

Datasheet

Universal SMARC Carrier Board

Version 1.0

REVISION HISTORY

Version	Date	Notes	Contributors	Approver
1.0	3 August 2023	Initial Release	Gary Bisson	Dan Kephart

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1 SCOPE

This document describes key hardware aspects of Boundary Device's Universal SMARC Carrier Board.

Note: Information in this document is subject to change. Contact us for the most updated version of this document.

2 INTRODUCTION

The Universal SMARC Carrier Board is compliant with the SMARC standard pinout and therefore can accept any SMARC System-On-Module (SOM). It is recommended to use one of [Boundary Devices' SMARC modules](#).

The carrier, also known as motherboard for some, mostly exposes what the SOM provides. Therefore, its feature set depends on the module connected as some modules have more, or less, features than others.

This documentation will describe all the connectors of the board as if it was connected to a module that supports all the features possible.

3 UNIVERSAL SMARC CARRIER BOARD INTERFACES SUMMARY

The Universal SMARC Carrier Board complies with the [SMARC v2.1 specification from SGET](#).

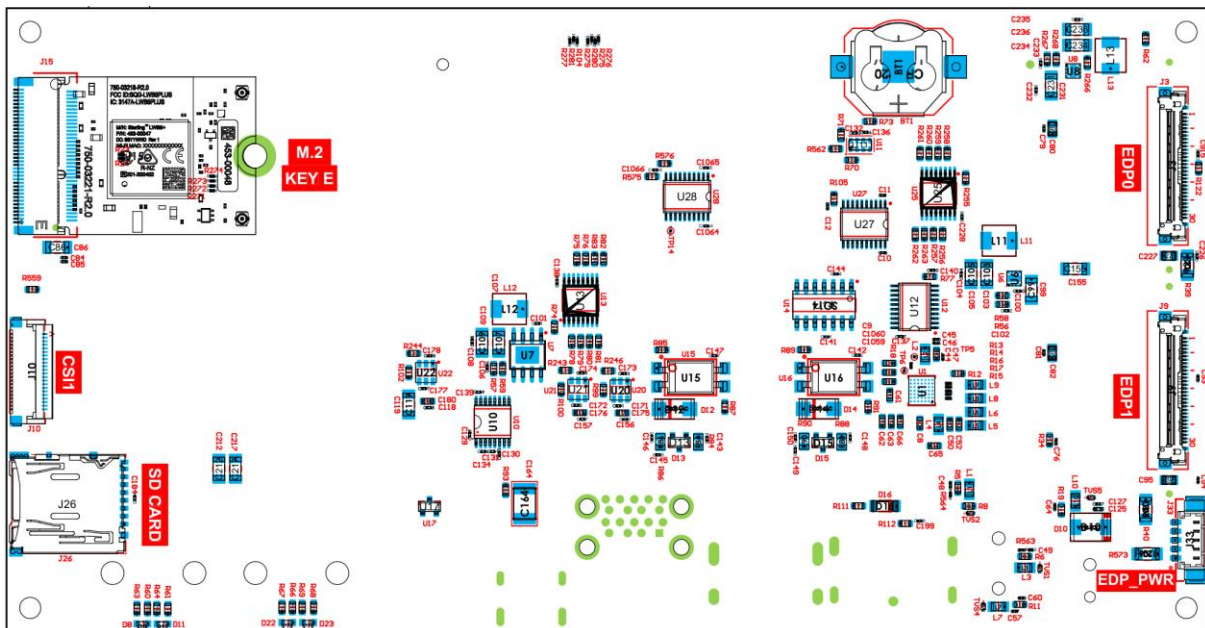
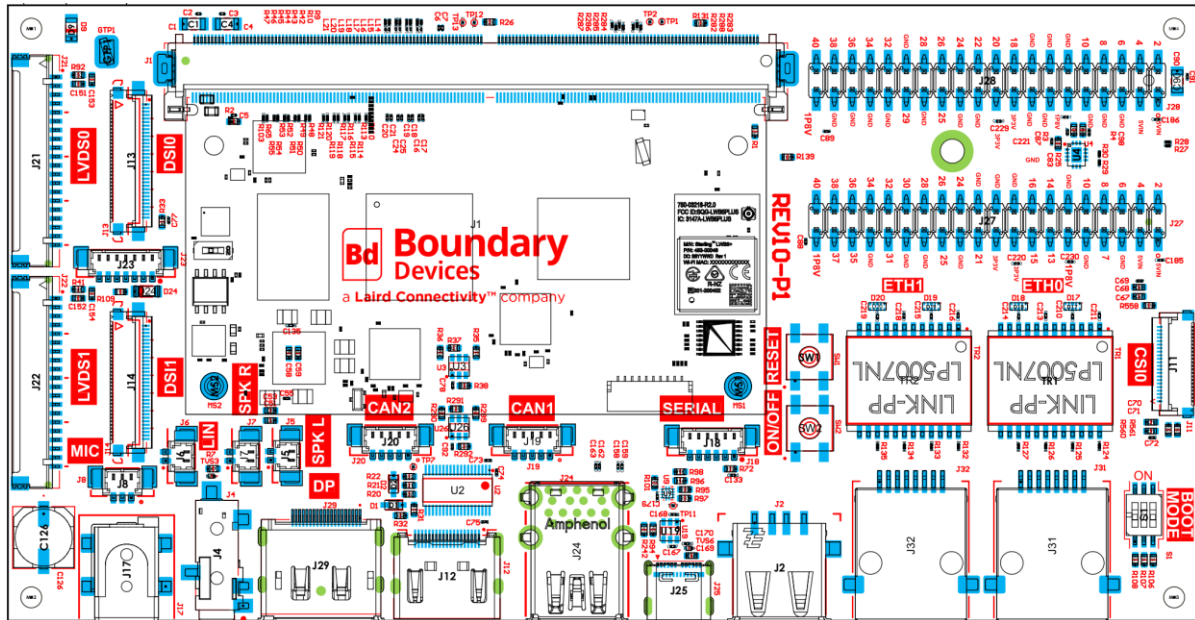
Key interfaces are described in [Table 1](#).

Table 1: Key Interfaces of the Universal SMARC Carrier Board

Interfaces	Description
Multimedia Interfaces	
HDMI	x1 (up to 4k@60)
DisplayPort	x1 (up to 4k@60)
eDP	x2 eDP
LVDS	x2 4-lane LVDS
MIPI DSI	x2 4-lane MIPI-DSI
Camera Interfaces	x2 4-lane MIPI-CSI
Networking Interfaces	
Ethernet	x2 Gigabit Ethernet
Wi-Fi	See SOM specification
Bluetooth	See SOM specification
Audio Interfaces	
Playback	x1 Headphones x2 Speakers (2W)
Capture	x1 Mic via molex connector x1 Mic via headphones connector x1 Line In via molex connector
Connectivity Ports	
I2C	x2 (debug connectors) x2 (camera connectors) x2 (display connectors)
SPI	x2 (debug connectors) x1 (M.2 connector)

Interfaces	Description
UART	x1 (debug connector, TTL) x2 (molex connectors, RS-232)
USB	x2 USB 3.0 (USB-A) x1 USB 2.0 (USB-A) x1 USB 2.0 (M.2 connector) x1 USB 2.0 TypeC (dual role)
RTC	x1 + battery
PCIe	x1 (M.2 connector)
CAN	x2
PCB Specifications	
Dimensions (L x W)	168mm x 87mm
Miscellaneous Specifications	
Temperature Rating	Commercial 0-70°C
Power Supply	5V

4 BOARD OVERVIEW



5 ELECTRICAL CHARACTERISTIC AND POWER CONSUMPTION

5.1 Absolute Maximum Ratings

Table 2 summarizes the absolute maximum ratings and Table 3 lists the recommended operating conditions for the Universal SMARC Carrier Board. Absolute maximum ratings are those values beyond which damage to the device can occur. Functional operation under these conditions, or at any other condition beyond those indicated in the operational sections of this document, is not recommended.

Note: Maximum rating for signals follows the supply domain of the signals.

Table 2: Absolute maximum ratings

Symbol (Domain)	Parameter	Min.	Max	Unit
VSYS_5V	Input voltage for the SOM	-0.5	+6.0	V
I/O Input/output voltage range	Any I/O pin referred 1.8V tolerant	-0.3	+2.1	V
I/O Input/output voltage range	Any I/O pin referred 3.3V tolerant	-0.3	+3.6	V
T _{STORAGE}	Storage Temperature Range	-40	+125	°C
ESD	Electrostatic discharge tolerance	-2000	+2000	V

5.2 Recommended Operating Conditions

Table 3: Recommended Operating Conditions

Symbol (Domain)	Parameter	Min	Typ	Max	Unit
VSYS_5V	Input voltage for the SOM	3.3	5.0	5.5	V
I/O voltage range	Any I/O pin referred 1.8V tolerant	1.71	1.8	1.89	V
I/O voltage range	Any I/O pin referred 3.3V tolerant	3.0	3.3	3.6	V
T-ambient	Operating Ambient temperature	-40	25	85	°C

Note: The operating ambient temperature ratings are highly dependent on the design-case, such as the enclosure design, system design, processor activity, GPU/VPU activity, and peripherals used.

Running over 70° C ambient temperature typically requires the implementation of thermal management strategies such as passive (heatsink/spreader). Please contact Boundary Devices if you need information and guidance for thermal management.

6 INTERFACES DESCRIPTION AND PINOUT

This section will detail every connector from the Universal SMARC Carrier Board listed in Table 4.

Table 4: Universal SMARC Carrier Board connectors

Reference	Function	Type
J1	SMARC connector	JAE MM70-314B1-2-R300 (314-pin)
J12	HDMI display	Molex 47151-1041 (19-pin)
J29	DisplayPort display	Molex 47272-0001 (20-pin)
J3	eDP0 display	I-PEX 20455-030E-99 (30-pin)
J9	eDP1 display	I-PEX 20455-030E-99 (30-pin)
J21	LVDS0 display	Hirose DF14-20P-1.25H (20-pin)
J22	LVDS1 display	Hirose DF14-20P-1.25H (20-pin)
J23	LVDS touch connector	Molex 53398-0771 (7-pin)
J13	DSI0 display	Omron XF2M-3315-1A (33-pin)
J14	DSI1 display	Omron XF2M-3315-1A (33-pin)
J70	CSI0 camera	Omron XF2M-2215-1A (22-pin)
J10	CSI1 camera	Omron XF2M-2215-1A (22-pin)
J4	Headphones jack	Cui SJ-43515TS-SMT-TR
J8	Microphone connector	Molex 53398-0371
J6	Line in connector	Molex 53398-0271
J5	Left speaker connector	Molex 53398-0271
J7	Right speaker connector	Molex 53398-0271
J31	Ethernet0 connector	Link-PP LPJE8802DNL-1
J32	Ethernet1 connector	Link-PP LPJE8802DNL-1
J27	Debug connector #1	Amphenol 95157-440LF

Reference	Function	Type
J28	Debug connector #2	Amphenol 95157-440LF
J25	USB Type-C connector	Molex 1054500101
J24	USB 3.0 Host connector	Amphenol GSB311231HR
J71	USB 2.0 Host connector	TE 292303-9
J19	CAN0 connector	Molex 53398-0571
J20	CAN1 connector	Molex 53398-0571
J15	M.2 connector	TE 2199230-4
J26	SD card connector	Hirose DM3AT-SF-PEJM5
J18	Serial connector	Molex 53398-0671
J33	Power out connector	Molex 53398-0571
J17	Power in connector	KLDX-SMT2-0202-ATR
BT1	RTC battery socket	Keystone 3080
SW1	Reset button	Alps SKHUAKE010
SW2	Power button	Alps SKHUAKE010

6.1 Multimedia interfaces

Table 5: J12 - HDMI display connector

Pin #	Signal	Pin #	Signal
1	HDMI_D2+ (P92)	2	GND
3	HDMI_D2- (P93)	4	HDMI_D1+ (P95)
5	GND	6	HDMI_D1- (P96)
7	HDMI_D0+ (P98)	8	GND
9	HDMI_D0- (P99)	10	HDMI_CK+ (P101)
11	GND	12	HDMI_CK- (P102)
13	HDMI_CEC (P107)	14	TP7
15	HDMI_CTRL_CK (P105)	16	HDMI_CTRL_DAT (P106)
17	GND	18	5VIN
19	HDMI_HPDP (P104)		

Table 6: J29 - DisplayPort connector

Pin #	Signal	Pin #	Signal
1	DP0_LANE0_P (S93)	2	GND
3	DP0_LANE0_N (S94)	4	DP0_LANE1_P (S96)
5	GND	6	DP0_LANE1_N (S97)
7	DP0_LANE2_P (S99)	8	GND
9	DP0_LANE2_N (S100)	10	DP0_LANE3_P (S102)
11	GND	12	DP0_LANE3_N (S103)
13	DP0_AUX_SEL (S95)	14	GND

Pin #	Signal	Pin #	Signal
15	DP0_AUX+ (S105)	16	GND
17	DP0_AUX- (S106)	18	DP0_HPD (S98)
19	GND	20	3P3V

Table 7: J3 - eDP0 display connector

Pin #	Signal	Pin #	Signal
1	NC	2	GND
3	eDP0_TX1- (S129)	4	eDP0_TX1+ (S128)
5	GND	6	eDP0_TX0- (S126)
7	eDP0_TX0+ (S125)	8	GND
9	eDP0_AUX+ (S134)	10	eDP0_AUX- (S135)
11	GND	12	3P3V
13	3P3V	14	NC
15	GND	16	GND
17	eDP0_HPD (S144)	18	GND
19	GND	20	GND
21	GND	22	LCD0_BKLT_EN (S127)
23	LCD0_BKLT_PWM (S141)	24	NC
25	NC	26	5V
27	5V	28	5V
29	5V	30	NC

Table 8: J9 - eDP1 display connector

Pin #	Signal	Pin #	Signal
1	NC	2	GND
3	eDP1_TX1- (S115)	4	eDP1_TX1+ (S114)
5	GND	6	eDP1_TX0- (S112)
7	eDP1_TX0+ (S111)	8	GND
9	eDP1_AUX+ (S108)	10	eDP1_AUX- (S109)
11	GND	12	3P3V
13	3P3V	14	NC
15	GND	16	GND
17	eDP1_HPD (S113)	18	GND
19	GND	20	GND
21	GND	22	LCD1_BKLT_EN (S107)
23	LCD1_BKLT_PWM (S122)	24	NC
25	NC	26	5V
27	5V	28	5V
29	5V	30	NC

Table 9: J21 - LVDS0 display connector

Pin #	Signal	Pin #	Signal
1	3P3V	2	3P3V
3	GND	4	GND
5	LVDS0_0- (S126)	6	LVDS0_0+ (S125)
7	GND	8	LVDS0_1- (S129)
9	LVDS0_1+ (S128)	10	GND
11	LVDS0_2- (S132)	12	LVDS0_2+ (S131)
13	GND	14	LVDS0_CK- (S135)
15	LVDS0_CK+ (S134)	16	GND
17	LVDS0_3- (S138)	18	LVDS0_3+ (S137)
19	LCD0_BKLT_EN (S127)	20	LCD0_BKLT_PWM (S141)

Table 10: J22 - LVDS1 display connector

Pin #	Signal	Pin #	Signal
1	3P3V	2	3P3V
3	GND	4	GND
5	LVDS1_0- (S112)	6	LVDS1_0+ (S111)
7	GND	8	LVDS1_1- (S115)
9	LVDS1_1+ (S114)	10	GND
11	LVDS1_2- (S118)	12	LVDS1_2+ (S117)
13	GND	14	LVDS1_CK- (S109)
15	LVDS1_CK+ (S108)	16	GND
17	LVDS1_3- (S121)	18	LVDS1_3+ (S120)
19	LCD1_BKLT_EN (S107)	20	LCD1_BKLT_PWM (S122)

Table 11: J22 - LVDS touch connector

Pin #	Signal	Pin #	Signal
1	5VIN	2	5VIN
3	ESPI_ALERT0# (S43)	4	SMB_ALERT_1V8# (P1)
5	I2C_PM_DAT (P122)	6	I2C_PM_CK (P121)
7	GND		

Table 12: J13 - DSI0 display connector

Pin #	Signal	Pin #	Signal
1	GND	2	GND
3	5VIN	4	5VIN
5	5VIN	6	5VIN
7	LCD0_BKLT_PWM (S141)	8	CARRIER_STBY (S153)
9	LCD0_BKLT_EN (S127)	10	GPIO_07 (P115)
11	LCD0_VDD_EN (S133)	12	GND

Pin #	Signal	Pin #	Signal
13	DSI0_D3- (S138)	14	DSI0_D3+ (S137)
15	GND	16	DSI0_D2- (S132)
17	DSI0_D2+ (S131)	18	GND
19	DSI0_CLK- (S135)	20	DSI0_CLK+ (S134)
21	GND	22	DSI0_D1- (S129)
23	DSI0_D1+ (S128)	24	GND
25	DSI0_D0- (S126)	26	DSI0_D0+ (S125)
27	GND	28	DSI0_SCL
29	DSI0_SDA	30	GND
31	3P3V	32	3P3V
33	3P3V		

Table 13: J14 - DSI1 display connector

Pin #	Signal	Pin #	Signal
1	GND	2	GND
3	5VIN	4	5VIN
5	5VIN	6	5VIN
7	LCD1_BKLT_PWM (S122)	8	
9	LCD1_BKLT_EN (S107)	10	
11	LCD1_VDD_EN (S116)	12	GND
13	DSI1_D3- (S121)	14	DSI1_D3+ (S120)
15	GND	16	DSI1_D2- (S118)
17	DSI1_D2+ (S117)	18	GND
19	DSI1_CLK- (S109)	20	DSI1_CLK+ (S108)
21	GND	22	DSI1_D1- (S115)
23	DSI1_D1+ (S114)	24	GND
25	DSI1_D0- (S112)	26	DSI1_D0+ (S111)
27	GND	28	DSI1_SCL
29	DSI1_SDA	30	GND
31	3P3V	32	3P3V
33	3P3V		

Table 14: J70 - CSI0 camera connector

Pin #	Signal	Pin #	Signal
1	3P3V	2	I2C_CAM0_DAT (S7)
3	I2C_CAM0_CK (S5)	4	GND
5	GPIO5 (P113)	6	CAM0_PWR (P108)
7	GND	8	SATA_RX_P / CSI0_D3_P (P51)
9	SATA_RX_N / CSI0_D3_N (P52)	10	GND

Pin #	Signal	Pin #	Signal
11	SATA_TX_P / CSI0_D2_P (P48)	12	SATA_TX_N / CSI0_D2_N (P49)
13	GND	14	CSI0_CK+ (S8)
15	CSI0_CK- (S9)	16	GND
17	CSI0_RX1+ (S14)	18	CSI0_RX1- (S15)
19	GND	20	CSI0_RX0+ (S11)
21	CSI0_RX0- (S12)	22	GND

Table 15: J10 - CSI1 camera connector

Pin #	Signal	Pin #	Signal
1	3P3V	2	I2C_CAM1_DAT (S2)
3	I2C_CAM1_CK (S1)	4	GND
5	CAM_MCLK (S6)	6	CAM1_RST (P111)
7	GND	8	CSI1_RX3+ (P16)
9	CSI1_RX3- (P17)	10	GND
11	CSI1_RX2+ (P13)	12	CSI1_RX2- (P14)
13	GND	14	CSI3_CK+ (P3)
15	CSI1_CK- (P4)	16	GND
17	CSI1_RX1+ (P10)	18	CSI1_RX1+ (P10)
19	GND	20	CSI1_RX0+ (P7)
21	CSI1_RX0- (P8)	22	GND

6.2 Audio interfaces

Table 16: J4 - Headphones jack connector

Pin #	Signal	Pin #	Signal
1	MIC_IN1 / IN1R (wm8962)	2	HPOUTL (wm8962)
3	HPOUTR (wm8962)	4	GND
5	GPIO5 / HP_DET (wm8962)		

Table 17: J8 - Microphone connector

Pin #	Signal	Pin #	Signal
1	GND	2	MIC_IN2 / IN2R (wm8962)
3	GPIO6 / MIC_DET (wm8962)		

Table 18: J6 - Line in connector

Pin #	Signal	Pin #	Signal
1	IN3L (wm8962)	2	IN3R (wm8962)

Table 19: J5 - Left speaker connector

Pin #	Signal	Pin #	Signal
1	SPKOUTLN (wm8962)	2	SPKOUTLP (wm8962)

Table 20: J7 - Right speaker connector

Pin #	Signal	Pin #	Signal
1	SPKOUTRN (wm8962)	2	SPKOUTRP (wm8962)

6.3 Networking interfaces

Table 21: J31 - Ethernet0 connector

Pin #	Signal	Pin #	Signal
1	GBE0_MDI0+ (P30)	2	GBE0_MDI0- (P29)
3	GBE0_MDI1+ (P27)	4	GBE0_MDI2+ (P24)
5	GBE0_MDI2+ (P23)	6	GBE0_MDI1- (P26)
7	GBE0_MDI3+ (P20)	8	GBE0_MDI3- (P19)

Table 22: J32 - Ethernet1 connector

Pin #	Signal	Pin #	Signal
1	GBE1_MDI0+ (S17)	2	GBE1_MDI0- (S18)
3	GBE1_MDI1+ (S20)	4	GBE1_MDI2+ (S23)
5	GBE1_MDI2+ (S24)	6	GBE1_MDI1- (S21)
7	GBE1_MDI3+ (S26)	8	GBE1_MDI3- (S27)

6.4 Connectivity ports

Table 23: J27 - Debug connector #2

Pin #	Signal	Pin #	Signal
1	5VIN	2	VIN_PWR_BAD# (S150)
3	5VIN	4	SLEEP# (S149)
5	GND	6	WDT_TIME_OUT# (S145)
7	SDIO_WP (P33)	8	CHARGER_PRESENT# (S152)
9	GND	10	GBE1_SDP (P5)
11	1P8V	12	GND
13	GPIO2 (P110)	14	FORCE_RECOV# (S155)
15	GPIO9 (P117)	16	RESERVED5 (S4)
17	3P3V	18	GND
19	3P3V	20	GND
21	TEST# (S157)	22	GND
23	GND	24	SER0_TX (P129)
25	GBE0_SDP (P6)	26	SER0_RX (P130)

Pin #	Signal	Pin #	Signal
27	GND	28	SER0_CTS (P131)
29	GND	30	SER0_RTS (P132)
31	BAT_LOW# (S156)	32	ESPI_IO2 (S56)
33	GND	34	I2S2_CK (S53)
35	EXP1_I2C_SDA	36	I2S2_SDIN (S52)
37	EXP1_I2C_SCL	38	I2S2_SDOOUT (S51)
39	1P8V	40	I2S2_LRCK (S50)

Table 24: J28 - Debug connector #2

Pin #	Signal	Pin #	Signal
1	5VIN	2	SPI0_CS0# (P43)
3	5VIN	4	SPI0_CK (P44)
5	GND	6	SPI0_DIN (P45)
7	GND	8	SPI0_DO (P46)
9	GND	10	SPI0_CS1# (P31)
11	1P8V	12	GND
13	GND	14	GND
15	GND	16	GND
17	3P3V	18	ESPI_RESET# (S58)
19	3P3V	20	SPI1_DO (P58)
21	GND	22	SPI1_DI (P57)
23	GND	24	SPI1_CK (P56)
25	RESERVED_01 (P72)	26	SPI1_CS1# (P55)
27	GND	28	SPI1_CS0# (P54)
29	RESET_OUT# (P126)	30	GND
31	GND	32	CHARGING# (S151)
33	GND	34	LID# (S148)
35	GND	36	NC
37	GND	38	EXP2_I2C_SDA
39	1P8V	40	EXP2_I2C_SCL

Table 25: J25 – USB TypeC connector

Pin #	Signal	Pin #	Signal
A1	GND	B1	GND
A2	NC	B2	NC
A3	NC	B3	NC
A4	VBUS	B4	VBUS
A5	CC1	B5	NC

Pin #	Signal	Pin #	Signal
A6	USB0+ (P60)	B6	USB0- (P61)
A7	USB0- (P61)	B7	USB0+ (P60)
A8	NC	B8	CC2
A9	VBUS	B9	VBUS
A10	NC	B10	NC
A11	NC	B11	NC
A12	GND	B12	GND

Table 26: J71 - USB 2.0 Host connector

Pin #	Signal	Pin #	Signal
1	GND	2	USB1+ (P65)
3	USB1- (P66)	4	VBUS
5	GND	6	GND
7	GND	8	GND

Table 27: J26 - USB 3.0 Host connector

Pin #	Signal	Pin #	Signal
1	VBUS	2	USB3- (S69)
3	USB3+ (S68)	4	GND
5	USB3_SSRX- (S66)	6	USB3_SSRX+ (S65)
7	GND	8	USB3_SSTX- (S63)
9	USB3_SSTX+ (S62)	10	VBUS
11	USB2- (P70)	12	USB2+ (P69)
13	GND	14	USB2_SSRX- (S75)
15	USB2_SSRX+ (S74)	16	GND
17	USB2_SSTX- (S72)	18	USB2_SSTX+ (S71)
19	GND	20	GND
21	GND	22	GND

Table 28: J19 - CAN0 connector

Pin #	Signal	Pin #	Signal
1	CHIP_DETECT	2	CAN1_L (TJA1048 U14)
3	GND	4	CAN1_H (TJA1048 U14)
5	CHIP_DETECT		

Table 29: J20 - CAN1 connector

Pin #	Signal	Pin #	Signal
1	CHIP_DETECT	2	CAN2_L (TJA1048 U14)
3	GND	4	CAN2_H (TJA1048 U14)
5	CHIP_DETECT		

Table 30: J15 - M.2 connector

Pin #	Signal	Pin #	Signal
1	GND	2	3P3V
3	USB4+ (S35)	4	3P3V
5	USB4- (S36)	6	NC
7	GND	8	NC
9	SDIO_CK (P36 if R282 stuffed)	10	NC
11	SDIO_CMD (P34 if R283 stuffed)	12	NC
13	SDIO_D0 (P39 if R284 stuffed)	14	NC
15	SDIO_D1 (P40 if R285 stuffed)	16	NC
17	SDIO_D2 (P41 if R286 stuffed)	18	3P3V
19	SDIO_D3 (P42 if R287 stuffed)	20	NC
21	SDIO_CD (P35 if R288 stuffed)	22	SER0_TX (P129)
23	CARRIER_PWR_ON (S154)	24	NC
25	NC	26	NC
27	NC	28	NC
29	NC	30	NC
31	NC	32	SER0_RX (P130)
33	3P3V	34	SER0_CTS (P132)
35	PCIE_A_TX_P (P89)	36	SER0_RTS (P131)
37	PCIE_A_TX_N (P90)	38	SPI0_DO (P46)
39	3P3V	40	SPI0_DIN (P45)
41	PCIE_A_RX_P (P86)	42	SPI0_CK (P44)
43	PCIE_A_RX_N (P87)	44	NC
45	3P3V	46	NC
47	PCIE_A_REFCK+ (P83)	48	NC
49	PCIE_A_REFCK- (P84)	50	CLK_OUT (RTC – 32kHz)
51	3P3V	52	PCIE_A_RST# (P75)
53	PCIE_A_CKREQ# (P78)	54	NC
55	PCIE_WAKE# (S146)	56	SDIO_PWR_EN (P37)
57	3P3V	58	PCIE_SDA
59	NC	60	PCIE_SCL
61	NC	62	ESPI_CS1 (P55)
63	3P3V	64	SPI0_CS0# (P43)
65	NC	66	NC
67	NC	68	NC
69	3P3V	70	NC
71	NC	72	3P3V
73	NC	74	3P3V
75	GND		

Table 31: J26 - SD Card connector

Pin #	Signal	Pin #	Signal
1	SDIO_D2 (P41)	2	SDIO_D3 (P42)
3	SDIO_CMD (P34)	4	3P3V
5	SDIO_CK (P36)	6	GND
7	SDIO_D0 (P39)	8	SDIO_D1 (P40)
9	GND	10	GND
11	GND	12	SDIO_CD (P35)

Table 32: J18 - Serial connector (RS-232 +/- 5V)

Pin #	Signal	Pin #	Signal
1	SER2_TX (P136)	2	5VIN
3	GND	4	SER1_TX (P134)
5	SER1_RX (P135)	6	SER2_RX (P137)

6.5 Miscellaneous interfaces

Table 33: J33 - Power out connector

Pin #	Signal	Pin #	Signal
1	GND	2	GND
3	5VIN	4	5VIN
5	5VIN		

Table 34: J17 - Power in connector

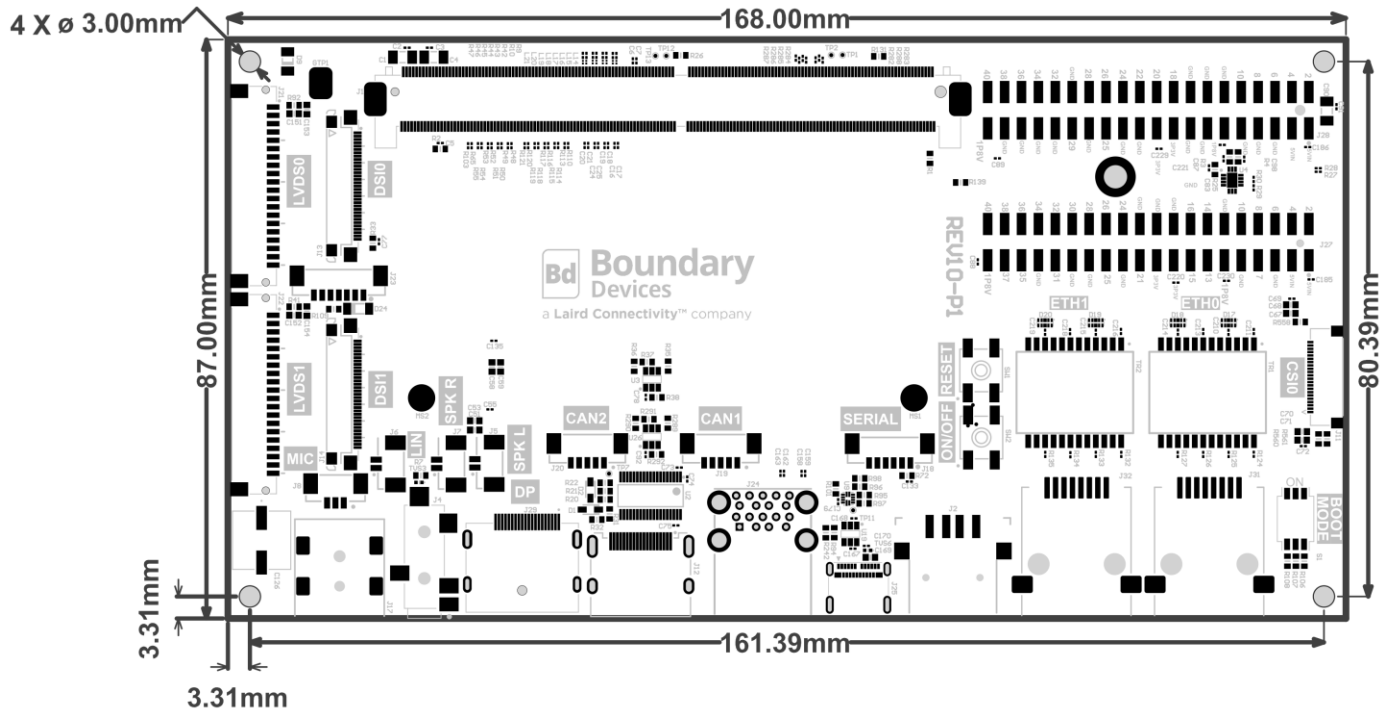
Pin #	Signal	Pin #	Signal
1	GND	2	GND
3	5VIN		

Table 35: BT1 - RTC Battery socket

Pin #	Signal	Pin #	Signal
1	3V	2	GND

7 MECHANICAL AND PCB FOOTPRINT SPECIFICATION

Module dimensions of the Universal SMARC Carrier Board are 168 x 87 mm. Detail drawings are shown below.



8 STORAGE INSTRUCTIONS

Required Storage Conditions:

- **Prior to Opening the Dry Packing**

The following are required storage conditions prior to opening the dry packing:

- Normal temperature: 5~40°C
- Normal humidity: 80% (Relative humidity) or less
- Storage period: One year or less

9 ORDERING INFORMATION

Order Model	Description
SMARC_CAR_BRD	Universal Carrier Board - SMARC (Note - SOM sold separately)

10 ADDITIONAL ASSISTANCE

Please contact your local sales representative or our support team for further assistance:

Boundary Devices Support Center: <https://boundarydevices.com/support/>

Email: support@boundarydevices.com

Phone: Americas: +1-800-492-2320

Europe: +44-1628-858-940

Hong Kong: +852-2762-4823

Web: <https://www.lairdconnect.com/products>

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