



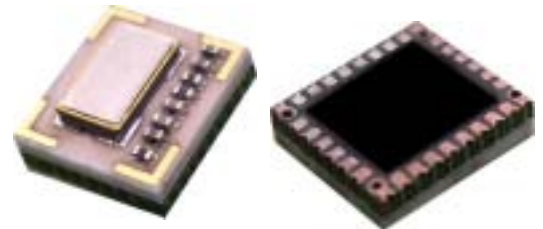
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DLBM-CS220/CS221

DLBM-CS220/DLBM-CS221

Bluetooth™ Module Class 2

**A Class 2 Bluetooth V1.2 HCI module
Suitable for various applications.**



1.FEATURES:

- **Fully qualified Bluetooth V1.2 module includes RF & BB.**
- **Low cost solution suitable for Cellular, PDA & other high volume consumer products.**
- **Reducing size greatly by combining SOP & SIP technologies.**
- **Smallest size: 6.0*5.5*1.7mm(Build-in X'tal)
/6.0*5.5*1.5mm(Without X'tal)**
- **Compliant to various interfaces: UART, USB, PCM, PIO...**
- **No shielding case needed.**
- **Wide operating temperature range: -30~+80 .**

2.Device diagram

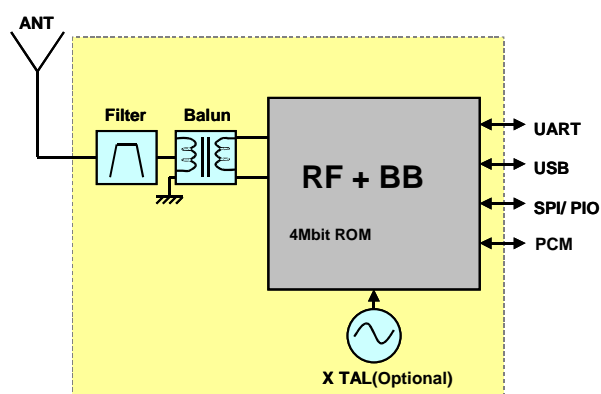


Figure 1. DLBM-CS220 Block Diagram



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3. General Specification

Bluetooth™ Specification	Version 1.2
Frequency	2402~2480MHz
Modulation	AFH/GFSK
Transmission rate	723.2kbps
Receive sensitivity	-80dBm
Maximum output power	+4dBm(Class 2)
Operating Voltage	2.2~3.6V core
Operating temperature	-30~+80
Antenna Impedance	50 ohm
Package size	6.0*5.5*1.7mm (With X'tal)
	6.0*5.5*1.5mm (Without X'tal)
Operating range	More than 10 meters

4. Rating

	Min	Max	Unit
Storage Temperature	-40	+85	
VDD_1.8V	-0.4	+2.2	V
VREG_IN	-0.4	+3.6	V



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5.Interface

Interface		Description
Antenna		External Antenna 50 ohm
PIO Interface		8 terminals
SPI Interface		For System debugging
PCM Interface		Pulse Code Modulation
UART Interface	DLBM-CS220	TX,RX,RTS,CTS
	DLBM-CS221	TX,RX
USB Interface	DLBM-CS220	None.
	DLBM-CS221	USB_DP,USB_DN

6.RF Characteristics

Operating Condition: +25 , VDD=3.0V

RF Characteristics	Min.	Typ.	Max.	Unit
1. Frequency Range	2400 ~ 2483.5			MHz
2. Output Power	-6	1.5	4	dBm
3. Sensitivity at 0.1% BER				
1) 2402MHz	-70	-80		dBm
2) 2441MHz	-70	-80		dBm
3) 2480MHz	-70	-80		dBm
4. Maximum Input Level (BER 0.1%)	-20	0		dBm
5. Adjacent channel selectivity				
1) C/I F=F ₀ + 1MHz		-4	0	dB



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2) C/I F=F ₀ - 1MHz		-4	0	dB
3) C/I F=F ₀ + 2MHz		-35	-30	dB
4) C/I F=F ₀ - 2MHz		-21	-20	dB
5) C/I F F ₀ + 3MHz		-45	-40	dB
6) C/I F F ₀ - 5MHz		-45	-40	dB
7) C/I F=F _{image}		-18	-9	dB
6. Adjacent channel transmit power				
1) F=F ₀ ± 2MHz		-35	-20	dBc
2) F=F ₀ ± 3MHz		-45	-40	dBc
7. Modulation Characteristics				
1) Maximum modulation f _{1avg}	140	165	175	kHz
2) Minimum modulation f _{2max}	115	135		kHz
8. Initial Carrier Frequency Tolerance	-35	10	+35	KHz
9. Carrier Frequency Drift				
1) 1slot	-20	9	20	kHz
2) 5slot	-28	10	28	kHz
4) Drift rate	-20	9	20	KHz/50us
10. 20dB Bandwidth for modulated carrier		820	1000	KHz
11.C/I co - channel		9	11	dB

7. Application circuit

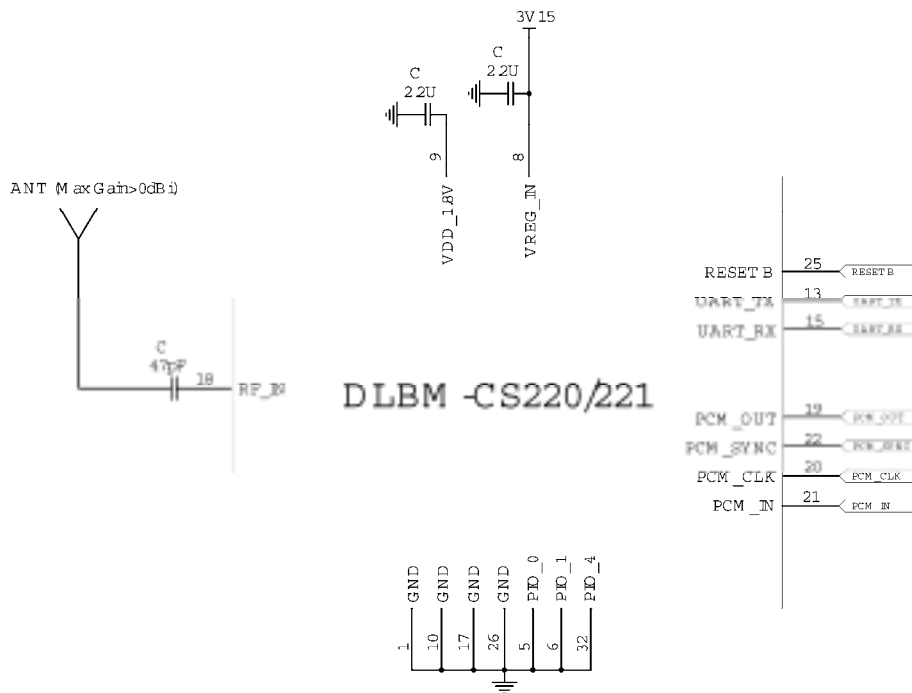
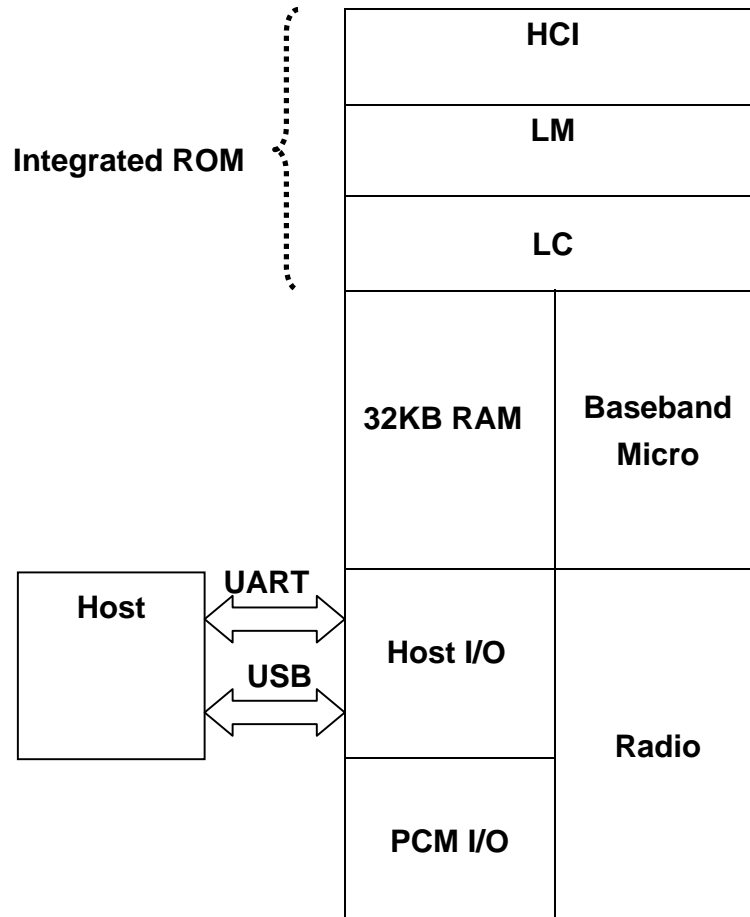


Figure 3. Application circuit by using 26MHz crystal for UART BCSP interface.

8. HCI Stack



In the implementation the internal processor runs the Bluetooth stack up to the Host Controller Interface (HCI). The Host processor must provide all upper layers including the applications.

9. RECOMMENDED REFLOW PROFILE

The temperature rise to 150 for preliminary heating shall be made for 30 seconds or longer.

The preliminary heating shall be done at the temperature of 160 \pm 10 for 60 ~ 90 seconds.

The heating shall be at the temperature of 200 or higher For 20 ~ 40 seconds and the peak temperature shall be 230 \pm 5

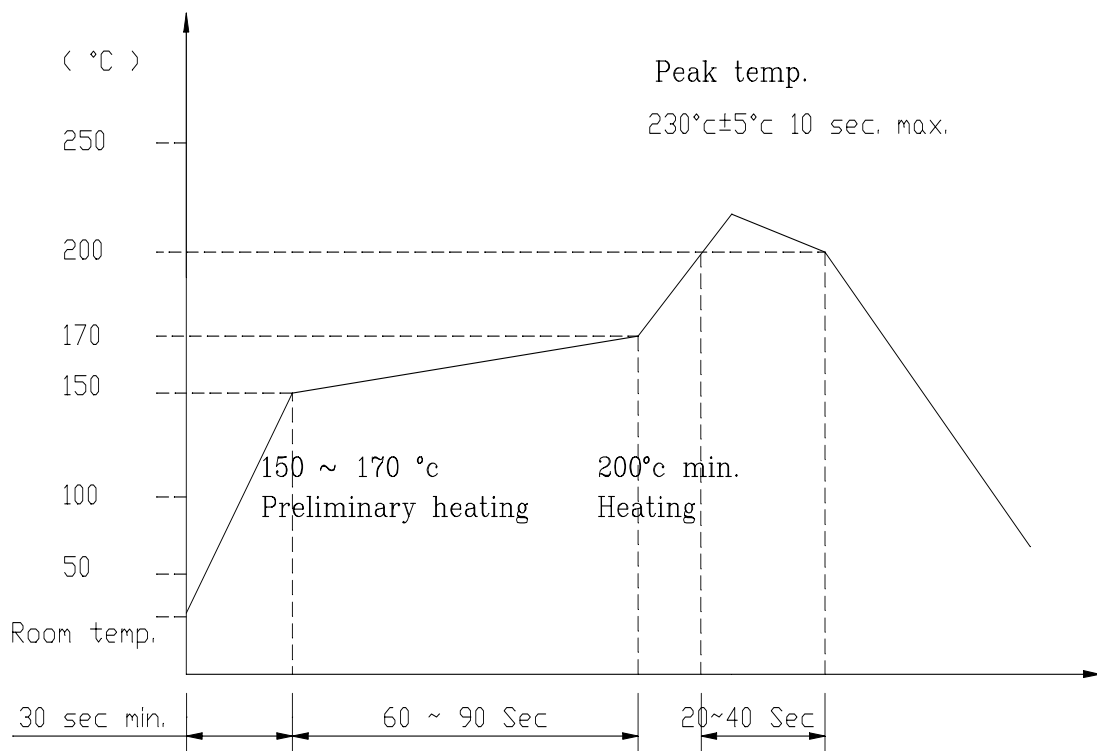


Figure 4. REFLOW PROFILE



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10.Pin description

Pin No.	Name		Description
	DLBM-CS220	DLBM-CS221	
1	GND		
2	PIO_5		Programmable Input/Output Line
3	PIO_3		Programmable Input/Output Line
4	PIO_2		Programmable Input/Output Line
5	PIO_0		Programmable Input/Output Line
6	PIO_1		Programmable Input/Output Line
7	AIO_0		Programmable Input/Output Line
8	VREG_IN		Regulator Input
9	VDD_1.8		Positive Supply & 1.8V Regulated Output
10	GND		
11	XTAL_IN		External Clock Input /NC (Build-in XTAL)
12	XTAL_OUT		Drive for Crystal /NC (Build-in XTAL)
13	UART_TX		UART Data Output Active High
14	UART_CTS	USB_DP	UART Clear To Send Active Low /USB Data Plus

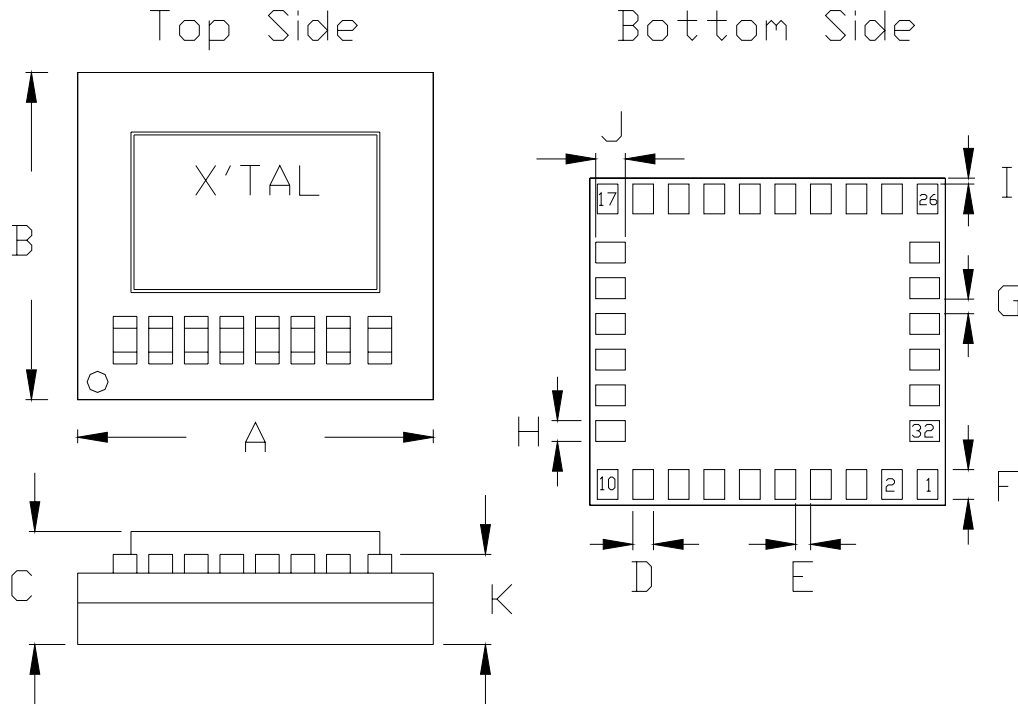


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15	UART_RX		UART Data Input Active High
16	UART_RTS	USB_DN	UART Request To Send Active Low /USB Data Minus
17	GND		
18	RF_IN		50 Ohm Antenna Input
19	PCM_OUT		Synchronous Data Output
20	PCM_CLK		Synchronous Data Clock
21	PCM_IN		Synchronous Data Input
22	PCM_SYNC		Synchronous Data Sync
23	PIO_7		Programmable Input/Output Line
24	PIO_6		Programmable Input/Output Line
25	Reset B		Reset If Low
26	GND		
27	SPI_MISO		Serial Peripheral Interface Data Output
28	SPI_CSB		Chip Select For Synchronous Serial Interface Active Low
29	SPI_CLK		Serial Peripheral Interface Clock
30	SPI_MOSI		Serial Peripheral Interface Data Input
31	TEST_EN		For Test Purposes Only (Leave Unconnected)
32	PIO_4		Programmable Input/Output Line

11. Dimensions (mm)



A	6.0 +/- 0.15	G	0.25
B	5.5 +/- 0.15	H	0.35
C	1.7 +/- 0.1	I	0.10
D	0.35	J	0.50
E	0.25	K	1.5 +/- 0.1
F	0.50		

Figure 5. Output pin dimensions



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Contact information:

Website: <http://www.deltaww.com>

Email: Jonathan.Chen@delta.com.tw

Tel No.: 886-3-3591968#2925