

## 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™ communication
- Supports 3D gestures together with the [MGC3130 GestIC® controller](#)

### Applications

- Up to 8" touch screen designs that require cost-effective, 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

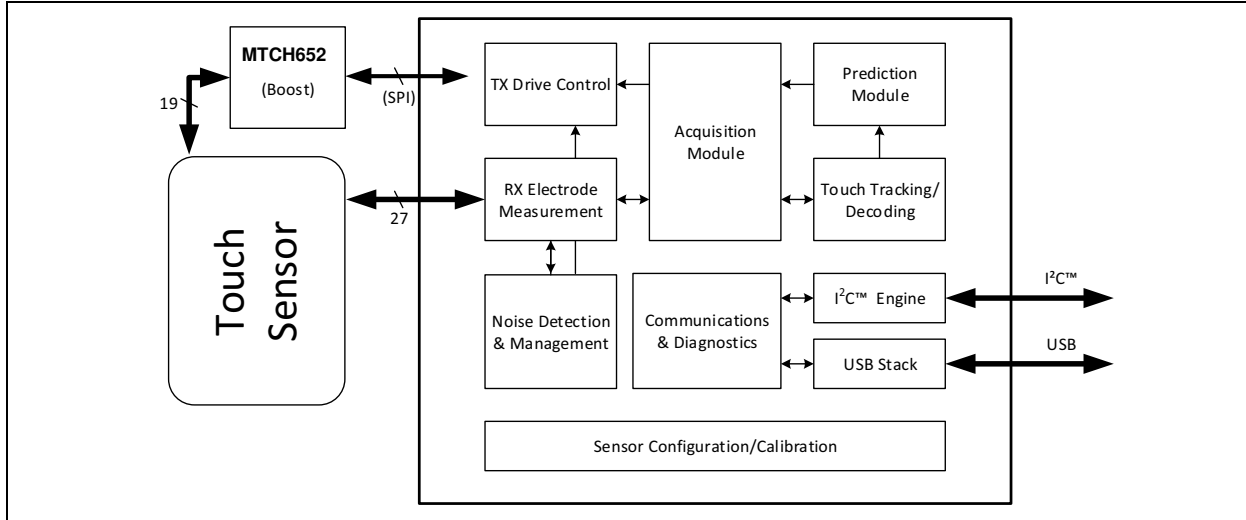
**TABLE 1: MTCH6303 SOLUTION PART NUMBERS**

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.

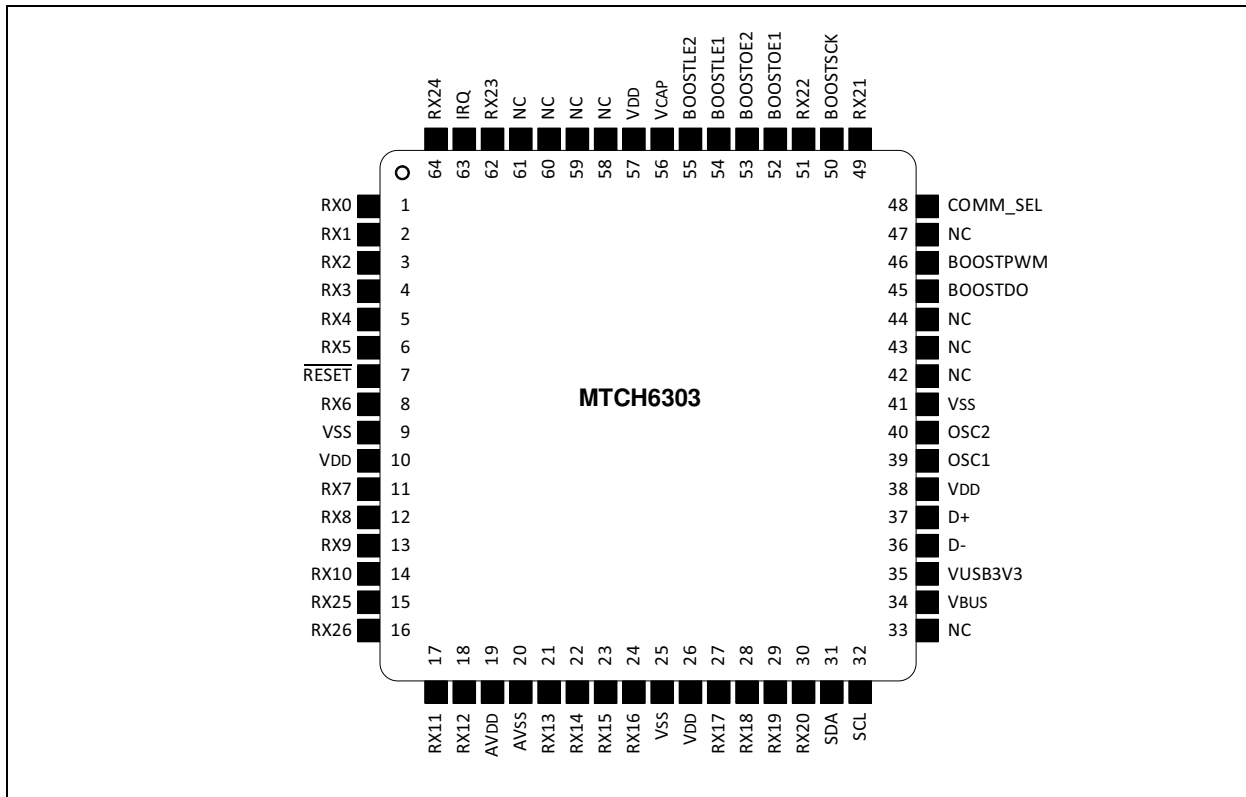
# MTCH6303

**FIGURE 1: MTCH6303 BLOCK DIAGRAM**



## Pin Diagram

**FIGURE 2: MTCH6303 64-PIN DIAGRAM TQFP/QFN**



## PIN ALLOCATION TABLE

TABLE 2: MTCH6303 PIN ALLOCATION TABLE

Name	Pin	Description
RX0	1	Rx 0-5
RX1	2	
RX2	3	
RX3	4	
RX4	5	
RX5	6	
RESET	7	Reset
RX6	8	Rx 6
V <sub>SS</sub>	9	Ground
V <sub>DD</sub>	10	Power Supply Input
RX7	11	Rx 7-12, Rx 25-26
RX8	12	
RX9	13	
RX10	14	
RX25	15	
RX26	16	
RX11	17	
RX12	18	
AV <sub>DD</sub>	19	Positive supply for analog modules. This pin must be connected at all times.
AV <sub>SS</sub>	20	Ground reference for analog modules
RX13	21	Rx 13-16
RX14	22	
RX15	23	
RX16	24	
V <sub>SS</sub>	25	Ground
V <sub>DD</sub>	26	Power Supply Input
RX17	27	Rx 17-20
RX18	28	
RX19	29	
RX20	30	
SDA	31	I <sup>2</sup> C™ Data
SCL	32	I <sup>2</sup> C™ Clock
NC	33	Not Connected
V <sub>BUS</sub>	34	USB Bus Power Monitor
V <sub>USB3V3</sub>	35	USB internal transceiver supply. If the USB module is not used, this pin must be connected to V <sub>DD</sub>
D-	36	USB D-
D+	37	USB D+
V <sub>DD</sub>	38	Power Supply Input
OSC1	39	Oscillator Pin 1
OSC2	40	Oscillator Pin 2

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

Name	Pin	Description
Vss	41	Ground
NC	42	Not Connected
NC	43	
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
V <sub>CAP</sub>	56	Capacitor for Internal Voltage Regulator
V <sub>DD</sub>	57	Power Supply Input
NC	58	Not connected
NC	59	
NC	60	
NC	61	
RX23	62	Rx 23
IRQ	63	I <sup>2</sup> C™ Interrupt
RX24	64	Rx 24

## PIN DESCRIPTIONS

### RESET

- Pulling the  $\overline{\text{RESET}}$  pin low generates a device Reset.

### AVDD

- 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
- V<sub>DD</sub>: 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 V<sub>DD</sub>

### OSC1/OSC2

- Clock signal input

### VCAP

- A low-ESR capacitor is required on the V<sub>CAP</sub> pin, which is used to stabilize the internal voltage regulator output. The V<sub>CAP</sub> pin must not be connected to V<sub>DD</sub> 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 (OUT<sub>xx</sub>) 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.

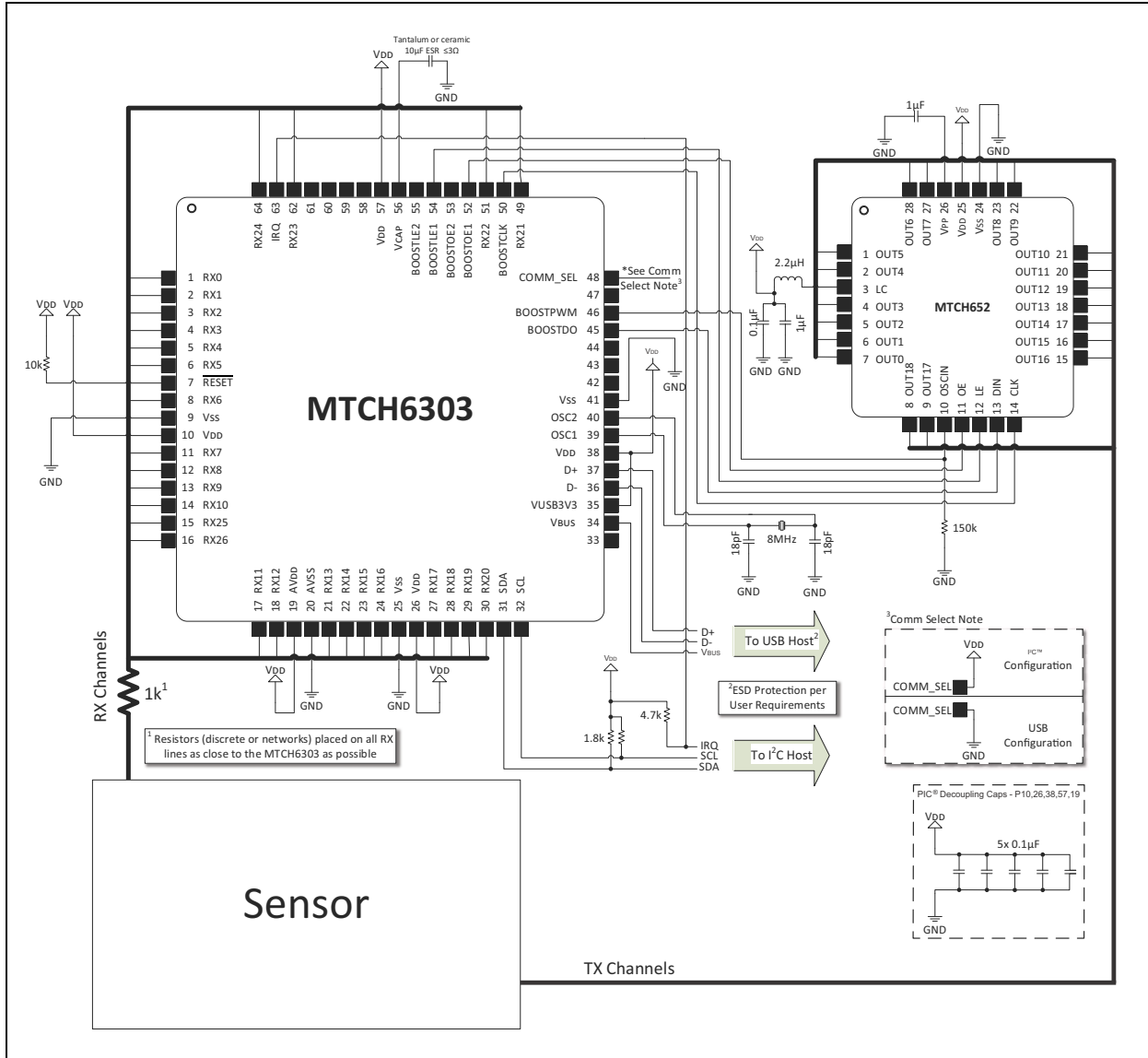
### BOOSTLE1/ BOOSTLE2

- 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.

# MTCH6303

## TYPICAL APPLICATION CIRCUIT

FIGURE 3: MTCH6303 AND MTCH652 APPLICATION CIRCUIT



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