Section	Title	Requirement statement	Compliance Directive	Board	Board Vendor Comments	Cross-chack	Comments	naro Documented Exceptions
1	96Boards CE Physical Footprint		Directive	Board	Comments	CIUSS-CIIECK	Comments	Documented Exceptions
1.1	Area							
1.1.1	Dimensions	The board without population of connectors shall fit into a 85 x	Required	Yes		OK		
		Connectors should not protrude from the area footprint except as	Highly	Yes		ОК		
1.1.2	Area exceptions	component design requires (for example USB Type A front shrouds). A compatible extended version is defined that shall fit into a 85 x	Recommended					
1.1.3	Area - Extended	100mm footprint with the same conditions.	If, Required	N.A.		OK		
1.2	Height	100mm rootprint with the same conditions.	ii, rioquirou					ı
1.2.1	PCB	62mil (1.575mm) nominal	Required	Yes		OK		
1.2.2	Below PCB	3.4 mm maximum	Required	Yes		OK		
1.2.3		7.0 mm maximum	Required	Yes		OK		
1.2.4	Tota	Total height of the board including on board connectors shall not	Required	Yes		OK		
		Note that the maximum height for general components on the board						
		top side is 4mm (not including the allowed areas for connectors and		Yes		OK		
1.2.5	Component Height	larger components)	Required					
1.2.6	Maximum height in allowed area	The maximum height in the allowed areas is 6.5mm	Required	Yes		OK		
1.2.7		The two Type A USB connectors which can be up to 7.0mm	Required If, Required	Yes		OK		
	Option - Extended A	Extended area shall conform to 4mm (except for user links and thermal		N.A.		OK		
1.2.9.1	Option - Extended B	Extended area and extended connector rear connector area shall use Exceeds underside height restrictions	If, Required Optional	N.A.		OK OK		
1.2.5.1	Delow 1 CD	Board footprint on the underside shall be fully documented and	Optional	N.A.		UK		
		standoffs and/or additional heat management shall be documented or		Yes		ок		
1.2.9.2	Documentation	provided	If, Required	100		l on		
2	SoC Location Options	Jr	, quirou		•			1
2.1	SoC Top Placement							
2.1.1	Height with a low-profile heatsink/fan	Total maximum height of 6.0mm	Required	Yes		OK		
2.2	SoC Bottom Placement							
2.2.1	Height	The board should meet the "Below PCB" footprint requirement	Highly	Yes		OK		
		This then allows additional thermal management in the case or	Highly	Yes		ОК		
2.2.2	Heatsink	enclosure for the board as required	Recommended	162		UN		
3	DRAM						<u> </u>	
3.1	Minimum	The board shall be populated with a minimum of 0.5GB of DRAM	Required	Yes		OK		
3.2	Recommended	It is strongly recommended that a minimum of 1GB DRAM is fitted where the board is expected to run Android	Highly Recommended	Yes		OK		1
3.2	eMMC/Flash	where the board is expected to run Android	Hecommended					l
4.1		The board may optionally be populated with eMMC or other format	Optional	Yes	UES	ОК		T
4.1	Cit-boald elvilvich lash	If the SoC used is not able to boot from microSDHC then a minimum	Optional		013			
4.2	No microSDHC boot?	of 8MB of bootable flash memory shall be provided on the board	If, Required	Yes		OK		
		Where multiple boot options are provided the choice of boot location	,					
4.3	Multiple boot options?	shall be user selectable in hardware (links or switches)	If, Required	Yes				
		Note that the insertion of a cable shall not automatically require boot						
		from that cable (for example the insertion of a microUSB cable into				TBD		
		an OTG port to use FastBoot). In this case the boot option must still				100		
4.4	Cable insert no boot	be user selectable.	Required		Check			
5	microSDHC							,
	t th-	A microSDHC card socket shall be fitted in the specified location on	Domition of	Yes		OK		
5.1	Location	the board In the absence of on-board Flash memory, the system shall be	Required					
		capable of booting from the boot software installed on a microSDHC		No		ок		
5.2	Bootable?	card at power up.	If, Required	NU		UK		
6	WiFi/Bluetooth LE		.,			l .	l.	<u> </u>
6.1	Minimum	The board shall support WiFi (minimally 802.11g/n) and Bluetooth	Required	Yes		OK		
6.2	Recommended	It is recommended that WiFi 802.11ac is also supported.	Highly	Yes		OK		
7	Display Interface							
		HDMI shall be provided on a full size (Type A) or a micro Type D						
		connector OR		Yes	Type A	OK		
		MHL shall be provided on a 5 pin microUSB connector OR						
7.1	Display Output Connector	Display Port which shall be provided on a USB Type C connector	Required			1		1
		In all cases the display interface shall include audio with support for		V		6.1		
7.2	Audio support	at least 1 channel	Required	Yes		OK		1
7.3	Location	In all cases the connector shall be located in the specified location	Required	Yes		OK		
7.4	MIPI-DSI							
7.4.1		A MIPI DSI port shall be provided on the expansion bus interface.	Required	Yes		OK		ļ
7.4.2	Number of lanes	1-4 lanes are supported. An implementation may use less than 4	Optional	2		OK		
		Note that if a single DSI interface on the SoC is used to provide both (1)	1			1		1
			1			1		1
		the high speed expansion bus interface DSI port and (2) the on board HDMI/MHL/DisplayPort interface (via suitable transmitter), then the	l	Yes		ок		
			1			1		1
7.4.3	MIPI-DSI/HDMI priority	expansion port interface shall be operational if a mezzanine board that	If, Required			1		1
	Will I South Swift priority		,		one 4 lane DSI dedicated for			1
			l		HDMI, second 4 lane DSI	l		
			1	Yes	switchable between HDMI 4k	ок		1
		It is then optional as to whether the on-board interface is usable at	l	1.00	output and high speed	I		
7.4.4	MIPI-DIS/HDMI simultaneous	the same time	Optional		expansion interface	L		1
8	Camera Interfaces							
8.1	Expansion bus	1 or 2 MIPI CSI-2 ports may be provided on the expansion bus	Optional		3 x 4lane+1 x 2lane	OK		
8.2	CSIO	Maria de la constanta de la co						
8.2.1 8.2.2	Interface	If 1 port is provided it shall be located on the CSI0 port interface From 1-4 lanes may be implemented on the CSI0 port interface	If, Required Optional	Yes	labelled CSI0 in pinout	OK		
8.2.2	Number of lanes CS/I	rium i-+ ianes may be implemented on the CSIU port interface	Optional	4	labelled CSIU in pinout	OK		
0.0	CSII				labelled CSI3 in pinout (two			1
			1		additional 4 lane CSI interfaces	1		1
			1	2	are also provided on new HS2	ок		1
		L			connector - labelled CSI1 and	l		1
8.3.1	Number of lanes	From 1-2 lanes may be implemented on the CSI1 port interface	Optional		CSI2)	l		1

		_						
		An implementation may support dual (stereo) cameras through the		Yes		OK		
8.4	Stereo Cameras		Optional					
		The specified GPIO and CLK signals on the expansion connectors		Yes		ОК		
8.5	Camera/Sensor Control Signals	shall be used for these functions if implemented	Required	res		UK		
		If the cameras/sensors are not available/used then these signals		Yes		ок		
8.6	No camera	shall be available as GPIO and CLK signals	If, Required	162		UK		
9	USB Ports							
					2x USB 3.0 Type A and 1 USB			
					Type C onboard. High speed			
				Yes	connectors have additional	OK		
					Type 2.0 and Type 3.0 USB			
9.1	Number of ports	A total of 4 USB ports shall be provided for a board.	Required		capability			
9.2	Ports 1 & 2				,			
9.2.1	Type	Two Type A or Type C USB host ports (USB 2.x or 3.x) shall be	Required	Yes	Type A USB 3.0	OK		
9.2.2		The connectors shall be in the specified locations	Required	Yes	Type A GOD C.S	OK		
9.3	Port 3	There are two options for Port 3:	,	103		OK		
9.3.1	Location	The connector shall be placed in the specified location.	Required	Yes	1	OK		
9.3.2		The third port shall be available as a slave port.	Required	Yes	1	OK		
9.3.3	OTG	The third port may be an OTG port.	Optional	Yes	1	OK		
9.3.4	Option 1	, , ,		103	1	OK		
9.3.4.1		A 5 pin microUSB USB 2.0 slave port shall be provided.	Required, OR	N A	1	OK		
9.3.4.2		The connector type shall be micro-AB for an OTG port or micro-B for	If. Required	N.A.	 	OK	i e	i e
9.3.4.3	Power	This port shall not provide power to the board, due to insufficient	If, Required	N.A.	+	OK OK	1	
9.3.5	Option 2	par provide power to the board, due to mountain	, moquirou	IN.A.	+	UK	1	
9.3.5.1	Туре	A Type C USB port shall be provided (USB 2.x or 3.x).	Required, OR	Yes	 	OK	1	
0.0.	Туре	A Type C 050 port silali de provided (050 2.x or 5.x).	squirou, on		+		1	
9.3.5.2	Down	This port may also be used to provide 5V external power to the board.	Optional	No	1	OK	1	
9.3.3.2	Port 4	inis port may also be used to provide 5 v external power to the board.	Ориона		+		1	
J.4	Pon 4	A fourth USB host port shall be provided on the high speed			 		ł	
9.4.1	Туре		Required	Yes	USB 2.0 and USB 3.0	OK	1	
9.4.1	Restrictions	oxpanion bao.	nequired		000 E.0 and 000 0.0			
ø.3	Hestrictions				 			
9.5.1	Simultaneous use	There may be some restrictions on simultaneous USB port usage.	Optional	No	l l	OK	1	
9.5.1					1			
9.5.2	Audio Documented	Any such restrictions shall be clearly documented.	If, Required	N.A.		OK		
10.1	Audio Port 1							
10.1		I/O via Bluetooth 4.0	Deguired					
	Type	I/O VIA BIDEROUTT 4.0	Required	Yes	1	OK		
10.2	Port 2	Control the Control of the Control o	Be environd					
10.2.1	Type	Output through the HDMI/MHL/DisplayPort interface	Required	Yes		OK		
10.3	Port 3							
		An I2S/PCM audio channel shall be provided on the low speed		Yes	Additional PCM/I2S also	ок		
		expansion interface.			provided on LS2			
10.3.1		expansion interiace.	Required		piovided on Laz			
10.3.1	DC Power		Required		piovided on L32		<u>l</u>	
10.3.1 11 11.1	DC Power	Power shall be provided to the board by one (and only one) of the	Required		provided on E32			
11	DC Power		Required		provided on E32			
11	DC Power		недигеа	Ven	provided on ES2	OV.		
11	DC Power	Power shall be provided to the board by one (and only one) of the	Hequirea	Yes	provided off ES2	ОК		
11 11.1	DC Power Source	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector, CUI Inc	.,	Yes	Diovided on Lo2	ОК		
11	DC Power Source	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector, CUI inc PJ-041H or equivalent, shall be placed in the specified location.	Required, OR		provided on LG2			
11.1.1	DC Power Source DC Jack	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector, CUI Inc PJ-041H or equivalent, shall be placed in the specified beation. An 8V to 18V power supply from the SVS_DCIN pins on the low	Required, OR	Yes	Diovided Oil F25	ОК		
11 11.1	DC Power Source DC Jack	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector, CUI Inc PJO-81H or equivalent, shall be placed in the specified location. An 8V to 18V power specified promise of the SYS_DCIN pins on the low speed expansion connector.	.,		provided oil LS2			
11.1.1	DC Power Source DC Jacke Expansion bus	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.85mm center pin positive DC jack connector, CUI inc PJ-0411 or equivalent, sup	Required, OR	Yes	provided oil LSZ			
11 11.1 11.1.1 11.1.2 11.1.3	DC Power Source DC Jack Expansion bus USB Type C	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector, CUI Inc PJO-81H or equivalent, shall be placed in the specified location. An 8V to 18V power specified promise of the SYS_DCIN pins on the low speed expansion connector.	Required, OR		provided oil Lisz	ОК		
11.1.1	DC Power Source DC Jacke Expansion bus	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. At 165mm center pin positive DC jack connector, CUI Inc PL/041H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SVS_DCIN pins on the low speed expansion connector. A USB Type C pont at SV (if fitted) according to the USB 3.1 specifications.	Required, OR	Yes	poveed units	ОК		
11 11.1 11.1.1 11.1.2 11.1.3 11.2	DC Fower Source DC Jack Expansion bus USB Type C Multiple supples	Fower shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector, CUII Inc PJ.041H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. A USB Type C port at 5V (if fitted) according to the USB 3.1 specifications.	Required, OR Required, OR	Yes Yes	poweeu un Laz	ок ок		
11 11.1 11.1.1 11.1.2 11.1.3 11.2	DC Power Source DC Jack Expansion bus USB Type C Multiple supplies Safety	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. At 165mm center pin positive DC jack connector, CUI Inc PL-1041H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SVS_DCIN pins on the low speed expansion connector. A USB Type C port at SV (if fitted) according to the USB 3.1 specifications. If multiple in-specification supplies are connected there shall not be a safety save	Required, OR Required, OR Required, OR	Yes Yes Yes	provided on LSC	ок ок		
11 11.1 11.1.1 11.1.2 11.1.3 11.2	DC Power Source DC Jack Expansion bus USB Type C Multiple supplies Safety	Fower shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector, CUII Inc PJ.041H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. A USB Type C port at 5V (if fitted) according to the USB 3.1 specifications.	Required, OR Required, OR	Yes Yes	poweeu un Laz	ок ок		
11 11.1 11.1.1 11.1.2 11.1.3 11.2	DC Power Source DC Jack Expansion bus USB Type C Multiple supplies Safety	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.85mm center pin positive DC jack connector, CUI Inc PJ-0411 for equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SVS DCIN pins on the low speed expansion connector. A USB Type C port at SV (if fitted) according to the USB 3.1 specifications. If multiple in-specification supplies are connected there shall not be a safety issue. These shall be no damage to the board.	Required, OR Required, OR Required, OR	Yes Yes Yes	poveed on LSC	ок ок		
11 11.1 11.1.1 11.1.2 11.1.3 11.2	DC Power Source DC Jack Expansion bus USB Type C Multiple supplies Safety	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector. CUII no PJ-041H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector: A USB Type C port at 5V (if fitted) according to the USB 3.1 specifications. If multiple in especification supplies are connected there shall not be a safety sure	Required, OR Required, OR Required, OR	Yes Yes Yes	poweeu un Laz	ок ок		
11 11.1 11.1.1 11.1.2 11.1.3 11.2	DC Power Source DC Jack Expansion bus USB Type C Multiple supplies Safety	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A1 65mm center by possible DC jack connector, CUI Inc PJ.041H or equivalent shall be placed in the specified connector, CUI Inc PJ.041H or equivalent shall be placed in the specified of the specified shall be placed in the specified shall be placed in the specified shall be placed in the BYS DCIN pins on the low speed expansion connector. A USB Type C port at SV (if fitted) according to the USB 3.1 specifications. If multiple in-specification supplies are connected there shall not be a safety issue. There shall be no damage to the board. There shall be no damage to the board. The shall be no damage to the board. The count shall be DC Jack (b) the Expansion connector or from (c) a sufficiently rated power supply is connected to the DC Jack (b) the Expansion connector or from (c) a	Required, OR Required, OR Required, OR	Yes Yes Yes	provided on LSZ	ок ок		
11 11.1 11.1.1 11.1.2 11.1.3 11.2 11.2.1 11.2.2	DC Power Source DC Jack Expansion bus USB Type C Multiple supples Safety Damage	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector. CUII no. PJ-041H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector: A USB Type C port at 5V (if fitted) according to the USB 3.1 specifications. If multiple in especification supplies are connected there shall not be a safety sure	Required, OR Required, OR Required, OR	Yes Yes Yes	poweeu un Laz	ок ок		
11 11.1 11.1.1 11.1.2 11.1.3 11.2	DC Power Source DC Jack Expansion bus USB Type C Multiple supplies Safety	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector. CUII no. PJ-041H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector: A USB Type C port at 5V (if fitted) according to the USB 3.1 specifications. If multiple in especification supplies are connected there shall not be a safety sure	Required, OR Required, OR Required, OR	Yes Yes Yes Yes	provided on LSZ	OK OK OK		
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11 11.1 11.1.1 11.1.2 11.1.3 11.2 11.2.1 11.2.2	DC Power Source DC Jack Expansion bus USB Type C Multiple supples Safety Damage Common for all supplies	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A1 65mm center pin positive DC jack connector, CUI Inc PL/941H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SVS_DCIN pins on the low speed expansion connector. A USB Type C port at SV (if fitted) according to the USB 3.1 specifications. If multiple in-specification supplies are connected there shall not be a safety issue. There shall be no damage to the board. There shall be no damage to the board. There shall be no damage to the board. The count shall be DC Jack (b) the Expansion connector or from (c) a Type C USB port (when power does not have to be provided on the SVS_DCIN line) A minimum of SW to a mezzanine module via the regulated +5V line	Required, OR Required, OR Required, OR	Yes Yes Yes Yes	poveed units2	ОК ОК ОК ОК		
11.1.1 11.1.1 11.1.2 11.1.3 11.2.1 11.2.1 11.2.1 11.3 11.3	DC Fower Source DC Jack Expansion bus USB Type C Multiple supplies Safety Damage Common for all supplies Mezzanine +5V	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector. CUI Inc PJ-0.41H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low appead expansion connector. A USB Type C port at 5V (if filted) according to the USB 3.1 specifications. If multiple in-specification supplies are connected there shall not be a safety issue and a supplier of the board. There shall be no damage to the board. There shall be no damage to the board. Type CUSB port (when powered from (a) a sufficiently rated power supply is connected to the DC Jack (b) the Expansion connector or from (c) a Type CUSB port (when powered when the power of the SYS_DCIN line) A minimum of 5W to a exercise module via the regulated +5V line A minimum of 5W to external USB devices connected to the 2 host with a minimum of 5W to external USB devices connected to the 2 host with the connected to the 2 ho	Required, OR Required, OR Required, OR Required Required Required	Yes Yes Yes Yes	poweeu un Laz	OK OK OK		
11.1.1 11.1.1 11.1.2 11.1.3 11.2 11.2.1 11.2.2	DC Fower Source DC Jack Expansion bus USB Type C Multiple supplies Safety Damage Common for all supplies Mezzanine +5V	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector, CUI Inc PJ.041 Hor equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. A USB Type C port at SV (if fitted) according to the USB 3.1 specifications. If multiple in-specification supplies are connected there shall not be a safety issue the specification of the C power of the SYS_DCIN pins on the low speed to the board. There shall be no damage to the board. There SYS_DCIN line DC Jack (b) the Expansion connector or from (c) a Type C USB port (when power does not have to be provided on the SYS_DCIN line). A minimum of SW to a mezzanine module via the regulated +5V line A minimum of SW to external USB devices connected to the 2 host USB ports.	Required, OR Required, OR Required, OR Required Required	Yes Yes Yes Yes	poveed units2	ОК ОК ОК ОК		
11.1.1 11.1.1 11.1.2 11.1.3 11.2 11.2.1 11.2.2 11.3 11.3	DC Jack Expansion bus USB Type C Multiple supplies Safely Common for all supplies Mezzanine +5V USB Hosts	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector, CUII Inc PL-0411 for equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. A USB Type C port at 5V (if fitted) according to the USB 3.1 queedifications. If multiple in especification supplies are connected there shall not be a safety issue. There shall be no damage to the board. The count state of the SYS_DCIN pins on the SYS ports of SYV to a mezzanihe module via the regulated +5V line A minimum of SW to a mezzanihe module via the regulated +1.8V LISB ports.	Required, OR Required, OR Required, OR Required Required Required Required Required	Yes Yes Yes Yes Yes Yes	poveed on LSC	OK OK OK OK		
11.1.1 11.1.1 11.1.2 11.1.3 11.2.1 11.2.1 11.2.1 11.3 11.3	DC Fower Source DC Jack Expansion bus USB Type C Multiple supplies Safety Damage Common for all supplies Mezzanine +5V	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector, CUII Inc PL-0411 for equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. A USB Type C port at 5V (if fitted) according to the USB 3.1 queedifications. If multiple in especification supplies are connected there shall not be a safety issue. There shall be no damage to the board. The count state of the SYS_DCIN pins on the SYS ports of SYV to a mezzanihe module via the regulated +5V line A minimum of SW to a mezzanihe module via the regulated +1.8V LISB ports.	Required, OR Required, OR Required, OR Required Required Required	Yes Yes Yes Yes	provided on LSZ	ОК ОК ОК ОК		
11.1.1 11.1.1 11.1.2 11.1.3 11.2 11.2.1 11.2.2 11.3 11.3	DC Jack Expansion bus USB Type C Multiple supplies Safely Common for all supplies Mezzanine +5V USB Hosts	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector. CUI Inc PJ-041H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. A USB Type CD and 18V (if fitted) according to the USB 3.1 specifications. If multiple in-specification supplies are connected there shall not be a safety issue and a sufficiently rated power supply is connected to the DC Jack (b) the Expansion connector or from (c) a Type CUSB port (when power does not have to be provided on the SYS_DCIN line) A minimum of 5W to a mezzanine module via the regulated +5V line A minimum of 5W to external USB devices connected to the 2 host USB ports A minimum of 5W to external USB devices connected to the 2 host USB ports	Required, OR Required, OR Required, OR Required Required Required Required Required	Yes Yes Yes Yes Yes Yes	poveed units	OK OK OK OK		
11.1.1 11.1.1 11.1.2 11.1.3 11.2 11.2.1 11.2.2 11.3 11.3	DC Jack Expansion bus USB Type C Multiple supplies Safely Common for all supplies Mezzanine +5V USB Hosts	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector, CUII Inc PJ.041H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. A USB Type C port at 5V (if fitted) according to the USB 3.1 specifications. If multiple in-specification supplies are connected there shall not be a safety issue. If multiple in-specification supplies are connected there shall not be a safety issue. There shall be no damage to the board. The count shall be an observed from (a) a sufficiently rated power supply is connected to the DC Jack (b) the Expansion connector or from (c) a Type C USB port (when power does not have to be provided on the SYS_DCIN line). A minimum of SW to a mezzanine module via the regulated ±SV line. A minimum of USW to a mezzanine module via the regulated ±1.8V line. The board shall be able to provide the following power to external	Required, OR Required, OR Required, OR Required Required Required Required Required	Yes Yes Yes Yes Yes Yes	poveed units2	OK OK OK OK		
11.1.1 11.1.2 11.1.2 11.1.3 11.2.1 11.2.2 11.3 11.3	DC Fower Source DC Jack Expansion bus USB Type C Multiple supplies Safety Damage Common for all supplies Mezzanine +5V USB Hosts Mezzanine 1.8V	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector. CUI Inc PJ-041H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low appead expansion connector. A USB Type C port at 5V (if filted) according to the USB 3.1 specifications. If multiple in-specification supplies are connected there shall not be a safety issue and a supplies are connected the shall not be a safety issue and a supplies are connected the shall not be a safety issue and a supplies are connected the shall not be a safety issue on the shall be not damage to the board. There shall be no damage to the board. There shall be no damage to the board. There shall be no damage to the board. There shall be not defined to the board on the SYS_DCIN line) A minimum of style or determal USB devices connected to the 2 host USB ports A minimum of 0.18W to a mezzanine module via the regulated +5V line A minimum of 0.18W to a mezzanine module via the regulated +1.8V line A minimum of 0.18W to a mezzanine module via the regulated +1.8V line and the shall be able to provide the following power to external devices when a sufficiently rated power supply is connected to the	Required, OR Required, OR Required, OR Required Required Required Required Required	Yes Yes Yes Yes Yes Yes	poweed on LSC	OK OK OK OK		
11.1.1 11.1.1 11.1.2 11.1.3 11.2 11.2.1 11.2.2 11.3 11.3	DC Fower Source DC Jack Expansion bus USB Type C Multiple supplies Safety Damage Common for all supplies Mezzanine +5V USB Hosts Mezzanine 1.8V	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector. CUI Inc PJ-041H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low appead expansion connector. A USB Type C port at 5V (if filted) according to the USB 3.1 specifications. If multiple in-specification supplies are connected there shall not be a safety issue and a supplies are connected the shall not be a safety issue and a supplies are connected the shall not be a safety issue and a supplies are connected the shall not be a safety issue on the shall be not damage to the board. There shall be no damage to the board. There shall be no damage to the board. There shall be no damage to the board. There shall be not defined to the board on the SYS_DCIN line) A minimum of style or determal USB devices connected to the 2 host USB ports A minimum of 0.18W to a mezzanine module via the regulated +5V line A minimum of 0.18W to a mezzanine module via the regulated +1.8V line A minimum of 0.18W to a mezzanine module via the regulated +1.8V line and the shall be able to provide the following power to external devices when a sufficiently rated power supply is connected to the	Required, OR Required, OR Required, OR Required Required Required Required Required	Yes Yes Yes Yes Yes Yes	poveed units.	OK OK OK OK		
11.1.1 11.1.1 11.1.2 11.1.3 11.2.1 11.2.2 11.3.1 11.3.1 11.3.2 11.3.3	DC Jack Source DC Jack Expansion bus USB Type C Multiple supplies Safety Damage Common for all supplies Mezzanine +5V USB Hosts Mezzanine 1.8V	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector. CUI Inc PJ-041H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low ageed expansion connector. A USB Type C port at SV (if fitted) according to the USB 3.1 specifications. If multiple in-specification supplies are connected there shall not be a safety issue. If multiple in-specification supplies are connected there shall not be a safety issue. If multiple in-specification supplies are connected there shall not be a safety issue. If multiple in-specification supplies are connected there shall not be a safety issue. If multiple in-specification supplies are connected there shall not be a safety issue. If multiple in-specification supplies are connected there shall not be a safety issue. If multiple in-specification supplies are connected to the Stall position of S	Required, OR Required, OR Required, OR Required Required Required Required Required Required Required	Yes Yes Yes Yes Yes Yes Yes Yes	poveed units	OK OK OK OK OK OK		
11.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	DC Jack DC Jack Expansion bus USB Type C Multiple supples Safety Damage Common for all supples Mezzanine +5V USB Hosts Mezzanine SVS, DCIN Mezzanine SVS, DCIN	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector. CUI Inc PJ-041H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low appead expansion connector. A USB Type C port at 5V (if filted) according to the USB 3.1 specifications. If multiple in-specification supplies are connected there shall not be a safety issue and a supplies are connected the shall not be a safety issue and a supplies are connected the shall not be a safety issue and a supplies are connected the shall not be a safety issue on the shall be not damage to the board. There shall be no damage to the board. There shall be no damage to the board. There shall be no damage to the board. There shall be not defined to the board on the SYS_DCIN line) A minimum of style or determal USB devices connected to the 2 host USB ports A minimum of 0.18W to a mezzanine module via the regulated +5V line A minimum of 0.18W to a mezzanine module via the regulated +1.8V line A minimum of 0.18W to a mezzanine module via the regulated +1.8V line and the shall be able to provide the following power to external devices when a sufficiently rated power supply is connected to the	Required, OR Required, OR Required, OR Required Required Required Required Required	Yes Yes Yes Yes Yes Yes	poweeu un Lac	OK OK OK OK		
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11.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	DC Jack DC Jack Expansion bus USB Type C Multiple supples Safety Damage Common for all supples Mezzanine +5V USB Hosts Mezzanine SVS, DCIN Mezzanine SVS, DCIN	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector. CUI Inc PL-0411 for equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. A USB Type C port at 5V (if fitted) according to the USB 3.1 specifications. If multiple in especification supplies are connected there shall not be a tartery issue. There chall be no damage to the board. There chall be no damage to the board. There chall be no damage to the board. The count size or size or provide or moving power to existence devices when powered from (a) a sufficiently rated power supply is connected to the DC Jack (b) the Expansion connector or from (c) a Type C USB point (when power does not have to be provided on the SYS_DCIN line) A minimum of 5W to a mezzanine module via the regulated +5V line A minimum of 5W to external USB devices connected to the 2 host USB ports A minimum of 0.18W to a mezzanine module via the regulated +1.8V line The board shall be able to provide the following power to external devices when a sufficiently rated power supply is connected to the DC Jack. A minimum of 7W to a mezzanine module via the SYS_DCIN line A board could be powered either by a low cost power supply that is only capable of providing power for the board and for two power	Required, OR Required, OR Required, OR Required Required Required Required Required Required Required	Yes	provided on LSC	OK OK OK OK OK		
11.1.1.1 11.1.1.2 11.1.3 11.2 11.1.3 11.2 11.2	DC Jack Expansion bus USB Type C Multiple supples Safety Damage Common for all supples Mezzanine +5V USB Hosts Mezzanine 1.8V Only DC Jack supply Mezzanine SYS_DCIN Battery Power	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector, CUII Inc PJ.041H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. A USB Type C port at 5V (if fitted) according to the USB 3.1 specifications. If multiple in-specification supplies are connected there shall not be a safety issue. If multiple in-specification supplies are connected there shall not be a safety issue. There shall be no damage to the board. The count shall be no damage to the board. The count shall be not go to the connected to the DC with the country of t	Required, OR Required, OR Required, OR Required Required Required Required Required Required Required	Yes Yes Yes Yes Yes Yes Yes Yes	poweed units.	OK OK OK OK OK OK		
11.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	DC Jack Expansion bus USB Type C Multiple supples Safety Damage Common for all supples Mezzanine +5V USB Hosts Mezzanine 1.8V Only DC Jack supply Mezzanine SYS_DCIN Battery Power	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector, CUII Inc PJ.041H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. A USB Type C port at 5V (if fitted) according to the USB 3.1 specifications. If multiple in-specification supplies are connected there shall not be a safety issue. If multiple in-specification supplies are connected there shall not be a safety issue. There shall be no damage to the board. The count shall be no damage to the board. The count shall be not go to the connected to the DC with the country of t	Required, OR Required, OR Required, OR Required Required Required Required Required Required Required	Yes		OK OK OK OK OK		
11 11.1.1 11.1.1 11.1.2 11.1.3 11.2 11.2.1 11.2.2 11.3 11.3.1 11.3.1 11.3.2 11.3.3 11.4 11.4.1 12	DC Jack Expansion bus USB Type C Multiple supples Safety Damage Common for all supples Mezzanine +5V USB Hosts Mezzanine 1.8V Only DC Jack supply Mezzanine SYS_DCIN Battery Power	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector, CUII Inc PJ-041H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. A USB Type C port at 5V (if fitted) according to the USB 3.1 specifications. If multiple in-specification supplies are connected there shall not be a safety issue. There shall be no damage to the board. The observation of SW to a sufficientify rated power supply is connected to the DC Jack (b) the Expansion connector or from (c) a Type C USB port (when power does not have to be provided on the SYS_DCIN line) A minimum of SW to a mezzanine module via the regulated 4-5V line A minimum of SW to external USB devices connected to the 2 host uSB ports A minimum of U-18W to a mezzanine module via the regulated 4-1.8V line The board shall be able to provide the following power to external devices when a sufficiently rated power supply is connected to the DC Jack: A minimum of TW to a mezzanine module via the regulated 4-1.8V line A manimum of SW to external to the connected to the DC Jack: A minimum of TW to a mezzanine module via the SYS_DCIN line A board could be powered either by a low cost power supply that is only capable of providing power for the board and for fow power mezzanine boards, or by an external battery (for example from the SYS_DCIN line or a separate battery connection)	Required, OR Required, OR Required, OR Required Required Required Required Required Required Required Optional	Yes	no charging	OK OK OK OK OK OK		
11.1.1.1 11.1.2 11.1.3 11.2 11.2.1 11.2.1 11.3.1 11.3.1 11.3.1 11.3.2 11.3.3 11.4 11.4.1 12	DC Power Source DC Jack Expansion bus USB Type C Multiple supplies Safety Damage Common for all supplies Mezzanine +5V USB Hosts Mezzanine 1.8V Only DC Jack supply Mezzanine SYS_DCIN Battery Power	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector. CUI Inc PL-0411 for equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. A USB Type C port at 5V (if fitted) according to the USB 3.1 specifications. If multiple in especification supplies are connected there shall not be a tartery issue to the power supply is supplied to the power supply is connected to the DC dack (by the Expansion connector or from (c) a Type C USB power of them (a) a sufficiently rated power supply is connected to the DC dack (by the Expansion connector or from (c) a Type C USB power of when power does not have to be provided on the SYS_DCIN line) A minimum of 5W to a mezzanine module via the regulated +5V line A minimum of 0.18W to a mezzanine module via the regulated +1.8V line The board shall be able to provide the following power to external devices when a sufficiently rated power supply is connected to the DC dack. A minimum of 7W to a mezzanine module via the SYS_DCIN line A board could be powered either by a low cost power supply that is only capable of providing power for the board and for low power mezzanine boards, or by an external battery (for example from the SYS_DCIN line or a separate battery connection)	Required, OR Required, OR Required, OR Required Required Required Required Required Required	Yes		OK OK OK OK OK		
11.1.1.1 11.1.1 11.1.2 11.1.3 11.2 11.2.1 11.2.1 11.3.1 11.3.1 11.3.1 11.3.1 11.3.2 11.3.3 11.4 11.4.1 12	DC Jack Expansion bus USB Type C Multiple supples Safety Damage Common for all supples Mezzanine +5V USB Hosts Mezzanine 1.8V Only DC Jack supply Mezzanine SYS_DCIN Battery Power	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector, CUII Inc PJ-041H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. A USB Type C port at 5V (if fitted) according to the USB 3.1 specifications. If multiple in-specification supplies are connected there shall not be a safety issue. There shall be no damage to the board. The observation of SW to a sufficientify rated power supply is connected to the DC Jack (b) the Expansion connector or from (c) a Type C USB port (when power does not have to be provided on the SYS_DCIN line) A minimum of SW to a mezzanine module via the regulated 4-5V line A minimum of SW to external USB devices connected to the 2 host uSB ports A minimum of U-18W to a mezzanine module via the regulated 4-1.8V line The board shall be able to provide the following power to external devices when a sufficiently rated power supply is connected to the DC Jack: A minimum of TW to a mezzanine module via the regulated 4-1.8V line A manimum of SW to external to the connected to the DC Jack: A minimum of TW to a mezzanine module via the SYS_DCIN line A board could be powered either by a low cost power supply that is only capable of providing power for the board and for fow power mezzanine boards, or by an external battery (for example from the SYS_DCIN line or a separate battery connection)	Required, OR Required, OR Required, OR Required Required Required Required Required Required Required Optional	Yes		OK OK OK OK OK OK		
11.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	DC Power Source DC Jack Expansion bus USB Type C Multiple supplies Safety Damage Common for all supplies Mezzanine +5V USB Hosts Mezzanine 1.8V Only DC Jack supply Mezzanine SYS_DCIN Battery Power	Power shall be provided to the board by one (and only one) of the An 8V to 18V power supply from a dedicated DC jack power connector. A 1.65mm center pin positive DC jack connector, CUII Inc PJ-041H or equivalent, shall be placed in the specified location. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. An 8V to 18V power supply from the SYS_DCIN pins on the low speed expansion connector. A USB Type C port at 5V (if fitted) according to the USB 3.1 specifications. If multiple in-specification supplies are connected there shall not be a safety issue. There shall be no damage to the board. The observation of SW to a sufficientify rated power supply is connected to the DC Jack (b) the Expansion connector or from (c) a Type C USB port (when power does not have to be provided on the SYS_DCIN line) A minimum of SW to a mezzanine module via the regulated 4-5V line A minimum of SW to external USB devices connected to the 2 host uSB ports A minimum of U-18W to a mezzanine module via the regulated 4-1.8V line The board shall be able to provide the following power to external devices when a sufficiently rated power supply is connected to the DC Jack: A minimum of TW to a mezzanine module via the regulated 4-1.8V line A manimum of SW to external to the connected to the DC Jack: A minimum of TW to a mezzanine module via the SYS_DCIN line A board could be powered either by a low cost power supply that is only capable of providing power for the board and for fow power mezzanine boards, or by an external battery (for example from the SYS_DCIN line or a separate battery connection)	Required, OR Required, OR Required, OR Required Required Required Required Required Required Required Optional	Yes		OK OK OK OK OK OK		

		A minimum of 1 current sense resistor shall be placed to permit basic		Yes		ок		
13.1.1	Minimum	power measurement functions.	Required	100		OI.		
	_	The total power consumption of the board shall be measurable		Yes		ок		
13.1.2	Power	through a suitable 1% current sense resistor.	Required					
		This may be a developer install option (i.e. the sense resistor may be shipped as a zero ohm resistor for production boards that a						
13.1.3	Installed	developer can replace for power measurement)	Ontional	Yes		OK		
10.1.0	Illotaliou	The sense resistor shall be placed on the main board power supply	Ориона					
13.1.4	Location	to measure the total base board power.	Required	Yes		OK		
		It is optional as to whether this will measure any mezzanine board						
13.1.5	Mezzanine power	power usage.	Optional	Yes		OK		
		Additional current sense resistors may be placed at the discretion of		Vee		OV		
13.2	Other resistors	the board designer.	Optional	Yes		OK		
		It is recommended that additional sense resistors are provided for	Highly	No		OK		
13.3	Recommended resistors	the main PMIC downstream supplies to the SoC core, memory etc.	Recommended					
		Current sense resistors shall be made available externally to		Yes		ОК		
13.4	External	measurement equipment.	Required	res		UK		
		The PCB design shall provide for low profile male 0.1" header pins to		V		OV		
13.5	Headers		Required	Yes		OK		
		A single ground pin (for voltage measurement). The Low speed						
		expansion connector may be documented as being usable for the		Yes		ок		
13.5.1	Sense Resistor	ground pin requirement.	Required					
				Yes		ок		
13.5.2	Ground	4	Required	100		OK.		
		L			Low speed connector may be		l	1
1		This header (or headers) may be unpopulated on a retail 96Boards CE		Yes	used as allowed by spec	OK	I	1
13.5.3		board (enabling users to add the headers themselves).	Optional					
14	Power Button and Reset Button	The uses shall be able to manually never up/down and reset the						•
14.1	Minimum	The user shall be able to manually power up/down and reset the	Required	Yes		OK		
14.1	WIIIIII		nequired					
14.2	Eutomol	It shall be possible to connect external switches for power on/off and for hard reset.	Required	Yes		OK		
14.2	External		Hequirea					
		This shall be implemented using the specified pins on the low speed						
14.3	Mannanina	bus connector (adjacent pins allowing direct connect of a 3 pin connector for both switches).	Required	Yes		OK		
14.3	Wezzanne	It shall be possible to configure the board to power up automatically	nequired					
14 4	Auto nower on	if external power is removed and then re-applied.	Required	Yes		OK		
14.4	Auto power on	This may either be default operation or through a configuration	nequired					
14.5	Auto power on default	option (e.g. link or switch).	Optional	Yes		OK		
15	External Fan Connection		Optional				I.	1
15	External Fan Connection		Optional					
15	External Fan Connection	An external fan (for example for a case) connection is available on	Optional			OV.		
		An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for	·	Yes		ОК		
15.1	Connection	An external fan (for example for a case) connection is available on	Required			ок		
		An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fans.	·	Yes				
15.1	Connection	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fans. One standard UAHT from the SoC shall be made available for	·			ок		
15.1 16 16.1	Connection UART 1	An external fain (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fains. One standard UART from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UART (RD/RSO dny) may be made available on the low	Required Required	Yes Yes		ОК		
15.1 16 16.1 16.2	Connection UART 1 additional UARTs a	An external fain (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fains. One standard UART from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UART (RD/RSO dny) may be made available on the low	Required	Yes				
15.1 16 16.1 16.2	Connection UART 1 Additional UARTs JTAG	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fans. One standard UAHT from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UAHT (ToD/FtX) only) may be made available on the low speed expansion connector.	Required Required Optional	Yes Yes Yes		ок ок		
15.1 16 16.1 16.2 17	UART UART 1 UART 1 additional UARTS JYAG JYAG	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fans. One standard UAHT from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UAHT (TXD/R4D only) may be made available on the low speed expansion connector. JTAC facilities may be provided on a board.	Required Required Optional	Yes Yes Yes		ОК ОК		
15.1 16 16.1 16.2 17	UART UART 1 additional UARTs JTAG JTAG Connection	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fans. One standard UAHT from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UAHT (ToD/FtX) only) may be made available on the low speed expansion connector.	Required Required Optional	Yes Yes Yes		ок ок		
15.1 16 16.1 16.2 17.1 17.2 18	UART UART 1 additional UARTs JTAG JTAG Connector System and User LEDs	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fans. One standard UAHT from the SoC shall be made available for general purpose use for the low speed expansion connector. A second UAHT (TND/FXD only) may be made available on the low speed expansion connector. JTAC facilities may be provided on a board. It implemented the JTACs interface shall use the 10 pin JTACs	Required Required Optional Optional If, Required	Yes Yes Yes No		OK OK OK		
15.1 16.1 16.1 16.2 17 17.1 17.2 18	UART UART 1 additional UARTs JTAG JTAG JTAG JTAG JTAG System and User LEDs Required	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fans. One standard UAHT from the SoC shall be made available for one standard UAHT from the low speed available for one standard UAHT from the low speed available for one standard UAHT from the low speed expansion connector. A second UAHT (SD/RAC only) may be provided on the low speed expansion connector. JTAC's facilities may be provided on a board. It implemented bu JTACs interface shall use the 10 pin JTACs. The following LEDs shall be present on the board.	Required Required Optional Optional If, Required Required	Yes Yes Yes Yes No Yes		OK OK OK OK OK		
15.1 16.1 16.2 17 17.1 17.2 18 18.1 18.1,1 18.1,1	UART UART 1 additional UARTs JTAG JTAG JTAG Connector System and User LEDs Bequired WFI activity LED	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or ±12V fans. One standard UART from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UART (TxD/RxD only) may be made available on the low speed expansion connector. JTAG facilities may be provided on a board. If implemented the JTAG interface shall use the 10 pin JTAG The following LEDs shall be present on the board. Yellow Type: 6003 SMD	Required Required Optional Optional If, Required Required Required	Yes Yes Yes No Yes Yes Yes		OK OK OK OK OK		
15.1 16.1 16.2 17 17.1 17.2 18 18.1 18.1,1 18.1,1	UART UART 1 additional UARTs JTAG JTAG JTAG JTAG System and User LEDs Required WiFi activity LED Bluetoth activity LED	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fans. One standard UART from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UART (TAD/RAZ only) may be made available on the low speed expansion connector. JRAS facilities may be provided on a board. If implemented the JTAS interface shall use the 10 pin JTAS. The following LEDs shall be present on the board. Yellow Type: 0603 SMD	Required Required Optional Optional If, Required Required	Yes Yes Yes No Yes Yes Yes Yes		OK OK OK OK OK OK OK		
15.1 16.1 16.2 17.1 17.2 18 18.1 18.1.1 18.1.2 18.1.3 18.2	UART 1 Additional UART 1 Additional UARTS JTAG JTAG JTAG JTAG Connector System and User LEDs Will activity LED Bluetooth activity LED User LEDs X:	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or ±12V fans. One standard UART from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UART (TxD/RxD only) may be made available on the low speed expansion connector. JTAG facilities may be provided on a board. If implemented the JTAG interface shall use the 10 pin JTAG The following LEDs shall be present on the board. Yellow Type: 6003 SMD	Required Required Optional Optional II, Required Required Required Required	Yes Yes Yes No Yes Yes Yes		OK OK OK OK OK		
15.1 16.1 16.2 17 17.1 17.2 18 18.1 18.1.1 18.1.2 18.1.3 18.2 18.3	UART I Additional UART 1 additional UART 5 JTAG JTAG JTAG System and User LEDs We nachwy LED Buetooth activity LED Buetooth activity LED User LEDS User LEDS User LEDS	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fans. One standard UART from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UART (TxD/RxD only) may be made available on the low speed expansion connector. JTAG facilities may be provided on a board. If implemented the JTAG interface shall use the 10 pin JTAG The following LEDs shall be present on the board. Yellow Type: 06003 SMD Bible Type: 06003 SMD	Required Optional Optional Optional If, Required Required Required Required Required Required Required	Yes Yes Yes No Yes Yes Yes Yes Yes Yes		OK		
15.1 16.1 16.2 17.1 17.2 18 18.1 18.1.1 18.1.2 18.1.3	UART UART I additional UART s JTAG JTAG System and User LEDs Required WFI activity LED Bluetooth activity LED User LEDs x4 Size, Color, Location	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for 45V or 12V fans. One standard Thom the SoC shall be made available for gene standard purpose use on the low speed expansion connector. A second UART (NDHAD only) may be made available for the low speed expansion connector. JIASI facilities may be provided on a board. If implemented the JTASI interface shall use the 10 pin JTASI The following LEDs shall be present on the board. Yellow Type: 0603 SMD Blue Type: 0603 SMD Green Type: 0803 SMD Green Type: 0803 SMD to the LEDs shall be of the specified size, color and location.	Required Required Optional Optional If, Required Required Required Required Required Required Required Required Required	Yes Yes Yes No Yes Yes Yes Yes Yes Yes Yes Yes		OK OK OK OK OK OK OK		
15.1 16.1 16.2 17 17.1 17.2 18 18.1 18.1.1 18.1.2 18.1.3 18.2 18.3	UART I Additional UART 1 additional UART 5 JTAG JTAG JTAG System and User LEDs We nachwy LED Buetooth activity LED Buetooth activity LED User LEDS User LEDS User LEDS	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fans. One standard UAHT from the SoC shall be made available for one standard UAHT from the low speed expansion connector. A second UAHT from the low speed expansion connector. A second UAHT som the low speed expansion connector. JIACI facilities may be provided on a board. If implemented the JIACI interface shall use the 10 pin JIACI The following LEDs shall be present on the board. Yellow Type: 0603 SMD Bible Type: 0603 SMD Green Type: 0803 SMD The LEDs shall be of the specified size, color and location. The User LEDs shall be of the specified size, color and location. The User LEDs shall be directly programmable from the SoC.	Required Required Optional Optional If, Required Required Required Required Required Required Required Required Required	Yes Yes Yes No Yes Yes Yes Yes Yes Yes Yes Yes		OK OK OK OK OK OK OK		
15.1 16.1 16.2 17.1 17.1 17.2 18.1 18.1.1 18.1.2 18.1.3 18.2 18.3 19.3	UART UART 1 additional UARTs JTAG JIAG JIAG System and User LEDs Requixed WiFi activity LED Bluelooth activity LED User LEDs x4 Size, Color, Location User LEDs Front Panel and DC Jack Connectors	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for 45V or 12V fans. One standard MART from the Stot shall be made available for gene standard purpose use on the low speed expansion connector. A second UART (NDFAD only) may be made available for the low speed expansion connector. JIASI facilities may be provided on a board. If implemented the JIASI interface shall use the 10 pin JIASI The following LEDs shall be present on the board. Yellow Type: 0603 SMD Blue Type: 0603 SMD Green Type: 0803 SMD creen type: 0503 SMD creen	Required Required Optional Optional Optional If, Required	Yes Yes Yes No Yes Yes Yes Yes Yes Yes Yes Yes		OK OK OK OK OK OK OK		
15.1 16.1 16.2 17 17.1 17.2 18 18.1 18.1.1 18.1.2 18.1.3 18.2 18.3	UART I Additional UART 1 additional UART 5 JTAG JTAG JTAG System and User LEDs We nachwy LED Buetooth activity LED Buetooth activity LED User LEDS User LEDS User LEDS	An external fain (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for ±5V or ±2V fans. One standard UAHT from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UAHT (TND/RXD only) may be made available for the low speed expansion connector. JTAG facilities may be provided on a board. If implemented the UTAG interface shall use the 10 pin JTAG The following LEDs shall be present on the board. Yellow Type: 0603 SMID Green Type: 0603 SMID The LES shall be directly programmable from the SoC. The font panel connectors (Display, USB Type A and	Required Required Optional Optional If, Required Required Required Required Required Required Required Required Required	Yes Yes Yes Yes No Yes		OK		
15.1 16.1 16.2 17.1 17.2 18.1 18.1,1 18.1,1 18.1,3 18.2 18.3 19.	UART UART 1 additional UARTs JTAG JIAG JIAG System and User LEDs Requixed WiFi activity LED Bluelooth activity LED User LEDs x4 Size, Color, Location User LEDs Front Panel and DC Jack Connectors	An external fain (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fains. One standard UART from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UART (TND/R3D only) may be made available on the low speed expansion connector. JTAG facilities may be provided on a board. If implementate the UTAG interface shall use the 10 pin JTAG The following LEDs shall be present on the board. Yellow Type: 0603 SMD Bits Type: 0603 SMD The LEDs shall be directly programmable from the SoC. The front panel connectors (Display, USB Type A and microUSB/USB Type C) and the DC Jack connector shall include through +CB mechanical support.	Required Required Optional Optional Optional If, Required	Yes Yes Yes Yes No Yes		OK		
15.1 16.1 16.2 17.1 17.2 18.1 18.1,1 18.1,1 18.1,3 18.2 18.3 19.	UART UART 1 additional UARTs JTAG JIAG JIAG System and User LEDs Requixed WiFi activity LED Bluelooth activity LED User LEDs x4 Size, Color, Location User LEDs Front Panel and DC Jack Connectors	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for 45V or 12V fans. One standard MART from the Stot shall be made available for gene standard purpose use on the low speed expansion connector. A second UART (NDFAD only) may be made available for the low speed expansion connector. JIASI facilities may be provided on a board. If implemented the JIASI interface shall use the 10 pin JIASI The following LEDs shall be present on the board. Yellow Type: 0603 SMD Blue Type: 0603 SMD Green Type: 0803 SMD creen type: 0503 SMD creen	Required Required Optional Optional Optional If, Required	Yes Yes Yes Yes No Yes		OK		
15.1 16.1 16.2 17.1 17.2 18.1 18.1,1 18.1,1 18.1,3 18.2 18.3 19.	UART UART 1 additional UARTs JTAG JIAG JIAG System and User LEDs Requixed WiFi activity LED Bluelooth activity LED User LEDs x4 Size, Color, Location User LEDs Front Panel and DC Jack Connectors	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for ±5V or ±2V fans. One standard UART from the Soc shall be made available for general purpose use on the low speed expansion connector. A second UART (TND/R4D only) may be made available for the low speed expansion connector. JTAG facilities may be provided on a board. If implemented the UTAG interface shall use the 10 pin JTAG The following LEDs shall be present on the board. Yellow Type: 0603 SMD Green Type: 0603 SMD Green Type: 0603 SMD The USB shall be of the specified size, color and location. The User LEDs shall be of the specified size, color and location. The User LEDs shall be of the Draw of the Soc. The front panel connectors (Display, USB Type A and microUSB/USB Type C) and the DC Jack connector shall include through-PCB mechanical support. While surface mount electrical connectors are acceptable, a fully surface mount electrical connector without enthing the properties.	Required Required Optional Optional Optional If, Required	Yes Yes Yes No Yes		OK OK OK OK OK OK OK OK OK		
15.1 16.1 16.1 16.2 17.1 17.2 18.1 18.1.1 18.1.2 18.1.3 18.2 18.3 19.1	UART 1 JTAG JTAG JTAG System and User LEDs Required WHF activity LED Bluetooth acityly LED User LEDs Viser LEDs Connector Street, Color, Location User LEDs Size, Color, Location Size, Color, Location Learning	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for ±5V or ±2V fans. One standard UART from the Soc shall be made available for general purpose use on the low speed expansion connector. A second UART (TND/R4D only) may be made available for the low speed expansion connector. JTAG facilities may be provided on a board. If implemented the UTAG interface shall use the 10 pin JTAG The following LEDs shall be present on the board. Yellow Type: 0603 SMD Green Type: 0603 SMD Green Type: 0603 SMD The USB shall be of the specified size, color and location. The User LEDs shall be of the specified size, color and location. The User LEDs shall be of the Draw of the Soc. The front panel connectors (Display, USB Type A and microUSB/USB Type C) and the DC Jack connector shall include through-PCB mechanical support. While surface mount electrical connectors are acceptable, a fully surface mount electrical connector without enthing the properties.	Required Required Optional Optional If, Required	Yes Yes Yes No Yes		OK OK OK OK OK OK OK OK OK		
15.1 16.1 16.1 16.2 17 17.1 17.1 17.1 18.1.1 18.1.2 18.1.3 18.2 19.1 19.1	Connection UART JTAG JTAG JTAG System and User LEDs Required With activity, LED Bluetooth activity, LED Stack, Cooler, Localion Joer LEDs After Connectors Front Panel and DC Jack Connectors Through hole SMT	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for ±5V or ±2V fans. One standard UART from the Soc shall be made available for general purpose use on the low speed expansion connector. A second UART (TND/R4D only) may be made available for the low speed expansion connector. JTAG facilities may be provided on a board. If implemented the UTAG interface shall use the 10 pin JTAG The following LEDs shall be present on the board. Yellow Type: 0603 SMD Green Type: 0603 SMD Green Type: 0603 SMD The USB shall be of the specified size, color and location. The User LEDs shall be of the specified size, color and location. The User LEDs shall be of the Draw of the Soc. The front panel connectors (Display, USB Type A and microUSB/USB Type C) and the DC Jack connector shall include through-PCB mechanical support. While surface mount electrical connectors are acceptable, a fully surface mount electrical connector without enthing the properties.	Required Required Optional Optional If, Required	Yes Yes Yes Yes No Yes	5 provided (3 low speed 2 hinh	OK O		
15.1 16.1 16.1 16.2 17 17.1 17.1 17.1 18.1 18.1 18.13 18.2 18.13 19.1	Connection UART 1 additional UARTs JTAG JTAG JTAG JTAG System and User LEDs Wife activity LED Buetooth activity LED User LEDs Xie User LEDs Xie Through hole Expansion Connectors	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fans. One standard UAHT from the SoC shall be made available for one standard UAHT from the SoC shall be made available for one standard UAHT from the low speed expansion connector. A second UAHT (SDFRLD only) may be made available on the low speed expansion connector. JIACI facilities may be provided on a board. If implemented the JIACI interface shall use the 10 pin JIACI The following LEDs shall be present on the board. Yellow Type: 0603 SMD Bitle Type: 0603 SMD Green Type: 0603 SMD The LEDS shall be of the specified size, color and location. The LEDS shall be of the specified size, color and location. The font panel connectors (bisplay, USB Type A and microUSB/USB Type C) and the DC Jack connector shall include through-PCB mechanical support. While surface mount electrical connections are acceptable, a fully surface mount connector without any in/through board mechanical support shall not be used.	Required Optional Optional Optional If, Hequired Required	Yes Yes Yes No Yes	5 provided (3 low speed, 2 high speed)	OK OK OK OK OK OK OK OK OK		
15.1 16.1 16.1 16.2 17 17.1 17.1 17.2 18.1 18.1.1 18.1.2 18.1.3 18.1 19.1	Connection UART JTAG JTAG JTAG System and User LEDs Required With activity, LED Bluetooth activity, LED Stack, Cooler, Localion Joer LEDs After Connectors Front Panel and DC Jack Connectors Through hole	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fans. One standard UAHT from the SoC shall be made available for one standard UAHT from the SoC shall be made available for one standard UAHT from the low speed expansion connector. A second UAHT (SDFRLD only) may be made available on the low speed expansion connector. JIACI facilities may be provided on a board. If implemented the JIACI interface shall use the 10 pin JIACI The following LEDs shall be present on the board. Yellow Type: 0603 SMD Bitle Type: 0603 SMD Green Type: 0603 SMD The LEDS shall be of the specified size, color and location. The LEDS shall be of the specified size, color and location. The font panel connectors (bisplay, USB Type A and microUSB/USB Type C) and the DC Jack connector shall include through-PCB mechanical support. While surface mount electrical connections are acceptable, a fully surface mount connector without any in/through board mechanical support shall not be used.	Required Required Optional Optional If, Required	Yes Yes Yes Yes No Yes		OK O		
15.1 16.1 16.2 17.7 17.1 17.1 18.1 18.1.1 18.1.2 18.1.3 18.2 18.3 19.1 19.1 19.2 20 20.1 20.2	UART 1 JTAG JTAG JTAG System and User LEDs Required WiF1 activity LED Buetooth activity LED Survey Cook, Location District Connectors Front Panel and DC Jack Connectors Through hole Expansion Connectors Number Low Speed Expansion Connector	An external fair (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fairs. One standard UART from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UART (TXD/RXD only) may be made available on the low speed expansion connector. JTAGI facilities may be provided on a board. If implemented the UTAGI miteriace shall use the 10 pin JTAGI The following LEDs shall be present on the board. Yellow Type 1003 SMD. Step 1003 SMD. Other LEDs shall be of the specified size, color and location. The LEDs shall be of the specified size, color and location. The User LEDs shall be directly programmable from the SoC. The front panel connectors (Display, USB Type A and micro USB/USB Type C) and the DC Jack connector shall include through PCB mechanical support. While surface mount electrical connections are acceptable, a fully surface mount connector without any in/through board mechanical support shall not be used. A 40 pin low profile female 2mm receptable (20x2) 4.5mm height is	Required Required Optional Optional If, Required	Yes Yes Yes Yes No Yes		OK OK OK OK OK OK OK OK		
15.1 16.1 16.1 16.2 17 17.1 17.1 18.1 18.1.1 18.1.3 18.1.3 18.3 19.1 19.1	UART 1 UART 1 additional UARTs 5 JTAG JTAG JTAG System and User LEDs Required WiF1 activity LED Buetooth activity LED User LEDs Size, Color, Location Discrete Control of the Control o	An external fair (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fairs. One standard UART from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UART (TXD/RXD only) may be made available on the low speed expansion connector. JTAGI facilities may be provided on a board. If implemented the UTAGI miteriace shall use the 10 pin JTAGI The following LEDs shall be present on the board. Yellow Type 1003 SMD. Step 1003 SMD. Other LEDs shall be of the specified size, color and location. The LEDs shall be of the specified size, color and location. The User LEDs shall be directly programmable from the SoC. The front panel connectors (Display, USB Type A and micro USB/USB Type C) and the DC Jack connector shall include through PCB mechanical support. While surface mount electrical connections are acceptable, a fully surface mount connector without any in/through board mechanical support shall not be used. A 40 pin low profile female 2mm receptable (20x2) 4.5mm height is	Required Optional Optional Optional If, Hequired Required	Yes Yes Yes Yes No Yes		OK O		
15.1 16.1 16.2 17.7 17.1 17.1 18.1 18.1.1 18.1.2 18.1.3 18.2 18.3 19.1 19.1 19.2 20 20.1 20.2	UART 1 JTAG JTAG JTAG System and User LEDs Required WiF1 activity LED Buetooth activity LED Survey Cook, Location District Connectors Front Panel and DC Jack Connectors Through hole Expansion Connectors Number Low Speed Expansion Connector	An external fair (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fairs. One standard UART from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UART (TXD/RXD only) may be made available on the low speed expansion connector. JTAGI facilities may be provided on a board. If implemented the UTAGI miteriace shall use the 10 pin JTAGI The following LEDs shall be present on the board. Yellow Type 1003 SMD. Step 1003 SMD. Other LEDs shall be of the specified size, color and location. The LEDs shall be of the specified size, color and location. The User LEDs shall be directly programmable from the SoC. The front panel connectors (Display, USB Type A and micro USB/USB Type C) and the DC Jack connector shall include through PCB mechanical support. While surface mount electrical connections are acceptable, a fully surface mount connector without any in/through board mechanical support shall not be used. A 40 pin low profile female 2mm receptable (20x2) 4.5mm height is	Required Required Optional Optional If, Required	Yes Yes Yes Yes No Yes		OK OK OK OK OK OK OK OK		
15.1 16.1 16.2 17.7 17.1 17.1 18.1 18.1.1 18.1.2 18.1.3 18.2 18.3 19.1 19.1 19.2 20 20.1 20.2	UART 1 JTAG JTAG JTAG System and User LEDs Required WiF1 activity LED Buetooth activity LED Survey Cook, Location District Connectors Front Panel and DC Jack Connectors Through hole Expansion Connectors Number Low Speed Expansion Connector	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for 45V or 12V fans. One standard UART from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UART (TXD/RXD only) may be made available on the low speed expansion connector. JTAS facilities may be provided on a board. It implemented the JTAS interface shall use the 10 pin JTAS. The following LEDs shall be present on the board. Vellow Type: 0603 SMD Green Type: 0604 SMD. The LEDs shall be of the specified size, color and location. The User LEDs shall be directly programmable from the SoC. The font panel connectors (Display, USB Type A and microUSB/USB Type C) and the OL Jack connector shall include through-PCB mechanical support. While surface mount electrical connections are acceptable, a fully surface mount connector without any infibrough board mechanical support shall not be used. A 40 pin low profile female 2mm receptable (20x2) 4.5mm height is specified.	Required Required Optional Optional If, Required	Yes Yes Yes Yes No Yes		OK OK OK OK OK OK OK OK		
15.1 16.1 16.2 17. 17.2 18.1 18.1.1 18.1.2 18.1.3 18.2 18.3 19. 19.1 19.2 20. 20.2 20.2.1	UART 1 additional UARTs 1 additional UARTs 3 JTAG JTAG JTAG System and User LEDs Well activity LED Well activity LED Well activity LED Size, Color, Location User LEDs Size, Color, Location User LEDs Through hole Trinough hole Well Activity LED Size Color, Location User LEDs Through hole Well Activity LEDS Well Ac	An external fain (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for ±5V or ±2V fans. One standard UART from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UART (TND/RXD only) may be made available for general purpose use on the low speed expansion connector. JTAG facilities may be provided on a board. If implemented the UTAG interface shall use the 10 pin JTAG The following LEDs shall be present on the board. Yellow Type: 0603 SMIO Green Type: 0603 SMIO Green Type: 0603 SMIO The LEDs shall be directly programmable from the SoC. The front panel connectors (Display, USB Type A and microUSB/USB Type C) and the DC Jack connector shall include through-PCB mechanical support. While surface mount electrical connections are acceptable, a fully surface mount connector without any infitnough board mechanical support shall not be used. A 40 pin low profile female 2mm receptable (20:2) 4.5mm height is specified. Molex 87381-4083 OR FCI 55510-1401F OR Samter TLE-120-01-G-	Required Required Optional Optional If, Required Required	Yes Yes Yes Yes No Yes		OK OK OK OK OK OK OK OK OK		
15.1 16.1 16.1 16.2 17 17.1 17.1 18.1 18.1.1 18.1.2 18.3 19.1 19.1 19.2 20 20.1 20.2	UART 1 additional UARTs 1 additional UARTs 3 JTAG JTAG JTAG System and User LEDs Well activity LED Well activity LED Well activity LED Size, Color, Location User LEDs Size, Color, Location User LEDs Through hole Trinough hole Well Activity LED Size Color, Location User LEDs Through hole Well Activity LEDS Well Ac	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fans. One standard UAHT from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UART (TAD/TRXD only) may be made available on the low speed expansion connector. JTAST facilities may be provided on a board. It implemented the JTASI interface shall use the 10 pin JTASI The following LEDs shall be present on the board. Yellow Type: 0603 SMD Green Type: 0603 SMD Green Type: 0603 SMD The LEDs shall be of the specified size, color and location. The LEDs shall be of the specified size, color and location. The USE shall be of the specified size, color and location. The USE shall be of the specified size, color and location. The USE shall be of the specified size, color and location. Whis surface mount electrical connections are acceptable, a fully surface mount connector without any inthrough board mechanical support shall not be used. Two expansion connectors shall be provided. A 40 pin bow profile female 2mm receptacle (20x2) 4.5mm height is specified. Molex 87881-4083 OR FCI 55510-1401 F OR Samtec TLE-120-01-6-DV OR TE 4.1470209-3 OR TEI-1734506-3 OR FCI 53453-1401 F DV OR TE 4.1470209-3 OR TEI 55510-1401 F OR Samtec TLE-120-01-6-DV OR TE 4.1470209-3 OR TEI-1734506-3 OR FCI 53453-1401 F	Required Required Optional Optional If, Required	Yes Yes Yes Yes No No Yes Yes Yes Yes Yes Yes Yes Ye		OK OK OK OK OK OK OK		
15.1 16.1 16.2 17. 17.2 18.1 18.1.1 18.1.2 18.1.3 18.2 18.3 19.1 19.2 20.2 20.2.1	UART 1 JTAG JTAG JTAG JTAG JTAG JTAG System and User LEDs Will activity LED Buetooth activity LED Size, Color, Location User LEDs Through hole Expansion Connectors Number Low Speed Expansion Connector Type Part Numbers	An external fain (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for ±5V or ±2V fains. One standard UART from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UART (TND/R4D only) may be made available for the low speed expansion connector. JTAG facilities may be provided on a board. If implementate the UTAG interface shall use the 10 pin JTAG The following LEDs shall be present on the board. Yellow Type: 0603 SMD Green Type: 0603 SMD Green Type: 0603 SMD The LEDs shall be of the specified size, color and location. The User LEDs shall be of the specified size, color and location. The User LEDs shall be of the specified size, color and location. The front panel connectors (Display, USB Type A and microUSB/USB Type C) and the DC Jack connector shall include through-PCB mechanical support. While surface mount electrical connections are acceptable, a fully surface mount connector without any in/through board mechanical support shall not be used. A 40 pin low profile female 2mm receptacle (20x2) 4.5mm height is specified. Molex 87381-4083 OR FCI 55510-1401F OR Samter TLE-120-01-G-DV OR TLE-1470209-3 OR TLE-13734506-3 OR FCI 534351-401F Unless otherwise indicated the low speed expansion connector connections of the connection of the following the connections of the following the	Required Required Optional Optional II, Required Optional	Yes Yes Yes Yes No Yes		OK OK OK OK OK OK OK OK OK		
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15.1 16.1 16.2 17. 17.2 18.1 18.1.1 18.1.2 18.1.3 18.2 18.3 19.1 19.2 20.2 20.2.1	UART 1 JTAG JTAG JTAG JTAG JTAG JTAG System and User LEDs Will activity LED Buetooth activity LED Size, Color, Location User LEDs Through hole Expansion Connectors Number Low Speed Expansion Connector Type Part Numbers	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for +5V or +12V fans. One standard UAHT from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UART (TAD/RXD only) may be made available on the low speed expansion connector. JTAS facilities may be provided on a board. The following LEDs shall be present on the 10 pin JTAS. The following LEDs shall be present on the 10 pin JTAS. The following LEDs shall be present on the board. Yellow Type: 0603 SMD Green Type: 0603 SMD Green Type: 0603 SMD The LEDs shall be of the specified size, color and focation. The LEDs shall be of the specified size, color and focation. The USEr LEDs shall be directly programmable from the SoC. The front panel connectors (Deplay, USB Type A and microUSB/USB Type C) and the CLesk connector shall include through-PCB mechanical support. While surface mount electrical connections are acceptable, a fully surface mount connector without any inthrough board mechanical support shall not be used. Two expansion connectors shall be provided. A 40 pin bow profile female 2mm receptacle (20x2) 4.5mm height is specified. Molex 87881-4083 OR FCI 55510-140LF OR Samtec TLE-120-01-6-DV OR TE-4.1470209-3 OR TE-4.1734506-3 OR FCI G3435-140LF Unless otherwise indicated the low speed expansion connector signals are at 1.470209-3 OR TE-4.1734506-3 OR FCI G3435-140LF Unless otherwise indicated the low speed expansion connector signals are at 1.470209-3 OR TE-4.1734506-3 OR FCI G3435-140LF	Required Required Optional Optional II, Required Optional	Yes Yes Yes Yes No Yes Yes Yes Yes Yes Yes Yes Ye		OK OK OK OK OK OK OK OK OK		
15.1 16.1 16.2 17.1 17.2 18.1 18.1 18.1.1 18.1.2 18.1 18.1 19.1 19.2 20 20.1 20.2 20.2.1	UART 1 JTAG JTAG JTAG JTAG JTAG JTAG System and User LEDs Will activity LED Buetooth activity LED Size, Color, Location User LEDs Through hole Expansion Connectors Number Low Speed Expansion Connector Type Part Numbers	An external fan (for example for a case) connection is available on the low speed expansion connector by using a 2 pin male header for 45V or 12V fans. One standard UART from the SoC shall be made available for general purpose use on the low speed expansion connector. A second UART (TXD/RXD only) may be made available on the low speed expansion connector. JIAS facilities may be provided on a board. If the following LEDs shall be present on the 10 pin JTAG. The following LEDs shall be present on the board. Vellow Type: 0603 SMD Green Type: 0603 SMD Green Type: 0603 SMD Green Type: 0603 SMD Green Type: 0603 SMD The LEDs shall be of the specified size, color and location. The User LEDs shall be directly programmable from the SoC. The front panel connectors (Deplay, USB Type A and microUSB/USB Type C) and the OL Jack connector shall include through-PCB mechanical support. While surface mount electrical connections are acceptable, a fully surface mount connector without any infihrough board mechanical support shall not be used. A 40 pin low profile female 2mm receptacle (20x2) 4.5mm height is specified. A 40 pin low profile female 2mm receptacle (20x2) 4.5mm height is specified. Wolker 87881-4083 OR FCI 55510-140LF OR Samtec TLE-120-01-G-DV OR TE-4.170209-3 OR TE-4.1734506-3 OR FCI 53433-140LF Unless otherwise indicated the low speed expansion connector signals are at 1.2 Volopic lews. Since a strought part and the used me connector polymit should be 43.0x6.5mm with no other components on the board top side in the low speed expansion connector signals are at 1.2 Volopic lews.	Required Required Optional Optional II, Required Optional	Yes Yes Yes Yes No No Yes Yes Yes Yes Yes Yes Yes Ye		OK OK OK OK OK OK OK		

20.2.5	Interfaces							1
20.2.5		One UART shall be provided on the low speed expansion bus	Required	V		ОК		
20.2.5.2		A second UART may be provided	Optional	Yes		OK		
20.2.5.3	SPI	One SPI bus master shall be provided on the low speed expansion	Required	Yes		OK		
20.2.5.4	12C x 2	Two I2C interfaces shall be provided on the low speed expansion	Required	Yes		OK		
		It is recommended that a 2K2R pullup is provided on each I2C						
		signal, dependent on any relevant drive/pullup specifications of the	Highly	Yes		OK		
20.2.5.4.1	Pullups	SoC.	Recommended					
		One PCM/Inter IC Sound (I2S) PCM audio data bus shall be		Yes		OK		
20.2.5.5	I2S	provided on the low speed expansion bus.	Required	100		OK		
20.2.5.6	GPIO x 12	12 GPIO lines shall be provided on the low speed expansion bus.	Required	Yes		OK		
20.2.5.7	Reset and Power button	Reset and Power external request signals shall be provided	Required	Yes		OK		
20.2.5.7.1	Logic Levels	These signals shall be active low.	Required	Yes		OK		
20.2.5.8	1.8V, 5V and DC_IN power supplies	Power supplies	Required	Yes		OK		
20.3	High Speed Expansion Connector							
		A 60 pin 0.8mm high speed Board to Board low profile receptacle		Yes		ок		
20.3.1	Туре	connector is specified.	Required			-		
20.3.2	Part Numbers	FCI 61082-061409LF OR TE5177983-2	Optional	Yes		OK		
		unless otherwise indicated the high speed expansion connector		Yes		ОК		
20.3.3	Logic Levels	signals are at 1.8V logic levels.	Required	res		UK		
20.3.4	Interfaces							
		A MIPI DSI interface shall be provided on the high speed expansion		Yes		ок		
20.3.4.1	MIPI DSI	bus.	Required	100		OK		
		One USB host port shall be provided on the high speed expansion		Yes		ОК		
20.3.4.2	USB	bus.	Required	100		***		
		In many designs the USB port is expected to come from a USB hub solution ready for direct connect to a USB interface, therefore these		Yes		OK		
20.3.4.2.1	Logic Lovole	solution ready for direct connect to a USB interface, therefore these signals are specified at USB PHY signal levels.	Required	res		UK		
20.0.4.2.1	Logic Levels	The expansion port shall be configured with either an SD port or a	nequireu					
20.3.4.3	SD or SPI interface	second SPI Port SD Configuration	Required	SD		OK		
20.3.4.4	MIPI CSI-2 (x2 optional)	Two MIPI CSI-2 interfaces may be provided on the high speed	Optional	-	4 provided	OK		
20.0.4.4	WIFT COT-2 (X2 OPTIONAL)	Two I2C interfaces may be provided on the high speed expansion	Ораблаг		- provided			
20.3.4.5	iac	two I2C interfaces may be provided on the high speed expansion bus.	Optional	2		OK		
20.5.4.5	120	If one or two CSI2 interfaces are implemented then at least the same	Ориона					
		number of I2C interfaces shall be provided on the high speed		Yes		ок		l l
20.3.4.5.1	with CSI	expansion bus.	Required	162		UK		
		It is recommended that a 2K2R pullup is provided on each I2C						
		signal, dependent on any relevant drive/pullup specifications of the	Highly	Yes		ок		
20.3.4.5.2	Pullups	SoC.	Recommended	100		***		
		One MIPI-HSIC interface may be provided on the high speed						
20.3.4.6	HSIC	expansion bus.	Optional	No		OK		
		One pin shall be reserved for future use. It shall be pulled up via		Yes		ок		
20.3.4.7	Reserved	100K to 1.8V.	Required	163		OK		
		One or two programmable clock interfaces may be provided on the		2		ок		
20.3.4.8	Clocks	high speed expansion bus.	Optional	-		OK		
		If CSI camera(s) are supported on mezzanine boards these clocks						
000101		shall be available as the CSI reference clocks (in case they are	Be well and	Yes		OK		
20.3.4.8.1	with CSI	needed)	Required					
20.4	GPIO-A	GPIO-A shall be capable of waking up the SoC from sleep/standby	Required	Yes		OK		
20.4		mode	Required					
		By default all GPIO pins should be configured at boot as inputs to		Yes		ОК		
20.5	GPIO Default	the SoC.	Required					
21	Standalone Functionality							
		The standalone board requires only a power supply and display						
		connected to be used as an advanced single board computer (using		Yes		OK		
21.1	Minimum	wireless keyboard/mouse/WiFi & Bluetooth).	Required					
22	Software							
		All the sources required to rebuild the image are downloadable via		Yes		OK		1
22.1		public git repositories where the license (e.g. GPL) requires it.	Required					
22.2	User changes							
		It shall be possible to replace or update the bootloader, kernel and		Yes		ок		l l
22.2.4	Software replacement	rootfs	Required	163		OK.		
		It shall be possible to recover from a "bricked" board (for example as						
		a result of use of a user built bootloader) without specialized		Yes		OK		
22.2.5	Unbricking a board	additional hardware	Required		using fastboot			
		The bundled software enables all mandatory HW specified in the						
		96Boards specification e.g. USB, Display, Connectivity, Serial, on-		Yes		ок		l l
22.3	Core Functionality	board switches and LEDs, various mandatory interfaces on the LS and HS connectors	Required					l l
23	Licensing Core Functionality	and no confieduis	nequirea		l			L
23.1	Binary software				1			
		Binary distribution license to Linaro/96Boards to allow any binaries to						
	License to Linaro	be redistributed on the 96Boards website	Required	Yes		ок		
		Binary distributions license to allow board manufacturer to ship all		Yes		OK		
L.	License to Board Manufacturer	necessary binaries	Required	163		OK.		
24	Documentation							
L		Board schematics shall be available under CC BY 4.0 licence on the		Yes		ок		
24.1		96Boards.org site BOM for the board	Required Optional			-		
24.2	Board BOM		Optional	Yes		OK		
		Includes information on hardware and software interfaces to enable the maker community and developers of bootloaders, kernels and						
		OS distributions. This information will be contributed in specified		Yes		OK		
24.3	Board User Manual	markup language to be hosted on 96Boards.org	Required					
		The manual shall include sufficient information for developers to be						
		able to create board drivers and software interfaces for the		Yes		ок		
24.4		supported SoC features	Required		<u> </u>	<u></u>		<u> </u>
25	Misc		_			-		
		The 96Boards team is to be sent no less than 7 (seven) sample					·	
25.1	96Boards team board sample delivery	boards for support, testing, documentation, website, engineering,	Required	Yes		ОК		
			negalieu		1			