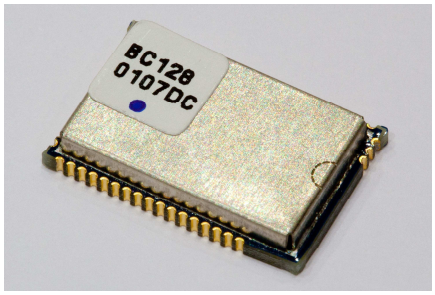
Datasheet

Key Specifications

- Bluetooth Certified 4.0 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
- 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
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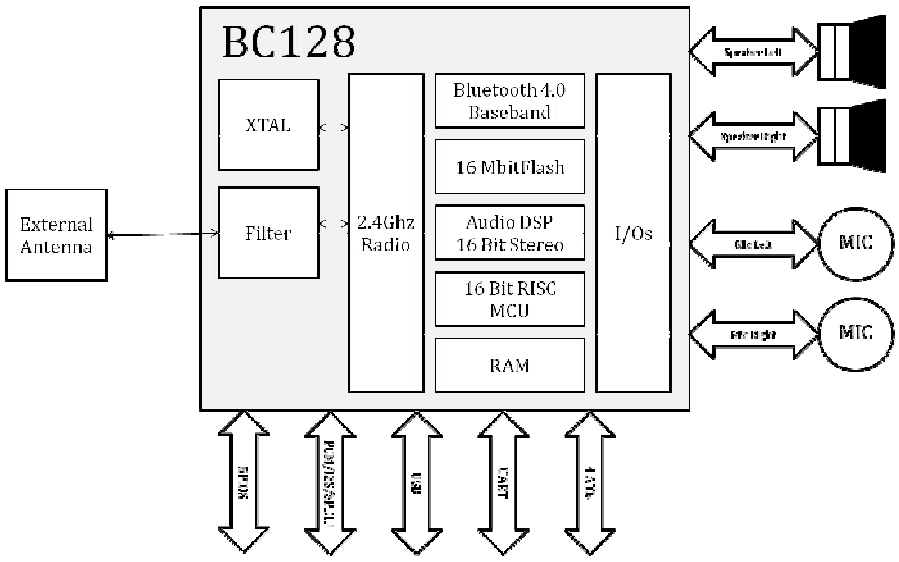
Description

BC128 is a highly flexible, low power, small form factor Bluetooth Version 4.0 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 4.0 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	Antenna dependant
RF Sensitivity	0.1% BER at -88dBm
Transmit Power	BER/EDR Class2＜4dBm, BLE＜10dBm

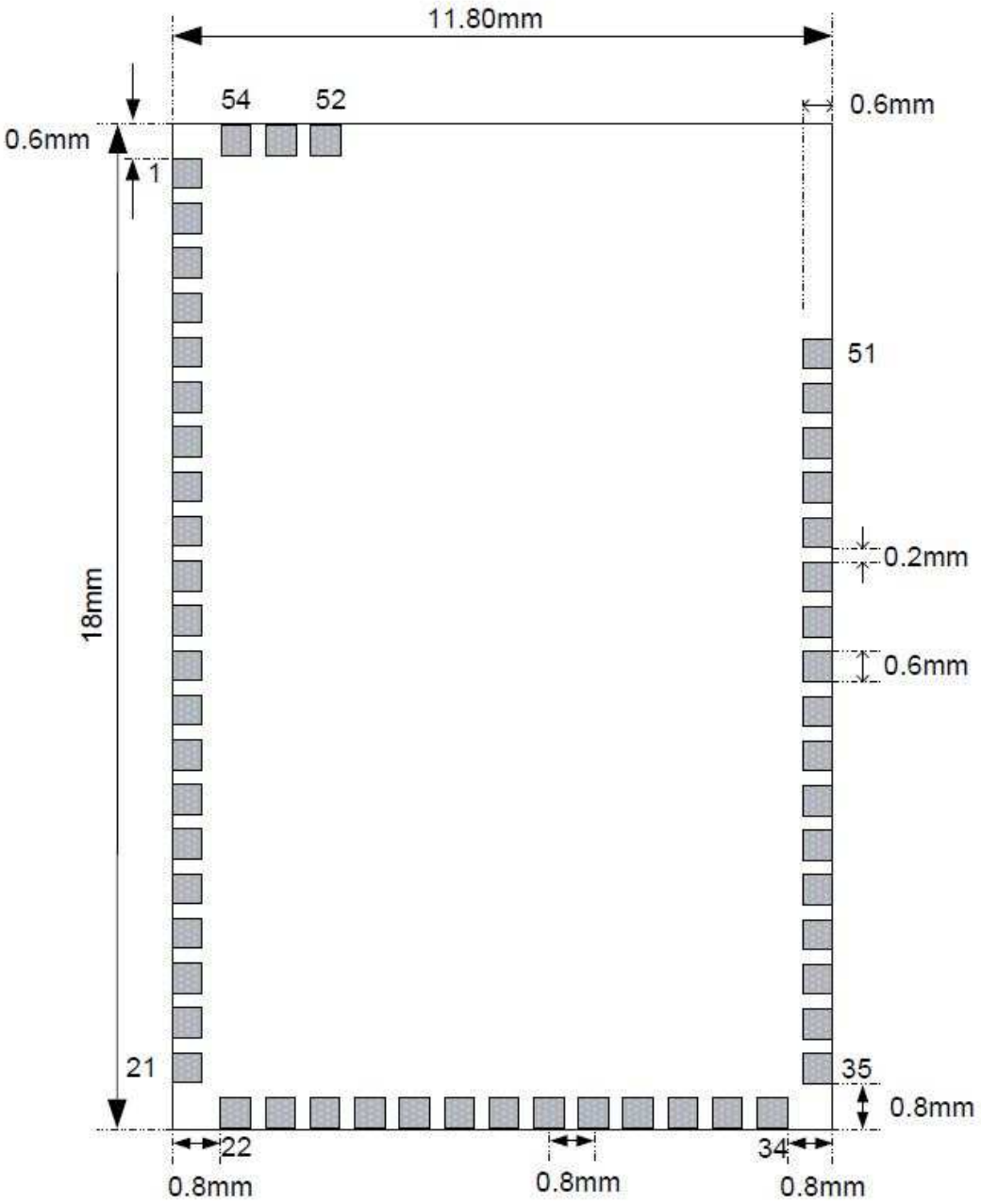
Audio Specifications

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

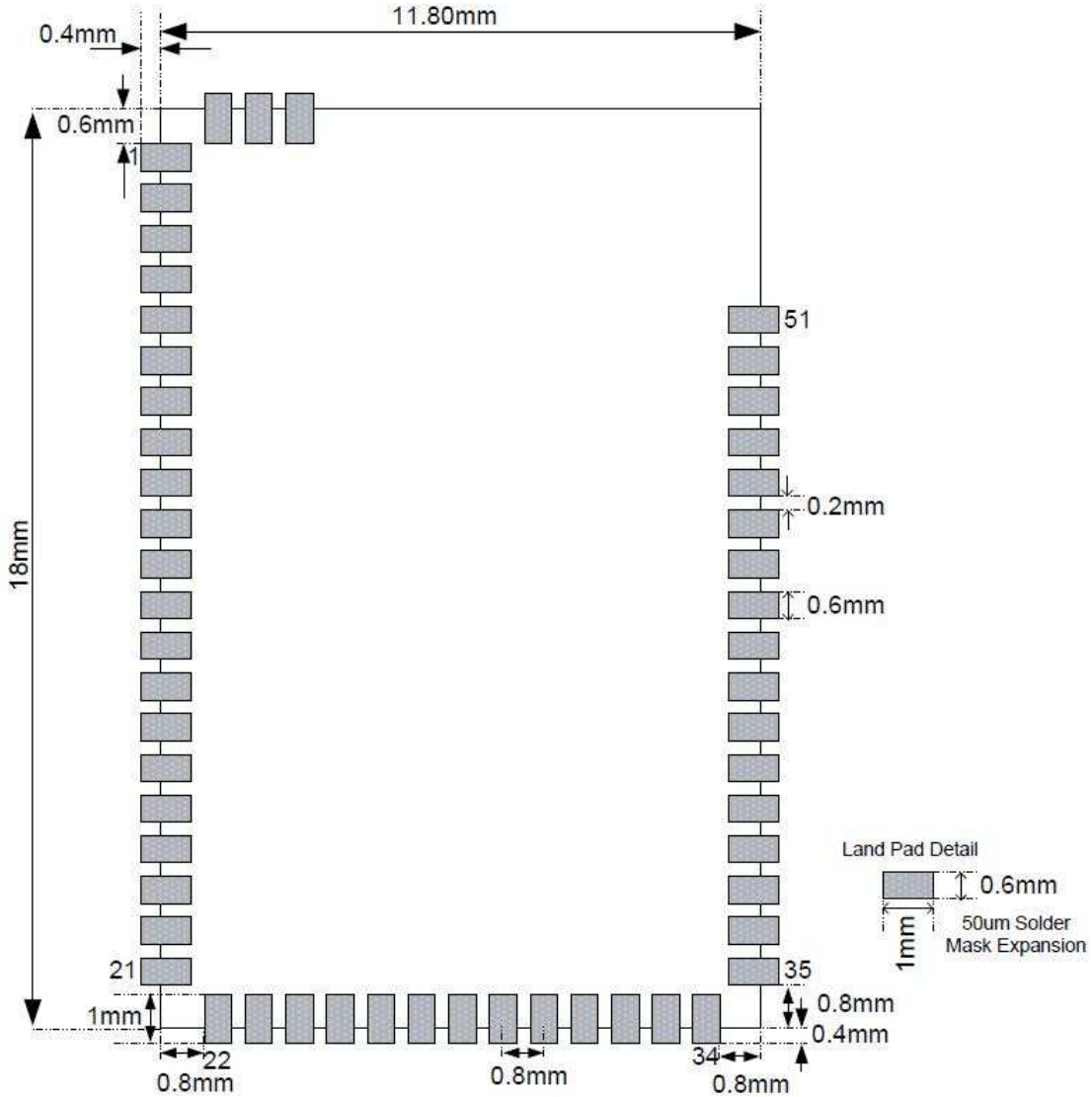
Electric Specifications

Specifications	Description
Supply Voltage	3.3V to 4.7 V DC
Typical Current	15mA (Music streaming)
Typical Current Idle	<1mA (Connectable)
Operating Temperature	-40℃ to 85℃

Module Footprint



Placement Considerations



Audio Circuit

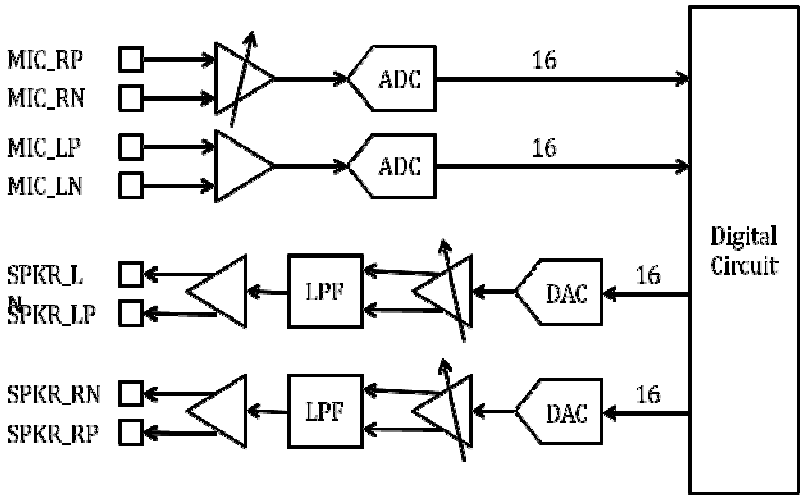
The Audio circuit consists of:

- 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	Bi-directional	Programmable input/output line
6	PIO_7	Bi-directional	Programmable input/output line
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	Bi-directional	Programmable input/output line
26	PIO_4	Bi-directional	Programmable input/output line
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 input
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	PCM_SYNC	Bi-directional	Synchronous data sync
47	PCM_CLK	Bi-directional	Synchronous data clock
48	PCM_OUT	CMOS output	Synchronous data output
49	PCM_IN	CMOS input	Synchronous data input
50	PIO_2	Bi-directional	Programmable input/output line
51	PIO_3	Bi-directional	Programmable input/output line
52	GND	GND	Common Ground
53	BT RF	BT RF	BT RF
54	GND	GND	Common Ground

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

Solder Reflow Profile

- Preheat Temperature: 150℃ for 100 seconds
- Temperature: 220℃ for 40 seconds.
- Single Pass

Notes:

- Changes or modifications that are made to the module circuitry can hinder the certification
- Installers must comply with all of the instructions provided by the certification agency, which indicate installation and/or operating conditions necessary for compliance
- It is important to note that the finished product is required to comply with all applicable authorizations regulations and requirement that is not associated with the BC127 module, including non-intentional transmitting modules and other intentionally transmitting modules.
- The previous section represents BlueCreation interpretation of the salient issues of the certifications. For full details of the certification please refer to the local agencies' websites. Where there is any difference between this document and the local agencies' website, the subsequent should be followed.
- At the time of writing this document FCC, CE and BQP certification were still processed by the relevant authorities.

Ordering Information

Part number BC127

Order number	Description
BC128	Bluetooth 4.0 Module with external Antenna
BC128-A	Class2 Bluetooth 4.0 Module with external Antenna and connection to iOS
BC127-DEVKIT-001	Development kit for the BC127 module (used to evaluate BC128 function)
BC127-DEVKIT-A-001	Development kit for the BC127-A module (used to evaluate BC128 function)

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.
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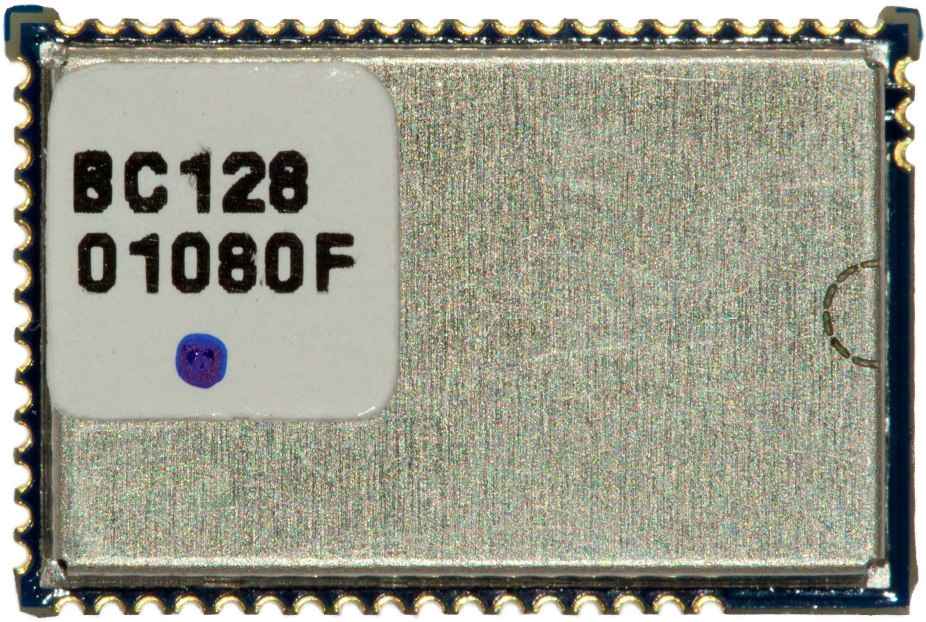
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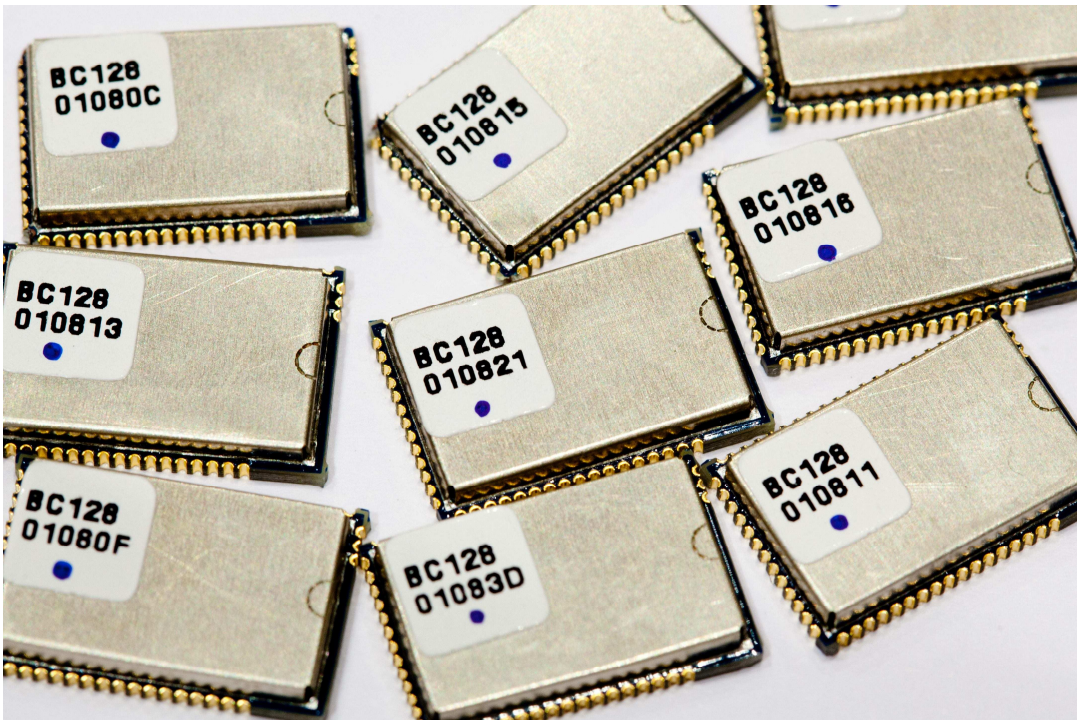
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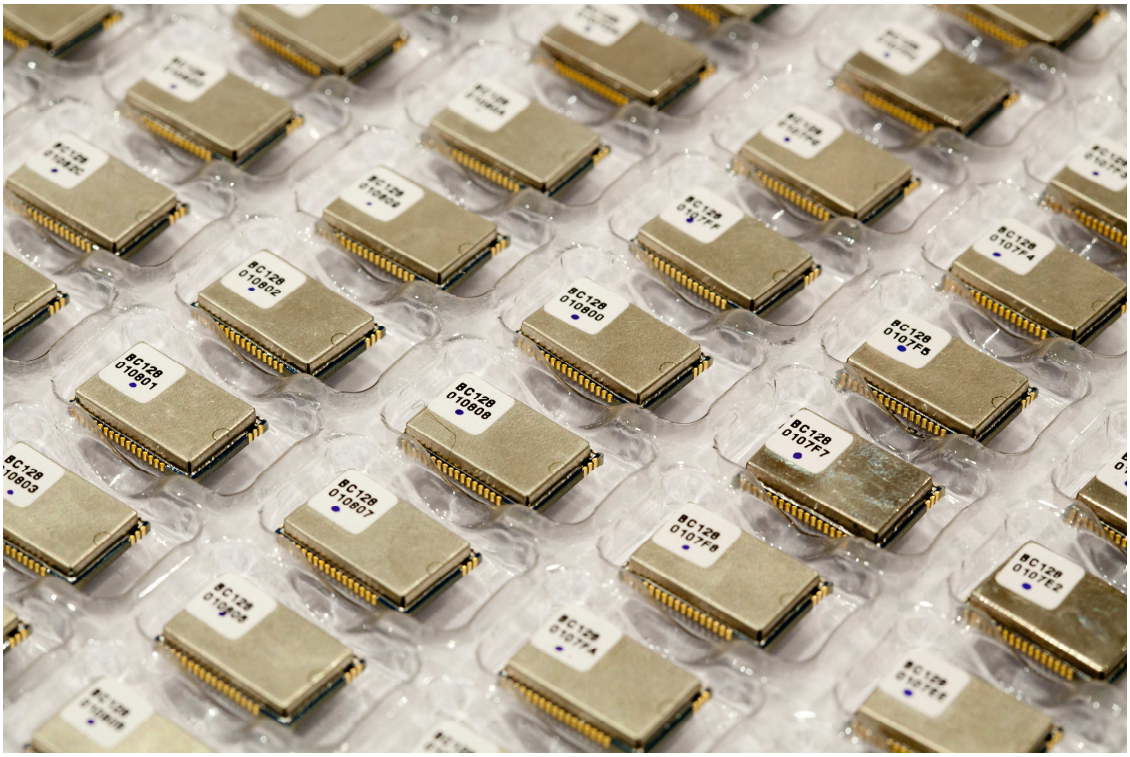
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