

User manual Bluetooth module BM875A

Type name	BM875A
Brand	ONKYO

Regulatory Statements

- OEM integrators must ensure that its product is electrically identical to BM875A reference designs. Any modifications to BM875A reference designs may invalidate regulatory approvals in relation to the product, or may necessitate notifications to the relevant regulatory authorities.
 - OEM integrators are responsible for regression testing to accommodate changes to designs, new antennas, and host and submit for C2PC filings.
- Colocation with other transmitter modules will be addressed through filings for those co-located transmitters when necessary or that colocation of other transmitters will be according to applicable KDB guidelines including those for RF exposure
- The final system integrator must ensure there is no instruction provided in the user manual or customer documentation indicating how to install or remove the transmitter
 - Appropriate labels must be affixed to the product that complies with applicable regulations in all respects. The regulatory label on the final system must include the statement: "Contains FCC ID: ATM-BM875A and/or IC: 6547A-BM875A".
 - A user's manual or instruction manual must be included with the product that contains the text as required by applicable law shall be provided to OEM integrators.

For USA—Federal Communications Commission (FCC)

FCC COMPLIANCE STATEMENT:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

INFORMATION TO USER:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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. If not installed and used in accordance with the instructions, it 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 tuning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

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

Caution: Exposure to Radio Frequency Radiation.

To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons. This device must not be collocated or operating in conjunction with any other antenna or transmitter.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

The final host manual shall include the following regulatory statement:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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. If not installed and used in accordance with the instructions, it 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 tuning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

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

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.

To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons. This device must not be collocated or operating in conjunction with any other antenna or transmitter.

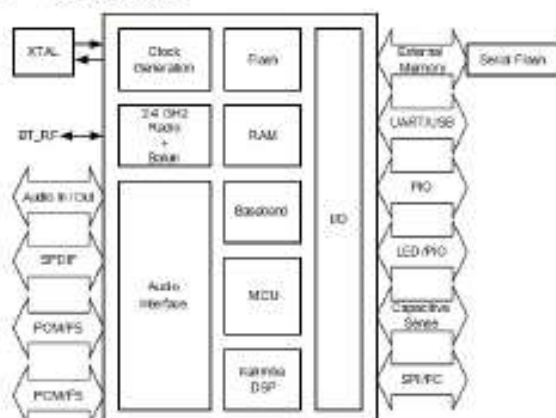
For Canada - Industry Canada (IC)

This device complies with Industry Canada licence-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.

Cet appareil est conforme avec Industrie Canada exempts de licence standard RSS (s). L'utilisation de ce dispositif est autorisée seulement aux conditions suivantes : (1) il ne doit pas produire de brouillage et (2) l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

Features:

- Bluetooth Spec V4.1 fully qualified
- Class 2 type Output Power
- Support Firmware Upgrade
- USB 2.0 interface (full-speed) and UART Host Interface
- Integrated Switched-Mode Regulator
- Integrated Battery Charger
- Integrated Microphone bias
- Integrated LED Driver
- 80 MHz RISC MCU and 120 MHz Kalimba DSP
- Up to 120 MIPS DSP for intensive digital signal processing algorithms
- Stereo codec with 2 channels of ADC and up to 6 microphone inputs (includes bias generation and digital microphone support)
- Audio interfaces:
2 x I²S/PCM
1 x SPDIF (independent of I²S/PCM ports)
- Built in 24-bit Stereo Codec- 96dB SNR for DAC
- Factory configurable to either 1.8V or 3.3V supply.
- 16Mb internal flash memory (64-bit wide, 45ns); optional support up to 64Mb of external SPI flash
- Enhanced Audibility and Noise Cancellation
- Support for 802.11 Co-existence
- Size: 24.89±0.5mm x 13.5±0.5mm x 2.2±0.5mm
- Weight: 0.9g



System Architecture

BM875A Multimedia Module



CSR,
CSR8675B



(This Photos are for reference only)

Product Description:

The BM875A module consumer audio platform for wired and wireless applications integrates an ultra-low-power DSP and application processor with embedded flash memory, a high-performance stereo codec, a power management subsystem, LED and LCD drivers and capacitive touch sensor inputs in a SOC IC. The dual-core architecture with flash memory enables manufacturers to easily differentiate their products with new features without extending development cycles.

Applications:

- Smart remote controllers
- High-end Wired or wireless speakers and headphones
- High-end Wearable audio with sensors
- High-end Mono headsets for voice
- Low-end docking stations and soundbars
- Gaming headsets

Specifications:

Operating Frequency Band	2.4GHz ~ 2.48GHz unlicensed ISM band
Bluetooth Specification	V4.1
Output Power Class	Class 2
Max. Output Power	4dBm
Data Rate	3Mbps
Channel No.	79
Modulation Type	GFSK $\pi/4$ DQPSK 8DPSK
Operating Voltage	3.3V
Host Interface	USB 2.0 or UART
Audio Interface	PCM, I2S, SPDIF
Flash Memory Size	16Mbits, optional support up to 64Mb of external SPI flash
Dimension	24.89mm (L) x 13.5 (W) mm x 2.2mm (H)

Specifications are subject to change without prior notice

Electrical Characteristics

Absolute Maximum Rating	Min	Max
Storage Temperature	-40°C	+105°C
Supply Voltage, (VREGENABLE)	-0.4V	+4.4V
Supply Voltage, (VDD)	-0.4V	+3.6V
Supply Voltage, (V_CHG)	-0.30V	+6.5V
Other terminal voltages	VSS - 0.4	VDD + 0.4

Recommended Operating Conditions	Min	Max
Operating Temperature Range	-20°C	+70°C
Supply Voltage, (VREGENABLE)	0.7 x VDD	+4.25V
Supply Voltage, (VDD)	+1.7V	+3.6V
Supply Voltage, (V_CHG)	4.5V	+5.75V

Power Consumption	Units	Average
SCO Connection HV3 (30ms interval sniff mode)	mA	
SCO Connection HV1	mA	
ACL Data Transfer 115.2Kbps UART no traffic (Master)	mA	
ACL Data Transfer 115.2Kbps UART no traffic (Slave)	mA	
CODEC		
Microphone inputs and ADC/channel	mA	
DAC and loudspeaker driver, no signal/channel	mA	
Digital audio processing subsystem	mA	

VBAT = 4.2V; f = 2.441GHz; T=20°C

RF Characteristics

Receiver	Units	Min	Typ	Max	Bluetooth Spec
Sensitivity at 0.1% BER	dBm	-	-90	-86	≤ -70
Maximum Receiver Signal	dBm	-20	-10	-	≥ -20
C/I Co-Channel	dB	-	6	11	≤ 11
Adjacent Channel Selectivity C/I -1MHz	dB	-	-6	0	≤ 0
2nd Adjacent Channel Selectivity C/I -2MHz	dB	-	-38	-30	≤ -30
3rd Adjacent Channel Selectivity C/I -3MHz	dB	-	-45	-40	≤ -40
Image Rejection C/I	dB	-	-16	-9	≤ -9

VBAT = 4.2V; f = 2.4441GHz; T=20°C

Transmitter	Units	Min	Typ	Max	Bluetooth Spec
RF Output Power	dBm	0	3	-	-6 to +4
RF Power Control Range	dB	16	24	-	> 16
RF Power Range Control Resolution	dB	-	0.5	-	-
20dB Bandwidth for Modulated Carrier	KHz	-	940	1000	<1000
2nd Adjacent Channel Power (+/- 2MHz)	dBm	-	-36	-20	≤ -20
3rd Adjacent Channel Power (+/- 3MHz)	dBm	-	-45	-40	≤ -40

VBAT = 4.2V; f = 2.4441GHz; T=20°C

All specifications including pinouts and electrical specifications may be changed without prior notice

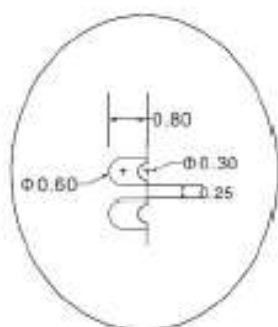
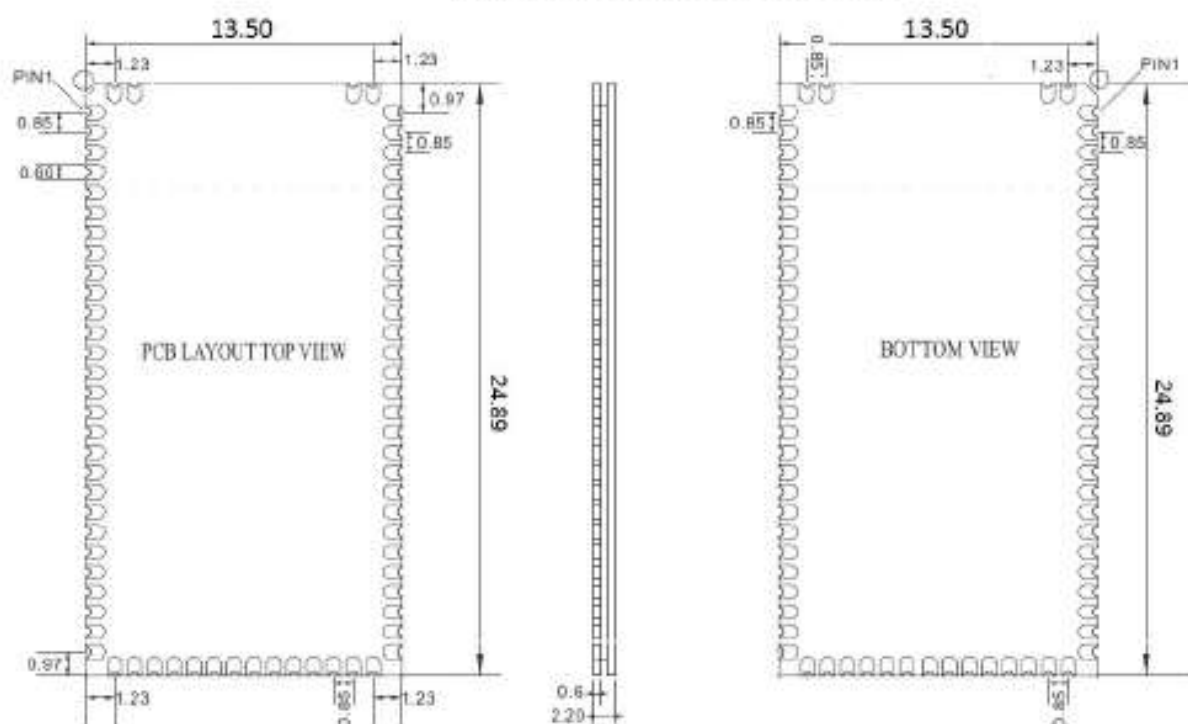
Pin Configurations

PIN NO.	NAME	TYPE	FUNCTION	RE-MARK
1	GND	GND	Ground	
2	AIO0	Bi-directional	Programmable input/output line	C4
3	AIO1	Bi-directional	Programmable input/output line	D1
4	GND	GND	Ground	
5	GPIO33	Bi-directional	Programmable Input/Output Line	G2
6	GPIO1	Bi-directional	Programmable Input/Output Line	H2
7	GPIO2	Bi-directional	Programmable Input/Output Line	H3
8	GPIO3	Bi-directional	Programmable Input/Output Line	F1
9	GND	GND	Ground	
10	SPI_CLK	CMOS Input	Serial Peripheral Interface Clock	E1
11	SPI_MISO	CMOS Output	Serial Peripheral Interface Data Output	L2
12	SPI_CSB	CMOS Input	Chip Select For Synchronous Serial Interface (Active Low)	M1
13	SPI_MOSI	CMOS Input	Serial Peripheral Interface Data Input	G3
14	GND	GND	Ground	
15	RESET	CMOS input with weak internal pull-up	Reset if low. Input debounced so must be low for >5ms to cause a reset	L1
16	GPIO4	Bi-directional	Programmable Input/Output Line	K3
17	GPIO5	Bi-directional	Programmable Input/Output Line	L3
18	GPIO6	Bi-directional	Programmable Input/Output Line	M2
19	GPIO7	Bi-directional	Programmable Input/Output Line	M3
20	LED0	Open drain output	LED Driver	K4
21	LED1	Open drain output	LED Driver	K5
22	LED2	Open drain output	LED Driver	M4
23	GPIO8	Bi-directional	Programmable Input/Output Line	L4
24	I2C_SCL	Bi-directional	Programmable Input/Output Line(Serial Clock), Alternative function GPIO9	L5
25	I2C_SDA	Bi-directional	Programmable Input/Output Line(Serial Address/Data I/O), Alternative function GPIO10	M5
26	GPIO11	Bi-directional	Programmable Input/Output Line	K6
27	GPIO12	Bi-directional	Programmable Input/Output Line	K8
28	GPIO13	Bi-directional	Programmable Input/Output Line	L7
29	GPIO14	Bi-directional	Programmable Input/Output Line	L8
30	GPIO15	Bi-directional	Programmable Input/Output Line	L10
31	GPIO16	Bi-directional	Programmable Input/Output Line	M8
32	GPIO17	Bi-directional	Programmable Input/Output Line	L9
33	GPIO18	Bi-directional	Programmable Input/Output Line	K10
34	GPIO19	Bi-directional	Programmable Input/Output Line	J10
35	GPIO20	Bi-directional	Programmable Input/Output Line	M7
36	GPIO21	Bi-directional	Programmable Input/Output Line	L6
37	GND	GND	Ground	
38	GPIO22	Bi-directional	Programmable Input/Output Line	C10
39	GPIO23	Bi-directional	Programmable Input/Output Line	C11
40	GPIO24	Bi-directional	Programmable Input/Output Line	B11
41	GPIO25	Bi-directional	Programmable Input/Output Line	D11
42	GPIO26	Bi-directional	Programmable Input/Output Line	C12
43	GPIO27	Bi-directional	Programmable Input/Output Line	D12
44	GPIO28	Bi-directional	Programmable Input/Output Line	M6
45	GPIO29	Bi-directional	Programmable Input/Output Line	K9
46	GND	GND	Ground	
47	USB_D+	Bi-directional	USB Data Plus	M9
48	USB_D-	Bi-directional	USB Data Minus	M10
49	GND	GND	Ground	
50	VDD_PADS	Power	1.7V to 3.6V positive supply input for input/output ports: ■ RST# ■ UART ■ PCM ■ SPI ■ PIO[15:0]	K1,k7
51	VDD_MEM	Power	1.7V to 3.6V positive supply input for input/output ports: ■ Serial quad I/O flash port	A12

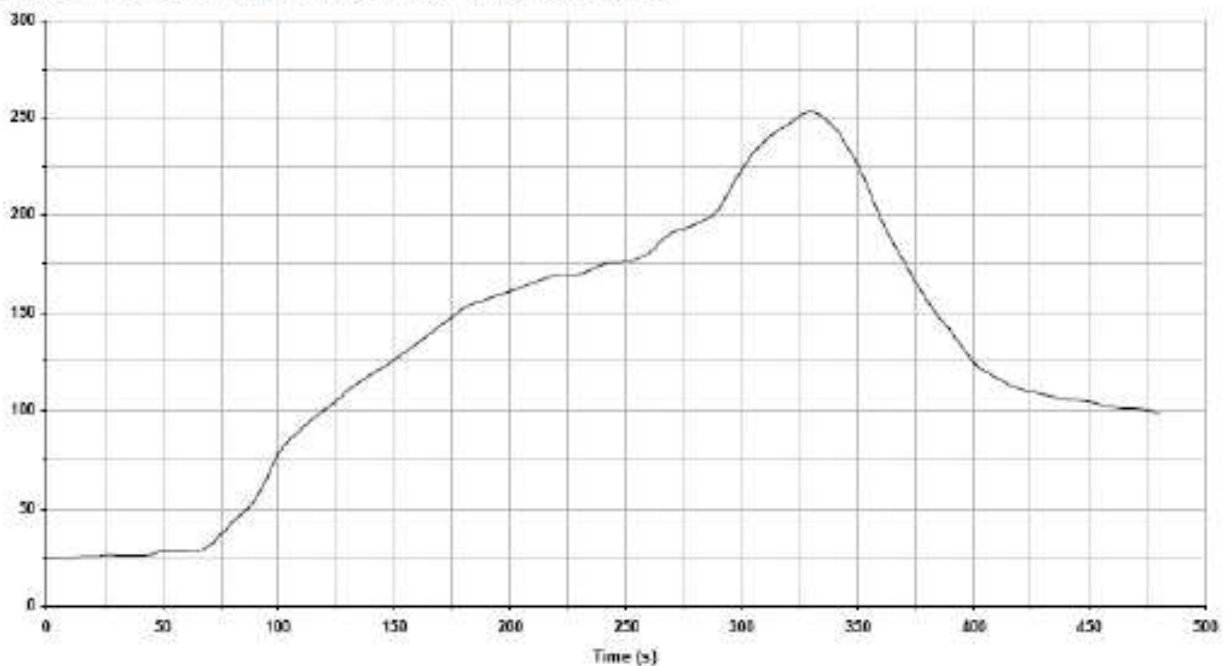
52	IV8_OUT	Power	1.8V switch-mode power regulator output	J12
53	VBAT	Power	Battery positive terminal	H12
54	VBAT_SENSE			H11
55	CHG_EXT			F11
56	V5.0	Power	Battery charger input	G11,G12
57	GPIO30	Bi-directional	Programmable Input/Output Line	E10
58	GPIO31	Bi-directional	Programmable Input/Output Line	B12
59	GPIO32	Bi-directional	Programmable Input/Output Line	B10
60	GND	GND	Ground	
61	MIC_RN	Analogue	Microphone input negative, right	C8
62	MIC_RP	Analogue	Microphone input positive, right	C7
63	MIC_LN	Analogue	Microphone input negative, left	A11
64	MIC_LP	Analogue	Microphone input positive, left	A10
65	MIC_BIAS_B	Analogue out	Microphone bias B	B8
66	MIC_BIAS_A	Analogue out	Microphone bias A	A9
67	SPK_LN	Analogue	Speaker output negative, left	C6
68	SPK_LP	Analogue	Speaker output positive, left	C5
69	SPK_RN	Analogue	Speaker output negative, right	A7
70	SPK_RP	Analogue	Speaker output positive, right	B7
71	GND	GND	Ground	
72	GND	GND	Ground	
73	GND	GND	Ground	
74	GND	GND	Ground	

Recommended Layout patterns:

Physical Dimension Unit in mm



Recommended Reflow Temperature Profile:



Key features of the profile:

- Initial Ramp=1-2.5°C/sec to 175°C equilibrium
- Equilibrium time=60 to 80 seconds
- Ramp to Maximum temperature (250°C)=3°C/sec Max
- Time above liquidus temperature(217°C): 45 - 90 seconds
- Device absolute maximum reflow temperature: 250°C

MAC Address:

Each Module has his MAC Address

0CA6 94 XXXXXX

Concerning the dimension and printing content of the tab:

- 1 line the last six letters of the LAP on the module
 - 2 line the software version
 - 3 line the customer material part number
- Qr code area, with 12 letters (MAC Address)

Length: 14 * Width: 7 (mm)

The tab code pastes style:



(This Photos are for reference only)

QDL Certificate**Ordering Information**

No	Items	Ordering Code	Description
1	CSR8675 Module	BM875A	Without SPI flash, without license
2	CSR8675 Module	BM875AF4	4Mbit internal SPI flash operating voltage is 1.8V, without license
3	CSR8675 Module	BM875AF1	16Mbit internal SPI flash operating voltage is 1.8V, without license
4	CSR8675 Module	BM875AF3	32Mbit internal SPI flash operating voltage is 1.8V, without license
5	BM875A Module Test Kit	BM875A TK	Test kit to fit CSR Casira Kit
BM875A Test Kit			

Document References

References	Version
Specifications of the Bluetooth System	Bluetooth Specification Version 4.0, 17 December 2009
CSR8675 BGA Data Sheet	CS-232426-DS-5

Document History

Revision	Date	History
Draft V0.1	2014-12-10	First release