

创耀科技工业互联网产品线介绍



2025.11

01 公司简介

02 工业互联网芯片及解决方案

关于我们



公司简介：

创耀科技（688259）是一家科创板上市的芯片设计公司，成立于2006年，总部在江苏省苏州市工业园区。在上海、南京、珠海、重庆、成都等地设有分子公司。



公司业务：

创耀科技致力于结合市场需求，将持续积累的物理层通信算法、模拟及射频电路设计、复杂SoC芯片设计和版图设计等平台性技术应用在不同业务领域，发展了通信芯片与解决方案业务、芯片版图设计服务及其他技术服务。



公司大事记



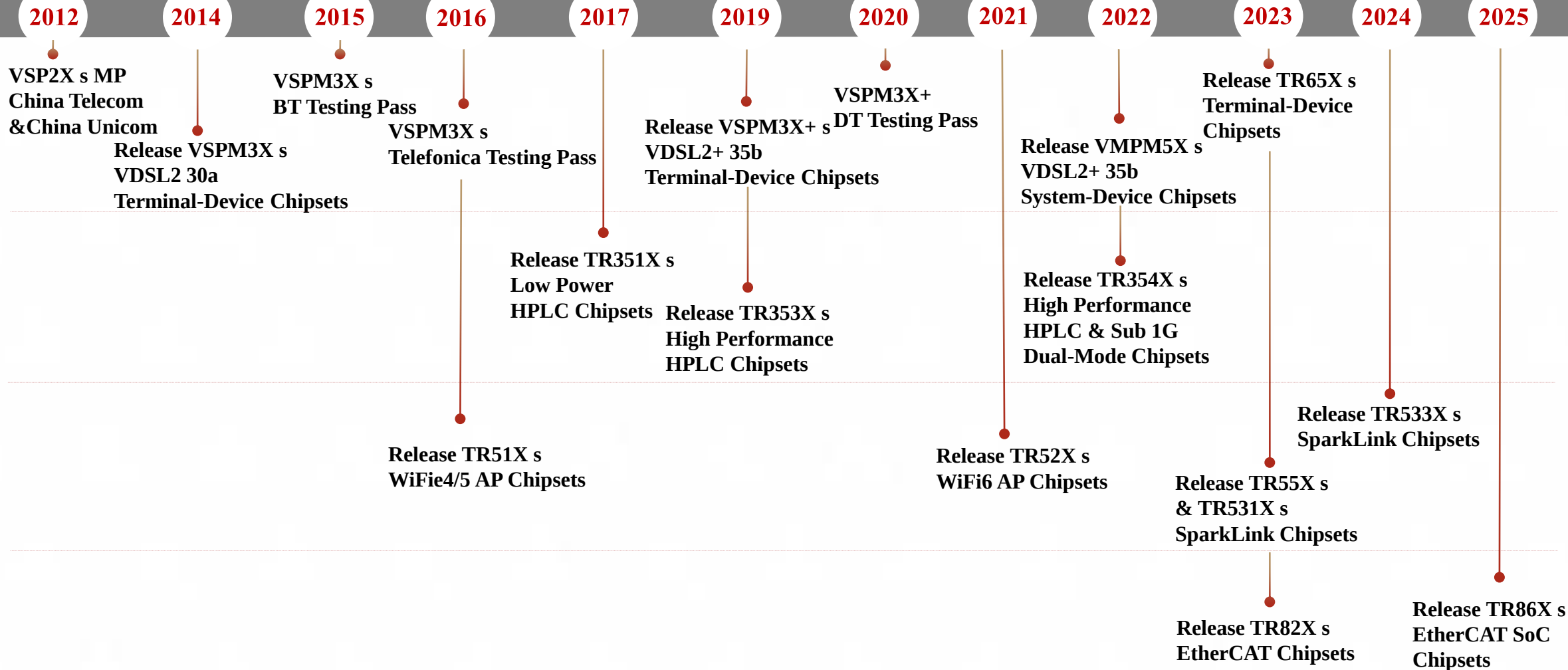
2022/1/12 Shanghai IPO

宽带接入网

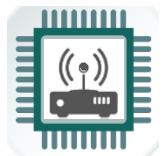
电力线载波

无线Wi-Fi

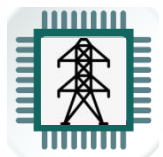
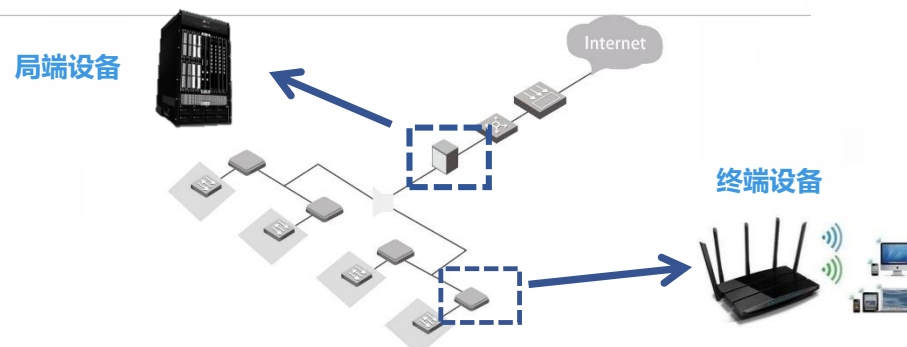
工业以太网



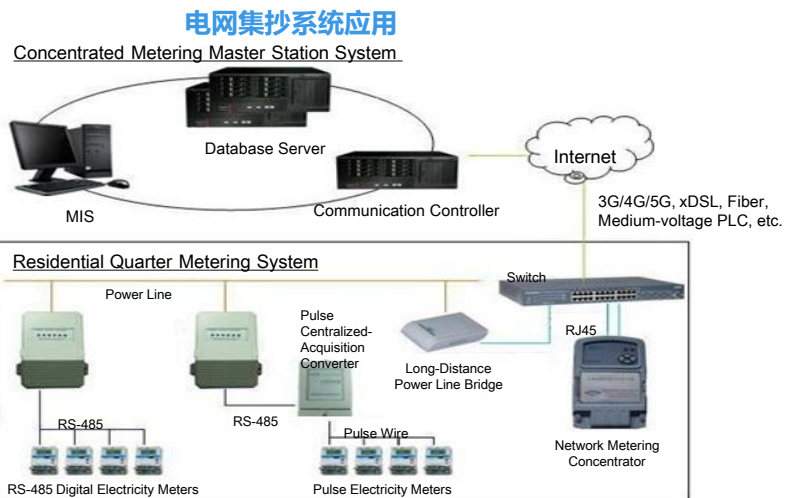
公司业务介绍



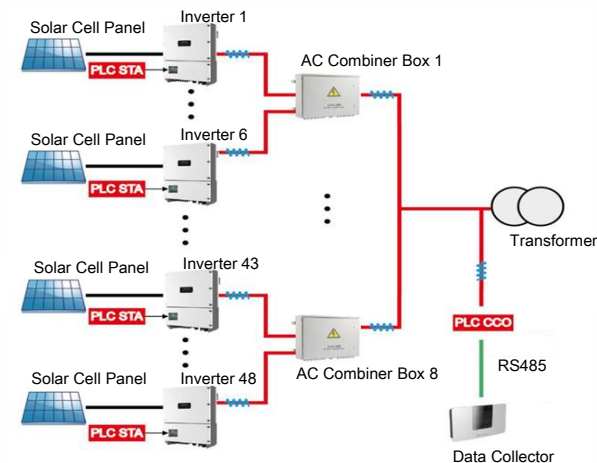
宽带接入网



电力线载波



光伏逆变器组网应用



星闪及IoT



智能终端



智能座舱



智能家居

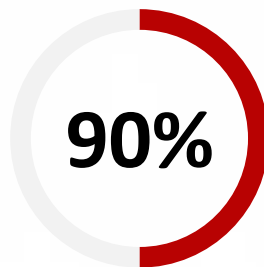


智能制造

公司资质及行业组织



员工人数



研发占比

荣誉资质

国家高新技术企业

江苏省瞪羚企业

苏州市集成电路企业20强

科创板上市企业 (股票代码: 688259)

行业协会组织

ETG组织会员单位



国际宽带联盟会员单位



WiFi联盟会员单位



蓝牙SIG会员单位



星闪联盟会员单位



中国通信标准化协会会员

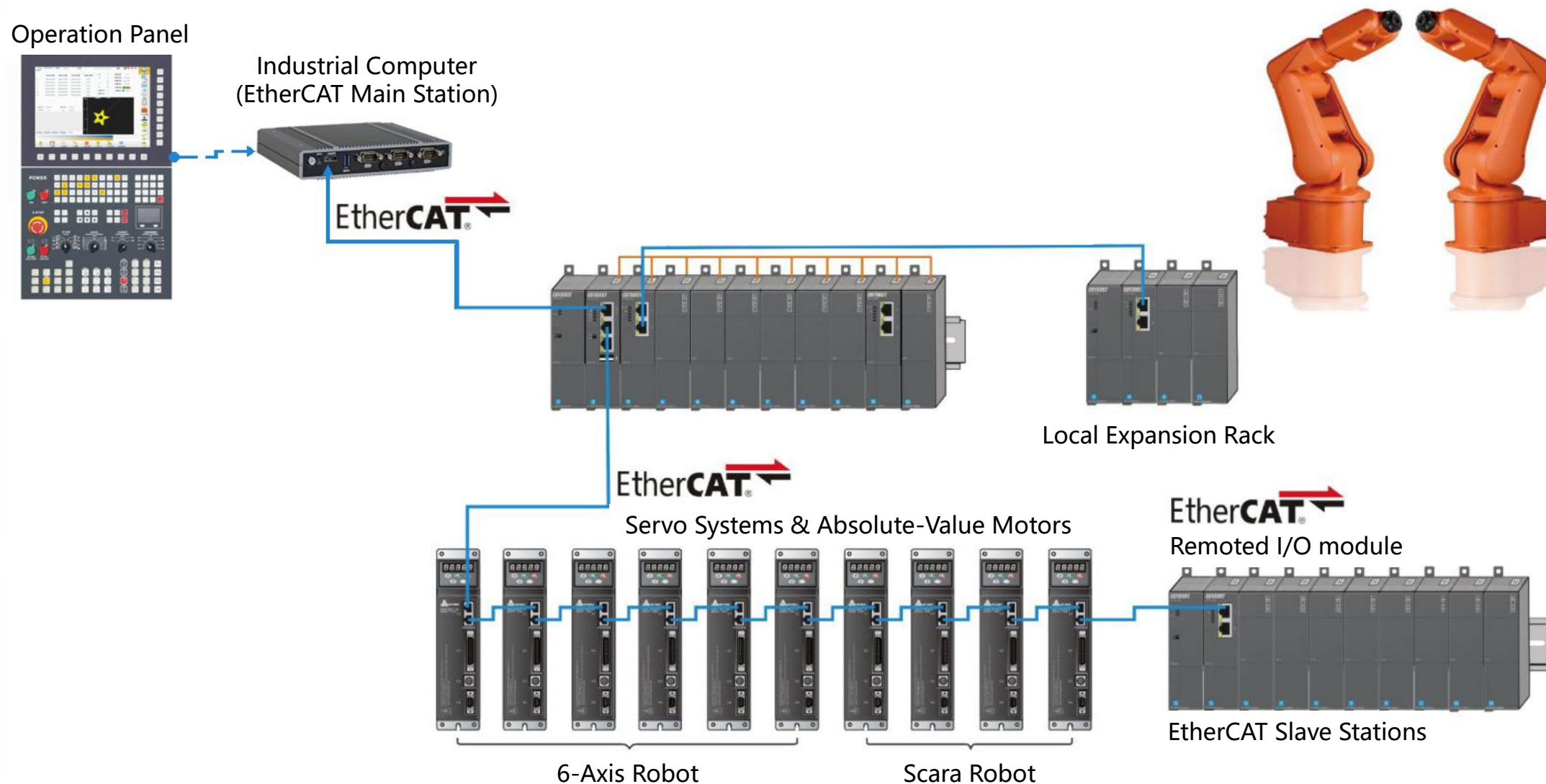


The background of the slide is a grayscale, high-magnification image of a microchip. It shows a complex grid of circuitry with various rectangular and circular components, some of which are highlighted in white. The overall tone is technical and futuristic.

01 公司简介

02 工业互联网芯片及解决方案

创耀科技工业以太网产品线 —— EtherCAT通信



创耀科技工业以太网芯片产品路标



EtherCAT从站控制芯片 (集成MCU)



TR8640E
Cortex M4F 288MHz
EtherCAT 2x Port (2x FE PHY)
2x CAN
BGA-196 12*12mm



TR8640EC
Cortex M4F 288MHz
EtherCAT 2x Port (2x FE PHY)
2x CAN
BGA-196 12*12mm



TR8630EC
Cortex M4F 192MHz
EtherCAT 2x Port (2x FE PHY)
2x CAN FD
QFN (TBD)



TR8670
Cortex H7 500MHz+
EtherCAT 2x Port (2x FE/GE PHY Integrated)
QFN or BGA (TBD)

EtherCAT从站协议芯片



TR8253
TR8253L
3x ports : 2x FE PHY+ 1x MII
16x Digital IO
SPI / SQI / HBI
TR8253: QFN-64 9*9mm
TR8253L: LGA-64 9*9mm



TR8211K
4x ports : 4x MII (w/o PHY)
32x Digital IO
SPI / SQI / HBI
BGA-128 10*10mm

TR825xC系列: 低功耗, 低温升



TR8254EC
4 x ports : 2x FE PHY+ 2x MII
SPI / SQI / HBI , 32x Digital IO
Embedded EEPROM
QFN-80 9*9mm, 0.4mm Pitch



TR8253EC
3(or4) x ports : 2x FE PHY+ 1x MII / 2x RMII
SPI / SQI / HBI , 16x Digital IO
Embedded EEPROM
QFN-64 9*9mm, 0.5mm Pitch



TR8253LC
3x ports : 2x FE PHY+ 1x MII
SPI / SQI / HBI , 16x Digital IO
QFN-64 9*9mm, 0.5mm Pitch



TR8251EC
2x ports : 2x FE PHY
SPI / SQI
Embedded EEPROM
Ultra Small Size: QFN-40 5*5mm, 0.4mm Pitch



TR8366
4x ports : 4x RGMII
SPI / SQI / HBI (/ PCIe)
QFN or BGA (TBD)

~2025

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- 量产
- 样片
- 开发中
- 规划中

TR825xC系列：低功耗、低温升



型号	TR8253LC	TR8253EC	TR8251EC	TR8254EC
Ethernet Ports	3 (2x FE PHY+1x MII)	3 or 4* (2x FE PHY+1x MII / 2x RMII)	2 (2x FE PHY)	4* (2x FE PHY + 2x MII)
MCU Interfaces	SPI / SQI / HBI	SPI / SQI / HBI	SPI / SQI	SPI / SQI / HBI
Embedded EEPROM	-	64K bit	64K bit	64K bit
Digital I/O	16	16	-	32
Low Power Mode	Low Power	Extra Low Power	Extra Low Power	Extra Low Power
Package	QFN-64 9*9mm	QFN-64 9*9mm	QFN-40 5*5mm	QFN-80 9*9mm
Pin2Pin Compatible with	TR8253L** LAN9252/9253	TR8253***	-	-

说明:

*) TR8253EC/TR8254EC 支持4 端口(2x PHY + 2x RMII/MII), 但其中第4端口(RMII/MII) 与并口 (HBI接口) 为复用关系, 不可同时支持HBI接口与4端口通信功能;

**) TR8253LC 替代 TR8253L 时, 硬件电路需要加上PHY端供电的磁珠; 兼容替代 LAN9252/9253 时, 外围电路没有区别, 且也可以支持间接访问模式;

***) TR8253EC 替代 TR8253时, 外部电路电源方案需要调整为内部DC-DC供电模式

创耀科技ESC芯片选型建议



功能概要	推荐型号	产品特点	选型建议	封装尺寸
ESC only	TR8211K	兼容替代ET1100 (不支持e-bus功能)	推荐用ET1100 (不使用e-bus功能) 的产品直接替代使用	BGA-128 10x10mm
ESC+PHY	TR8253L -> TR8253LC	兼容替代LAN9252/LAN9253 的QFN封装版本	推荐需要替代LAN9252/LAN9253 QFN封装版本的项目 替代使用	TR8253L: LGA-64 9x9mm TR8253LC: QFN-64 9x9mm
	TR8253 -> TR8253EC	1. 自定义pin序, 与TR8253L / T8253LC 性能一致, 但硬件设计走线更顺, 不交叉 2. 集成EEPROM, 进一步提升集成度 3. 支持超低功耗&温升设计	1. 可提供用EVB板的全套软硬件参考设计, 建议新规划或改板项目设计使用, 新设计优先选择TR8253EC 2. 如以前已使用TR8253, 可用TR8253EC替换, 如需超低功耗&超低温升性能, 可修改外部电源设计实现 3. 分支器应用: 可用TR8253EC级联实现多口分支器方案 4. 插片式IO: 可用 TR8253EC+TR8251EC 实现插片式IO产品方案	QFN-64 9x9mm
	TR8251EC	1. 5x5mm 超小尺寸 2. 集成EEPROM, 进一步提升集成度 3. 支持超低功耗&温升设计	1. 适用于产品小型化应用 (如关节模组、灵巧手等), 且不适合选用集成MCU芯片的产品选用 (尤其适合原LAN9252/9253或AX58100等方案的产品需要小型化) 2. 插片式IO: 可用 TR8253EC+TR8251EC 实现插片式IO产品方案	QFN-40 5x5mm
	TR8254EC	1. 32 Digital IO 2. 集成EEPROM, 进一步提升集成度	推荐需要32 Digital IO的产品应用	QFN-80 9x9mm
ESC+MCU+PHY	TR8640E -> TR8640EC	1. 在TR8253系列功能 (ESC+PHY)基础上, 集成 ARM Cortex M4 MCU(主频288MHz), 方案生态成熟 2. 集成Flash和EEPROM, 单芯片复合功能集成度高	单芯片集成度高, 适用于产品小型化应用(如关节电机模组等), 尤其针对ARM MCU (类ST架构生态)开发经验者适用	BGA-196 12*12mm

德国倍福授权及ETG一致性认证



ETHERCAT TECHNOLOGY LICENSE AGREEMENT

between

Beckhoff Automation GmbH & Co. KG
Huelshorstweg 20, 33415 Verl
Germany
VAT ID No.: DE 815529334

("Licensor")

and

Triductor Technology (Suzhou), Inc.
NO.1355 Jin Ji Hu Avenue Suite 133
Suzhou Industrial Park, Jiangsu,
China

统一社会信用代码 (Unified Social Credit Code): 91320594789949044E

("Licensee")

Preamble

Whereas, Beckhoff Automation GmbH is the owner of the Intellectual Property Rights pertaining to the EtherCAT Technology (as defined below), including but not limited to related (a) patents with corresponding applications or registrations in various other countries, (b) Trade-marks and (c) Know-how and copyright/software, as further described herein, to be used by Licensee for an EtherCAT slave-device semiconductor chip.

Whereas, Beckhoff Automation GmbH granted to Licensor the right to license the intellectual property rights pertaining to the EtherCAT Technology to Third Parties, including for the PRC.

Whereas, Licensee is an experienced semiconductor company well familiar with the design of semiconductor chips and intends to create and/or sell or otherwise distribute Products in-

1/45
EtherCAT Technology License Agreement
Licensee: Triductor Technology (Suzhou), Inc.
2023-03-13

Handwritten signatures: KR, Kai

Certificate
EtherCAT Conformance Test

Triductor Technology(Suzhou), Inc.

EtherCAT Technology Group hereby confirms the above named company that the following device is successfully **EtherCAT Conformance Tested**.

Device under Test

Product Name:	TR8253-EVB
Product Code:	0x16500
Revision Number:	0x1

Assigned Vendor ID: 0x6500
Test Report Number: 0x6500_001
EtherCAT Test Center: Beihang University, LNC, Beijing, China
Test Date: June 03, 2025

Supported features tested:

✓ Conformance Test Tool 2.7.0.0	✓ CoE Mailbox Protocol
✓ EtherCAT Slave Machine	✓ CIA402 Profile
✓ Indicator and Labeling	✓ Semi Device Profile
✓ Distributed Clocks	
Explicit Device ID	

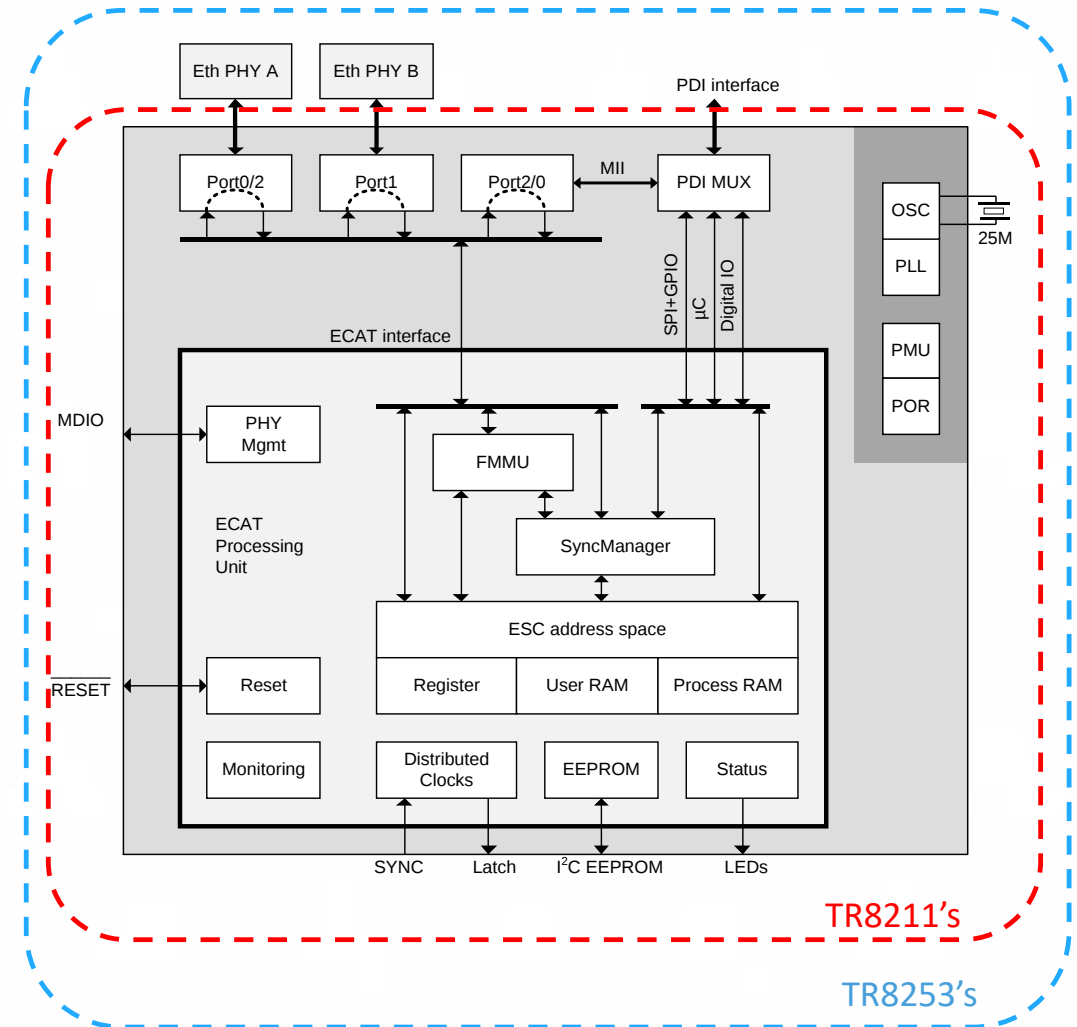
Nuremberg, June 16, 2025

Handwritten signature: M. Rostan
Majlin Rostan, Executive Director
EtherCAT Technology Group

创耀科技EtherCAT协议芯片都是基于德国倍福公司授权的ESC IP设计开发，并已经通过ETG协议一致性认证。

EtherCAT 从站协议芯片参数规格 – TR82xx系列

Items	TR8211's	TR8253's
Ports	2-3 ports w/o PHY	2-3 ports 2x Fast Eth PHY
FMMUs	8x	8x
Sync Managers	8x	8x
Process RAM	8 Kbytes	8 Kbytes
Distributed Clocks	64 bit	64 bit
Process Data Interfaces	16/32 Bit Digital I/O	16Bit Digital I/O
	SPI Slave (direct addressing)	SPI Slave (direct addressing)
	8/16 Bit μ C interface Multiplex & deMultiplex (direct addressing)	8/16 Bit μ C interface Multiplex mode only (direct addressing)
Power supply	Single 3.3V power supply , Integrated voltage regulator for logic core and PLL	
I/O	3.3V compatible I/O, Integrated power-on reset circuit	
Package	TR8211 : QFP-100, 12x12, 0.5pitch TR8211K : BGA-128, 10x10, 0.8pitch	TR8253 : QFN-64, 9x9, 0.5pitch TR8253L : LGA-64, 9x9, 0.5pitch



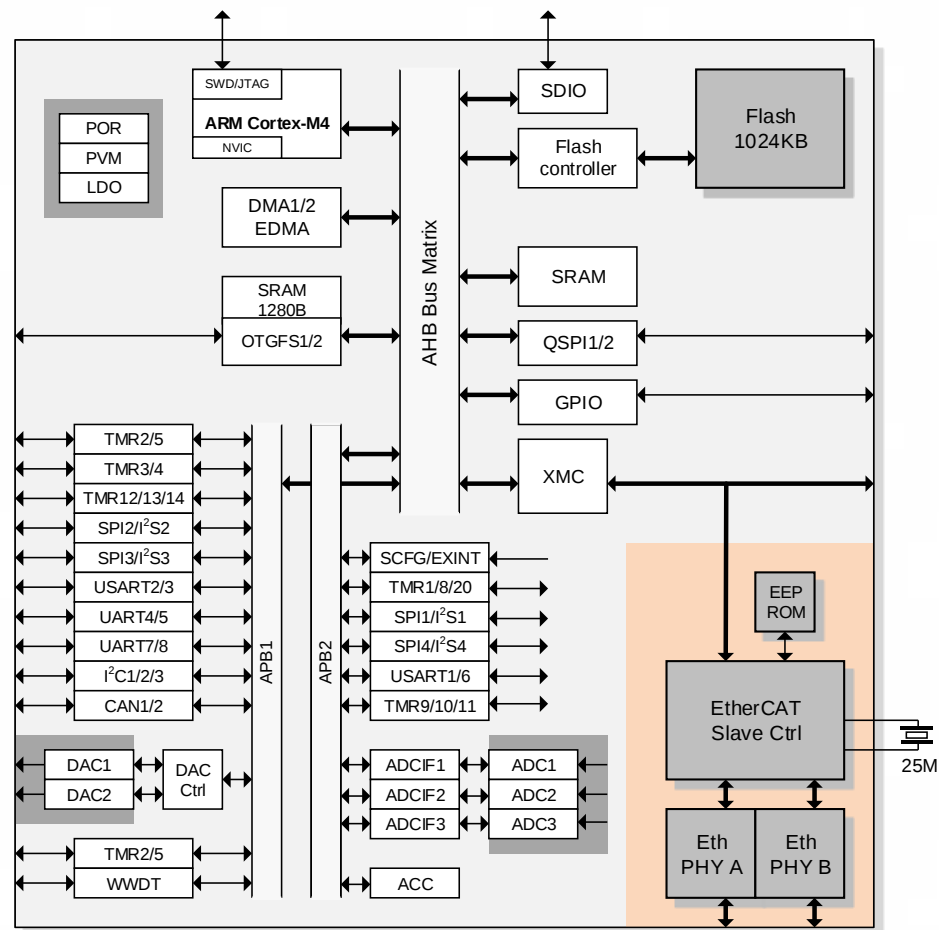
TR8211's & TR8253's Block Diagram

EtherCAT 从站芯片参数规格 – ESC core

Items	parameters
EtherCAT Ports	MII ports
	Ports 0, 1
	Ports 0, 1, 2
General Ethernet Features	MII Management Interface
	Link Polarity configurable
	Enhanced Link Detection supported
	Link detection using PHY signal (LED)
MII Features	CLK25OUT as PHY clock source
	Bootstrap TX Shift settings
Digital I/O PDI	Digital I/O width 16/32 bits
	PDI Control register value
	Control/Status signals
	Bidirectional mode
SPI Slave PDI	Max. SPI clock 50MHz
	Direct address mapping
µController PDI	Asynchronous mode 8/16 bits
	Synchronous mode 8/16 bits (optional)

Items	parameters
General Purpose I/O	GPO bits 0-16 bits
	GPI bits 0-16 bits
	GPIO available independent of PDI or port configuration
	GPO bits 0-16 bits
Error Counters	Supports various Error counters
Watchdog	Supports watchdog
SII EEPROM Interface	Supports SII EEPROM Interface
FMMUs	8x FMMUs Bit-oriented operation
SyncManagers	8x SyncManagers
Distributed Clocks	64bits Width
	2x Sync/Latch signals
Process RAM and User RAM	Process RAM 8Kbytes
	User RAM
LED Signals	Link/Activity(x) LED per port
	PERR(x) LED per port
	RUN LED: Bootstrap

EtherCAT 从站控制芯片参数规格 – TR8640E

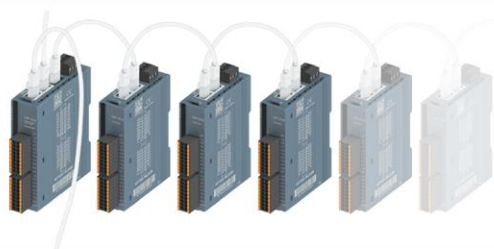


TR8640E Block Diagram

创耀科技EtherCAT从站芯片典型应用



工业机器人及伺服/步进电机驱动



自动化生产线及分布式现场IO模块



协作机器人



人形机器人



An aerial, high-angle view of a city grid, showing a dense pattern of streets and building footprints. The image is faded and serves as a background for the text.

THANK YOU