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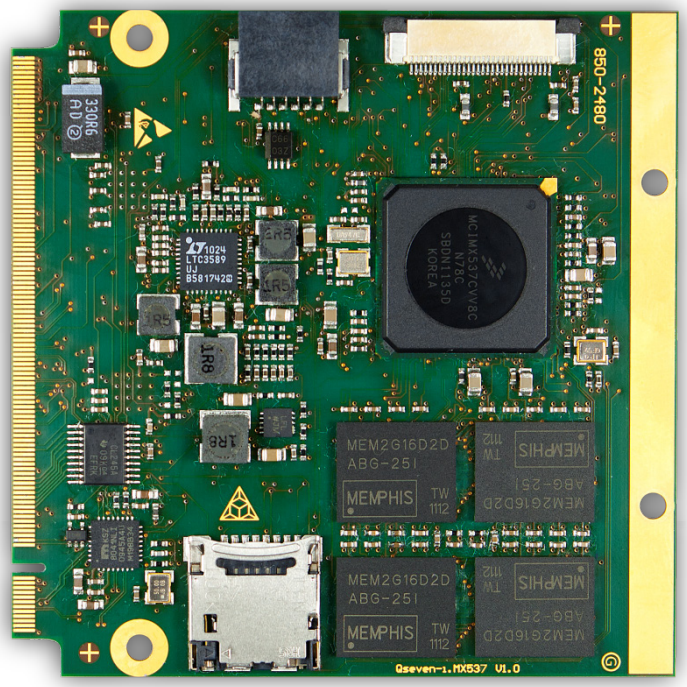
Embedding Ideas

Qseven-i.MX537



Hardware User Manual

Version 1.2

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Table of Contents

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Warning

Due to technical requirements components may contain dangerous substances.

1 Introduction

The Qseven-i.MX537 module is based on Freescale's next generation, high-performance, power-efficient, multimedia applications processor i.MX53. This processor features OpenGL® ES 2.0 and OpenVG™ 1.1 hardware accelerators, a multi-format HD1080p video decoder and a HD720p video encoder hardware engine, dual display capability, a SATA controller, IEEE1588 time-stamping and numerous serial interfaces (SDIO, SPI, I2C, UART). Further features are integrated security solutions, USB 2.0 controllers, Ethernet controller, two LVDS Display outputs and a camera sensor input (CSI). The Qseven module is available for industrial temperature range. It addresses 1GByte DDR2-SDRAM, has an on-board NAND flash of 2GByte and an additional SPI-NOR flash of 4MByte.

The state of the art i.MX53 SoC in combination with the outstanding integration of several peripheral controllers, memory and voltage control, turn the Qseven-i.MX537 module into a high-performance embedded platform for your future applications.

1.1 Overview

Figure 1-1 shows the main components of Qseven-i.MX537 module.

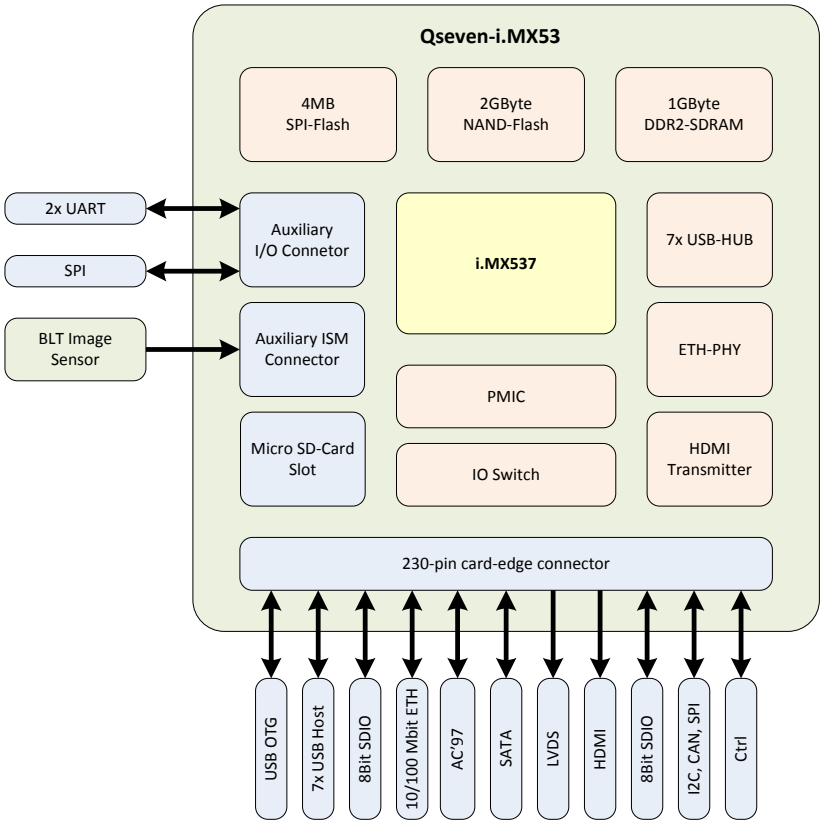

Figure 1-1: Main components of the Qseven-i.MX537 module

1.2 Key Features

- **Freescale Application Processor**
  - MCIMX537CVV8C Rev2.1
- **1 GB DDR2-SDRAM**
  - MEM2G16D2DABG-25I
  - DDR2-SDRAM Clock up to 400MHz
  - 4x (128Mx16, 1Gbit at 1.8V)
- **2 GB NAND-Flash**
  - MT29F16G08ABACAWP-IT:C
  - (16Gbit at 3.3V)
- **4 MB SPI-Flash**
  - M25PX32-VMW6E
  - 32Mbit at 3.3V
- **PMIC**
  - LTC3589 & ADP2119
  - Energy Management
  - Power-up sequencer
- **Ethernet-PHY**
  - KSZ8041NLI
- **HDMI-Trasmitter**
  - AD9889B
- **USB-Hub**
  - USB2517-JZX
- **µSD Card slot**
- **Connectors**
  - Qseven 230-pin card-edge connector
  - Auxiliary ISM connector
  - Auxiliary I/O connector

1.3 Applications

- Tablets
- Smart Mobile Devices
- Human-Machine-Interface
- Medical Devices
- Video Conference Systems
- Imaging and Consumer Multimedia
- Set Top Boxes
- Video Conference Applications
- Portable Media Players
- Industrial Applications

2 General Description

2.1 Functional Description

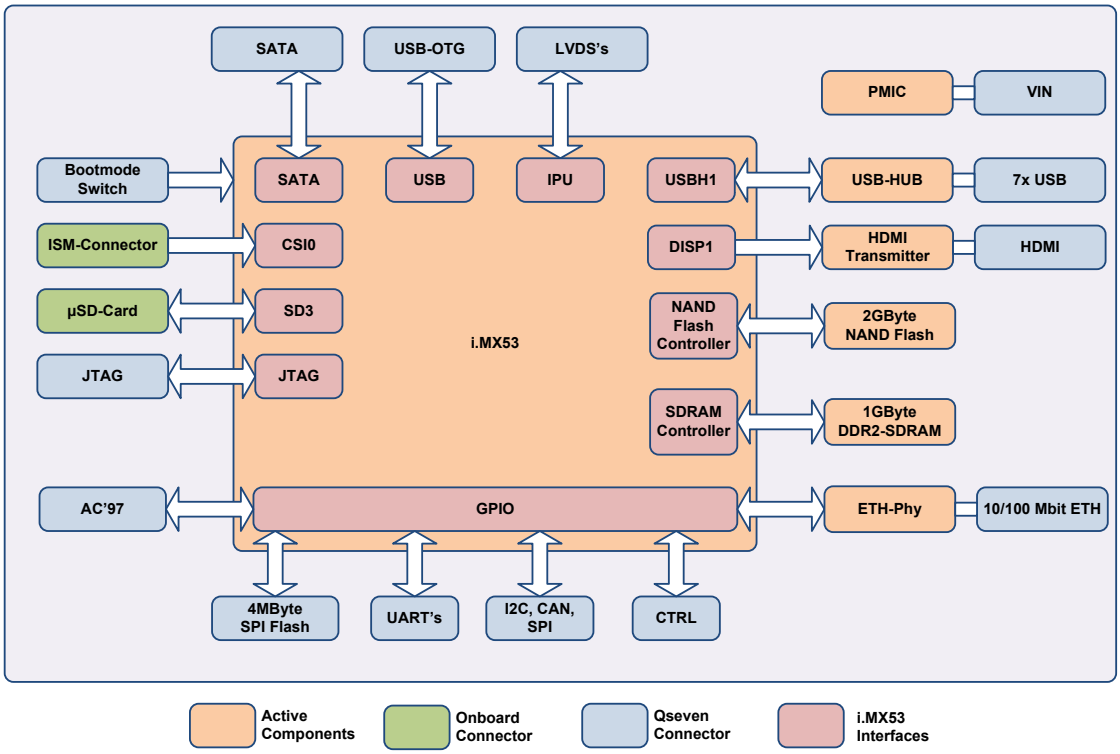

Figure 2-1: Functional overview

2.2 Boot Mode

The boot mode of the i.MX53 processor is determined by BOOT_ALT pin (pin 41of edge connector).

Pin	SPI-Flash	USB/UART
BOOT_ALT	0	1

Table 2-1: Boot Mode Selection Table

2.3 Memory Map

Component	Memory area	Chip select
512 MB DDR2-800 SDRAM	0x7000_0000 – 0x8FFF_FFFF	CSD0
512 MB DDR2-800 SDRAM	0xB000_0000 – 0xCFFF_FFFF	CSD1

Table 2-2: Memory Map

SPI-NOR and NAND flashes are not directly memory-mapped, but accessed via i.MX53 internal controllers. Please consult the i.MX53 Reference Manual for the i.MX53 memory map.

2.4 PCB Placement

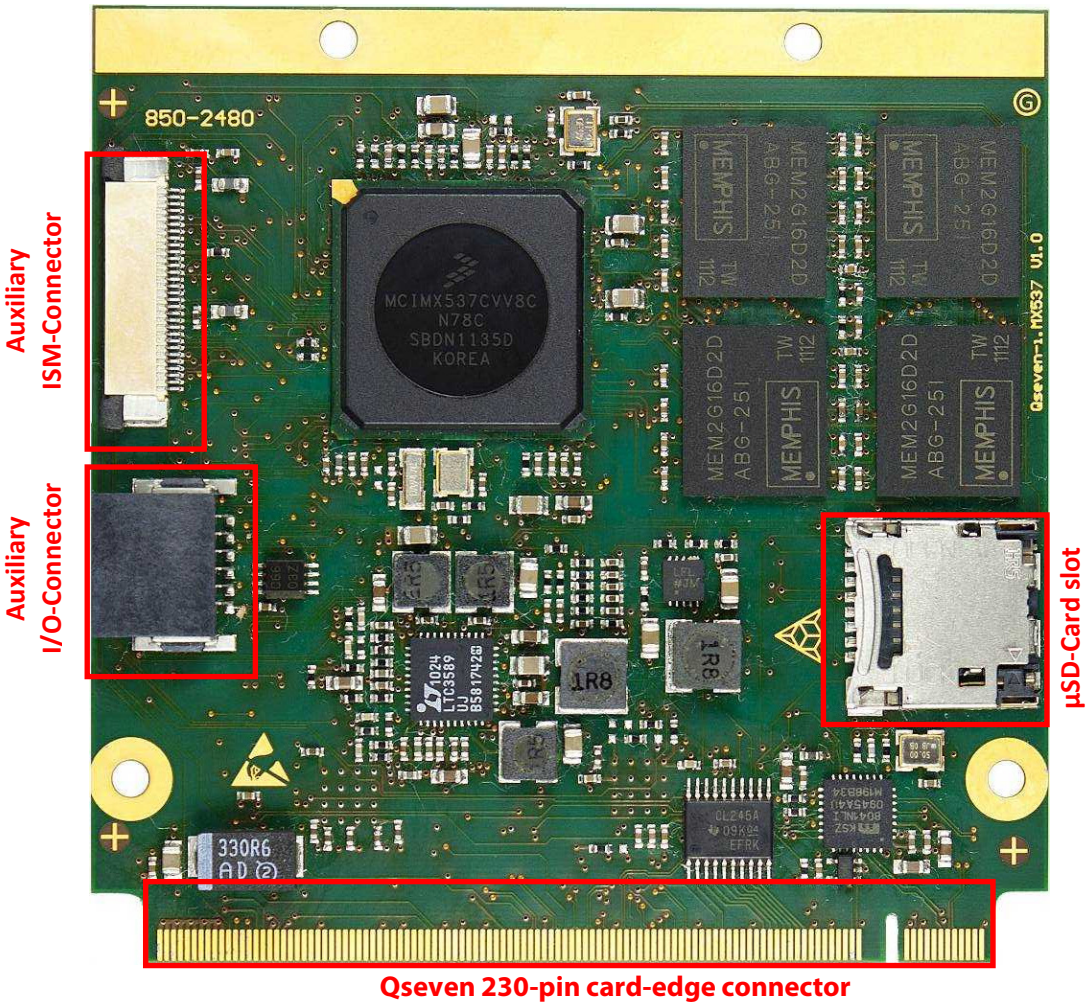

Figure 2-2: Top connectors placement

3 Specifications

3.1 Electrical Specifications

3.1.1 Operating Conditions

Symbol	Parameter	Min	Typical	Max	Unit
V_{IN}	Input supply voltage	4.5	5.0	5.5	V
I_{IN}	Input supply current @ V_{IN}=5.0V, T_{AMB}=25°C	300[1]	500[2]	1000[3]	mA
V_{OH}	High level output voltage	2.0	3.3	3.6	V
V_{OL}	Low level output voltage	-0.3		1.0	V
I_{IO}[4]	IO input current	2		161	µA
I_{RTC}	V_{RTC} current			1	mA
I_{USB_FS}	V_{USB} current in low/full speed mode			7	mA
I_{USB_HS}	V_{USB} current in high speed mode			22	mA
f_{CCLKC}	Core clock frequency for industrial grade modules			800	MHz
f_{CCLKI}	Core clock frequency for commercial grade modules			1000	MHz

Table 3-1: Electrical characteristics

[1] Linux running in idle mode; no USB devices plugged in
[2] Linux writes file to SATA HDD; one USB devices plugged in; display output on one LVDS interface
[3] TBD
[4] Dependent on which internal Pull-up resistor is asserted

3.1.2 Maximum Ratings

Stressing the device above the rating listed in the absolute maximum ratings table may cause permanent damage to the device. These are stress ratings only. Operation of the device at these or any other conditions greater than those indicated in the operating sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Symbol	Parameter	Min	Max	Unit
V_{IO}	Input or output voltage	-0.5	OVDD+0.3	V
V_{IN}	Input supply voltage	-0.3	6	V
I_{OH} / I_{OL}	Output current per pin		10	mA
T_{AMBI}	Ambient temperature for industrial grade modules	-40	85[1]	°C
T_{AMBC}	Ambient temperature for commercial grade modules	0	70[1]	°C
T_{STO}	Storage temperature	-55	150	°C
φ_{AMB}	Relative ambient humidity (non condensing)		90	%

Table 3-2: Absolute maximum ratings

[1] If extreme high ambient temperatures are expected (75°C in industrial environments or 60°C for commercial products), the user has to apply a heat dissipator on CPU and DDR-RAM (avoid heat accumulation!). The die temperature should be monitored regular, so that the CPU and RAM clock can be throttled if necessary.

3.1.3 ESD Sensitivity

ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

4 Connector Description

For a detail signal description please consult the i.MX53 reference manual, available on the Freescale web site.

4.1 Qseven edge connector

Pin No.	Signal Name	Direction	I/O Type	Function
1	GND	PWR	GND	
2	GND	PWR	GND	
3	NC			
4	NC			
5	NC			
6	NC			
7	ETH.LED_SPD	O	CMOS 3.3V PP	ETH Speed LED Driver
8	NC			
9	ETH.Rx_P	I_DP	LAN	ETH Receive Data+
10	ETH.Tx_N	O_DP	LAN	ETH Transmit Data-
11	ETH.Rx_N	I_DP	LAN	ETH Receive Data-
12	ETH.Tx_P	O_DP	LAN	ETH Transmit Data+
13	NC			
14	ETH.LED_ACT	O	CMOS 3.3V PP	ETH Activity LED Driver
15	VA_ETH	PWR_O	3.3V	ETH Analog Voltage
16	NC			
17	NC			
18	NC			
19	NC			
20	PWRON	I – 10k pull-up	CMOS 1.2V OD	Start-Up Module if PIN is low for 400ms
21	UART2.CTS	O	CMOS 3.3V PP	UART Request To Send / GPIO7_2
22	UART2.RTS	I	CMOS 3.3V PP	UART Clear To Send / GPIO7_3
23	GND	PWR	GND	
24	GND	PWR	GND	
25	GND	PWR	GND	
26	PWGIN	I	CMOS 5.0V	High active input for the Qseven® module indicates that all power rails located on the carrier board are ready for use.
27	OWIRE	I/O	CMOS 3.3V PP	One Wire Interface / GPIO7_6
28	CTRL.nRESET_IN	I – 100k pull up	CMOS 1.8V OD	Soft Reset
29	SATA.TX_P	O_DP	SATA	SATA Transmit Data+
30	NC			
31	SATA.TX_N	O_DP	SATA	SATA Transmit Data-
32	NC			
33	NC			
34	GND	PWR	GND	

Pin No.	Signal Name	Direction	I/O Type	Function
35	SATA.RX_P	I_DP	SATA	SATA Receive Data+
36	NC			
37	SATA.RX_N	I_DP	SATA	SATA Receive Data-
38	NC			
39	GND	PWR	GND	
40	GND	PWR	GND	
41	BOOT_ALT	I - 10k pull-up	CMOS 3.3V OD	Pull low to disable module's on-board BIOS
42	SD2.CLK	O	CMOS 3.3V PP	SD Clock / GPIO1_15
43	SD2.CD	I	CMOS 3.3V PP	SD Card Detect / GPIO1_4
44	UART3.RXD		CMOS 3.3V PP	UART Receive Data / GPIO7_10
45	SD2.CMD	O	CMOS 3.3V PP	SD Command / GPIO1_11
46	SD2.WP	I	CMOS 3.3V PP	SD Write Protect / GPIO1_2
47	UART3.TXD		CMOS 3.3V PP	UART Transmit Data / GPIO7_9
48	SD2.D1	I/O	CMOS 3.3V PP	SD Data 1 / GPIO1_14
49	SD2.D0	I/O	CMOS 3.3V PP	SD Data 0 / GPIO1_15
50	SD2.D3	I/O	CMOS 3.3V PP	SD Data 3 / GPIO1_12
51	SD2.D2	I/O	CMOS 3.3V PP	SD Data 2 / GPIO1_13
52	SD2.D5	I/O	CMOS 3.3V PP	SD Data 5 / GPIO2_13
53	SD2.D4	I/O	CMOS 3.3V PP	SD Data 4 / GPIO2_12
54	SD2.D7	I/O	CMOS 3.3V PP	SD Data 7 / GPIO2_15
55	SD2.D6	I/O	CMOS 3.3V PP	SD Data 6 / GPIO2_14
56	NC			
57	GND	PWR	GND	
58	GND	PWR	GND	
59	AUD5.RFS	I – 47R serial	CMOS 3.3V PP	AUD Receive Frame Sync / GPIO3_24
60	NC			
61	GPIO.(3V3)_3	I/O	CMOS 3.3V PP	GPIO4_5 / CLKO
62	NC			
63	AUD5.RSCK	I – 47R serial	CMOS 3.3V PP	AUD Receive Clock / GPIO3_25
64	NC			
65	AUD5.RX	I	CMOS 3.3V PP	AUD Receive Data / GPIO4_9
66	I2C1.SCL	O – 4k7 pull-up	CMOS 3.3V PP	I2C Clock / GPIO5_27
67	AUD5.TX	O	CMOS 3.3V PP	AUD Transmit Data / GPIO4_7
68	I2C1.SDA	I/O – 4k7 pull-up	CMOS 3.3V	I2C Data / GPIO5_26

Pin No.	Signal Name	Direction	I/O Type	Function
			PP	
69	FIRI.TXD	O	CMOS 3.3V PP	FIRI Transmit Data / GPIO1_8
70	NC			
71	FIRI.RXD	I	CMOS 3.3V PP	FIRI Receive Data / GPIO1_7
72	NC			
73	GND	PWR	GND	
74	GND	PWR	GND	
75	USBH2.D_N	I/O_DP	USB	USB Data-
76	USBH3.D_N	I/O_DP	USB	USB Data-
77	USBH2.D_P	I/O_DP	USB	USB Data+
78	USBH3.D_P	I/O_DP	USB	USB Data+
79	USBH3.OC USBH2.OC	I	CMOS 3.3V PP	Over-Current Sense
80	USBH4.OC USBH5.OC	I	CMOS 3.3V PP	Over-Current Sense
81	USBH5.D_N	I/O_DP	USB	USB Data-
82	USBH4.D_N	I/O_DP	USB	USB Data-
83	USBH5.D_P	I/O_DP	USB	USB Data+
84	USBH4.D_P	I/O_DP	USB	USB Data+
85	USBH7.OC USBH6.OC	I	CMOS 3.3V PP	Over-Current Sense
86	USBOTG.OC USBH0.OC	I	CMOS 3.3V PP	Over-Current Sense
87	USBH7.D_N	I/O_DP	USB	USB Data-
88	USBH6.D_N	I/O_DP	USB	USB Data-
89	USBH7.D_P	I/O_DP	USB	USB Data+
90	USBH6.D_P	I/O_DP	USB	USB Data+
91	USBOTG.VBUS	PWR	CMOS 3.3V PP	USB VBUS
92	USBOTG.ID	I	CMOS 3.3V PP	USB ID
93	USBOTG.D_N	I/O_DP	USB	USB Data-
94	USBH0.D_N	I/O_DP	USB	USB Data-
95	USBOTG.D_P	I/O_DP	USB	USB Data+
96	USBH0.D_P	I/O_DP	USB	USB Data+
97	GND	PWR	GND	
98	GND	PWR	GND	
99	LVDS0.TX0_P	O_DP	LVDS	LVDS0 Transmit Data0+ / GPIO7_30
100	LVDS1.TX0_P	O_DP	LVDS	LVDS1 Transmit Data 0+ / GPIO6_30
101	LVDS0.TX0_N	O_DP	LVDS	LVDS0 Transmit Data0- / GPIO7_31
102	LVDS1.TX0_N	O_DP	LVDS	LVDS1 Transmit Data 0- / GPIO6_31
103	LVDS0.TX1_P	O_DP	LVDS	LVDS0 Transmit Data1+ / GPIO7_28
104	LVDS1.TX1_P	O_DP	LVDS	LVDS1 Transmit Data 1+ / GPIO6_28
105	LVDS0.TX1_N	O_DP	LVDS	LVDS0 Transmit Data1- / GPIO7_29
106	LVDS1.TX1_N	O_DP	LVDS	LVDS1 Transmit Data 1- / GPIO6_29
107	LVDS0.TX2_P	O_DP	LVDS	LVDS0 Transmit Data2+ / GPIO7_26
108	LVDS1.TX2_P	O_DP	LVDS	LVDS1 Transmit Data 2+ / GPIO6_24
109	LVDS0.TX2_N	O_DP	LVDS	LVDS0 Transmit Data2- / GPIO7_27
110	LVDS1.TX2_N	O_DP	LVDS	LVDS1 Transmit Data 2- / GPIO6_25
111	UART3.CTS	I	CMOS 3.3V	UART Clear To Send / GPIO7_7

Pin No.	Signal Name	Direction	I/O Type	Function
			PP	
112	UART3.RTS	I	CMOS 3.3V PP	UART Clear To Send / GPIO7_3
113	LVDS0.TX3_P	O_DP	LVDS	LVDS0 Transmit Data3+ / GPIO7_22
114	LVDS1.TX3_P	O_DP	LVDS	LVDS1 Transmit Data 3+ / GPIO6_22
115	LVDS0.TX3_N	O_DP	LVDS	LVDS0 Transmit Data3- / GPIO7_23
116	LVDS1.TX3_N	O_DP	LVDS	LVDS1 Transmit Data 3- / GPIO6_23
117	GND	PWR	GND	
118	GND	PWR	GND	
119	LVDS0.CLK_P	O_DP	LVDS	LVDS0 Clock+ / GPIO7_24
120	LVDS1.CLK_P	O_DP	LVDS	LVDS1 Clock + / GPIO6_26
121	LVDS0.CLK_N	O_DP	LVDS	LVDS0 Clock- / GPIO7_25
122	LVDS1.CLK_N	O_DP	LVDS	LVDS1 Clock - / GPIO6_27
123	CTRL.PWM1	O	CMOS 3.3V PP	Pulse Width Modulation Output / GPIO1_9
124	NC			
125	I2C3.SDA	I/O – 4k7 pull-up	CMOS 3.3V OD	I2C3 Data / GPIO1_6
126	NC			
127	I2C3.SCL	O – 4k7 pull-up	CMOS 3.3V OD	I2C3 Clock / GPIO1_5
128	NC			
129	CAN1.TX	O	CMOS 3.3V PP	CAN Transmit Data / GPIO4_10
130	CAN1.RX	I	CMOS 3.3V PP	CAN Receive Data / GPIO4_11
131	HDMI.TC_P	O_DP	HDMI	HDMI Clock+
132	NC			
133	HDMI.TC_N	O_DP	HDMI	HDMI Clock-
134	NC			
135	GND	PWR	GND	
136	GND	PWR	GND	
137	HDMI.Tx1.P	O_DP	HDMI	HDMI Transmit Data 1+
138	NC			
139	HDMI.Tx1_N	O_DP	HDMI	HDMI Transmit Data 1-
140	NC			
141	GND	PWR	GND	
142	GND	PWR	GND	
143	HDMI.Tx0_P	O_DP	HDMI	HDMI Transmit Data 0+
144	NC			
145	HDMI.Tx0_N	O_DP	HDMI	HDMI Transmit Data 0-
146	NC			
147	GND	PWR	GND	
148	GND	PWR	GND	
149	HDMI.Tx2_P	O_DP	HDMI	HDMI Transmit Data 2+
150	HDMI.SDA	I/O – 2k2 pull-up	CMOS 5.0V OD	HDMI I2C Data
151	HDMI.Tx2_N	O_DP	HDMI	HDMI Transmit Data 2-
152	HDMI.SCL	I/O – 2k2 pull-up	CMOS 5.0V OD	HDMI I2C Clock
153	HDMI.HPD	I	CMOS 5.0V PP	HDMI Hot Plug Detect

Pin No.	Signal Name	Direction	I/O Type	Function
154	NC			
155	NC			
156	NC			
157	NC			
158	NC			
159	GND	PWR	GND	
160	GND	PWR	GND	
161	NC			
162	NC			
163	NC			
164	NC			
165	GND	PWR	GND	
166	GND	PWR	GND	
167	NC			
168	NC			
169	NC			
170	NC			
171	NC			
172	NC			
173	NC			
174	NC			
175	NC			
176	NC			
177	NC			
178	NC			
179	NC			
180	NC			
181	NC			
182	NC			
183	GND	PWR	GND	
184	GND	PWR	GND	
185	NC			
186	NC			
187	NC			
188	NC			
189	NC			
190	NC			
191	NC			
192	NC			
193	NC			
194	GPIO.(2V5)_2	I/O	CMOS 2.5V PP	GPIO1_18
195	GPIO.(2V5)_1	I/O	CMOS 2.5V PP	GPIO1_17
196	CTRL.PWM2	O	CMOS 2.5V PP	Pulse Width Modulation Output / GPIO1_19
197	GND	PWR	GND	
198	GND	PWR	GND	
199	ECSPI1.MOSI	O	CMOS 3.3V PP	SPI MOSI / GPIO5_23
200	ECSPI1.SS0	O	CMOS 3.3V PP	SPI Select 0 / GPIO5_25

Pin No.	Signal Name	Direction	I/O Type	Function
201	ECSPI1.MISO	I	CMOS 3.3V PP	SPI MISO / GPIO5_24
202	ECSPI1.SS1	O	CMOS 3.3V PP	SPI Select 1 / GPIO3_19
203	ECSPI1.SCLK	O	CMOS 3.3V PP	SPI CLK / GPIO5_22
204	JTAG.nTRST	I	CMOS 2.8V PP	JTAG Test Reset
205	NC			
206	NC			
207	JTAG.TCK	I	CMOS 2.8V PP	JTAG Test Clock
208	JTAG.TDI	I	CMOS 2.8V PP	JTAG Test Data Input
209	JTAG.TDO	O	CMOS 2.8V PP	JTAG Test Data Output
210	JTAG.TMS	I	CMOS 2.8V PP	JTAG Test Mode Select
211	VIN	PWR	5V0	
212	VIN	PWR	5V0	
213	VIN	PWR	5V0	
214	VIN	PWR	5V0	
215	VIN	PWR	5V0	
216	VIN	PWR	5V0	
217	VIN	PWR	5V0	
218	VIN	PWR	5V0	
219	VIN	PWR	5V0	
220	VIN	PWR	5V0	
221	VIN	PWR	5V0	
222	VIN	PWR	5V0	
223	VIN	PWR	5V0	
224	VIN	PWR	5V0	
225	VIN	PWR	5V0	
226	VIN	PWR	5V0	
227	VIN	PWR	5V0	
228	VIN	PWR	5V0	
229	VIN	PWR	5V0	
230	VIN	PWR	5V0	

Table 4-1: Qseven edge connector description

4.2 Image Sensor Connector X4 (Auxiliary-ISM-Connector)

Pin	Name	Direction	I/O Type	Description
1	VCAMA	PWR	-	Camera Analog Voltage Supply
2	GND	PWR	-	Power Ground
3	SADDR	NC	-	Not Connected
4	NC	NC	-	Not Connected
5	GPIO4_0	O	CMOS 2.8V PP	Global Camera Reset
6	I2C1.SCL	O – 4k7 pull-up	CMOS 3.3V OD	Configuration Bus Clock Line
7	I2C1.SDA	I/O – 4k7 pull-up	CMOS 3.3V	Configuration Bus Data Line

Pin	Name	Direction	I/O Type	Description
			OD	
8	NC	NC	-	Not Connected
9	GND	PWR	-	Power Ground
10	CSI0.PCLK	I	CMOS 3.3V PP	Pixel Clock
11	CSI0.VSYNC	I	CMOS 3.3V PP	VSYNC
12	CSI0.HSYNC	I	CMOS 3.3V PP	HSYNC
13	GPIO4_1	O	CMOS 2.8V PP	Camera Trigger
14	GPIO4_2	I	CMOS 2.8V PP	Strobe Signal from Camera
15	NC	NC	-	Not Connected
16	NC	NC	-	Not Connected
17	CSI0.D0	I	CMOS 3.3V PP	Pixel Data
18	CSI0.D1	I	CMOS 3.3V PP	Pixel Data
19	VCAMIO	PWR	-	Camera IO Power Supply
20	GND	PWR	-	Power Ground
21	CSI0.D2	I	CMOS 3.3V PP	Pixel Data
22	CSI0.D3	I	CMOS 3.3V PP	Pixel Data
23	CSI0.D4	I	CMOS 3.3V PP	Pixel Data
24	CSI0.D5	I	CMOS 3.3V PP	Pixel Data
25	GND	PWR	-	Power Ground
26	CSI0.D6	I	CMOS 3.3V PP	Pixel Data
27	CSI0.D7	I	CMOS 3.3V PP	Pixel Data
28	CSI0.D8	I	CMOS 3.3V PP	Pixel Data
29	CSI0.D9	I	CMOS 3.3V PP	Pixel Data
30	CSI0.DE	O	CMOS 3.3V PP	Output Enable (Active Low)

Table 4-2: BLT-ISM-Connector interface description (X4)

4.3 Auxiliary I/O Connector X3

All I/O Types are CMOS 3.3V PP.

Pin	Name	Direction	Description
1	3.3V	PWR	Power Supply
2	GND	PWR	Power Supply
3	EN_PERI	O –1k pull-up	Enable Periphery
4	GPIO5_0	IO	General Purpose GPIO
5	UART1.RXD	IO	UART1 RxD or GPIO6_18
6	UART1.TXD	IO	UART1 TxD or GPIO6_17
7	UART2.RXD	IO	UART2 RxD or GPIO7_1

Pin	Name	Direction	Description
8	UART2.TXD	IO	UART2 TxD or GPIO7_0
9	ECSPI2.MISO	IO	ECSPI2 MISO or GPIO2_25
10	ECSPI2.MOSI	IO	ECSPI2 MOSI or GPIO2_24
11	ECSPI2.SCLK	IO	ECSPI2 SCLK or GPIO2_24
12	ECSPI2.SS0	IO	ECSPI2 SS0 or GPIO2_26

Table 4-3: Extension Connector interface description (X3)

5 Application Information

5.1 Qseven Specification

Have a look at the Qseven Specification to get more information about the Qseven standard:

http://www.qseven-standard.org/fileadmin/spec/Qseven-Spec_1.20.pdf

5.2 Differential pairs

All signals/pins named *_N/*_P (for example: LVDS1.CLK_N and LVDS1.CLK_P) are differential pairs which should be routed with a differential impedance of 100Ω for LVDS and SATA or 90Ω for USB for a good signal integrity and to prevent EMI problems.

5.3 Signals

All signals which are not differential pairs should be routed with a single ended impedance of 50Ohm to minimize EMI.

6 Mechanical Outline

6.1 Top View

Figure 6-1 shows the top view of the mechanical outline of the Qseven-i.MX537 module. All dimensions are given in millimeters! Outline dimensions +/- 0,5mm.

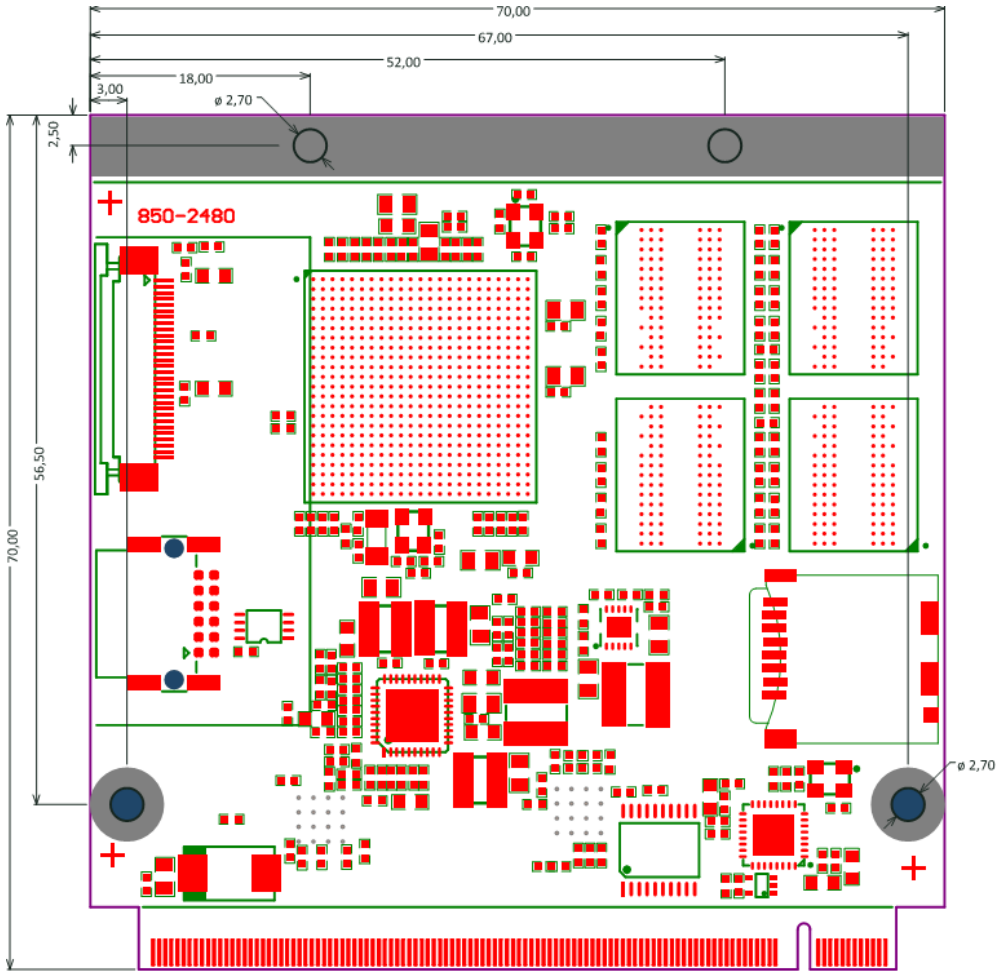

Figure 6-1: Mechanical outline (top view)

6.2 MXM Connector

The Qseven module features a 230-pin card-edge connector. The base board has to use the opposite connector (AS0B326-S78N-7F).

Manufacturer	Part Number
Foxconn	AS0B326-S78N-7F
Yamaichi	BEC-0.5-230-S9-xF-R-EDC

Table 6-1: Compatible Qseven connector types

7 Support

7.1 General Support

General support for products can be found at Bluetechnix' support site https://support.bluetechnix.at/wiki

7.2 Board Support Packages

Board support packages and software downloads are for registered customers only
https://support.bluetechnix.at/software/

7.3 Blackfin® Software Support

7.3.1 BLACKSheep® OS

BLACKSheep® OS stands for a powerfully and multithreaded real-time operating system (RTOS) originally designed for digital signal processing application development on Analog Devices Blackfin® embedded processors. This high-performance OS is based on the reliable and stable real-time VDK kernel from Analog Devices that comes with VDSP++ IDE. Of course BLACKSheep® OS is fully supported by all Bluetechnix Core-Modules and development hardware.

7.3.2 LabVIEW

You can get LabVIEW embedded support for Bluetechnix Core Modules by Schmid-Engineering AG http://www.schmid-engineering.ch.

7.3.3 uClinux

You can get uClinux support (boot loader and uClinux) for Bluetechnix Core Modules at http://blackfin.uClinux.org.

7.4 Blackfin® Design Services

Based on more than seven years of experience with Blackfin, Bluetechnix offers development assistance as well as custom design services and software development.

7.4.1 Upcoming Products and Software Releases

Keep up to date with all product changes, releases and software updates of Bluetechnix at http://www.bluetechnix.com.

8 Ordering Information

Article Number	Name	Temperature Range
100-1500-1	Qseven-i.MX537	Industrial
100-1520-1	DEV-Qseven-i.MX	Commercial

Table 8-1: Ordering information

NOTE: Custom Core Modules are available on request! Please contact Bluetechnix (office@bluetechnix.com) if you are interested in custom Core Modules.

9 Dependability

9.1 MTBF

Please keep in mind that a part stress analysis would be the only way to obtain significant failure rate results, because MTBF numbers just represent a statistical approximation of how long a set of devices should last before failure. Nevertheless, we can calculate an MTBF of the Core Module using the bill of material. We take all the components into account. The PCB and solder connections are excluded from this estimation. For test conditions we assume an ambient temperature of 30°C of all Core Module components except the Blackfin® processor (80°C) and the memories (70°C). We use the MTBF Calculator from ALD (http://www.aldservice.com/) and use the reliability prediction MIL-217F2 Part Stress standard. Please get in touch with Bluetechnix (office@bluetechnix.com) if you are interested in the MTBF result.

10 Product History

10.1 Version Information

10.1.1 Qseven-i.MX537

Version	Component	Type
1.1.0	Processor	MCIMX537CVV8C Rev2.1
	RAM	MEM2G16D2DABG-25I
	SPI-Flash	M25PX32-VMW6E
	NAND-Flash	MT29F16G08ABACAWP-IT:C
	ETH PHY	KSZ8041NLI
	USB HUB	KUSB2517I-JZX
	HDMI Trans.	AD9889BBCPZ-165
	Audio	SGTL5000XNAA3R2

Table 10-1: Overview Qseven-i.MX537 product changes

10.2 Anomalies

Version	Date	Description
1.0.0	2011-12-09	No anomalies reported yet.

Table 10-2: Overview product anomalies

11 Document Revision History

Version	Date	Document Revision
1	2011-11-22	Preliminary Release of the Document
1	2012-01-10	Processor change to MCIMX537CVV8C
2	2012-11-28	Updated HUM with new CI-Design.

Table 11-1: Revision history

12 List of Abbreviations

Abbreviation	Description
ADI	Analog Devices Inc.
AI	Analog Input
AMS	Asynchronous Memory Select
AO	Analog Output
CM	Core Module
DC	Direct Current
DSP	Digital Signal Processor
eCM	Enhanced Core Module
EBI	External Bus Interface
ESD	Electrostatic Discharge
GPIO	General Purpose Input Output
I	Input
I²C	Inter-Integrated Circuit
I/O	Input/Output
ISM	Image Sensor Module
LDO	Low Drop-Out regulator
MTBF	Mean Time Between Failure
NC	Not Connected
NFC	NAND Flash Controller
O	Output
OS	Operating System
PPI	Parallel Peripheral Interface
PWR	Power
RTOS	Real-Time Operating System
SADA	Stand Alone Debug Agent
SD	Secure Digital
SoC	System on Chip
SPI	Serial Peripheral Interface
SPM	Speech Processing Module
SPORT	Serial Port
TFT	Thin-Film Transistor
TISM	Tiny Image Sensor Module
TSC	Touch Screen Controller
UART	Universal Asynchronous Receiver Transmitter
USB	Universal Serial Bus
USBOTG	USB On The Go
ZIF	Zero Insertion Force

Table 12.1: List of abbreviations