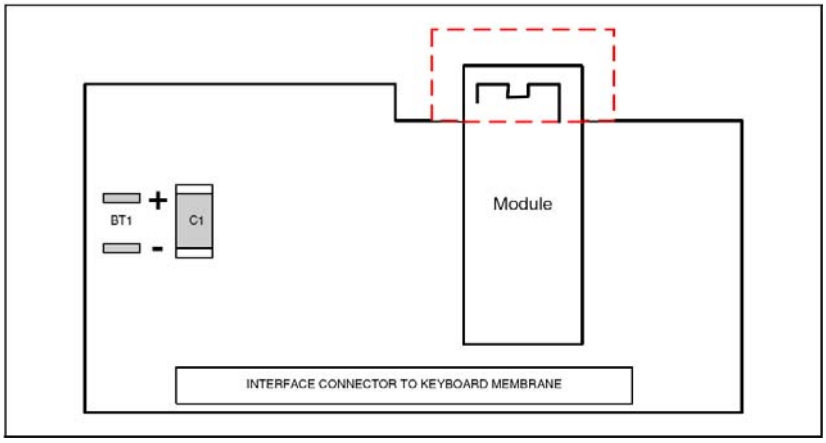


Figure 3: Keyboard PCB

2.3 Electrical Characteristics

Table 3: Maximum Electrical Rating

Rating	*Symbol*	*Value*	*Unit*
Dc supply voltage	—	1.4(Min)--3.8(Max)	V
Voltage on input or output pin	—	Vss -0.3 to Vdd +0.3	V
Operating ambient temperature range	Topr	0 to +70	℃
Storage temperature range	Tstg	-40 to +125	℃

Table 4 :Power supply

Rating	*Minimum*	*Typical*	*Maximum*
Dc supply voltage	1.6V	2.8V	3.6V

2.4 RF Specification

	BQB Specifications		*Measured*			
Transmitter	***Min***	***Max***	***Min***	***Avg***	***Max***	***Unit***
Output Power	–6	4	2.65	2.66	3.16	dBm
Output Spectrum – Frequency Range	2400	2483.5	2401.24	–	2480.78	MHz
Output Spectrum – 20 dB BW	–	1000	930	920	930	kHz
Output Spectrum – Adjacent Channel	–	–	–	–	–	–
|M–N|=2	–	–20	–48.19	–48.08	–47.71	dBm
|M–N|>=3	–	–40	–52.49	–52.24	–52.36	dBm
Modulation Characteristics	–	–	–	–	–	–
Delta f2max>=99.9% of all Delta f2max	115	–	134.4	132.8	133.7	kHz
Delta f1 (average)	140	175	151.0	152.7	151.8	kHz
Delta f2 / Delta f1	0.8	–	0.95	0.92	0.93	Ratio
Initial Carrier Frequency Tolerance	–75	75	5.3	7.8	11.2	kHz from Ftx
Carrier Frequency Drift	–	–	–	–	–	–
DH1	–	25	7	9	7	kHz from Fo
DH3	–	40	11	8	9	kHz from Fo
Drift Rate	–20	20	6.83	–6.43	–5.67	kHz/50 µs
Single-slot Sensitivity (non-hopping)	–	–	–	–	–	–
2402	–	–	–	–86.14	–	dBm
2441	–	–	–	–86.92	–	dBm
2480	–	–	–	–87.25	–	dBm

Table 5 : Module RF Specifications(Vdd_RF=1.5,T=25C)

Section3:Application Examples

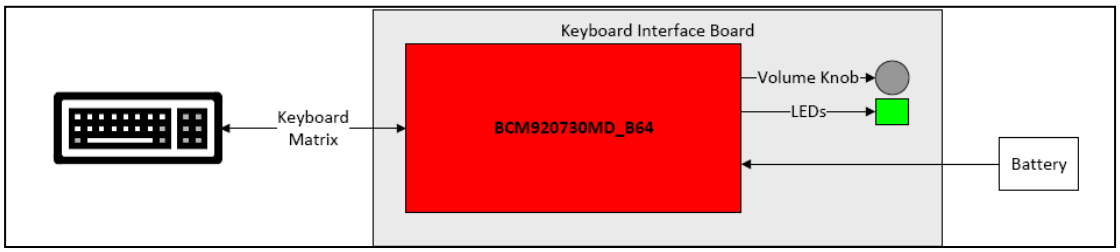


Figure 4: Keyboard PCB

Power consumption	***Vdd @1.8V***	***Vdd @2.8V***
operating current	1mA	<2mA
Standby current	0.03-0.4mA	0.03-0.4mA
Deep sleep	22.5uA	22.5uA

Table 6: keyboard Performance

Power consumption	***Vdd @3V***	***Remark***
Pairing current	15mA	30 second timeout, the 2 LEDs flash by tunes
operating current	1.2mA	
Deep sleep	1.2uA	push power switch one time will wake up the device and push one time again will power off the device

Table 7: 3D Galsses Performance

Section 4: Mechanical Specification

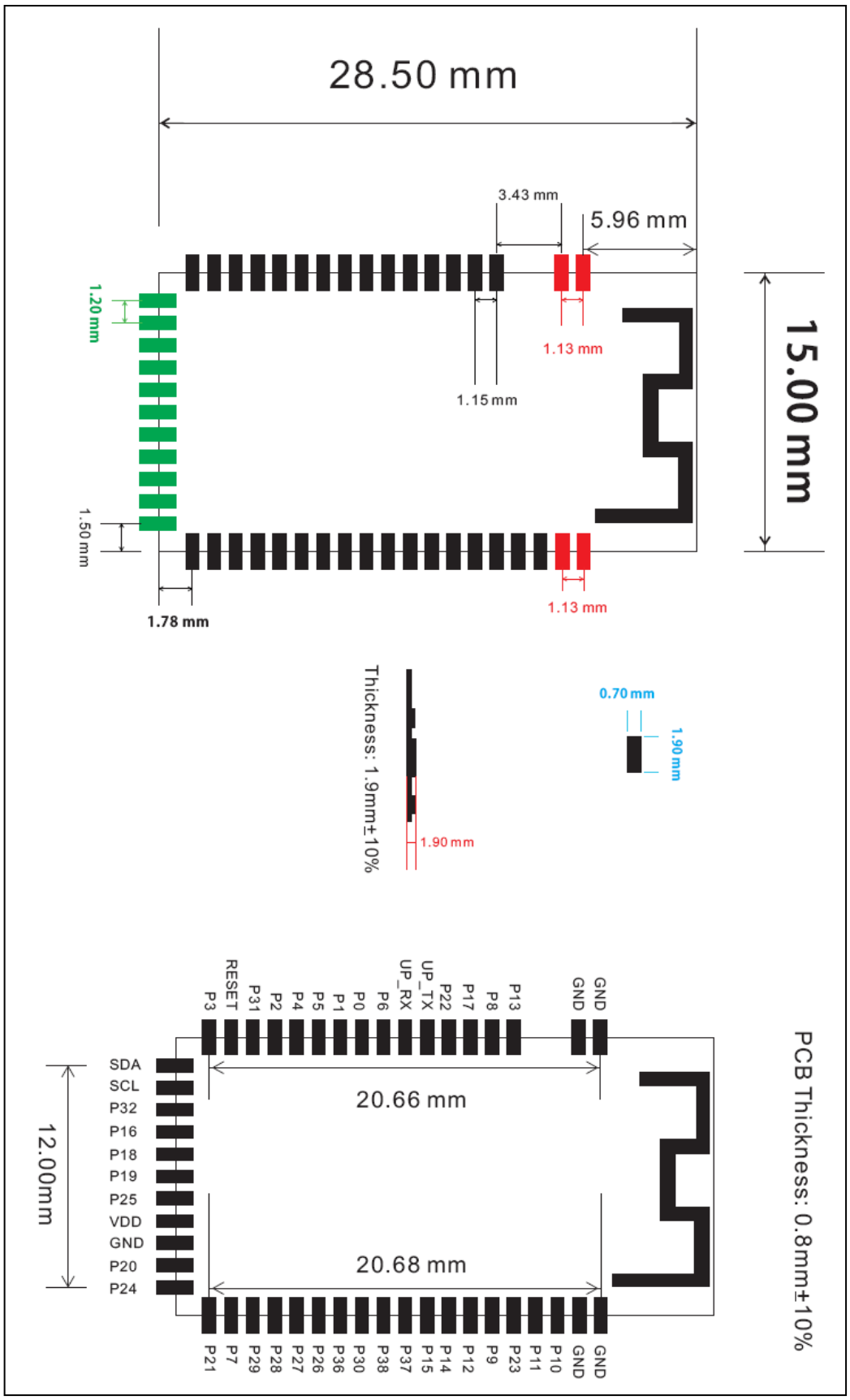


Figure 5: 47Pin-Bluetooth Module

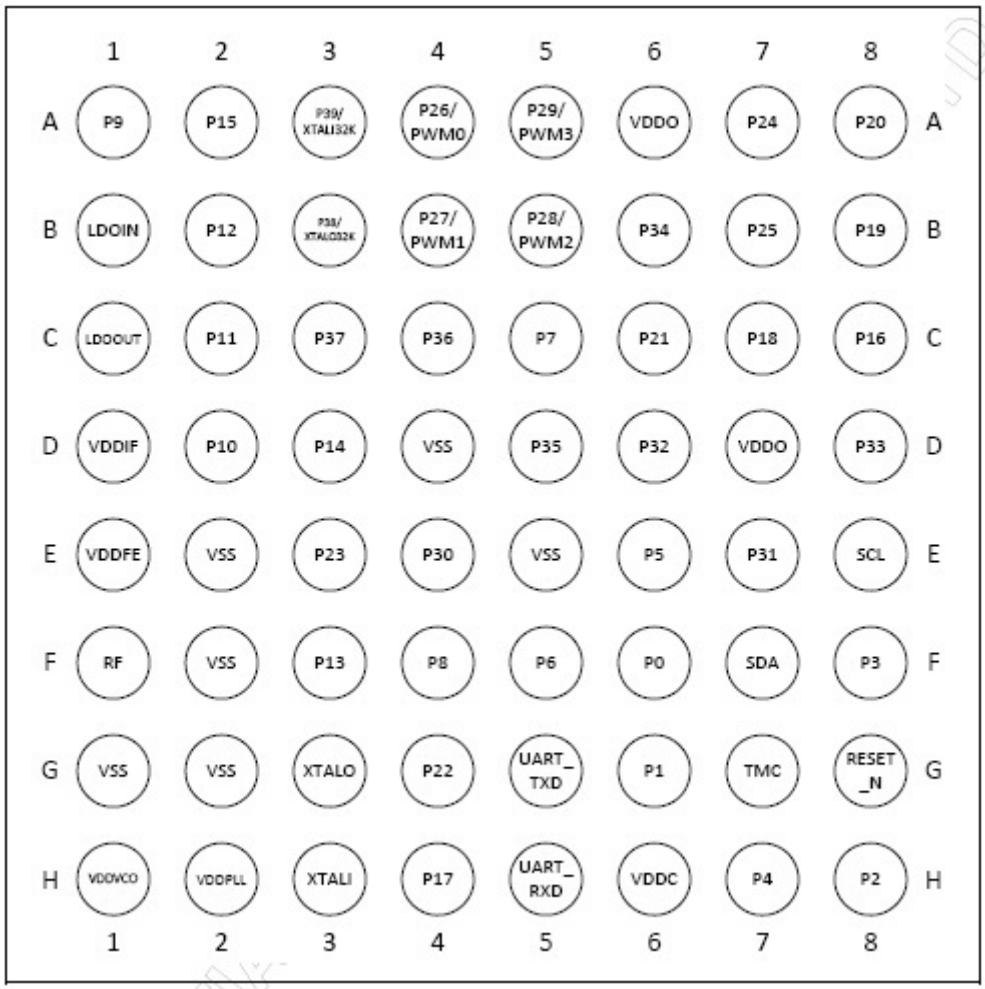
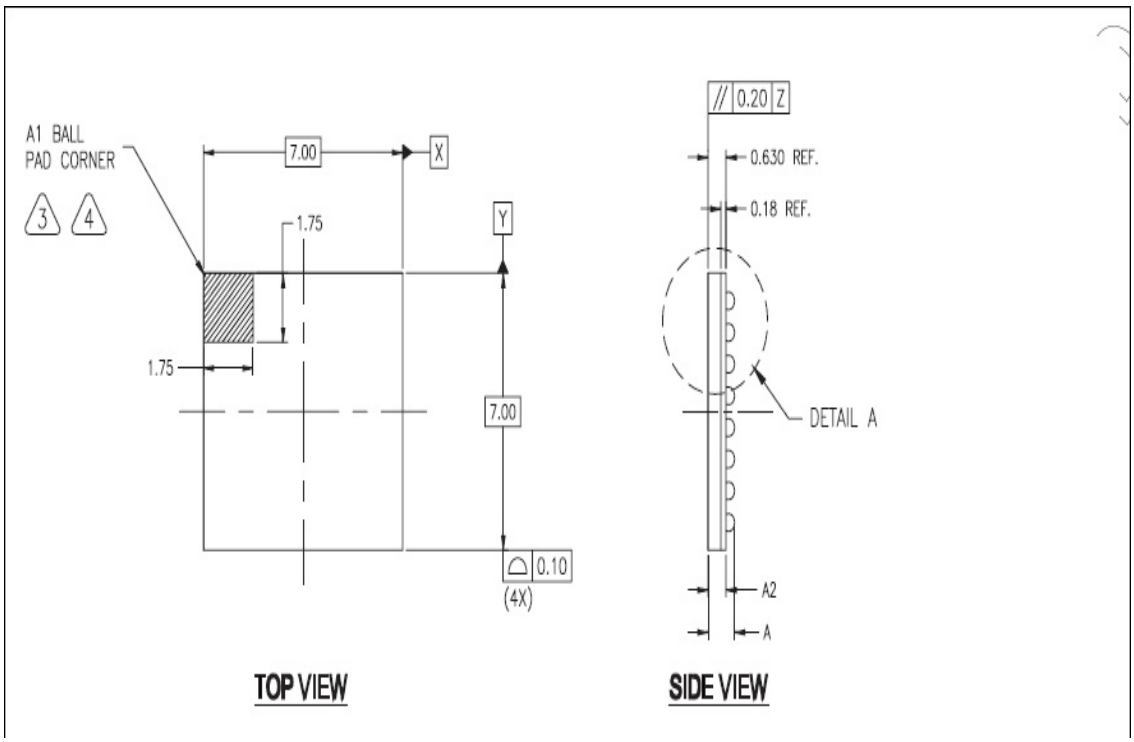
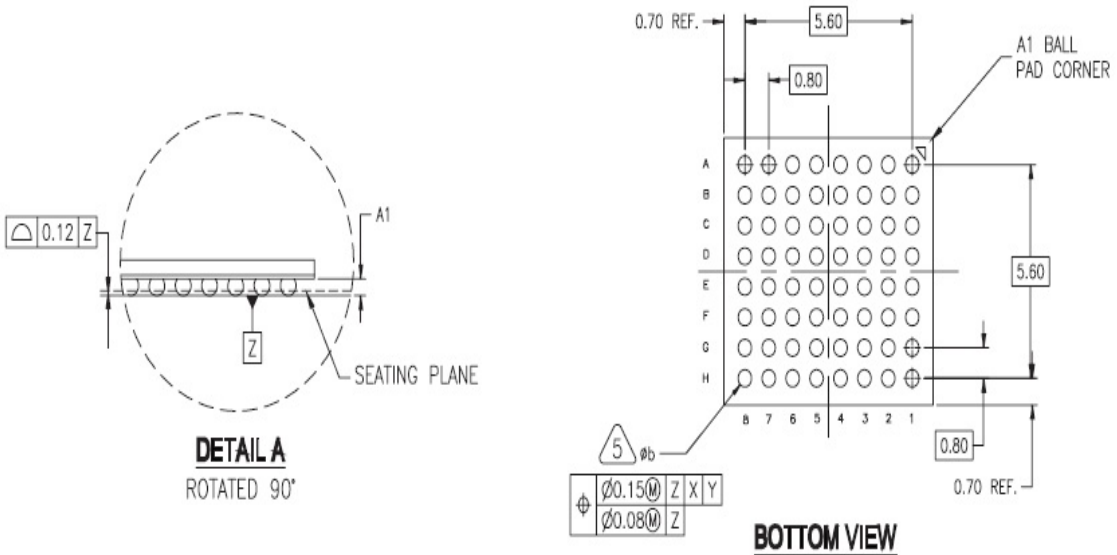


Figure 6: 64Pin BGA Ball Map





DIMENSION	MINIMUM	NOMINAL	MAXIMUM
A	--	0.93	1.00
A1	0.25	0.30	0.35
A2	0.56	0.63	0.70
b	0.40	0.45	0.50
NUMBER OF BALLS 64			

1. All dimensions and tolerance conform to ASME Y14.5M-1994.
2. Terminal positions designation per JESD 95-1, SPP-010.
3. Corner details per STATS ChipPAC option.
4. Pin 1 identifier can be chamfer, ink mark, metallized mark or shiny dot, must be but located within zone indicated
5. Dimension "b" is measured at the maximum solder ball diameter parallel to primary datum Z
6. Compliant to JEDEC registered outline MO-192, variation DAG-1 with exception to mold surface flatness and other GD&T control.
7. Raw solder ball size during assembly is ø0.40mm.

Figure 7: 64Pin FBGA Package

Attention: Limited Modular Approval ‐ this RF Module may not be sold to the generic public and requires professional installation. Due to the fact that this RF Module is not equipped with an own shielding, the end ‐ product incl. this RF Module has to show compliance to the FCC rules (15B/radiated emissions).

(OEM)Integrator has to assure compliance of the entire end ‐ product incl. the integrated RF Module. Additional measurements (15B) and/ or equipment authorizations (e.g Verification) may need to be addressed depending on co ‐ location or simultaneous transmission issues if applicable.

Integrator is reminded to assure that these installation instructions will not be made available to the end ‐ user of the final host device.

With the low output power, this RF Module meets the FCC SAR exemption.

The final host device, into which this RF Module is integrated "has to be labeled with an auxiliary lable stating the FCC ID of the RF Module, such as" Contains FCC ID: QTG-ZKMS

The RF Module is powered by DC ,the antenna is PCB antenna and the antenna gain is 2 dBi.

This device complies with part15 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. "should be placed also on the device or alternatively within a prominent location of the users manual

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

This module is intended for OEM integrator. The OEM integrator is still responsible for the FCC compliance requirement of the end product, which integrates this module. Due to missing shielding the module is strictly limited to integration by the Grantee himself or his dedicated OEM Integrator.

The integration is strictly limited into following host platform(s) that are electrically identical incl. variations that are defined as Class I Permissive Change to the documented and certified samples

-Bluetooth Keyboard

under the control of the Grantee.

Additional hosts and/or platforms can be added via Class II Permissive Change by the Grantee.

This RF Module will be exclusively integrated into battery power host devices under strict control of the Grantee.