# LM556 Development Board

Stereo headset mode
User's Guide
Rev 1.0

1. Overview

The LM740 is CSR ® BlueCore 5® MM based Bluetooth module and is suitable for A2DP, SPP, DUN, OPP, FTP, PBAP and HID applications. It also allows to implement advanced functions such as noise cancellation and multi-media streaming. The LM740 module board is designed for using with the LM556 Bluetooth module Evaluation Kit. This user's guide will introduce the settings of LM556 with LM740 module board to implement wireless stereo headset application.
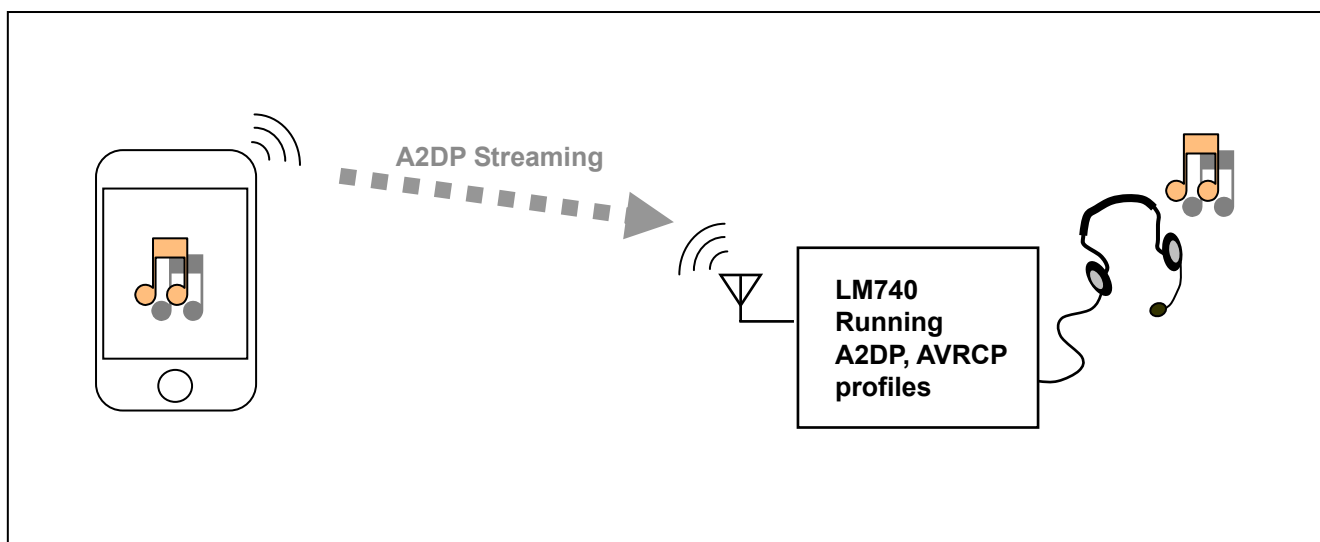
2. The Settings

LM740 Stereo Loud speakers

Device name：LM740 RX-HIC

Profiles：A2DP-Sink, AVRCP, HFP/HSP

Pin code：0000

Image file: LM740-RX-HIC.zip

Description: These settings enable the LM556 with LM740 module board to receive A2DP streaming from music audio source as well as answering phone call with HFP/HSP. That is, to implement the wireless stereo headset application.

When receiving or making a call, the music playback will be automatically paused. The music playback can be resumes when the call is ended.

Each time the LM740 - RX - HIC is switched on, it will intend to connect to the Bluetooth device that the last it had connected with.

The LM740 -RX-HIC has battery low detection and protection. When battery low occurred, it will worn by flashing red LED. If the battery is exhausted, the firmware will switch off the system to protect the Li-ion battery.

LM556   Blue LED (LED1) & Red LED (LED0) Indicators

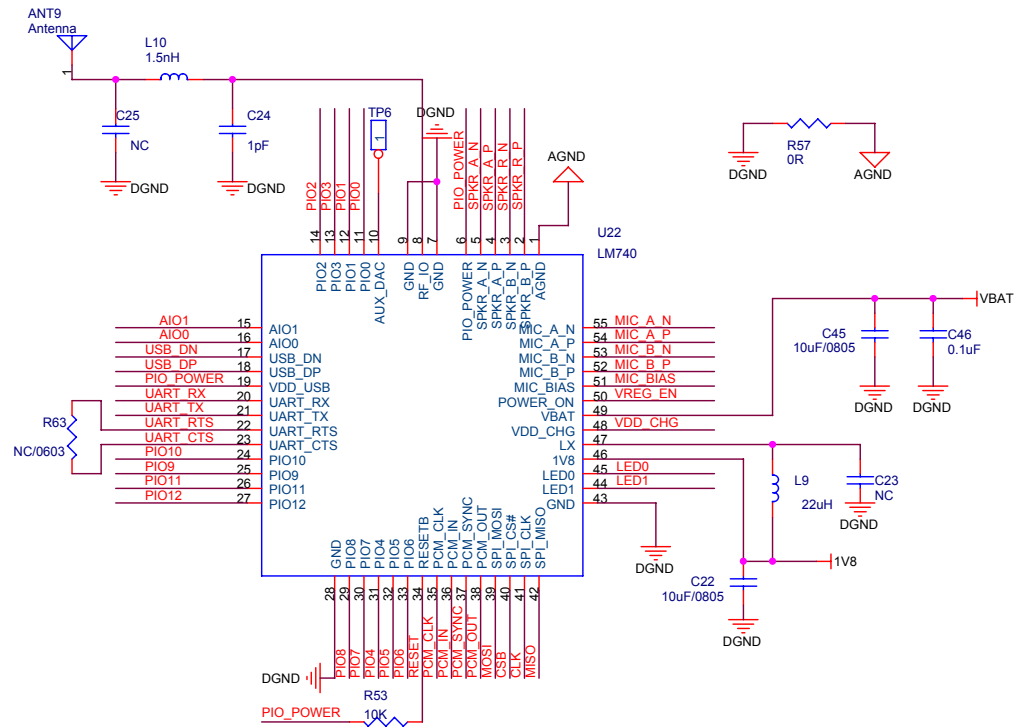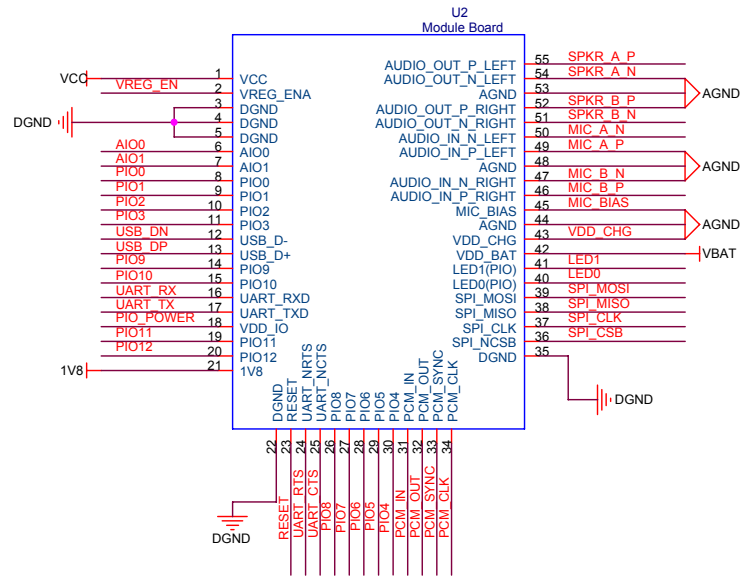| Operating State	Blue LED (LED1) & Red LED (LED0) controlled by LM740
Standby	The system is standby but not connected to any Bluetooth device yet. Blue LED: (repeat cycles) 2 seconds on, 1 second off.
Pairing mode	Flashing Blue and red LEDs alternatively.
Connecting state	Try to connect with paired Bluetooth device. Blue LED is flashing rapidly (in blue).
Both A2DP and HFP are connected	Flashing Blue LED twice by every 2 sec.
Only A2DP is connected	Flashing Blue LED once by every 2 sec.
Only HFP is connected	Flashing Blue LED once by every 4 sec.
Battery Low	Flashing Red LED once by every 5 sec
Charging the battery	Red LED steady on
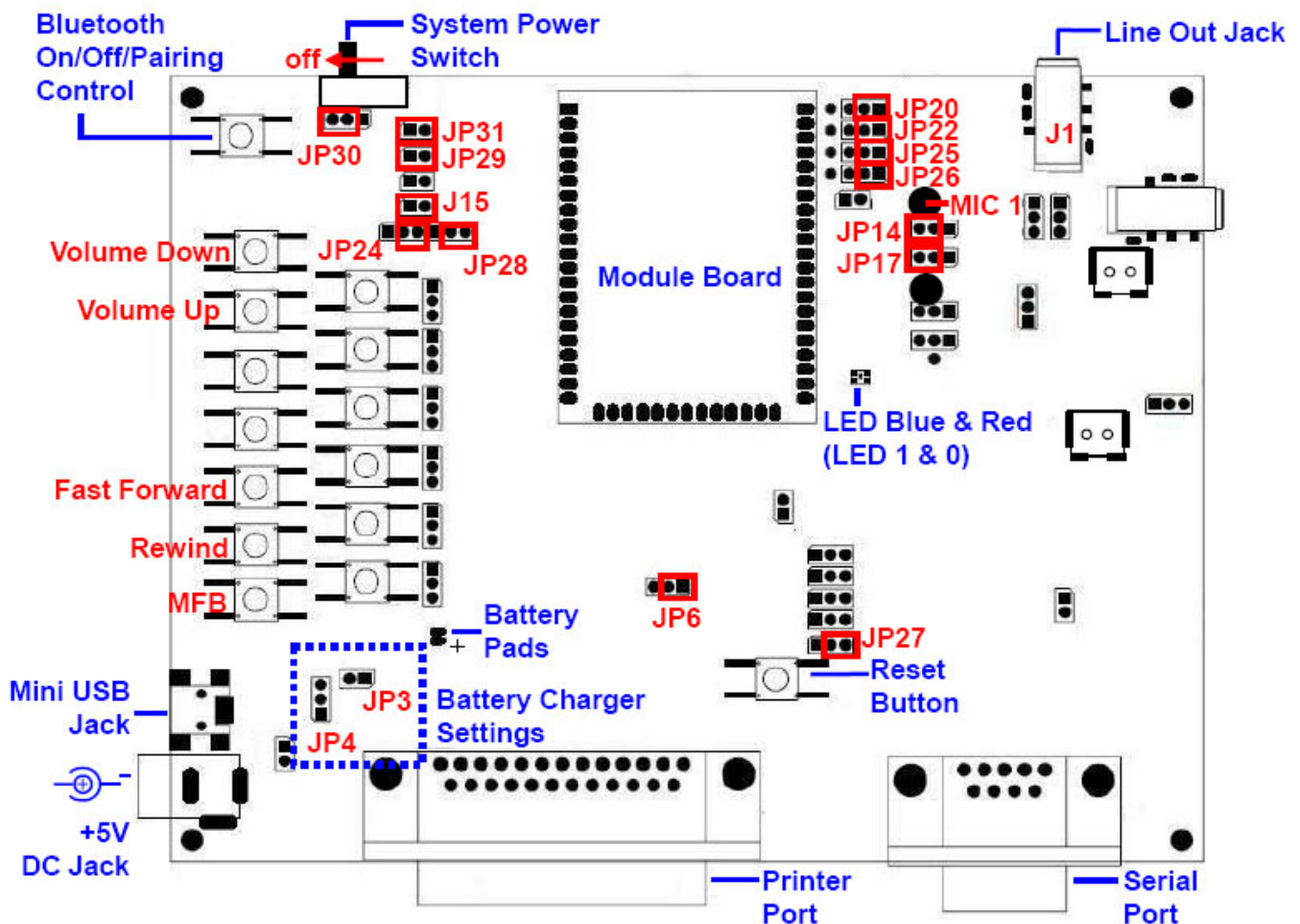
LM556   Jumper Settings

Jumper No.	Descriptions
J1	∅3.5mm phone jack for audio output
JP3, JP4	Battery charger settings. Please refer to the " LM556 Evaluation Kit General Guide" for details. **Warning:** To use the internal charger of LM740, the Li-ion re-chargeable battery shall be installed permanently.
JP6	Short circuit to pin1 & pin2. Set the voltage level of SPI interface to LM740 module board.
JP14, JP17	Short circuit to pin2 & pin3 to each of these jumpers. These will wire the MIC1 to the audio input of LM740.

J15	Short circuit. Select 3.3V for system power
JP20, JP22, JP25, JP26	Short circuit to pin1 & pin2 to each of these jumpers. These will wire the audio outputs (L & R channels) of LM740 to headphone amplifier. and then output to J1 phone jack.
JP24	Short circuit to pin2 & pin3. Select 3.3V for power supply to LM740 module board
JP27	Short circuit to pin2 & pin3. Select active low Reset for LM740 module board
JP28	Short circuit to pin2 & pin3. Select 3.3V for the signal level of PIOs of LM740 module board
JP29	Short circuit. Seelect 3.3V for headphone power supply.
JP30	Short circuit to pin2 & pin3. Enable the self sustain powering scheme
JP31	Short circuit Enable 3.3V power supply to the driver ICs of printer port (SPI) and serial port.
On/Off/Pairing Control	1. Pressed and held for more than 2 seconds can turn on/off the module board. 2. Short pressed will set the module board to Pairing mode.
MFB (PIO6)	This is multi-function button for A2DP and HFP modes. Please refer to firmware guide of LM740 RX-HIC version.
Rewind (PIO7)	Rewind the music playback (A2DP) of the audio source by AVRCP.
Fast Forward (PIO8)	Fast Forward the music playback (A2DP) of the audio source by AVRCP.
Volume Up (PIO11)	Turn volume up of the audio source.
Volume Down (PIO12)	Turn volume down of the audio source.
System Power Switch	Disengage 'System Power Switch' that allows the operation of 'On/Off/Pairing Control' button

U2 Module Board

Pin	Name		Name	Pin
1	VCC		AUDIO_OUT_P_LEFT	55 SPKR_A_P
2	VREG_ENA		AUDIO_OUT_N_LEFT	54 SPKR_A_N
3	DGND		AGND	53
4	DGND		AUDIO_OUT_P_RIGHT	52 SPKR_B_P
5	DGND		AUDIO_OUT_N_RIGHT	51 SPKR_B_N
6	AIO0		AUDIO_IN_N_LEFT	50 MIC_A_N
7	AIO1		AUDIO_IN_P_LEFT	49 MIC_A_P
8	PIO0		AGND	48
9	PIO1		AUDIO_IN_N_RIGHT	47 MIC_B_N
10	PIO2		AUDIO_IN_P_RIGHT	46 MIC_B_P
11	PIO3		MIC_BIAS	45 MIC_BIAS
12	USB_D-		AGND	44
13	USB_D+		VDD_CHG	43 VDD_CHG
14	PIO9		VDD_BAT	42 VBAT
15	PIO10		LED1(PIO)	41 LED1
16	UART_RXD		LED0(PIO)	40 LED0
17	UART_TXD		SPI_MOSI	39 SPI_MOSI
18	VDD_IO		SPI_MISO	38 SPI_MISO
19	PIO11		SPI_CLK	37 SPI_CLK
20	PIO12		SPI_NCSB	36 SPI_CSB
21	1V8		DGND	35

Lower pins (22–34): DGND, RESET, UART_NRTS, UART_NCTS, PIO8, PIO7, PIO6, PIO5, PIO4, PCM_IN, PCM_OUT, PCM_SYNC, PCM_CLK
(RESET, UART_RTS, UART_CTS, PIO8, PIO7, PIO6, PIO5, PIO4, PCM_IN, PCM_OUT, PCM_SYNC, PCM_CLK)

U22 LM740

Pin	Name		Name	Pin
15	AIO1		MIC_A_N	55 MIC_A_N
16	AIO0		MIC_A_P	54 MIC_A_P
17	USB_DN		MIC_B_N	53 MIC_B_N
18	USB_DP		MIC_B_P	52 MIC_B_P
19	PIO_POWER		MIC_BIAS	51 MIC_BIAS
20	UART_RX		VREG_EN	50 VREG_EN
21	UART_TX		VBAT	49
22	UART_RTS		VDD_CHG	48 VDD_CHG
23	UART_CTS		LX	47
24	PIO10		1V8	46
25	PIO9		LED0	45 LED0
26	PIO11		LED1	44 LED1
27	PIO12		GND	43

Top pins (10–14): PIO2, PIO3, PIO1, PIO0, AUX_DAC
(9) GND, RF_IO, GND, PIO_POWER, SPKR_A_N, SPKR_A_P, SPKR_B_N, SPKR_B_P, AGND

Bottom pins (28–42): GND, PIO8, PIO7, PIO4, PIO5, PIO6, RESETB, PCM_CLK, PCM_IN, PCM_SYNC, PCM_OUT, SPI_MOSI, SPI_CS#, SPI_CLK, SPI_MISO
(PIO8, PIO7, PIO4, PIO5, PIO6, RESET, PCM_CLK, PCM_IN, PCM_SYNC, PCM_OUT, MOSI, CSB, CLK, MISO)

ANT9 Antenna
L10 1.5nH
C25 NC — DGND
C24 1pF — DGND
TP6
DGND
AGND

R57 0R — DGND — AGND

VCC — VREG_EN
DGND
1V8

R63 NC/0603

R53 10K
PIO_POWER
DGND

C45 10uF/0805 — DGND
C46 0.1uF — DGND
VBAT

L9 22uH
C23 NC — DGND
C22 10uF/0805 — DGND
1V8

SPKR_A_P, SPKR_A_N, AGND, SPKR_B_P, SPKR_B_N
MIC_A_N, MIC_A_P, AGND, MIC_B_N, MIC_B_P, MIC_BIAS, AGND
VDD_CHG, AGND, VBAT
LED1, LED0, SPI_MOSI, SPI_MISO, SPI_CLK, SPI_CSB, DGND