PSoC™ Automotive Multitouch Generation 7L

Datasheet Summary

Note that this is a Summary Datasheet. To access the full version of this datasheet, register in My Infineon Collaboration Platform (MyICP).

Features

- Automotive Electronics Council (AEC) Q100 qualified

- Single-chip system solution that integrates touch controller with MCU functions

- Target Application
  - Entry and mid-level central information display (CID) systems

- 32-bit MCU subsystem
  - 48-MHz Arm® Cortex®-M0+ CPU
  - 12-bit SAR ADC for system monitoring (voltage, temperature) and other features (such as day/night sensor)
  - Four timer counter pulse width modulators (TCPWMs)
  - Three serial communication blocks (SCBs) that can be individually configured as SPI/I^{2}C/UART
  - Up to 48 KB flash for user-specific system MCU functionality
  - Up to 4 KB SRAM for user-specific system MCU functionality
  - Up to 29 programmable GPIO pins with interrupt functionality

- Multi-touch capacitive touchscreen controller
  - Register-configurable
  - Noise-suppression technologies for display and EMI
    - Effective 20-V drive for higher signal-to-noise ratio (SNR)[1]
    - AutoArmor improves both electromagnetic emissions and immunity
    - External display synchronization
  - Water rejection and wet-finger tracking using DualSense
  - Multi-touch glove with automatic mode switching
    - Ten fingers with thin glove (≤ 1-mm thick)
    - Two fingers with thick glove (≤ 5-mm thick)
  - Large object rejection
  - Automatic baseline tracking to environmental changes
  - Low-power look-for-touch mode
  - Field upgrades via bootloader
  - Touchscreen sensor self-test
  - Low power CAPSENSE™ wake-up button with power consumption of 50 µA
  - Low power wake-on-touchscreen with power consumption of 120 µA

Note
1. Effective voltage when using 17 multi-phase TX and 5-V V$_{CCTX}$ supply.

Datasheet Summary
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002-35927 Rev. **
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Features

- System performance (configuration dependent)
  - Screen sizes up to 11-inch diagonal
    - 5-mm electrode pitch; 8:3 aspect ratio
  - Screen sizes up to 12.3-inch diagonal
    - 5.7-mm electrode pitch; 8:3 aspect ratio
  - Up to 72 sense pins supporting different aspect ratios, up to 1200 intersections (46 × 26)
  - Reports up to ten fingers
  - Small finger support down to 4 mm
  - Refresh rate up to 250 Hz; other rates configurable
  - TX frequency up to 350 kHz

- Power (configuration-dependent)
  - 1.71 to 1.95 V and 3.0 to 5.5 V logic and digital I/Os supply
  - 3.0 to 5.5 V analog supply
  - 20-mW average power
  - 20-µW typical deep-sleep power

- Sensor and system design (configuration-dependent)
  - Supports a variety of touchscreen sensors and stackups
    - Manhattan, diamond
    - Sensor-on-lens (SOL)
    - On-cell
    - Plastic (PET) and glass-sensor substrates
    - LCD, AMOLED, and IPS displays
    - Metal mesh

- Communication interface
  - I^2C slave at 100 kbps, 400 kbps, 1 Mbps, and 3.4 Mbps
  - SPI slave bit rates up to 8 Mbps

- Development and debug environment
  - Arm® MDK for system MCU
  - Touch tuning host emulator (TTHE) to configure touch
  - MTK for debugging
  - PSoC™ programmer for programming

- Packages
  - 100-pin TQFP 14 × 14 × 1.4 mm (0.5-mm pitch)
  - 128-pin TQFP 14 × 20 × 1.4 mm (0.5-mm pitch)

- Ambient temperature range
  - Automotive-A: –40°C to 85°C
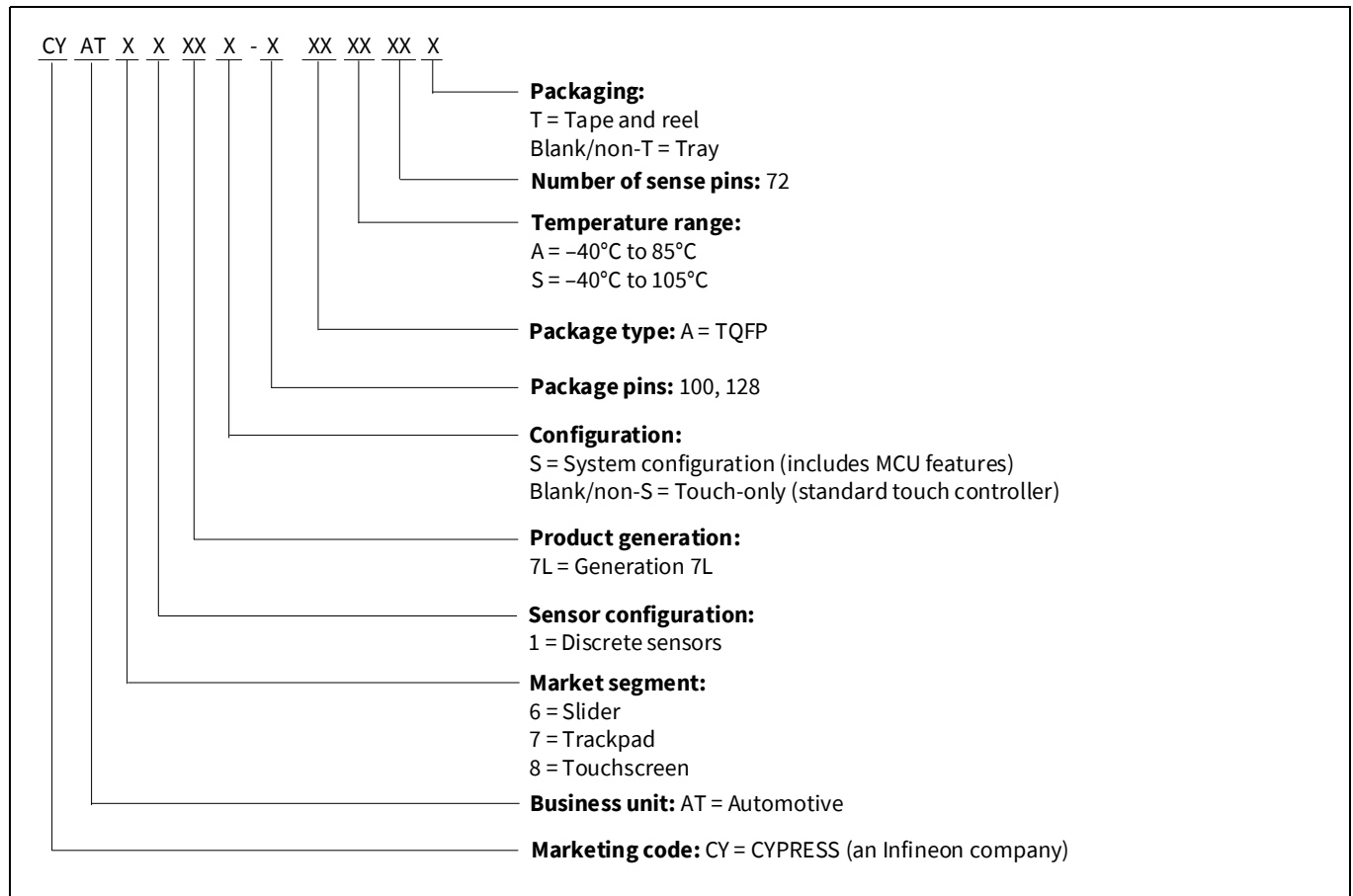 - Automotive-S: –40°C to 105°C

1   Ordering information

Table 1 lists the CYAT817L touchscreen controllers.

Table 1   Ordering information

MPN	Number of sense pins	No. of fingers	Touch only	Touch+ MCU functions	No. of GPIOs	Package	Temperature
CYAT817L-100AA72	72	10	✔	–	13	100-pin TQFP	−40°C to +85°C
CYAT817L-100AS72	72	10	✔	–	13	100-pin TQFP	−40°C to +105°C
CYAT817LS-100AA72	72	10	–	✔	13	100-pin TQFP	−40°C to +85°C
CYAT817LS-100AS72	72	10	–	✔	13	100-pin TQFP	−40°C to +105°C
CYAT817L-128AA72	72	10	✔	–	29	128-pin TQFP	−40°C to +85°C
CYAT817L-128AS72	72	10	✔	–	29	128-pin TQFP	−40°C to +105°C
CYAT817LS-128AA72	72	10	–	✔	29	128-pin TQFP	−40°C to +85°C
CYAT817LS-128AS72	72	10	–	✔	29	128-pin TQFP	−40°C to +105°C

1.1   Ordering code definitions

CY AT X X XX X - X XX XX XX X

Packaging:
T = Tape and reel
Blank/non-T = Tray

Number of sense pins: 72

Temperature range:
A = –40°C to 85°C
S = –40°C to 105°C

Package type: A = TQFP

Package pins: 100, 128

Configuration:
S = System configuration (includes MCU features)
Blank/non-S = Touch-only (standard touch controller)

Product generation:
7L = Generation 7L

Sensor configuration:
1 = Discrete sensors

Market segment:
6 = Slider
7 = Trackpad
8 = Touchscreen

Business unit: AT = Automotive

Marketing code: CY = CYPRESS (an Infineon company)

Revision history

Document revision	Date	Description of changes
**	2022-07-26	Initial release.

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