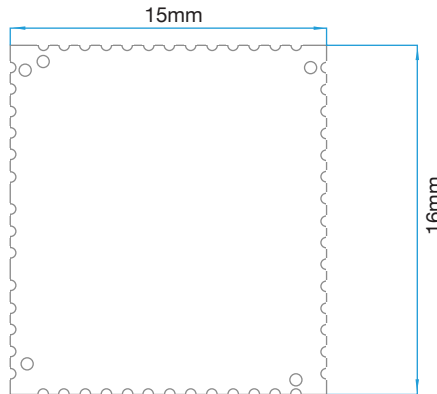
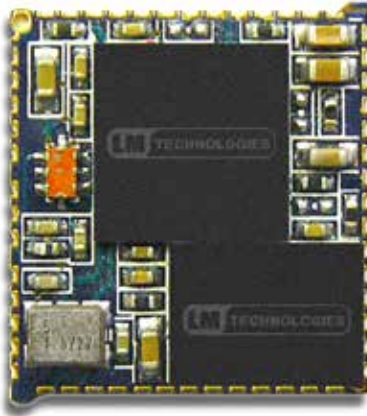




LM740 Bluetooth Audio Module

Class 2 Module CSR BC05 MM - External Antenna

Product LM740
 Part No 740-0411
 Revised 27/FEB/2015



Features

- Bluetooth v2.1 + EDR compliant firmware
- Class 2 device with up to 25 m range in open space
- AT Command interface available for HFP/HSP/A2DP/AVRCP firmware
- HFP/HSP/A2DP/AVRCP profiles supported. SPP/PBAP firmware under development
- Development kit (LM556) for LM740 available for development
- Application Schematic for LM740 available for development
- Integrated Switched-mode regulator
- Embedded Kalimba DSP Co-processor
- Integrated Switched-mode regulator
- Embedded Kalimba DSP Co-processor
- Integrated battery charging option
- Integrated 16-bit Stereo Audio CODEC 95dB SNR for DAC
- UART baud rate upto 921600 bps supported
- Enhanced Audibility and Noise cancellation
- Integrated 16 MB flash memory

- True Wireless Stereo Support
- APTX Support
- Support UART, PIO and USB Host Interface
- CSR Bluecore 05 Multimedia External Flash (BC05-MM Ext) chipset
- Lead free - RoHS compliant
- Small Size : 16mm x 15mm x 2.2mm

Applications

- High Quality Stereo Wireless Headsets
- High Quality Mono Headsets
- Vehicle Infotainment Systems
- Wireless Speakers
- VoIP Handsets
- Bluetooth Enabled Automotive Wireless Gateways
- Handsfree kits

Overview

LM740 is LM Technologies Ltd Class 2 Bluetooth Multimedia module with external antenna. This module is a CSR Bluecore 5 Multimedia External BC05 MM chip based surface mount module available with Bluetooth Handsfree (HFP), Headset (HSP), Advanced Audio Distribution Profile (A2DP) and Audio Video Remote Control Profile (AVRCP) combo firmware. The firmware can be configured via AT commands over UART interface or PIO interface via push buttons.

This module is ideal for multimedia applications in vehicle infotainment systems, handsfree kits, headsets, Bluetooth speakers and Bluetooth Stereo Headsets. This module is available with Bluetooth 2.1 + EDR compliant firmware. Firmware for A2DP Speakers, Stereo Transmitter is available upon request.



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Packaging Options

Tape and Reel
 Part No 740-0413

Tray Packaging
 Part No 740-0412

Individual
 Part No 740-0411

LM740 with Bluetooth 2.1 +EDR firmware LM740 with Bluetooth 2.1 +EDR firmware LM740 with Bluetooth 2.1 +EDR firmware

- User Guides, Manuals and Widcomm Configuration Software available to download via our website - <http://www.lm-technologies.com/support/downloads>

General Specification

Chipset	CSR Bluecore 5 Multimedia External BC05 MM
Power Classification	Class 2
Module Type	Surface Mount SMT
Bluetooth Specification	Core v2.1 + EDR
Frequency	2402 - 2480 MHz
Temperature Range	-20° C to +70° C
Data Rate	Up to 3 Mbps in HCI Mode
Range	25m in open space
Rx Sensitivity	-82 dBm typical
Antenna	External Antenna
Voltage operation	1.8 - 3.6v
Current Consumption (standby mode)	0.06 mA
Current Consumption (ACL Connection, master role)	4.4 mA
Current Consumption (data transfer, master role)	9.1 mA
Current Consumption (ACL Connection, slave role)	15 mA
Current Consumption (data transfer, slave role)	21 mA
Power Output	+ dBm
Default Firmware	LM-SRX-ATC-YYYYMMDD (AT Command Firmware), LM-RX-HIC (PIO firmware)
Size	16mm x 15mm x 2mm
Bluetooth Profile	Handsfree Profile (HFP), Advanced Audio Distribution Profile (A2DP), Audio Video Remote Control (AVRCP), Serial Port Profile (SPP), Phone Book Access Profile (PBAP)
Interface	UART, PIO's, USB Host Interface
Digital Audio Bus	PCM, I2S or SPDIF
Codec	Yes, Integrated 16 bit Stereo Audio CODEC
DSP Processor	Embedded Kalimba DSP Co-Processor
Flash Memory	16MB
RoSH Compliant	Yes

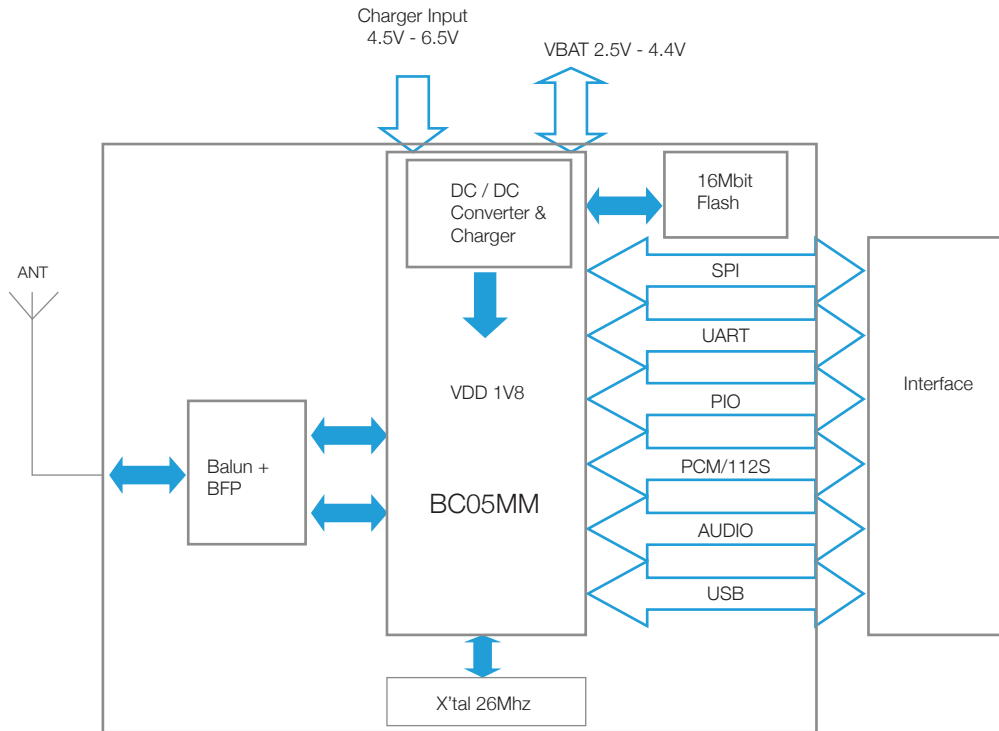


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Block Diagram



Pin Assignments

Pin	Name	Type	Description
1	AGND	AGND	Analog Ground
2	SPKR_B_P	Analogue	Speaker output positive, right
3	SPKR_B_N	Analogue	Speaker output positive, right
4	SPKR_A_P	Analogue	Speaker output positive, left
5	SPKR_A_N	Analogue	Speaker output negative, left
6	VDD_PIO / VDD_PADS	VDD	Positive supply for PIO, AUX DAC and all other digital Input / Output ports
7	GND	GND	Common Ground
8	ANT	Analogue	Connect to 50 ohm antenna (RF signal)
9	GND	GND	Common Ground
10	AUX_DAC	Analogue	8 bit voltage output DAC
11	PIO 0	I/O	Programmable Input / Output Line
12	PIO 1	I/O	Programmable Input / Output Line
13	PIO 3	I/O	Programmable Input / Output Line
14	PIO 2	I/O	Programmable Input / Output Line



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Pin Assignments Continued

Pin	Name	Type	Description
15	AIO 1	I/O	Analog Programmable Input / Output Line
16	AIO 0	I/O	Analog Programmable Input / Output Line
17	USB_DN	I/O	USB Data Minus
18	USB_DP	I/O	USB Data Plus
19	VDD_USB	VDD	Positive Supply for UART / USB Ports
20	UART_RX	CMOS Input	UART Rx Data
21	UART_TX	CMOS Output	UART Tx Data
22	UART_RTS	CMOS Output	UART Request to Send, Active Low
23	UART_CTS	CMOS Input	UART Clear to Send, Active Low
24	PIO 10	I/O	Programmable Input / Output Line
25	PIO 9	I/O	Programmable Input / Output Line
26	PIO 11	I/O	Programmable Input / Output Line
27	PIO 12	I/O	Programmable Input / Output Line
28	GND	GND	Common Ground
29	PIO 8	I/O	Programmable Input / Output Line
30	PIO 7	I/O	Programmable Input / Output Line
31	PIO 4	I/O	Programmable Input / Output Line
32	PIO 5	I/O	Programmable Input / Output Line
33	PIO 6	I/O	Programmable Input / Output Line
34	RESET #	CMOS Input	Rest if low. Input debounced so must be low >5ms to cause reset
35	PCM_CLK	I/O	Synchronous Data Clock
36	PCM_IN	CMOS Input	Synchronous Data Input
37	PCM_SYNC	I/O	Synchronous Data Sync
38	PCM_OUT	CMOS Output	Synchronous Data Output
39	SPI_MOSI	CMOS Input	SPI Data Input
40	SPI_CS #	CMOS Input	Chip select for serial Peripheral Interface (SPI), active low
41	SPI_CLK	CMOS Input	SPI Clock
42	SPI_MISO	CMOS Output	SPI Data Output
43	GND	GND	Common Ground
44	LED 1	Open Drain Output	LED Driver
45	LED 0	Open Drain Output	LED Driver
46	1V8	VDD	1V8 Input
47	LX	Switch Mode power regulator output	Switch Mode power regulator output
48	VDD_CHG	Charger Input	Lithium Ion/Polymer battery charger input
49	VBAT	Battery Terminal Positive	Lithium Ion/Polymer battery positive terminal. Battery O/I to SMR



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Pin Assignments Continued

Pin	Name	Type	Description
50	VREGENABLE_H (Power_On)	Analogue	Take high to enable high-voltage linear regulator and switch-mode regulator
51	MIC_BIAS	Analogue	Microphone Bias
52	MIC_B_P	Analogue	Microphone Bias positive, right
53	MIC_B_N	Analogue	Microphone Bias negative, right
54	MIC_A_P	Analogue	Microphone Bias positive, left
55	MIC_A_N	Analogue	Microphone Bias negative, left

RF Characteristics Transmitter: VDD=1.8V, Temperature= +20°C

Characteristic	Frequency	Min	Typ	Max	Bluetooth Specificaiton	Unit
Sensitivity at 0.1%	2.402	-	-82	-	<=-70	dBm
BER for all packet types	2.441	-	-82	-		
	2.480	-	-82	-		
Maximum received signal at 0.1% BER		-	>=-10	-	>=-20	dBm
C/I co-channel		-	7	-	<=11	dB
Adjacent channel selectivity C/I F=F0+1 Mhz		-	-6	-	<=0	dB
Adjacent channel selectivity C/I F=F0-1 Mhz		-	-7	-	<=0	dB
Adjacent channel selectivity C/I F=F0+2 Mhz		-	-21	-	<=-20	dB
Adjacent channel selectivity C/I F=F0-2 Mhz		-	-39	-	<=-30	dB
Adjacent channel selectivity C/I F=F0-3 Mhz		-	-43	-	<=-40	dB
Adjacent channel selectivity C/I F=F0+5 Mhz		-	-47	-	<=-40	dB
Adjacent channel selectivity C/I F=FImage		-	-17	-	<=-9	dB
Maximum Level of inter-modulation interferers		-	-30	-	>=-39	dBm
Spurious output level		-	-156	-		dBm/Hz
Maximum RF Transmit Power		-	1	-	-6 to +4	dBm
RF power control resolution		-	35	-	>=16	dB
RF power control range		-	0.5	-	-	dB
20 dB Bandwidth for modulated carrier		-	916	-	<=1000	kHz
Adjacent channel trasmit power F=F0+2 Mhz		-	-30	-	<=-20	dBm
Adjacent channel trasmit power F=F0+3 Mhz		-	-50	-	<=-40	dBm
Adjacent channel trasmit power F=F0+> 3Mhz		-	<=-50	-	<=-40	dBm
Δf1 avg Maximum Modulation		-	166	-	140<f1avg<175	kHz
Δf2 max Minimum Modulation		-	154	-	115	kHz
Δf1 avg / Δf2 avg		-	0.92	-	>=0.80	
Initial Carrier Tolerance		-	10	-	+/-75	kHz
Drift Rate		-	8	-	<=20	kHz/50μ
Drift (Single Slot Packet)		-	8	-	<=25	kHz
Drift (Five Slot Packet)		-	10	-	<=40	kHz
2nd Harmonic Content		-	-50	-	<=-30	dBm
3rd Harmonic Content		-	-55	-	<=-30	dBm

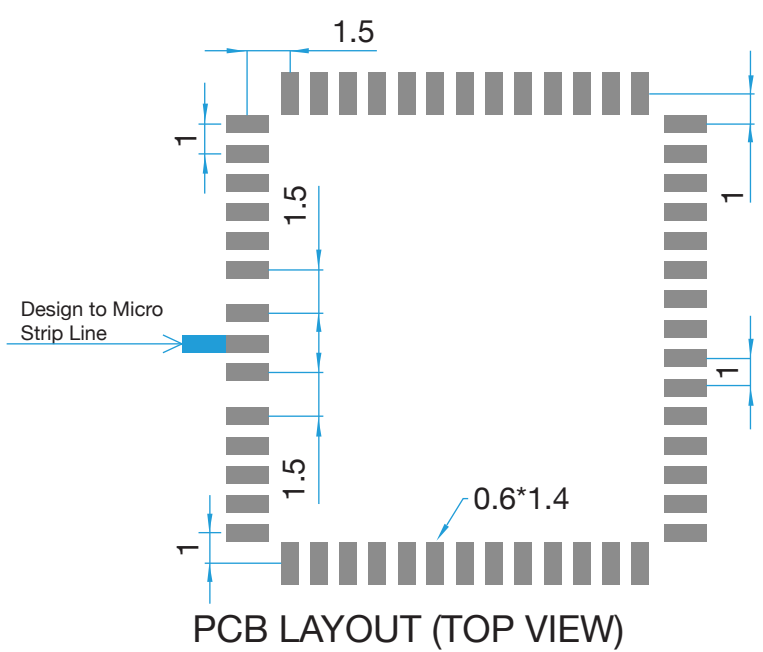
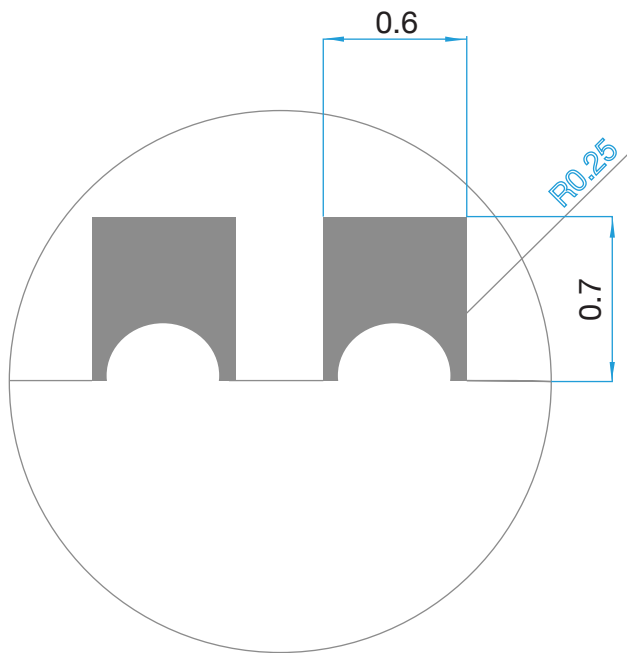
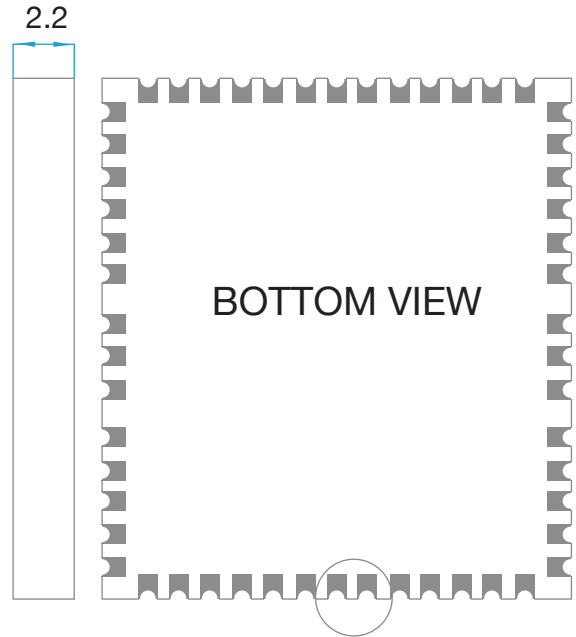
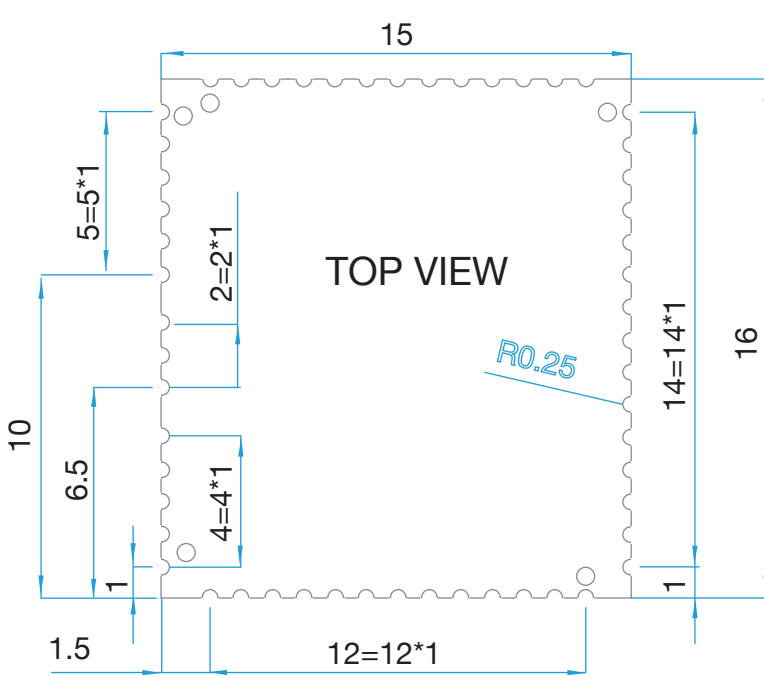


LM740 Bluetooth Audio Module
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Dimensions

All measurements in mm



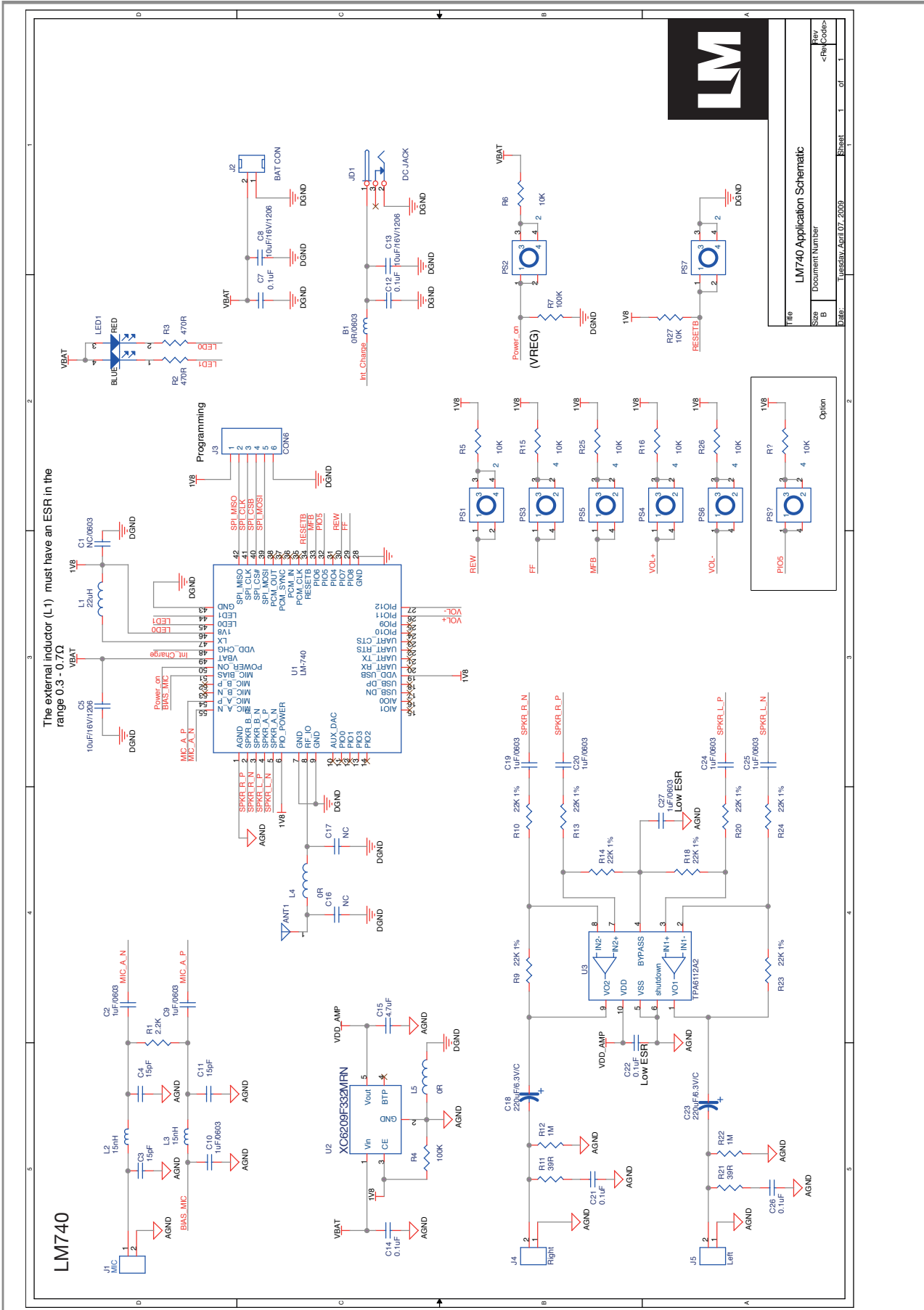


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Class 2 Module CSR BC05 MM - External Antenna

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Part No
Revised

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740-0411
27/FEB/2015





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Product LM740
Part No 740-0411
Revised 27/FEB/2015

Revision History

1.0	17/NOV/2011	First version with new layout
1.1	20/MAR/2012	Some minor changes in data sheet content
1.2	12/FEB/2014	1. Packaging information corrected 2. Revision information added
1.3	27/FEB/2015	Updated Datasheet