

# **MTCH6303**

## **Multi-Touch Projected Capacitive Touch Controller Product Brief**

#### **Description**

MTCH6303 is an innovative turnkey projected capacitive touch controller that allows easy integration of multi-touch and gestures to create a rich user interface in your design.

The MTCH6303 provides advanced features including noise robustness, larger sensor size support up to 8", faster scanning speeds, and combines with the MTCH652 high-voltage driver to achieve a superior signal-to-noise ratio (SNR). The MTCH6303 reduces time to market by providing designers with a ready-made gesture recognition suite of multi-finger gestures including taps, slides and edge flicks for selecting, scrolling, pinching and zooming with ease. Advanced new decoding algorithms automatically enable intelligent touch prediction for a smooth user experience. These capabilities are critical in demanding environments such as industrial controls, home and office automation with security control panels, thermostat, printers and lighting controls, and various consumer applications including exercise equipment and audio systems.

#### **Features**

- Multi-touch up to ten touches
- Five touches at a minimum of 100 Hz+ each
- 27RX x 19TX channels support for up to approximately 8" touch screens
- Combines with MTCH652 high-voltage driver for advanced signal-to-noise ratio (SNR)
- Integrated single and multi-finger gesture recognition suite including taps, slides, edge and pinching and zooming
- Advanced DSP algorithms assess signal acquisition frequencies to avoid noise and achieve the cleanest measurements
- USB and I<sup>2</sup>C<sup>™</sup> communication
- Supports 3D gestures together with the MGC3130 GestIC<sup>®</sup> controller

#### **Applications**

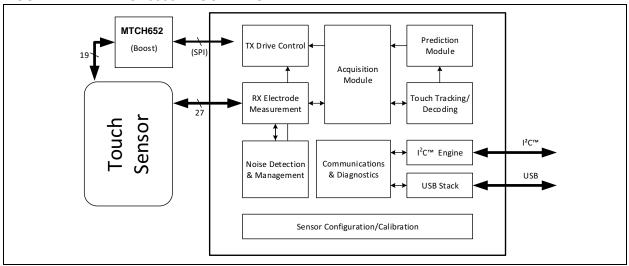
- Up to 8" touch screen designs that require costeffective, easy to integrate, fast time to market PCap touch solutions
- Perfect for touch screens over displays, control panels, keypads and many other input devices
- Targeting the industrial, medical, home and office automation, and consumer markets

TABLE 1: MTCH6303 SOLUTION PART NUMBERS

Device	Pin Count	Package Types	Touch Channels	Features
MTCH6303-I/PT	64	10 x10 mm TQFP	27 RX, 19 TX	Multi-touch, up to 8" sensors
MTCH6303-I/RG		9 x 9 mm QFN		
*MTCH652-I/SO	28	7.5 mm SOIC	Up to 19 TX	1.8-5.5V input, 6V-18V configurable output
*MTCH652-I/SS		5.3 mm SSOP		
*MTCH652-I/MV		4 x 4 mm UQFN		

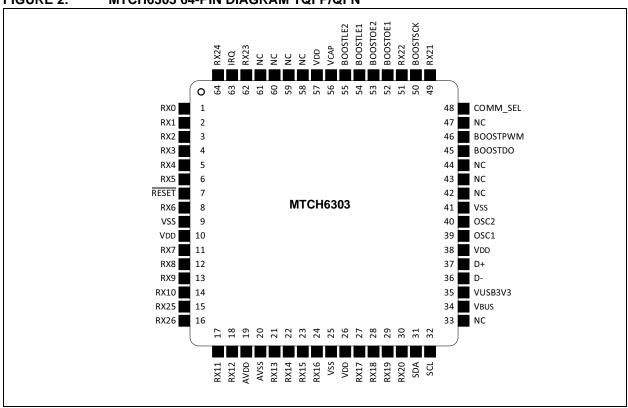
**Note:** \*One MTCH652 high-voltage driver (boost) is required with MTCH6303.

FIGURE 1: MTCH6303 BLOCK DIAGRAM



#### Pin Diagram

FIGURE 2: MTCH6303 64-PIN DIAGRAM TQFP/QFN



### **PIN ALLOCATION TABLE**

TABLE 2: MTCH6303 PIN ALLOCATION TABLE

	1	H6303 PIN ALLOCATION TABLE		
Name	Pin	Description		
RX0	1	- Rx 0-5		
RX1	2			
RX2	3			
RX3	4	1 KX 0-5		
RX4	5			
RX5	6			
RESET	7	Reset		
RX6	8	Rx 6		
Vss	9	Ground		
Vdd	10	Power Supply Input		
RX7	11			
RX8	12	Du 7 40 Du 05 00		
RX9	13			
RX10	14			
RX25	15	Rx 7-12, Rx 25-26		
RX26	16			
RX11	17			
RX12	18			
AVDD	19	Positive supply for analog modules. This pin must be connected at all times.		
AVss	20	Ground reference for analog modules		
RX13	21			
RX14	22	D:: 40.40		
RX15	23	Rx 13-16		
RX16	24			
Vss	25	Ground		
Vdd	26	Power Supply Input		
RX17	27			
RX18	28	D:: 47.00		
RX19	29	Rx 17-20		
RX20	30			
SDA	31	I <sup>2</sup> C™ Data		
SCL	32	I <sup>2</sup> C™ Clock		
NC	33	Not Connected		
VBUS	34	USB Bus Power Monitor		
VUSB3V3	35	USB internal transceiver supply. If the USB module is not used, this pin must be connected to VDD		
D-	36	USB D-		
D+	37	USB D+		
V <sub>D</sub> D	38	Power Supply Input		
OSC1	39	Oscillator Pin 1		
OSC2	40	Oscillator Pin 2		

# **MTCH6303**

#### TABLE 2: MTCH6303 PIN ALLOCATION TABLE (CONTINUED)

IADLE Z.	IVIIC	HOSUS FIN ALLOCATION TABLE (CONTINUED)		
Name	Pin	Description		
Vss	41	Ground		
NC	42			
NC	43	Not Connected		
NC	44			
BOOSTDO	45	MTCH652 DO output/DIN Input		
BOOSTPWM	46	MTCH652 PWM Out/OSCIN input		
NC	47	Not connected		
COMM_SEL	48	_		
RX21	49	Rx 21		
BOOSTSCK	50	MTCH652 CLK Output		
RX22	51	Rx 22		
BOOSTOE1	52	MTCH652 OE Output 1		
BOOSTOE2	53	MTCH652 OE Output 2		
BOOSTLE1	54	MTCH652 LE Output 1		
BOOSTLE2	55	MTCH652 LE Output 2		
VCAP	56	Capacitor for Internal Voltage Regulator		
VDD	57	Power Supply Input		
NC	58			
NC	59	Not connected		
NC	60	Not connected		
NC	61			
RX23	62	Rx 23		
IRQ	63	I <sup>2</sup> C™ Interrupt		
RX24	64	Rx 24		

#### PIN DESCRIPTIONS

#### **RESET**

 Pulling the RESET pin low generates a device Reset.

#### **AV**DD

 Positive supply for analog modules. This pin must be connected at all times.

#### **AVss**

 Ground reference for analog modules. This pin must be connected at all times.

#### SDA/SCL/IRQ

- I<sup>2</sup>C™ Data
- I<sup>2</sup>C Clock
- I<sup>2</sup>C Interrupt

#### D+/D-

• USB D+ and D-

#### **COMM SEL**

- · Communication selection pin
- VDD: I<sup>2</sup>C
- · GND: USB

#### VUSB3V3

• USB internal transceiver supply
If the USB module is not used, this pin must be connected to VDD

#### OSC1/OSC2

· Clock signal input

#### **VCAP**

 A low-ESR capacitor is required on the VCAP pin, which is used to stabilize the internal voltage regulator output. The VCAP pin must not be connected to VDD and must have a CEFC capacitor, with at least a 6V rating, connected to ground.

#### RX0-RX26

 RX sensor lines must correspond to the longer axis of the touch sensor. TX sensor lines are connected to the required MTCH652. Refer to Typical Application Circuit for more details.

#### **BOOSTDO**

 MTCH6303 DO serial data output, connect to MTCH652 DIN Input.

#### **BOOSTPWM**

· MTCH652 OSCIN input signal for boost

#### **BOOSTOE1/BOOSTOE2**

• MTCH652 OE Outputs

When OE is set to logic '0', all MTCH652 output latches (OUTxx) are GND. When OE is set to logic '1', all output latches that are set to drive '1' will output the boost voltage level. The MTCH6303 supports up to two MTCH652 devices for larger size screen support.

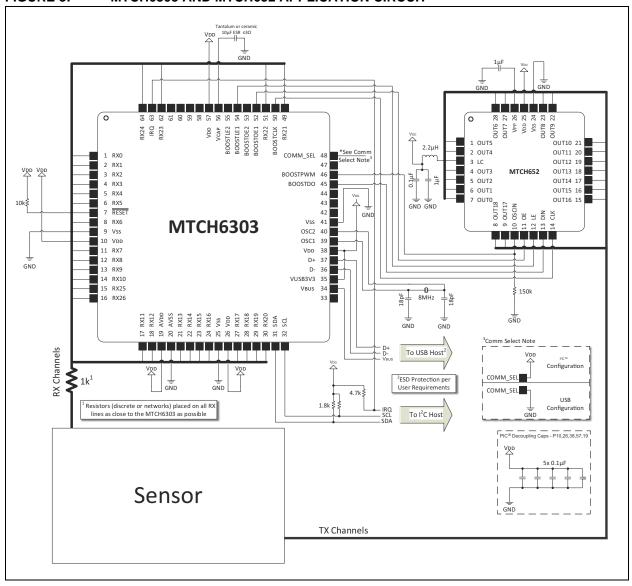
#### **BOOSTLE1/BOOSTLE2**

• MTCH652 LE Outputs

Latch Enable Input (LE) is the active-low latch input used for latching-in serial data. Serial data is ignored unless LE is logic '0'. After clocking serial data, the data is internally latched when LE changes from logic '0' to logic '1'. The MTCH6303 supports up to two MTCH652 devices for larger size screen support.

#### TYPICAL APPLICATION CIRCUIT

FIGURE 3: MTCH6303 AND MTCH652 APPLICATION CIRCUIT



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