

RAMN V1 main board (STM32L552, Non-automotive version)

Designation	Qty	Component	Reference	Maker	Comment
C1 C2	2	4.7nF			0603 low precision
C11 C12 C21 C22 C31 C32 C41 C42	8	1uF			1206 low precision
C3 C4 C8 C9 C10 C13 C14 C18 C19 C20 C23 C24 C28 C29 C30 C33 C34 C38 C39 C40 C43	21	100nF			0603 low precision
C5 C6 C15 C16 C25 C26 C35 C36	8	10pF			0603 high precision
C7 C17 C27 C37	4	10uF			1206 low precision
R8 R10 R11 R12 R13 R14 R15 R17	8	10k			0603 low precision
R1 R4 R5 R16	4	0ohm / solder bridge / shunt resistor			0603 low precision OK, high precision if shunt
R2 R3 R6 R7	4	60R			0603 low precision OK, high precision preferred
R9	1	Do Not Mount	Do Not Mount	Do Not Mount	
J1	1	USB Micro Connector	629105150521	Wurth	
J2	1	Terminal Block 3pin	1770966	Phoenix Contact	
J3 J4 J5 J6	4	Pin socket 2x13	M20-7831346	Harwin	
TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP9 TP10	10	Test probe	20-313143	Vero Technologies	Optional probes
U1 U4 U7 U10	4	MCP2558FD-H/SN	MCP2558FD-H/SN	Microchip	
U2 U5 U8 U11	4	STM32L552CET6	STM32L552CET6	STMicroelectronics	~+85 degrees Celcius version
U3 U6 U9 U12	4	NCV8163	NCV8163ASN330T1G	On Semi	
Y1 Y2 Y3 Y4	4	NX3225GD-10.000M-STD-CRA-3	NX3225GD-10.000M-STD-CRA-3	NDK	
D1 D2 D3 D4	4	Reverse current protection	RB520S30T1G	On Semi	Optional protection

RAMN V1 expansions (Non-automotive version)

1 - Screen

Designation	Qty	Component	Reference	Maker	Comment
J1	1	Pin header 2x13	68021-226HLF	Amphenol ICC	
J5	1	Pin socket 1x11	M20-7821146	Harwin	
J3	1	Pin socket 1x13	M20-7821346	Harwin	Optional
J4	1	Pin socket 1x08	M20-7820846	Harwin	Optional
J2	1	Pin socket 1x11	M20-7821146	Harwin	Optional

2 - Chassis

Designation	Qty	Component	Reference	Maker	Comment
R7 R8 R9 R10 R11	5	10k			0603 low precision
C4	1	100nF			0603 low precision
J7	1	Elevated socket 2x13	SSQ-113-23-G-D	Samtec	Other platings: SSQ-113-23-L-D / SSQ-113-23-F-D / SSQ-113-23-T-D
RV3	1	Rotating potentiometer	RK09D1110C0R	Alps Alpine	
SW2	1	Slide Switch	OS102011MA1QN1	C&K	
SW3	1	Rotating switch	NR01104ANG13-2A	NKK switches	
TVS4 TVS5 TVS6	3	ESD Protection	SMF5V0TR	Rohm	Optional ESD protection

3 - Powertrain

Designation	Qty	Component	Reference	Maker	Comment
R1 R2 R3 R4 R5 R6	6	10k			0603 low precision
C2 C3	2	100nF			0603 low precision
J6	1	Elevated socket 2x13	SSQ-113-23-G-D	Samtec	Other platings: SSQ-113-23-L-D / SSQ-113-23-F-D / SSQ-113-23-T-D
RV1 RV2	2	Slide potentiometer	RS15111A900B	Alps Alpine	RS15111A900B: logarithmic RS20111A9A03: linear
SW1	1	Joystick	SKRHADE010	Alps Alpine	
Brake Accel Shift GND 3V3	5	Test probe	20-313143	Vero Technologies	
TVS1 TVS2 TVS3	3	ESD Protection	SMF5V0TR	Rohm	Optional ESD protection

4 - Body

Designation	Qty	Component	Reference	Maker	Comment
C1	1	100nF			0603 low precision
R12 R13 R14	3	10k			0603 low precision
R15	1	1.8k			0603 high precision
D1 D2 D3 D4 D5	5	LED green	SML-310PT	Rohm	
D6 D7	2	LED orange	SML-310DT	Rohm	
D8	1	LED red	SML-310VT	Rohm	
J8	1	Elevated socket 2x13	SSQ-113-23-G-D	Samtec	Other platings: SSQ-113-23-L-D / SSQ-113-23-F-D / SSQ-113-23-T-D
MOSI SCK LE GND KEY OE	6	Test probe	20-313143	Vero Technologies	
SW4	1	Key switch	SK14EG13	NKK	
U1	1	STP08CP05XT	STP08CP05TTR	STMicroelectronics	With or without exposed pad (both OK)
TVS7	1	EST Protection	SMF5V0TR	Rohm	Optional ESD protection

5 - Debugger

Designation	Qty	Component	Reference	Maker	Comment
J10	1	JTAG Connector 20pin	AWHW 20A-0202-T	Assmann	
J9	1	Elevated socket 2x13	SSQ-113-23-G-D	Samtec	Other platings: SSQ-113-23-L-D / SSQ-113-23-F-D / SSQ-113-23-T-D
PB0 PA1 GND (x2) PB1 JTMS nRST JTDI JTDO JTCK JTRST1 PA2 PB2 GND PA3 PA4 PA5 PA6 PA7 PA8 PB10 PB11 PB12 PB13 PB14 PB15 3V3 5V	27	Test probe	20-313143	Vero Technologies	Optional probes

Additional parts

Designation	Qty	Component	Reference	Maker	Comment
external-1	1	TFT Screen	4313	Adafruit	
external-2	1	Rotating Potentiometer Knob	1231-M	Davies Molding, LLC	
external-3	2	KNOB SMOOTH 0.157 X 0.079" NYLON	1300-F	Davies Molding, LLC	Depending on design, 1300-d <u>might</u> be a better choice. 1300-c might also be a good choice but require larger spacing between sliders.
external-4	4	Hex Standoff M3 10mm BRASS (male)	24313	Keystone	
external-5	4	Hex Standoff M3 5mm BRASS (female)	24390	Keystone	