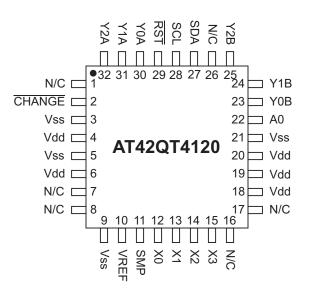
Features

- QField[™] Touchscreen:
 - Up to 3.4 inches diagonal screen size supported
- Technology:
 - Patented spread-spectrum charge-transfer (transverse mode)
- Panel Materials:
 - Plastic, glass, composites, painted surfaces (low particle density metallic paints possible)
- Adjacent Metal:
 - Compatible with grounded metal immediately next to sensing channels
- Panel Thickness:
 - 1 to 2 mm glass, 0.5 to 1.5 mm plastic
- Interface:
 - I²C-compatible slave mode, 100 kHz or 400 kHz
- Moisture Tolerance:
 - Best in class
- Power:
 - 1.8V to 5.5V (2.5V to 5.5V in high speed mode)
- Packages:
 - 32-pin 5 x 5 mm MLF RoHS compliant
- Signal Processing:
 - Self-calibration, auto drift compensation, noise filtering
- Applications:
 - Mobile electronics, terminals, appliances
- Patents:
 - QMatrix[™] (patented Charge-transfer method)
 - QField (patented Charge-transfer method, patent-pending QField optimized for one-layer sensor element designs)

1. Pin-out and Pin Listing Descriptions

1.1 Device Pin-out





QField[™] 10-bit Touchscreen Sensor IC

AT42QT4120

Summary

Note: This is a summary document. A complete document is available under NDA. For more information contact www.atmel.com/touchscreen.

9506AS-AT42-10/08





1.2 **Pin Listing Description**

Table 1-1.	Pin Listing
------------	-------------

Pin	Name	Туре	Comments	If Unused, connect To
1	N/C	0	Not connected	Leave open
2	CHANGE	OD	State change notification	Leave open
3	Vss	Р	Supply ground	_
4	Vdd	Р	Power	_
5	Vss	Р	Supply ground	_
6	Vdd	Р	Power	_
7	N/C	0	Not connected	Leave open
8	N/C	0	Not connected	Leave open
9	Vss	Р	Supply ground	_
10	VREF	I	Supply ground	_
11	SMP	0	Sample output	_
12	X0	0	X matrix drive line	Leave open
13	X1	0	X matrix drive line	Leave open
14	X2	0	X matrix drive line	Leave open
15	Х3	0	X matrix drive line	Leave open
16	N/C	0	Not connected	Leave open
17	N/C	0	Not connected	Leave open
18	Vdd	Р	Power	_
19	Vdd	Р	Power	_
20	Vdd	Р	Power	_
21	Vss	Р	Supply ground	_
22	A0	I	I ² C-compatible address select	_
23	Y0B	I/O	Y line connection	Leave open
24	Y1B	I/O	Y line connection	Leave open
25	Y2B	I/O	Y line connection	Leave open
26	N/C	0	Not connected	Leave open
27	SDA	OD	Serial Interface Data	_
28	SCL	OD	Serial Interface Clock	_
29	RST	Ι	Reset low; has internal 30k - 60k pull-up	Leave open or Vdd
30	Y0A	0	Y line connection	Leave open
31	Y1A	0	Y line connection	Leave open
32	Y2A	0	Y line connection	Leave open

Input only

I

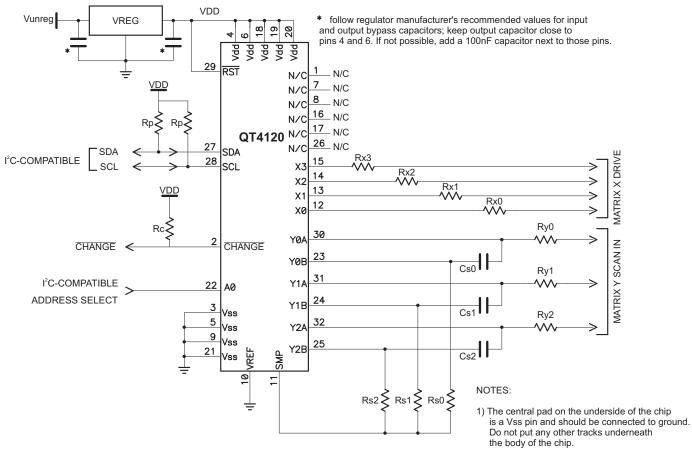
0

- I/O Input and output
 - Clock resonator Х
- Output only, push-pull OD Open drain output
- Ρ Ground or power

AT42QT4120 2

1.3 Wiring Diagram

Figure 1-1. Wiring Diagram



2) It is important to place all Cs, Rs, Rx and Ry components physically near to the chip.

Suggested regulator manufacturers:

- Torex (XC6215 series)
- Seiko (S817 series)
- BCDSemi (AP2121 series)

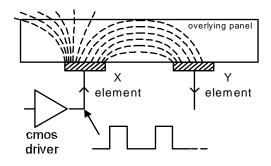




2. Overview

The AT42QT4120 (QT4120) QField IC is a self-contained capacitive touchscreen controller that employs Atmel's patented transverse charge-transfer (QT^{M}) acquisition method. The controller senses changes in electrical charge forced across two electrode elements by a pulse edge (see Figure 2-1).

Figure 2-1. Field Flow Between X and Y Elements



The touchscreen is critical to the design and is specially patterned to improve linearity, limit hand shadow and keep the number of connection lines to a minimum.

The device includes all signal processing functions necessary to provide stable sensing under a wide variety of changing conditions. Only a few external parts are required for operation. The entire circuit can be built within a few square centimeters of single-sided PCB area. CEM-1 and FR1 punched, single-sided materials can be used for the lowest possible cost. The PCB's rear can be mounted flush on the back of a glass or plastic panel using a conventional adhesive, such as 3M VHB two-sided adhesive acrylic film.

The device uses an I²C-compatible interface to allow channel data to be extracted and to permit touchscreen parameter setup. The command structure is designed to minimize the amount of data traffic while maximizing the amount of information conveyed.

In addition to normal operating and setup functions the device can also report back actual signal strengths.

3. Revision History

Revision No.	History
Revision AS – October 2008	Initial release for chip revision 7.0





Headquarters

Atmel Corporation 2325 Orchard Parkway San Jose, CA 95131 USA Tel: 1(408) 441-0311 Fax: 1(408) 487-2600

International

Atmel Asia

Unit 01-05 & 16, 19/F BEA Tower, Millennium City 5 418 Kwun Tong Road Kwun Tong Kowloon Hong Kong Tel: (852) 2245-6100 Fax: (852) 2722-1369

Touch Technology Division

1 Mitchell Point Ensign Way Hamble Southampton Hampshire SO31 4RF United Kingdom Tel: (44) 23-8056-5600 Fax: (44) 23-8045-3939

Atmel Europe

Le Krebs 8, Rue Jean-Pierre Timbaud BP 309 78054 Saint-Quentin-en-Yvelines Cedex France Tel: (33) 1-30-60-70-00 Fax: (33) 1-30-60-71-11

Atmel Japan

9F, Tonetsu Shinkawa Bldg. 1-24-8 Shinkawa Chuo-ku, Tokyo 104-0033 Japan Tel: (81) 3-3523-3551 Fax: (81) 3-3523-7581

Product Contact

Web Site www.atmel.com Technical Support touch@atmel.com Sales Contact www.atmel.com/contacts

Literature Requests www.atmel.com/literature

Disclaimer: The information in this document is provided in connection with Atmel products. No license, express or implied, by estoppel or otherwise, to any intellectual property right is granted by this document or in connection with the sale of Atmel products. EXCEPT AS SET FORTH IN ATMEL'S TERMS AND CONDITIONS OF SALE LOCATED ON ATMEL'S WEB SITE, ATMEL ASSUMES NO LIABILITY WHATSOEVER AND DISCLAIMS ANY EXPRESS, IMPLIED OR STATUTORY WARRANTY RELATING TO ITS PRODUCTS INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTIC-ULAR PURPOSE, OR NON-INFRINGEMENT. IN NO EVENT SHALL ATMEL BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, PUNITIVE, SPECIAL OR INCIDENTAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF PROFITS, BUSINESS INTERRUPTION, OR LOSS OF INFORMA-TION) ARISING OUT OF THE USE OR INABILITY TO USE THIS DOCUMENT, EVEN IF ATMEL HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAM-AGES. Atmel makes no representations or warranties with respect to the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice. Atmel does not make any commitment to update the information contained herein. Unless specifically provided otherwise, Atmel products are not suitable for, and shall not be used in, automotive applications. Atmel's products are not intended, authorized, or warranted for use as components in applications intended to support or sustain life.

© 2008 Atmel Corporation. All rights reserved. Atmel[®], Atmel logo and combinations thereof, and others are registered trademarks, Adjacent Key Suppression[™], AKS[™], QT[™], QField[™], QMatrix[™], QTouch[™]and others are trademarks of Atmel Corporation or its subsidiaries. Other terms and product names may be registered trademarks or trademarks of others.