
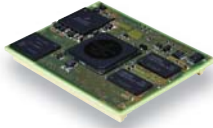










ARM® Low-Power and NXP QorIQ™ Modules

Quick Reference

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Module	TQMa28	TQMa53	TQMa335x	TQMa6S	TQMa6D
Partner	NXP	NXP	Texas Instruments	NXP	NXP
Processor*	i.MX287 ARM926™ 450 MHz	i.MX537 ARM® Cortex®-A8 800 MHz	AM3352/3354/3359 ARM® Cortex®-A8 800 MHz	Single Core i.MX6 ARM® Cortex®-A9 800 MHz	Dual Core i.MX6 ARM® Cortex®-A9 800 MHz
Memory*	Up to 256 MB DDR2 4GB eMMC Flash 64 KB EEPROM	Up to 1G DDR3 4 GB eMMC Flash 64 KB EEPROM	256 MB DDR3L 4 GB eMMC Flash 64 KB EEPROM Up to 128 MB NOR Flash	512 GB DDR3L 4 GB eMMC Flash 64 KB EEPROM Up to 128 MB NOR Flash	1 GB DDR3L 4 GB eMMC Flash 64 KB EEPROM Up to 128 MB NOR Flash
System Interfaces	2x Ethernet 10/100 (L2 Switch) 1x USB 2.0 High-Speed OTG 1x USB 2.0 High-Speed HOST Up to 2x CAN 2.0B Up to 2x I ² C Up to 2x SPI Up to 2x SSI/I ² S Up to 5x UART	1x Ethernet 10/100 Mbit (IEEE 1588) 1x USB 2.0 OTG 2x USB 2.0 Host 2x FlexCAN ESAI Up to 2x I ² C SATA SPDIF Up to 3x CSPI Up to 3x SSI/I ² C Up to 5x UART	Up to 1x Gigabit Ethernet - L2 Switch (IEEE 1588) 2x USB 2.0 High-Speed OTG Up to 2x CAN 2.0B Up to 3x I ² C Up to 2x McASP (4ch) Up to 2x SPI Up to 6x UART	Up to 1x Gigabit Ethernet (IEEE 1588) 1x USB 2.0 High-Speed OTG 1x USB 2.0 High-Speed HOST Up to 2x USB HSIC Up to 2x FlexCAN Up to 2x I ² C SATA SPDIF Up to 5x SPI Up to 3x SSI/I ² S Up to 5x UART ESAI	Up to 1x Gigabit Ethernet (IEEE 1588) 1x USB 2.0 High-Speed OTG 1x USB 2.0 High-Speed HOST Up to 2x USB HSIC Up to 2x FlexCAN Up to 2x I ² C SATA SPDIF Up to 5x SPI Up to 3x SSI/I ² S Up to 5x UART ESAI
Other Interfaces	Up to 8x 12-bit ADC CPU JTAG Interface GPIO Up to 8x PWM	CPU JTAG Interface 1x 16-bit Camera Interface	Up to 8x 12-bit ADC CPU JTAG Interface GPIO Up to 3x PWM	CPU JTAG Interface PCIe 2x 16-bit Camera Interface	CPU JTAG Interface PCIe
Graphics	24-bit TFT Interface	Analog VGA Parallel 1x 24-bit (RGB) UXGA Dual LVDS UXGA	24-bit TFT Interface	DVI (HDMI) Parallel 2x 24-bit (RGB) Dual LVDS	DVI (HDMI) Parallel 2x 24-bit (RGB) Dual LVDS
OS	Linux, WinCE 6, QNX	Linux, QNX	Linux, QNX, WEC2013	Linux, QNX, VX Works	Linux, QNX, VX Works
Power Supply	5V	5V	3.3V	5V	5V
Power Consump.	Typically 1W	Typically 3W	Typically 2W	Typically 4W	Typically 4W
Temp.	-25°C to +85°C -40°C to +85°C on request	-25°C to +85°C -40°C to +85°C on request	-25°C to +85°C -40°C to +85°C on request	-25°C to +85°C -40°C to +85°C on request	-25°C to +85°C -40°C to +85°C on request
Size	40 mm x 26 mm	55 mm x 44 mm	54 mm x 38 mm	70 mm x 46 mm	70 mm x 46 mm







ARM® Low-Power and NXP QorIQ™ Modules

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TQMa6Q	TQMLS102xA	Module TQMP1020	TQMP2020	TQMT1042 (Q2 2016)
NXP	NXP	Partner NXP	NXP	NXP
Quad Core i.MX6 ARM® Cortex®-A9 800 MHz	“Layerscape” LS102xA Dual ARM® Cortex®-A7 Up to 800 MHz	Processor* P1020 Dual Core QorIQ™ Power Architecture® 800 MHz	P2020 Dual Core QorIQ™ Power Architecture® Up to 1.0 GHz	T1042 Quad Core QorIQ™ Power Architecture® 1.4 GHz
1 GB DDR3L 4 GB eMMC Flash 64 KB EEPROM Up to 128 MB NOR Flash	Up to 1 GB DDR3L Up to 64 MB NOR Flash 64 KB EEPROM	Memory* 1 GB DDR3 128 MB NOR Flash 32 KB EEPROM	512 MB DDR3 128 MB NOR Flash 32 KB EEPROM	2 GB DDR3L 128 MB NOR Flash 32 KB EEPROM Up to 8 GB eMMC Flash (optional)
Up to 1x Gigabit Ethernet (IEEE 1588) 1x USB 2.0 High-Speed OTG 1x USB 2.0 High-Speed HOST Up to 2x USB HSIC Up to 2x FlexCAN Up to 2x I²C SATA SPDIF Up to 5x SPI Up to 3x SSI/I²S Up to 5x UART ESAI	Up to 3x Gigabit Ethernet (IEEE 1588) 1x USB 3.0 High-Speed HOST 1x USB 2.0 High-Speed OTG Up to 4x FlexCAN Up to 3x I²C Up to 1x SATA 3.0 SPDIF Up to 2x SPI Up to 4x SSI/I²S Up to 6x UART	System Interfaces 3x Gigabit Ethernet (IEEE 1588 v2) 1x USB 2.0 HOST with ULPI interface 2x I²C (max 400 kHz) 1x DUART, max 115 kBaud (RS232) 1x SPI	3x Gigabit Ethernet (IEEE 1588 v2) 1x USB 2.0 HOST with ULPI interface 2x I²C (max 400 kHz) 1x DUART, max 115 kBaud (RS232) 1x SPI	5x Gigabit Ethernet (IEEE 1588 v2) 2x USB 2.0 HOST/Device/ OTG 4x I²C (max. 400 kHz) 2x DUART, max 115 kBaud (RS232) 2x SATA 2.0 1x eSPI controller
CPU JTAG Interface PCIe	CPU JTAG Interface Up to 2x PCIe	Other Interfaces JTAG Interface Up to 16 GPIO 2x PCIe 1.0a 1x TDM 2x Serial RapidIO	JTAG Interface Up to 16 GPIO Local bus frequency: 16-bit enhanced/up to 66 MHz Up to 2x PCIe 1.0a 1x TDM Up to 2x Serial RapidIO	JTAG Interface Real-Time Debug Interface (Aurora) Up to 32x GPIOs 4x PCIe 2.0 1x TDM
DVI (HDMI) Parallel 2x 24-bit (RGB) Dual LVDS	LCD (only LS1021A)	Graphics None	None	LCD/TFT (up to 24-bit RGB)
Linux, QNX, VX Works	Linux	OS Linux, QNX	Linux, QNX	Linux
5V	3.3V	Power Supply 3.3V	3.3V	5V
Typically 4W	Typically 3W	Power Consump. Typically 3.5 - 5W	Typically 5 - 7W	Typically 5 - 7W
-25°C to +85°C -40°C to +85°C on request	-40°C to +85°C	Temp. -40°C to +85°C	-40°C to +85°C	-40°C to +85°C
70 mm x 46 mm	55 mm x 44 mm	Size 74 mm x 54 mm	74 mm x 54 mm	74 mm x 54 mm

* Different processor speeds and memory sizes are available.

COM Express® Intel® Atom™ and Intel® Core™ i3/i5/i7 Modules - Quick Reference

	 Page 28-29	 Page 28-29	 Page 28-29	 Page 28-29	 Page 28-29	 Page 28-29
Module	TQMxE38M-AA (Premium I-Temp)	TQMxE38M-AG (Premium)	TQMxE38M-AB (Mainstream)	TQMxE38M-AF (Mainstream Light)	TQMxE38M-AE (Light)	TQMxE38M-AC (Entry Level)
Partner	Intel	Intel	Intel	Intel	Intel	Intel
Processor	Atom™ E3845 Quad Core Up to 1.91 GHz	Atom™ E3845 Quad Core Up to 1.91 GHz	Atom™ E3827 Dual Core 1.75 GHz	Atom™ E3827 Dual Core 1.75 GHz	Atom™ E3825 Dual Core 1.33 GHz	Atom™ E3815 Single Core 1.46 GHz
Memory	2 MB L2-Cache 4 GB DDR3L-1333 ECC (soldered) 1x SD Card Interface	2 MB L2-Cache 4 GB DDR3L-1333 ECC (soldered) 1x SD Card Interface	1 MB L2-Cache 4 GB DDR3L-1333 ECC (soldered) 1x SD Card Interface	1 MB L2-Cache 2 GB DDR3L-1333 ECC (soldered) 1x SD Card Interface	1 MB L2-Cache 2 GB DDR3L-1066 ECC (soldered) 1x SD Card Interface	512 KB L2-Cache 2 GB DDR3L-1066 ECC (soldered) 1x SD Card Interface
System Interfaces	1x Gigabit Ethernet (Intel® i210) 1x I ² C 2x SATA 2.0 (up to 3 Gb/s) 3x Serial Port (Rx/Tx) 1x SPI 1x USB 3.0 3x USB 2.0	1x Gigabit Ethernet (Intel® i210) 1x I ² C 2x SATA 2.0 (up to 3 Gb/s) 3x Serial Port (Rx/Tx) 1x SPI 1x USB 3.0 3x USB 2.0	1x Gigabit Ethernet (Intel® i210) 1x I ² C 2x SATA 2.0 (up to 3 Gb/s) 3x Serial Port (Rx/Tx) 1x SPI 1x USB 3.0 3x USB 2.0	1x Gigabit Ethernet (Intel® i210) 1x I ² C 2x SATA 2.0 (up to 3 Gb/s) 3x Serial Port (Rx/Tx) 1x SPI 1x USB 3.0 3x USB 2.0	1x Gigabit Ethernet (Intel® i210) 1x I ² C 2x SATA 2.0 (up to 3 Gb/s) 3x Serial Port (Rx/Tx) 1x SPI 1x USB 3.0 3x USB 2.0	1x Gigabit Ethernet (Intel® i210) 1x I ² C 2x SATA 2.0 (up to 3 Gb/s) 3x Serial Port (Rx/Tx) 1x SPI 1x USB 3.0 3x USB 2.0
Other Interfaces	1x Intel® HD Audio (HDA) 1x LPC Bus 3x PCIe 2.0 (up to 5 Gb/s) 1x SMBus	1x Intel® HD Audio (HDA) 1x LPC Bus 3x PCIe 2.0 (up to 5 Gb/s) 1x SMBus	1x Intel® HD Audio (HDA) 1x LPC Bus 3x PCIe 2.0 (up to 5 Gb/s) 1x SMBus	1x Intel® HD Audio (HDA) 1x LPC Bus 3x PCIe 2.0 (up to 5 Gb/s) 1x SMBus	1x Intel® HD Audio (HDA) 1x LPC Bus 3x PCIe 2.0 (up to 5 Gb/s) 1x SMBus	1x Intel® HD Audio (HDA) 1x LPC Bus 3x PCIe 2.0 (up to 5 Gb/s) 1x SMBus
Graphics	Intel® HD Graphics 542/792 MHz 2x Digital Display Interface (DDI)	Intel® HD Graphics 542/792 MHz 2x Digital Display Interface (DDI)	Intel® HD Graphics 542/792 MHz 2x Digital Display Interface (DDI)	Intel® HD Graphics 542/792 MHz 2x Digital Display Interface (DDI)	Intel® HD Graphics 533/533 MHz 2x Digital Display Interface (DDI)	Intel® HD Graphics 400/400 MHz 2x Digital Display Interface (DDI)
TPM	TPM 1.2	TPM 1.2	none	none	none	none
OS	Linux, Windows	Linux, Windows	Linux, Windows	Linux, Windows	Linux, Windows	Linux, Windows
Power Supply	4.75V - 20V	4.75V - 20V	4.75V - 20V	4.75V - 20V	4.75V - 20V	4.75V - 20V
Power Consump.	Typically 10W	Typically 10W	Typically 8W	Typically 8W	Typically 6W	Typically 5W
Temp.	-40°C to +85°C	0°C to +60°C	0°C to +60°C	0°C to +60°C	0°C to +60°C	0°C to +60°C
Size	COM Express® Mini, Type 10, 84mm x 55mm	COM Express® Mini, Type 10, 84mm x 55mm	COM Express® Mini, Type 10, 84mm x 55mm	COM Express® Mini, Type 10, 84mm x 55mm	COM Express® Mini, Type 10, 84mm x 55mm	COM Express® Mini, Type 10, 84mm x 55mm

COM Express Intel® Atom™ and Intel® Core™ i3/i5/i7 Modules - Quick Reference

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TQMxE38M-AD (Gateway I-Temp)	TQMxE38C-AA (Premium I-Temp)	TQMxE38C-AB (Mainstream Light)	Module TQMx50UC-AA (Entry Level)	TQMx50UC-AB (Mainstream)	TQMx50UC-AC (Premium)
Intel	Intel	Intel	Partner Intel	Intel	Intel
Atom™ E3805 Dual Core 1.33GHz	Atom™ E3845 Quad Core 1.91 GHz	Atom™ E3827 Quad Core 1.75 GHz	Processor Core™ i3-5010U Dual Core Up to 2x 2.1 GHz	Core™ i5-5350U Dual Core 2x 1.8 GHz / 2.9 GHz Turbo	Core™ i7-5650U Dual Core 2x 2.2 GHz / 3.2 GHz Turbo
1 GB L2-Cache 2 GB DDR3L-1066 ECC (soldered) 1x SD Card Interface	2 MB L2-Cache 4 GB DDR3L-1066 ECC (soldered) 1x SD Card Interface	1 MB L2-Cache 2 GB DDR3L-1066 ECC (soldered) 1x SD Card Interface	Memory 3 MB L2-Cache 4 GB DDR3L-1600 (soldered)	3 MB L2-Cache 4 GB DDR3L-1600 (soldered)	4 MB L2-Cache 8 GB DDR3L-1600 (soldered)
System Interfaces 1x Gigabit Ethernet (Intel® i210) 1x I ² C 2x SATA 2.0 (up to 3 Gb/s) 3x Serial Port (Rx/Tx) 1x SPI 1x USB 3.0 3x USB 2.0	1x Gigabit Ethernet (Intel® i210) 1x I ² C 2x SATA 2.0 (up to 3 Gb/s) 2x Serial Port (Rx/Tx) 1x SPI 1x USB 3.0 7x USB 2.0	1x Gigabit Ethernet (Intel® i210) 1x I ² C 2x SATA 2.0 (up to 3 Gb/s) 2x Serial Port (Rx/Tx) 1x SPI 1x USB 3.0 7x USB 2.0	System Interfaces 1x Gigabit Ethernet (Intel® i218-LM) with IEEE 1588 1x I ² C 4x SATA Gen3 (up to 6 Gb/s) 2x Serial Port (Rx/Tx) 1x SPI 2x USB 3.0 8x USB 2.0	1x Gigabit Ethernet (Intel® i218-LM) with IEEE 1588 1x I ² C 4x SATA Gen3 (up to 6 Gb/s) 2x Serial Port (Rx/Tx) 1x SPI 2x USB 3.0 8x USB 2.0	1x Gigabit Ethernet (Intel® i218-LM) with IEEE 1588 1x I ² C 4x SATA Gen3 (up to 6 Gb/s) 2x Serial Port (Rx/Tx) 1x SPI 2x USB 3.0 8x USB 2.0
1x Intel® HD Audio (HDA) 1x LPC Bus 3x PCIe 2.0 (up to 5 Gb/s) 1x SMBus	1x Intel® HD Audio (HDA) 1x LPC Bus 3x PCIe 2.0 (up to 5 Gb/s) 1x SMBus	1x Intel® HD Audio (HDA) 1x LPC Bus 3x PCIe 2.0 (up to 5 Gb/s) 1x SMBus	Other Interfaces 1x Intel® HD Audio (HDA) 8x GPIO 1x LPC Bus 4x PCIe 2.0 (up to 5 Gb/s) 1x SMBus	1x Intel® HD Audio (HDA) 8x GPIO 1x LPC Bus 4x PCIe 2.0 (up to 5 Gb/s) 1x SMBus	1x Intel® HD Audio (HDA) 8x GPIO 1x LPC Bus 4x PCIe 2.0 (up to 5 Gb/s) 1x SMBus
none	2x Digital Display Interface (DDI)	2x Digital Display Interface (DDI)	Graphics Intel® HD Graphics 5500 300/900 MHz 2x Digital Display Interface LVDS (18/24-bit, Single/ Dual Channel)	Intel® HD Graphics 6000 300 MHz / 1 GHz 2x Digital Display Interface LVDS (18/24-bit, Single/ Dual Channel)	Intel® HD Graphics 6000 300 MHz / 1 GHz 2x Digital Display Interface LVDS (18/24-bit, Single/ Dual Channel)
TPM 1.2	TPM 1.2	none	TPM none	TPM 1.2 / 2.0	TPM 1.2 / 2.0
Linux, Windows	Linux, Windows	Linux, Windows	OS Linux, Windows	Linux, Windows	Linux, Windows
4.75V - 20V	4.75V - 20V	4.75V - 20V	Power Supply 8.5V - 20V	8.5V - 20V	8.5V - 20V
Typically 3W	Typically 10W	Typically 8W	Power Consump. Typically 10W	Typically 10W	Typically 10W
-40°C to +85°C	-40°C to +85°C	0°C to +60°C	Temp. 0°C to +60°C	0°C to +60°C	0°C to +60°C
COM Express® Mini, Type 10, 84mm x 55mm	COM Express® Compact, Type 6, 95mm x 95mm	COM Express® Compact, Type 6, 95mm x 95mm	Size COM Express® Compact, Type 6, 95mm x 95mm	COM Express® Compact, Type 6, 95mm x 95mm	COM Express® Compact, Type 6, 95mm x 95mm

* Different processor speeds and memory sizes are available.