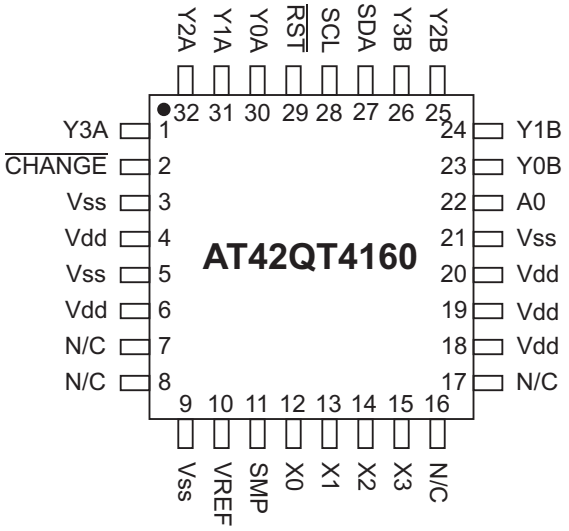
Features

- QField™ Touchscreen:
  - Up to 4.8 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:
  - I^2C-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

AT42QT4160

Summary

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

9507AS–AT42–10/08

1.2 Pin Listing Description

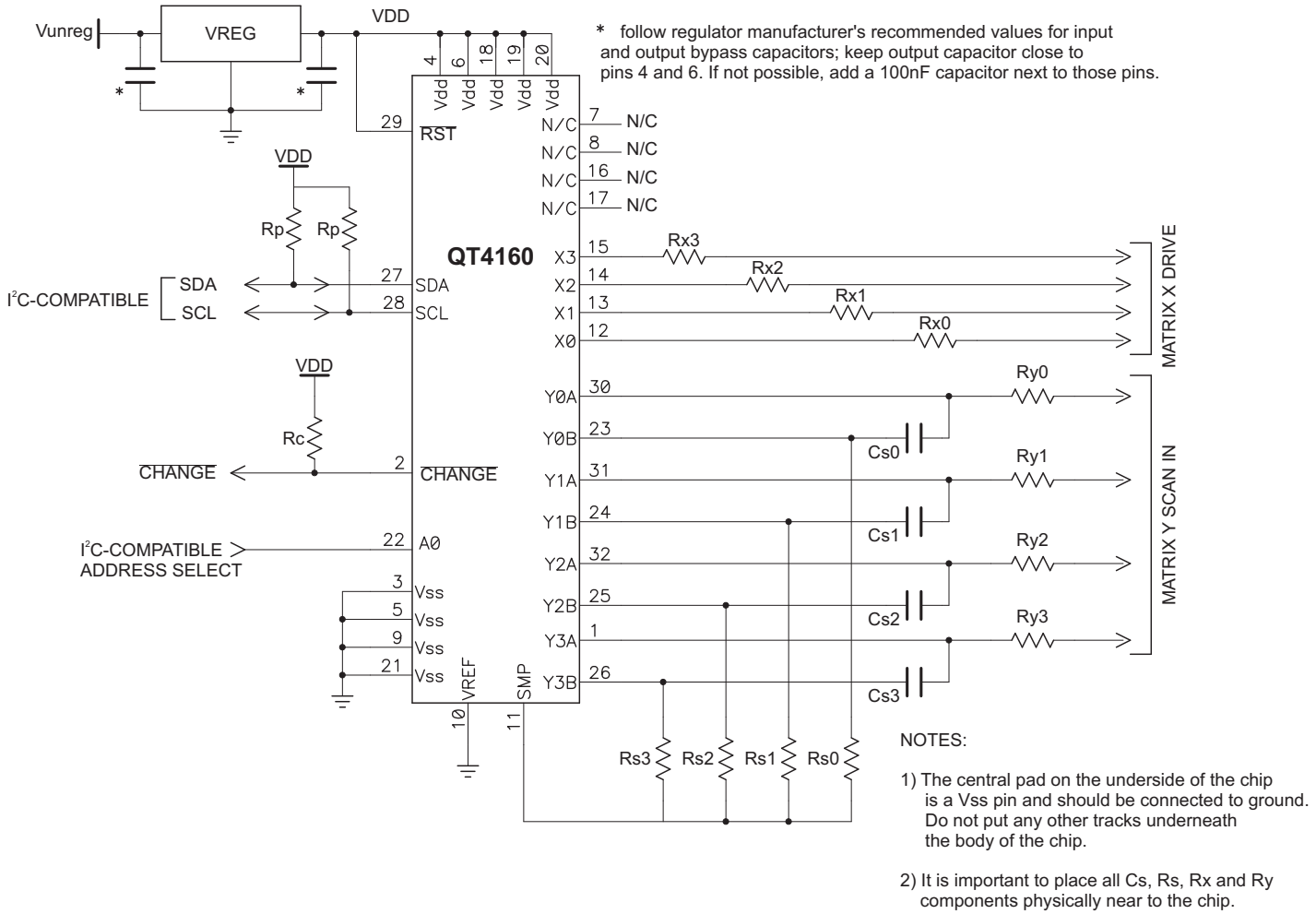
Table 1-1. Pin Listing

Pin	Name	Type	Comments	If Unused, connect To...
1	Y3A	O	Y line connection	Leave open
2	$\overline{\text{CHANGE}}$	OD	State change notification	Leave open
3	Vss	P	Supply ground	–
4	Vdd	P	Power	–
5	Vss	P	Supply ground	–
6	Vdd	P	Power	–
7	N/C	O	Not connected	Leave open
8	N/C	O	Not connected	Leave open
9	Vss	P	Supply ground	–
10	VREF	I	Supply ground	–
11	SMP	O	Sample output	–
12	X0	O	X matrix drive line	Leave open
13	X1	O	X matrix drive line	Leave open
14	X2	O	X matrix drive line	Leave open
15	X3	O	X matrix drive line	Leave open
16	N/C	O	Not connected	Leave open
17	N/C	O	Not connected	Leave open
18	Vdd	P	Power	–
19	Vdd	P	Power	–
20	Vdd	P	Power	–
21	Vss	P	Supply ground	–
22	A0	I	I^2C-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	Y3B	I/O	Y line connection	Leave open
27	SDA	OD	Serial Interface Data	–
28	SCL	OD	Serial Interface Clock	–
29	$\overline{\text{RST}}$	I	Reset low; has internal 30k - 60k pull-up	Leave open or Vdd
30	Y0A	O	Y line connection	Leave open
31	Y1A	O	Y line connection	Leave open
32	Y2A	O	Y line connection	Leave open

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

1.3 Wiring Diagram

Figure 1-1. Wiring Diagram



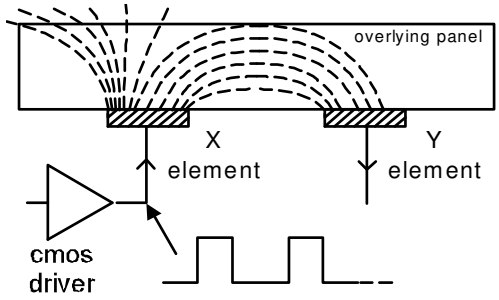
Suggested regulator manufacturers:

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

2. Overview

The AT42QT4160 (QT4160) QField IC is a self-contained capacitive touchscreen controller that employs Atmel's patented transverse charge-transfer (QT™) 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 I^2C-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

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

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

Product Contact

Web Site
www.atmel.com

Technical Support
touch@atmel.com

Sales Contact
www.atmel.com/contacts

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www.atmel.com/literature

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