Features

- Configurations:
  - Can be configured as a combination of touchscreen, sliders/wheels and keys, with Adjacent Key Suppression™ (AKS™) technology between groups
- QField™ Touchscreen:
  - Two-touch capable with independent XY tracking for one or two concurrent touches in real time, with touch size reporting
  - Up to eight-inch diagonal screen size supported
  - 1024 x 1024 resolution
- Discrete Keys:
  - Up to 48 (subject to other configurations)
- QSlide™/QWheel™:
  - Configurable up to six independent sliders/wheels
- Linearity:
  - Screen design dependent but typically better than ±1 percent
- Filtering:
  - Advanced digital filtering (user configurable)
- Response Times:
  - Sub 15 ms possible, depending on filter settings
- General Purpose Outputs (GPOs):
  - Up to four user controllable outputs
- Technology:
  - Patented charge-transfer (transverse mode)
- Panel Thickness:
  - Glass up to 5 mm, screen size dependent
  - Plastic up to 3 mm, screen size dependent
- Channel Sensitivity:
  - Individually settable via simple commands over serial interface
- Interface:
  - I^2C-compatible slave mode, 100 kHz or 400 kHz with 2.7V or greater Vdd
- Power:
  - 1.8V to 5.5V (2.7V to 5.5V in high speed mode)
- Packages:
  - 44-pin 7 x 7 mm MLF RoHS compliant
  - 44-pin 10 x 10 mm TQFP RoHS compliant
  - 49-ball 5 x 5 mm BGA RoHS compliant
- Signal Processing:
  - Self-calibration, auto drift compensation, noise filtering, Adjacent Key Suppression technology

QTwo™ 10-bit Touchscreen Controller

AT42QT5480

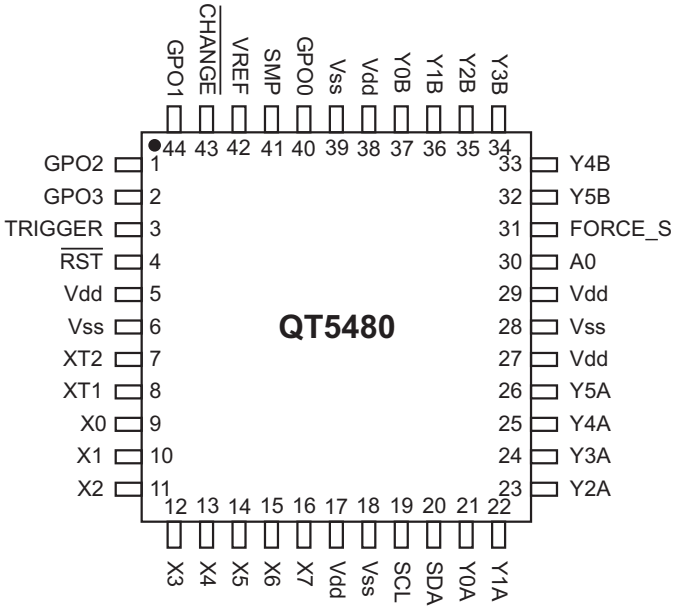
Summary

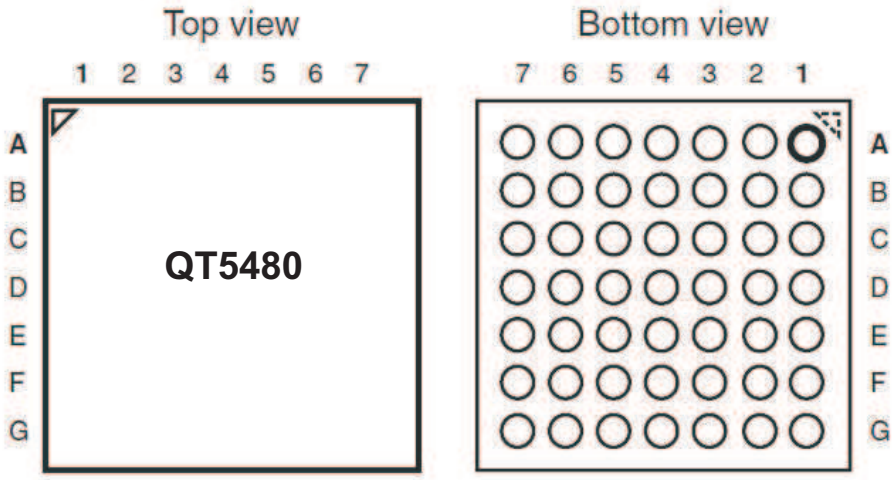
Note: This is a summary document. A complete document is available under NDA. For more information contact www.atmel.com/touchscreen.

9510AS–AT42–10/08

1. Pinout and Schematic

1.1 Pinout Configurations





1.2 Pin Descriptions

Table 1-2. Pin Listing

Pin	Ball	Name	Type	Comments	If Unused, Connect To...
1	B2	GPO2	O	General purpose output 2	Leave open
2	B1	GPO3	O	General purpose output 3	Leave open
3	C3	TRIGGER	I	Trigger input (active low)	Vss
4	C2	$\overline{\text{RST}}$	I	Reset low; has internal 30k - 60k pull-up	Leave open or Vdd
5	A5	Vdd	P	Power	–
6	A1	Vss	P	Supply ground	–
7	D2	XT2	X	Clock resonator	–
8	E1	XT1	X	Clock resonator	–
9	D3	X0	O	X matrix drive line	Leave open
10	E2	X1	O	X matrix drive line	Leave open
11	F1	X2	O	X matrix drive line	Leave open
12	F2	X3	O	X matrix drive line	Leave open
13	G2	X4	O	X matrix drive line	Leave open
14	E3	X5	O	X matrix drive line	Leave open
15	F3	X6	O	X matrix drive line	Leave open
16	E4	X7	O	X matrix drive line	Leave open
17	C1	Vdd	P	Power	–
18	A4	Vss	P	Supply ground	–
19	F4	SCL	OD	Serial Interface Clock	–
20	G5	SDA	OD	Serial Interface Data	–
21	F5	Y0A	I	Y line connection	Leave open
22	G6	Y1A	I	Y line connection	Leave open
23	F6	Y2A	I	Y line connection	Leave open
24	E5	Y3A	I	Y line connection	Leave open
25	F7	Y4A	I	Y line connection	Leave open
26	E6	Y5A	I	Y line connection	Leave open
27	E7	Vdd	P	Power	–
28	A7	Vss	P	Supply ground	–
29	C7	Vdd	P	Power	–
30	D6	A0	I	I2C-compatible address select	–
31	C6	FORCE_S	I	Force sensor input	Vdd or Vss
32	B7	Y5B	I	Y line connection	Leave open
33	D5	Y4B	I	Y line connection	Leave open
34	B6	Y3B	I	Y line connection	Leave open
35	A6	Y2B	I	Y line connection	Leave open

Table 1-2. Pin Listing (Continued)

Pin	Ball	Name	Type	Comments	If Unused, Connect To...
36	C5	Y1B	I	Y line connection	Leave open
37	B5	Y0B	I	Y line connection	Leave open
38	G3	Vdd	P	Power	–
39	D1	Vss	P	Supply ground	–
40	B4	GPO0	O	General purpose output 0	Leave open
41	C4	SMP	O	Sample output.	–
42	A3	Vref	I	Reference input	–
43	B3	$\overline{\text{CHANGE}}$	OD	State change notification	–
44	A2	GPO1	O	General purpose output 1	Leave open
–	D4	Vss	P	Supply ground	–
–	D7	Vss	P	Supply ground	–
–	G1	Vss	P	Supply ground	–
–	G4	Vss	P	Supply ground	–
–	G7	Vss	P	Supply ground	–

1.3 Schematic

Figure 1-1. Typical Circuit

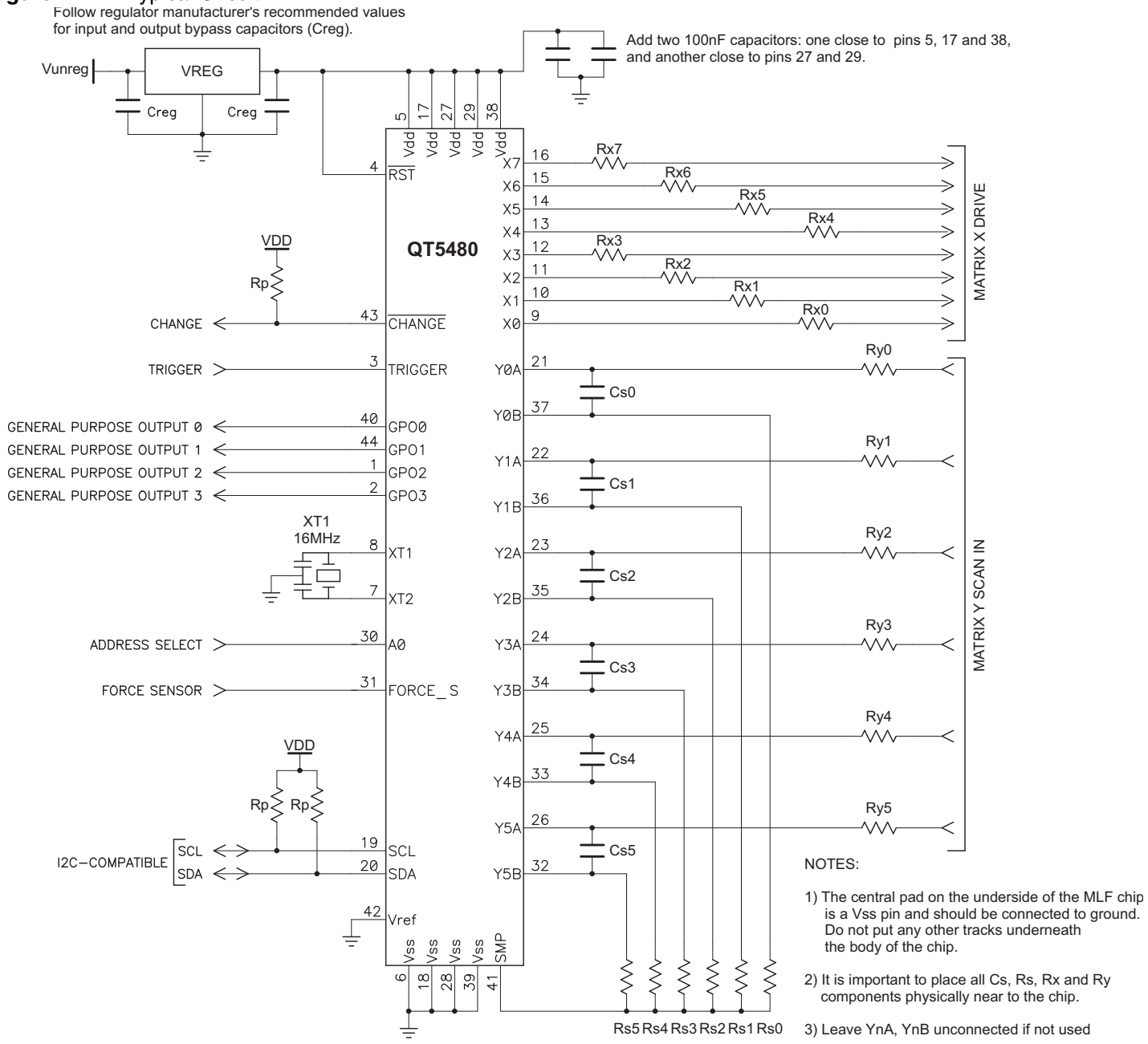
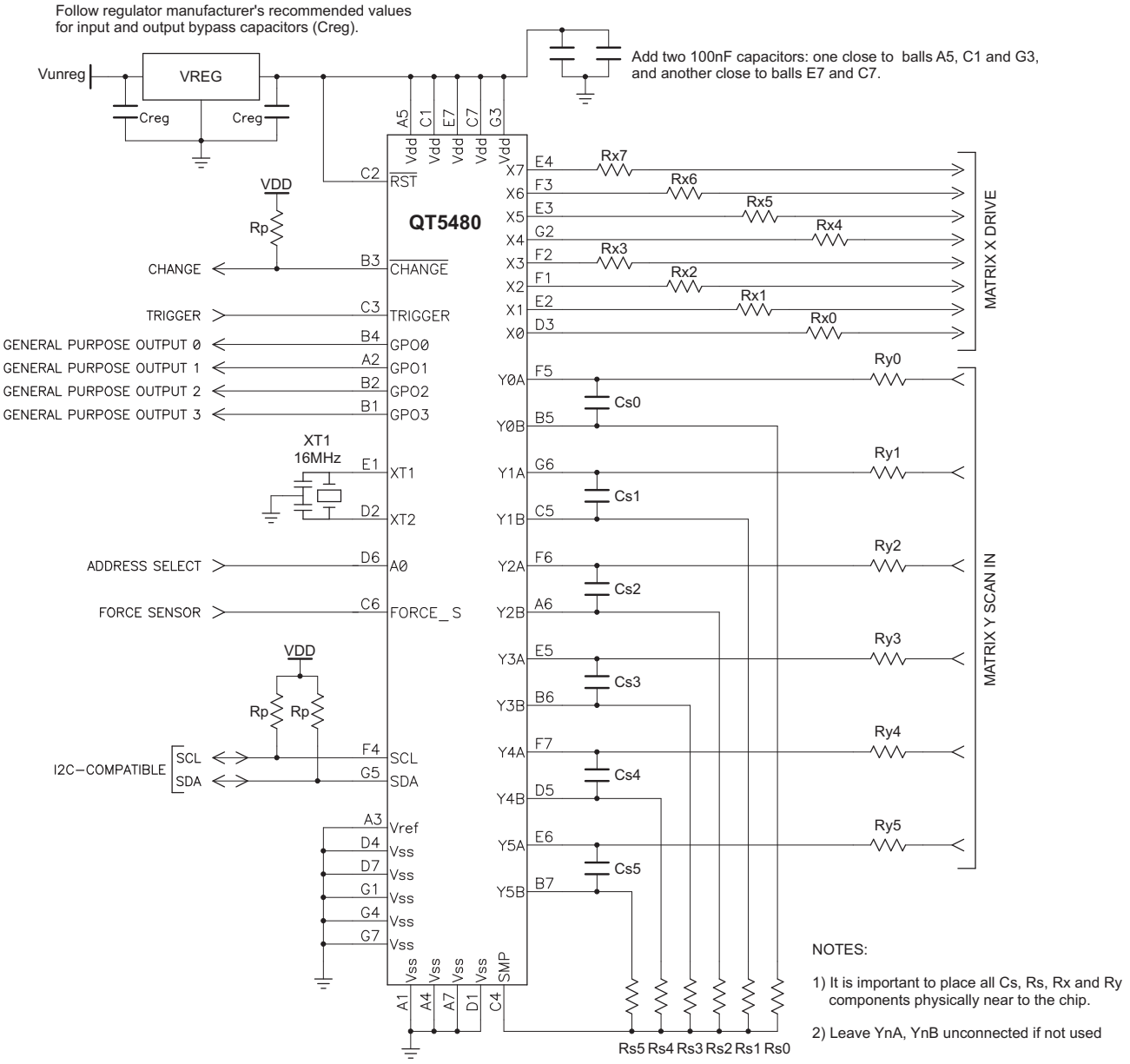


Figure 1-2. Typical Circuit – BGA



Suggested regulator manufacturers:

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

2. Overview of the QT5480

2.1 Introduction

The QT5480 is a versatile capacitive touchscreen controller, able to support a diagonal touchscreen of up to 8 inches. The IC supports Two Touch™ operation, part of the QTwo™ family of devices from Atmel®.

The QT5480 uses Atmel's patented QMatrix™ capacitive sensing technique, which offers excellent moisture tolerance, fast acquisition and outstanding ground load immunity.

A unique feature of the QT5480 is that it allows a choice to be made as to how many of the capacitive measurement channels form part of a touchscreen, and which ones form discrete keys or sliders.

This controller offers unrivalled flexibility to create touchscreens, sliders and keys. The device can report two touches on a touchscreen making it suitable for next generation touch interfaces. Concurrent use of a touchscreen plus keys or sliders is also possible.

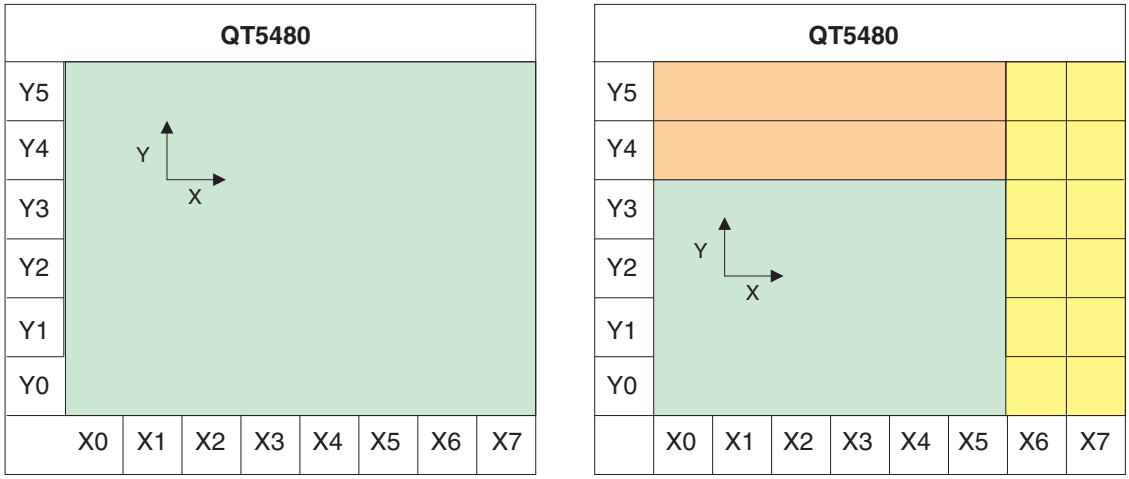
By treating all capacitive channels equally during measurement, and then applying additional signal processing, the device allows the channels to be used as part of a touchscreen, or part of one or more sliders, or as discrete touch keys.

Touchscreens can be created that are of arbitrary channel length and width. Channels not used in the touchscreen can either be turned into sliders or keys. There are some constraints on the starting channels for touchscreens and sliders, but these have no practical impact for most applications.

The controller also has the ability to save a Y line when configuring a touchscreen, reusing it in the touchscreen pattern at the two edges. This saved Y line can then be used to create extra objects like a slider or multiple keys, while allowing the touchscreen to be sized as though it was “one Y line larger”. In this “wrapped Y line” mode Two Touch processing cannot be used.

See Figure 2-1 for configuration examples.

Figure 2-1. Example Touchscreen Configurations



Object Color Code	
	= disabled
	= key
	= slider
	= touchscreen

3. Revision History

Revision No.	History
Revision AS – October 2008	•Initial release for chip revision 5.0

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

Literature Requests
www.atmel.com/literature

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