



TT21XXX/TT31XXX TrueTouch[®] Multi-touch All-points Touchscreen Controllers

Features

- Multi-touch capacitive touchscreen controller
 - 32-bit ARM[®] Cortex[®] CPU
 - Register configurable
 - Noise-suppression technologies for battery charger and display
 - Effective 14V TX drive for higher signal-to-noise ratio (SNR)
 - ChargerArmor[™] for charger noise immunity
 - External display synchronization
 - Water rejection and wet-finger tracking using DualSense[™]
 - 2.5mm passive stylus with automatic mode switching and palm rejection
 - Multi-touch glove with automatic mode switching
 - 10 fingers with thin glove (≤1mm thick)
 - 2 fingers with thick glove (≤5mm thick)
 - Fingernail tracking
 - Face detection up to 20mm
 - Large-object rejection
 - Automatic baseline tracking to environmental changes
 - Low-power look-for-touch mode
 - Field upgrades via bootloader
 - Android[™] and Windows[®] 8 driver support
 - Parade Technologies[™] TrueTouch[®] Manufacturing Test Kit (MTK)
 - Touchscreen sensor self-test and Panel ID reporting
 - System performance (configuration dependent)
 - Screen sizes up to 7.0-in. diagonal
 - 5.0mm electrode pitch; 16:9 aspect ratio
 - Screen sizes up to 5.5-in. diagonal
 - 4.0mm electrode pitch; 16:9 aspect ratio
 - Up to 48 sense I/O
 - 527 intersections (31 × 17)
 - Reports up to 10 fingers
 - Small finger support down to 4mm
 - Large finger support up to 30mm
 - Refresh rate up to 300Hz; other rates configurable
 - TX frequency up to 500kHz
 - Best-in-class charger noise immunity
 - Immunity up to 35V peak-to-peak (V_{PP})
 - Immunity to AT&T[®] Zero charger
- Power (configuration dependent)
 - 1.71 to 1.95V or 2.0 to 5.5V digital and I/O supply
 - 2.65 to 4.7V analog supply
 - 9mW average power
 - 10.7μW typical deep-sleep power
- Sensor and system design (configuration dependent)
 - Supports a variety of touchscreen sensors and stackups
 - Manhattan, Diamond, Single-Layer Independent Multi-touch (SLIM[®]), and Totem-pole patterns
 - Sensor-on-Lens (SOL)
 - On-cell touch-integrated display modules
 - Plastic (PET) and glass-sensor substrates
 - LCD, AMOLED, and IPS displays
 - Metal mesh
 - Single-layer flexible printed circuit (FPC) routing enabled by flexible TX/RX configurations
- Communication interface
 - I²C slave at 100 and 400kbps
 - SPI slave bit rates up to 8Mbps
- Package
 - 56-pin 6 × 6 × 0.6mm QFN (0.35mm lead pitch)

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Ordering Information

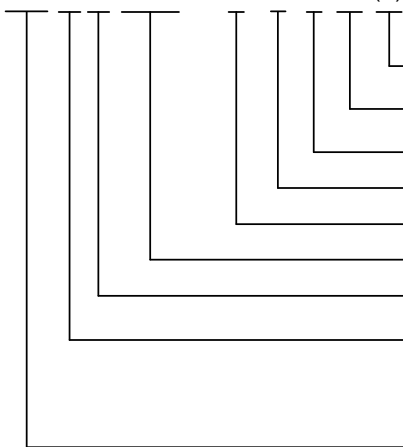
The following table lists the TT21XXX/TT31XXX 40, 44, and 48 I/O TrueTouch Multi-touch all-points touchscreen controllers ordering information. For information on other TrueTouch families, visit <http://www.paradetech.com/products/products-overview/>.

Device Ordering Information^[1]

Part Number	Top Marking	Features							Package
		# of Sense I/O	Max # of Finger Touches	Charger Armor	Glove	Easy Wake ^[2]	Face Detection	Passive Stylus	
TT21100-56LQI48(T)	TT21000-56LQ	48	10	✓					56-Pin QFN
TT21401-56LQI48(T)	TT21000-56LQ	48	10	✓	✓				56-Pin QFN
TT21402-56LQI48(T)	TT21000-56LQ	48	10	✓	✓	✓			56-Pin QFN
TT21403-56LQI48(T)	TT21000-56LQ	48	10	✓	✓	✓	✓		56-Pin QFN
TT21100-56LQI44(T)	TT21001-56LQ	44	10	✓					56-Pin QFN
TT21401-56LQI44(T)	TT21001-56LQ	44	10	✓	✓				56-Pin QFN
TT21402-56LQI44(T)	TT21001-56LQ	44	10	✓	✓	✓			56-Pin QFN
TT21403-56LQI44(T)	TT21001-56LQ	44	10	✓	✓	✓	✓		56-Pin QFN
TT21100-56LQI40(T)	TT21001-56LQ	40	10	✓					56-Pin QFN
TT21401-56LQI40(T)	TT21001-56LQ	40	10	✓	✓				56-Pin QFN
TT21402-56LQI40(T)	TT21001-56LQ	40	10	✓	✓	✓			56-Pin QFN
TT21403-56LQI40(T)	TT21001-56LQ	40	10	✓	✓	✓	✓		56-Pin QFN
TT31702-56LQI48(T)	TT31000-56LQ	48	10	✓	✓	✓		✓	56-Pin QFN

Ordering Code Definitions

TT # 1 ### - 56 LQ I ## (T)



- T: Tape and Reel
- Number of Sense I/O (##): 40, 44, or 48
- Temperature Range: I = Industrial
- Package Type: LQ = QFN
- Number of Pins: 56
- Product Feature Set (###): See Device Ordering Information table
- Sensor Configuration: 1 = Discrete Sensors, SLIM, On-cell/AMOLED, On-cell
- Market Segment:
 - 2 = Low-end to midrange phones, printers, office, portable gaming, and low-end tablets
 - 3 = High-end phones, e-readers, DSC, DVC, DSLR, navigation
- Business Unit: TT = TrueTouch

Notes

1. All devices listed have the following base features: ChargerArmor, DualSense, CapSense buttons, Large-Object Detection and Rejection, and Grip Suppression.
2. Easy-wake is a gesture made while the LCD is completely powered off to provide a quick and easy method to wake up a device and open a specific application. These gestures include finger swiping and tracing alphanumeric symbols.