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ACT-IR8210D
IrDA Compliant Protocol Processor
Design Specification

January 9, 2007
Version 0.4

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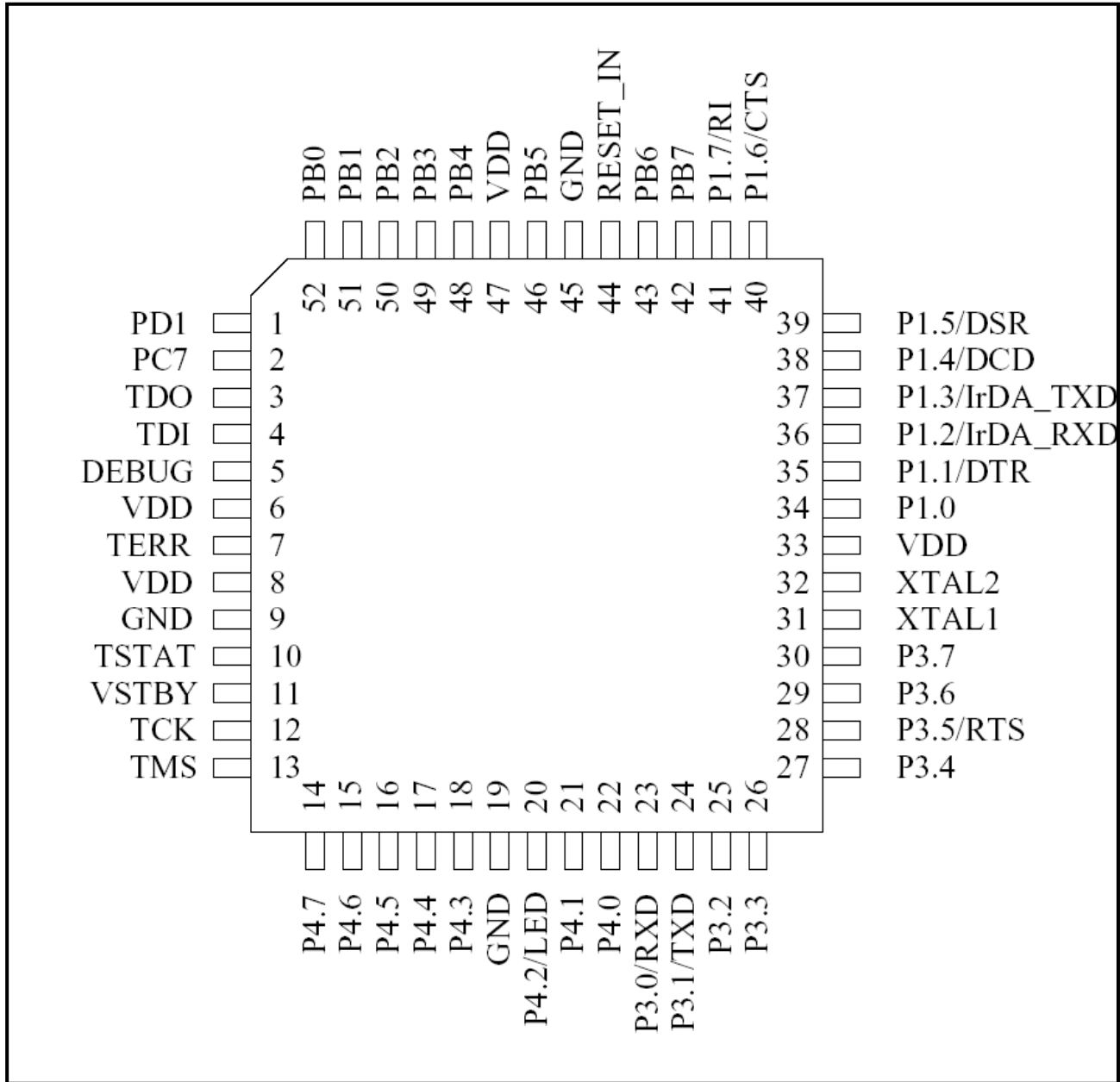
REVISION HISTORY

Revision History		
Version	Date	Comment
0.1	11/03/2004	Initial Released
0.2	11/10/2004	Added comset_IR100SD and others on chapter 6,7
0.2.1	02/02/2005	Changed the buffer for IR8210D.
0.3	01/27/2006	Added protocol selection on chapter 3 & overall reformat
0.3.1	05/24/2006	Modified application circuit of transceiver parts on chapter 9
0.3.2	08/31/2006	Added Chapter 8 for LED behavior
0.4	1/9/2007	Extracted technical sections

1. FEATURES

- A complete IrDA Protocol stack in a single chip.
- No any driver program is needed.
- Includes IrPHY encoding/decoding and interfaces directly to Infrared transceivers for data rate up to 115.2kbit/s. Only an external Infrared transceiver is needed to complete an IrDA compliant infrared communication subsystem.
- Supports mandatory IrDA layer: IrPHY, IrLAP, IrLMP and IAS.
- Supports upper layers TinyTP, IrCOMM, IrLPT, and OBEX transport.
- Supports host baud rate from 1.2kbit/s to 115.2kbit/s, which is changed by PC utility or 8 pins on chip. IrDA baud rate from 9.6kbit/s to 115.2kbit/s, which is flexible, setting by IrDA devices.
- Supports both IrDA Primary and Secondary mode.
- IR frame and Host buffer are 512 bytes separately.
- Low supply voltage, 3.0 V to 3.6 V.
- Current consumption: 20mA standby, 30mA active.
- Small low profile plastic 52-pin QFP package.
- Available in programmed and tested chips, assembled & tested boards, or fully packaged devices.
- A ready-made IrDA-compatible evaluation board ACT-IR100SD is available. It is strongly recommended to test ACT-IR100SD before purchasing ACT-IR8210D chip.
- A very useful Full Set Evaluation Kit is ACT-IR100SDK, which includes: ACT-IR100SD and ACT-IR4000US (notebook / desktop USB-IrDA adapter). This kit can evaluate ACT-IR100SD (connected to your device) exchanging IrDA data with ACT-IR4000US (connected to PC USB port), running under HyperTerminal with Windows IrDA driver. It can avoid debugging multiple issues: e.g. Does PDA application IrDA SW activate and behave properly with the matching protocol layer? Is this an ACT-IR100SD to host interface issue (UART data rates, flow control, data bit/parity/stop bit, UART signal pins, power levels)? Or is this a performance issue (throughput, distance, error rate/dropping bits)?

FIG. 1 ACT-IR8210D



2. OVERVIEW

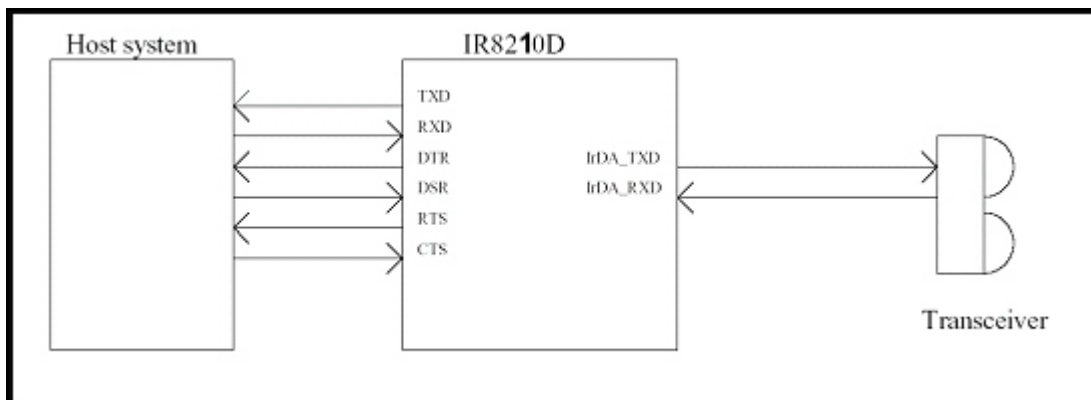
ACT-IR8210D is a low cost, high performance and highly integrated microcontroller, with on-chip IrDA protocol stack and on-chip infrared physical encoder/decoder. It provides a serial interface to a host device that intends to have infrared communication capability. The host device can be any equipment or device that needs to communicate with IrDA enabled devices via IrDA protocol with only a wired serial interface. ACT-IR8210D handles all the details regarding IrDA protocols. It sends and receives user data to and from the host device via the serial interface with hardware flow control.

IrDA has two modes: Primary and Secondary. The difference between them is that Primary initiates discovery, connection sequence and negotiates IrDA protocol parameters with Secondary; while Secondary always passively waits for commands from Primary. Both modes can run different protocols respectively, and may send or receive data.

ACT-IR8210D supports both Primary and Secondary modes.

Fig.2 shows its system diagram.

FIG. 2 SYSTEM DIAGRAM



3. HOW TO CONFIGURE ACT-IR8210D?

Since ACT-IR8210D support both Primary / Secondary modes and other parameters which provide flexibility for customer usage, the first thing needs to do is to make sure what host baud rate and which protocol you require before chip is implemented on PCB. Therefore, ACTiSYS developed a Windows program named Comset_IR100SD.exe to let you to configure ACT-IR8210D easier.

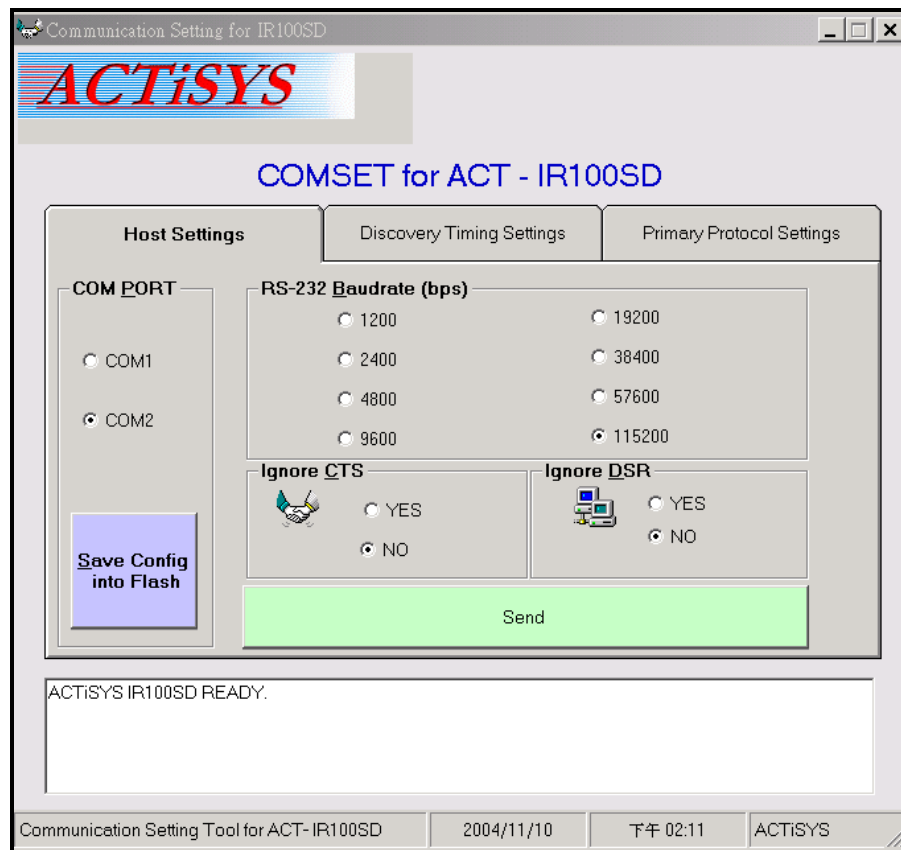
3.1. Wiring Note

Comset_IR100SD.exe program runs under Windows system (98, 98SE, Me, 2K and XP) and works with com port. So if you want to configure ACT-IR8210D on PCB, you should wire all 6 host signals of ACT-IR8210D to a DB9F connector. Those wires are TXD, RXD, DTR, DSR, RTS and CTS. After these have been done, you can change the configuration of ACT-IR8210D. Since you may sometimes need to wire those signals to other than a DB9 connector, we recommend that you can buy our ACT-IR8210D evaluation board (ACT-IR100SD) to test and configure before purchasing ACT-IR8210D. Please contact ACTiSYS to get the information of ACT-IR100SD.

Following sections show how to configure by Comset_IR100SD.exe.

3.2. The First Tab: Host Settings

The first tab is to set the host baud rate and the hardware flow control,



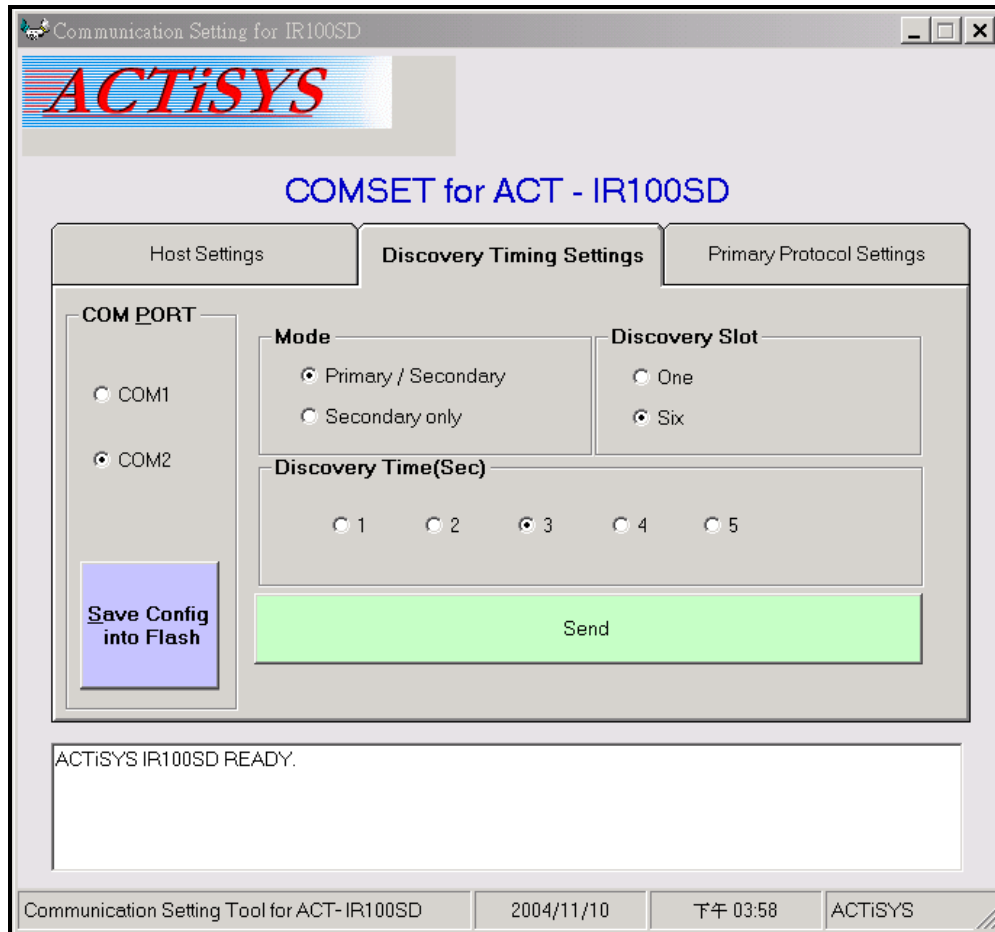
3.3. Flow Control Note

Ignore CTS If host device has no hardware flow control signals, only Tx, Rx and GND, then you have to select “**YES**” option. ACT-IR8210D will then pass the incoming data to host and not care the status of CTS (it will Ignore CTS). **Note: ACT-IR8210D is a buffer limited adapter (512 bytes for host and 512 bytes for IrDA).** If this option has been selected to “**YES**”, then it may cause **data loss because of no flow control**. Whereas data loss can be solved if user can send data segment by segment and every segment not exceeding 512 bytes. But normally we recommend to select “**NO**” option on this field.

Ignore DSR. If host system has no DSR signals, then this option should be set to “**YES**” to Ignore DSR signal. This is what we recommend when host device is Secondary. Since DSR signal will trigger ACT-IR8210D into Primary, if you select “Primary/Secondary” on “Mode” option (on the 2nd tab) and set option “Ignore DSR” to “**YES**”, it will always be in Primary mode and no way to ask it disconnecting IrDA link once power on. In other words, once you set option “Ignore DSR” to “**YES**”, you will not be able to control ACT-IR8210D at all until power off and set it to “**NO**”. So normally we recommend to select “**NO**” on this option.

3.4. The Second Tab: Discovery Timing Settings

The second tab is to set time interval of discovery, the slot number of discovery and the mode of ACT-IR8210D.



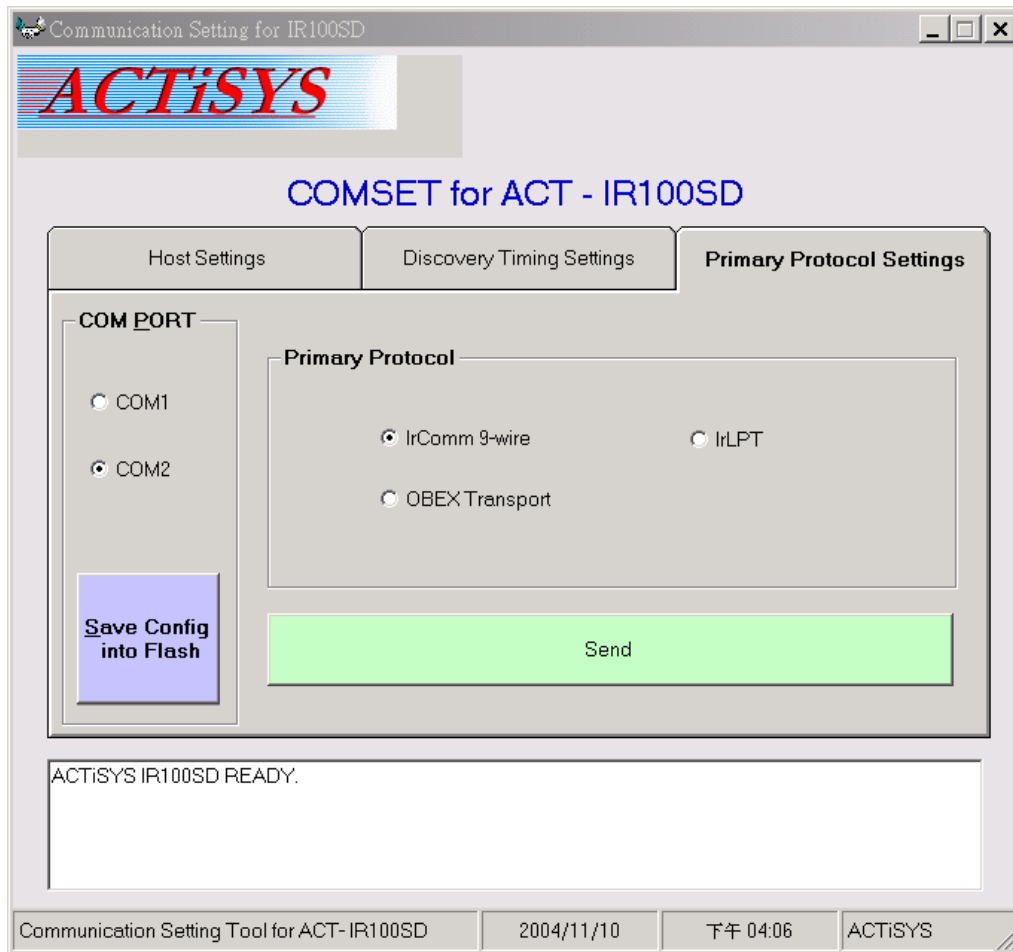
3.4.1. ACT-IR8210D supports both Primary and Secondary. It allows customer to change it.

3.4.2. Discovery time should be 3 seconds in general. If you want the discovery process faster, you can change it.

3.4.3. Discovery slot can also make discovery process faster.

3.5. The Third Tab: Primary Protocol Settings

The third tab is to set the IrDA protocols when ACT-IR8210D is in Primary.



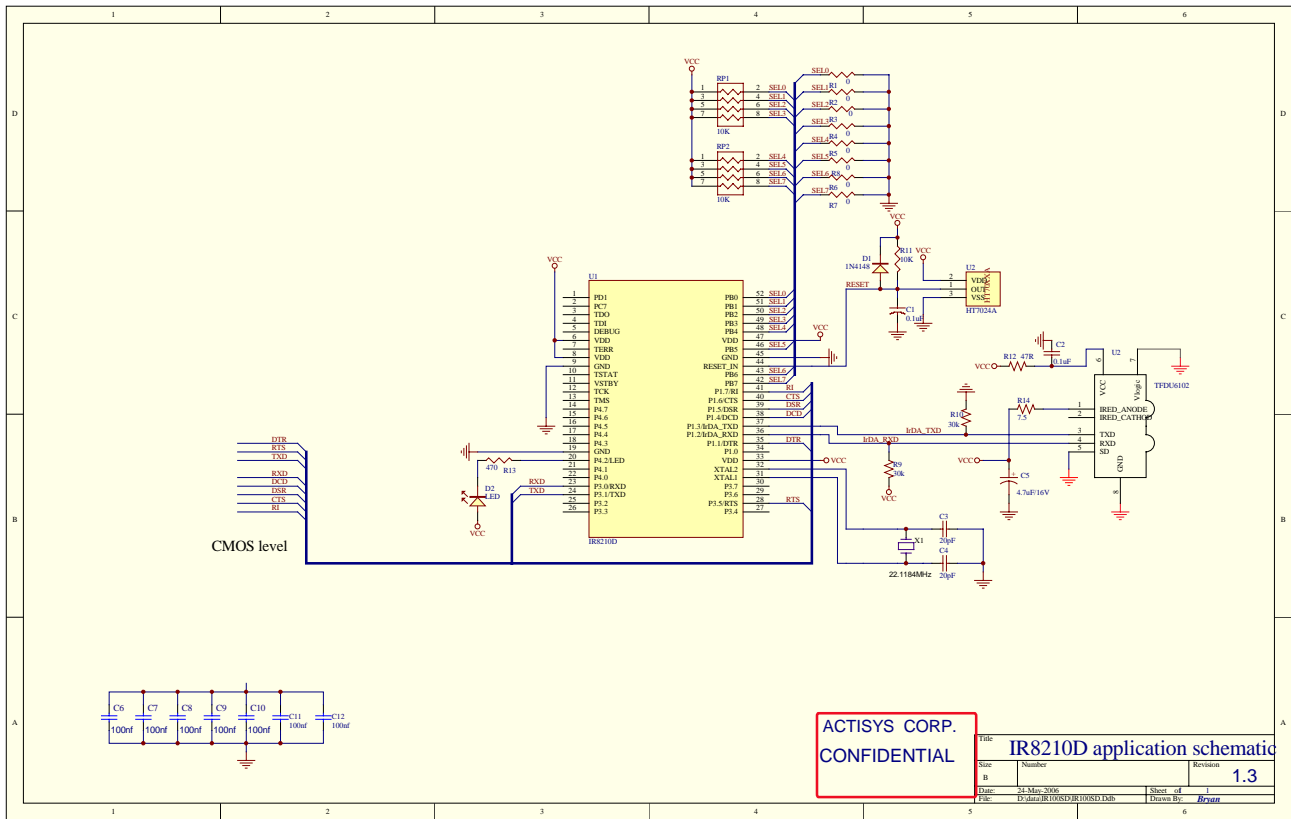
3.6. Save Configuration

After any parameter has been changed, you have to press “**Send**” button on every tab you changed first. Then press “**Save Config into Flash**”, so parameters can be configured successfully.

Instead of changing by program, there is another choice for you if you want to change the parameters manually. Or you have already soldered ACT-IR8210D on PCB. The PB7~PB0 pins on ACT-IR8210D can be configured host baud rate and hardware flow control signals to fit your requirements. Also you can change the Primary protocol or discovery time or slot here.

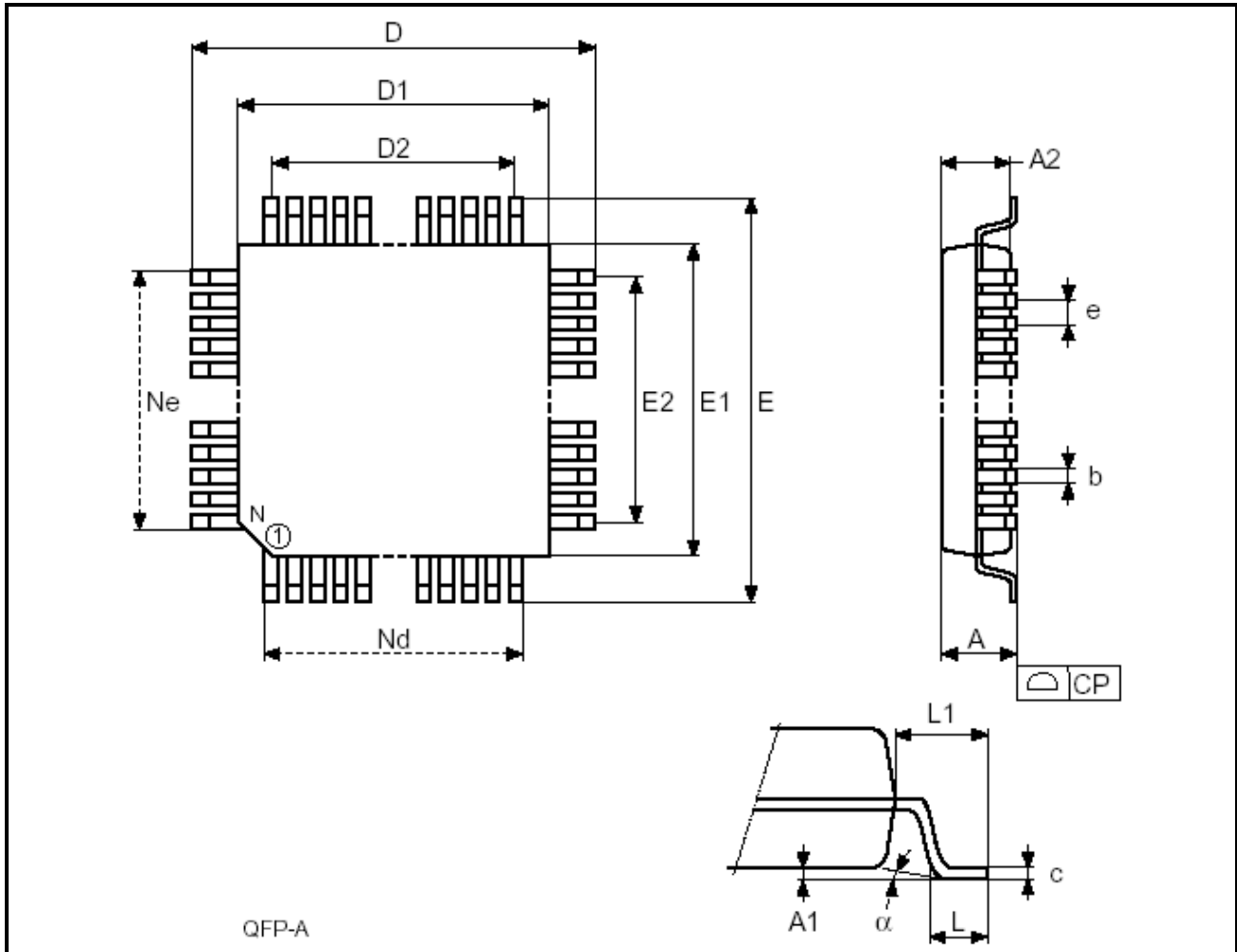
Please get information from tech support and refer to the pin description when required.

4. APPLICATION CIRCUIT



5. PACKAGE DIMENSIONS

FIG 3. 52-PIN QFP



Symb	mm			inches		
	Typ	Min	Max	Typ	Min	Max
A	-	-	1.75	-	-	0.069
A1	-	0.05	0.20	-	0.002	0.008
A2	-	1.25	1.55	-	0.049	0.061
b	-	0.20	0.40	-	0.008	0.016
c	-	0.07	0.23	-	0.002	0.009
D	12.00	-	-	0.473	-	-
D1	10.00	-	-	0.394	-	-
D2						
E	12.00	-	-	0.473	-	-
E1	10.00	-	-	0.394	-	-
E2	7.80			0.307		
e	0.65	-	-	0.026	-	-
L	-	0.45	0.75	-	0.018	0.030
L1	1.00	-	-	0.039	-	-
α	-	0°	7°	-	0°	7°
n	52			52		
Nd	13			13		
Ne	13			13		
CP	-	-	0.10	-	-	0.004

6. WARRANTY INFORMATION

ACTiSYS Corporation warrants the first end-user purchaser, for a period of 1 year from the date of purchase, that this wireless interface (The Product) will be free from defective workmanship and materials, and agrees that it will, at its option, either repair the defect or replace the defective Product or part thereof at no charge to the purchaser for parts or for labor.

This warranty does not apply to any appearance items of the Product, any consumable items such as paper, ink ribbon, or batteries supplied with the Product, or to any equipment or any hardware, software, firmware, or peripheral other than the Product. This warranty does not apply to any Product the exterior of which has been damaged or defected, which has been subjected to misuse, abnormal service or handling, or which has been altered or modified in design, construction or interfacing. Tampering with Label Voids Warranty.

In order to enforce the rights under this limited warranty, the purchaser should mail, ship or carry the Product, together with proof of purchase, to ACTiSYS.

The limited warranty described above is in addition to whatever implied warranties may be granted to purchasers by law. To the extent permitted by applicable law, ALL IMPLIED WARRANTIES INCLUDE THE WARRANTIES OF MERCHANT ABILITY AND FITNESS FOR USER ARE LIMITED TO A PERIOD OF 1 YEAR FROM THE DATE OF PURCHASE. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Neither the sales personnel of the seller nor any other person is authorized to make any warranties other than those described above, or to extend the duration of any warranties beyond the time period described above on behalf of ACTiSYS Corporation.

The warranties described above shall be the sole and exclusive remedy available to the purchaser. Correction of defects, in the manner and for the period of time described above, shall constitute full satisfaction of all claims, whether based on contract, negligence, strict liability or otherwise. In no event shall ACTiSYS Corporation be liable or in any way responsible, for any damages or defects in the Product which were caused by repair or attempted repairs performed by anyone other than ACTiSYS technician. Nor shall ACTiSYS Corporation be liable or in any way responsible for any incidental or consequential economic or property damage. Some states do not allow the exclusion of incidental or consequential damages, so the above exclusion may not apply to you.

FOR YOU RECORDS

For your assistance in reporting this product in case of loss or theft, please record below the model number and serial, which are located on the bottom of the case. Please retain this information.

Model Number:

Date Code:

Date of Purchase:



7. CONTACT INFORMATION

GO WIRELESS WITH ACTiSYS IR



ACTiSYS
The Wireless Infra-red Expert

- ◆ IrDA Protocol Software For Portable Devices
- ◆ IrDA Test Software For Hardware Systems
- ◆ IrDA Printer And Computer Adapters

115.2K, 4M and 16M bps



IR100M/1000M

IR2000L

IR220L/L+

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