











## as of July 2025

\*configurable

\*configurable

# EtherCAT SubDevice Controller (ESC) Overview











as of July 2025

<div>The ESC functionality of the chips listed in this overview has been developed with the support and authorization of ETG and the EtherCAT licensor.</div> <div>EtherCAT devices based on these chips can obtain a “Conformance Tested” certificate.</div> <div>Using unauthorized chips may lead to problems in the field.</div> <div>Licensees whose chips are released but not yet listed in this overview should contact <a href="mailto:info@ethercat.org">info@ethercat.org</a></div> <div>Trademarks and Patents EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany. Other designations used in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owners.</div> <div>Note: Subject to technical modifications; no responsibility is accepted for the accuracy of this information. The content of all entries within the ESC overview is submitted by ETG members themselves. The ETG members are in charge of sales and support of their products as well as for the content of their entries. ETG therefore disclaims any liability for information contained therein.</div> <div></div>	Name	ET1825/ET1826/ET1827	CF1103	CF1106	GD32H75E	GD32H77E	GDSCN832	Anybus NP40	netX 500	netX 51
	Type	Lattice FPGA + IP Core	A4h	A4h	MCU	MCU	ASIC	ARM MPU	ASIC	ASIC
	Supplier									
	Supplier	Beckhoff Automation	Codefair Semiconductor Technology	Codefair Semiconductor Technology	GigaDevice	GigaDevice	GigaDevice	HMS Industrial Networks	Hilscher Gesellschaft für Systemautomation mbH	Hilscher Gesellschaft für Systemautomation mbH
	Package	FPGA dependent	QFN88L/QFN100L	QFN64L/QFN88L	BGA240	BGA176, LQFP176, BGA100	QFN64	BGA VF400 0.8 mm pitch	BGA345 1 mm pitch	PBGA324 1 mm pitch
	Size	FPGA dependent	10mm x 10mm/12mm x 12mm	9mm X 9mm/10mm x 10mm	14 x 14 mm	10 x 10 mm, 26 x 26 mm, 8 x 8mm	9 x 9 mm	17 x 17 mm	22 x 22 mm	19 x 19 mm
	µC Interface	serial/parallel (8-/16-/32-bit, async) AMBA-AXI4-Interface	-	/8/16 bit µC interface	OSPI	OSPI/parallel (8/16-bit)	OSPI/parallel (8/16-bit)	Anybus interface (8-/16-bit 30 ns parallel, 20 MHz SPI, Shift register, UART)	µC bus (internal, 32bit)	µC bus (internal, 32bit)
	Digital I/O	8-64*	-	8bit/32bit	-	-	0-16	256 / 256 (Shift register mode)	-	-
	General Purpose I/O	0-128*	16bit	16bit	0-116	0-132	0-19	-	16	32
	DPRAM	0...60 kByte*	8KB	8KB	8 KB	8 KB	8 KB	12 kByte	256/512 Byte (Mailbox/Process Data)	6 kByte
	SyncManager Entities	0...16*	8	8	8	8	8	4	4	8
	FMMU Entities	0...16*	8	8	8	8	8	4	3	8
	Distributed Clock Support	yes*	64bit	64bit	yes (64 Bit)	yes (64 Bit)	yes (64 Bit)	yes	yes	yes
	No. of Ports	1-4 (MII/RMII/RGMII)	2	3	2 (100BaseTX)	2 (100BaseTX)	2 (100BaseTX) + 1 (MII)	2 (MII)	2 (100BaseTX)	2 (100BaseTX)
	Specials	estimated market release 4th quarter 2025  Various license models and evaluation Version are available.  A wide range of Lattice FPGAs are supported	Integrated MCU (Cortex-M3)	Integrated 2 100Mbps Ethernet PHYs	EtherCAT® SubDevice Controller integrated with Cortex®-M7 600MHz microcontroller and dual ENET PHY 1207 DMPIS, 1MB SRAM, 4MB FLASH Math acceleration engine, EXMC I/F for FPGA/CPLD extension, HPDF for sigma-delta demodulation PWM, CAN-FD, USB, 100M ENET, rich analogs (14bit ADC, DAC, CMP) TFT-LCD I/F, Image Processing Accelerator, IEC61508 support, TJ 125C, advanced security	EtherCAT® SubDevice Controller integrated with Cortex®-M7 600MHz microcontroller and optional dual ENET PHY high performance embedded memory (1.1MB SRAM, 2-10 MB NVM), Math acceleration engine, EXMC I/F for FPGA/CPLD extension, HPDF for sigma-delta demodulation PWM, CAN-FD, USB, 100M ENET, rich analogs (14bit ADC, DAC, CMP) integrated RDC and Encoder I/F (Tamagawa, SSI HIPERFACE, EnDAT, Biss-C, Nikon), IEC61508 support, TJ 125C, advanced security	2/3-port EtherCAT® SubDevice Controller with dual integrated ENET PHY which contain a full duplex 100BASE-TX transceiver and support 100Mbps (100BASE-TX) operation, supports HP Auto MDIX, allowing the use of direct connect or cross-over LAN cables.	Multi-protocol support, ESC Frame forwarding delay: 114 ns, MDP, possible to implement several device profiles	Multi-protocol support, Integrated PHYs, Integrated µC (ARM9-200MHz)	Multi-protocol support, Integrated PHYs, Integrated µC (ARM9-100MHz)
	Further information	<a href="#">www.beckhoff.com/ethercat</a>	<a href="http://www.codefairsemi.com/product/492238-207809.html">http://www.codefairsemi.com/product/492238-207809.html</a>	<a href="http://www.codefairsemi.com/product/492238-207809.html">http://www.codefairsemi.com/product/492238-207809.html</a>	<a href="#">www.gigadevice.com/en/ethernet-controllers/ethercat-subdevice-controller</a>	<a href="#">www.gigadevice.com/en/ethernet-controllers/ethercat-subdevice-controller</a>	<a href="#">www.gigadevice.com/en/ethernet-controllers/ethercat-subdevice-controller</a>	<a href="#">www.anybus.com/technology/network_processors/np40</a>	<a href="https://www.hilscher.com/netx">https://www.hilscher.com/netx</a>	<a href="https://www.hilscher.com/netx">https://www.hilscher.com/netx</a>
	Data Sheet	<a href="#">www.beckhoff.com/en/ethercat-subdevice-controller/ethercat-subdevice-controller</a>	<a href="#">www.codefairsemi.com/en/ethercat-subdevice-controller/ethercat-subdevice-controller</a>	<a href="#">www.codefairsemi.com/en/ethercat-subdevice-controller/ethercat-subdevice-controller</a>	<a href="#">www.gigadevice.com/en/ethernet-controllers/ethercat-subdevice-controller</a>	<a href="#">www.gigadevice.com/en/ethernet-controllers/ethercat-subdevice-controller</a>	<a href="#">www.gigadevice.com/en/ethernet-controllers/ethercat-subdevice-controller</a>	<a href="#">www.anybus.com/en/ethernet-controllers/ethercat-subdevice-controller</a>	<a href="#">www.hilscher.com/en/ethernet-controllers/ethercat-subdevice-controller</a>	<a href="#">www.hilscher.com/en/ethernet-controllers/ethercat-subdevice-controller</a>

\*configurable

# EtherCAT SubDevice Controller (ESC) Overview










as of July 2025

	Name	netX 52	netX 90	netX 100	HPM5E00	HPM5E00	XMC4300	XMC4800	LAN9252	LAN9253
<p>The ESC functionality of the chips listed in this overview has been developed with the support and authorization of ETG and the EtherCAT licensior.</p> <p>EtherCAT devices based on these chips can obtain a “Conformance Tested” certificate.</p> <p>Using unauthorized chips may lead to problems in the field.</p> <p>Licensees whose chips are released but not yet listed in this overview should contact <a href="mailto:info@ethercat.org">info@ethercat.org</a></p> <p>Trademarks and Patents EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany. Other designations used in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owners.</p> <p>Note: Subject to technical modifications; no responsibility is accepted for the accuracy of this information. The content of all entries within the ESC overview is submitted by ETG members themselves. The ETG members are in charge of sales and support of their products as well as for the content of their entries. ETG therefore disclaims any liability for information contained therein.</p> <p><b>EtherCAT</b> </p>	Type	ASIC	ASIC	ASIC	RISC-V MPU	RISC-V MPU	ARM MPU	ARM MPU	ASIC	ASIC
	Supplier									
	Supplier	Hilscher Gesellschaft für Systemautomation mbH	Hilscher Gesellschaft für Systemautomation mbH	Hilscher Gesellschaft für Systemautomation mbH	HPMicro Semiconductor	HPMicro Semiconductor	Infineon Technologies	Infineon Technologies	Microchip Technology Incorporated	Microchip Technology Incorporated
	Package	PBGA244 1 mm pitch	LFBGA144 0.8 mm pitch	BGA345 1 mm pitch	BGA289 (0.8mm pitch) BGA196 (0.8mm pitch)	BGA196 (0.8mm pitch) BGA121 (0.8mm pitch) eLQFP100 (0.5mm pitch)	100 LQFP (0.5 mm)	100 LQFP (0.5 mm)	64 pin QFN (0.5 mm pitch) 64 pin TQFP-EP (0.5 mm pitch)	64 pin QFN (0.5 mm pitch)
	Size	15 x 15 mm	10 x 10 mm	22 x 22 mm	14 mm x 14 mm 12 mm x 12 mm	12 mm x 12 mm 9 mm x 9 mm 14 mm x 14 mm	16 x 16 mm	20 x 20 mm 16 x 16 mm 12 x 12 mm	9 x9 mm 12 x 12 mm	9 x9 mm
	µC Interface	µC bus (internal, 32bit)	µC bus (internal, 32bit)	µC bus (internal, 32bit)	200MHz µc bus (internal 64bit)	200MHz µc bus (internal 64bit)	µC bus (internal, AHB)	µC bus (internal, AHB)	Host Bus/SPI/SQI	8/16-bit Host Bus/SPI/SQI
	Digital I/O	-	-	-	32	32	-	-	0-16*	0-16*
	General Purpose I/O	24	16	16	Up to 206	Up to 148	0 - 46	0 - 123	0-16*	0-16*
	DPRAM	6 kByte	6 kByte	256/512 Byte (Mailbox/Process Data)	60 kByte	60 kByte	8 kByte	8 kByte	4 kByte	8 kByte
	SyncManager Entities	8	8	4	8	8	8	8	4	8
FMMU Entities	8	8	3	8	8	8	8	3	8	
Distributed Clock Support	yes	yes	yes	Yes	Yes	yes (64 Bit)	yes (64 Bit)	yes	yes	
No. of Ports	2 (100BaseTX)	2 (100BaseTX)	2 (100BaseTX)	3 (MII/RMII/RGMII)	3 (MII/RMII/RGMII)	2 (MII)	2 (MII)	2 (100BaseTX) + opt. 1 (MII)	2 (100BaseTX) + opt. 1 (MII)	
Specials	Multi-protocol support, Integrated PHYs, Integrated µC (ARM9-100MHz)	Multi-protocol support, Integrated PHYs, Integrated µC, OnChip Flash 1,5 Mbytes, OnChip DC-DC Converter, (ARM Cortex M4-100MHz) Additional integrated Application Controller (ARM Cortex M4 - 100 MHz)	Multi-protocol support, Integrated PHYs, Integrated µC (ARM9-200MHz)	600MHz Dual-Core RISC-V CPU 2MB SRAM/Opt 4 MB Flash 4-axis motor controll digital encoder interface (EnDat, BiSS, others, etc) Multi-protocol support w/ 3- port 1Gpbs ENET TSN Switch USB HS OTG/CAN-FD UART/SPI/I2C 4x 16b/2MSPS ADC	480MHz RISC-V CPU 512KB SRAM/1 MB Flash 2-axis motor controll USB HS OTG/CAN-FD UART/SPI/I2C 2x 16b/2MSPS ADC	EtherCAT® node on an ARM® Cortex®-M4 processor with up to 256kB on-chip flash, 128kB on-chip RAM and analog/mixed signal capabilities. Qualified for up to 125°C ambient temperature.	EtherCAT® node on an ARM® Cortex®-M4 processor with up to 2MB on-chip flash, 352kB on- chip RAM and analog/mixed signal capabilities. Qualified for up to 125°C ambient temperature.	Cable Diagnostics, 100FX support, 2 Integrated PHYs, integrated 1.2V regulator	Host EEPROM Emulation support Supports for low-cost 25MHz crystal Cable Diagnostics, Wake on LAN, 2 integrated PHYs, Single Supply operation (3.3V) Integrated 1.2V regulator	
Further information	<a href="https://www.hilscher.com/netx">https://www.hilscher.com/netx</a>	<a href="https://www.hilscher.com/netx">https://www.hilscher.com/netx</a>	<a href="https://www.hilscher.com/netx">https://www.hilscher.com/netx</a>	<a href="https://www.hilscher.com/netx">https://www.hilscher.com/netx</a>	<a href="https://www.hilscher.com/netx">https://www.hilscher.com/netx</a>	<a href="https://www.hilscher.com/netx">https://www.hilscher.com/netx</a>	<a href="http://www.infineon.com/ethercat">www.infineon.com/ethercat</a>	<a href="http://www.infineon.com/ethercat">www.infineon.com/ethercat</a>	<a href="https://www.microchip.com/en-us/product/LAN9252">https://www.microchip.com/en-us/product/LAN9252</a>	<a href="https://www.microchip.com/en-us/product/LAN9253">https://www.microchip.com/en-us/product/LAN9253</a>
Data Sheet	<a href="https://www.hilscher.com/netx">https://www.hilscher.com/netx</a>	<a href="https://www.hilscher.com/netx">https://www.hilscher.com/netx</a>	<a href="https://www.hilscher.com/netx">https://www.hilscher.com/netx</a>	<a href="https://www.hilscher.com/netx">https://www.hilscher.com/netx</a>	<a href="https://www.hilscher.com/netx">https://www.hilscher.com/netx</a>	<a href="https://www.hilscher.com/netx">https://www.hilscher.com/netx</a>	<a href="http://www.infineon.com/ethercat">www.infineon.com/ethercat</a>	<a href="http://www.infineon.com/ethercat">www.infineon.com/ethercat</a>	<a href="https://www.microchip.com/en-us/product/LAN9252">https://www.microchip.com/en-us/product/LAN9252</a>	<a href="https://www.microchip.com/en-us/product/LAN9253">https://www.microchip.com/en-us/product/LAN9253</a>

\*configurable

# EtherCAT SubDevice Controller (ESC) Overview

as of July 2025

Name	LAN9254	LAN9255	N32H765Ix87EC	N32H785Xx87EC	N32H765Ix87EC	N32H785Xx87EC	i.MX RT1180	EC-1	RZ/T1
Type	ASIC	ARM MCU	ARM MCU	ARM MCU	ARM MCU	ARM MCU	ARM MCU	ARM MPU	ARM MPU
Supplier	 MICROCHIP	 MICROCHIP							
Supplier	Microchip Technology Incorporated	Microchip Technology Incorporated	Nations Technologies Inc	Nations Technologies Inc	NSING Technologies Pte	NSING Technologies Pte	NXP Semiconductors	Renesas Electronics Corporation	Renesas Electronics Corporation
Package	80 pin TQFP-EP (0.5 mm pitch)	128 pin TQFP (0.4 mm pitch)	UFPGA176+25 pitch 0.65mm	TFBGA240+25 pitch 0.8mm	UFPGA176+25 pitch 0.65mm	TFBGA240+25 pitch 0.8mm	289 pin MAPBGA (0.8 mm p.) 144 pin MAPBGA (0.8 mm p.)	196 pin BGA (0.8 mm)	FBGA320 0.8 mm pitch
Size	12x12 mm	14x14 mm	10x10 mm	14x14 mm	10x10 mm	14x14 mm	14 x 14 mm 10 x10 mm	12 x 12 mm	17 x 17 mm
µC Interface	8/16-bit Host Bus/SPI/SQI	SPI/SQI up to 60MHz	µC bus (internal, AHB)	µC bus (internal, AHB)	µC bus (internal, AHB)	µC bus (internal, AHB)		USB Host/Function, CAN, SCIFA, I2C RSPi, Flash	16/32-bit parallel and various serial (SPI/I2C/UART)
Digital I/O	0-32*	0-32*	-	-	-	-		-	-
General Purpose I/O	0-32*	0-32*	126 GPIOs	168 GPIOs	126 GPIOs	168 GPIOs		115* GPIOs / 8 Input (port multiplexed, partial 5V-tolerant, open drain, input pull-up)	0-209*
DPRAM	8 kByte	8 kByte	8KB	8KB	8KB	8KB	8 kByte	512 KB (ATCM) with ECC 32 KB (BTCM) with ECC	8 kByte
SyncManager Entities	8	8	8	8	8	8	8	8	8
FMMU Entities	8	8	8	8	8	8	8	8	8
Distributed Clock Support	yes	yes	yes (64 Bit)	yes (64 Bit)	yes (64 Bit)	yes (64 Bit)	yes	yes (64 bit)	yes
No. of Ports	2 (100BaseTX) + opt. 1 (MII)	2 (100BaseTX) + opt. 1 (MII)	2 (MII)	2 (MII)	2 (MII)	2 (MII)	2 (MII)	2 (MII)	2 (RMII/MII)
Specials	Host EEPROM Emulation support Supports for low-cost 25MHz crystal Cable Diagnostics, Wake on LAN, 2 integrated PHYs, Single Supply operation (3.3V) Integrated 1.2V regulator	Integrated SAME53J ARM Cortex-M4F MCU 1MB Programmable Flash Extended Industrial Temperature rated (-40 to +105C) Cable Diagnostics, Wake on LAN, 2 integrated PHYs, Single Supply operation (3.3V) Integrated 1.2V regulator	600MHz ARM Cortex-M7 MCU, 2/4MB on-chip FLASH, 1504KB SRAM + 4KB Backup SRAM, 3 12-bit 5Msps ADCs, 4 high-speed comparators, 6 12-bit DACs, integrated with multiple high-speed U(S)ART, I2C, xSPI, SPI, USBHS Dual Role, CAN-FD, SDRAM, FEMC, SDMMC, Ethernet, supports digital camera interface (DVP), supports TFT-LCD graphical interface, JPEG hardware encoder/decoder, and GPU, built-in high-performance encryption algorithm hardware acceleration engine, supports AES/TDES, SHA, SM4 algorithms, supports TRNG true random number generator, supports CRC8/16/32.	Dual-Core 600MHz ARM Cortex-M7 & 300MHz Cortex-M4 MCU, 2/4MB on-chip FLASH, 1504KB SRAM + 4KB Backup SRAM, 3 12-bit 5Msps ADCs, 4 high-speed comparators, 6 DACs, integrated with multiple high-speed U(S)ART, I2C, xSPI, SPI, USBHS Dual Role, CAN-FD, SDRAM, FEMC, SDMMC, Ethernet, supports digital camera interface (DVP), supports TFT-LCD graphical interface, JPEG hardware encoder/decoder, and GPU, built-in high-performance encryption algorithm hardware acceleration engine, supports AES/TDES, SHA, SM4 algorithms, supports TRNG true random number generator, supports CRC8/16/32.	600MHz ARM Cortex-M7 MCU, 2/4MB on-chip FLASH, 1504KB SRAM + 4KB Backup SRAM, 3 12-bit 5Msps ADCs, 4 high-speed comparators, 6 12-bit DACs, integrated with multiple high-speed U(S)ART, I2C, xSPI, SPI, USBHS Dual Role, CAN-FD, SDRAM, FEMC, SDMMC, Ethernet, supports digital camera interface (DVP), supports TFT-LCD graphical interface, JPEG hardware encoder/decoder, and GPU, built-in high-performance encryption algorithm hardware acceleration engine, supports AES/TDES, SHA, SM4 algorithms, supports TRNG true random number generator, supports CRC8/16/32.	Dual-Core 600MHz ARM Cortex-M7 & 300MHz Cortex-M4 MCU, 2/4MB on-chip FLASH, 1504KB SRAM + 4KB Backup SRAM, 3 12-bit 5Msps ADCs, 4 high-speed comparators, 6 DACs, integrated with multiple high-speed U(S)ART, I2C, xSPI, SPI, USBHS Dual Role, CAN-FD, SDRAM, FEMC, SDMMC, Ethernet, supports digital camera interface (DVP), supports TFT-LCD graphical interface, JPEG hardware encoder/decoder, and GPU, built-in high-performance encryption algorithm hardware acceleration engine, supports AES/TDES, SHA, SM4 algorithms, supports TRNG true random number generator, supports CRC8/16/32.	Multi-protocol support 240 MHz ARM® Cortex®-M33 Core (RT1181) 240 MHz ARM® Cortex®-M33 Core plus 800 MHz ARM® Cortex®-M7 Core (RT1189)	Safety Functions, Multi-Function Pin Controller	Additional Ethernet port (RMII/MII), 2-axis high-speed motion control support, digital encoder interfaces (EnDat, BiSS, others), Multi-protocol support, security option, functional safety support, Cortex-R4F (450/600MHz), Cortex-M3 (150MHz) cores
Further information	<a href="https://www.microchip.com/en-us/products/AN9254">https://www.microchip.com/en-us/products/AN9254</a>	<a href="https://www.microchip.com/en-us/products/AN9255">https://www.microchip.com/en-us/products/AN9255</a>	<a href="https://www.nationtech.com/product/general/32H765Ix87EC">https://www.nationtech.com/product/general/32H765Ix87EC</a>	<a href="https://www.nationtech.com/product/general/32H785Xx87EC">https://www.nationtech.com/product/general/32H785Xx87EC</a>	<a href="https://www.nsing.com.sg/product/General/765Ix87EC">https://www.nsing.com.sg/product/General/765Ix87EC</a>	<a href="https://www.nsing.com.sg/product/General/785Xx87EC">https://www.nsing.com.sg/product/General/785Xx87EC</a>	<a href="https://www.nxp.com/products/i.MX-RT1180">https://www.nxp.com/products/i.MX-RT1180</a>	<a href="https://www.renesas.com/en-eu/ec-1">www.renesas.com/en-eu/ec-1</a>	<a href="https://www.renesas.com/products/inputs/outputs/index.jsp">www.renesas.com/products/inputs/outputs/index.jsp</a>
Data Sheet	<a href="https://www.microchip.com/en-us/products/AN9254">https://www.microchip.com/en-us/products/AN9254</a>	<a href="https://www.microchip.com/en-us/products/AN9255">https://www.microchip.com/en-us/products/AN9255</a>	<a href="https://www.nationtech.com/support/download">https://www.nationtech.com/support/download</a>	<a href="https://www.nationtech.com/support/download">https://www.nationtech.com/support/download</a>	<a href="https://www.nsing.com.sg/api/download/Before765Ix87EC">https://www.nsing.com.sg/api/download/Before765Ix87EC</a>	<a href="https://www.nsing.com.sg/api/download/Before785Xx87EC">https://www.nsing.com.sg/api/download/Before785Xx87EC</a>	<a href="https://www.nxp.com/products/i.MX-RT1180">https://www.nxp.com/products/i.MX-RT1180</a>	<a href="https://www.renesas.com/en-eu/ec-1">https://www.renesas.com/en-eu/ec-1</a>	<a href="https://www.renesas.com/products/inputs/outputs/index.jsp">https://www.renesas.com/products/inputs/outputs/index.jsp</a>











\*configurable

## as of July 2025

\*configurable

# EtherCAT SubDevice Controller (ESC) Overview

as of July 2025

	Name	Sitara AM572xE	Sitara AM65x SoC	Sitara AM64x SoC	Sitara AM243x SoC	Sitara AM263x SoC	TR8211	TR8253	ANTAiOS	TRITON	
<p>The ESC functionality of the chips listed in this overview has been developed with the support and authorization of ETG and the EtherCAT licensor.</p> <p>EtherCAT devices based on these chips can obtain a “Conformance Tested” certificate.</p> <p>Using unauthorized chips may lead to problems in the field.</p>	Type	ARM MPU	ARM MPU	ARM MPU	ARM MCU	ARM MCU	ASIC	ASIC	ARM MPU	ARM MPU	
	Supplier	 TEXAS INSTRUMENTS	 TEXAS INSTRUMENTS	 TEXAS INSTRUMENTS	 TEXAS INSTRUMENTS	 TEXAS INSTRUMENTS	 创耀科技	 创耀科技	 YASKAWA	 YASKAWA	
	Supplier	Texas Instruments Incorporated	Texas Instruments Incorporated	Texas Instruments Incorporated	Texas Instruments Incorporated	Texas Instruments Incorporated	Triductor Technology (Suzhou) Inc.	Triductor Technology (Suzhou) Inc.	Yaskawa Europe GmbH	Yaskawa Europe GmbH	
	Package	760-pin FCBGA 0.8 mm pitch	784-pin S-PBGA 0.8mm pitch	441-pin FCBGA 0.8mm pitch	441-pin FCBGA 0.8mm pitch / 293-pin FCCSP 0.5mm pitch via channel array	324-pin NFBGA 0.8mm pitch	TQFP-100, 14x14mm, 0.5pitch / TFBGA-128, 10x10mm, 0.8pitch	QFN-64, 9x9mm, 0.5pitch / LGA-64, 9x9mm, 0.5pitch	TFBGA-380 (0.65 mm pitch) TFBGA-385 (0.8 mm pitch)	FCBGA-784 (0.8 mm pitch)	
	Size	23 x 23 mm	23mmx23mm	17.2mmx17.2mm	17.2mmx17.2mm / 11mmx11mm	15mmx15mm	TR8211: 14x14 mm TR8211K: 10x10 mm	TR8253: 9x9 mm TR8253L: 9x9 mm	15 mm x 15 mm 19 mm x 19 mm	23 mm x 23 mm	
<p>Licensees whose chips are released but not yet listed in this overview should contact <a href="mailto:info@ethercat.org">info@ethercat.org</a></p> <p>Trademarks and Patents EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany. Other designations used in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owners.</p> <p>Note: Subject to technical modifications; no responsibility is accepted for the accuracy of this information. The content of all entries within the ESC overview is submitted by ETG members themselves. The ETG members are in charge of sales and support of their products as well as for the content of their entries. ETG therefore disclaims any liability for information contained therein.</p> <div></div>	µC Interface	200 MHz interconnect (internal, 32bit)	250MHz interconnect (internal, 256bit)	250MHz interconnect (internal, 128bit)	250MHz interconnect (internal, 128bit), SPI (external)	200MHz interconnect (internal, 64bit)	SPI/SQI Slave HBI (8/16-bit Multiplexed/Indexed)	SPI/SQI Slave HBI (8/16-bit Multiplexed/Indexed)	SPI / QSPI / 16 Bit asynchronous interface	SPI / QSPI / 16 Bit asynchronous interface	
	Digital I/O	8	8	8	8	8	Aug 32	0-16	26Bits Input, 20bits Output	32Bits Input, 22Bits Output	
	General Purpose I/O	> 32	>32	>32	>32	>32	0-16	0-16	up to 32	up to 32	
	DPRAM	28 kByte	60 kByte	60 kByte	60 kByte	28 kByte	8 kByte	8 kByte	up to 64 kByte	up to 64 kByte	
	SyncManager Entities	8	8	8	8	8	8	8	8	8	
	FMMU Entities	8	8	8	8	8	8	8	8	8	
	Distributed Clock Support	yes	yes	yes	yes	yes	yes (64-bit)	yes (64-bit)	yes (64 bit)	yes (64 bit)	
	No. of Ports	2 (MII)	2 (MII)	2 (MII)	2 (MII)	2 (MII)	2-3 (MII)	2 (100BaseTX) + opt. 1 (MII)	2 (100BaseTX) or 2 (MII)	4 Gbit Ethernet port	
	Specials	Dual Industrial Communications Subsystem (PRU-ICSS) for multi-protocol support (2 EtherCAT slave instances or EtherCAT slave to protocol gateway), 2D/3D Graphics, Display subsystem, Video acceleration, PCIe, SATA, Optional secure boot, 2x ARM Cortex-A15 (upto 1.5 GHz), 2x M4 cores, 2x C66x DSP cores	Entire ESC can be implemented on internal memory (no external DDR needed), 3x Gigabit Industrial Communications Subsystem (PRU_ICSSG) for multi-protocol support (up to 3 EtherCAT slave instances), PRU_ICSSG also supports Motor Control functionality (Encoder feedback such as Hiperface-DSL and EnDat and Sigma Delta filtering), up to 4x Arm Cortex-A53 cores at 1.1GHz, 2x Cortex-R5F core at 400MHz with optional lock-step for functional safety or other purposes, 2MB on-chip SRAM	Entire ESC can be implemented on internal memory (no external DDR needed), Dual Gigabit Industrial Communications Subsystem (PRU_ICSSG) for multi-protocol support (2 EtherCAT slave instances or EtherCAT slave to protocol gateway), PRU_ICSSG also supports Motor Control functionality (Encoder feedback such as Hiperface-DSL and EnDat and Sigma Delta filtering), up to 4x Arm Cortex-R5F cores at 800MHz, up to 2x Cortex-A53 cores at 1GHz, 1x Cortex-M4 core at 400MHz for functional safety or other purposes, 2MB on-chip SRAM	Entire ESC can be implemented on internal memory (no external DDR needed), Dual Gigabit Industrial Communications Subsystem (PRU_ICSSG) for multi-protocol support (2 EtherCAT slave instances or EtherCAT slave to protocol gateway), PRU_ICSSG also supports Motor Control functionality (Encoder feedback such as Hiperface-DSL and EnDat and Sigma Delta filtering), up to 4x Arm Cortex-R5F cores at 800MHz, 1x Cortex-M4 core at 400MHz for functional safety or other purposes, 2MB on-chip SRAM	Entire EtherCAT slave controller can be implemented on internal memory, Industrial Communications Subsystem (PRU_ICSS), PRU_ICSS also supports Motor Control functionality (Encoder feedback such as Hiperface-DSL and EnDat and Sigma Delta filtering), up to 4x Arm Cortex-R5F cores at 400MHz, 2MB on-chip SRAM	Configurable clock output for external MCU, Configurable MII TX signal phase shift (0-30ns), Single Supply operation (3.3V), Integrated voltage regulator for logic core/PLL	Built-in 100Mbps fast Ethernet PHYs (Support for automatic detection and switching of cross lines i.e. HP Auto MDIX), 25MHz clock output for external MCU, LED polarity and EEPROM size configuration supported, Single Supply operation (3.3V)	Multi fieldbus protocol support, 2 x integrated PHYs, 1 x integrated GBit Ethernet MAC, Integrated ARM® Cortex®-A5 (288MHz), Backplane communication: SliceBus master for profichip's SNAP+ ASIC, Integrated technology module (2xSII / 4xPWM / 4xCounter), QuadSPI interface (e.g. NOR Flash for firmware), DDR2 external memory interface, Other external interfaces: SD/MMC, NAND, USB2 device, SRAM master/slave, SPI master/slave	Multi fieldbus protocol support, 2 port Real-Time Ethernet switch with integrated PHYs, 2x integrated GBit Ethernet MAC, 3 Integrated ARM® Cortex®-A17 (1.26GHz), Secure Core, Backplane communication: SliceBus master for profichip's SNAP+ ASIC, Integrated technology module (2xSII / 4xPWM / 4xCounter), QuadSPI interface (e.g. NOR Flash for firmware), DDR4 external memory interface, 3 PCI Express® Controller, Other external interfaces: 3 SD/MMC, NAND, USB2 device, SRAM master/slave, SPI master/slave	
	Further information	<a href="http://www.ti.com/product/AM5728">www.ti.com/product/AM5728</a>	<a href="http://www.ti.com/product/am6548">www.ti.com/product/am6548</a>	<a href="http://www.ti.com/product/am6442">www.ti.com/product/am6442</a>	<a href="http://www.ti.com/product/am2434">www.ti.com/product/am2434</a>	<a href="http://www.ti.com/product/am2634">www.ti.com/product/am2634</a>	<a href="https://www.triductor.com/product-5.html">https://www.triductor.com/product-5.html</a>	<a href="https://www.triductor.com/product-5.html">https://www.triductor.com/product-5.html</a>	<a href="https://www.triductor.com/product-5.html">https://www.triductor.com/product-5.html</a>	<a href="https://www.yaskawa.com/en/automation/robotics/robot-controllers/ethercat/">https://www.yaskawa.com/en/automation/robotics/robot-controllers/ethercat/</a>	<a href="https://www.yaskawa.com/en/automation/robotics/robot-controllers/ethercat/">https://www.yaskawa.com/en/automation/robotics/robot-controllers/ethercat/</a>
	Data Sheet	<a href="http://www.ti.com/lit/ds/symlink/am5728.pdf">www.ti.com/lit/ds/symlink/am5728.pdf</a>	<a href="http://www.ti.com/product/am6548/datasheet">http://www.ti.com/product/am6548/datasheet</a>	<a href="http://www.ti.com/product/am6442/datasheet">http://www.ti.com/product/am6442/datasheet</a>	<a href="http://www.ti.com/product/am2434/datasheet">http://www.ti.com/product/am2434/datasheet</a>	<a href="http://www.ti.com/product/am2634/datasheet">http://www.ti.com/product/am2634/datasheet</a>	<a href="https://www.triductor.com/product-5.html">https://www.triductor.com/product-5.html</a>	<a href="https://www.triductor.com/product-5.html">https://www.triductor.com/product-5.html</a>	<a href="https://www.triductor.com/product-5.html">https://www.triductor.com/product-5.html</a>	<a href="https://www.yaskawa.com/en/automation/robotics/robot-controllers/ethercat/">https://www.yaskawa.com/en/automation/robotics/robot-controllers/ethercat/</a>	<a href="https://www.yaskawa.com/en/automation/robotics/robot-controllers/ethercat/">https://www.yaskawa.com/en/automation/robotics/robot-controllers/ethercat/</a>

\*configurable