BC127-HD Datasheet

Key Specifications

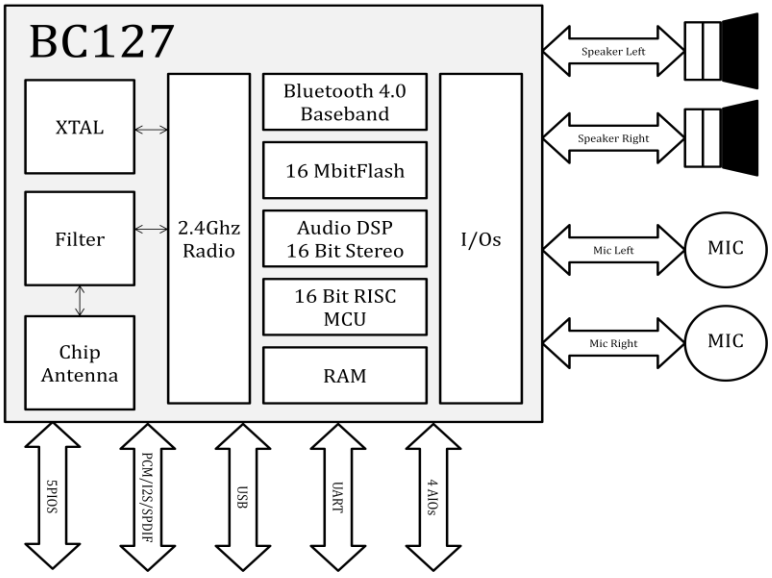
- Bluetooth Certified 4.2 Audio module
- Dual Mode: Bluetooth and Bluetooth Low Energy (BLE)
- Backwards compatible with 1.1, 2.0, 2.1 + EDR and 3.0
- Embedded Bluetooth Protocol Stack
- Supports HFP, A2DP, AVRCP, PBAP and SPP
- Supports IAP1/IAP2 profiles for connection to iOS devices
- Simple UART and GPIO interface for command and control
- Can connect to external Codecs with I2S, PCM, SPDIF interface
- Includes aptX-HD™ license and algorithm
- Small form factor (11.8mm x 18mm x 3.2mm)
- Bluetooth, FCC and CE certified

Applications

- Wireless Speakers, Docks and Headsets
- SmartPhone Controlled Audio Systems
- Automotive Infotainment Systems
- Medical Devices
- High Quality Audio Streaming
- Gaming Accessories and MP3 Players

Description

BC127-HD is a highly flexible, low power, small form factor Bluetooth Version 4.2 Certified Audio module. It comes preloaded with BlueCreation Melody software, and is ideal for developers who want to quickly and cost effectively integrate Bluetooth functionality into their products.



General Specifications

Specifications	Description
Bluetooth Standard	Bluetooth 4.2 Class 2
Interfaces	UART, AIO, GPIO, USB, SPI, Audio In, Mic In, PCM, I2S, SPDIF, I2C
Size	11.8mm x 18mm x 3.2mm
Weight	1.1g

RF Specifications

Specifications	Description
Frequency Band	2,402 MHz to 2,480 MHz
Modulation	8 DPSK, PI/4 DQPSK, GFSK
Maximum Data Rate	3Mbps (typical 1.6Mbps)
Operating Range	20m to 30m
RF Sensitivity	0.1% BER at -88dBm
Transmit Power	BER/EDR Class2＜4dBm, BLE＜10dBm

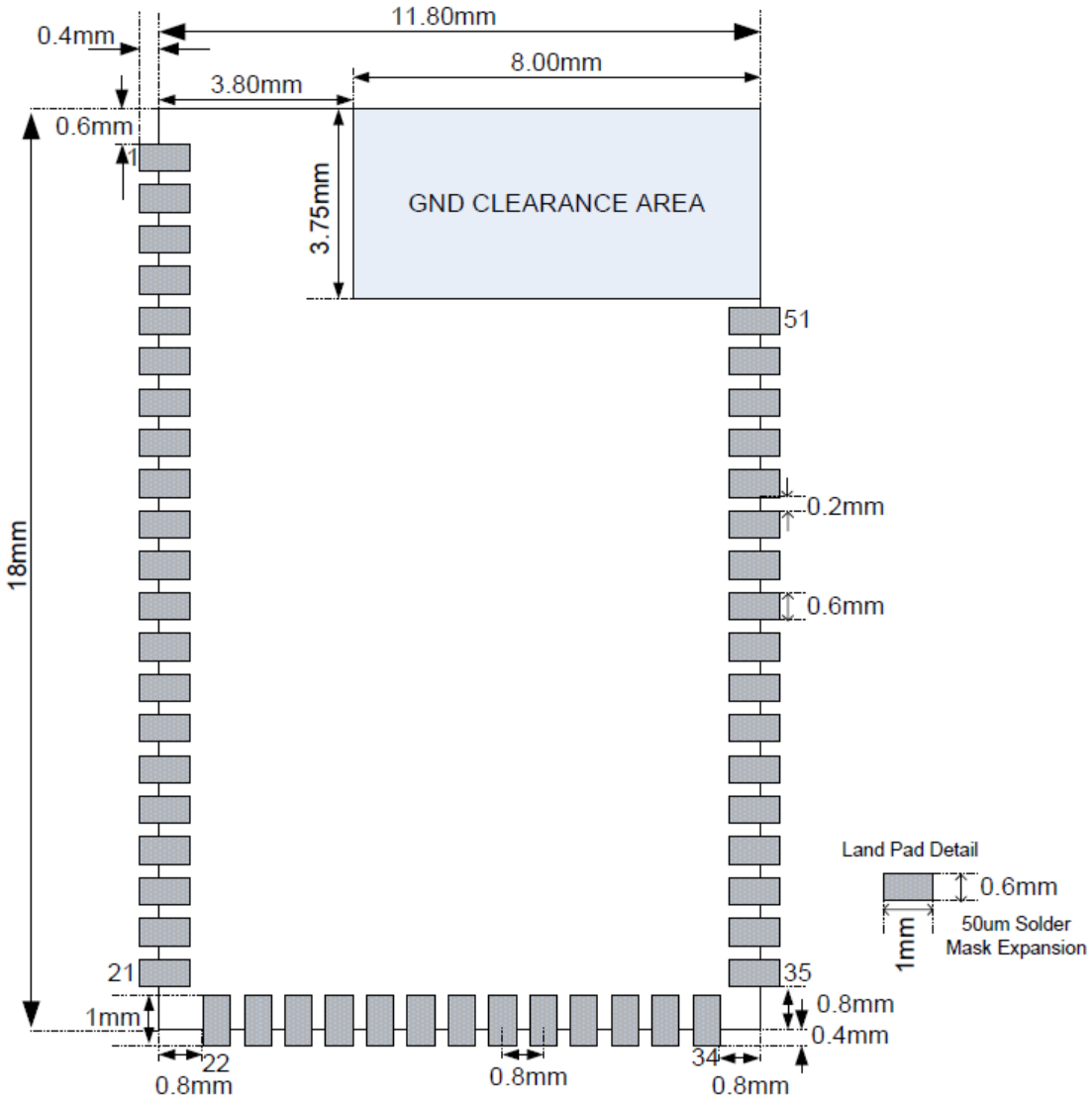
Audio Specifications

Specifications	Description
DAC resolution	16 bits
DAC Output Sample Rate	8 KHz to 90 KHz
DAC SNR	96dB
Stereo Separation	-87.7dB

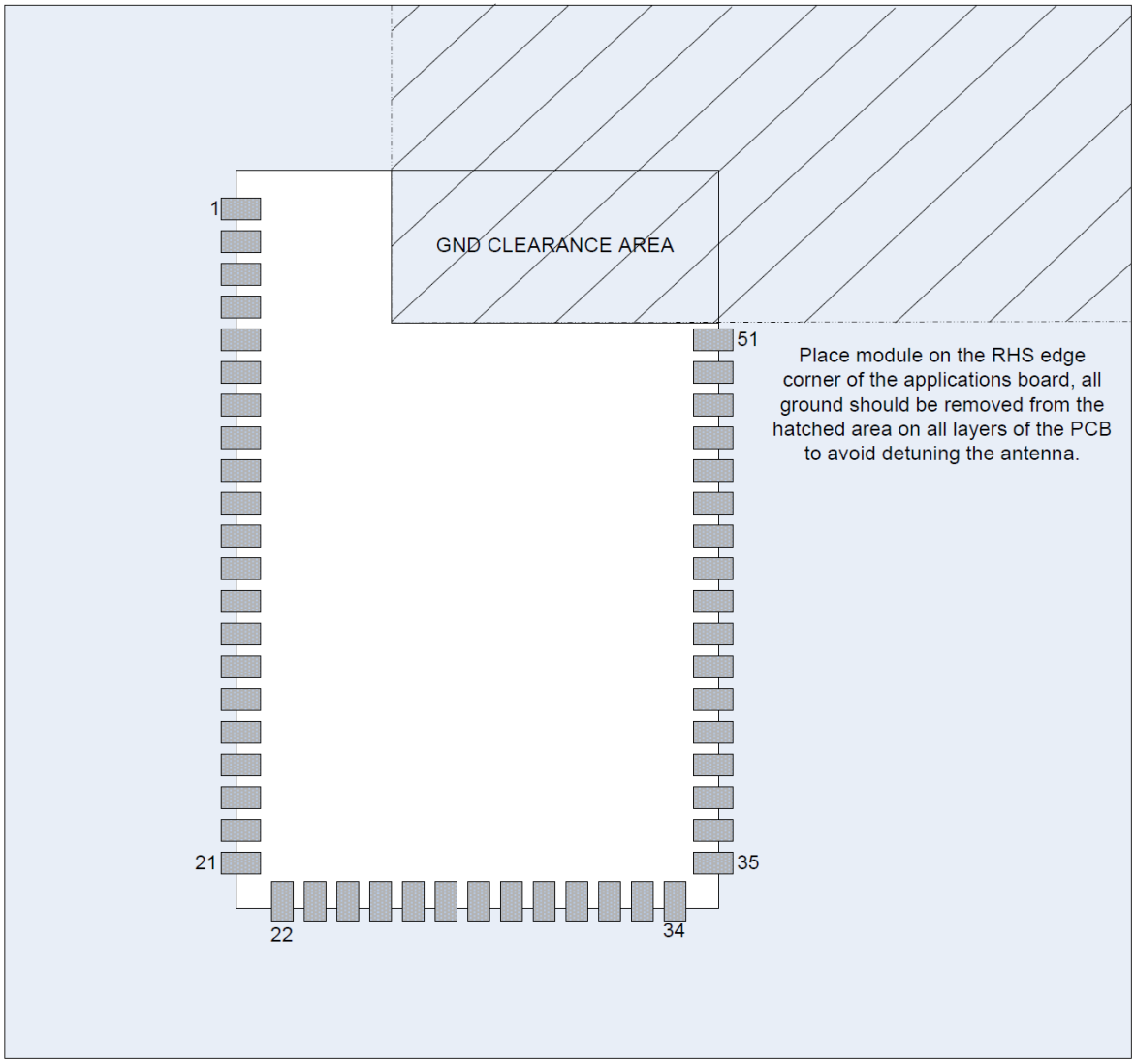
Electric Specifications

Specifications	Description
Supply Voltage	3.3V to 4.7 V DC (Supports Li Ion battery voltage range)
Typical Current	15mA (Music streaming)
Typical Current Idle	<1mA (Connectable)
Operating Temperature	-40°C to 85°C
Storage Temperature	-40°C to 105°C

Module Footprint



Placement Considerations



Audio Circuit

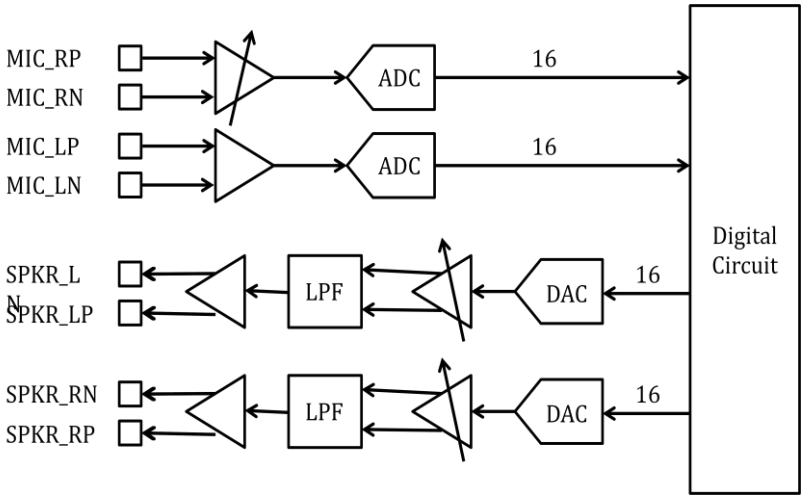
The Audio circuit consists of:

- 2 independent 16-bit high-quality ADC channels:
  - Programmable as either microphone or line input
  - Programmable as either stereo or dual-mono input
  - Multiplexed with 2 of the digital microphone inputs
  - Each channel is independently configurable to be either single-ended or fully differential
  - Each channel has an analog and digital programmable gain stage
- A dual differential class A-B output stage. If a single ended audio output is required, use an external differential to single-ended converter.

The main features of the interface are:

- Stereo and mono analog Input for voice band and audio band
- Stereo and mono analog output for voice band and audio band
- Support for stereo digital audio bus standards such as I2S
- Support for IEC-60958 standard stereo digital audio bus standards, e.g. SPDIF and AES3
- Support for PCM including PCM master codecs that require an external system clock

The analog Audio diagram is below:



PIN Description

No	Pin Name	Pin Type	Pin Description
1	GND	GND	Common Ground
2	GND	GND	Common Ground
3	GND	GND	Common Ground
4	GND	GND	Common Ground
5	PIO_6/PCM2_SYNC	Bi-directional	Programmable I/O (PCM2_SYNC or I2S_S)
6	PIO_7/PCM2_CLK	Bi-directional	Programmable I/O (PCM2_CLK or I2S_CLK)
7	CAP_SENSE_1	Analog Input	Capacitive Touch Sense Input
8	CAP_SENSE_4	Analog Input	Capacitive Touch Sense Input
9	CAP_SENSE_3	Analog Input	Capacitive Touch Sense Input
10	CAP_SENSE_2	Analog Input	Capacitive Touch Sense Input
11	GND	GND	Common Ground
12	AIO_1	Bi-directional	Analog programmable input/output line
13	SPKR_LN	Audio output	Speaker output negative, left
14	SPKR_LP	Audio output	Speaker output positive, left
15	SPKR_RN	Audio output	Speaker output negative, right
16	SPKR_RP	Audio output	Speaker output positive, right
17	MIC_BIAS_A	Analog input	Microphone bias
18	MIC_RN	Analog input	Microphone input negative, right
19	MIC_RP	Analog input	Microphone input positive, right
20	MIC_LN	Analog input	Microphone input negative, left
21	MIC_LP	Analog input	Microphone input positive, left
22	GND	GND	Common Ground
23	PIO_0	Bi-directional	Programmable input/output line
24	PIO_1	Bi-directional	Programmable input/output line
25	PIO5/ PCM2_OUT	Bi-directional	Programmable I/O (PCM2_OUT or I2S_OUT)
26	PIO_4/ PCM2_IN	Bi-directional	Programmable I/O (PCM2_IN or I2S_IN)
27	GND	GND	Common Ground
28	VREGEN	Analogue	Take High to Enable Switch-Mode Regulator
29	CHG_EXT	Charger input	External battery charger control
30	VCHG	Charger input	Battery Charger Input
31	VBAT_SENSE	Battery sense	Battery Charger Sense
32	VBAT	Battery terminal +ve	Battery Positive
33	VDD_PADS	Supply	Positive Supply input
34	3V3_USB	Supply	Positive Supply output
35	USB_N	Bi-directional	USB data negative
36	USB_P	Bi-directional	USB data positive
37	LED_0	Open drain output	LED Driver
38	LED_1	Open drain output	LED Driver

39	LED_2	Open drain output	LED Driver

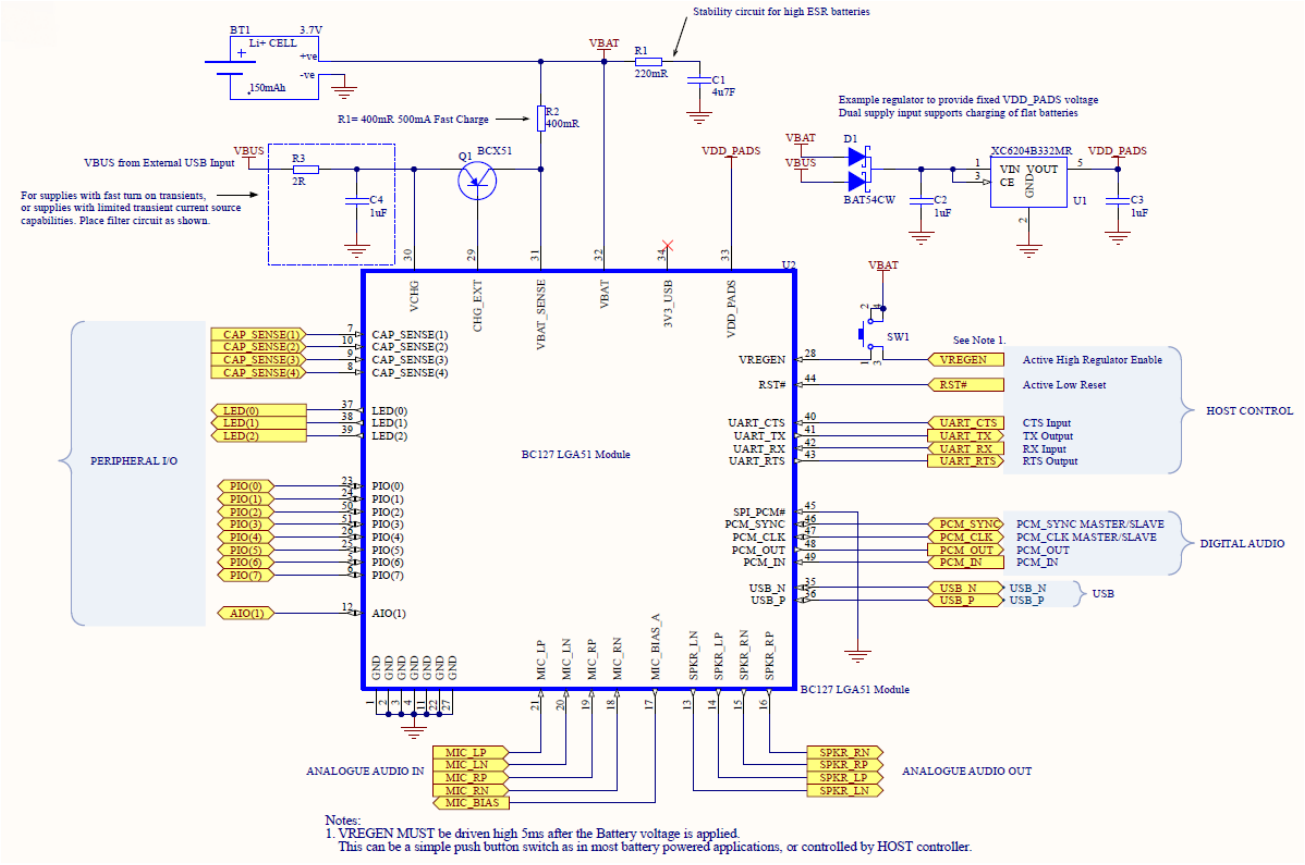
No	Pin Name	Pin Type	Pin Description
40	UART_CTS	Bi-directional	UART Clear to Send
41	UART_TX	Bi-directional	UART TX Data
42	UART_RX	Bi-directional	UART RX Data
43	UART_RTS	Bi-directional	UART request to send ,active low
44	RST#	Reset Input	Reset if low for more than 5ms
45	SPI_PCM#	Input	Select PCM/SPI
46	PCM1_SYNC	Bi-directional	Synchronous data sync
47	PCM1_CLK	Bi-directional	Synchronous data clock
48	PCM1_OUT	CMOS output	Synchronous data output
49	PCM1_IN	CMOS input	Synchronous data input
50	PIO_2	Bi-directional	Programmable input/output line
51	PIO_3	Bi-directional	Programmable input/output line

Notes

- PIO_X are bidirectional with weak pull down
- Reset Input is with strong pull-up
- USB data positive with selectable internal 1.5kΩ pull up resistor
- UART are Bidirectional with weak pull up
- PCM_OUT, IN, SYNC and CLK can be used as SPI_MISO, MOSI, CSB and CLK respectively. SPI-PCM# high switches SPI/PCM lines to SPI, low switches to PCM/PIO use

Hardware Design Guidelines

BC127-HD With a battery



Note 1. VREGEN should be driven high 5ms after VBAT is applied to boot the module.

Referring to the figure above, a Li Ion battery is connected to VBAT and VBUS from an external USB source is connected to VCHG. It is assumed that the VBUS supply is not connected permanently but periodically.

Net	Min	Typ	Max
VCHG	3.1V*/4.75V	5V	5.75V
VBAT_SENSE	2.8V	3.7V	4.25V
VBAT	2.8V	3.7V	4.25V
VDD_PADS	1.7V	3.3V	3.6V
VREGEN	2.8V	3.7V	4.25V

*This is the minimum voltage allowed to enable the module in the boot modes described below.

VCHG is the input to the battery charger regulator.
VBAT_SENSE is the input to the Battery sensor circuitry.
VBAT is the main supply input to the internal switch mode and LDO regulators and is the supply domain for ***VREGEN.***
VDD_PADS is the supply to all the I/O domains for PIO, UART, PCM, LED and RST#.

Boot Modes

The Module will boot automatically whenever a voltage greater than 3.1V is applied to VCHG (for example, when a USB source is plugged in).

The module does not support a soft start supply configuration, for fast transient supply sources or supply sources with limited sourcing current use a filter (see R3/C4 in the main schematic above) to slow the rising edge of the supply voltage at turn on. A large inrush current at turn on can cause a dipping of the supply voltage applied to the module, in turn causing the module to lock out, adding the filter as shown keeps the input supply voltage rise monotonic and avoids lock out.

Charging and Battery

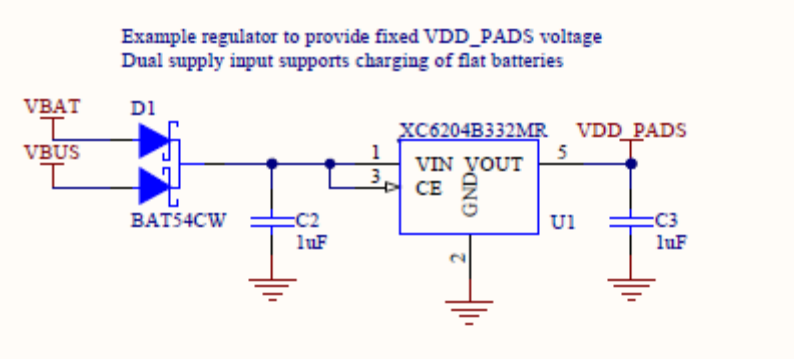
In this configuration an external pass transistor is connected between ***VCHG, VBAT_SENSE*** and ***CHG_EXT*** to support an external Fast charge configuration. VBAT_SENSE is connected to VBAT via a 400mR resistor,

The charging current is by default 150mAmph. It can be configured by UART command to be between 0 and 200mAmp. Please refer to the Melody Manual for configuration.

R1 and C1 in the main schematic diagram form a RC snubber circuit that is designed to maintain stability over a wide range of Battery ESRs. The maximum ESR of the battery should not exceed 1Ω.

The external VBUS voltage connected to VCHG is used to supply the current to charge the battery typically this comes from an external USB source.

In the above circuit VDD_PADS is supplied by a regulated voltage from VBAT, in the case of batteries that are flat or discharged, the absence of a voltage on VDD_PADS will halt the booting of the module. Therefore to ensure that a voltage is available on VDD_PADS to support discharged batteries the following circuit is required. This circuit combines the VBAT and VCHG inputs to generate the supply for VDD_PADS.



Circuit to support discharged battery starting

If the voltage of the battery is below 2.9V, the charger will enter 'trickle charge mode', when in this mode, the battery is charged at a current of a few milliamps in order to safely charge deeply discharged batteries. Once the voltage of the battery reaches anything above 2.9 V fast charging mode will be used, in this mode, the battery is charged at the current configured by the user in the battery configuration settings, provided that there is enough headroom between the charger's input voltage and the voltage of the battery.

The BC127-HD will stop charging when the voltage at VBAT_SENSE reaches 4.2V. The BC127-HD will shut down when the battery voltage reaches 2.9V indicating that the battery is depleted.

Role of VREG

Once the module is booted, VREGEN acts like a standard PIO. The function of VREGEN can be configured. Please refer to the Melody Manual for the VREGEN function once the module is booted.

ESD protection

The module has no supplementary ESD protection other than that provided by the IC within the module. The Bluetooth IC ESD protection is limited to:

Human Body Model Contact Discharge per ANSI/ESDA/JEDEC JS-001
Class 2 - 2kV (all pins except CHG_EXT; CHG_EXT rated at 1kV)

Machine Model Contact Discharge per JEDEC/EIA JESD22-A115
200V (all pins)

Charged Device Model Contact Discharge per JEDEC/EIA JESD22-C101
Class II - 200V (all pins)

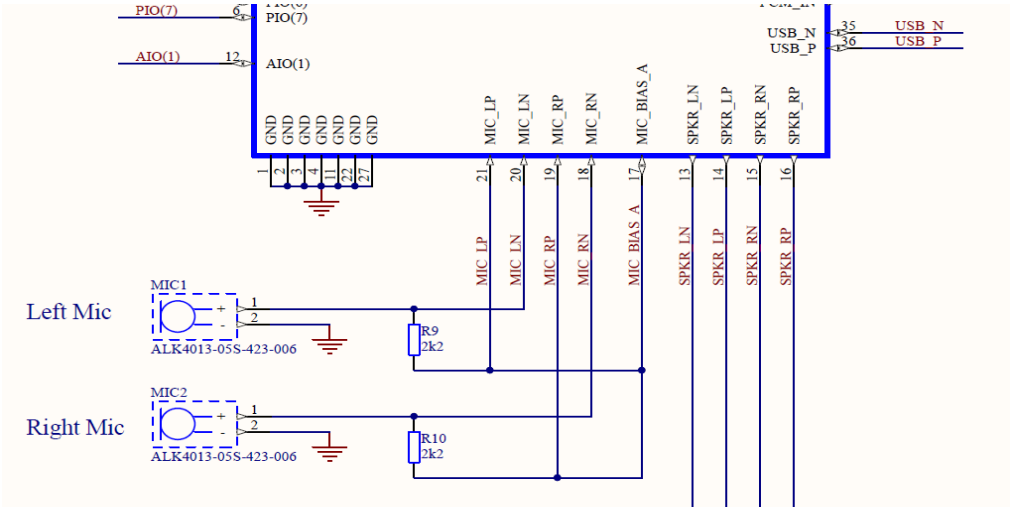
Bluecreation recommend adding supplementary ESD protection to externally available interfaces in the end application.

Role of VREG

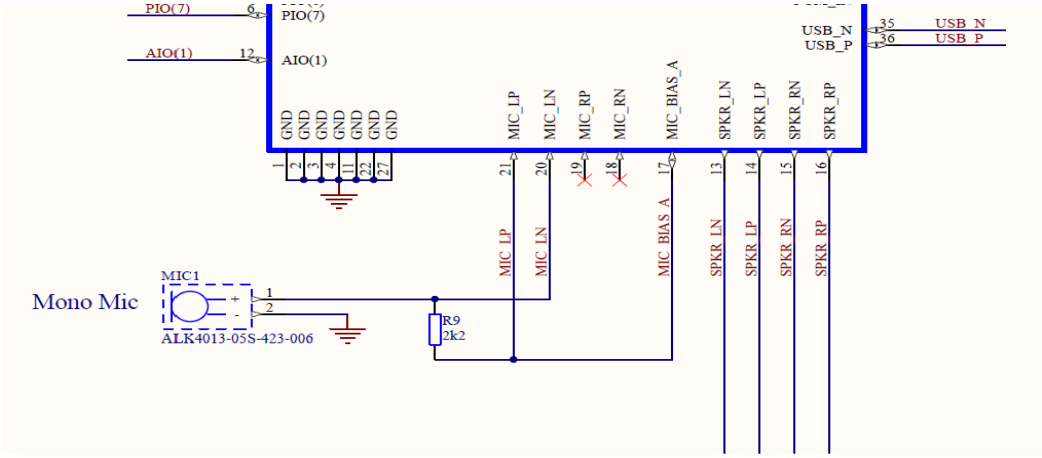
Once the module is booted, VREGEN acts like a standard PIO. The function of VREGEN can be configured. Please refer to the Melody Manual for the VREGEN function once the module is booted.

Connecting Microphones

Stereo Microphone example schematic.



Mono Microphone example schematic.



The Left Channel is used for Mono Operation, leave the right channel unconnected. For Dual Mono Operation the right channel forms the auxiliary channel, connect as per stereo example schematic.

By default Mic Bias will go High for a Hands-free and for a Music connection. The behaviour of Mic Bias can be configured. Please refer to the Melody UART manual for configuration options.

Mic Bias is 1.8V and can source up to 2.8mA of current. Melody fixes it at a certain voltage. Please refer to the manual. The Microphone input goes into a buffer stage so its input resistance is high.

Connecting Speakers

The analogue output is not AC coupled. The analogue output circuit comprises a DAC, a buffer with gain-setting, a low-pass filter and a class AB output stage amplifier. The output is available as a differential signal between SPKR_LN and SPKR_LP for the left channel, and between SPKR_RN and SPKR_RP for the right channel. The amplifiers expect a load impedance of 16 to 32 Ohms. Peak voltage output depends on the gain setting though one should expect nothing more than a peak to peak voltage of 1.5V with a DC offset of around 1.2V at maximum gain.

External Amplifier Support

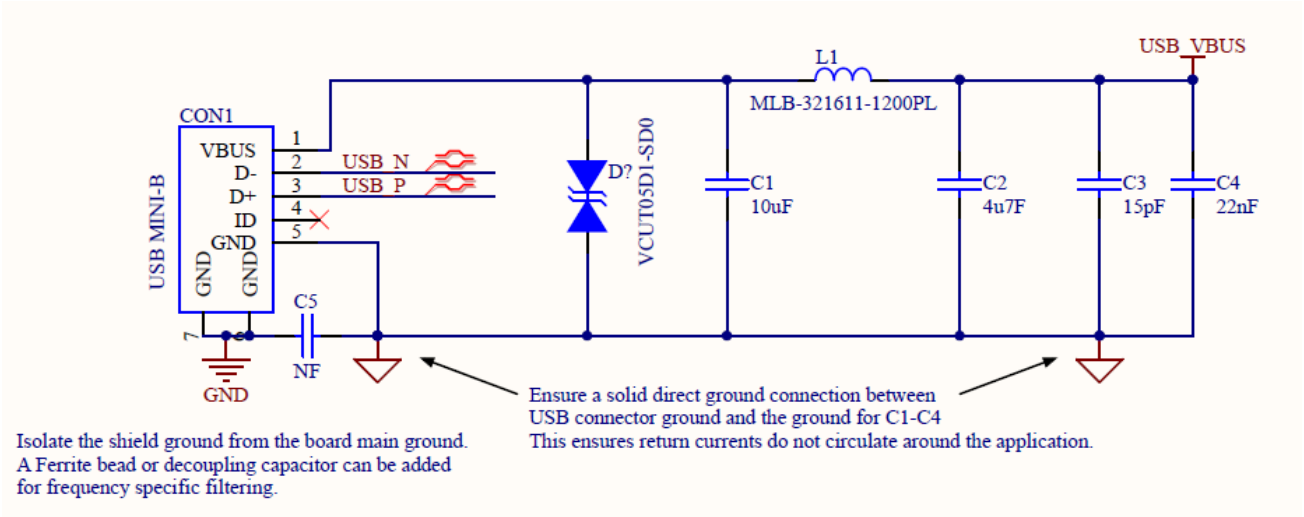
On the BC127-HD (non MFI builds), PIO3 goes High when an Audio Link is active. That PIO can be used for turning ON and OFF an external amplifier.

The BC127-HD is designed to provide direct speaker drive however in the case where higher Audio power is required the BC127-HD can drive an external amplifier.

The BC127-HD Speaker outputs are DC coupled to the Bluetooth IC internal to the module. The speaker outputs are referenced to 1.8V. Bluecreation recommends connecting the BC127-HD to an external amplifier in a differential configuration for enhanced noise immunity. In this configuration common mode noise is rejected by the amplifier configuration. In many applications supply noise can significantly degrade audio performance so supply filtering and layout grounding is essential to gain best performance in audio applications. This is especially important in USB powered applications or where a USB source is used to charge a battery powered applications, USB supplies vary significantly with noise levels and supply stability good grounding and isolation of noise ground currents is essential for superior audio applications.

In addition to steady state noise levels from USB supplies the plugging and unplugging of USB chargers can cause large supply transients that ripple through the supply chain to cause clicking and popping in the audio domain. Bluecreation recommends following good noise immunity pcb design practices, ground isolation, short residual current return paths and the use of ferrite bead and large decoupling capacitors on USB supply connections.

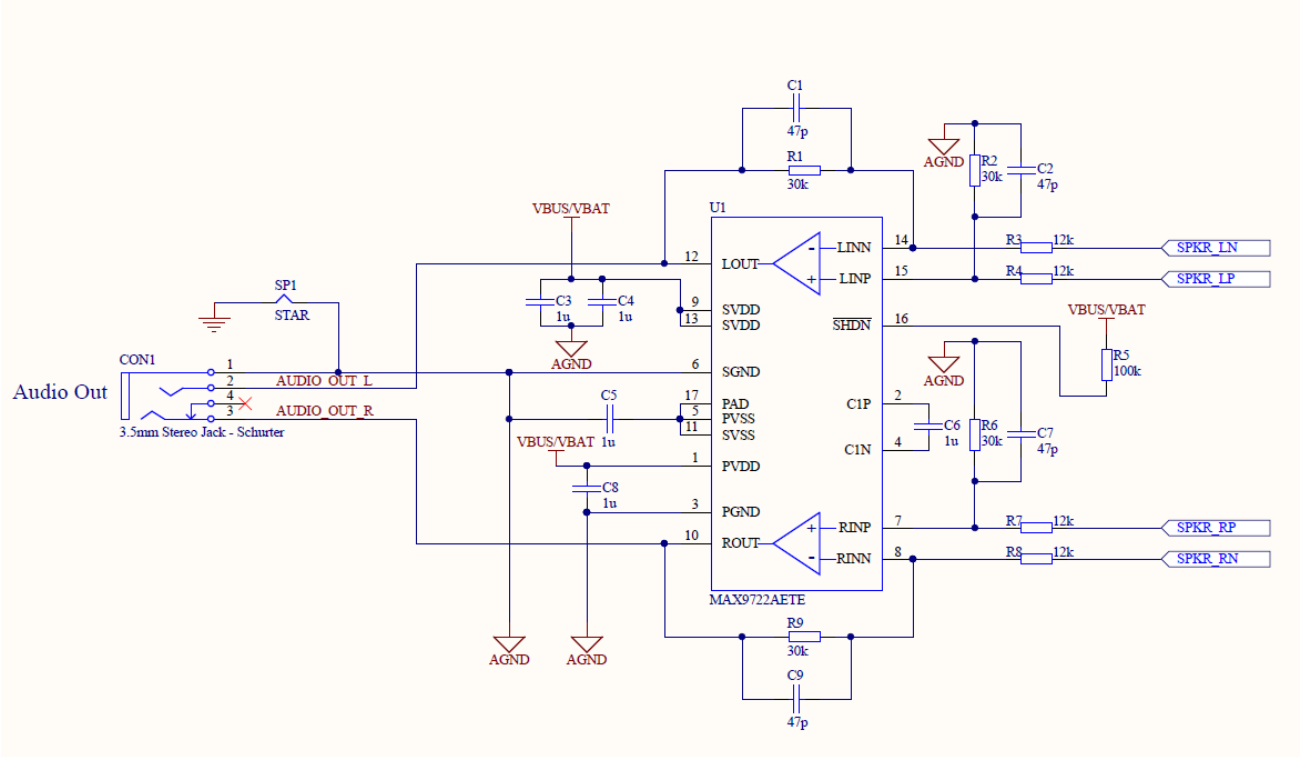
An example USB supply configuration is shown below.



The BC127-HD Discovery board and BC127-HD Development board uses an external Amplifier for audio application demonstration purposes. For superior audio performance always follow the design and layout guidelines provided by the amplifier manufacturer.

Always use a high quality audio amplifier ideally with click and pop suppression circuits built in. These amplifiers use noise suppression and soft start techniques to filter supply noise and transients as well as minimising ground loop currents and DC offsets that can cause degraded audio effects. Some amplifiers even employ ground sensing and suppression techniques to minimise and remove noise coupling to the audio path.

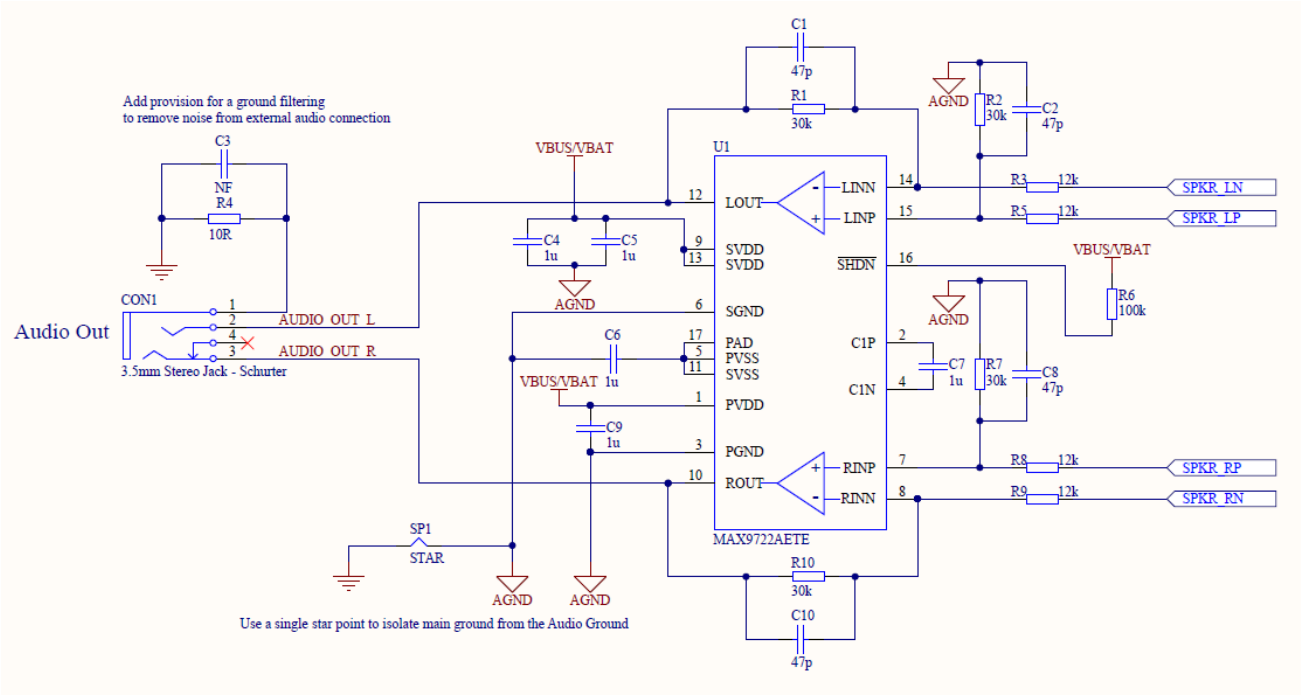
In the example amplifier circuit below the amplifier audio ground is connected to the main ground via a single “star” point at the audio output jack. This is suitable for connection to headphones where noise from an external source is not expected. This circuit is used on the BC127-HD Development Board.



Example External Audio amplifier connection suitable for connecting to external headphones.

No two audio amplifiers are the same it is important to ensure that you follow the design recommendations provided by the supplier of the amplifier.

When connecting to external devices such as laptops in a “Line In” configuration there is a possibility that the sleeve of the audio cable can carry noise derived from the laptop. Also external devices connected through the audio cable sleeve can have different ground potentials which causes currents to flow through the sleeve ground. In this case it is important to isolate the sleeve ground from the audio amplifier to avoid the noise coupling to the amplifier and degrading the signal source. In this case add a filter circuit or ferrite bead connecting the sleeve ground to the ground on the application board as shown below.

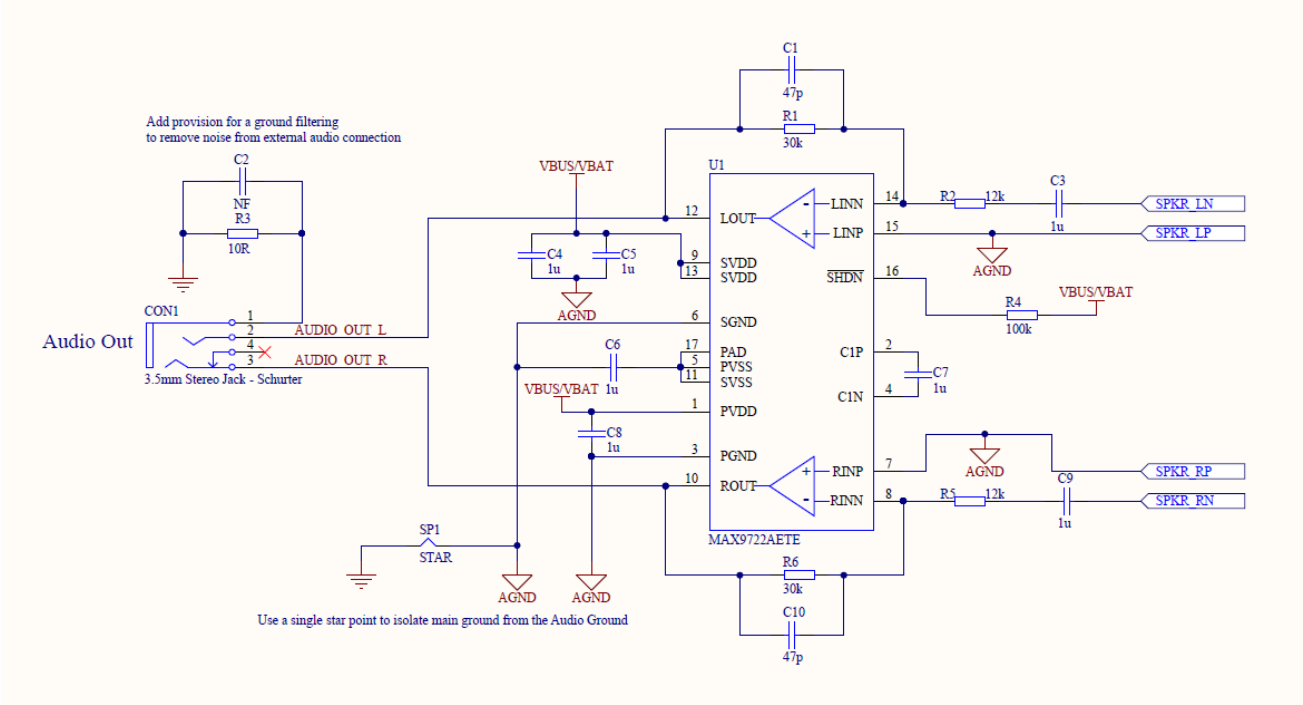


Some amplifiers do not support “capless” operation and require ac coupling on the input and output of the amplifier. Series capacitance can introduce clicks and pops during turn off and turn on as voltage transients occur across the capacitors causing audible spikes on the audio output.

Choice of capacitors used in these configurations is important, avoid using ceramic capacitors as these tend to have high voltage coefficients. Use low voltage coefficients capacitors such as tantalum or electrolytic capacitors to reduce low frequency distortion effects.

In differential mode the tolerance of the source and feedback resistors which set the gain of an amplifier is important. 1% resistors give a 40dB CMRR whereas 0.1% resistors give a 60dB CMRR. Use 0.1% resistor arrays for even better performance.

The BC127-HD can be used to drive amplifiers in a single ended format. Simply terminate the +ve differential outputs directly to the audio ground. An example of a single ended connection is shown below.



GPIOs and UART

The BC127-HD is controlled by GPIOs. This can be configured. If GPIO control is not used, these GPIOs should be left floating. The UART by default does not use RTS/CTS flow control. If the users do not expect to use it, these lines should be left floating.

Digital Pin States on RESET or after Power Up

The following table shows the Digital Pin States on RESET or after power up.

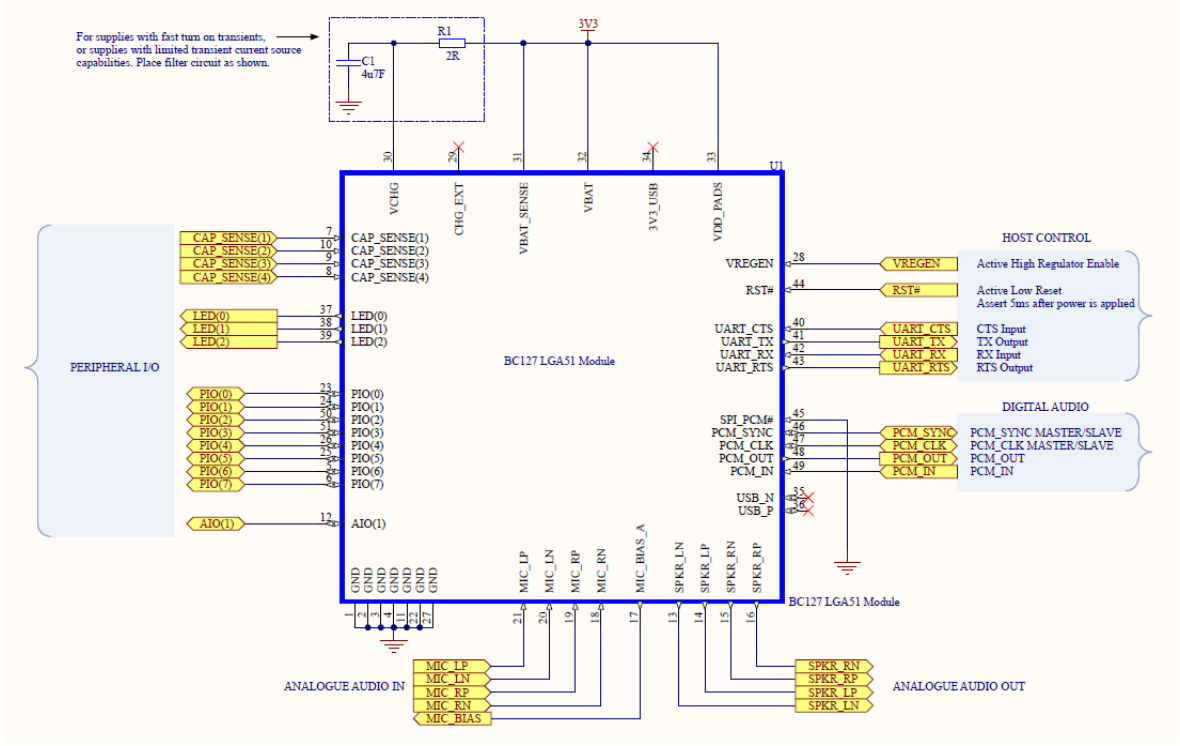
Pin Name / Group	I/O Type	State after Power Up or RESET
USB_DP	Digital bi-directional	N/A
USB_DN	Digital bi-directional	N/A
UART_RX	Digital bi-directional with PU	Strong PU
UART_TX	Digital bi-directional with PU	Weak PU
UART_CTS	Digital bi-directional with PD	Weak PD
UART_RTS	Digital bi-directional with PU	Weak PU
SPI_CS#	Digital input with PU	Strong PU
SPI_CLK	Digital input with PD	Weak PD
SPI_MISO	Digital tri-state output with PD	Weak PD
SPI_MOSI	Digital input with PD	Weak PD
SPI_PCM#	Digital bi-directional with PD	Strong PD
PCM_IN	Digital bi-directional with PD	Weak PD
PCM_OUT	Digital bi-directional with PD	Weak PD
PCM_SYNC	Digital bi-directional with PD	Weak PD
PCM_CLK	Digital bi-directional with PD	Weak PD
RST#	Digital input with PU	Strong PU
PIO[7:0]	Digital bi-directional with PD	Weak PD

PD = Pull Down, PU = Pull Up

Input and Tri-state Currents	Min	Typ	Max	Unit
Strong pull-up	-150	-40	-10	µA
Strong pull-down	10	40	150	µA
Weak pull-up	-5	-1.0	-0.33	µA
Weak pull-down	0.33	1.0	5.0	µA

BC127-HD With External Supply

The following figure represents an example of a fixed voltage configuration.



Referring to the figure above, a 3.3V supply is connected to pins ***VCHG, VBAT_SENSE, VBAT*** and ***VDD_PADS***. The minimum voltage is 3.1V to enable the module to boot.

VCHG is the input to the battery charger regulator though in this configuration the charging circuit is not used.
VBAT_SENSE is the input to the Battery sensor circuitry, which in this configuration is not used.
VBAT is the main supply input to the internal switch mode and LDO regulators and supply domain for **VREGEN.**
VDD_PADS is the supply to all the I/O domains for PIO, UART, PCM, LED and RST#.

Boot Modes

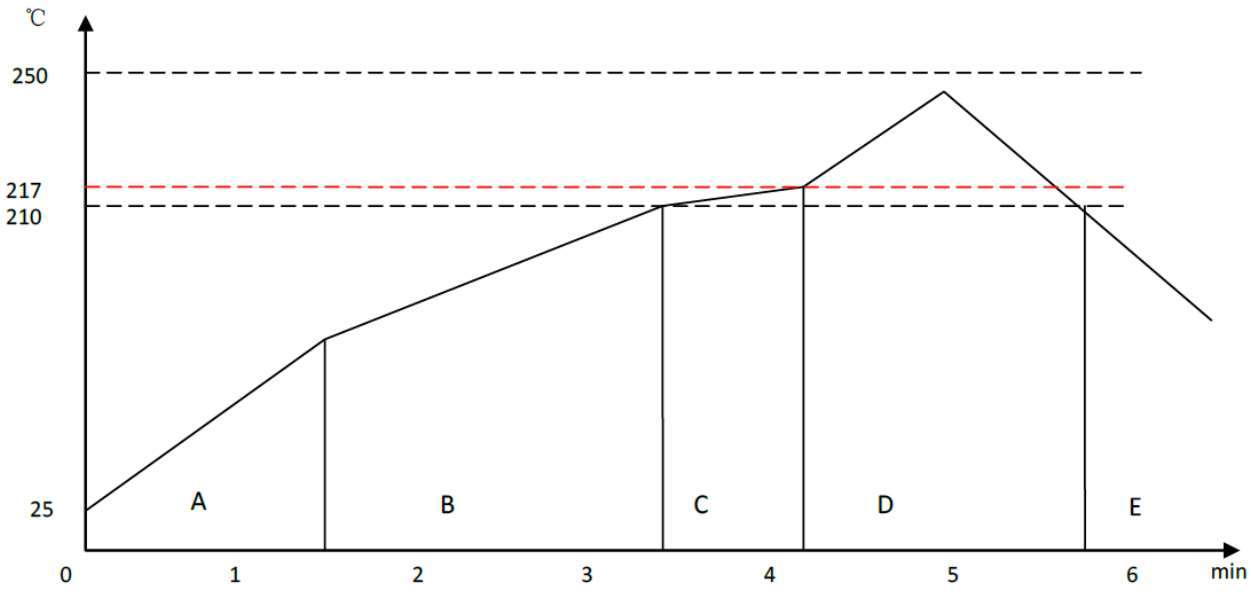
Application of a voltage greater than 3.1V correctly boots the module, the module can be powered down by removing the fixed supply voltage or by pulling VREGEN low. If the fixed supply voltage remains restart the module by pulling VREGEN high.

BC127-HD to Wake-Up an External Processor on Connection

With GPIO control disabled, BC127-HD has PIOs that will go High when a Bluetooth connection is established. Please refer to the Melody Manual for more details.

Solder Reflow Profile

The solder profile is described below.



Zone A: Preheat: This raises the temperature at a controlled rate, typically 0.5 - 2C/s. This will preheat the component to 120°C to 150°C to distribute the heat uniformly to the PCB.

Zone B: Equilibrium1: In this zone, the flux becomes soft and uniformly spreads solder particles over the PCB board, preventing re-oxidisation. The recommended temperature for this zone is 150°C to 200°C for 60s to 120s.

Zone C: Equilibrium2: This is optional and in order to resolve the upright component issue. Temperature is 210°C to 217°C for 20s to 30s.

Zone D: Reflow zone: The temperature should be high enough to avoid wetting but low enough to avoid component deterioration. The recommended peak temperature is 230°C to 250°C. The soldering time should be 30s to 90s when the temperature is above 217°C.

Zone E: Cooling: The cooling rate should be fast to keep the solder grains small which will give a longer lasting joint. A typical cooling rate is 4°C/s.

Regulatory Certifications

BC127-HD is delivered with FCC, CE, IC and Bluetooth SIG certifications. This allows to integrate the module in an end product without the need to obtain subsequent and separate approvals from these regulatory agencies. This is valid in the case no other intentional or un-intentional radiator components are incorporated into the product. Without these certification, an end product cannot be marketed in the relevant regions.

United States - FCC

- In case no other intentional or un-intentional radiator is incorporated, the BC127-HD's FCC certification allows users to integrate the module into products without the need to obtain subsequent and separate approval.
- The BC127-HD was approved as "intentional transmitter radio module" by the United States' Federal Communications Commission (FCC) with accordance to CFR47 Telecommunications Part 15, Subpart C, section 212. This certification is applicable in all the states in the United States.
- The certification allows products to be listed in the NRTL (National Recognized Test Laboratory) as appointed by OSHA (Occupational Safety and Health Administration).

Labelling

- The BC127-HD has been labelled with its own FCC ID number. In order to extend the certification granted to the BC127-HD, its FCC ID number must be displayed on the finished product in which the module is integrated. The following wording should be used "Contains Transmitter Module FCC ID: SSSBC127-X " or “Contains FCC ID: SSSBC127-X”.
- The user-manual for any product in which the BC127-HD is integrated in must include the following statements:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the 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 and, if not installed and used in accordance with the instructions, 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 turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Reorient or relocate the receiving antenna; Increase the separation between the equipment and receiver; Connect the equipment into an outlet on a circuit different from that to which the receiver is connected; Consult the dealer or an experienced radio/TV technician for help.

To satisfy FCC RF Exposure requirements for mobile and base station transmission devices, a separation distance of 70 mm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operation at closer than this distance is not recommended. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

For further information regarding the FCC certification requirements please review the following websites:

Federal Communications Commission (FCC):
http://www.fcc.gov

FCC Office of Engineering and Technology (OET) Laboratory Division Knowledge Database (KDB):
http://apps.fcc.gov/oetcf/kdb/index.cfm

Europe - CE and RoHS Marking

- In case no other intentional or un-intentional radiator is incorporated, the BC127-HD's CE marking certification allows users to integrate the module into products without the need to obtain subsequent and separate CE approval.
- The BC127-HD has been tested and granted approval as R&TTE Directive product under the 1999/5/EC Essential Requirements for Health and Safety (Article (3.1(a)), Electromagnetic Compatibility, (EMC) (Article 3.1(b)), and Radio (Article 3.2). A Notified Body Opinion has been issued.
- The BC127-HD has also been tested and granted approval under the directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment 2002/95/EC (commonly referred to as the Restriction of Hazardous Substances Directive or RoHS). This certification ensures the module is environmental safe and free from hazardous substances (including Lead).
- Both certifications are applicable in all the 27 countries of the European Economic Area.

Labelling and Documentation

- Products complying with all relevant essential requirements shall bear the CE conformity marking accompanied by the identification number XXX-XXX
- The RoHS certification does not dictate any specific product labelling. However, we recommend marking the product with a "RoHS Compliant" statement.
- R&TTE Directive requires a manufacturer to establish technical documentation. It must be kept by the manufacturer or his authorised representative in the EU for at least 10 years after the last product has been manufactured. The documentation must cover:
  - a general description of the product,
  - conceptual design and manufacturing drawings and schemes of components, sub-assemblies, circuits and other design documentation,
  - descriptions and explanations necessary for the understanding of said drawings and schemes and the operation of the product,
  - a list of the standards referred to in Article 5, applied in full or in part, and descriptions and explanations of the solutions adopted to meet the essential requirements of the Directive where such standards
  - results of design calculations made, examinations carried out, etc.,
  - test reports.

- Test reports must include the following table containing the BC127-HD tests:

Certification	Standards	Article	Laboratory	Report Number	Date
Safety	EN 60950-1:2006+A11:2009+A1:2010	(3.1(a))			
Health	EN 50371:2002-03				
EMC	EN 301 489-1 V1.8.1 (2008-04); EN 301 489-17 V2.1.1 (2009-05)	(3.1(b))			
Radio	EN 300 328 V1.7.1 (2006-10)	(3.2)			

- For further labelling and CE marking requirements please review the R&TTE Compliance Association Technical Guidance: http://rtteca.com/

For further information regarding the R&TTE certification requirements please review the following websites:

Radio and Telecommunications Terminal Equipment (R&TTE):
http://ec.europa.eu/enterprise/rtte/index_en.htm

European Conference of Postal and Telecommunications Administrations (CEPT):
http://www.cept.org

European Telecommunications Standards Institute (ETSI):
http://www.etsi.org

European Radio Communications Office (ERO):
http://www.ero.dk

Canada - IC

Industry Canada Industrie Canada

- In case no other intentional or un-intentional radiator is incorporated, the BC127-HD's IC certification allows users to integrate the module into products without the need to obtain subsequent and separate approval.
- The BC127-HD has been tested and granted approval under Industry Canada (IC) Radio Standards Specification (RSS) RSS-210, RSSGen and ICES-003. This certification is applicable in Canada.

Labelling and Documentation

- The BC127-HD has been labelled with its own IC ID number. In order to extend the certification granted to the BC127-HD, its CE ID number must be displayed on the finished product in which the module is integrated. The following wording should be used "Contains Transmitter Module IC: XXX"
- The user-manual for any product in which the BC127-HD is integrated in must include the following statements:

> This device complies with Industry Canada license 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.
>
> Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

> Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.
>
> Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante

- For further labelling and IC marking requirements please review the Industry Canada website: http://www.ic.gc.ca/

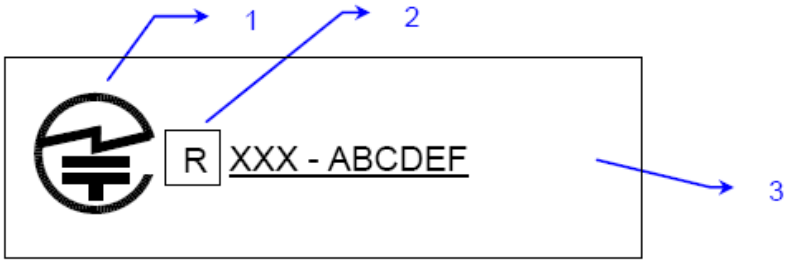
R 006-000353

Japan - GIDEKI (MIC)

- The BC127-HD has been tested and granted approval under Japan JEDEC, Article2, Paragraph1, Item19 WW in accordance with the provision of Article 38-24 Paragraph 1 of the Radio Law.

Labelling and Documentation

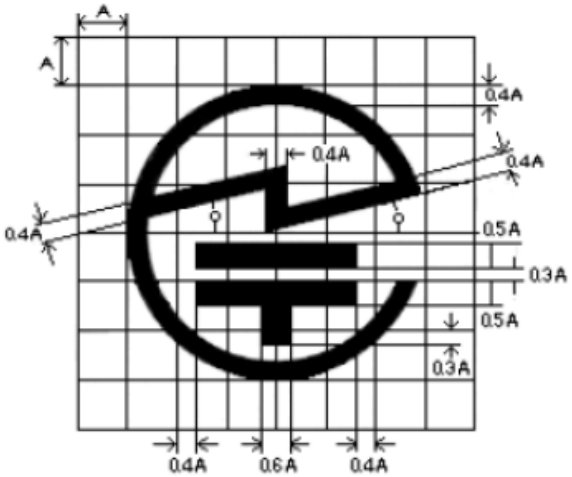
- The marking below must be affixed to an easily noticeable section of the specified radio equipment.



1. GITEKI (MIC) Mark
The diameter of the mark must be 5 mm or greater. (If the volume of certified equipment is less than 100 cc, the diameter of the mark may be 3 mm or greater).

2. Symbol of Radio Certification
Put 'R' in the square as it is shown above

3. Certified Type Number
Certified Type Number specific to this device. Details of this number are given below.



- For further labelling and JRF marking requirements, please review the MIC website at http://www.tele.soumu.go.jp/e/index.htm

Ordering Information

Part number BC127-HD

Order number	Description
BC127-HD	Class2 Bluetooth 4.2 Module with integrated chip Antenna
BC127-A	Class2 Bluetooth 4.2 Module with integrated Antenna and connection to iOS
BC127-DEVKIT-001	Development kit for the BC127-HD module
BC127-DEVKIT-A-001	Development kit for the BC127-HD-AI module

BC127-HD modules are shipped Flashed with the latest Melody firmware production build. Customers need to confirm at order with distributors that they will receive the firmware build they require. For volume orders (1k quantities), BC127-HD can be shipped Flashed with custom firmware. Please inquire with sales@bluecreation.com for more information.

General Notes

- BlueCreation's products are not authorised for use in life-support or safety-critical applications. Use in such applications is done at the sole discretion of the customer. BlueCreation will not warrant the use of its devices in such applications.
- While every care has been taken to ensure the accuracy of the contents of this document, BlueCreation cannot accept responsibility for any errors. BlueCreation reserves the right to make modifications, corrections and any other changes to its products at any time. Customers should obtain the latest information before placing orders.
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