



maXTouch 798-node Touchscreen Controller Product Brief

Description

The mXT799T-AT/mXT799T-AB uses a unique charge-transfer acquisition engine to implement Microchip's patented capacitive sensing method. Coupled with a state-of-the-art CPU, the entire touchscreen sensing solution can measure, classify and track a number of individual finger touches with a high degree of accuracy in the shortest response time. The mXT799T-AT/mXT799T-AB allows for both mutual and self capacitance measurements, with the self capacitance measurements being used to augment the mutual capacitance measurements to produce reliable touch information.

maXTouch[®] Adaptive Sensing Touchscreen Technology

- Up to 32 X (transmit) lines and 52 Y (receive) lines
- A maximum of 798 nodes can be allocated to the touchscreen
- Touchscreen size 9.4 inches (16:9 aspect ratio), assuming a sensor electrode pitch of 5.5 mm. Other sizes may be possible with different electrode pitches and appropriate sensor material
- Multiple touch support with up to 16 concurrent touches tracked in real time

Automotive Applications

- AEC-Q100 Qualified
- Developed following Automotive SPICE[®] Level 3 certified processes
- CISPR-25 compliant (for both mutual and self capacitance measurements)

Touch Sensor Technology

- Discrete/out-cell support including glass and PET film-based sensors
- On-cell/touch-on display support including TFT, IPS and OLED
- Synchronization with display refresh timing capability
- Support for standard (for example, Diamond) and proprietary sensor patterns (review of designs by Microchip recommended)

Front Panel Material

- Works with PET or glass, including curved profiles (configuration and stack-up to be approved by Microchip)
- Glass 0.4 mm to 4 mm with GFF stack, 0.55 mm to 4 mm with OGS stack (dependent on screen size, touch size, configuration and stack-up)
- Plastic 0.2 mm to 3 mm (dependent on screen size, touch size, configuration and stack-up)

Touch Performance

- Moisture/Water Compensation
 - No false touch with condensation or water drop up to 22 mm diameter
 - One-finger tracking with condensation or water drop up to 22 mm diameter
- Glove Support
 - Multiple-finger glove touches up to 1.5 mm thickness (subject to stack-up design)
 - Single-finger glove touch up to 5 mm thickness (subject to stack-up design)
- Mutual capacitance and self capacitance measurements supported for robust touch detection
- Noise suppression technology to combat ambient and power-line noise
 - Up to 240 Vpp between 1 Hz and 1 kHz sinusoidal waveform
 - Up to 20 Vpp between 1 kHz and 1 MHz sinusoidal waveform
- Burst Frequency
 - Controlled Tx burst frequency drift over process and temperature range
- Scan Speed
 - Up to 110 Hz one finger reporting rate (subject to configuration)
 - Typical report rate for 10 touches ≥ 100 Hz (subject to configuration)
 - Initial touch latency < 25 ms for first touch from idle (subject to configuration)
 - Configurable to allow for power and speed optimization

On-chip Gestures

- Reports one-touch and two-touch gestures

MXT799T-AT/MXT799T-AB 1.0

Keys

- Up to 32 nodes can be allocated as mutual capacitance sensor keys (subject to other configurations)
- Adjacent Key Suppression (AKS) technology is supported for false key touch prevention

Enhanced Algorithms

- Lens bending algorithms to remove display noise
- Touch suppression algorithms to remove unintentional large touches, such as palm
- Palm Recovery Algorithm for quick restoration to normal state

Power Saving

- Programmable timeout for automatic transition from active to idle states
- Pipelined analog sensing detection and digital processing to optimize system power efficiency

Application Interfaces

- I²C-compatible slave with support for:
 - Standard mode (up to 100 kHz)
 - Fast mode (up to 400 kHz)
 - Fast-mode Plus (up to 1 MHz)
 - High-speed mode (up to 3.4 MHz)
- SPI slave interface (up to 8 MHz)
- Interrupt to indicate when a message is available
- SPI Debug Interface to read the real-time raw data for tuning and debugging purposes

Power Supply

- Digital (Vdd) 3.3 V nominal
- Digital I/O (VddIO) 3.3 V nominal
- Analog (AVdd) 3.3 V nominal
- High voltage external X line drive (XVdd) up to 9.0 V

Package

- 144-pin LQFP 20 × 20 × 1.4 mm, 0.5 mm pitch

Operating Temperature

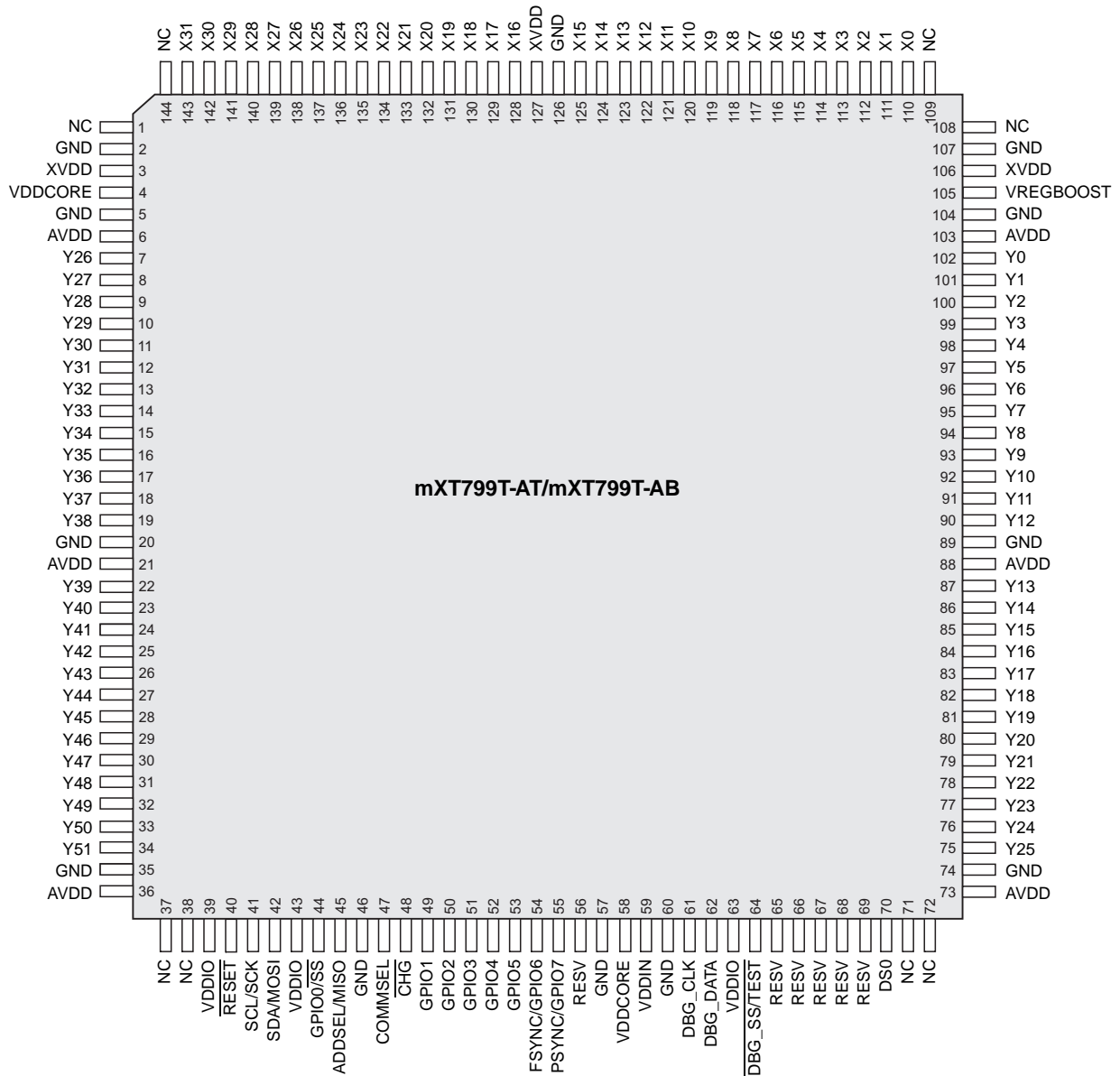
- mXT799T-AT: -40°C to +85°C (Grade 3)
- mXT799T-AB: -40°C to +105°C (Grade 2)

Design Services

- Review of device configuration, stack-up and sensor patterns
- Custom firmware versions can be considered, such as for specific gestures or proprietary OEM host communication protocols
- Contact your Microchip representative for more information

PIN CONFIGURATION

Pin Configuration – 144-pin LQFP



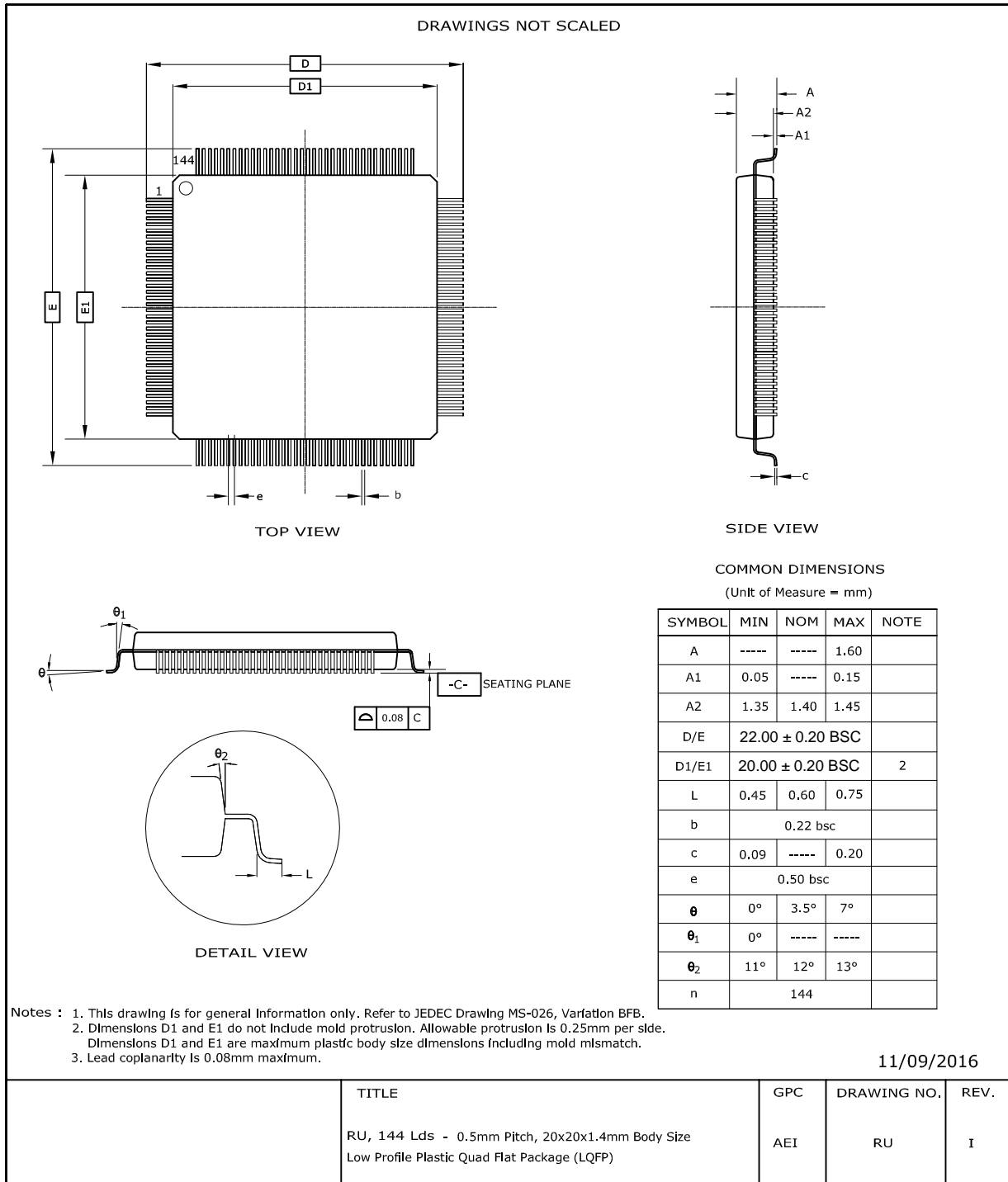
Top view

MXT799T-AT/MXT799T-AB 1.0

1.0 PACKAGING INFORMATION

The following section gives the technical details of the package for the device.

1.1 144-pin LQFP 20 x 20 x 1.4 mm



APPENDIX A: REVISION HISTORY

Revision A (October 2017)

Initial edition for firmware revision 1.0.AB – Release

MXT799T-AT/MXT799T-AB 1.0

PRODUCT IDENTIFICATION SYSTEM

The table below gives details on the product identification system for maXTouch devices. See [“Orderable Part Numbers”](#) below for example part numbers for the mXT799T-AT/mXT799T-AB.

To order or obtain information, for example on pricing or delivery, refer to the factory or the listed sales office.

| PART NO. | -XXX | [X] | [XX] | [X] | [XXX] |
|-----------------------|--|-------------------|--|----------------------|---------|
| Device | Package | Temperature Range | Sample Type | Tape and Reel Option | Pattern |
| Device: | Base device name | | | | |
| Package: | A | = | QFP (Plastic Quad Flatpack) | | |
| | CCU | = | UFBGA (Ultra Thin Fine-pitch Ball Grid Array) | | |
| | C2U | = | UFBGA (Ultra Thin Fine-pitch Ball Grid Array) | | |
| | NHU | = | UFBGA (Ultra Thin Fine-pitch Ball Grid Array) | | |
| | C4U | = | X1FBGA (Extra Thin Fine-pitch Ball Grid Array) | | |
| | MAU | = | XQFN (Super Thin Quad Flat No Lead Sawn) | | |
| | MA5U | = | XQFN (Super Thin Quad Flat No Lead Sawn) | | |
| | UU | = | WLCSP (Wafer Level Chip Scale Package) | | |
| Temperature Range: | <i>Blank</i> | = | -40°C to +85°C (Grade 3) | | |
| | T | = | -40°C to +85°C (Grade 3) | | |
| | B | = | -40°C to +105°C (Grade 2) | | |
| Sample Type: | <i>Blank</i> | = | Release Sample | | |
| | ES | = | Pre-release (Engineering) Sample | | |
| Tape and Reel Option: | <i>Blank</i> | = | Standard Packaging (Tube or Tray) | | |
| | R | = | Tape and Reel ⁽¹⁾ | | |
| Pattern: | QTP, SQTP, Code or Special Requirements (Blank Otherwise) | | | | |

Note 1: Tape and Reel identifier only appears in the catalog part number description. This identifier is used for ordering purposes and is not printed on the device package. See [“Orderable Part Numbers”](#) below or check with your Microchip Sales Office for package availability with the Tape and Reel option.

Orderable Part Numbers

| Orderable Part Number | Firmware Revision | Description |
|--|-------------------|---|
| ATMXT799T-AT (Supplied in trays) | 1.0.AB | 144-pin LQFP 20 x 20 x 1.4 mm, RoHS compliant Operating temperature range -40°C to +85°C (Grade 3) Automotive grade sample; suitable for automotive characterization |
| ATMXT799T-ATR (Supplied in tape and reel) | | |
| ATMXT799T-AB (Supplied in trays) | 1.0.AB | 144-pin LQFP 20 x 20 x 1.4 mm, RoHS compliant Operating temperature range -40°C to +105°C (Grade 2) Automotive grade sample; suitable for automotive characterization |
| ATMXT799T-ABR (Supplied in tape and reel) | | |

Note the following details of the code protection feature on Microchip devices:

- Microchip products meet the specification contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is one of the most secure families of its kind on the market today, when used in the intended manner and under normal conditions.
- There are dishonest and possibly illegal methods used to breach the code protection feature. All of these methods, to our knowledge, require using the Microchip products in a manner outside the operating specifications contained in Microchip's Data Sheets. Most likely, the person doing so is engaged in theft of intellectual property.
- Microchip is willing to work with the customer who is concerned about the integrity of their code.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as “unbreakable.”

Code protection is constantly evolving. We at Microchip are committed to continuously improving the code protection features of our products. Attempts to break Microchip's code protection feature may be a violation of the Digital Millennium Copyright Act. If such acts allow unauthorized access to your software or other copyrighted work, you may have a right to sue for relief under that Act.

Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION, INCLUDING BUT NOT LIMITED TO ITS CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE. Microchip disclaims all liability arising from this information and its use. Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights unless otherwise stated.

Microchip received ISO/TS-16949:2009 certification for its worldwide headquarters, design and wafer fabrication facilities in Chandler and Tempe, Arizona; Gresham, Oregon and design centers in California and India. The Company's quality system processes and procedures are for its PIC[®] MCUs and dsPIC[®] DSCs, KEELOQ[®] code hopping devices, Serial EEPROMs, microperipherals, nonvolatile memory and analog products. In addition, Microchip's quality system for the design and manufacture of development systems is ISO 9001:2000 certified.

**QUALITY MANAGEMENT SYSTEM
CERTIFIED BY DNV
= ISO/TS 16949 =**

Trademarks

The Microchip name and logo, the Microchip logo, AnyRate, AVR, AVR logo, AVR Freaks, BeaconThings, BitCloud, CryptoMemory, CryptoRF, dsPIC, FlashFlex, flexPWR, Heldo, JukeBlox, KEELOQ, KEELOQ logo, Kleer, LANCheck, LINK MD, maXStylus, maXTouch, MediaLB, megaAVR, MOST, MOST logo, MPLAB, OptoLyzer, PIC, picoPower, PICSTART, PIC32 logo, Prochip Designer, QTouch, RightTouch, SAM-BA, SpyNIC, SST, SST Logo, SuperFlash, tinyAVR, UNI/O, and XMEGA are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

ClockWorks, The Embedded Control Solutions Company, EtherSynch, Hyper Speed Control, HyperLight Load, IntelliMOS, mTouch, Precision Edge, and Quiet-Wire are registered trademarks of Microchip Technology Incorporated in the U.S.A.

Adjacent Key Suppression, AKS, Analog-for-the-Digital Age, Any Capacitor, AnyIn, AnyOut, BodyCom, chipKIT, chipKIT logo, CodeGuard, CryptoAuthentication, CryptoCompanion, CryptoController, dsPICDEM, dsPICDEM.net, Dynamic Average Matching, DAM, ECAN, EtherGREEN, In-Circuit Serial Programming, ICSP, Inter-Chip Connectivity, JitterBlocker, KleerNet, KleerNet logo, Mindi, MiWi, motorBench, MPASM, MPF, MPLAB Certified logo, MPLIB, MPLINK, MultiTRAK, NetDetach, Omniscient Code Generation, PICDEM, PICDEM.net, PICkit, PICtail, PureSilicon, QMatrix, RightTouch logo, REAL ICE, Ripple Blocker, SAM-ICE, Serial Quad I/O, SMART-I.S., SQI, SuperSwitcher, SuperSwitcher II, Total Endurance, TSHARC, USBCheck, VariSense, ViewSpan, WiperLock, Wireless DNA, and ZENA are trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

SQTP is a service mark of Microchip Technology Incorporated in the U.S.A.

Silicon Storage Technology is a registered trademark of Microchip Technology Inc. in other countries.

GestIC is a registered trademark of Microchip Technology Germany II GmbH & Co. KG, a subsidiary of Microchip Technology Inc., in other countries.

All other trademarks mentioned herein are property of their respective companies.

© 2017, Microchip Technology Incorporated, All Rights Reserved.

ISBN: 978-1-5224-2113-9

Worldwide Sales and Service

AMERICAS

Corporate Office
2355 West Chandler Blvd.
Chandler, AZ 85224-6199
Tel: 480-792-7200
Fax: 480-792-7277
Technical Support:
[http://www.microchip.com/
support](http://www.microchip.com/support)
Web Address:
www.microchip.com

Atlanta
Duluth, GA
Tel: 678-957-9614
Fax: 678-957-1455

Austin, TX
Tel: 512-257-3370

Boston
Westborough, MA
Tel: 774-760-0087
Fax: 774-760-0088

Chicago
Itasca, IL
Tel: 630-285-0071
Fax: 630-285-0075

Dallas
Addison, TX
Tel: 972-818-7423
Fax: 972-818-2924

Detroit
Novi, MI
Tel: 248-848-4000

Houston, TX
Tel: 281-894-5983

Indianapolis
Noblesville, IN
Tel: 317-773-8323
Fax: 317-773-5453
Tel: 317-536-2380

Los Angeles
Mission Viejo, CA
Tel: 949-462-9523
Fax: 949-462-9608
Tel: 951-273-7800

Raleigh, NC
Tel: 919-844-7510

New York, NY
Tel: 631-435-6000

San Jose, CA
Tel: 408-735-9110
Tel: 408-436-4270

Canada - Toronto
Tel: 905-695-1980
Fax: 905-695-2078

ASIA/PACIFIC

Asia Pacific Office
Suites 3707-14, 37th Floor
Tower 6, The Gateway
Harbour City, Kowloon

Hong Kong
Tel: 852-2943-5100
Fax: 852-2401-3431

Australia - Sydney
Tel: 61-2-9868-6733
Fax: 61-2-9868-6755

China - Beijing
Tel: 86-10-8569-7000
Fax: 86-10-8528-2104

China - Chengdu
Tel: 86-28-8665-5511
Fax: 86-28-8665-7889

China - Chongqing
Tel: 86-23-8980-9588
Fax: 86-23-8980-9500

China - Dongguan
Tel: 86-769-8702-9880

China - Guangzhou
Tel: 86-20-8755-8029

China - Hangzhou
Tel: 86-571-8792-8115
Fax: 86-571-8792-8116

China - Hong Kong SAR
Tel: 852-2943-5100
Fax: 852-2401-3431

China - Nanjing
Tel: 86-25-8473-2460
Fax: 86-25-8473-2470

China - Qingdao
Tel: 86-532-8502-7355
Fax: 86-532-8502-7205

China - Shanghai
Tel: 86-21-3326-8000
Fax: 86-21-3326-8021

China - Shenyang
Tel: 86-24-2334-2829
Fax: 86-24-2334-2393

China - Shenzhen
Tel: 86-755-8864-2200
Fax: 86-755-8203-1760

China - Wuhan
Tel: 86-27-5980-5300
Fax: 86-27-5980-5118

China - Xian
Tel: 86-29-8833-7252
Fax: 86-29-8833-7256

ASIA/PACIFIC

China - Xiamen
Tel: 86-592-2388138
Fax: 86-592-2388130

China - Zhuhai
Tel: 86-756-3210040
Fax: 86-756-3210049

India - Bangalore
Tel: 91-80-3090-4444
Fax: 91-80-3090-4123

India - New Delhi
Tel: 91-11-4160-8631
Fax: 91-11-4160-8632

India - Pune
Tel: 91-20-3019-1500

Japan - Osaka
Tel: 81-6-6152-7160
Fax: 81-6-6152-9310

Japan - Tokyo
Tel: 81-3-6880-3770
Fax: 81-3-6880-3771

Korea - Daegu
Tel: 82-53-744-4301
Fax: 82-53-744-4302

Korea - Seoul
Tel: 82-2-554-7200
Fax: 82-2-558-5932 or
82-2-558-5934

Malaysia - Kuala Lumpur
Tel: 60-3-6201-9857
Fax: 60-3-6201-9859

Malaysia - Penang
Tel: 60-4-227-8870
Fax: 60-4-227-4068

Philippines - Manila
Tel: 63-2-634-9065
Fax: 63-2-634-9069

Singapore
Tel: 65-6334-8870
Fax: 65-6334-8850

Taiwan - Hsin Chu
Tel: 886-3-5778-366
Fax: 886-3-5770-955

Taiwan - Kaohsiung
Tel: 886-7-213-7830

Taiwan - Taipei
Tel: 886-2-2508-8600
Fax: 886-2-2508-0102

Thailand - Bangkok
Tel: 66-2-694-1351
Fax: 66-2-694-1350

EUROPE

Austria - Wels
Tel: 43-7242-2244-39
Fax: 43-7242-2244-393

Denmark - Copenhagen
Tel: 45-4450-2828
Fax: 45-4485-2829

Finland - Espoo
Tel: 358-9-4520-820

France - Paris
Tel: 33-1-69-53-63-20
Fax: 33-1-69-30-90-79

France - Saint Cloud
Tel: 33-1-30-60-70-00

Germany - Garching
Tel: 49-8931-9700
Germany - Haan
Tel: 49-2129-3766400

Germany - Heilbronn
Tel: 49-7131-67-3636

Germany - Karlsruhe
Tel: 49-721-625370

Germany - Munich
Tel: 49-89-627-144-0
Fax: 49-89-627-144-44

Germany - Rosenheim
Tel: 49-8031-354-560

Israel - Ra'anana
Tel: 972-9-744-7705

Italy - Milan
Tel: 39-0331-742611
Fax: 39-0331-466781

Italy - Padova
Tel: 39-049-7625286

Netherlands - Drunen
Tel: 31-416-690399
Fax: 31-416-690340

Norway - Trondheim
Tel: 47-7289-7561

Poland - Warsaw
Tel: 48-22-3325737

Romania - Bucharest
Tel: 40-21-407-87-50

Spain - Madrid
Tel: 34-91-708-08-90
Fax: 34-91-708-08-91

Sweden - Gothenberg
Tel: 46-31-704-60-40

Sweden - Stockholm
Tel: 46-8-5090-4654

UK - Wokingham
Tel: 44-118-921-5800
Fax: 44-118-921-5820

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Microchip:](#)

[ATMXT799TPABES](#) [ATMXT799THATES](#) [ATMXT799TAT](#) [ATMXT799TPATES](#) [ATMXT799THABES](#)
[ATMXT799TABES](#) [ATMXT799TATES](#)

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9