

Features

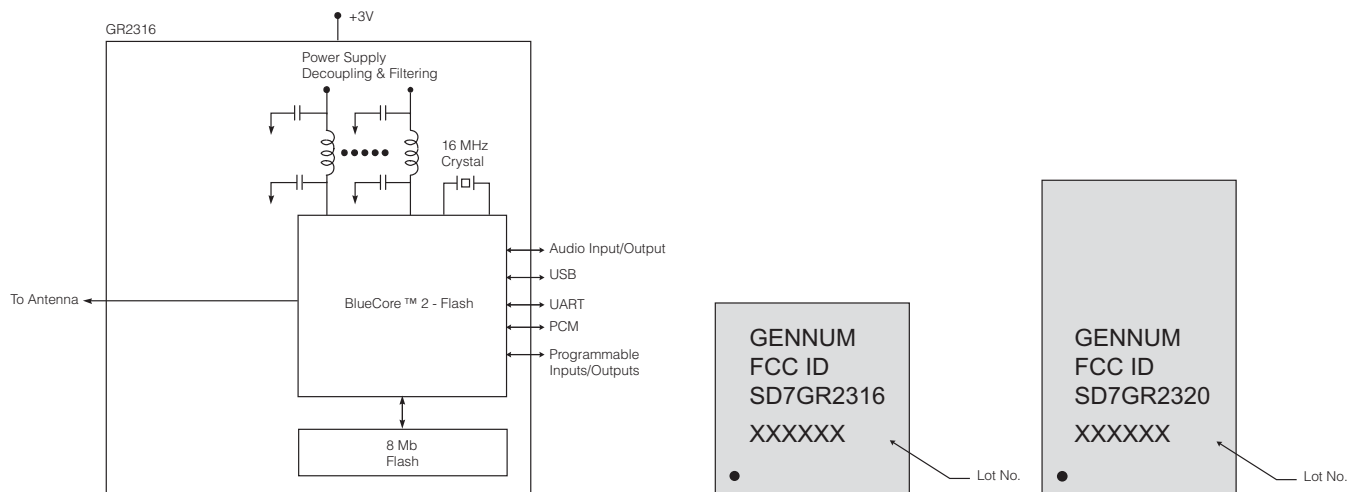
- Compliant to the Bluetooth™ specification v1.1
- FCC and CE certified
- Class 2 operation
- Integrated voice codec
- BlueCore™ HCI software stack
- Internal 8Mb flash, 16MHz crystal
- Power control function supported
- Surface mount compatible with standard 1.0mm BGA package interface
- GR2316 size: 14.5mm x 14.5mm x 3mm
- GR2320 size: 23mm x 14.5mm x 3mm
- Temperature range: -20°C to +85°C
- Voltage range: +2.2V to +3.6V

Description

The GR2316 (without on-board antenna) / GR2320 (with on-board antenna) is one of the smallest modules available providing the most flexibility for a wide range of applications. Powered by Cambridge Silicon Radio's world leading single-chip technology, and combined with Gennum's packaging technology, the result is a fully integrated module providing a complete system for data and voice communications.

Applications

- Headsets
- Keyboards
- Mobile Phones
- Personal Digital Assistants (PDAs)



Bluetooth™ is a trademark owned by the Bluetooth SIG, Inc. and licensed to Gennum Corporation.
BlueCore™ is a trademark owned by Cambridge Silicon Radio.
GenBlue™ is a trademark owned by Gennum Corporation.



Block diagram

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1. Pinout

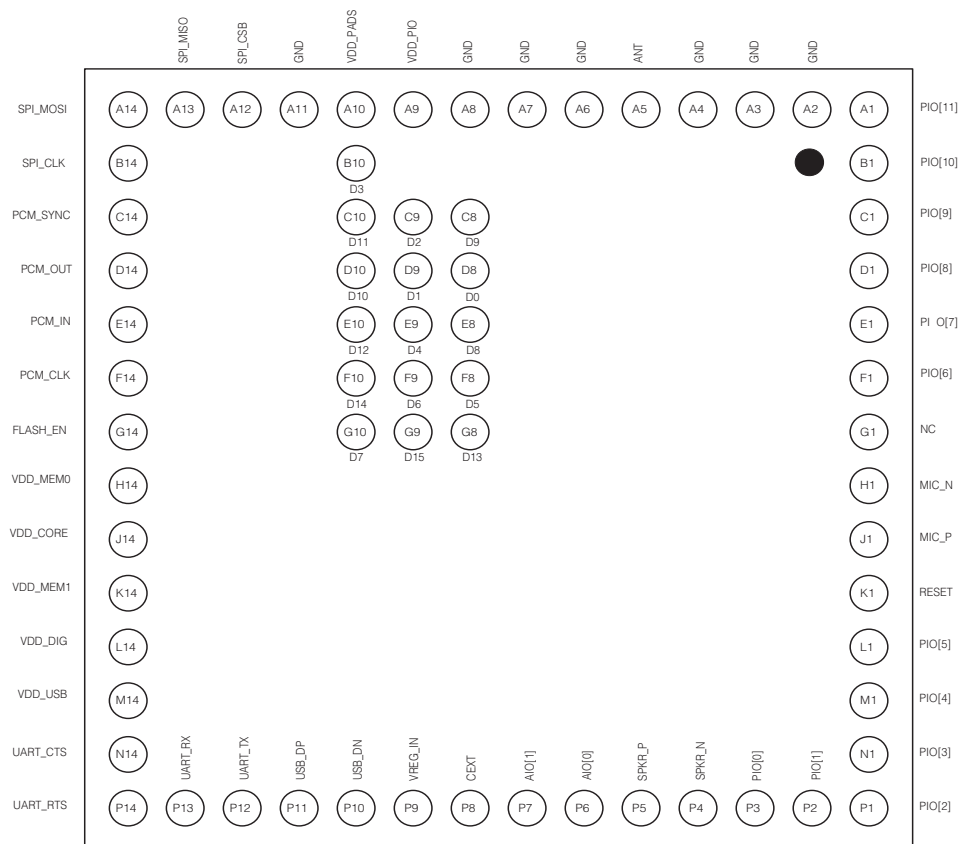


Figure 1-1: GR2316 bottom view

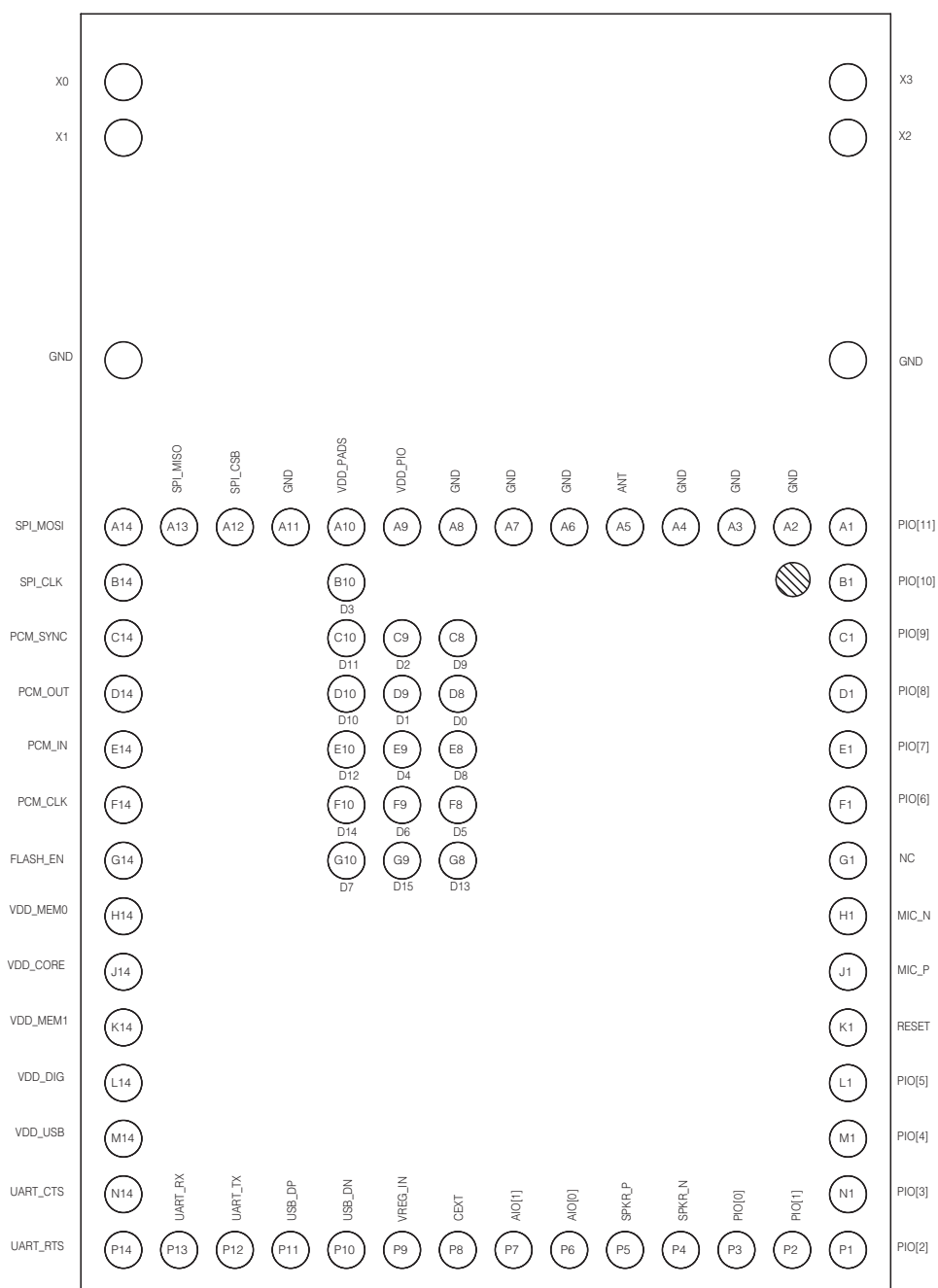


Figure 1-2: GR2320 bottom view

2. Package Information

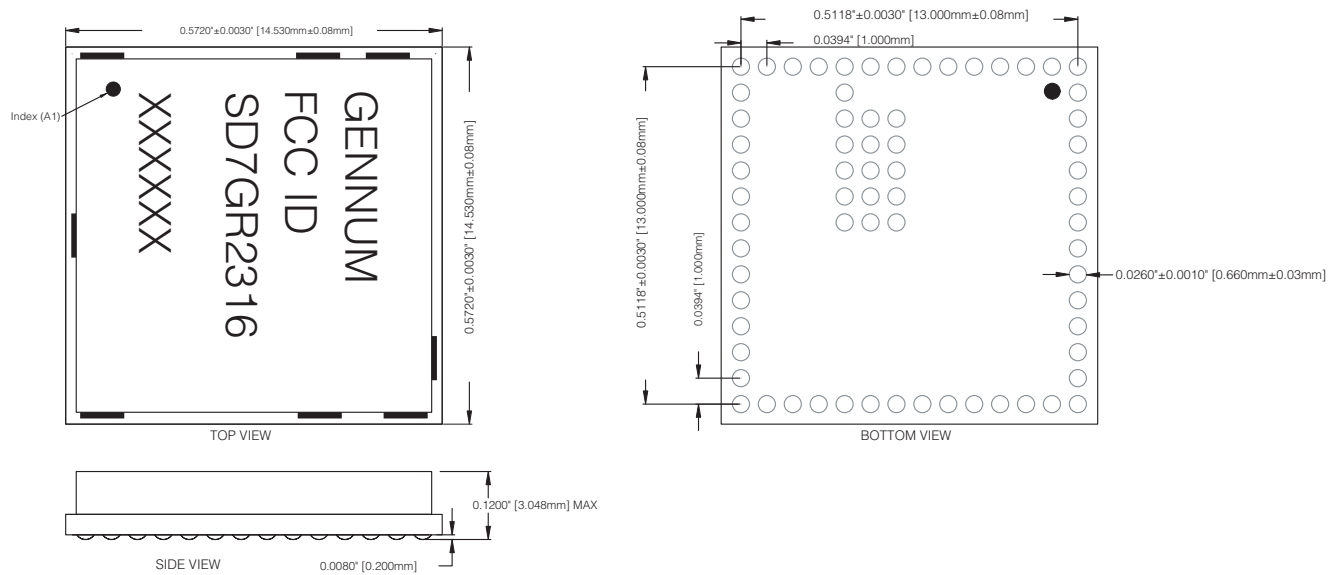


Figure 2-1: GR2316 package dimensions

NOTE: The following GigaAnt (www.gigaant.com) antennas have been approved for use with the GR2316 module:

- Rufa
- Picea
- Titanis
- Flavus
- Mica

For other types of antennas, please contact Gennum (bluetooth@gennum.com).

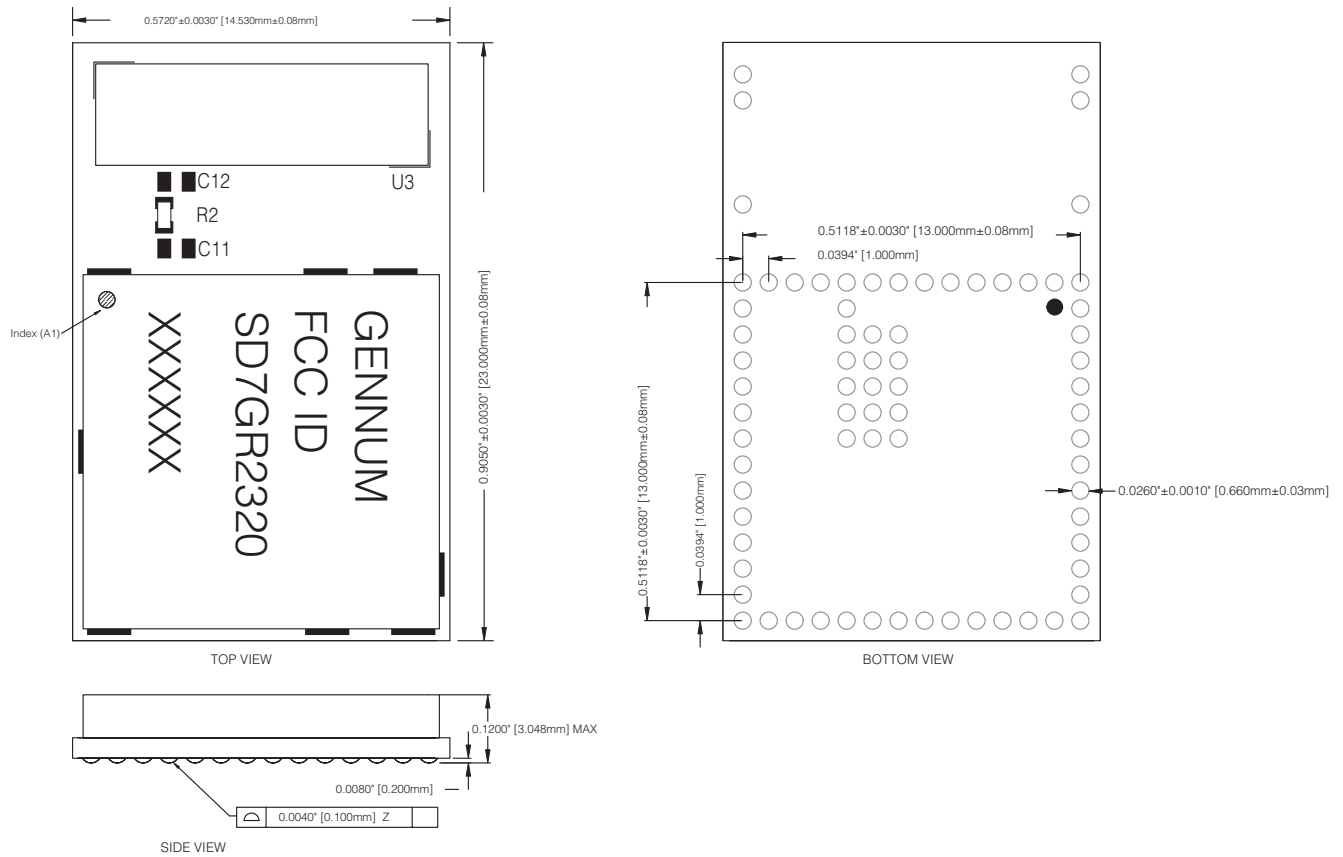


Figure 2-2: GR2320 package dimensions

3. Pin Descriptions

Table 3-1: Pin Descriptions

Pin Number	Pin Name	Description
A2	GND	Ground connection to external low impedance ground plane
A3	GND	Ground connection to external low impedance ground plane
A4	GND	Ground connection to external low impedance ground plane
A6	GND	Ground connection to external low impedance ground plane
A7	GND	Ground connection to external low impedance ground plane
A8	GND	Ground connection to external low impedance ground plane
A11	GND	Ground connection to external low impedance ground plane
A5 (GR2316)	ANT	RF Connection to Antenna
A5 (GR2320)	DNC	Do not connect this pin for the GR2320
A12	SPI_CSB	Chip select for serial peripheral interface, active low
A13	SPI_MISO	Serial peripheral interface data output
A14	SPI_MOSI	Serial peripheral interface data input
B14	SPI_CLK	Serial peripheral interface clock
C14	PCM_SYNC	Synchronous data sync
D14	PCM_OUT	Synchronous data output
E14	PCM_IN	Synchronous data input
F14	PCM_CLK	Synchronous data clock
N14	UART_CTS	UART clear to send, active low
P14	UART_RTS	UART request to send, active low
P13	UART_RX	UART data input, active low (idle status high)
P12	UART_TX	UART data output, active low
P11	USB_P	USB data plus with selectable internal 1.5k pull-up resistor
P10	USB_N	USB data minus
P5	SPKR_P	Speaker output positive
P4	SPKR_N	Speaker output negative
J1	MIC_P	Microphone input positive
H1	MIC_N	Microphone input negative
P7	AIO(1)	Programmable input/output line
P6	AIO(0)	Programmable input/output line

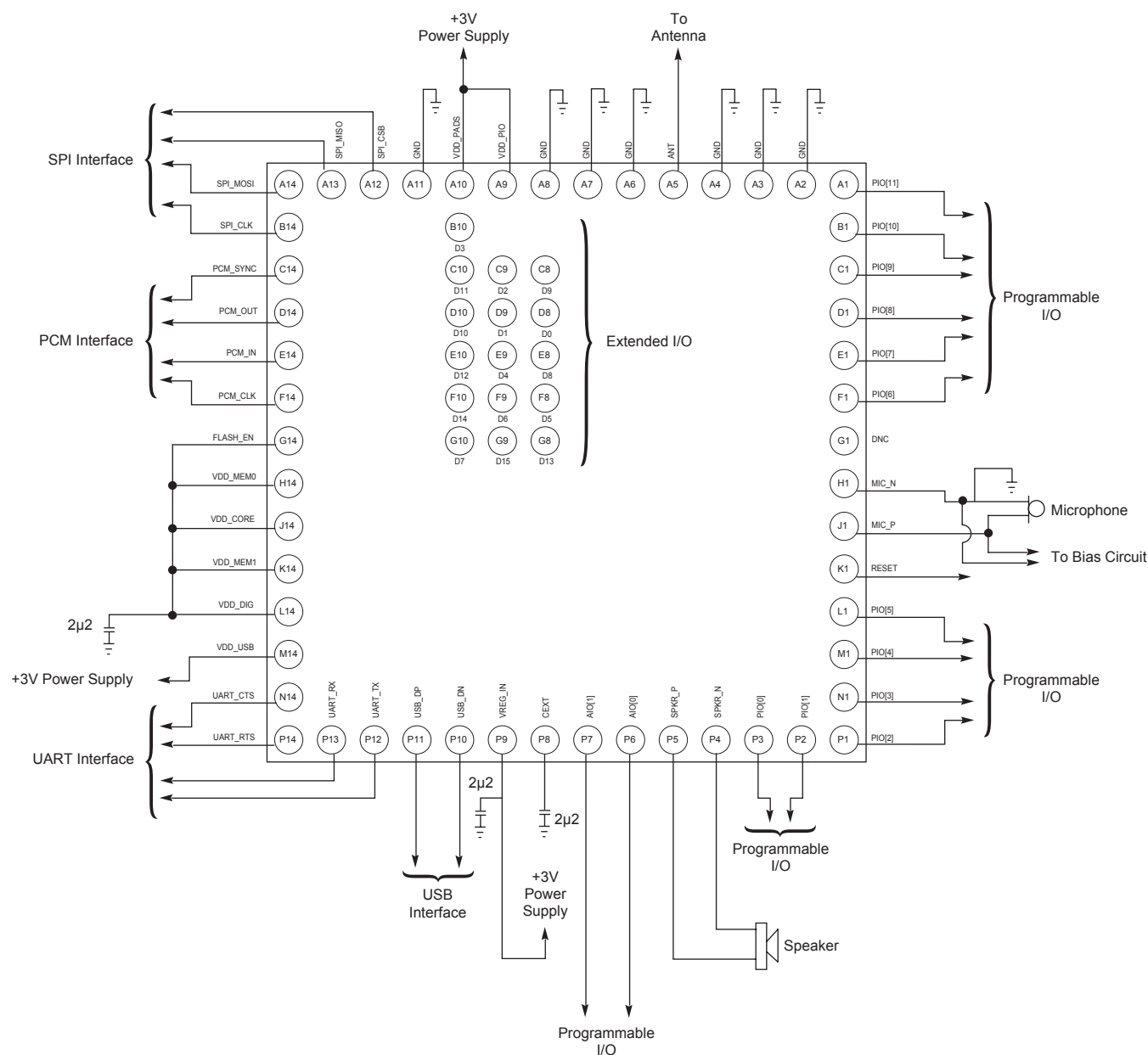
Table 3-1: Pin Descriptions (Continued)

Pin Number	Pin Name	Description
P3	PIO(0)	Programmable input/output line
P2	PIO(1)	Programmable input/output line
P1	PIO(2)	Programmable input/output line
N1	PIO(3)	Programmable input/output line
M1	PIO(4)	Programmable input/output line
L1	PIO(5)	Programmable input/output line
F1	PIO(6)	Programmable input/output line
E1	PIO(7)	Programmable input/output line
D1	PIO(8)	Programmable input/output line
C1	PIO(9)	Programmable input/output line
B1	PIO(10)	Programmable input/output line
A1	PIO(11)	Programmable input/output line
D8	D0	Extended input/output line
D9	D1	Extended input/output line
C9	D2	Extended input/output line
B10	D3	Extended input/output line
E9	D4	Extended input/output line
F8	D5	Extended input/output line
F9	D6	Extended input/output line
G10	D7	Extended input/output line
E8	D8	Extended input/output line
C8	D9	Extended input/output line
D10	D10	Extended input/output line
C10	D11	Extended input/output line
E10	D12	Extended input/output line
G8	D13	Extended input/output line
F10	D14	Extended input/output line
G9	D15	Extended input/output line
K1	RESET	Reset high (input debounced so must be high for >5ms)
P8	CEXT	Connection to external decoupling capacitor
G1	DNC	No connection. Do not connect this pin.
P9	VREG_IN	Linear regulator voltage input (3 VOLTS)

Table 3-1: Pin Descriptions (Continued)

Pin Number	Pin Name	Description
A9	VDD_PIO	Positive supply for PIO (connect to +3 volts supply)
A10	VDD_PADS	Positive supply for digital input/output ports (connect to +3 volts supply)
M14	VDD_USB	Positive supply for UART/USB ports (connect to +3 volts supply)
L14	VDD_DIG	Positive 1.8V supply output for VDD_MEM, FLASH_EN and VDD_CORE
G14	FLASH_EN	Connect to VDD_DIG
H14	VDD_MEM0	Connect to VDD_DIG
J14	VDD_CORE	Connect to VDD_DIG
K14	VDD_MEM1	Connect to VDD_DIG
X0 (GR2320)	–	Mounting pad only
X1 (GR2320)	–	Mounting pad only
X2 (GR2320)	–	Mounting pad only
X3 (GR2320)	–	Mounting pad only
GND (GR2320)	–	Ground connection to external low impedance ground plane.
GND (GR2320)	–	Ground connection to external low impedance ground plane.

4. Typical Application



DNC = Do not connect, for test purposes only.

 = Connection to low impedance ground plane

Figure 4-1: Typical application circuit (bottom view)

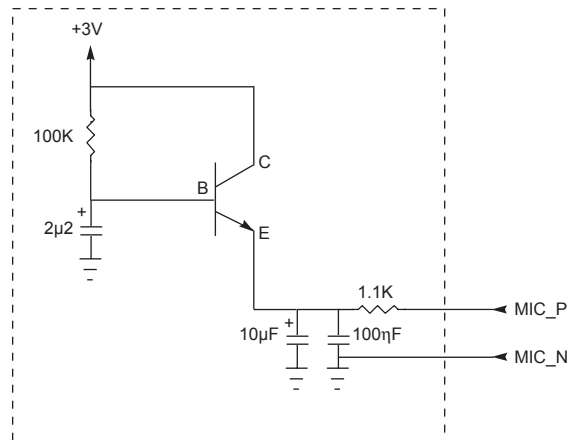


Figure 4-2: Typical Microphone Bias Circuit

5. FCC and EU Compliance

FCC Notice

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.

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

NOTE: 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
- Consult the dealer or an experienced radio/TV technician for help

If the modules are integrated in a way that they are not visible after installation, the product in which the modules are integrated shall be labelled as follows:

- Contains FCC ID SD7GR2316
or
- Contains FCC ID SD7GR2320

EU Notice

In accordance with Annex IV of the EU directive 1999/5/EC, **Gennum Corporation** declares under our responsibility that the product:

Type: **GR2316 and GR2320**
Intended Purpose: **Bluetooth Transceivers**
Equipment Class: **1**

complies with the appropriate essential requirements of the Article 3 of the R&TTE and the other relevant provisions, when used for its intended purpose.

Means of the efficient use of the radio frequency spectrum Art.3 (2)

EN 300 328-2 V1.2.1, Electromagnetic compatibility and Radio Spectrum Matters (ERM); Wideband Transmission systems; Data transmission equipment operating in the 2.4 GHz ISM band and using spread spectrum modulation techniques; Part 2: Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive.

6. Revision History

Version	ECR	Date	Changes and / or Modifications
A	134127	July 2004	New document.
B	134483	August 2004	Added features information, updated part marking, updated application schematic and added FCC and EU notice.
C	136634	April 2005	Removed Note on page 1, added list of antennas, added to FCC statement.

CAUTION

ELECTROSTATIC SENSITIVE DEVICES
DO NOT OPEN PACKAGES OR HANDLE
EXCEPT AT A STATIC-FREE WORKSTATION



DOCUMENT IDENTIFICATION

ADVANCE INFORMATION NOTE

The product is in a development phase and specifications are subject to change without notice. Gennum reserves the right to remove the product at any time. Listing the product does not constitute an offer for sale.

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