				Board Vendor		Linaro			
Section	Title	Requirement statement	Compliance Directive	Board satisfies requirement?	Comments	Cross-check	Comments	Documented Exceptions	
1	96Boards CE Physical Footprint					'		•	
1.1	Area								
1.1.1	Dimensions		Required	Yes		ОК			
1.1.2	Area exceptions	Connectors should not protrude from the area footprint except as component design requires (for example USB Type A front shrouds).	Highly Recommended	Yes		ОК			
1.1.3		A compatible extended version is defined that shall fit into a 85 x 100mm footprint with the same conditions.	If, Required	N.A.		ок			
	Height 			V		OK			
1.2.1		62mil (1.575mm) nominal	Required	Yes		OK			
1.2.2		3.4 mm maximum	Required	Yes		OK			
1.2.3	Above PCB	7.0 mm maximum	Required	Yes		OK			
1.2.4	Total	Total height of the board including on board connectors shall not exceed 12mm	Required	Yes		ОК			
1.2.5	Component Height	Note that the maximum height for general components on the board top side is 4mm (not including the allowed areas for connectors and larger components)	Required	Yes		ОК			
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	Yes		OK			
1.2.8	Option - Extended A	Extended area shall conform to 4mm (except for user links and thermal management) rules as specified for the main area of the standard board. The extended rear connector area shall conform to 6.5mm maximum height	If, Required	N.A.		ОК			
1.2.9	Option - Extended B	Extended area and extended connector rear connector area shall use components that extend to a maximum of 15mm above the board surface	If, Required	N.A.		ОК			
1.2.9.1	Below PCB	Exceeds underside height restrictions	Optional	N.A.		OK			
1.2.9.2	Documentation	Board footprint on the underside shall be fully documented and standoffs and/or additional heat management shall be documented or provided	If, Required	N.A.		ок			
2	SoC Location Options								
2.1	SoC Top Placement								
2.1.1	Height with a low-profile heatsink/fan		Required	Yes	No heatsink.The user can place a 3mm heatsink.The total maximum height with heatsink is 5.0mm.	ОК			
2.2	SoC Bottom Placement								
2.2.1	Height	The board should meet the "Below PCB" footprint requirement	Highly Recommended	N.A.		ОК			
2.2.2	Hashsiak	This then allows additional thermal management in the case or enclosure for the board as required	Highly Recommended	N.A.		ок			
2.2.2	DRAM Heatsink	encrosure for the board as required	Recommended	l	1			1	
3.1	DRAM Minimum	The board shall be populated with a minimum of 0.5GB of	Required	Yes	2GB LPDDR3	ОК			
3.2		It is strongly recommended that a minimum of 1GB DRAM is fitted where the board is expected to run Android	Highly Recommended	Yes	2GB LPDDR3	ОК			
4	eMMC/Flash	Thece where the board is expected to run Androld	recommended	1	1200 LY DUNG			1	
4.1		The board may optionally be populated with eMMC or other format flash memory	Optional	Yes	8GB EMMC 5.1	ОК			
4.2	No microSDHC boot?	If the SoC used is not able to boot from microSDHC then a minimum of 8MB of bootable flash memory shall be provided	If, Required	No	Not able to boot from microSDHC	ок			
4.3		Where multiple boot options are provided the choice of boot location shall be user selectable in hardware (links or switches)	If, Required	No		ОК			

				Board Vendor		Linaro			
Section	Title	Requirement statement	Compliance	Board					
Section		nequi emene seacement	Directive	satisfies requirement?		Cross-check	Comments	Documented Exceptions	
4.4	Cable insert no boot	Note that the insertion of a cable shall not automatically require boot from that cable (for example the insertion of a microUSB cable into an OTG port to use FastBoot). In this case the boot option must still be user selectable.	Required	No	The board will automatically start when the SYS_DC power(8-18V) is on and the insertion of the micro USB is detected. When the PMIC MT6351 detects the VBUS voltage(5V) on PIN VCDT (k16), it will go into boot process. User can choose which mode to enter by modifying the code. This is the feature of X20 platform. User can choose which mode to enter by modifying the code. Of course, the mode can be defined by the user, for example: normal boot, fast boot and so on. The default mode is normal boot in code that is shipped.	Waiver	Please document the various modes that the PMIC supports. Support for other modes can be added during a software update.		
5	microSDHC								
5.1	Location	A microSDHC card socket shall be fitted in the specified location on the board	Required	Yes		ОК			
5.2	Bootable?	In the absence of on-board Flash memory, the system shall be capable of booting from the boot software installed on a microSDHC card at power up.	If, Required	No		ОК			
6	WiFi/Bluetooth LE			1	1		+	1	
6.1	Minimum	The board shall support WiFi (minimally 802.11g/n) and Bluetooth 4.0 (Bluetooth Low Energy)	Required	Yes		OK			
6.2	Recommended	It is recommended that WiFi 802.11ac is also supported.	Highly Recommended	Yes		OK	Skipped testing		
7	Display Interface			ļ.	!		1		
7.1	Display Output Connector	HDMI shall be provided on a full size (Type A) or a micro Type D connector OR MHL shall be provided on a 5 pin microUSB connector OR Display Port which shall be provided on a USB Type C connector	Required	Yes	HDMI Type A	ок			
7.2	Audio support	In all cases the display interface shall include audio with support for at least 1 channel	Required	Yes	It supports Stereo audio output over HDMI.	ОК			
7.3		In all cases the connector shall be located in the specified location	Required	Yes		ОК			
7.4	MIPI-DSI	A MIPI DSI port shall be provided on the expansion bus							
7.4.1	Expansion bus	interface.	Required	Yes		OK			
7.4.2	Number of lanes		Optional	4	support two 4-lane DSI. 1-4 lanes are supported on the DSI-1.	ОК			
7.4.3	MIPI-DSI/HDMI priority	Note that if a single DSI interface on the SoC is used to provide both (1) the high speed expansion bus interface DSI port and (2) the on board HDMI/MHIL/DisplayPort interface (via suitable transmitter), then the expansion port interface shall be operational if a mezzanine board that uses DSI is fitted	If, Required	N.A.	Can support MIPI-DSI and HDMI output simultaneously	ок			
		It is then optional as to whether the on-board interface is		Yes		ОК			
7.4.4	MIPI-DIS/HDMI simultaneous  Camera Interfaces	usavie at the same time	Optional						
	•	1 or 2 MIPI CSI-2 ports may be provided on the expansion bus		2	support two 4-lane CSI and	ОК			
8.1	Expansion bus		Optional		one 2-lane CSI	UK .			
8.2	CSIO	If 1 port is provided it shall be located on the CSI0 port							
8.2.1		interface	If, Required	Yes		OK			
8.2.2		From 1-4 lanes may be implemented on the CSIO port interface	Optional	4		OK			
8.3 8.3.1	CSI1	From 1-2 lanes may be implemented on the CSI1 port interface	Optional	2		OK			
		An implementation may support dual (stereo) cameras- through the CSIO interface if the SoC provides the necessary		N.A.		OK			
8.4	Stereo Cameras	<del>functionality.</del>	Optional						

	Board Vendor		Lir	Linaro				
Section	Title	Requirement statement	Compliance Directive	Board satisfies requirement?	Comments	Cross-check	Comments	Documented Exceptions
8.5	Camera/Sensor Control Signals	The specified GPIO and CLK signals on the expansion connectors shall be used for these functions if implemented	Required	Yes		OK		
8.6		If the cameras/sensors are not available/used then these signals shall be available as GPIO and CLK signals	If, Required	Yes		OK		
9	USB Ports			1	1		1	1
9.1	• •	A total of 4 USB ports shall be provided for a board.	Required	Yes		OK		
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 provided on the board.	Required	Yes	Two Type A USB2.0 ports	OK		
9.2.2		The connectors shall be in the specified locations.	Required	Yes	TWO Type A 03B2.0 ports	OK		
9.3		There are two options for Port 3:	Required	103		O.K		
9.3.1		The connector shall be placed in the specified location.	Required	Yes		OK		
9.3.2		The third port shall be available as a slave port.	Required	Yes		OK		
9.3.3		The third port may be an OTG port.	Optional	No		OK		
9.3.4	Option 1	The third port may be an OTG port.	Орсіонас	110				
9.3.4.1		A 5 pin microUSB USB 2.0 slave port shall be provided.	Required, OR	Yes		OK		
9.3.4.2	•	The connector type shall be micro-AB for an OTG port or micro-B for a slave only port	If, Required	Yes	Micro-B for a slave only port	OK		
		This port shall not provide power to the board, due to		Yes		OK		
9.3.4.3		insufficient power rating.	If, Required	ies		OK .		
9.3.5	Option 2							
9.3.5.1	Туре	A Type C USB port shall be provided (USB 2.x or 3.x).	Required, OR	N.A.		OK		
9.3.5.2	Power	This port may also be used to provide 5V external power to the board.	Optional	N.A.		OK		
9.3.3.2	Port 4	<del>board.</del>	Орсіонає					
9.4	POIL 4	A fourth USB host port shall be provided on the high speed						
9.4.1	Туре	expansion bus.	Required	Yes		OK		
9.5	Restrictions		•					
		There may be some restrictions on simultaneous USB port		Yes	Can be used simultaneously	ОК		
9.5.1	Simultaneous use		Optional		with the two Type A ports		+	
9.5.2		Any such restrictions shall be clearly documented.	If, Required	N.A.		OK		
10	Audio			1	1		1	
10.1	Port 1	//		V		01/		
10.1.1		I/O via Bluetooth 4.0	Required	Yes		OK		
10.2	Port 2			Vas		OK		
10.2.1		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						
10.3.1	Type	expansion interface.	Required	Yes		OK	Skipped testing	
	DC Power			1	1			•
11.1		Power shall be provided to the board by one (and only one) of the following:						
		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		Yes		ОК		
11.1.1	DC Jack	Location.  An 8V to 18V power supply from the SYS_DCIN pins on the low	Required, OR			<u> </u>		
11.1.2	Expansion bus	speed expansion connector.  A USB Type C port at 5V (if fitted) according to the USB 3.1	Required, OR	Yes		OK		
11.1.3		specifications.	Required, OR	No		ОК		
11.2	Multiple supplies							
11.2.1	Safety	If multiple in-specification supplies are connected there shall not be a safety issue	Required	Yes		ОК		
11.2.2	Damage	There shall be no damage to the board.	Required	Yes		OK	Skipped testing	
11.3	Common for all supplies	The board shall be able to provide the following power to external 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 port (when power does not have to be provided on the SYS DCIN line)						
11.3.1	Mezzanine +5V	A minimum of 5W to a mezzanine module via the regulated	Required	Yes		ОК	Not tested the limits	

				E	oard Vendor		Linaro	
Section	Title	Requirement statement	Compliance Directive	Board satisfies requirement?	Comments	Cross-check	Comments	Documented Exceptions
11.3.2	USB Hosts	A minimum of 5W to external USB devices connected to the 2 host USB ports	Required	Yes		ок	Not tested the limits	
11.3.3	Mezzanine 1.8V	A minimum of 0.18W to a mezzanine module via the regulated +1.8V line	Required	Yes		ОК	Not tested the limits	
11.4	Only DC Jack supply	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:						
11.4.1	Mezzanine SYS DCIN	A minimum of 7W to a mezzanine module via the SYS_DCIN line	If, Required	Yes		ОК	Not tested the limits	
12	Battery Power							
12.1	Battery	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)	Optional	Yes	It can be powered by an external battery from the SYS_DCIN lines which are on the low speed expansion interface CON7001.	ОК		
12.2	Limitations	Limitations on available power covering the use of smaller	Required	Yes		ОК		
	Measurement, Instrumentation and Testing	anayor beccery power supplies show be every obcomenced.						
13 13.1	Facilities Power Measurement							
13.1.1		A minimum of 1 current sense resistor shall be placed to permit basic power measurement functions.	Required	Yes		ОК		
13.1.2	Power	The total power consumption of the board shall be measurable through a suitable 1% current sense resistor.	Required	Yes	There are two current sense resistors R923 and R926 which are used to measure the current of SYS_5V and VBAT respectively. The total power consumption of the board can be calculated through the accumulation of power on SYS_5V and VBAT.	Waiver	Needs two measurement points instead of one, but it is still possible	
13.1.3		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 developer can replace for power measurement)		Yes	_	ок		
		The sense resistor shall be placed on the main board power	Optional	Yes		ОК		
13.1.4		supply to measure the total base board power.  It is optional as to whether this will measure any mezzanine board power usage.	Required Optional	No		ОК		
13.2		Additional current sense resistors may be placed at the discretion of the board designer.	Optional	No		ОК		
13.3	Recommended resistors	It is recommended that additional sense resistors are provided for the main PMIC downstream supplies to the SoC core,	Highly Recommended	No		ОК		
13.4		Current sense resistors shall be made available externally to measurement equipment.	Required	Yes		ОК		
13.5	Henders	The PCB design shall provide for low profile male 0.1" header pins to enable the connection of:	Required	Yes		ОК		
13.5.1		A single ground pin (for voltage measurement). The Low speed expansion connector may be documented as being usable for the ground pin requirement.	Required	Yes		ОК		
13.5.2	Ground		Required	Yes		ОК		
13.5.3		This header (or headers) may be unpopulated on a retail 96Boards CE board (enabling users to add the headers themselves).	Optional	N.A.	There is no single ground pin on the board but user can get the ground pin from low speed expansion connector.	ОК		
14	Power Button and Reset Button							
14.1	Minimum	The user shall be able to manually power up/down and reset the board.	Required	Yes		ОК		
14.2	External	It shall be possible to connect external switches for power on/off and for hard reset.  This shall be implemented using the specified pins on the low	Required	Yes		OK		
14.3	Mezzanine	speed bus connector (adjacent pins allowing direct connect of a 3 pin connector for both switches).	Required	Yes		ОК		

		Board Vendor		Linaro				
Section	Title	Requirement statement	Compliance Directive	Board satisfies requirement	Comments	Cross-check	Comments	Documented Exceptions
14.4	Auto power on		Required	Yes		ОК		
14.5	Auto power on default	This may either be default operation or through a configuration option (e.g. link or switch).	Optional	Yes	through a switch	ок		
15	External Fan Connection			•				
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.	Required	Yes		ОК		
16.1	UART 1	One standard UART from the SoC shall be made available for general purpose use on the low speed expansion connector.	Required	Yes	UART0	ОК		
16.2	additional UARTs	A second UART (TxD/RxD only) may be made available on the low speed expansion connector.	Optional	Yes	UART1	ОК	Skipped testing	
17	JTAG							
17.1	JTAG	JTAG facilities may be provided on a board.  If implemented the JTAG interface shall use the 10 pin JTAG	Optional	Yes No	Compliance with MTK debug	OK OK		
17.2		connector (0.05" pitch)	If, Required	INO	board			
18	System and User LEDs					6"		
18.1		The following LEDs shall be present on the board.	Required	Yes		OK		
18.1.1		Yellow Type: 0603 SMD	Required	Yes Yes		OK OK		
18.1.2 18.1.3	Bluetooth activity LED		Required	Yes		OK		
18.1.3		Green Type: 0603 SMD	Required	Yes		OK OK		
18.3		The LEDs shall be of the specified size, color and location.  The User LEDs shall be directly programmable from the SoC.	Required	Yes		OK	Skipped testing	
18.3	Front Panel and DC Jack Connectors	The User LEDS shall be directly programmable from the Soc.	Required	163		OK .	Skipped testing	
19.1	Through hole	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	Required	Yes Yes		ок		
19.2 <b>20</b>		mechanical support shall not be used.	Required					
20.1	Expansion Connectors	Two expansion connectors shall be provided.	Required	Yes		ОК		
20.2	Low Speed Expansion Connector	Two expansion connectors shall be provided.	Required					
20.2.1	, ,	A 40 pin low profile female 2mm receptacle (20x2) 4.5mm height is specified.	Required	Yes		OK		
20.2.2	Part Numbers	Molex 87381-4063 OR FCI 55510-140LF OR Samtec TLE-120- 01-G-DV OR TE 4-1470209-3 OR TE 4-1734506-3 OR FCI	Optional	Yes	Molex 87381-4063 FCI 55510-140LF	ОК		
20.2.3	Logic Levels	Unless otherwise indicated the low speed expansion connector signals are at 1.8V logic levels.	Required	Yes		ОК		
20.2.4	Keep out	Since a shrouded part can be used the connector footprint should be 43.0x6.5mm with no other components on the board top side in this area.	Required	Yes		ОК		
20.2.5	Interfaces							
20.2.5.1		One UART shall be provided on the low speed expansion bus	Required	Yes		OK		
20.2.5.2	UART1	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 bus.	Required	Yes		OK	Skipped testing	
20.2.5.4	12C x 2	Two 12C interfaces shall be provided on the low speed expansion bus  It is recommended that a 2K2R pullup is provided on each 12C	Required	Yes		OK	Skipped testing	
20.2.5.4.1	Pullups	signal, dependent on any relevant drive/pullup specifications of the Soc.	Highly Recommended	Yes	The pullup resistors are 4.7k	ОК		
20.2.5.5	I2S	One PCM/Inter IC Sound (I2S) PCM audio data bus shall be provided on the low speed expansion bus.	Required	Yes	12 CDIO lines	OK	Skipped testing	
20.2.5.6	GPIO x 12		Required	Yes	12 GPIO lines are provided on the low speed expansion bus	ОК	Provide documentation about the SoC GPIO numbers wired up to the LS connector	
20.2.5.7	Reset and Power button	The following controls shall be provided on the low speed	Required	Yes		OK		
20.2.5.7.1		These signals shall be active low.	Required	Yes		ОК		
20.2.3.1.1	Logic Levels	These signals shall be active tow.	required		1			

				E	Board Vendor	Linaro		naro
Section	Title	Requirement statement	Compliance	Board				
Section		Requirement statement	Directive	satisfies requirement?	Comments	Cross-check	Comments	Documented Exceptions
20.2.5.8	1.8V, 5V and DC_IN power supplies	Power supplies	Required	Yes		OK		
20.3	High Speed Expansion Connector							
20.3.1	Type	A 60 pin 0.8mm high speed Board to Board low profile receptacle connector is specified.	Required	Yes		ok		
20.3.1		FCI 61082-061409LF OR TE 5177983-2	Optional	Yes	FCI 61082-061409LF	OK	<u> </u>	
20.5.2	Fait Numbers	unless otherwise indicated the high speed expansion	Орсіонас	Yes	1 CI 0 1002-001409EI	OK		
20.3.3		connector signals are at 1.8V logic levels.	Required	Yes		UK		
20.3.4	Interfaces							
20.3.4.1	MIPI DSI	A MIPI DSI interface shall be provided on the high speed expansion bus.	Required	Yes		ОК	Tested using mezzanine board provided by Mediatek/Archermind	
20242	LICE	One USB host port shall be provided on the high speed expansion bus.	Required	Yes		ок		
20.3.4.2	USB	In many designs the USB port is expected to come from a USB hub solution ready for direct connect to a USB interface,	Required	Yes		OK		
20.3.4.2.1	Logic Levels	therefore these signals are specified at USB PHY signal levels.	Required					
20.3.4.3	SD or SPI interface	The expansion port shall be configured with either an SD port or a second SPI Port SD Configuration	Required	SPI		OK	Skipped testing	
	MIDI 661 0 / 5	Two MIPI CSI-2 interfaces may be provided on the high speed	0.11	2	41 21	ОК	ati ti ii	
20.3.4.4	MIPI CSI-2 (x2 optional)	Two I2C interfaces may be provided on the high speed	Optional		4lanes + 2lanes		Skipped testing	
20.3.4.5	I2C	expansion bus.	Optional	2		ОК	Skipped testing	
20.3.4.5.1	with CCI	If one or two CSI2 interfaces are implemented then at least the same number of I2C interfaces shall be provided on the high speed expansion bus.	Required	Yes		ОК	Skipped testing	
20.3.4.3.1	With Cal	It is recommended that a 2K2R pullup is provided on each I2C	Required				Skipped testing	
20.3.4.5.2	Pullups	signal, dependent on any relevant drive/pullup specifications of the SoC.	Highly Recommended	Yes	The pullup resistors are 1.5k	OK		
20.3.4.6	HSIC	One MIPI-HSIC interface may be provided on the high speed expansion bus.  One pin shall be reserved for future use. It shall be pulled up	Optional	No		OK	Skipped testing	
20.3.4.7	Reserved	via 100K to 1.8V.	Required	Yes		ОК	Skipped testing	
20.3.4.8	Clocks	One or two programmable clock interfaces may be provided on the high speed expansion bus.	Optional	2		OK	Skipped testing	
20.3.4.8.1	with CSI	If CSI camera(s) are supported on mezzanine boards these clocks shall be available as the CSI reference clocks (in case they are needed)	Required	Yes		OK	Skipped testing	
20.4	GPIO-A	GPIO-A shall be capable of waking up the SoC from sleep/standby mode	Required	Yes		ОК	Skipped testing	
20.5	GPIO Default	By default all GPIO pins should be configured at boot as inputs to the SoC.	Required	Yes		ОК	Skipped testing	
21	Standalone Functionality			'	-		1 11	
	<u> </u>	The standalone board requires only a power supply and display connected to be used as an advanced single board computer		Yes		ОК		
21.1		(using wireless keyboard/mouse/WiFi & Bluetooth).	Required				-	
22	Software	All the sources required to rebuild the image are			We will ensure that the			
22.1	License compliance	downloadable via public git repositories where the license (e.g.	Required	Yes	License compliance of source code.	OK	Need locations from Archermind	
22.1	License computance User changes		Required		coue.		Archenning	
		It shall be possible to replace or update the bootloader, kernel		Yes		OK		
22.2.4	Software replacement	and rootfs	Required	res		UK		
22.2.5	Unbrickina a board	It shall be possible to recover from a "bricked" board (for example as a result of use of a user built bootloader) without specialized additional hardware	Required	Yes		ОК		
22.3		The bundled software enables all mandatory HW specified in the 96Boards specification e.g. USB, Display, Connectivity, Serial, on-board switches and LEDs, various mandatory interfaces on the LS and HS connectors	Required	Yes		ОК		
	Licensing						1	1
23.1	Binary software							
		Binary distribution license to Linaro/96Boards to allow any		Yes		ОК		
	License to Linaro	binaries to be redistributed on the 96Boards website	Required	103				

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Section	Title	Requirement statement	Compliance Directive	Board satisfies requirement?	Comments	Cross-check	Comments	Documented Exceptions	
	License to Board Manufacturer	Binary distributions license to allow board manufacturer to ship all necessary binaries	Required	Yes		ОК			
24	Documentation								
24.1		Board schematics shall be available under CC BY 4.0 licence on the 96Boards.org site	Required	Yes		ОК			
24.2	Board BOM	BOM for the board	Required	Yes		OK			
24.3		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 markup language to be hosted on 96Boards.org	Required	Yes		ок	WIP: Robert converting over the manual into the right format		
24.4	SoC Programmers Tehnical Reference Manual	The manual shall include sufficient information for developers to be able to create board drivers and software interfaces for the supported SoC features	Required	Yes		ОК			