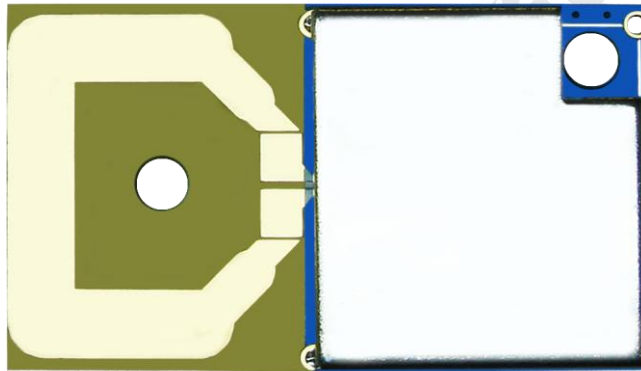

2.4G Direct Sequence Spread Spectrum RF Module



Version History

Version	Date	Changes
V1.00	May 23, 2009	1 st . Edition
V1.01	Jan 7, 2010	2 nd . Edition
V1.02	July 15, 2010	3 rd . Edition

Product Profile

This module apply to wireless data two-way transmission, working frequency is 2.4GHz and taking Spread Spectrum Technology. Strong anti-jamming, especially not impact on the wireless LAN, Bluetooth receiver, Wireless Network, Wifi, microwave ovens and so on...

TRW-24DSMCU two-way transceiver module is taking Direct Sequence Spread Spectrum; DSSS. It can reach the highest reliability and show high data rate performance through Variable phase modulation, such as PSK、QPSK(Quadrature Phase Shift Keying)、DQPSK(Differential Quadrature Phase Shift Keying).The advantage is for the existing 2.4GHz wireless network in a high-interference environment, it can still maintain good communication.

Maximum data transfer rate is 250Kbps, the biggest output power is +4dBm, working voltage rang is 3.5V~6V, build-in UART Micro-controller interface and can apply to various data transmitting and short distance of handheld device application, such as wireless mouse, wireless keyboard, wireless remote controller, wireless home automatically control, wireless toy and so on.

Application

- Wireless Keyboard and Mouse
- Remote Control
- VOIP Phone
- AMR – Automatic Meter Reading
- Wireless Game Pad
- Wireless Toys
- Home Automation
- RKE – Two-way Remote Keyless Entry

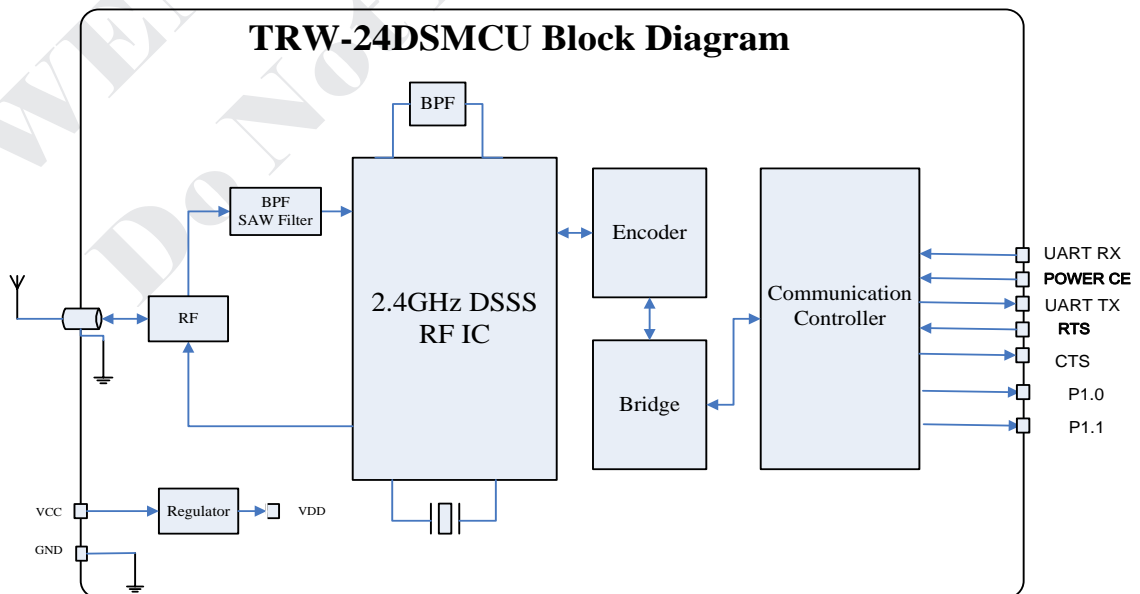
Key Feature

- 2.4GHz Sequence Spread Spectrum
- RF Output Power up to +4dBm
- Receive Sensitivity up to -98dBm
- Voltage Supply from 3.5V~6V
- Distance range up to 180m(Open Space)
- DSSS Data rate up to 250KBps
- Auto transaction sequencer no need MCU
- Dynamic data rate reception
- UART Micro-controller Interface(TTL 3V3)

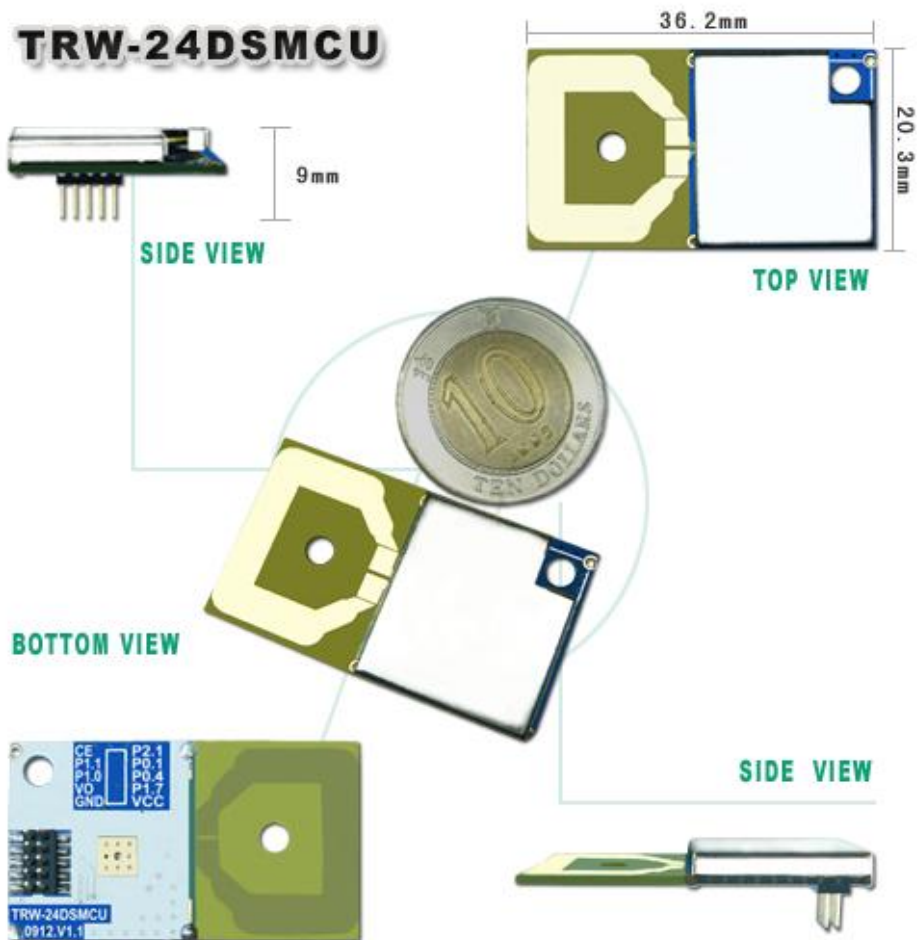
Characteristic

Parameter	Min	Type	Max	Unit	Condition
Operating Condition					
Operating Temperature Range	-10		+70	°C	
Storage Temperature Range	-40		+90	°C	
Operating Supply Voltage	3.5		6	V	
Current Consumption					
Rx Mode			30	mA	
Tx Mode			48	mA	
Sleep Mode			3	μA	
RF Characteristic					
Frequency Range	2400		2490	MHz	
Frequency Deviation	270		330	KHz	
Data Rate	15.62 5		1000	Kbps	
Tx Output Power	-35		+4	dBm	8 Step select
Rx Sensitivity			-98	dBm	
Link Turnaround Time	30		65	μs	
Modulation	DSSS				

Block Diagram



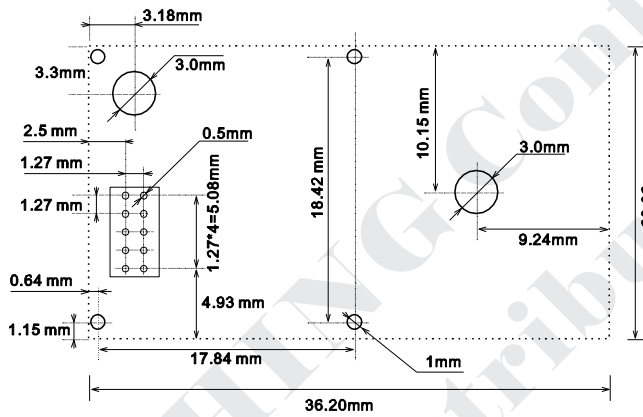
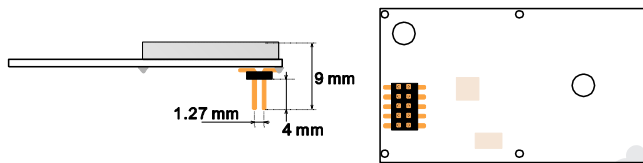
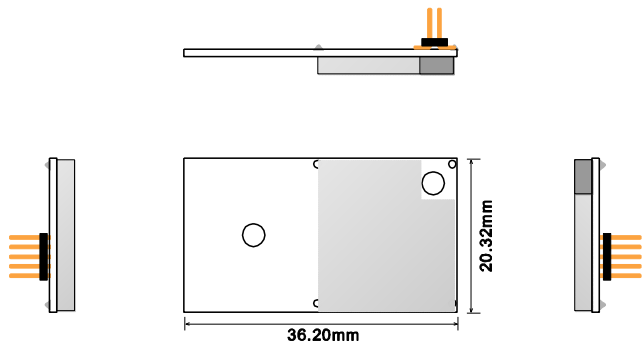
View



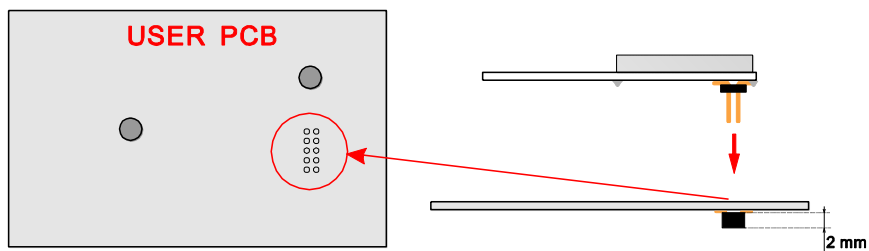
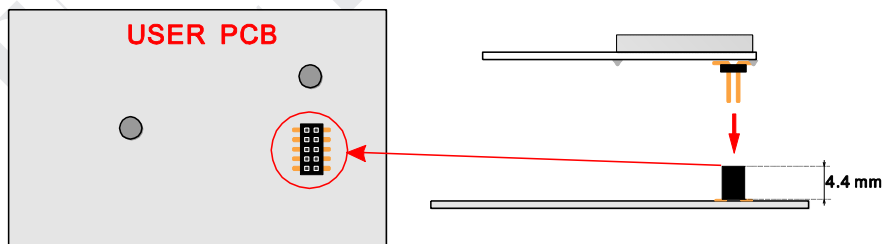
Pin Assignment

Pin	Function	I/O	Description
1	P2.1	O	CTS
2	P0.1	I	RTS
3	P0.4	O	UART TX
4	P1.7	I	UART RX
5	VCC	P	Power Cathode
6	GND	G	Power Negative
7	VO	O	3.3V Output
8	P1.0	O	If send the data this pin will puller-low
9	P1.1	O	If receive the data this pin will puller-low
10	CE	I	Puller-low to turn off Module Power

Size

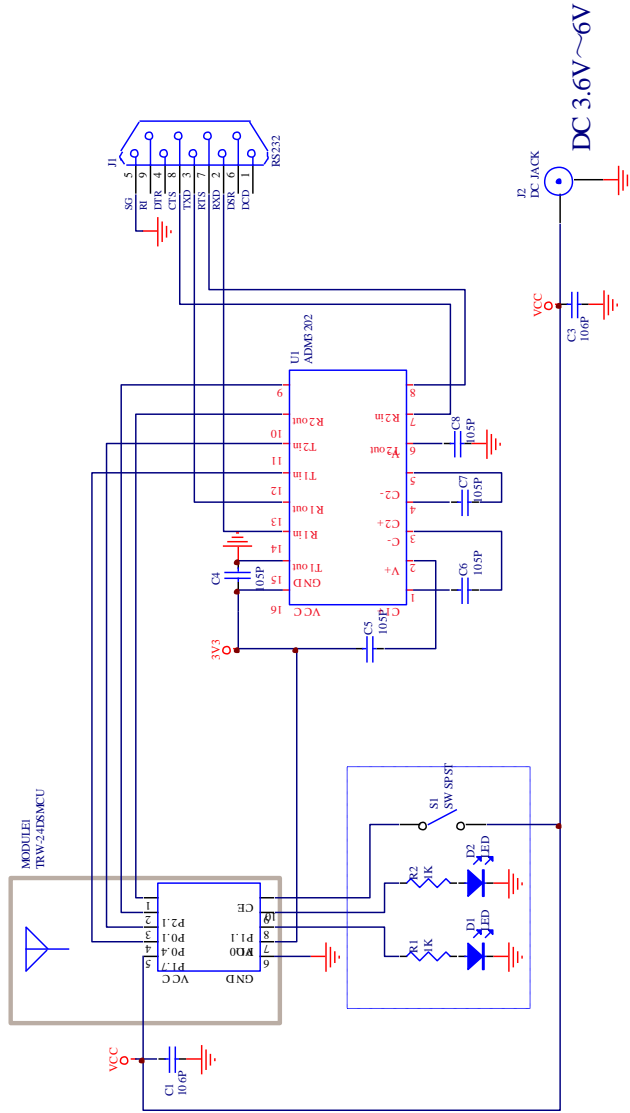


Reference hole position for PCB mounting(Bottom view)



Application Circuit

TRW-24DSMCU to RS232 Demo Circuit



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Title		WENSHENG	
Size	A4	Document Number	TRW-24DSMCU
Date:	31/03/2009	Rev	Rev
Sheet: 3		of 4	

時序圖



When the data into the RF no more than 2 BYTE time, RF began to send, and DATA should not exceed 64BYTE

Interface Data Rate Select

P1.1	P1.0	Data Rate
0	0	4.8K
0	1	9.6K
1	0	19.2K
1	1	19.2K

Command Summary

1. 介面速率選擇：當模組與設備的介面速率相同時會透過 UART 持續回覆 0xFE 0xFE 0xFE 0xFE 的數值，直到配置模組完成才會停止回覆。
2. 配置模組：
 - 0xFE+1Byte(頻道)+1Byte(RF 速率)+1Byte(固定為 00)+1Byte(高位 GID)+1Byte(低位 GID)
 - 頻道：0x01(2400MHz)~0x53(2483MHz)，頻道間隔 1MHz。

Interface Data Rate Select

P1.1	P1.0	Data Rate
0	0	4.8K
0	1	9.6K
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Command Summary

3. 介面速率選擇：當模組與設備的介面速率相同時會透過 UART 持續回覆 0xFE 0xFE 0xFE 0xFE 的數值，直到配置模組完成才會停止回覆。

4. 配置模組：

0xFE+1Byte(頻道)+1Byte(RF 速率)+1Byte(固定為 00)+1Byte(高位 GID)+1Byte(低位 GID).

● 頻道：0x01(2400MHz)~0x53(2483MHz)，頻道間隔 1MHz.

● RF 速率：

Value	RF Data Rate	Modulation Mode
00	1M	GFSK
01	250K	32 Chip 8DR
02	125K	64 Chip 8DR
03	62.5K	32 Chip DDR
04	31.25K	64 Chip DDR

◇ In GFSK mode, data is transmitted at 1 Mbps, without any DSSS.

◇ In 8DR mode, 1 byte is encoded in each PN code symbol transmitted.

◇ In DDR mode, 2 bits are encoded in each PN code symbol transmitted.

◇ In SDR mode, a single bit is encoded in each PN code symbol transmitted.

● 群組 ID(GID)：共有 2 個 Bytes 可供使用者自行設定，若設定 0000 則為廣播模式在相同頻道內的所有設備都可收到。

5. 讀取內部設定：Value=0x7E

回傳值=0x7E+1Byte(頻道)+1Byte(RF 速率)+1Byte(RF 功率)+1Byte(高位 GID)+1Byte(低位 GID).

6. 傳輸資料：0xFD+data(需小於 62bytes).