TQMa67xxL
User's Manual

TQMa67xxL UM 0100
27.03.2026

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REVISION HISTORY

Rev.	Date	Name	Pos.	Modification
0100	26.03.2026	M. Kreuzer		Initial release

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1.6 Tips on safety

Improper or incorrect handling of the product can substantially reduce its life span.

1.7 Symbols and typographic conventions

Table 1: Terms and Conventions

Symbol	Meaning
	This symbol represents the handling of electrostatic-sensitive devices and / or components. These components are often damaged / destroyed by the transmission of a voltage higher than about 50 V. A human body usually only experiences electrostatic discharges above approximately 3,000 V.
	This symbol indicates the possible use of voltages higher than 24 V. Please note the relevant statutory regulations in this regard. Non-compliance with these regulations can lead to serious damage to your health and also cause damage / destruction of the component.
	This symbol indicates a possible source of danger. Acting against the procedure described can lead to possible damage to your health and / or cause damage / destruction of the material used.
	This symbol represents important details or aspects for working with TQ-products.
`Command`	A font with fixed-width is used to denote commands, file names, or menu items.

1.8 Handling and ESD tips

General handling of your TQ-products

	The TQ-product may only be used and serviced by certified personnel who have taken note of the information, the safety regulations in this document and all related rules and regulations. A general rule is: do not touch the TQ-product during operation. This is especially important when switching on, changing jumper settings or connecting other devices without ensuring beforehand that the power supply of the system has been switched off. Violation of this guideline may result in damage / destruction of the TQMa67xxL and be dangerous to your health. Improper handling of your TQ-product would render the guarantee invalid.

Proper ESD handling

	The electronic components of your TQ-product are sensitive to electrostatic discharge (ESD). Always wear antistatic clothing, use ESD-safe tools, packing materials etc., and operate your TQ-product in an ESD-safe environment. Especially when you power up the TQMa67xxL or the Starterkit, change jumper settings, or connect other devices.

1.9 Naming of signals

A hash mark (#) at the end of the signal name indicates a low-active signal.
Example: RESET#

If a signal can switch between two functions and if this is noted in the name of the signal, the low-active function is marked with a hash mark and shown at the end.
Example: C / D#

If a signal has multiple functions, the individual functions are separated by slashes when they are important for the wiring.
The identification of the individual functions follows the above conventions.
Example: WE2# / OE#

1.10 Further applicable documents / presumed knowledge

- **Specifications and manuals of the modules used:**
  These documents describe the service, functionality and special characteristics of the module used (incl. BIOS).
- **Specifications of the components used:**
  The manufacturer's specifications of the components used, for example CompactFlash cards, are to be taken note of. They contain, if applicable, additional information that must be taken note of for safe and reliable operation.
  These documents are stored at TQ-Systems GmbH.
- **Chip errata:**
  It is the user's responsibility to make sure all errata published by the manufacturer of each component are taken note of. The manufacturer's advice should be followed.
- **Software behaviour:**
  No warranty can be given, nor responsibility taken for any unexpected software behaviour due to deficient components.
- **General expertise:**
  Expertise in electrical engineering / computer engineering is required for the installation and the use of the device.

The following documents are required to fully comprehend the following contents:

- MBa67xx circuit diagram
- MBa67xx User's Manual
- Jacinto™ AM67x Data Sheet
- U-Boot documentation: www.denx.de/wiki/U-Boot/Documentation
- PTXdist documentation: www.ptxdist.de
- TQ-Support Wiki: support.tq-group.com/doku.php?id=en:arm:tqmax67xxL

2. BRIEF DESCRIPTION

The TQMa67xxL is a universal TQ mini module based on the TI Jacinto family AM67x with ARM Cortex A53, Cortex R5F and C7 DSP cores.

This User's Manual describes the hardware of the TQMa67xxL Rev.020x and refers to some software settings.

It does not replace the AM67x Reference Manual (2).

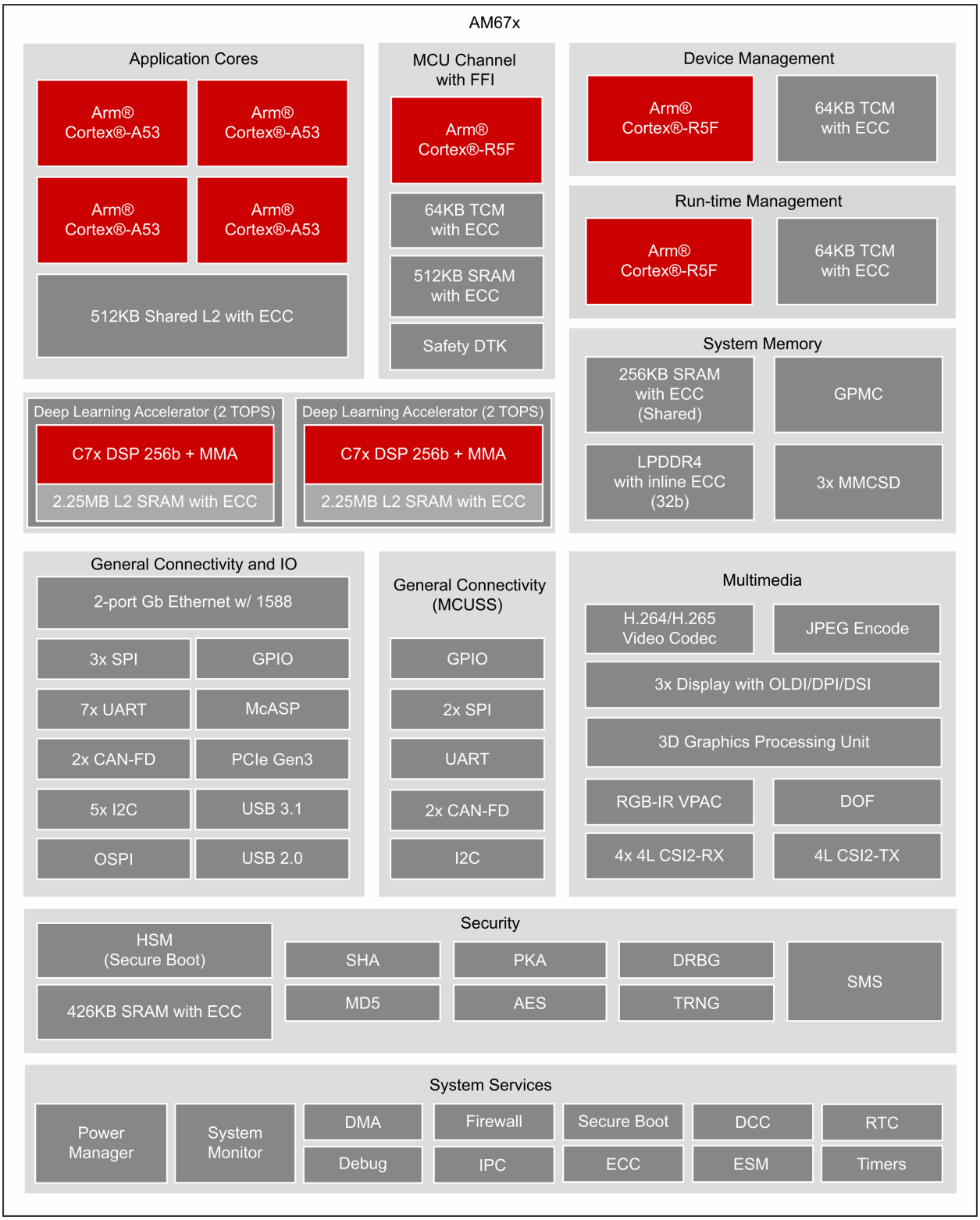


Figure 1: Block diagram AM67x

(Source: Texas Instruments)

All useful AM67x signals are routed to the TQMa67xxL LGA-pads. There are no restrictions for customers using the TQMa67xxL with respect to an integrated customised design.
Please take note of that not all interfaces can be used simultaneously.

3. ELECTRONICS

The information provided in this User's Manual is only valid in connection with the tailored boot loader, which is preinstalled on the TQMa67xxL, and the BSP provided by TQ-Systems GmbH, see also section 4.

3.1 System overview

3.1.1 System architecture / block diagram

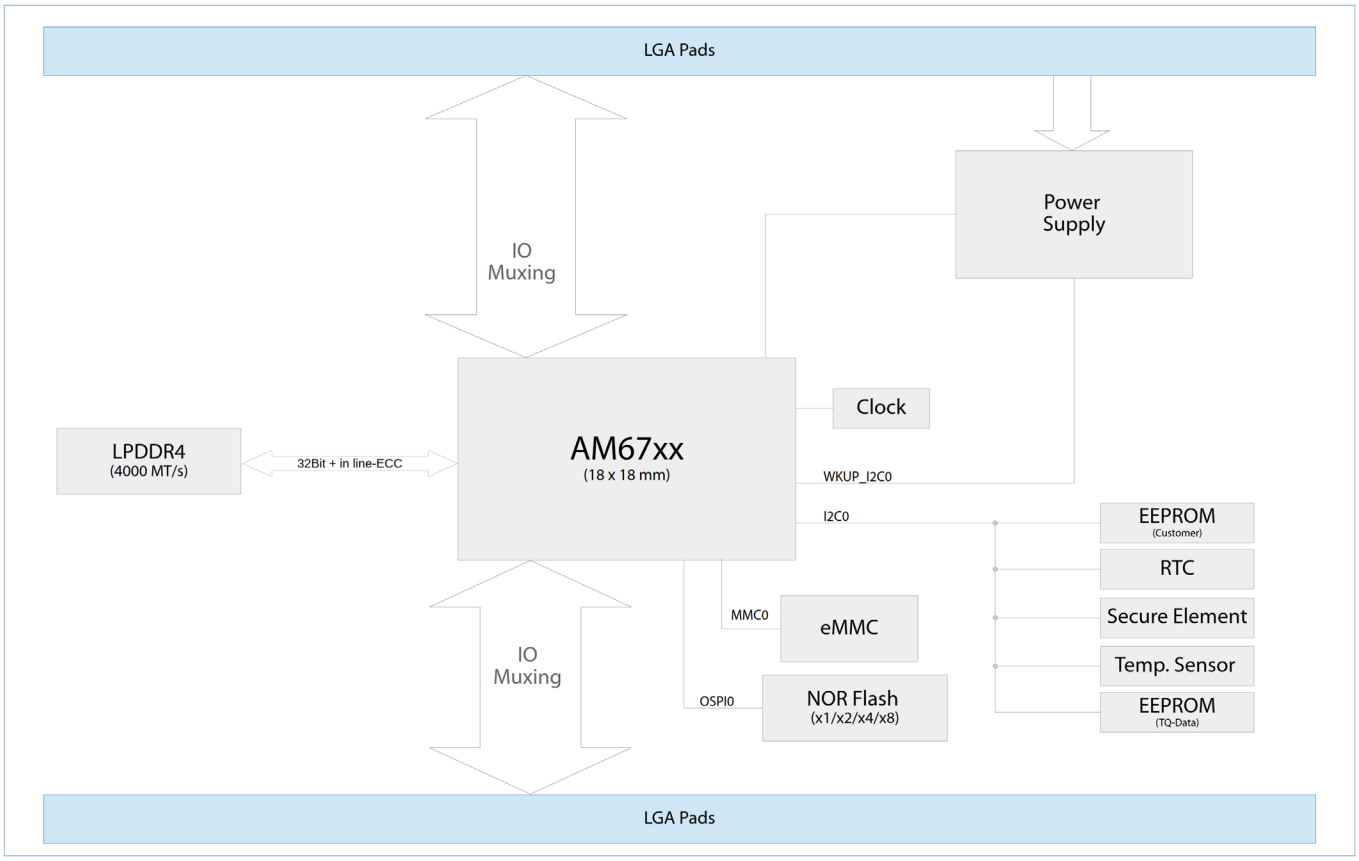


Figure 2: Block diagram TQMa67xxL

3.1.2 Functionality

The following key functions are implemented on the TQMa67xxL:

- Minimodule in form factor 44 mm x 44 mm
- AM67x processor (up to 4 x A53 and 1x R5F)
- Deep Learning Accelerator with up to 2 x C7x DSP and MMA
- Up to 8 GByte LPDDR4 memory with/without in-line ECC
- Up to 128 GByte eMMC Flash
- Up to 256 Mbyte QSPI Flash (optional)
- Up 64 Kbit customer EEPROM
- 2 Kbit TQ factory EEPROM
- Real-time clock (optional)
- Secure Element chip (optional)
- Temperature sensor (optional)
- Single Power Supply 5.0 V
- Availability of all essential signals of the AM67x at the module LGA-pads

3.1.3 Pin multiplexing

The pin multiplexing of the AM67x permits to use many pins for different interfaces.
The information provided in this User's Manual is based on the BSP provided by TQ-Systems GmbH.

Attention: Destruction or malfunction	
	Many AM67x pins can be configured as different function. Please take note of the information in the AM67 data sheet (1) concerning the configuration of these pins before integration / start-up of your carrier board / Starter kit. Please also take note of the latest AM67x errata (3).

3.2 System components

3.2.1 Processor derivatives

Depending on the TQMa67xxL version, one of the following AM67x derivatives is assembled:
AM67A94 / AM67A74 / AM6754 / AM6734

Please refer to the AM67x data sheet (1) for full processor features. The main differences between the AM67x derivatives are as follows:

Feature	Reference Name	AM67A94	AM67A74	AM6754	AM6734
C7x Floating Point, Vector DSP	C7x256V DSP	Dual Core		No	
Deep Learning Accelerator	MMA	Dual Core		No	
Graphics Processing Unit	GPU	Yes	No	Yes	No
Video Encoder / Decoder	VENC/VDEC	Yes			No
Motion JPEG Encoder	JPEG	Yes			No
Depth and Motion Processing Accelerators	DMPAC	Yes		No	
Vision Processing Accelerators	VPAC3L	Yes		No	

3.2.2 Booting

3.2.2.1 Boot source

The boot source is selected via the boot strapping pins of the AM67x. The signals are directly routed to the module pad and will be available again as GPIO after reading the boot configuration.

After the release of MCU_PORz the boot configuration is read in at the BOOTMODE[15:0] pins. Independent of the boot device, the ROM bootloader is executed first, which assists in reading and executing the application code. The data can be read and loaded either directly from the memory device or by a peripheral.

The following figure shows the implementation of boot strapping on the module:

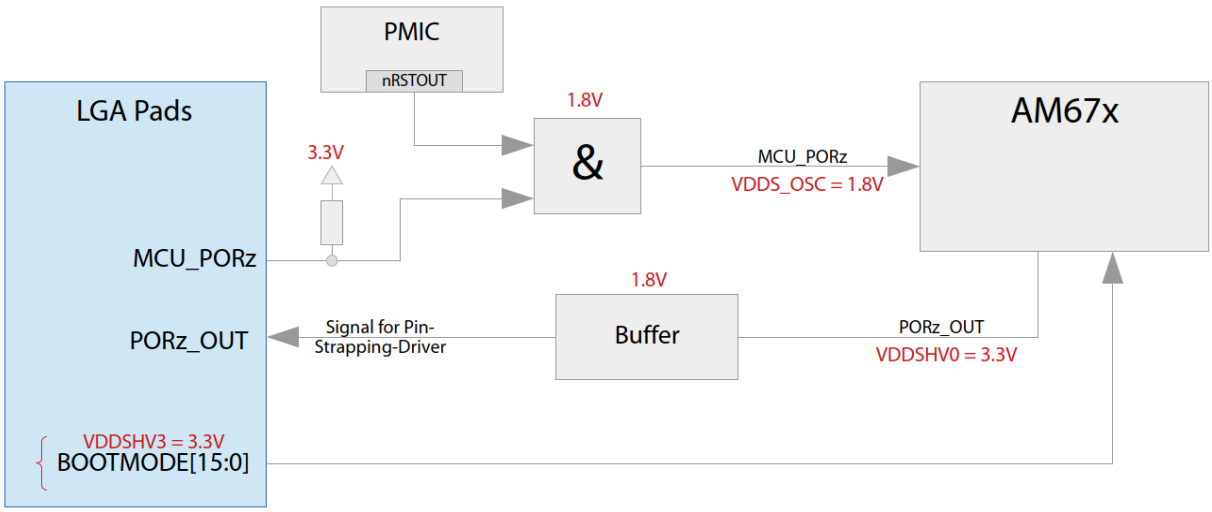


Figure 3: Block diagram boot strapping

According to the Reference Manual (2) the general boot configuration at the TQMa67xxL can be set as follows:

Table 2: Selecting the General Boot Configuration

Boot configuration pin	Setting	TQMa67xxL
BOOTMODE[15:14]	Reserved, fixed to 0	00
BOOTMODE[13:10]	Select the backup boot mode, if primary boot device failed	Don't care
BOOTMODE[9:3]	See following chapters for primary boot devices	-
BOOTMODE[2:0]	Ref Clock Select: 000 = reserved 001 = reserved 010 = 24 MHz 011 = 25 MHz 100 = 26 MHz 101 = reserved 110 = reserved 111 = reserved	011

Attention: Malfunction	
	All BOOTMODE[15:00] signals must have either a pullup (to V_3V3) or pulldown (to Ground). Undefined levels can lead to a malfunction during booting.

3.2.2.2 Boot device eMMc

Table 3: Boot device selection eMMC

Boot configuration pin	Setting	TQMa67xxL
BOOTMODE[9]	Port: MMCSD Port 0 (8 bit width) This bit must be set to 0	000
BOOTMODE[8]	Reserved	
BOOTMODE[7]	0 = Filesystem Mode 1 = Raw Mode	
BOOTMODE[6:3]	Primary Boot Mode: 0000 = Serial NAND 0001 = OSPI 0010 = QSPI 0011 = SPI 0100 = Ethernet RGMII 0101 = Ethernet RMII 0110 = I2C 0111 = UART 1000 = MMCSD boot 1001 = eMMC Boot 1010 = USB 1011 = GPMC NAND 1100 = GPMC NOR 1101 = Fast-xSPI 1110 = xSPI 1111 = No-boot/Dev boot	1000

3.2.2.3 Boot device NOR-flash

Table 4: Selection of the boot device NOR flash

Boot configuration pin	Setting	TQMa67xxL
BOOTMODE9	Reserved, fixed to 0	Don't Care
BOOTMODE8	SPI mode: 0 = SPI Mode 0 1 = SPI Mode 3	0
BOOTMODE7	Chip-Select: 0 = Boot-Flash is on CS0 1 = Boot-Flash is on CS1	0
BOOTMODE[6:3]	Primary Boot Mode: 0000 = Serial NAND 0001 = OSPI 0010 = QSPI 0011 = SPI 0100 = Ethernet RGMII 0101 = Ethernet RMII 0110 = I2C 0111 = UART 1000 = MMCSD Boot 1001 = eMMC Boot 1010 = USB 1011 = GPMC NAND 1100 = GPMC NOR 1101 = Fast-xSPI 1110 = xSPI 1111 = No-boot/Dev boot	0011

Further boot configurations can be found in the Reference Manual (2).

Besides the mentioned boot configurations above, it is recommended to consider an alternative boot source during development, e.g. USB boot or no-boot mode for JTAG debug.

Note: Update	
	When designing a mainboard, it is recommended to plan a redundant update concept for software updates in the field. Furthermore, it is recommended to switch the conversion of the boot strap pins to high impedance after reading in.

3.2.3 Memory

3.2.3.1 LPDDR4 SDRAM

The TQMa67xxL has LPDDR4 memory with the use of in-line ECC:

- 32-bit bus width with optional ECC (24-bit data + 8-bit ECC). 1/9th of the total SDRAM space is used for ECC storage.
- Up to 4000 Mbps = 2000 MHz
- 1 GByte (=8 Gbit) / 2 GByte (=16 Gbit) / 4 GByte (=32 Gbit) / 8 GByte (=64 Gbit)

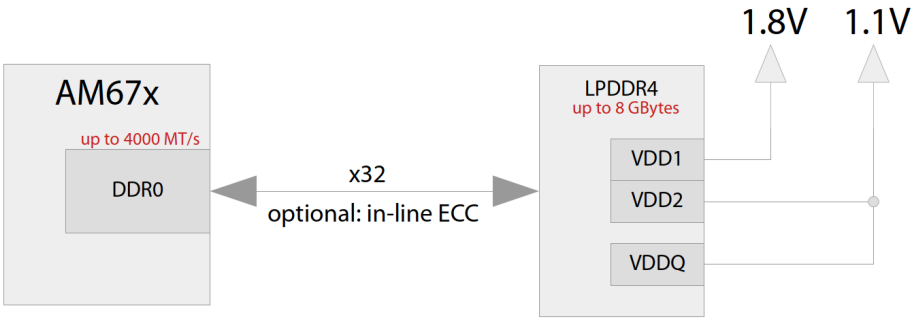


Figure 4: Block diagram LPDDR4 SDRAM connection

3.2.3.2 eMMC

An eMMC is available to the TQMa67xxL as non-volatile data memory for programs and data (e.g. boot loader, operating system). The MMC0 signals that are used can be made available on the module pads as an option.

- MMC0 is connected to the eMMC Flash
- 8 / 16 / 32 / 64 /128 GByte

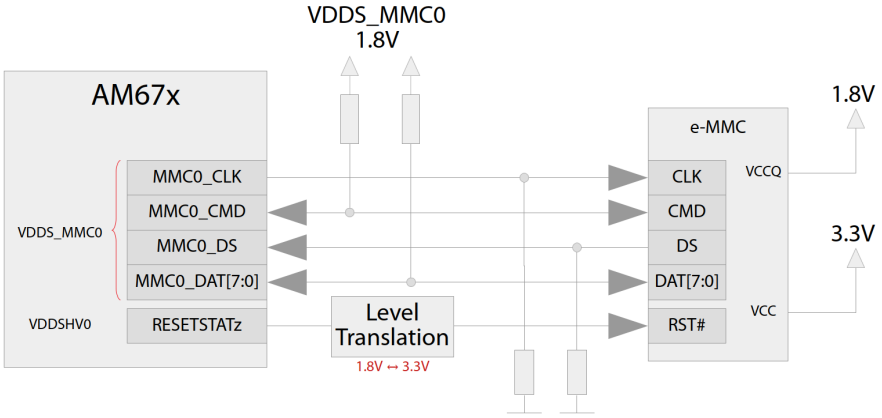


Figure 5: Block diagram eMMC flash interface

The TQMa67xxL supports the following transmission modes:

Table 5: eMMC Flash modes

Mode	1-bit	4-bit	8-bit	Note
Default Speed	n/a	n/a	n/a	
High Speed	n/a	n/a	Yes	Boot process
HS200	n/a	n/a	Yes	U-boot / Linux (default)
HS400	n/a	n/a	n/a	

3.2.3.3 NOR-Flash

A NOR-Flash on the TQMa67xxL is available as non-volatile memory. The OSPI0 signals that are used can be made available on the module pad as an option.

- The NOR-Flash variants Quad SPI Flash and Octal SPI Flash are usable
- 512 / 1024 / 2048 Mbit

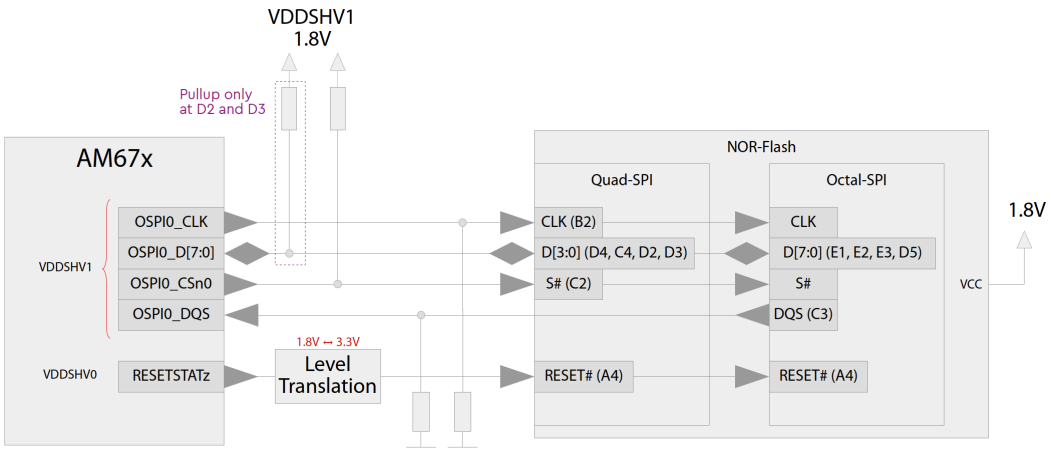


Figure 6: Block diagram NOR-Flash

The TQMa67xxL supports the following transmission modes:

Table 6: NOR-Flash modes

Mode	Read	Write	Note
Extended SPI (SDR)	1-4-4	1-1-4	Clock = max. 83.33 MHz

3.2.3.4 EEPROMs

I²C EEPROMs are provided on the TQMa67xxL for non-volatile storage. A distinction is made here between:

- Customer data, freely accessible
- TQ manufacturing data (Serial Number, MAC, ...)

All I²C slave address and bus structure are summarized in chapter 3.2.8.3.

3.2.4 Clock supply

The clock supply of the TQMa67xxL is represented as follows:

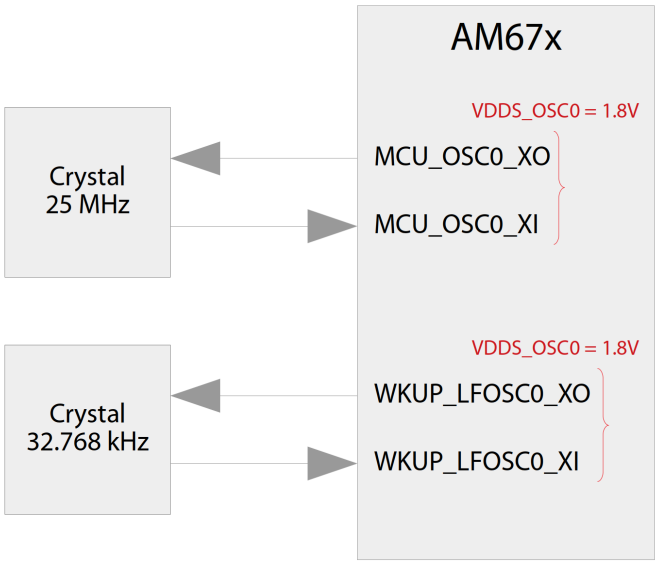


Figure 7: Block diagram clock supply

To get the module executable only with a 5.0 V supply, MCU_OSC0_XO / XI and WKUP_LFOSC_XO / XI are implemented as clock on the module.

The remaining clock inputs can either be derived from the system clock or fed externally via the module pads, as an example the following clocks can be fed externally:

- EXT_REFCLK1
- MCU_EXT_REFCLK0 (optional external System Clock inputs)
- CP_GMAC_CPTS0_RFT_CLK (optional CPTS Reference Clock input)
- AUDIO_EXT_REFCLK0/1 (optional, External Clock input to McASP)
- SERDES0/1_REFCLK0N/P (optional, Serdes PHY Reference Clock input)
- …

For more information, please refer to the relevant datasheet (1).

3.2.5 RTC

An optional RTC (NXP PCF85063A) can be equipped on the TQMa67xxL. The connection is realized as follows:

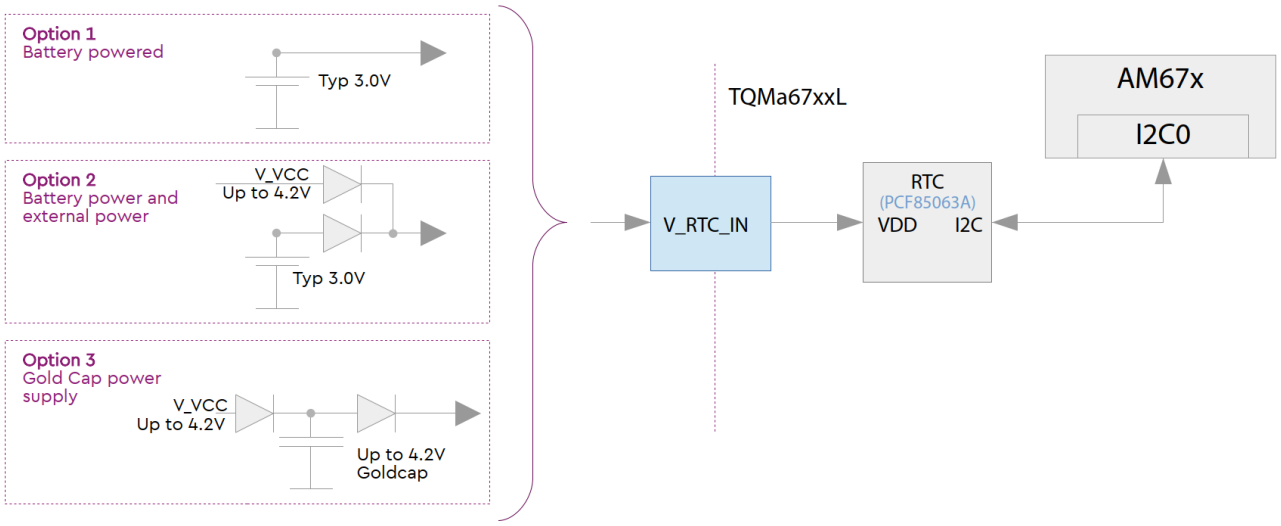


Figure 8: Block diagram RTC

- The RTC can be supplied from the base board via V_RTC_IN. V_RTC_IN = 2.0 V to 4.2 V
- RTC_INT# and RTC_CLKOUT is accessible at the module pads.
- RTC_CLKOUT is only activated as soon as the TQMa67xxL is supplied with V_5V_IN.
- I2C is connected via I2C0 (I^2C addresses are described in chapter 3.2.8.3)

Note: Equipping the base board	
	The RTC is supplied directly via V_RTC_IN. This allows the user an easy use of Gold-Caps or Coin cells on the main board.

3.2.6 Secure Element

A Secure Element Chip can optionally be fitted on the TQMa67xxL. The connection can be seen in the following figure:

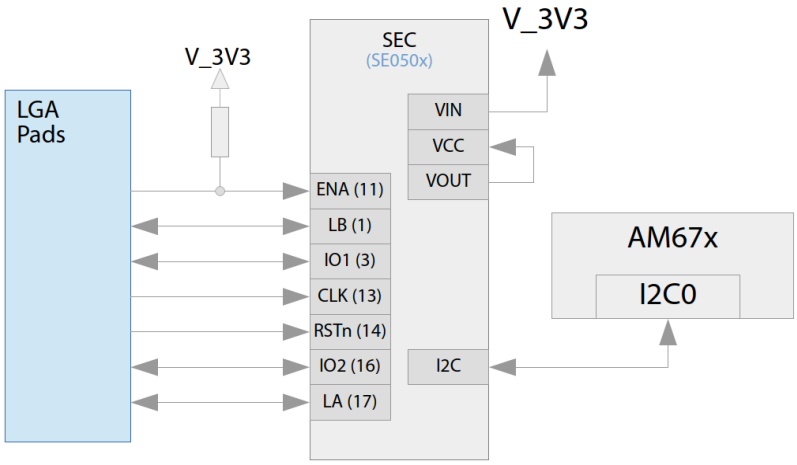


Figure 9: Block diagram SEC

The SE050E2HQ1/Z01Z3 from NXP is used as the secure element. All I^2C addresses are described in chapter 3.2.8.3.

3.2.7 Temperature sensor

A temperature sensor (TI TMP1075DSGR) is placed on the TQMa67xxL to monitor the module temperature.
The over temperature output (TEMP_ALERT) of the sensor is available at the module pads as an open drain output.
The I^2C addresses are described in chapter 3.2.8.3.

3.2.8 Interfaces

In general, except for the memory connection, all IO pins of the AM67x are provided at the module pads.
For further information about the interfaces and the pin multiplexing refer to the Processor Reference Manual (2).

3.2.8.1 GPIO

Besides their interface function, most AM67x pins can also be used as GPIOs. Details are to be taken from the AM67x Data Sheet (1).

3.2.8.2 JTAG

The AM67x has a JTAG interface that is directly accessible at the module pads. The following default configuration is provided on the TQMa67xxL:

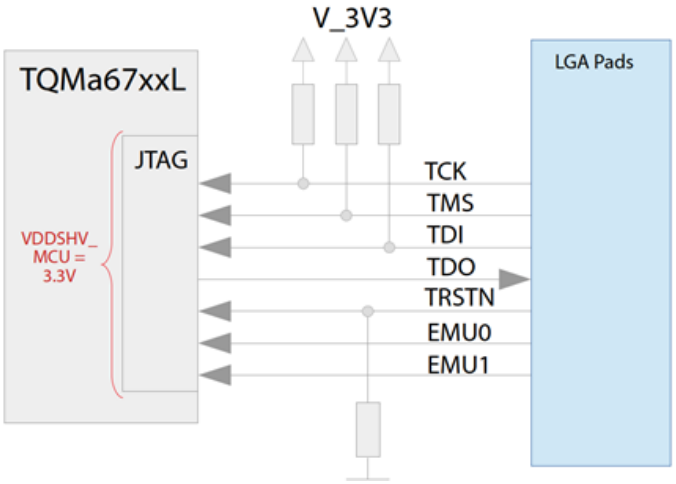


Figure 10: Block diagram JTAG

The following table shows the signals used by the JTAG interface.

Table 7: JTAG signals

Signal / Multiplexing	I/O	Power domain	Note
TCK	I	VDDSHV_MCU (3.3 V)	10 kΩ Pull-up on module
TDI	I		10 kΩ Pull-up on module
TDO	OZ		
TMS	I		10 kΩ Pull-up on module
TRST#	I		4.7 kΩ Pull-up on module
EMU[1:0]	IO		Optional signals, not required for JTAG

For more information please refer to the Reference Manual (2).

3.2.8.3 I²C

The accessible I²C buses depend on the pin multiplexing. To use the internal I²C devices, the WKUP_I2C0- and I2C0-bus are permanently provided on the TQMa67xxL. The following devices are connected to the module:

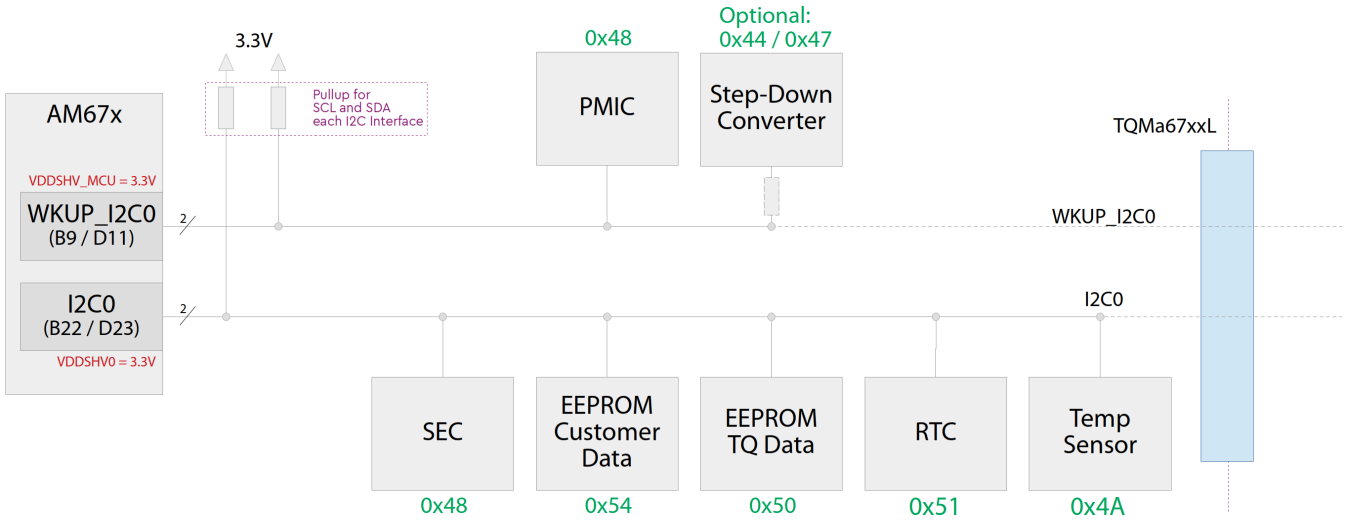


Figure 11: Block diagram I2C bus on the TQMa67xxL

Table 8: I2C address assignment on the module

Bus	Component	Address	Note
WKUP_I2C	PMIC TPS652G1	0b1001000 / 0x48	
	DC/DC	0b1000100 / 0x44 0b1000111 / 0x47	Optional
I2C0	Temperature sensor TMP1075	0b1001010 / 0x4A	
	EEPROM M24C02	0b1010000 / 0x50	TQ-Data
	EEPROM M24C64	0b1010100 / 0x54	Customer EEPROM
	RTC PCF85063ATL	0b1010001 / 0x51	
	SEC	0b1001000 / 0x48	

3.2.9 Reset

The following figure describes the implementation of the reset structure of the TQMa67xxL:

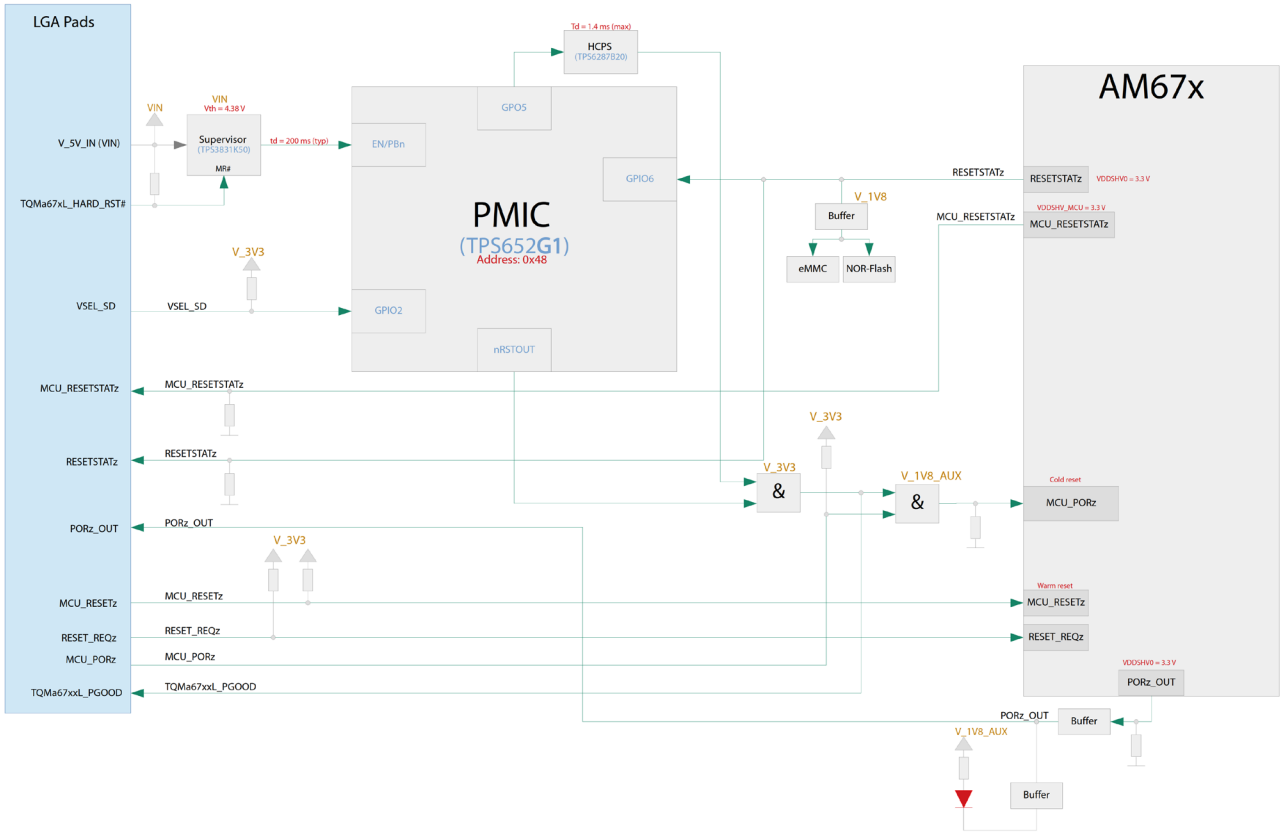


Figure 12: Block diagram Reset

3.2.9.1 Reset Options (Input)

3.2.9.1.1 TQMa67xxL_HARD_RST#

The input signal TQMa67xxL_HARD_RST# is used to control the entire module. Coming from the module pad a reset with power cycle of the module is executed. As soon as the signal becomes HIGH, the power-up sequencing takes place after a delay of approx. 200 ms.

By default the signal is connected with a pullup to V_5V_IN (5.0 V), therefore only a LOW can reset the module with power cycle.

3.2.9.1.2 MCU_PORz

The MCU_PORz signal is used to control a cold reset. Between the module pad signal MCU_PORz and the AM67x MCU_PORz signal is an AND element and a PMIC, which keeps the signal at LOW during power sequencing and pulls it HIGH afterwards.

By default the signal is connected with a pullup to 3.3 V, so only a LOW can trigger a cold reset of the module.

3.2.9.1.3 MCU_RESETz

The MCU_RESETz signal is used to control a warm reset of the MCU domain of the AM67x.

By default the signal is connected to a pullup to 3.3 V, so only a LOW can trigger a warm reset of the MCU domain on the module.

3.2.9.1.4 RESET_REQz

The RESET_REQz signal is used to control a warm reset of the main domain of the AM67x.

By default the signal is connected to a pullup to 3.3 V, so only a LOW can trigger a warm reset of the main domain on the module.

3.2.9.2 Reset Status (Output)

3.2.9.2.1 PORz_OUT

The PORz_OUT signal serves as status signal for a cold reset of the main domain of the AM67x.

By default the signal is driven via a buffer with 1.8 V.

3.2.9.2.2 MCU_RESETSTATz

The MCU_RESETSTATz signal serves as a status signal for a warm reset of the MCU domain.

By default the signal is connected with a pulldown to ground.

3.2.9.2.3 RESETSTATz

The RESETSTATz signal serves as a status signal for a warm reset of the main domain.

By default the signal is connected with a pulldown to ground.

3.2.9.3 Control signals

3.2.9.3.1 TQMa67xxL_PGOOD

TQMa67xxL_PGOOD serves as a status signal to the base board that the voltages on the main board can now be switched on. Power GOOD (PGOOD) is only active when the power sequencing on the module has been successfully completed.

By default the signal is driven via a buffer with 3.3 V

3.2.9.3.2 VSEL_SD

VSEL_SD is used to select the V_VDDSHV5 supply voltage:

- LOW: V_VDDSHV5 = 1.8 V
- HIGH: V_VDDSHV5 = 3.3 V

By default the signal is connected with a pullup to 3.3 V, thus initially V_VDDSHV5 is always supplied with 3.3 V.

3.2.10 Power supply

3.2.10.1 Main power supply

The main supply of the TQMa67xxL is defined to typ. 5.0 V. By applying the 5.0 V voltage the module generates all required voltages.

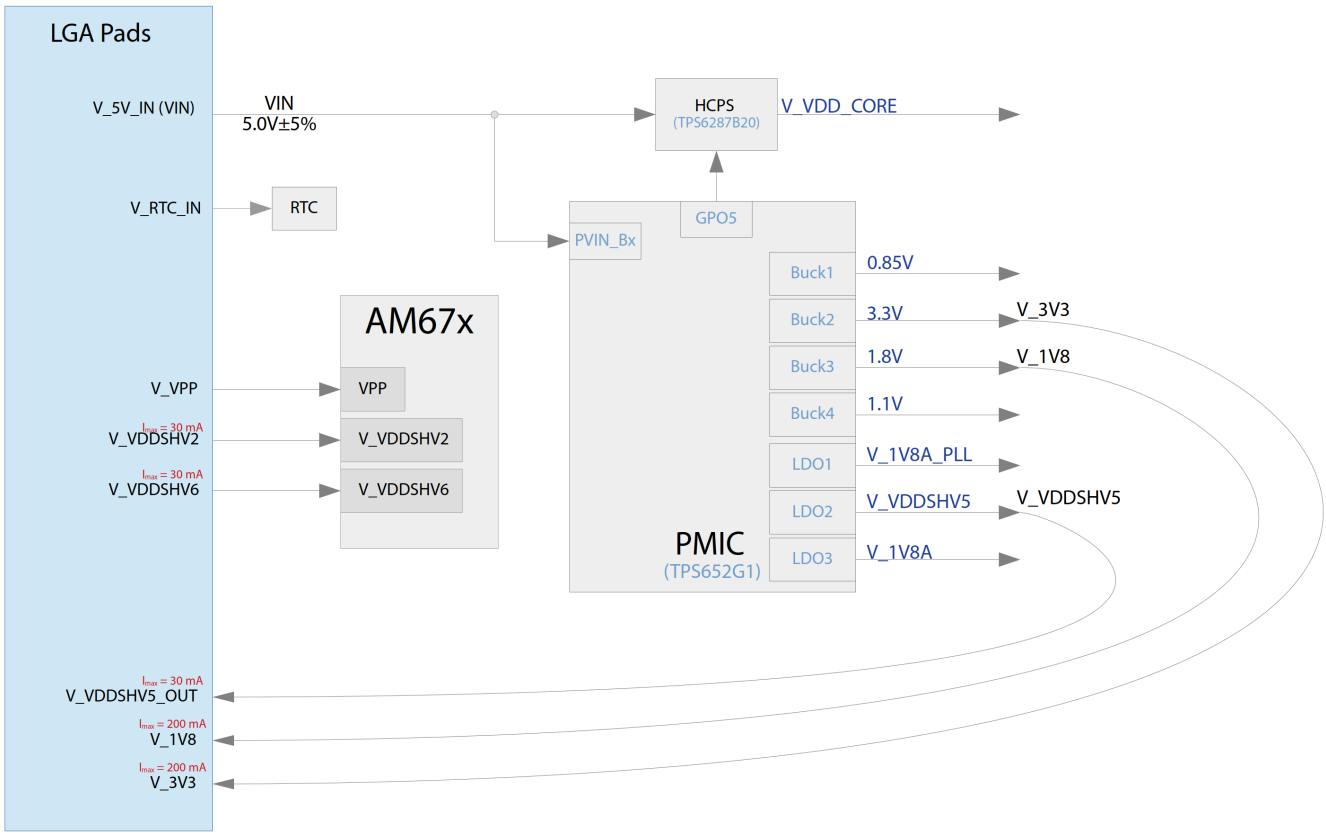


Figure 13: Block diagram power supply

3.2.10.2 Overview TQMa67xxL supply

The following table shows all relevant supply voltages of the TQMa67xxL.

Table 9: Supply voltages

Module pad / Signal	Voltage	Current	Use
V_5V_IN	4.75 V to 5.25 V	see Table 11	Input: module supply
V_3V3	3.201 V to 3.399 V	max. 100 mA	Output: for Boot-Configuration
V_1V8	1.746 V to 1.854 V	max. 100 mA	Output
V_VDDSHV5	1.8 V / 3.3 V	< 30 mA	Output: MMC1 IO-Bank supply
V_RTC_IN	2.0 V to 5.5 V	see 3.2.5	Input: supply for module RTC
V_VPP	1.8 V	max. 400 mA	Input: supply for eFuse programming
V_VDDSHV2	1.8 V / 3.3 V	max. 30 mA	Input: can be supplied by V_3V3 / V_1V8
V_VDSSHV6	1.8 V / 3.3 V	max. 30 mA	Input: can be supplied by V_3V3 / V_1V8
USB0_VBUS USB1_VBUS	typ. 5 V	< 1 mA	Input: Used to detect the USB-VBUS voltage and is usually supplied with the VBUS voltage switched by the USB host. External circuitry is required – see (2).

Attention: Malfunction	
	If the absolute maximum voltages of the AM67x are exceeded, malfunctions and component failures may occur. The mentioned outputs may not be supplied externally under any circumstances.

3.2.10.3 Power sequencing

After switching on the module supply V_5V_IN and TQMa67xxL_HARD_RST# to HIGH the power-up sequence starts. With completion of the power sequencing the supply of the external mainboard components is signaled via TQMa67xx_PGOOD. The following figure shows the chronological sequence of the signals involved.

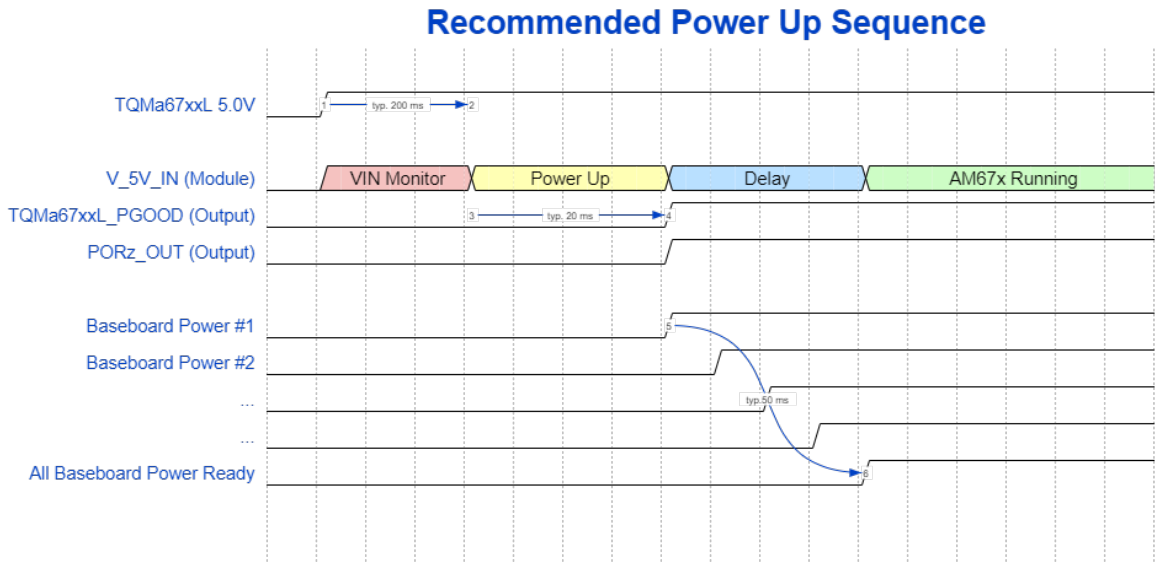


Figure 14: Recommended power up sequence

Attention: Malfunction	
	To avoid cross-supply and errors in the power-up sequence, no I/O pads may be driven by external components until the power-up sequence is completed. The end of the power-up sequence is signaled by a high level of the TQMa67xx_PGOOD signal.

3.2.10.4 Power modes

The TQMa67xxL has the following power modes:

- Active Mode - The module is powered and everything is active.

Depending on the use of the processor, different power / module domains can be switched off. For more information, refer to the AM67x Reference Manual (2).

Independent of the AM67x, the following low power modes can be provided:

- Module RTC Mode
  - Module is no longer supplied via V_5V_IN
  - Only V_RTC_IN remains supplied and active
  - The current consumption is then determined solely by the current consumption of the RTC
- Self-Refresh Mode (Suspend to RAM)
  - The LPDDR4 memory can be set to self-refresh mode using an SRE command.
  - IDD6 is specified in self-refresh, typ. current consumption at 25 °C ambient temperature is approx. 0.4 mA to 2.7 mA

3.2.10.5 Power consumption

The following table lists some technical parameters of the module supply. The specified current consumptions are to be regarded as a guide value. Since the current consumption of the TQMa67xxL can differ greatly depending on the application, modes and operating system, the values listed here should only be used for a performance estimate.

Table 10: Current consumption TQMa67xxL

TQMa67A94L (16Gbit LPDDR4, 512 Mbit NOR-Flash, 8 GByte eMMC-Flash)		
Current consumption Power OFF	16 mA	TQMa67xxL_HARD_RST# = LOW
Current consumption Reset mode	212 mA	MCU_PORz = LOW
Current consumption theoretical Worst Case	4.8 A	Current consumption @ 5.0 V
Current consumption U-Boot prompt	465 mA	U-Boot Idle
Current consumption Linux prompt	500 mA	Linux Idle
Current consumption Linux (stressapptest -W -s 407500 -M 1408 -m 4 -C 4 -i 4 stress-ng --cpu-load 95 --cpu 4 --timeout 407500)	630 mA	Higher current consumption must be expected when using additional interfaces in parallel

3.3 TQMa67xxL interface

3.3.1 Pad assignment

The TQMa67xxL has a total of 404 LGA-pads. With the LGA design, the module is soldered once and has a permanent, stable connection to its peripherals. Removing the module from its soldered position is not easy, is not recommended, and may shorten the life of the module or destroy it. The electrical and pin characteristics are to be taken from the AM67x (1).

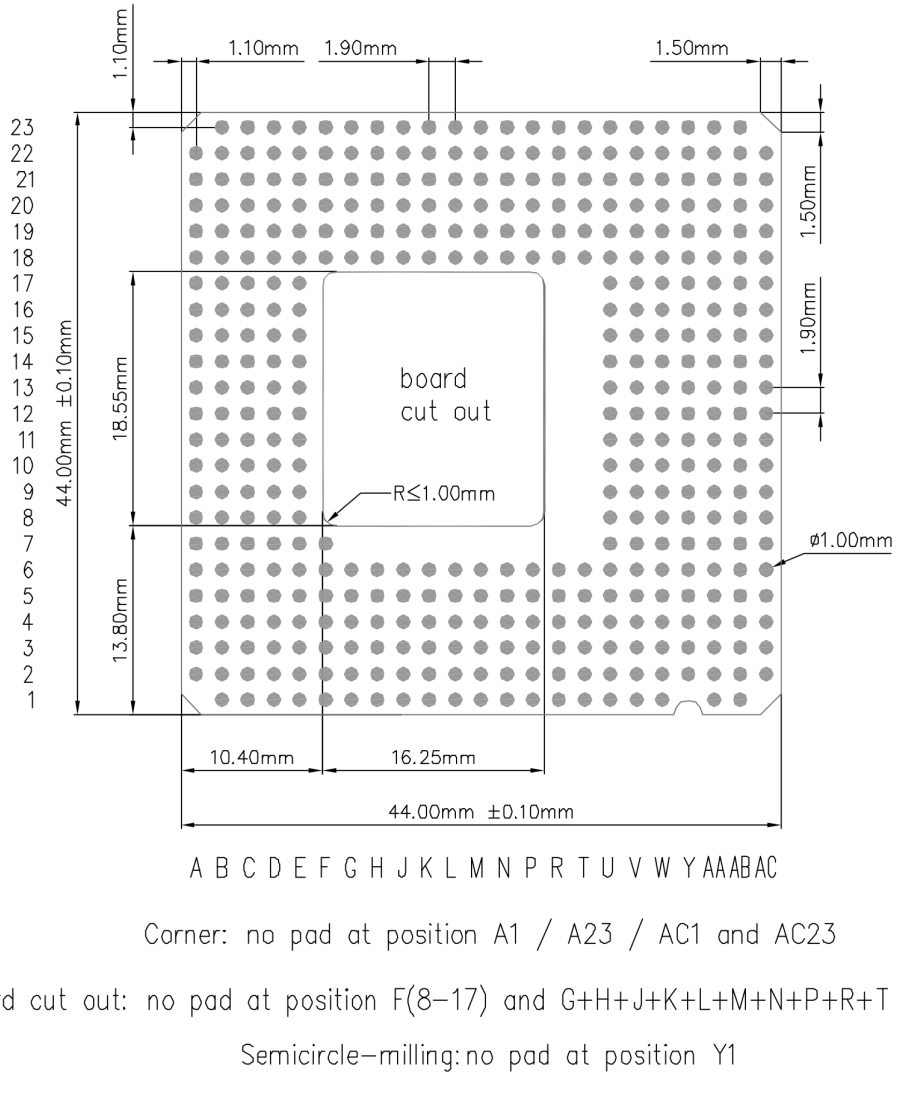


Figure 15: LGA module pad dimensions

Attention: Destruction or malfunction	
	The multiple pad configurations of all AM67x internal function units must be taken note of. The pad assignment shown in Table 11 refers to the corresponding BSP provided by TQ-Systems GmbH.

Attention: Destruction or malfunction	
	Observe the meanings given in the following subsections: RFU: Reserved pads with no function. To support future module revisions, these pads must not be connected. NC: These pads must never be connected and must remain unconnected.

Figure 16: TQMa67xxL pads

3.3.2 Pinout TQMa67xxL

Table 11: Pinout LGA pads

Pad label	Pad number	Direction
CSI0_RXCLKN	AC10	In
CSI0_RXCLKP	AC9	In
CSI0_RXN0	AB12	In
CSI0_RXP0	AB11	In
CSI0_RXN1	AA11	In
CSI0_RXP1	AA10	In
CSI0_RXN2	AB9	In
CSI0_RXP2	AB8	In
CSI0_RXN3	AA8	In
CSI0_RXP3	AA7	In
CSI1_RXCLKN	AB15	In
CSI1_RXCLKP	AB14	In
CSI1_RXN0	AA17	In
CSI1_RXP0	AA16	In
CSI1_RXN1	AC16	In
CSI1_RXP1	AC15	In
CSI1_RXN2	AA14	In
CSI1_RXP2	AA13	In
CSI1_RXN3	AC13	In
CSI1_RXP3	AC12	In
CSI2_RXCLKN	AA20	In
CSI2_RXCLKP	AA19	In
CSI2_RXN0	AC22	In
CSI2_RXP0	AC21	In
CSI2_RXN1	AB21	In
CSI2_RXP1	AB20	In
CSI2_RXN2	AC19	In
CSI2_RXP2	AC18	In
CSI2_RXN3	AB18	In
CSI2_RXP3	AB17	In
CSI3_RXCLKP	Y21	In
CSI3_RXCLKN	W21	In
CSI3_RXN0	U22	In
CSI3_RXP0	V22	In
CSI3_RXN1	V23	In
CSI3_RXP1	W23	In
CSI3_RXN2	Y22	In
CSI3_RXP2	AA22	In
CSI3_RXN3	AA23	In
CSI3_RXP3	AB23	In
CUST_EEPROM_WC#	K20	In
DGND	N1, N4, N19, N22, P2, P5, P20, P23, R3, R6, R21, T1, T4, T19, T22, U2, U5, U20, U23, V3, V6, V9, V12, V15, V18, V21, W1, C18, C21, D1, D4, D7, D10, D13, D16, D19, D22, A4, A7, A10, A13, A15, A19, A22, B2, B5, B8, B11, B14, B17, B20, B23, C3, C6, C9, C12, C15, W4, W7, W10, W13, W16, W19, W22, G1, G4, F18, G19, G22, H2, H5, H20, H23, J3, J6, J18, J21, K1, F21, K4, K19, K22, L2, L5, L20, L23, M3, M6, M21, E2, E5, E8, E14, E17, E20, E23, F3, F6, Y2, Y5, Y8, Y11, Y14, Y17, Y20, Y23, AA3, AA6, AA9, AA12, AA15, AA18, AA21, AB1, AB4, AB7, AB10, AB13, AB16, AB19, AB22, AC2, AC5, AC8, AC11, AC14, AC17, AC20	Power

3.3.2 Pinout TQMa67xxL (Table continued)

DSI0_TXN0	M23	Bidirectional
DSI0_TXP0	N23	Bidirectional
DSI0_TXN1	N21	Bidirectional
DSI0_TXP1	P21	Bidirectional
DSI0_TXCLKN	P22	Bidirectional
DSI0_TXCLKP	R22	Bidirectional
DSI0_TXN2	R23	Bidirectional
DSI0_TXP2	T23	Bidirectional
DSI0_TXN3	T21	Bidirectional
DSI0_TXP3	U21	Bidirectional
EMU0	U15	Bidirectional
EMU1	U14	Bidirectional
EXTINT#	M18	Bidirectional
EXT_REFCLK1	B10	Bidirectional
GPMC0_ADV#_ALE	L3	Out
GPMC0_AD0	B1	Bidirectional
GPMC0_AD1	C1	Bidirectional
GPMC0_AD2	C2	Bidirectional
GPMC0_AD3	D2	Bidirectional
GPMC0_AD4	D3	Bidirectional
GPMC0_AD5	E3	Bidirectional
GPMC0_AD6	E4	Bidirectional
GPMC0_AD7	F4	Bidirectional
GPMC0_AD8	E1	Bidirectional
GPMC0_AD9	F1	Bidirectional
GPMC0_AD10	F2	Bidirectional
GPMC0_AD11	G2	Bidirectional
GPMC0_AD12	G3	Bidirectional
GPMC0_AD13	H3	Bidirectional
GPMC0_AD14	H4	Bidirectional
GPMC0_AD15	J4	Bidirectional
GPMC0_BE0#_CLE	G5	Out
GPMC0_BE1#	G6	Out
GPMC0_CLK	F5	Out
GPMC0_CS0#	L4	Out
GPMC0_CS1#	M4	Out
GPMC0_CS2#	M5	Out
GPMC0_CS3#	N5	Out
GPMC0_DIR	K3	Out
GPMC0_OE#_RE#	H6	Out
GPMC0_WAIT0	K6	In
GPMC0_WAIT1	L6	In
GPMC0_WE#	K5	Out
GPMC0_WP#	J5	Out
I2C0_SCL	N20	Bidirectional
I2C0_SDA	M20	Bidirectional
I2C1_SDA	A8	Bidirectional
I2C1_SCL	A9	Bidirectional
MCAN0_RX	A12	In
MCAN0_TX	A11	Out
MCASP0_ACLKX	E16	Bidirectional
MCASP0_ACLKR	E15	Bidirectional
MCASP0_AFSR	D14	Bidirectional
MCASP0_AFSX	D15	Bidirectional
MCASP0_AXR0	D17	Bidirectional
MCASP0_AXR1	D18	Bidirectional
MCASP0_AXR2	E18	Bidirectional
MCASP0_AXR3	E19	Bidirectional

3.3.2 Pinout TQMa67xxL (Table continued)

MCU_ERROR#	U16	Bidirectional
MCU_I2C0_SCL	P6	Bidirectional
MCU_I2C0_SDA	N6	Bidirectional
MCU_MCAN0_RX	U18	In
MCU_MCAN0_TX	T18	Out
MCU_MCAN1_RX	R18	In
MCU_MCAN1_TX	P18	Out
MCU_PORz	B13	In
MCU_RESETz	U17	In
MCU_RESETSTATz	P19	Out
MCU_SPI0_CLK	U3	Bidirectional
MCU_SPI0_D0	U4	Bidirectional
MCU_SPI0_D1	V4	Bidirectional
MCU_SPI0_CS0	V5	Bidirectional
MCU_SPI0_CS1	W5	Bidirectional
MCU_UART0_RXD	Y10	In
MCU_UART0_TXD	Y9	Out
MCU_UART0_CTS#	W8	In
MCU_UART0_RTS#	W9	Out
MDIO0_MDIO	F20	Bidirectional
MDIO0_MDC	G20	Out
MMC1_SDCD	C20	In
MMC1_SDWP	B21	In
MMC1_CMD	A21	Bidirectional
MMC1_CLK	A20	Bidirectional
MMC1_DAT0	A17	Bidirectional
MMC1_DAT1	A18	Bidirectional
MMC1_DAT2	B18	Bidirectional
MMC1_DAT3	B19	Bidirectional
MMC2_SDCD	D20	In
MMC2_SDWP	C19	In
MMC2_CLK	A14	Bidirectional
MMC2_DAT0	B15	Bidirectional
MMC2_DAT1	B16	Bidirectional
MMC2_DAT2	C16	Bidirectional
MMC2_DAT3	C17	Bidirectional
MMC2_CMD	A15	Bidirectional
OLDI0_A7P	B22	Bidirectional
OLDI0_A7N	C22	Bidirectional
OLDI0_CLK1P	C23	Bidirectional
OLDI0_CLK1N	D23	Bidirectional
OLDI0_A6P	D21	Bidirectional
OLDI0_A6N	E21	Bidirectional
OLDI0_A5P	E22	Bidirectional
OLDI0_A5N	F22	Bidirectional
OLDI0_A4P	F23	Bidirectional
OLDI0_A4N	G23	Bidirectional
OLDI0_A3P	G21	Bidirectional
OLDI0_A3N	H21	Bidirectional
OLDI0_CLK0P	H22	Bidirectional
OLDI0_CLK0N	J22	Bidirectional
OLDI0_A2P	J23	Bidirectional
OLDI0_A2N	K23	Bidirectional
OLDI0_A1P	K21	Bidirectional
OLDI0_A1N	L21	Bidirectional
OLDI0_A0P	L22	Bidirectional
OLDI0_A0N	M22	Bidirectional

3.3.2 Pinout TQMa67xxL (Table continued)

OSPI0_CS1#	D11	Out
OSPI0_CS2#	E12	Out
OSPI0_CS3#	E13	Out
OSPI0_LBCLKO	D12	Bidirectional
PCIE0_CLKREQ#	C11	Bidirectional
PMIC_LPM_EN0	N18	Bidirectional
PORz_OUT	B12	Out
RESETSTATz	R19	Out
RESET_REQz	C10	In
RFU1	L19	NC
RFU2	M19	NC
RFU3	F7	NC
RGMII1_TXC	V16	Out
RGMII1_TX_CTL	V17	Out
RGMII1_TD0	Y19	Out
RGMII1_TD1	Y18	Out
RGMII1_TD2	W18	Out
RGMII1_TD3	W17	Out
RGMII1_RXC	V13	In
RGMII1_RX_CTL	V14	In
RGMII1_RD0	Y16	In
RGMII1_RD1	Y15	In
RGMII1_RD2	W15	In
RGMII1_RD3	W14	In
RTC_CLKOUT	H19	In
RTC_INT#	G18	OCL
SE_ENA	J19	In
SE_ISO7816_IO1	V19	Bidirectional
SE_ISO7816_IO2	U19	Bidirectional
SE_ISO7816_RST#	V20	In
SE_ISO7816_CLK	W20	In
SE_ISO14443_LA	T20	Bidirectional
SE_ISO14443_LB	R20	Bidirectional
SERDES0_REFCLK0_N	AA2	Bidirectional
SERDES0_REFCLK0_P	AA1	Bidirectional
SERDES0_RX0_N	AB3	In
SERDES0_RX0_P	AB2	In
SERDES0_TX0_N	AC4	Out
SERDES0_TX0_P	AC3	Out
SERDES1_RX0_N	AB6	In
SERDES1_RX0_P	AB5	In
SERDES1_TX0_N	AC7	Out
SERDES1_TX0_P	AC6	Out
SERDES1_REFCLK0_N	AA5	Bidirectional
SERDES1_REFCLK0_P	AA4	Bidirectional
SPI0_CLK	R2	Bidirectional
SPI0_CS0	T2	Bidirectional
SPI0_CS1	T3	Bidirectional
SPI0_D0	P1	Bidirectional
SPI0_D1	R1	Bidirectional
TCK	U11	In
TDI	U12	In
TDO	U13	Out
TMS	U10	In
TRST#	U9	In
TEMP_ALERT	F19	OCL
TQMa67xxL_HARD_RST#	B9	In
TQMa67xxL_PGOOD	C13	Out
TQ_EEPROM_WC#	J20	In

3.3.2 Pinout TQMa67xxL (Table continued)

UART0_CTS#	W11	In
UART0_RTS#	W12	Out
UART0_RXD	Y13	In
UART0_TXD	Y12	Out
USB0_DM	V1	Bidirectional
USB0_DP	U1	Bidirectional
USB0_DRVVBUS	Y7	Out
USB0_VBUS	Y3	In
USB1_DM	W2	Bidirectional
USB1_DP	V2	Bidirectional
USB1_DRVVBUS	W3	Out
USB1_VBUS	Y4	In
VOUT0_DATA0	A3	Out
VOUT0_DATA1	B3	Out
VOUT0_DATA2	B4	Out
VOUT0_DATA3	C4	Out
VOUT0_DATA4	C5	Out
VOUT0_DATA5	D5	Out
VOUT0_DATA6	D6	Out
VOUT0_DATA7	E6	Out
VOUT0_DATA8	E7	Out
VOUT0_DATA9	A5	Out
VOUT0_DATA10	A6	Out
VOUT0_DATA11	B6	Out
VOUT0_DATA12	B7	Out
VOUT0_DATA13	C7	Out
VOUT0_DATA14	C8	Out
VOUT0_DATA15	D8	Out
VOUT0_DE	D9	Out
VOUT0_HSYNC	E10	Out
VOUT0_PCLK	A2	Out
VOUT0_VSYNC	E9	Out
VSEL_SD	T5	In
V_RTC_IN	H18	In
V_VDDSHV2	L18	Power
V_VDDSHV5	Y6	Power
V_VDDSHV6	C14	Power
V_VDD_CORE	N3	NC
V_VPP	T6	In
V_0V85	R5	NC
V_1V1	R4	NC
V_1V8	P4	Power
V_1V8A	U6	NC
V_1V8A_PLL	W6	NC
V_1V8_AUX	E11	NC
V_3V3	P3	Power
V_5V_IN	H1, J1, J2, K2, L1, M1, M2, N2	In
WKUP_CLKOUT0	K18	Out
WKUP_I2C0_SDA	U7	Bidirectional
WKUP_I2C0_SCL	V7	Bidirectional
WKUP_UART0_RXD	V11	In
WKUP_UART0_TXD	V10	Out
WKUP_UART0_CTS#	U8	In
WKUP_UART0_RTS#	V8	Out

4. SOFTWARE

The TQMa67xxL is shipped with a specially adapted bootloader, which is configured for use on an MBa67xx.
This bootloader contains module specific as well as board specific adjustments like e.g.

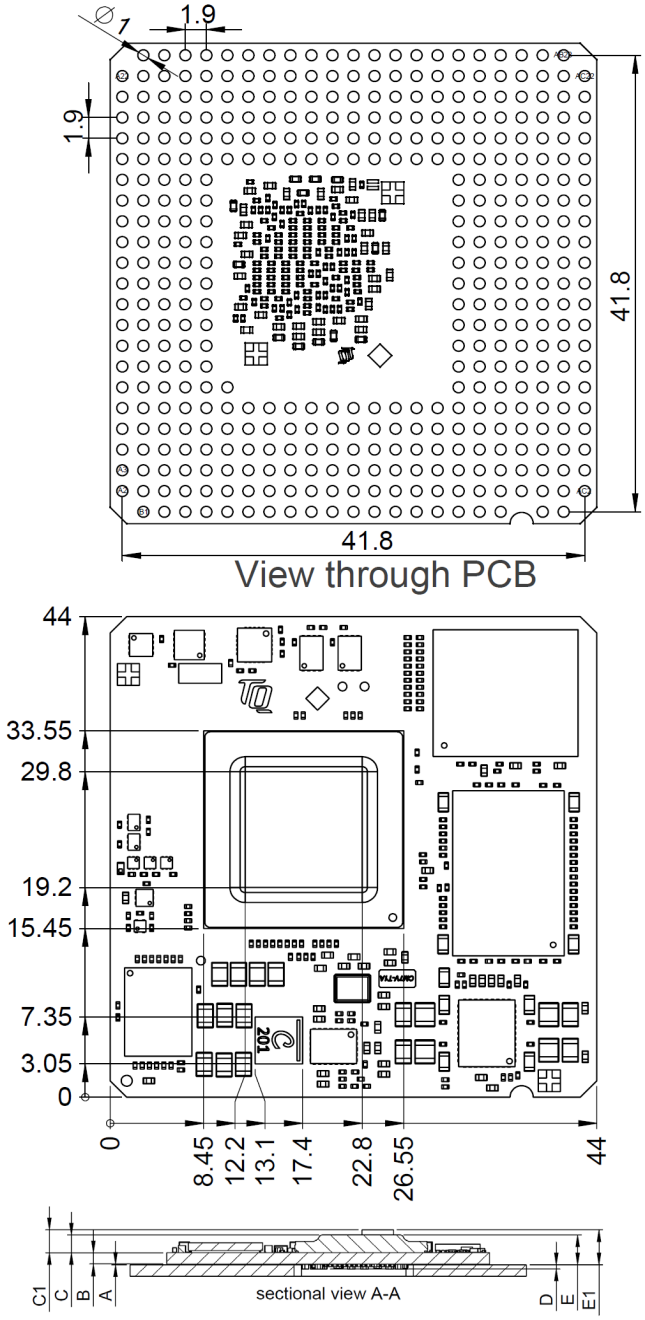
- AM67x configuration
- RAM configuration / timing
- Muxing
- Clocks
- Driver strengths

When using a different bootloader this data has to be adapted. Details can be requested from TQ support. More information can be found in the Support Wiki for the TQMa67xxL.

5. MECHANICS

5.1 TQMa67xxL dimensions and footprint

The overall dimensions (length × width) of the TQMa67xxL are 44.0 mm × 44.0 mm (± 0.1 mm).
Mounting hole: none
The mass of TQMa67xxL94 is 13 g (± 2 g).



Heigth [mm]			
Dimension	Value	Tolerance	Comment
A	0.125	+0.075/-0.025	Board to board distance
B	1.45	±0.15	PCB thickness
C	2.43	±0.12	CPU height
C1	3.27	±0.10	Inductor (highest component)
D	0.57	±0.15	Component height below module
E	4.04	±0.19	Overall height to CPU surface
E1	4.87	±0.18	Overall height to inductor

99.73 % of all modules will meet the tolerance specified in table above.
Height values of 3D model may differ from this drawing.

Figure 17: Dimensions

5.2 TQMa67xxL component placement

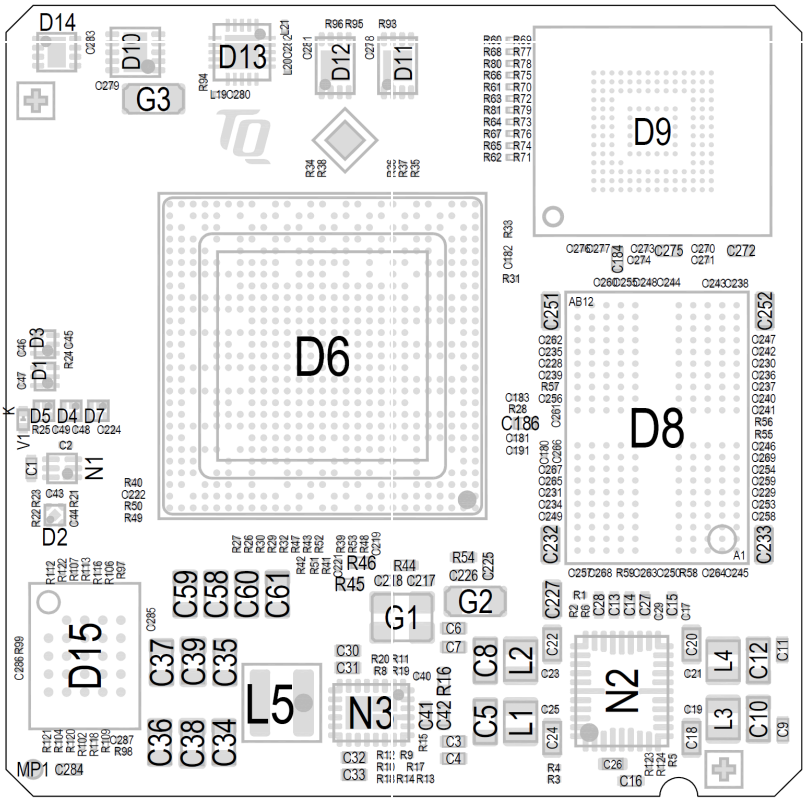


Figure 18: TQMa67xxL top view

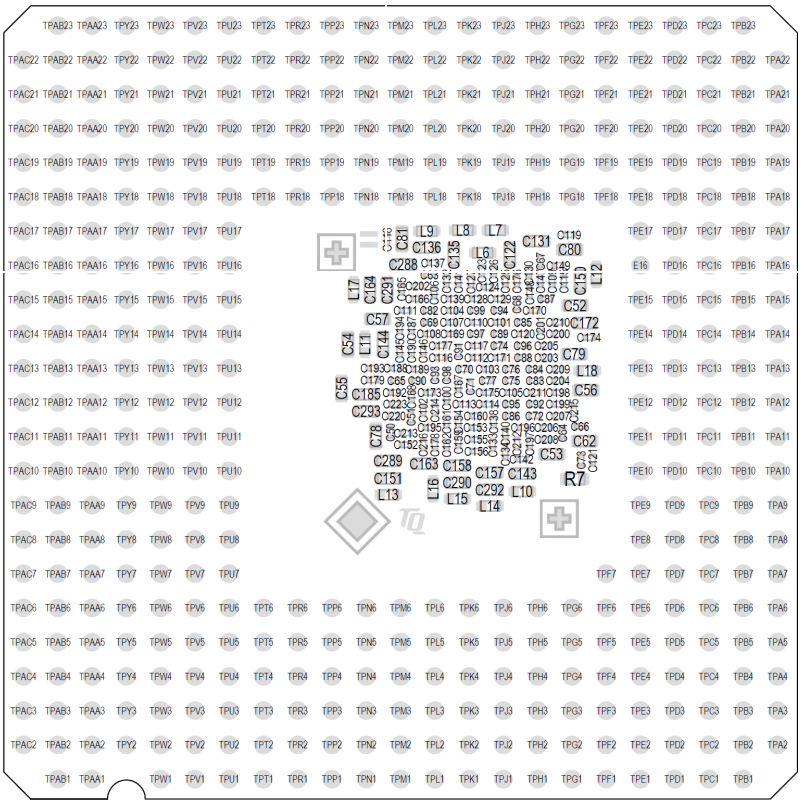


Figure 19: TQMa67xxL bottom view

5.3 Protection against external effects

As an embedded module the TQMa67xxL is not protected against dust, external impact and contact (IP00).
Adequate protection has to be guaranteed by the surrounding system.

5.4 Thermal management

The power dissipation mainly depends on the software used and can vary according to the application. The power dissipation mainly arises at the processor, the switching regulators and the LPDDR4 devices. It is the customer's responsibility to define a suitable cooling method for his use case.

Attention: Destruction or malfunction, TQMa67xxL cooling	
	The AM67x belongs to a performance category in which a cooling system is essential. It is the user's sole responsibility to define a suitable heat sink (weight and mounting position) depending on the specific mode of operation (e.g., dependence on clock frequency, stack height, airflow, and software). Particularly the tolerance chain (PCB thickness, board warpage, BGA balls, BGA package, thermal pad, heatsink) as well as the maximum pressure on the AM67x must be taken into consideration when connecting the heat sink. The AM67x is not necessarily the highest component. Inadequate cooling connections can lead to overheating of the TQMa67xxL and thus malfunction, deterioration or destruction.

5.5 Structural requirements

The TQMa67xxL is held on the mainboard by the holding force of the solder connection of the LGA pads and does not require any further fastening measures. If there are high requirements for vibration and shock resistance, a module holder must be provided in the end application to additionally hold the module in position. As no heavy or large components are used, no further requirements are specified.

6. SAFETY REQUIREMENTS AND PROTECTIVE REGULATIONS

6.1 EMC

The TQMa67xxL was developed according to the requirements of electromagnetic compatibility (EMC). Depending on the target system, anti-interference measures may still be necessary to guarantee the adherence to the limits for the overall system.

Following measures are recommended:

- Robust ground planes (adequate ground planes) on the printed circuit board
- A sufficient number of blocking capacitors in all supply voltages
- Fast or permanent clocked lines (e.g., clock) should be kept short; avoid interference of other signals by distance and/or shielding besides, take note of not only the frequency, but also the signal rise times
- Filtering of all signals, which can be connected externally (also "slow signals" and DC can radiate RF indirectly)

6.2 ESD

In order to avoid interspersion on the signal path from the input to the protection circuit in the system, the protection against electrostatic discharge should be arranged directly at the inputs of a system.
As these measures always have to be implemented on the carrier board, no special preventive measures were planned on the TQMa67xxL.

Following measures are recommended for a carrier board:

- Generally applicable: Shielding of the inputs (shielding connected well to ground / housing on both ends)
- Supply voltages: Protection by suppressor diode(s)
- Slow signal lines: RC filtering, Zener diode(s)
- Fast signal lines: Integrated protective devices (e.g., suppressor diode arrays)

6.3 Operational safety and personal security

Due to the occurring voltages (≤ 5 V DC), tests with respect to the operational and personal safety haven't been carried out.

6.4 Cyber Security

A Threat Analysis and Risk Assessment (TARA) must always be performed by the customer for their individual end application, as the TQMa67xxL is only a sub-component of an overall system.

6.5 Climatic and operational conditions

The temperature range, in which the TQMa67xxL works reliably, strongly depends on the installation situation (heat dissipation by heat conduction and convection); hence, no fixed value can be given for the whole assembly.

In general, a reliable operation is given when following conditions are met:

Table 12: Climate and operational conditions industrial temperature range

Parameter	Range	Remark
Environmental temperature	–40 °C to +85 °C	With appropriate cooling
Permitted storage temperature	–40 °C to +100 °C	–
Relative humidity (operating / storage)	10 % to 90 %	Not condensing

6.6 Export Control and Sanctions Compliance

The customer is responsible for ensuring that the product purchased from TQ is not subject to any national or international export/import restrictions. If any part of the purchased product or the product itself is subject to said restrictions, the customer must procure the required export/import licenses at its own expense. In the case of breaches of export or import limitations, the customer indemnifies TQ against all liability and accountability in the external relationship,irrespective of the legal grounds. If there is a transgression or violation, the customer will also be held accountable for any losses, damages or fines sustained by TQ. TQ is not liable for any delivery delays due to national or international export restrictions or for the inability to make a delivery as a result of those restrictions. Any compensation or damages will not be provided by TQ in such instances.

The classification according to the European Foreign Trade Regulations (export list number of Reg. No. 2021/821 for dual-use-goods) as well as the classification according to the U.S. Export Administration Regulations in case of US products (ECCN

according to the U.S. Commerce Control List) are stated on TQ´s invoices or can be requested at any time. Also listed is the Commodity code (HS) in accordance with the current commodity classification for foreign trade statistics as well as the country of origin of the goods requested/ordered.

6.7 Warranty

TQ-Systems GmbH warrants that the product, when used in accordance with the contract, fulfills the respective contractually agreed specifications and functionalities and corresponds to the recognized state of the art.

The warranty is limited to material, manufacturing and processing defects. The manufacturer's liability is void in the following cases:

- Original parts have been replaced by non-original parts.
- Improper installation, commissioning or repairs.
- Improper installation, commissioning or repair due to lack of special equipment.
- Incorrect operation
- Improper handling
- Use of force
- Normal wear and tear

6.8 Reliability and service life

For the TQMa67xxL, a constant error rate results in an MTBF of approximately 932,741 hours (TQMa67A94L).

Attention must be paid to a construction that is insensitive to vibration and shock.

Service life-limiting components such as electrolytic capacitors were not used.

6.9 Environment protection

6.9.1 RoHS

The TQMa67xxL is manufactured RoHS compliant.

- All components and assemblies are RoHS compliant
- The soldering processes are RoHS compliant

6.9.2 WEEE®

The final distributor is responsible for compliance with the WEEE® regulation.

Within the scope of the technical possibilities, the TQMa67xxL was designed to be recyclable and easy to repair.

6.10 REACH®

The EU-chemical regulation 1907/2006 (REACH® regulation) stands for registration, evaluation, certification and restriction of substances SVHC (Substances of very high concern, e.g., carcinogen, mutagen and/or persistent, bio accumulative and toxic). Within the scope of this juridical liability, TQ-Systems GmbH meets the information duty within the supply chain with regard to the SVHC substances, insofar as suppliers inform TQ-Systems GmbH accordingly.

6.11 EuP

The Ecodesign Directive, also Energy using Products (EuP), is applicable to products for the end user with an annual quantity >200,000. The TQMa67xxL must therefore always be seen in conjunction with the complete device.

The available standby and sleep modes of the components on the TQMa67xxL enable compliance with EuP requirements for the TQMa67xxL.

6.12 Statement on California Proposition 65

California Proposition 65, formerly known as the Safe Drinking Water and Toxic Enforcement Act of 1986, was enacted as a ballot initiative in November 1986. The proposition helps protect the state's drinking water sources from contamination by approximately 1,000 chemicals known to cause cancer, birth defects, or other reproductive harm ("Proposition 65 Substances") and requires businesses to inform Californians about exposure to Proposition 65 Substances.

The TQ device or product is not designed or manufactured or distributed as consumer product or for any contact with end-consumers. Consumer products are defined as products intended for a consumer's personal use, consumption, or enjoyment. Therefore, our products or devices are not subject to this regulation and no warning label is required on the assembly.

Individual components of the assembly may contain substances that may require a warning under California Proposition 65. However, it should be noted that the Intended Use of our products will not result in the release of these substances or direct human contact with these substances. Therefore you must take care through your product design that consumers cannot touch the product at all and specify that issue in your own product related documentation.

TQ reserves the right to update and modify this notice as it deems necessary or appropriate.

6.13 Battery

No batteries are used on the TQMa67xxL.

6.14 Packaging

By environmentally friendly processes, production equipment and products, we contribute to the protection of our environment. To be able to reuse the TQMa67xxL, it is produced in such a way (a modular construction) that it can be easily repaired and disassembled. The energy consumption of this subassembly is minimised by suitable measures. The TQMa67xxL is delivered in reusable packaging.

6.15 Other entries

The energy consumption of this subassembly is minimised by suitable measures.

Because currently there is still no technical equivalent alternative for printed circuit boards with bromine-containing flame protection (FR-4 material), such printed circuit boards are still used.

No use of PCB containing capacitors and transformers (polychlorinated biphenyls).

These points are an essential part of the following laws:

- The law to encourage the circular flow economy and assurance of the environmentally acceptable removal of waste as at 27.9.94
  (Source of information: BGBl I 1994, 2705)
- Regulation with respect to the utilization and proof of removal as at 1.9.96
  (Source of information: BGBl I 1996, 1382, (1997, 2860))
- Regulation with respect to the avoidance and utilization of packaging waste as at 21.8.98
  (Source of information: BGBl I 1998, 2379)
- Regulation with respect to the European Waste Directory as at 1.12.01
  (Source of information: BGBl I 2001, 3379)

This information is to be seen as notes. Tests or certifications were not carried out in this respect.

7. APPENDIX

7.1 Acronyms and definitions

The following acronyms and abbreviations are used in this document:

Table 13: Acronyms

Acronym	Meaning
ADC	Analog/Digital Converter
AIN	Analog In
ARM®	Advanced RISC Machine
AVS	Adaptive Voltage Scaling
BIOS	Basic Input/Output System
BSP	Board Support Package
CAN	Controller Area Network
DC	Direct Current
DDR3L	Double Data Rate Type three Low voltage
DIN	Deutsche Industrie Norm
DVS	Dynamic Voltage Scaling
EEPROM	Electrically Erasable Programmable Read-only Memory
EMC	Electro-Magnetic Compatibility
eMMC	embedded Multi-Media Card
EN	Europäische Norm
ESD	Electro-Static Discharge
EU	European Union
EuP	Energy using Products
FR-4	Flame Retardant 4
GMII	Gigabit Media Independent Interface
GPIO	General Purpose Input/Output
GPMC	General Purpose Memory Controller
I2C	Inter-Integrated Circuit
I2S	Inter-Integrated Sound
IP	Ingress Protection
JTAG	Joint Test Action Group
LCD	Liquid Crystal Display
MAC	Media Access Control
MCASP	Multichannel Audio Serial Port
MCSPI	Multichannel Serial Port Interface
MD	Management Data
MII	Media-Independent Interface
MMC	Multi-Media Card
MTBF	Mean operating Time Between Failures

7.1 Acronyms and definitions (continued)

Table 13: Acronyms (continued)

Acronym	Meaning
n.a.	Not Available
NC	Not Connected
PCB	Printed Circuit Board
PCMCIA	People Can't Memorize Computer Industry Acronyms
PD	Pull-Down
PHY	Physical (layer of the OSI model)
PMIC	Power Management Integrated Circuit
PRCM	Power and Clock Management
PU	Pull-Up
PWM	Pulse-Width Modulation
RC	Resistor-Capacitor
REACH®	Registration, Evaluation, Authorisation (and restriction of) Chemicals
RF	Radio Frequency
RFU	Reserved for Future Usage
RGB	Red Green Blue
RGMII	Reduced Gigabit Media Independent Interface
RMII	Reduced Media Independent Interface
RoHS	Restriction of (the use of certain) Hazardous Substances
ROM	Read-Only Memory
RTC	Real-Time Clock
SD	Secure Digital
SDIO	Secure Digital Input Output
SDRAM	Synchronous Dynamic Random Access Memory
SPI	Serial Peripheral Interface
UART	Universal Asynchronous Receiver/Transmitter
UM	User's Manual
USB	Universal Serial Bus
WEEE®	Waste Electrical and Electronic Equipment
WP	Write-Protection
WXGA	Wide Extended Graphics Array

7.2 References

Table 14: Further applicable documents

No.	Name	Rev. / Date	Company
(1)	AM67x Processors Datasheet	A / Sep. 2024	Texas Instruments
(2)	AM67 Processors Silicon Revision 1.0 Technical Reference Manual	A / Jan. 2025	Texas Instruments
(3)	AM67x Processor Errata	1.0 / Nov. 2023	Texas Instruments
(4)	MBa67xx User's Manual	– current –	TQ-Systems
(5)	Support-Wiki for the TQMa67xxL	– current –	TQ-Systems
(6)	Processing instructions for TQMa67xxL	– current –	TQ-Systems

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