



## TT21XXX 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 24V 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™
  - 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 25mm with grip suppression
  - 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 5.0-in. diagonal
    - 4.8mm sensor pitch; 16:9 aspect ratio
  - Up to 36 sense I/O
    - 308 intersections (22 × 14)
  - 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<sub>PP</sub>)
  - 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
  - 4mW average power
  - 5.7μW 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)
    - 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
  - I<sup>2</sup>C slave at 100 and 400kbps
  - SPI slave bit rates up to 8Mbps<sup>[1]</sup>
- Package options
  - 44-pin 5 × 5 × 0.6mm QFN (0.35mm lead pitch)
  - 48-pin 6 × 6 × 0.6mm QFN (0.4mm lead pitch)

#### Note

1. SPI support is available only in the 48-pin QFN package.

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## Ordering Information

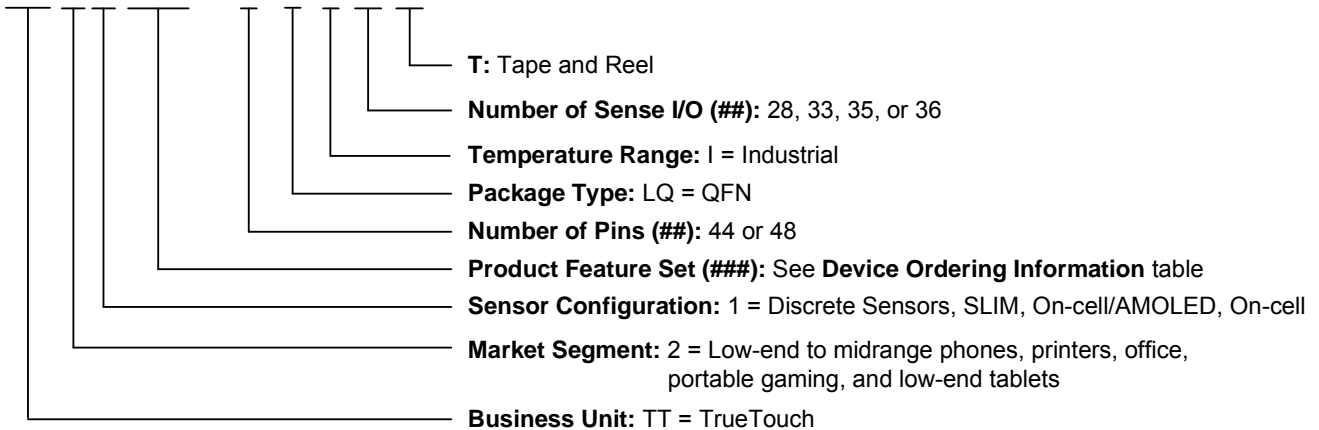
The following table lists the TT21XXX 28, 33, 35, and 36 I/O TrueTouch Multi-touch all-points touchscreen controllers ordering information. For information on other TrueTouch families, visit <http://www.paradetech.com/products/products-overview/>.

### Device Ordering Information<sup>[2]</sup>

Part Number	Top Marking	Features					Package
		# of Sense I/O	Advanced Wet-finger Tracking	Glove	Easy Wake <sup>[3]</sup>	Face Detection	
TT21100-44LQI28(T)	TT21000-44LQI	28					44-Pin QFN
TT21401-44LQI28(T)	TT21000-44LQI	28	✓	✓			44-Pin QFN
TT21402-44LQI28(T)	TT21000-44LQI	28	✓	✓	✓		44-Pin QFN
TT21100-44LQI33(T)	TT21000-44LQI	33					44-Pin QFN
TT21401-44LQI33(T)	TT21000-44LQI	33	✓	✓			44-Pin QFN
TT21402-44LQI33(T)	TT21000-44LQI	33	✓	✓	✓		44-Pin QFN
TT21100-44LQI35(T)	TT21000-44LQI	35					44-Pin QFN
TT21401-44LQI35(T)	TT21000-44LQI	35	✓	✓			44-Pin QFN
TT21402-44LQI35(T)	TT21000-44LQI	35	✓	✓	✓		44-Pin QFN
TT21403-44LQI35(T)	TT21000-44LQI	35	✓	✓	✓	✓	44-Pin QFN
TT21100-48LQI36(T)	TT21000-48LQI	36					48-Pin QFN
TT21401-48LQI36(T)	TT21000-48LQI	36	✓	✓			48-Pin QFN
TT21402-48LQI36(T)	TT21000-48LQI	36	✓	✓	✓		48-Pin QFN
TT21403-48LQI36(T)	TT21000-48LQI	36	✓	✓	✓	✓	48-Pin QFN

### Ordering Code Definitions

TT 2 1 ### - ## LQ I ## (T)



#### Notes

2. All devices listed have the following base features: Water Rejection, ChargerArmor, CapSense buttons, Large-Object Detection and Rejection, and Grip Suppression.
3. 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.