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**Module Specification****Of****ALM-801****BC05-MM-External**

<b>Product Name</b>	<b>Module Specification Of ALM-801 (BC05-MM-External)</b>
<b>Customer</b>	
<b>Revision</b>	<b>V1.1</b>

<b>Product Development Department</b>		<b>DATE</b>
<b>Prepared By</b>	<b>Kevin</b>	<b>2008-11-11</b>

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<b>Approved By</b>		
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**DOCUMENT CHANGE HISTORY**

Version	Date	Person	Remarks
V1.0	2008-4-24	Kevin	First release
V1.1	2008-11-11	winson	Format changed

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## 1. Introduction

### 1.1 Product Introduction

The ALM-801 is a high performance Bluetooth module for embedded AV Bluetooth applications. Integrated with Flash, Crystal, Radio, Link control, Codec, DSP, Flash and MCU, This all-in-one module provides the potential to cost down client's BOM cost. The only external components needed are antenna, Microphone, Speaker and components for power supply and UI circuitry.

ALM-801 is also designed for low power applications including sleep and deep sleep modes, and operates from a single 1.8V or 3.3V supply. It supports AV/Headset/Handsfree/TTS/OPP profile. With compliance to Bluetooth V2.0 standard, the ALM-801 provides a fully compliant Bluetooth system for data and voice communications. The integrated Stereo CODEC and an open platform digital signal process or (DSP) co-process or allows for support of enhanced audio applications in more compact designs. Further more, ALM-801 is able to provide faster connection, Adaptive Frequency Hopping (AFH) and extended SCO link, The latter two features help on improving voice quality. ALM-801 offers great flexibility by configurable PIO pins. With free choice of suitable definitions of PIO pins, Customers can easily fit ALM-801 into their product design and greatly shorten time-to-market.

ALM-801 is a single-chip radio and baseband IC for Bluetooth 2.4GHz systems. When used with the CSR Bluetooth stack, it provides a fully compliant Bluetooth V2.1+ EDR specification system for data and voice.

### 1.2 Applications

1.2.1 High-quality Stereo Headset

1.2.2 Hands-free Car Kits

1.2.3A/V USB Dongle

1.2.4 GPS BT

1.2.5 Wireless Speakers

1.2.6 VoIP Handsets

1.2.7. Automotive Wireless Gateways

## 2. Specification

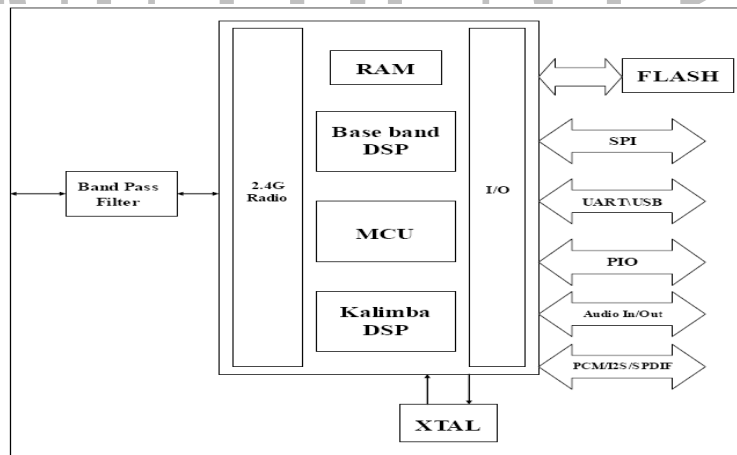
### 2.1 Features

- Communication Standard: Bluetooth Spec. V2.0 /V2.1 Compliant

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- Support Mode: A2DP-SINK, AVRCP, Headset, Hands Free
- Operating Frequency Band: 2.402GHz to 2.483GHz unlicensed ISMBand
- OutputPower: -6 dBm to 4dBm(Class 2)
- Link Mode: SCO, ACL
- Audio Codec: Integrated 16-bit linear Audio Codec, S/N Ratio > 90dB
- Low Power Mode Support: Park, Sniff, Hold and Deep Sleep
- Built-in 16-bit stereo codec.
- May drive speaker by 150mW, and do not need connect audio amplifier
- Integrative 64MIPS Kalimba DSP Co-processor
- It's high integration and periphery circuit is easy

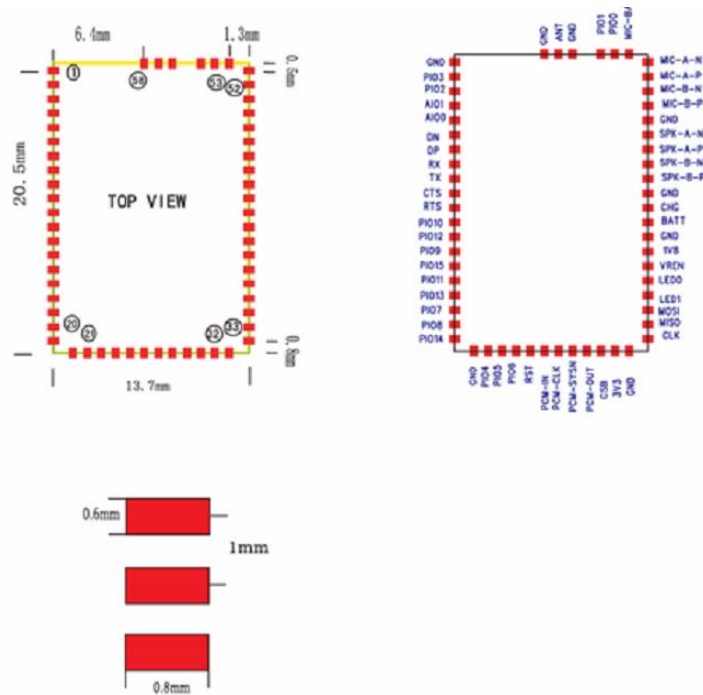
## 2.2 Module feature and Interface



## 2.3 Module Dimension

Unit: mm

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### 2.4 PIN Configuration

PIN	Name	Type	Function	Remark
1.21.32.40 43.48.56.8 5	GND	GND	Ground Pot	
14	PIO9	Bi-directional	Programmable Input/Output Line	
54	PIO0	Bi-directional	Programmable Input/Output Line	
3	PIO2	Bi-directional	Programmable Input/Output Line	
55	PIO1	Bi-directional	Programmable Input/Output Line	
2	PIO3	Bi-directional	Programmable Input/Output Line	
12	PIO10	Bi-directional	Programmable Input/Output Line	
16	PIO11	Bi-directional	Programmable Input/Output Line	
25	RESET	CMOS Input	Reset if Low	
34	SPI_MISO	CMOS Output	Serial Peripheral interface Data Output	
30	SPI_CSB	CMOS Input	Chip Select For Synchronous serial interface (Active Low)	
33	SPI_CLK	CMOS Input	Serial Peripheral interface clock	
35	SPI_MOSI	CMOS Input	Serial Peripheral interface Data input	
31	3V3	Power	+3.3V Supply for Flash and Chipset	3.3V Version
39	1V8	Power	Integrated 1.8V (+) supply with On-chip output within 1.7-1.9V	Integrated 1.8V with LDO
41	BATTERY/B ATT	Battery Terminal	Lithiumion/Polymer Battery Positiveterminal.	
42	CHG	Charger Input	Lithiumion/Polymer Battery Charger Input	Charger I/O
38	VREN	Analogue	High-voltage linear regulator and Switch-moderegulator	
22	PIO4	Bi-directional	Programmable Input/Output Line	
23	PIO5	Bi-directional	Programmable Input/Output Line	
24	PIO6	Bi-directional	Programmable Input/Output Line	
18	PIO7	Bi-directional	Programmable Input/Output Line	
19	PIO8	Bi-directional	Programmable Input/Output Line	
29	PCM_OUT	CMOS Output	Synchronous Data Output	

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28	PCM_SYNC	Bi-directional	Synchronous Data Sync	
27	PCM_CLK	Bi-directional	Synchronous Data Clock	
26	PCM_IN	CMOS Input	Synchronous Data Input	
9	UART_TX	CMOS Output	UART Data Output (Active Low)	
8	UART_RX	CMOS Input	UART Data input(Active High)	
11	UART_RTS	CMOS Output	UART Request to Send(Active Low)	
10	UART_CTS	CMOS Input	UART Clear to Send(Active Low)	
6	USB_DN	Bi-directional	USB Data Minus	
7	USB_DP	Bi-directional	USB Data Plus	
4	AIO1	Bi-directional	Programmable input/Output Lin	
52	MICR-	Analogue	Audio Line In Negative(Right Side)	
51	MICR+	Analogue	Audio Line In Positive(Right Side)	
50	MICL-	Analogue	Audio Line In Negative(Left Side)	
49	MICL+	Analogue	Audio Line In Negative(Left Side)	
5	AIO0	Bi-directional	Programmable Input/Output Line	
46	SPKR+	Analogue	Audio Line Out Positive(Right Side)	
47	SPKR-	Analogue	Audio Line Out Negative(Right Side)	
44	SPKRL+	Analogue	Audio Line Out Positive(Left Side)	
45	SPKRL-	Analogue	Audio Line Out Negative(Left Side)	
57	ANT	RF	RF Interface Class II	Support 10m
37	LED0	Open drain output	LED driver	
36	LED0	Open drain output	LED driver	
53	Mic-BAIS	Analogue	Microphone bia	

## 2.5 Product Specification

Items	Specification
Operating Frequency Band	2.402GHz to 2.483GHz unlicensed ISMBand
Bluetooth Specification	V2.0
Output Power Class	Class2
Operating Voltage	3.3V
Host interface	USB1.1 or UART
Low Power Mode Support	Park, Sniff, Hold and Deep Sleep
Audio interface	PCM,Speaker, Microphone, I2S, SPDIF

## 2.6 Electrical Characteristics

Absolute Maximum Rating	Min	Max
Storage Temperature	-40°C	+85°C
3.3V Version		
Supply Voltage Vcc	3.0V	3.7V
Supply Voltage:VREN_IN	3.0V	4.2V
Supply Voltage:BAT_P	3.0V	4.2V
Supply Voltage:V_CHG	4.3V	6.5V

Recommended Operating Conditions	Min	Max
Operating Temperature Range	-25°C	+75°C
3.3V Version		
Supply Voltage Vcc	3.0V	3.7V
<b>Power Consumption</b>		
Page Scan	Units	Average
Peak Current	mW	1
Peak Current	mA	Peak
ACL data over 115k Baud UART at Maximum throughput(Master)	mW	Peak
ACL data over 115k Baud UART at Maximum throughput(Slave)	mW	45
ACL data over USB at maximum throughput (Master)	mW	134
ACL data over USB at maximum throughput (Slave)	mW	69

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SCO correction HV1, Master	mW	78	
SCO correction HV1, Slave	mW	79	
SCO correction HV3, Master	mW	45	
SCO correction HV3, Slave	mW	54	
Connection, No data traffic master	mW	17	
Connection, No data traffic master	mW	39	

## 2.7 RF Characteristics

Transmitter	Units	Min	Type	Max	Bluetooth Spec
Output Power	dBm	-	2.0	-	-6 to 4
Power Control Range	dB	-	2.74	-	2<P<8
20dB Bandwidth	kHz	-	716.1	-	<1000
2 <sup>nd</sup> Adjacent Channel Power(+/- 2MHz)	dB	-	-47.57	-	<-30
3 <sup>rd</sup> Adjacent Channel Power(+/- 3MHz)	dB	-	-58.63	-	<-40
Modulation Characteristic	kHz	-	Df1max=163 Df1avg=171.3 Df2max=173.0 Df2avg=162.6 Df2avg/Df1avg=0.949		140<Df1max<175 Df2max>115 Δf2avg/Δf1avg>=0.8
ICFT	kHz	-	-7.3		ICF<75
Carrier Frequency Drift	kHz	-	DH1 -1.4 DH3/DH5 -2.3		For DH1<25 For DH3/DH5<40K

VDD=3.3V, Operating Temperature: 25°C, Operating Frequency Band:2.402 GHz to 2.483GHz.

Transmitter	Units	Min	Typ	Max	Bluetooth Spec
Single-slot Sensitivity at 0.1% BER	dBm	-	-81	-	-70
Single-slot Sensitivity at 0.1% BER	dBm	-	-80	-	-70
Maximum Receiver Signal	dBm	-	-20	-	-20
C/I CO-Channel	dB	-	9	-	11

VDD: 3.3V, Operating Temperature: 25°C, Operating Frequency Band: 2.402 GHz to 2.483GHz.

## 3. Interface Part

### 3.1PIO Interface

PIO0-PIO11 can be used to control, display, data bus, etc.

### 3.2Audio Interface

SPKR and SPKL are used for external speaker. It uses a fully differential output.

Signal to Noise ratio:90dB

Frequency Respond:20Hz-20KHz.

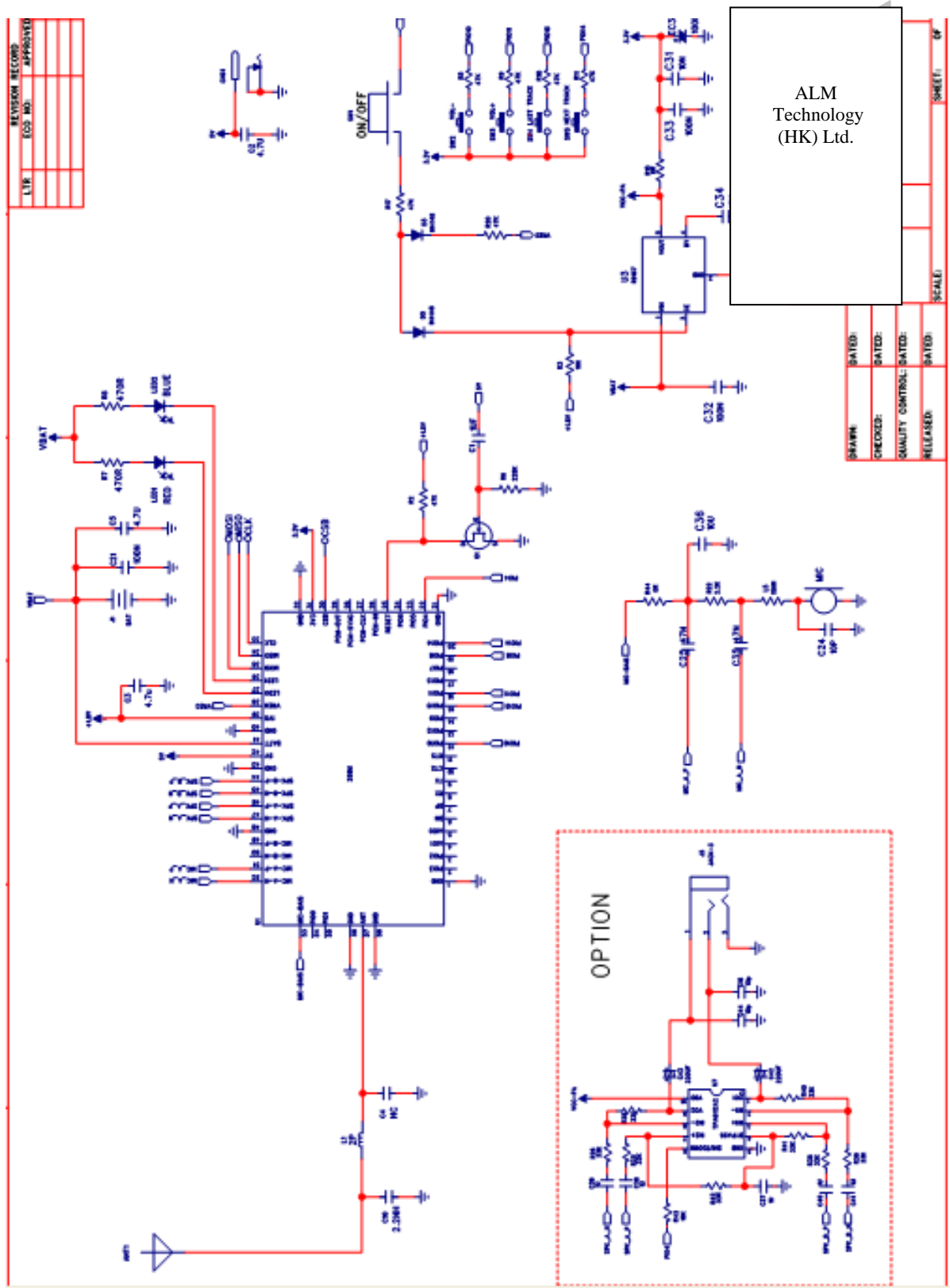
Output Level: Typical 0.7V RMS, Max 1V RMS

The audio input circuitry consists of a dual audio input that can be configured to be either single ended or fully differential

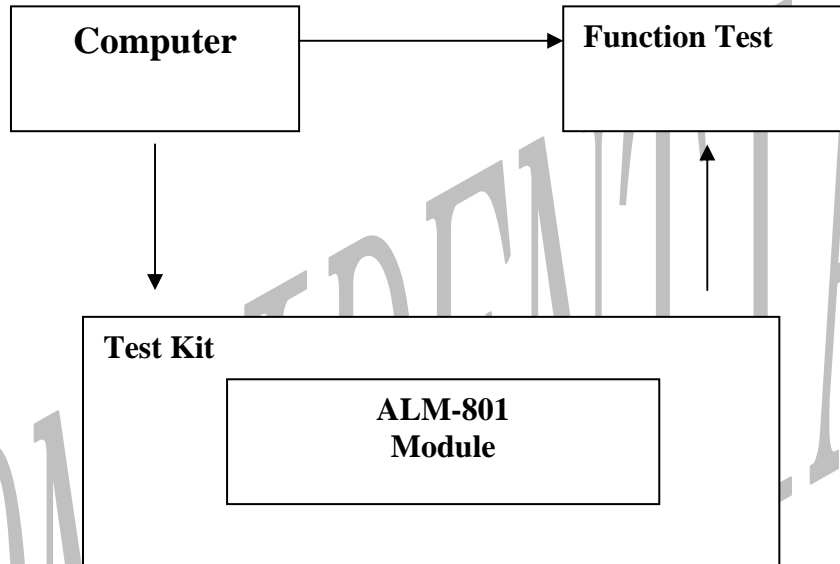
Input Level: Max 1V RMS

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## 4. Typical Application Circuit Drawing



### 5. Function Test Drawing



**The End**