



IC8205A

UNIVERSAL LEARNING REMOTE CONTROL INTEGRATED CIRCUIT

FEATURES

- Combines Innotech's extensive remote control Infrared code library with a powerful IR learning capability.
- Single chip solution provided in die form for lowest cost.
- Available in QFN package.
- Available in OTP form for prototyping.
- 6 device slots
- Simple Asynchronous (UART) host interface.
- Total learning capacity 112 buttons dynamically distributed over the 6 device slots.
- Broad coverage of all popular entertainment models.
- Two battery operation.
- Low operating power and Sleep Mode for long battery life.
- Flexible learner. Understands codes with toggle bits.
- Upload and Download extra IR codes.
- Retains learned codes even with battery removed via external EEPROM.

DESCRIPTION

The IC8205A Universal Learning Remote Integrated Circuit is a fully integrated solution for any system that requires IR transmission and learning capability. The chip can be configured for keypad or serial control. The IC8205A includes a comprehensive IR library of entertainment remote control codes. The IC8205A is provided in die form for the lowest manufacturing costs using chip-on-board assembly and is also available in a One-Time-Programmable daughterboard for prototyping.

The IC8205A is a complete "six-in-one" remote control IC capable of controlling any combination of TV, VCR, CBL, DSS, DVD, Audio and Aux.

Based on the advanced Innotech IR learning technology, the IC8205A can "capture" remote control codes for the vast majority of home entertainment and automation equipment including TV, VCR, Cable Box, Satellite (DSS) Receiver, Audio equipment and DVD players.

**DESCRIPTION OF PIN FUNCTIONS**

Die Pad #	COB/OTP Pin# daughterboard	Symbol	I/O	Description
2, 37	35, 28	IR_INP2 IR_INP3	Input	IR Learner & Host Async Serial Inputs
33	13	Serial Output	Output	Async Serial Output
42	33	Continuous Tx	Input	Button held down. Used to extend IR transmissions.
41	32	SLEEP	Input	Force power down
34	25	PDN	Output	Power-Down indicator
38	29	~IRLED	Output	IR LED for transmitting IR codes
32	12	LED	Output	Visible LED indicator for visual feedback to user.
21	15	~Reset	Input	Power On Reset
30	10	SCL	Output	Clock output to I ² C serial EEPROM used for non-volatile storage of learned codes
29	9	SDA	I/O	Data signal to I ² C serial EEPROM used for non-volatile storage of learned codes
24	18	GND	Ground	Ground
1	34	IR_INP1	Input	Learner IR input 1
31	11	ENABLE	Output	Enables the IR detector during learning
25, 26	19, 20	FXI, FXO	I/O	4 MHz ceramic resonator connection
22, 23	16, 17	SX1, SXO	I/O	Control resistor for internal secondary clock.
20	24	TSTPT	Input	Test point input. Should be tied low.
27, 28	21, 22	Vcc	Power	Positive battery connection
35, 36	26, 27	CFG1, CFG2	Input	Configuration Straps = 1,1 for Async mode
12-19	45-48, 1 5-7	X7-X0	Input	Keypad sense lines (not used in Async serial configuration)
39	30	WAKE	Input	Keypad wakeup signal (not used in Async serial configuration)
40	31	SYNC_DATA	I/O	Synchronous Serial Data line (not used in Async serial configuration)



HOST INTERFACE

Asynchronous (UART) serial interface (Cfg1=1 Cfg2=1)

Data communications between the IC8205A and the host processor is accomplished through an asynchronous half-duplex bit-serial interface. The host processor initiates all functions by sending the IC8205A commands which consist of *virtual button presses*. This is equivalent to pressing the buttons on a traditional remote control. Depending on the function being performed, these command sequence may consist of from one to several bytes going into the IC8205A.

With few exceptions every “button press” sent by the host processor will elicit a status byte returned from the IC8205A. This lock-step approach is the flow control mechanism for controlling the chip.

Data Rate

Data is exchanged at a fix data rate of **2400** bits per second (baud) with one start bit, 8 data bits, (no parity) and one or more stop bits. Separate transmit (TxD) and receive (RxD) data lines are used to send commands to, and receive responses from the IC8205A. The Request-To-Send (RTS) signal is used to stretch the transmitted IR data if necessary.

From Host

Command	TxD	Start Bit	DB0 (lsb)	DB1	DB2 417	DB3 uSec	DB4	DB5	DB6	DB7 (msb)	Stop Bit	
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To Host

Status Response	RxD	Start Bit	DB0 (lsb)	DB1	DB2 417	DB3 uSec	DB4	DB5	DB6	DB7 (msb)	Stop Bit	
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The following tables show the button codes that are sent to the IC8205A and the status codes that are returned to the host.

NOTE: To maintain backwards compatibility with a legacy product, the MSB must always be set to 1 for all button codes. This was the “button down” bit in the earlier product.



VIRTUAL BUTTON MAPPING

Buttons that Transmit IR

Function	CODE	Class Page 7
0	80h	channel
1	81h	channel
2	82h	channel
3	83h	channel
4	84h	channel
5	85h	channel
6	86h	channel
7	87h	channel
8	88h	channel
9	89h	channel
Enter	8Ah	channel
Mute	8Bh	volume
Volume up	8Ch	volume
Volume down	8Dh	volume
Channel up	8Eh	channel
Channel down	8Fh	channel
Rewind	90h	transport
Play	91h	transport
Fast Forward	92h	transport
Record	93h	transport
Stop	94h	transport
Pause	95h	transport
Power	96h	power
Previous	97h	channel
Input	98h	PIP
Display	99h	setup
Menu	9Ah	setup
Select	9Bh	Setup
Navigate up	9Ch	Setup
Navigate down	9Dh	Setup
Navigate left	9Eh	setup
Navigate Right	9Fh	setup
Exit	A0h	setup
Guide	A1h	setup
10+	A2h	channel
TITLE	A3h	
Sleep	A4h	power
Yellow Square	A5h	channel
Blue Circle	A6h	channel
Red Triangle	A7h	Channel
PIP	A8h	PIP
PIP Ch+	A9h	PIP
PIP CH-	AAh	PIP
PIP move	ABh	PIP
PIP swap	ACh	PIP

Function	CODE	Class Page 7
Page up	ADh	channel
Page down	A Eh	channel
Power off	AFh	power
XIR48	B0h	none
XIR49	B1h	none
XIR50	B2h	none
XIR51	B3h	none
XIR52	B4h	none
XIR53	B5h	none
XIR54	B6h	none
XIR55	B7h	none
XIR56	B8h	none
XIR57	B9h	none
XIR58	BAh	none
XIR59	BBh	none
XIR60	BCh	none
XIR61	BDh	none
XIR62	BEh	none
XIR63	BFh	none

Control Buttons

Function	Code	Type
Program	C0h	Setup
AUX	C1h	Slot
TV	C2h	Slot
VCR	C3h	Slot
DVD	C4h	Slot
Audio	C5h	Slot
CBL/SAT	C6h	Slot
Search	C7h	Setup
Learn	C8h	Setup
F1	C9h	Macro
F2	CAh	Macro
F3	CBh	Macro
F4	CCh	Macro
Smart Source ON	CDh	Setup
Smart Source Off	CEh	Setup
Toggle Smart Source	CFh	Setup
IR repeat 0	D0h	Setup
IR repeat 1	D1h	Setup
IR repeat 2	D2h	Setup
IR repeat 3	D3h	Setup
IR repeat 4	D4h	Setup
IR repeat 5	D5h	Setup
IR repeat 6	D6h	Setup



Function	Code	Type
IR repeat 7	D7h	Setup
Erase Learned button	D8h	Setup
Write EEPROM	D9h	Setup
Read EEPROM	DAh	Setup
Clear EEPROM	DBh	Setup
Revision number	DCh	Setup
Device number	DDh	Setup
Number of learned buttons	DEh	Setup
Erase Selected Device	DFh	Setup
Enable Punch-Thru	E0h	Setup
Disable Punch-Thru	E1h	Setup
Size EEPROM	E2h	Setup

Response byte	Code
Send Start Address Hi	12h
Send End Address Lo	13h
Send End Address Hi	14h
Read Complete	15h
Write Complete	16h
Start Write	17h
Read/Write Error	18h
Memory Full	19h
EEPROM NG	1Ah
EEPROM SIZE 128	1Bh
EEPROM SIZE 64	1Ch
Erase Complete	1Dh
Search Exhausted	1Eh
Indicator Flash 0	A0h
Indicator Flash 1	A1h
Indicator Flash 2	A2h
Indicator Flash 3	A3h
Indicator Flash 4	A4h
Indicator Flash 5	A5h
Indicator Flash 6	A6h
Indicator Flash 7	A7h
Indicator Flash 8	A8h
Indicator Flash 9	A9h
Abort Learn	2Ah
IR Xmit from AUX slot	40h
IR Xmit from TV Slot	41h
IR Xmit from VCR slot	42h
IR Xmit from DVD slot	43h
IR Xmit from AUD slot	44h
IR Xmit from CBL/SAT slot	45h
IR Xmit Macro End-Of-String	46h
IR Xmit Macro End Of Macro	47h
Xmit Macro Delay	48h

Status Byte from IC8205A to Host

Response byte	Code
Invalid Scan Code	31h
Invalid Device Code	32h
Search Exhausted	33h
Slot Empty	34h
Program Abort	35h
IR Xmit complete	36h
Invalid IR type	37h
Power-On-Reset	38h
Auto Search	39h
No Learn button specified	3Ah
No Learn IR detected	3Bh
Learn Started	3Ch
Brand Search	3Dh
Non-Learnable button	3Eh
Learn analysis Error	3Fh
Send Start Address Lo	11h



REMOTE CONTROL OPERATION

General

The IC8205A implements a fully functional 6-in-1 universal remote control. It supports 64 traditional remote control buttons, in addition to extended buttons used for control purposes. The IC8205A contains an IR learner to augment the built-in library. All user preferences, programmed codes, learned codes, and downloadable IR codes are stored in an external serial EEPROM.

Programming the IC8205A

Many of the IC8205A parameters can be setup using the following model..

- Host sends one of the 6 slot commands to the IC8205A (TV, DVD CBL/SAT, AUDIO, VCR, AUX)
Receive 1 LED flash status. This marks the slot as active until changed.
- Host sends the PROGRAM command
Receive 2 LED flashes status response
- Host sends 1 numeric digit to set some user preference.
- or- send 2 digits to prepare to do a brand auto-search.
- or- send 3 digits to program a device from the internal library.
- or- send 4 digits to program a device from the extended (downloadable) library
Receive 1 LED flash for each digit
- Host sends PROGRAM (or SEARCH) to complete to operation.
Response varies depending on the operation.

Slots

Before the IC8205A can transmit an IR signal, one or more devices must be programmed from the library database or one or more buttons must be learned. The IC8205A is a 6-in-1 remote control meaning that 6 independent slots can be setup. These 6 slots can be programmed for any combination of device category. The 6 default categories are AUX, TV, VCR, DVD, AUD, and CBL/SAT, however there is no restriction on what device category gets programmed into what slot. For example all 6 slots can be programmed to be a different TV.

Programming a slot from the library

Slots are programmed either by directly entering a 3 or 4 digit device code for a selected slot or by using one of the auto-search modes. 3 digit device codes are built into the IC8205A. 4 digit device codes are for extra devices that can be uploaded into the extended non-volatile memory.

Direct Device Code Programming

Like any universal remote control, the IC8205A can be programmed by directly entering a 3 (or 4) digit device code from the device list. The button sequence to program a slot from the device list is as follows....

Button	Host sends	Status returned	IC8205A sends
Send one of the six slot buttons	C1h – C6h	1 indicator LED flash	A1h
Send PROGRAM	C0h	2 LED flashes	A2h
Send #0 - #9 hundreds digit of device code	80h – 89h	1 LED flash	A1h
Send #0 - #9 tens digit of device code	80h – 89h	1 LED flash	A1h
Send #0 - #9 tens digit of device code	80h – 89h	1 LED flash	A1h
Send PROGRAM	C0h	3 LED flashes. If code exists	A3h



Customized IR libraries are available to fit any application.

Transmitting IR codes from the library

Once a slot is programmed, the appropriate IR code is transmitted by “pressing” any virtual button that is implemented for the device that was programmed. The IR code will be transmitted a minimum of 3 times. This default repeat count can be adjusted by sending an IR_repeat_N command (Dh – D7h). The IR code will also repeat as long as the “button” is held unless the code is designated as a non-repeat type. IR Transmissions are extended by asserting the Continuous Tx pin. This signal can be tied to Request-To-Send (RTS) on a typical serial communications port. The IR signal will continue to repeat until the line is de-asserted, or until it is transmitted 256 times.

Punch-Through

Library devices generally implement some subset of all the possible buttons that exist. For example it is unlikely that a TV in the library will implement the PLAY button (unless it’s a combo). If a button is not implemented, the IC8205A will check the other slots for programmed devices that have the requested button implemented in a logical order depending on the class of button. Punch-Through can be handy for most remote control operation however there may be applications where punch-through is not desired. Punch-Through mode can be turned on or off by sending the PunchOn or PunchOff commands.

Function	Scancode	Status response
Enable Punch Through	E0h	2 indicator LED flashes
Disable Punch Through	E1h	1 indicator LED flash

Smart Source (patented)

The IC8205A can be programmed to pre-select specific slots when certain *classes* of buttons are transmitted. Button classes are defined in the following table.

Class	Buttons
POWER	POWER, PWR_OFF, SLEEP
VOLUME	VOL+, VOL-, MUTE
CHANNEL	0-9, Enter, CH+, CH-, PREVIOUS
TRANSPORT	PLAY, STOP, FF, REW, PAUSE, RECORD
SETUP	UP, DOWN, LEFT, RIGHT, MENU, EXIT, GUIDE, DISPLAY
PIP	INPUT, PIP, PIP swap PIP Ch+ PIP Ch- PIP move

To program *smart source* send the following button sequence for each class that you want to setup.

Button	Host sends	Status returned	IC8205A sends
Send one of the six slot buttons TV, DVD, etc)	C1h – C6h	1 indicator LED flash	A1h
Send PROGRAM	C0h	2 LED flashes	A2h
Send any button from the desired class	80h – BFh	3 LED flashes	A3h

NOTE: To program the channel class you cannot use the numbers (0-9) because they are used for device setup. Instead use another button from the channel class such as CH+. Programming a class automatically enables smart-source mode. Smart source can be temporarily disabled by sending the SMART button.



An example best explains the utility of *Smart-Source*.

- If you want the TV to turn on and off when the POWER button is sent independent of what slot was selected previously you send; TV PROG POWER. (Note for simplicity, the status bytes returned for each button sent are assumed)
- In addition you want to select the TV whenever you adjust the volume. Send TV PROG VOL+
- You also want to select your cable box whenever you change the channel. Send CBL PROG CH+
- To automatically select the VCR slot whenever you send a transport button, Send VCR PROG PLAY.

Once *smart source* is setup, you may never need to send a slot button. However there are times when you may need to circumvent the automatic slot selection that *smart source* provides. For example, if you have a VCR that you need to tune to a specific channel to record a program while watching another channel. Normally *smart-source* will automatically set the slot to your cable or satellite box but in this situation, you need to set the channel on the VCR. When *smart source* is turned off, you can use the slot buttons to determine what device the numbers control. Once the VCR is set to the proper channel, you can turn *smart source* back on and resume the automatic slot selection you programmed.

Function	Scancode	Status response
Enable Smart Source	CDh	2 indicator LED flashes
Disable Smart Source	CEh	1 indicator LED flash

Auto-Search

Auto-Search mode causes the IC8205A to transmit a button from each device in the library, wait 3 seconds, and then move to the next device until told to stop. There are two auto-search modes in the IC8205A.

Category auto-search will search through an entire category (TV, DVD, VCR, etc) of device from the database. The category of the search is determined by the currently active slot. For example, selecting the TV slot will only search for TVs. Selecting the AUX slot will search through the entire library without regard to category. The button sequence to start a category auto-search is...

Function	Host Sends	Status returned	IC8205A sends
Send a Slot button	C1h – C6h	1 indicator LED flash	A1h
Send PROGRAM	C0h	2 LED flashes	A2h
Send SEARCH	C7h	AutoSearch	39h

The IC8205A will start its search from the currently programmed device code in the currently active slot. It will transmit the POWER button, and then pause 3 seconds to give the user time to respond. Before each IR message is sent, the IC8205A returns an IR Xmit Start status byte (40h-45H). When the IR transmission is done, it sends a IR Xmit Complete status byte (36h).

The IC8205A will stop searching when one of the following happens:

Function	Host Sends	Status returned	IC8205A sends
Send PROGRAM code Code is saved in the currently active slot	C0h	3 indicator LED flashes	A3h
Send one of the 6 slot codes Code is saved in the selected slot	C1h- C6h	3 indicator LED flashes	A3h
Send any other button Search is aborted. No code saved	80h - BFh		



Search will stop automatically when all of the pertinent codes have been sent.



Brand Auto-Search

The IC8205A can filter its auto-search by category and brand. For example, it can be told to search only for Sony TVs. This reduces the time it takes to find the desired code. To start a brand search the following button sequence is sent...

Function	Host Sends	Status returned	IC8205A sends
Send a Slot button	C1h – C6h	1 indicator LED flash	A1h
Send PROGRAM	C0h	2 LED flashes	A2h
Send brand code tens digit	80h – 89h	1 LED flash	A1h
Send brand code ones digit	80h – 89h	1 LED flash	A1h
Send SEARCH	C7h	AutoSearch	39h

See the brand code list. Customized IR libraries are available to fit any application.

Brand auto-search is stopped the same was as the category auto-search. Send the PROGRAM button or one of the 6 slot buttons.

Learning from another remote

The IC8205A can learn IR codes from other remote controls. These learned codes can be programmed on top of library codes or they can be learned onto unused buttons. If a learned code is programmed on top of an existing library code, the learned code has precedence. Up to 112 learned codes can be programmed into the IC8205A distributed in any way amongst the 6 source slots. Note that re-programming a device from the library will erase all the learned codes for that device slot. The button sequence to learn an IR code is..

Function	Host Sends	Status returned	IC8205A sends
Send a Slot button	C1h – C6h	1 indicator LED flash	A1h
Send LEARN	C8h	Learn Started	3Ch
Send any learnable button code (see page 4)	80h - BFh	Not a learnable button	3Eh
		Memory Full	19h
		No button specified	3Ah
		Learn Started 1 flash	A1h
While holding the two remotes nose to nose, press the button that you want to learn on the teaching remote for about 2 seconds or one of the following status messages is received.		No IR detected	3Bh
		No IR detected	3Bh
		Learn analysis error	3Fh
		Memory Full	19h
		Learn Complete	A2h (2 flashes)

You can only learn IR codes onto the 64 buttons that send IR. You cannot learn IR codes onto the following buttons that are used for device programming purposes.

- The 6 slot buttons. (TV, DVD CBL/SAT, AUDIO, VCR, AUX)
- PROGRAM
- LEARN
- F1 – F4 (macro buttons)
- SMART-SOURCE
- SEARCH



Programming a macro

There are 4 macro buttons in the IC8205A (F1 – F4). These buttons can be programmed to transmit a series of up to 25 button codes each. The macro buttons can be setup to send a series of favorite channels or to turn all your equipment on or off. To program a macro Send the following buttons...

Function	Host Sends	Status returned	IC8205A sends
Send the Learn command	C8h	2 indicator LED flash	A2h
Send F1 – F4	C9h - CCh	2 LED flashes	A2h
Send button sequence	80h - BFh	<u>IR Xmit Start</u> then <u>IR Xmit complete</u> for each button sent	40h 36h
End of String (Learn)	C8h	2 Flashes	A2h
End of Macro (Program)	C0h	3 Flashes	A3h

Multi String Macros.

You can program a macro button to send out a sequence of buttons that is different each time the macro button is sent. For example, if you want to program macro 1 to go to each of your favorite sports channels.

- Send CBL (1 flash)
- Send LEARN (2 flashes)
- Send the F1 (2 flashes)
- Send #1
- Send #9
- Send LEARN (end of 1st macro string for channel 19) (2 flashes)
- Send #2
- Send #8
- Send LEARN (end of 2nd macro string for channel 28) (2 flashes)
- Send #4
- Send #5
- Send PROGRAM (end of 3rd macro string for channel 45 and end of the macro) (3 flashes)

The first time you Send F1 the TV will go to channel 19, the 2nd Send will show channel 28 and the 3rd will go to channel 45. After that the sequence begins at channel 19 again. Another macro button can be programmed to go to you favorite movie channels.



Reading back the programmed device code

To read back the 3 or 4 digit library device codes enter the following button sequence...

Button	Host sends	Status returned	IC8205A sends
Send the slot code that you want to read	C1h – C6h	1 indicator LED flash	A1h
Send PROGRAM	C0h	2 LED flashes	A2h
Send #1	81h	1 LED flash	A1h
Send PROGRAM	C0h	Flash hundreds digit	A0h – A9h
Send the slot code that you want to read	C1h – C6h	1 indicator LED flash	A1h
Send PROGRAM	C0h	2 LED flashes	A2h
Send #2	82h	1 LED flash	A1h
Send PROGRAM	C0h	Flash tens digit	A0h – A9h
Send the slot code that you want to read	C1h – C6h	1 indicator LED flash	A1h
Send PROGRAM	C0h	2 LED flashes	A2h
Send #3	83h	1 LED flash	A1h
Send PROGRAM	40h	Flash ones digit	A0h – A9h
Send the slot code that you want to read	C1h – C6h	1 indicator LED flash	A1h
Send PROGRAM	C0h	2 LED flashes	A2h
Send #4	84h	1 LED flash	A1h
Send PROGRAM	C0h	Flash thousands digit	A0h – A9h

To read out the firmware revision levels...

Button	Host sends	Status returned	IC8205A sends
To read firmware major send AUX	C1h or	1 indicator LED flash	A1h
To read firmware minor send TV	C2h or		
To read library major send VCR	C3h or		
To read library minor send DVD	C4h		
Send PROGRAM	C0h	2 LED flashes	A2h
Send #0	80h	1 LED flash	A1h
Send PROGRAM	C0h	Flash digit	A0h – A9h

Resetting the IC8205A to factory default settings.

This sequence will erase all user device codes, learned buttons, preference settings, smart-source programming, and macros.

Button	Host sends	Status returned	IC8205A sends
Send one of the six slot buttons	C1h – C6h	1 indicator LED flash	A1h
Send PROGRAM	C0h	2 LED flashes	A2h
Send #9	89h	1 LED flash	A1h
Send PROGRAM	C0h	After a delay of several seconds, Erase Complete	1Dh

**ABSOLUTE GUARANTEED RATINGS***

Operating Temperature Range 0°C to 70°C
 Storage Temperature Range -20°C to + 100°C
 Voltage from any pin to V_{SS} -0.3 to V_{CC} + 0.3
 Voltage from V_{CC} to V_{SS} -0.5 to +3.9

*Stresses above those listed could cause permanent damage to the device. This is a stress rating only and functional operation of the device at any other condition above those indicated in the operation sections of this specification is not implied.

DC ELECTRICAL CHARACTERISTICS (T_A = 0° to 70°C, V_{CC} = 2.2 to 3.6 V)

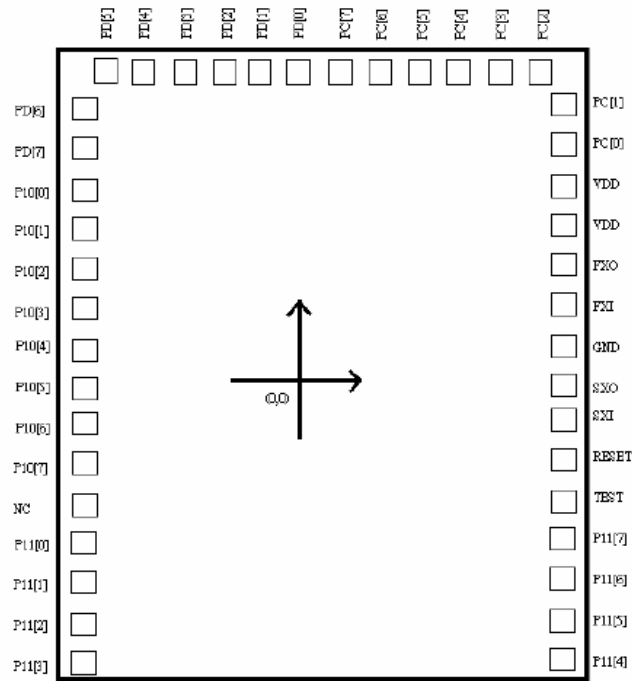
SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT	COMMENT
V _{IL}	Input Voltage Low			0.2V _{CC}	V	
V _{IH}	Input Voltage High	0.8V _{CC}			V	Except XTAL
V _{HYS}	Reset Input Voltage Low			1/3V _{CC}	V	
V _{IHR}	Reset Input Voltage High	.67 V _{CC}			V	
I _{IL}	Logic 0 Sink Current	.8	1		mA	V _{OL} = .4 V _{CC}
I _{IL}	Logic 1 Source Current	-40	-50	-60	μA	V _{OH} = .9 V _{CC}
V _{OL}	Output Voltage Low			.45	V	I _{OL} = 1.0mA
V _{OH}	Output Voltage High	2.4			V	I _{OH} = -50μA
I _{CC}	Power Supply Current		0.75	2	mA	Active
I _{CC}	Power Supply Current			1	μA	Sleep

AC ELECTRICAL CHARACTERISTICS (T_A = 0° to 70°C, V_{CC} = +2.2 to 3.6 V)

SYMBOL	PARAMETER	MIN	MAX	UNIT	COMMENT
f _{in}	Clock frequency	3.98	4.02	MHz	
T _{IR}	Infrared Output Resolution		±500	ns	
T _{RD}	Reset Pulse Width	2		μs	
f _{cap}	IR Capture (Learn) Frequency	10	70	kHz	



Pad Diagram



Chip Size : 1640um X 2160um
 IC 's substrate is connected to GND

Pad Coordination

Pin Number	Pin Name	X Coordinate	Y Coordinate	Pin Number	Pin Name	X Coordinate	Y Coordinate
1	PD.6	-747.400	485.250	22	SXI	747.400	-368.800
2	PD.7	-747.400	380.250	23	SXO	747.400	-263.800
3	P10.0	-747.400	275.250	24	GND	747.400	-158.800
4	P10.1	-747.400	170.250	25	FXI	747.400	-53.800
5	P10.2	-747.400	65.250	26	FXO	747.400	51.200
6	P10.3	-747.400	-39.750	27	VDD	747.400	156.800
7	P10.4	-747.400	-144.750	28	VDD	747.400	262.400
8	P10.5	-747.400	-249.750	29	PC.0	747.400	367.400
9	P10.6	-747.400	-354.750	30	PC.1	747.400	472.400
10	P10.7	-747.400	-459.750	31	PC.2	598.700	1006.300
11	NC	-747.400	-572.650	32	PC.3	493.700	1006.300
12	P11.0	-747.400	-682.400	33	PC.4	388.700	1006.300
13	P11.1	-747.400	-787.400	34	PC.5	283.700	1006.300
14	P11.2	-747.400	-892.400	35	PC.6	178.700	1006.300
15	P11.3	-747.400	-997.400	36	PC.7	73.700	1006.300
16	P11.4	747.400	-998.800	37	PD.0	-31.300	1006.300
17	P11.5	747.400	-893.800	38	PD.1	-136.300	1006.300
18	P11.6	747.400	-788.800	39	PD.2	-241.300	1006.300
19	P11.7	747.400	-683.800	40	PD.3	-346.300	1006.300
20	TEST	747.400	-578.800	41	PD.4	-451.300	1006.300
21	RESET	747.400	-473.800	42	PD.5	-556.300	1006.300

