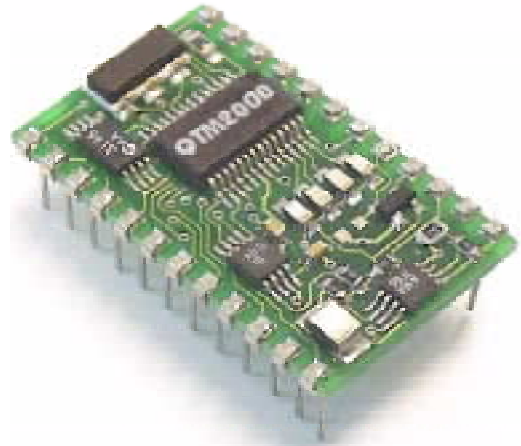


# QProx™ QTM2000 Module

- Auto calibration on demand with BG, OBJ modes
- Multistage internal digital filtering
- 200µs response time
- 200ns to 1.4µs selectable drive pulse width
- Usable with external pulse network for shorter transfer times
- 4-stage charge cancellation for large load capacity
- Psuedorandom burst modes
- Programmable sensitivity, hysteresis, response time, digital filtering, detection mode, drift compensation
- Extensive post-detection processing
- Shorted electrode detection
- Processed analog output
- 5 volt single supply operation
- Use E297S board to program in Setups to eeprom



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## APPLICATIONS

- ◆ Fluid level sensing
- ◆ Security sensing
- ◆ Moisture detection
- ◆ Switch replacement
- ◆ Distance gauging
- ◆ Material properties analysis
- ◆ Human presence detection
- ◆ Collision avoidance
- ◆ Transducer drivers

## DESCRIPTION

The QTM2000 is a module which employs the QT9701B2 IC and its essential operating circuitry in a single 24 pin 0.6" DIP package. The E297S programming board when used with this module makes it equivalent in functionality to an E97S eval board. The QTM2000 can be embedded onto a circuit board to provide a very high level of circuit density.

The QTM2000 contains the eeprom necessary to make the device take on Setup parameters as described in the QT9701B2 datasheet. The E297S board is used to both program the module and to test it with its desired Setup parameters; the E297S board has a ZIF socket to facilitate this. After the module has been setup using the E297S programming board and a PC using QTWinView software, it can be assembled into the user's own PCB.

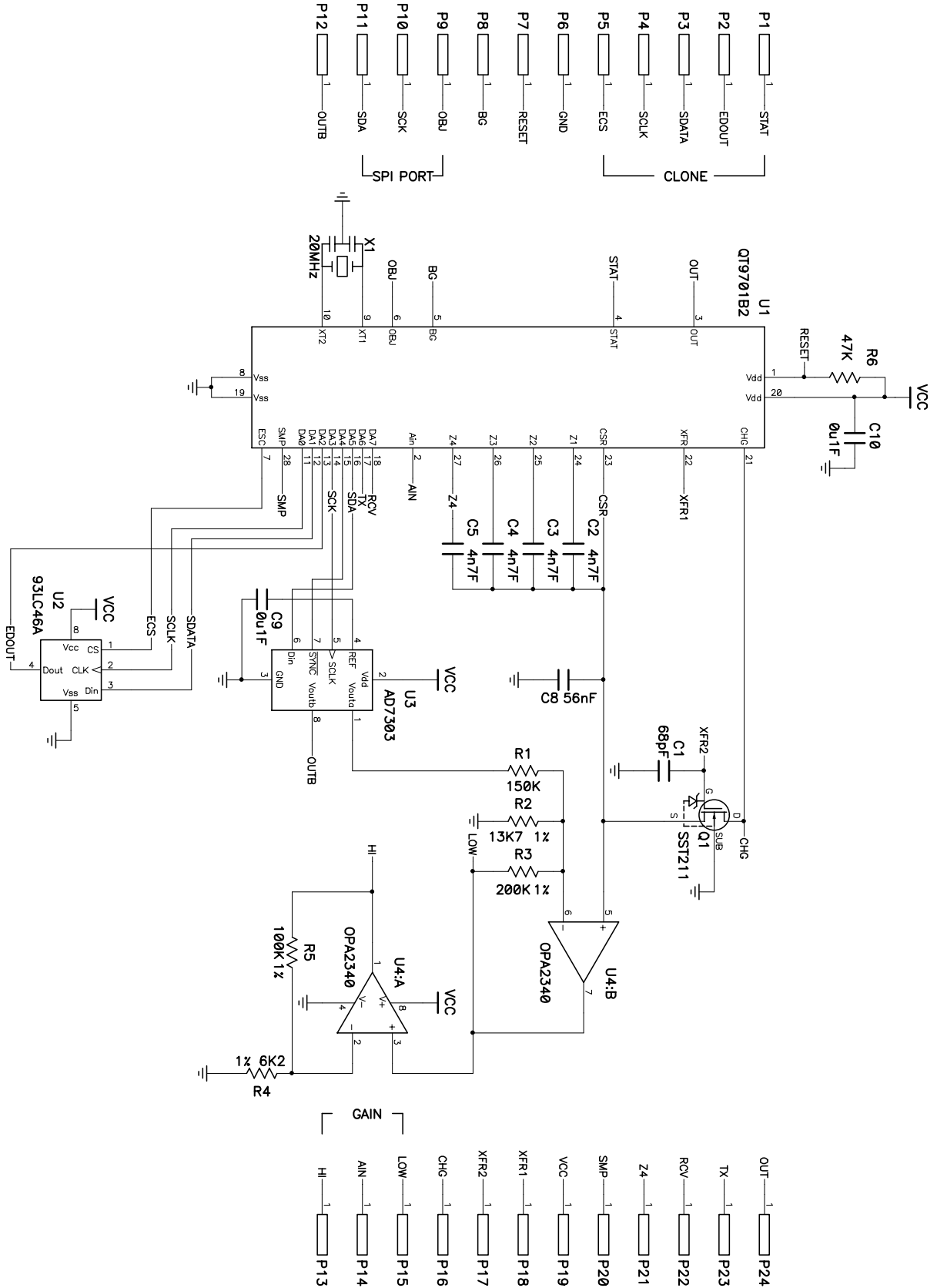
Provision is made for an external pulse-forming network to control the transfer switch to shorter transfer times; this feature is particularly useful for suppressing the effects of wicking and films on fluid level probes.

The module can be used for proximity detection, fluid level sensing, and industrial controls where it is desirable to embed a complete sensing circuit onto a board.

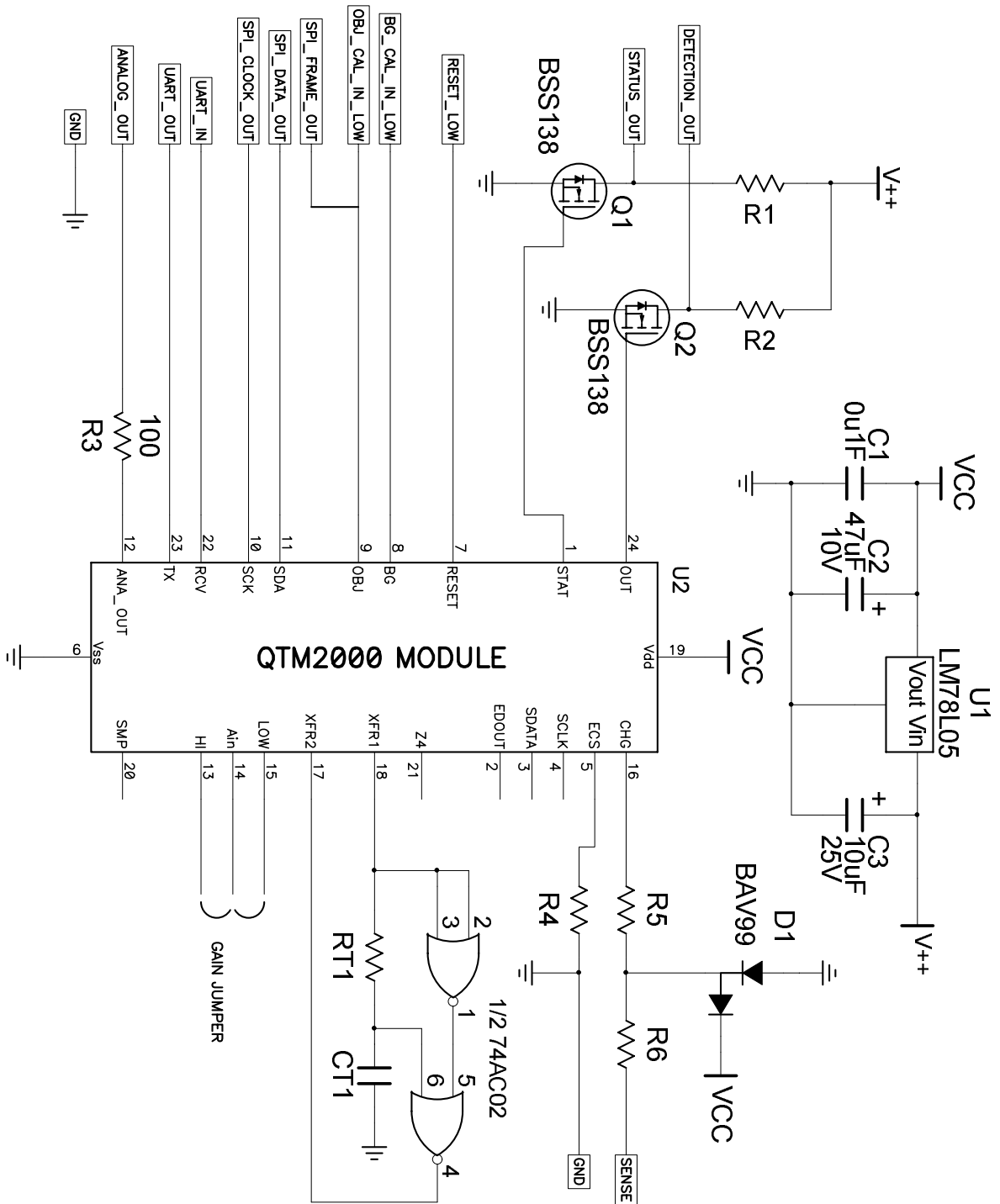
For further information on this product please refer to the QT9701B2 datasheet.

# 1 MODULE SCHEMATIC

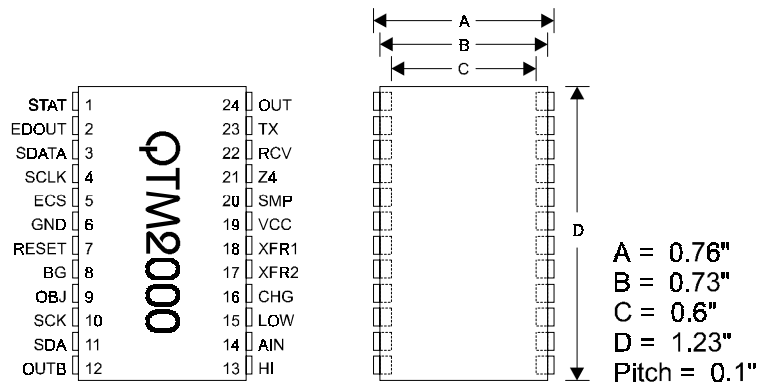
Please refer to QT9701B2 datasheet for operational details.



## 2 SUGGESTED WIRING



### 3 MECHANICAL OUTLINE



### 4 PIN DESCRIPTIONS

Pin	Name	Description
1	STAT	Status output line
2	EDOUT	Serial data input line from/to onboard serial eeprom
3	SDATA	Serial data output line from/to onboard serial eeprom
4	SCLK	Clock output from/to onboard serial eeprom
5	ECS	Enable line from/to onboard eeprom
6	GND	Negative supply
7	RESET	Reset line. Pull this line to Gnd for 100uS to reset module
8	BG	Background calibration input line, active low.
9	OBJ	Object calibration input line, active low. Also outputs a negative framing pulse for an external SPI device to receive data from the module
10	SCK	Serial SPI clock used to clock out data from the module to possible external SPI device
11	SDA	SPI data output line to possible external SPI device
12	OUTB	Analog output of onboard AD7303 DAC B
13	HI	Hi-gain output tap of opamp circuit; either HI or LOW should be jumpered to AIN
14	AIN	Analog input from opamp
15	LOW	Low-gain output tap of opamp circuit; either HI or LOW should be jumpered to AIN
16	CHG	Sensor electrode drive
17	XFR1	Control output to drive SST211 transfer FET; normally jumpered to XFR2
18	XFR2	Drive input to SST211 transfer switch
19	VCC	Power pin to +5 volts, regulated DC @ 25mA max
20	SMP	Sampler control line to sample the raw signal externally
21	Z4	Charge cancellation control line to drive Cz4
22	RCV	Receive UART data to the device
23	TX	Transmit UART data from the device
24	OUT	Detection line output; Active high or active low depending on setup [J].

## 5 ABSOLUTE MAXIMUM SPECIFICATIONS

Operating temp	.....	as designated by suffix
Storage temp	.....	-55°C to +125°C
V <sub>DD</sub>	.....	-0.5 to +6.5 V
Max continuous pin current, any control or drive pin	.....	±25mA
Short circuit duration to ground, CHG line	.....	infinite
Short circuit duration to V <sub>DD</sub> , CHG line	.....	infinite
Short circuit duration to ground, any other pin	.....	5 secs
Voltage forced onto any control or drive pin	.....	-0.3V to (V <sub>DD</sub> + 0.3) Volts

## 6 RECOMMENDED OPERATING CONDITIONS

V <sub>DD</sub>	.....	5.0 ±0.2V
Supply ripple+noise	.....	5mV p-p
Load capacitance	.....	0 to 1,000pF

**QUANTUM Research Group Ltd.**

Patents and patents applied for

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*Notice: This device is not for use in any medical or human safety related application without the express written consent of an officer of the company.*