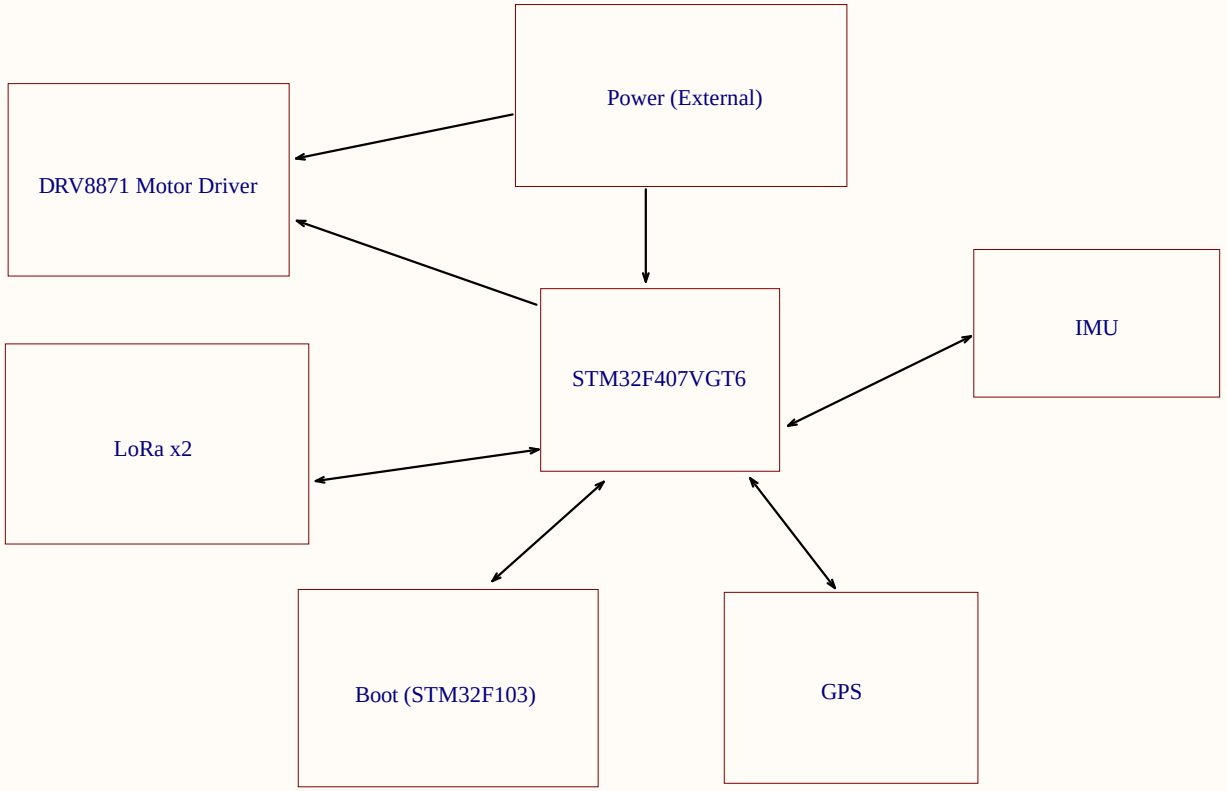
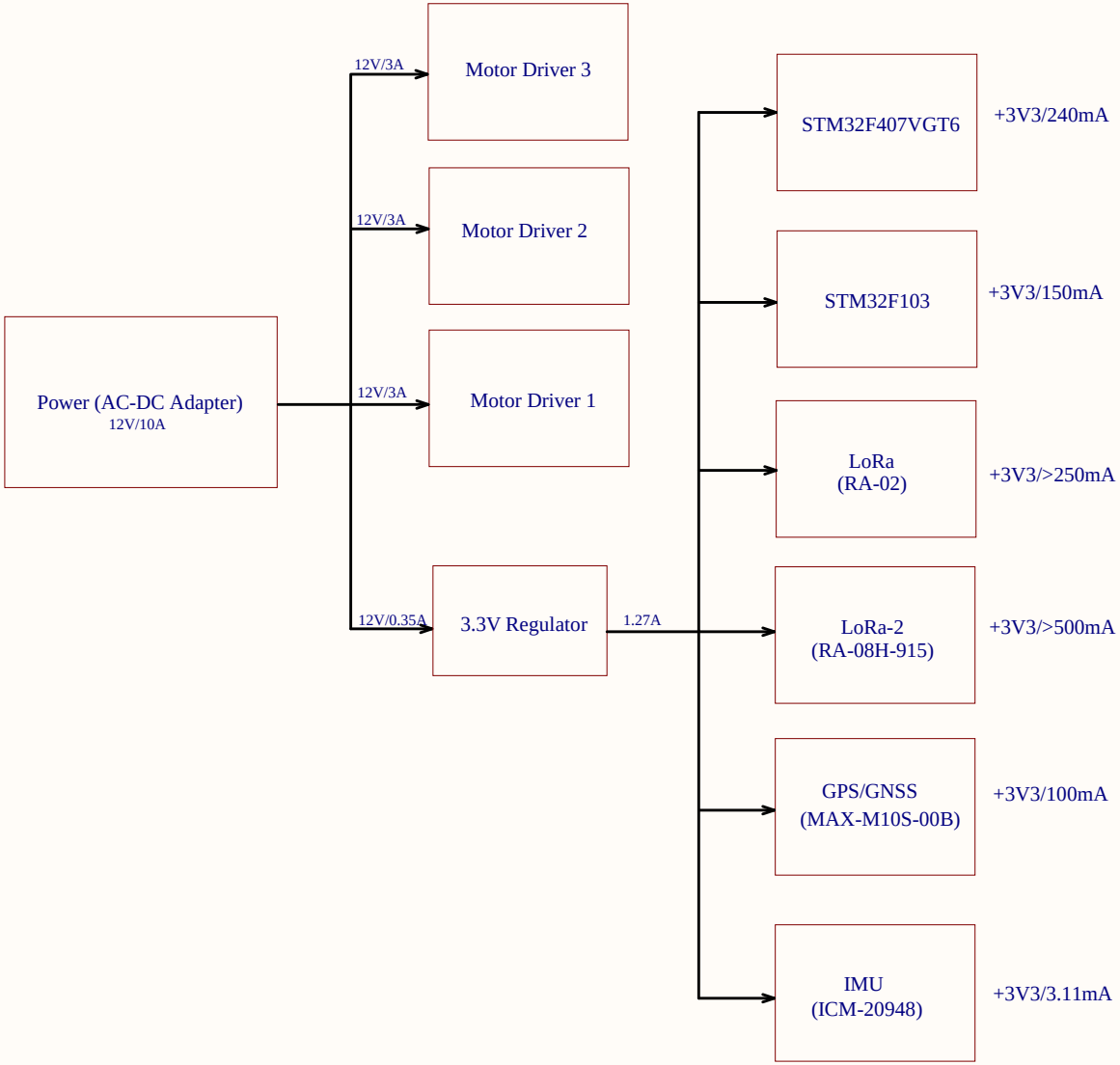
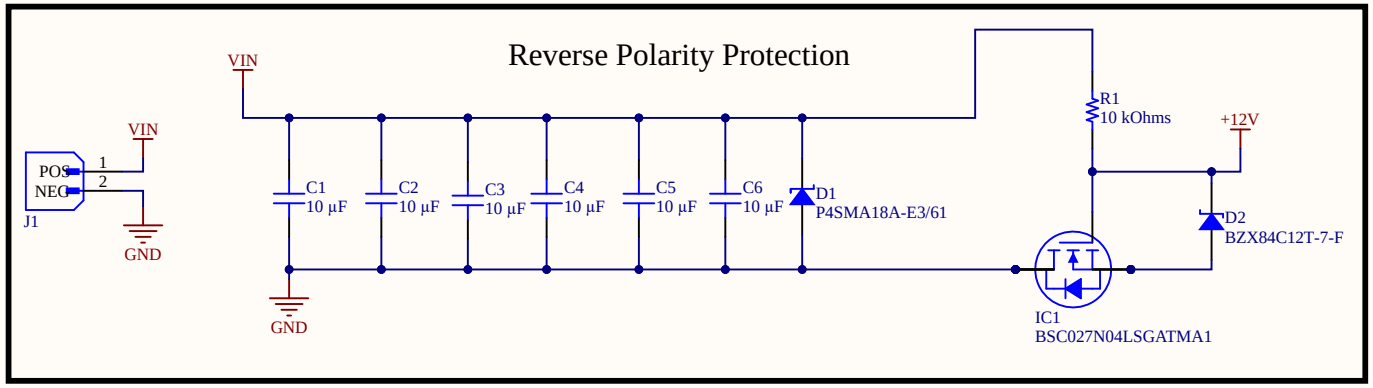


TITLE:	Tracking Radar PCB.PrjPcb
DOCUMENT NAME:	Block Diagram.SchDoc
PROJECT CODE:	02938838
Sheet:	1 of 9
TEMPLATE:	A1
REVISION:	V1.0
AUTHOR:	İlker KESER

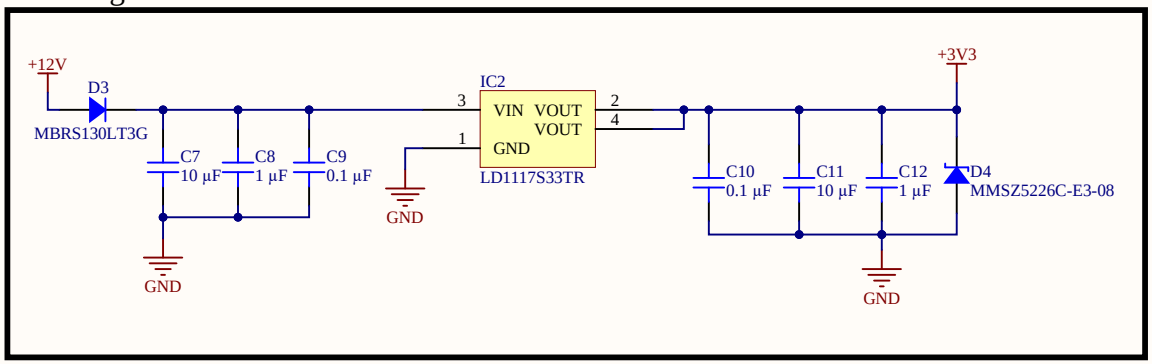


TITLE:	Tracking Radar PCB.PrjPcb		
DOCUMENT NAME:	Power budget.SchDoc		
PROJECT CODE:	02050838	Sheet: 2 of 9	
TEMPLATE:	A2	REVISION:	V1.0
AUTHOR:	İlker KESER		

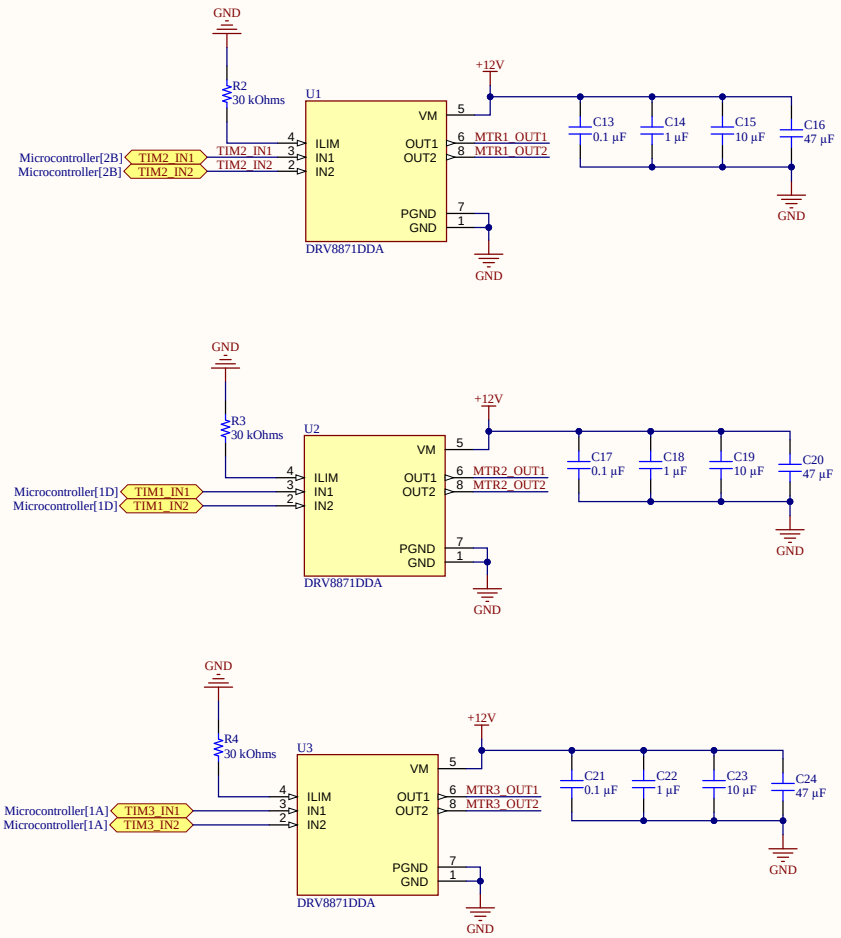
12V/10A Voltage Source

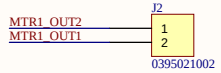


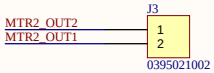
+3V3 Regulator



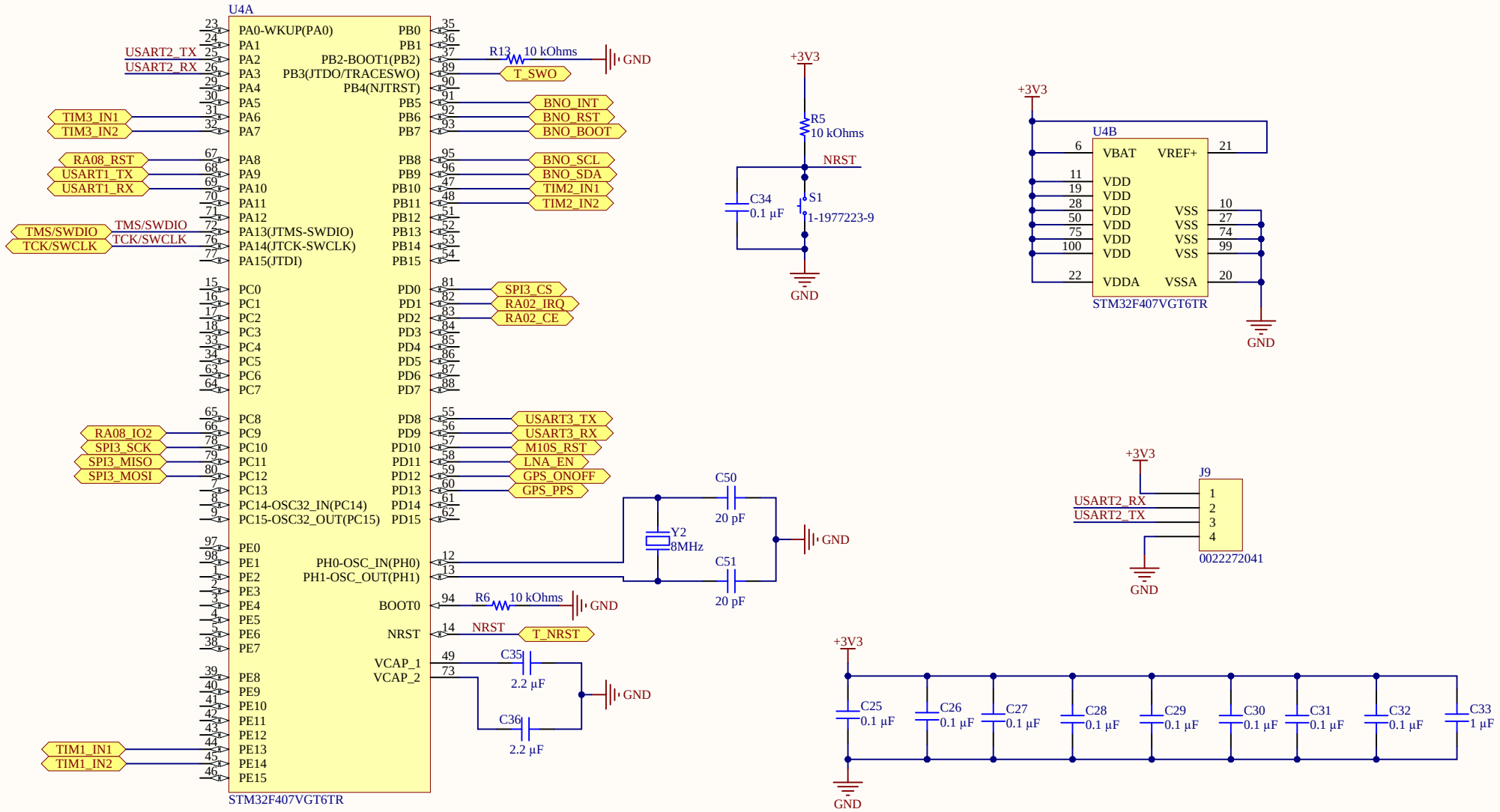
TITLE:	Tracking Radar PCB.PrjPcb		
DOCUMENT NAME:	Power Management.SchDoc		
PROJECT CODE:	02050838	Sheet: 3 of 9	
TEMPLATE:	A4	REVISION:	V1.0
AUTHOR:	İlker KESER		



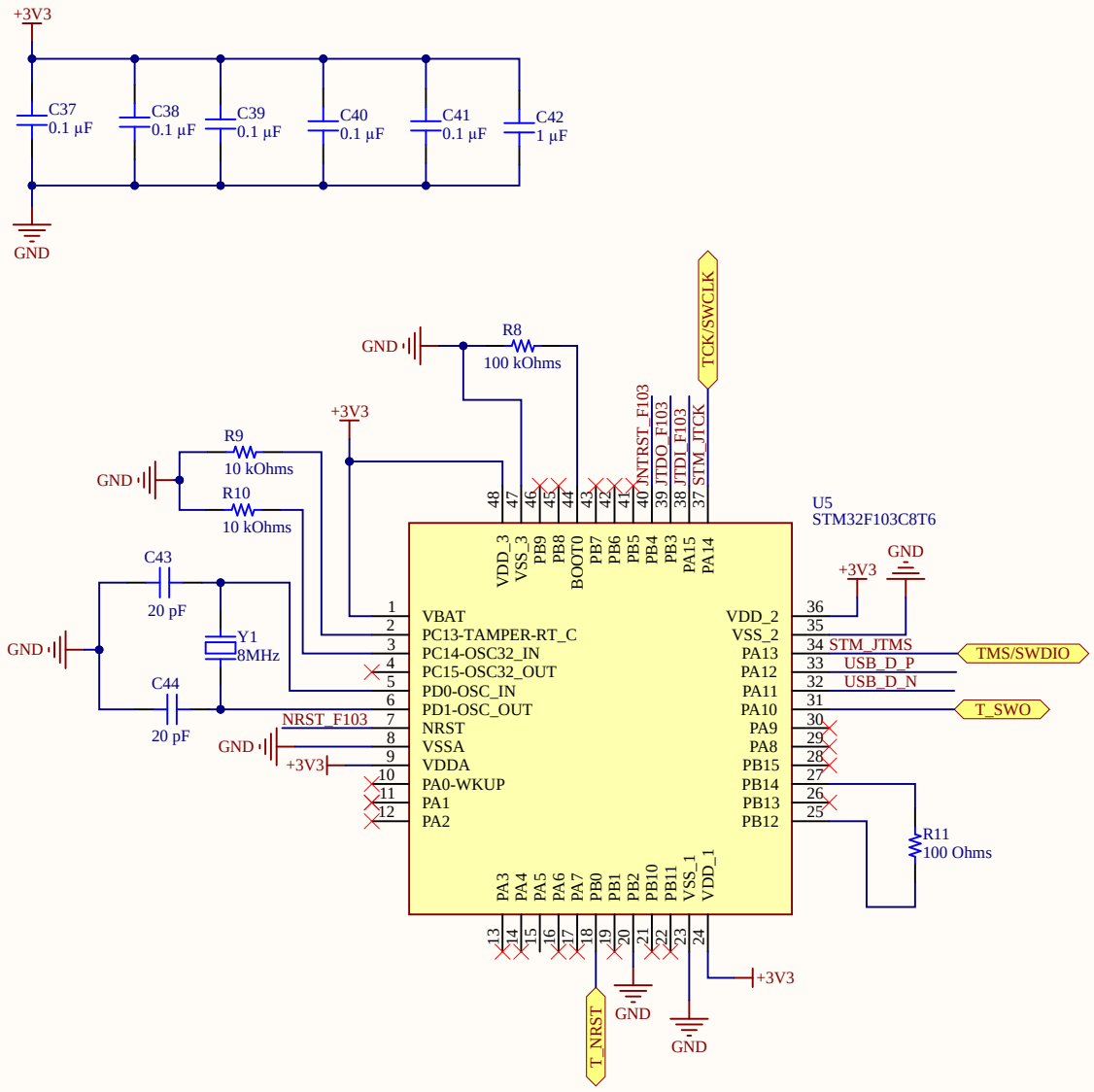




TITLE:	Tracking Radar PCB.PrjPcb		
DOCUMENT NAME:	Motor_Drivers.SchDoc		
PROJECT CODE:	02050838	Sheet: 4 of 9	
TEMPLATE:	A3	REVISION:	V1.0
AUTHOR:	İlker KESER		

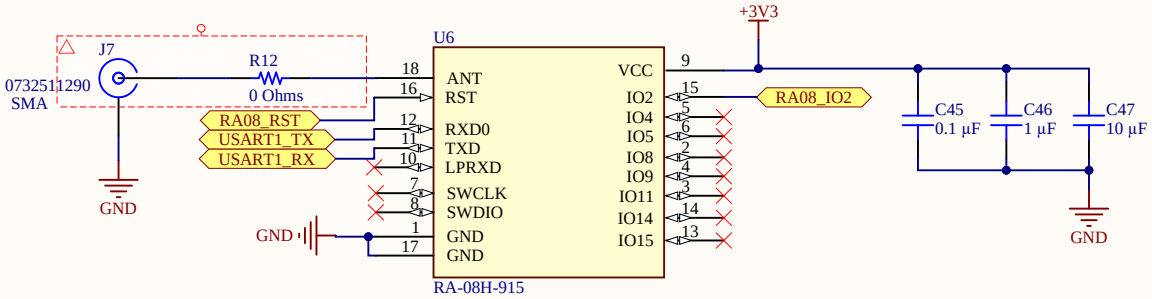


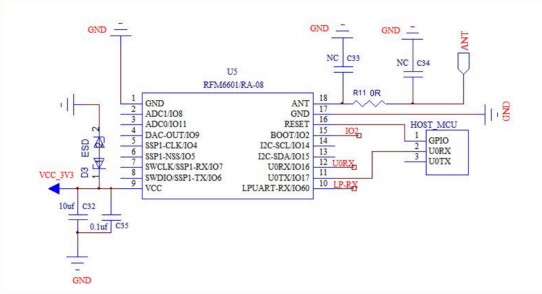
TITLE:	Tracking Radar PCB.PrjPcb
DOCUMENT NAME:	Microcontroller.SchDoc
PROJECT CODE:	02050838
Sheet:	5 of 9
TEMPLATE:	A4
REVISION:	V1.0
AUTHOR:	İlker Keser



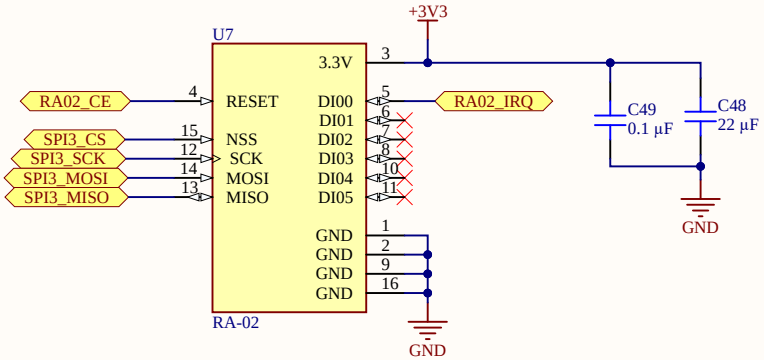
TITLE:	Tracking Radar PCB.PrjPcb
DOCUMENT NAME:	Debugger.SchDoc
PROJECT CODE:	02050838
Sheet:	6 of 9
TEMPLATE:	A4
REVISION:	V1.0
AUTHOR:	İlker KESER

915MHz LoRa

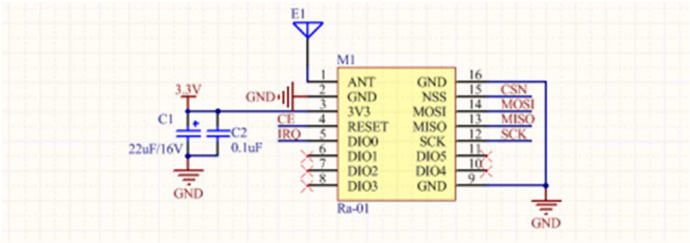




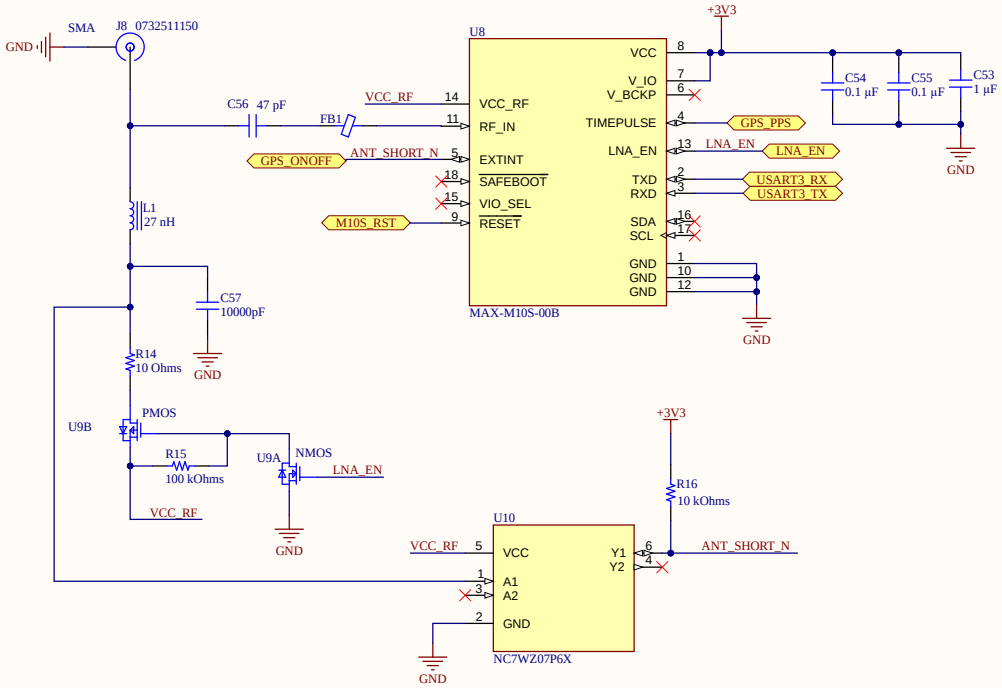
433MHz LoRa



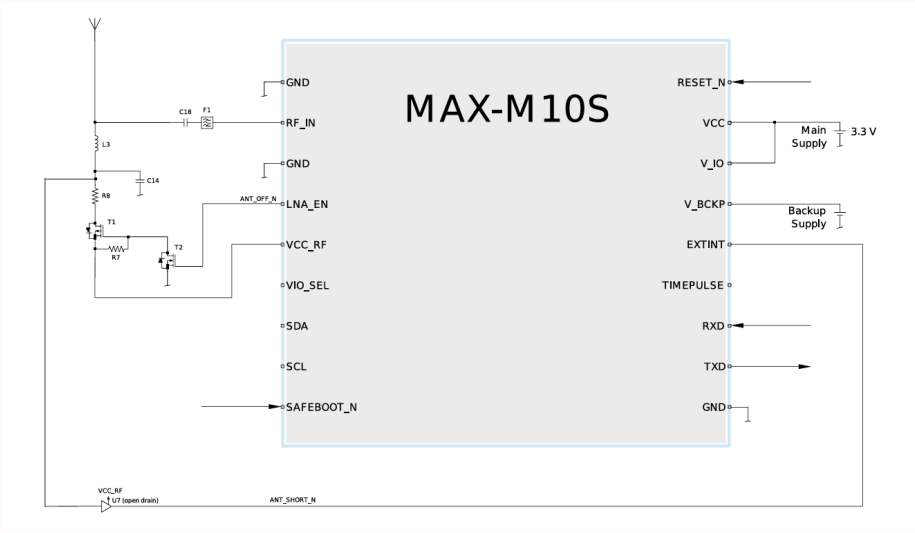
The connection diagram of Ra-01/Ra-02 module and MCU is shown in the figure below:



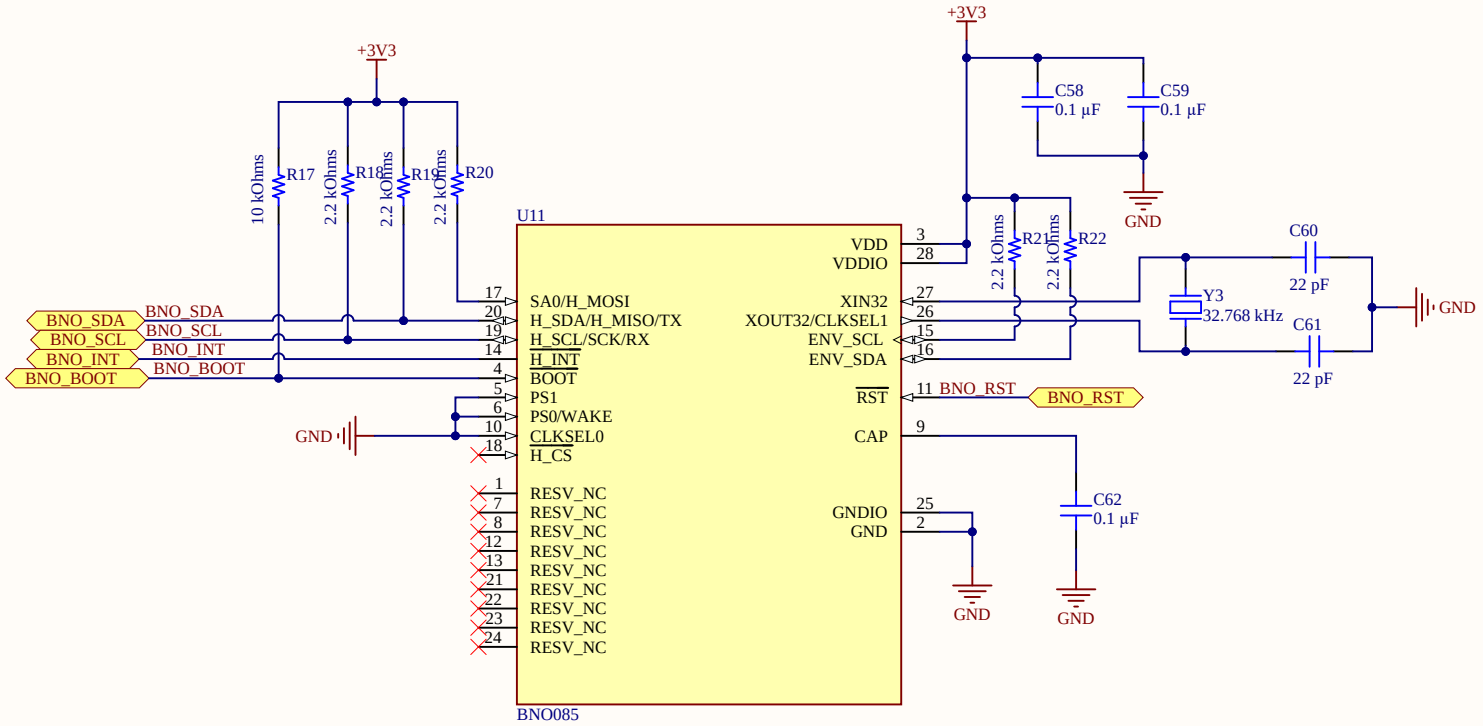
TITLE:	Tracking Radar PCB.PrjPcb		
DOCUMENT NAME:	LoRa_Com.SchDoc		
PROJECT CODE:	02050838	Sheet: 7 of 9	
TEMPLATE:	A4	REVISION:	V1.0
AUTHOR:	İlker KESER		



Reference Design



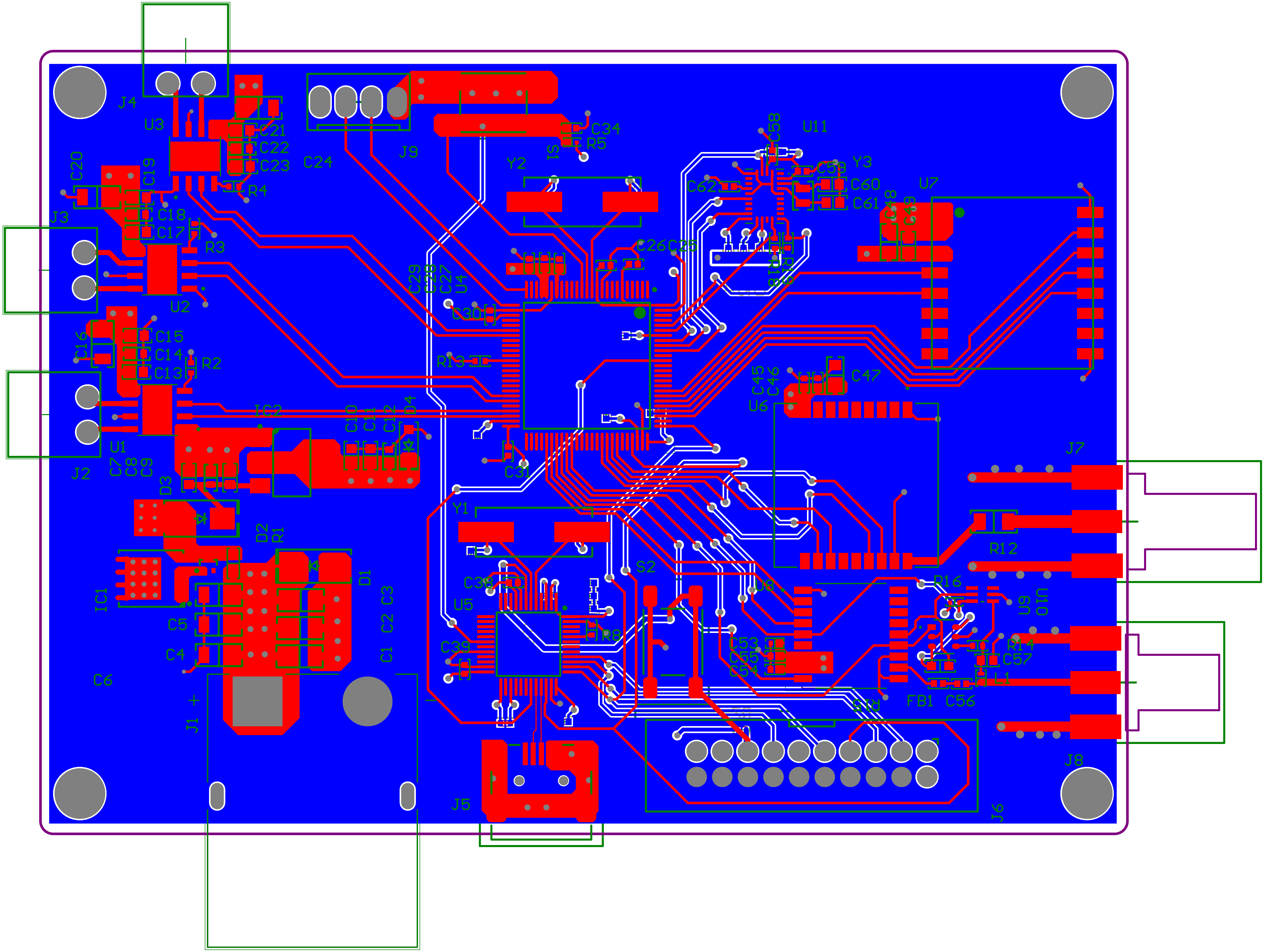
TITLE:	Tracking Radar PCB.PrjPcb		
DOCUMENT NAME:	GPS_GNSS.SchDoc		
PROJECT CODE:	02050838	Sheet: 8 of 9	
TEMPLATE:	A3	REVISION:	V1.0
AUTHOR:	İlker KESER		



I2C Address: 100101(SAO = 1) --> 0x4B

BNO_INT: Active Low
BNO_RST: Active Low Reset
BNO_BOOT: BOOT is sampled at reset. If low the BNO08X will enter bootloader mode

TITLE:	Tracking Radar PCB.PrjPcb		
DOCUMENT NAME:	IMU_Sensor.SchDoc		
PROJECT CODE:	02050838	Sheet: 9 of 9	
TEMPLATE:	A4	REVISION:	V1.0
AUTHOR:	İlker KESER		


J4
U3
C21
C22
C23
C24
J9
C34
R5
S1
U11
C58
Y3
C59
C60
C61
C62
U7
C48
C49
Y2
C20
C19
R4
C18
C17
R3
J3
U2
C26
C25
R18
R19
C29
C28
C27
U4
C30
C15
C16
C14
R2
C13
R13
C45
C46
C47
U6
IC2
C10
C11
C12
D4
U1
J2
C7
C8
C9
D3
C31
Y1
D2
R1
J7
R12
IC1
D1
C38
S2
U8
R16
U9
U10
C5
C4
C3
C2
C1
U5
R8
C39
C53
C55
C54
R14
C57
L1
C6
J1
FB1
C56
J8
J5
J6

Line #	Name	Description	Designator	Quantity	Manufacturer 1	Manufacturer Part Number 1	Manufacturer Lifecycle 1	Supplier 1	Supplier Part Number 1	Supplier Unit Price 1	Supplier Subtotal 1
	BNO085	Accelerometer, Gyroscope, Magnetometer, 9 Axis Sensor I2C, SPI, UART Output	U11	1							
	STM32F407VGT6TR	ARM Cortex-M4 32-bit MCU+FPU, 210 DMIPS, 1024 kB Flash, 192 kB Internal RAM, 82 I/Os, 100-pin LQFP, -40 to 85 degC, Tape and Reel	U4	1	STMicroelectronics	STM32F407VGT6TR	Volume Production	Mouser	511-STM32F407VGT6TR	11,58	11,58
	STM32F103C8T6	ARM®Cortex®-M3 STM32F1 Microcontroller IC 32-Bit 72MHz 64KB (64K x 8) FLASH 48-LQFP (7x7)	U5	1							
	NC7WZ07P6X	Buffer, Non-Inverting 2 Element 1 Bit per Element Open Drain Output SC-88 (SC-70-6)	U10	1							
	0.1 µF	CAP CER 0.1UF 6.3V X5R 0402	C25, C26, C27, C28, C29, C30, C31, C32, C34, C37, C38, C39, C40, C41, C45, C58, C59, C62	18				DigiKey	399-C0402C104M9PAC7867CT-ND		
	0.1 µF	CAP CER 0.1UF 10V X7R 0402	C54, C55	2				DigiKey	732-7513-1-ND		
	0.1 µF	CAP CER 0.1UF 16V X7R 0603	C49	1				DigiKey	732-7965-1-ND		
	0.1 µF	CAP CER 0.1UF 25V X7R 0603	C9, C10, C13, C17, C21	5				DigiKey	399-13148-1-ND		
	1 µF	CAP CER 1UF 6.3V X5R 0402	C33, C42, C46	3				DigiKey	490-10006-1-ND		
	1 µF	CAP CER 1UF 10V X7R 0402	C53	1				DigiKey	490-GRM155Z71A105KE01JCT-ND		
	1 µF	CAP CER 1UF 16V X7R 0603	C8, C12, C14, C18, C22	5				DigiKey	490-12657-1-ND		
	2.2 µF	CAP CER 2.2UF 10V X5R 0402	C35, C36	2				DigiKey	732-7490-1-ND		
	10 µF	CAP CER 10UF 10V X5R 0603	C47	1				DigiKey	490-12734-1-ND		
	10 µF	CAP CER 10UF 16V X5R 0603	C7, C11, C15, C19, C23	5				DigiKey	311-1822-1-ND		
	10 µF	CAP CER 10UF 25V X5R 1206	C1, C2, C3, C4, C5, C6	6				DigiKey	490-GRM319R61E106MA12DCT-ND		
	20 pF	CAP CER 20PF 10V NP0 0402	C43, C44	2				DigiKey	399-14429-1-ND		
	20 pF	CAP CER 20PF 10V X8R 0603	C50, C51	2				DigiKey	399-C0603C200G8HAC7867CT-ND		
	22 pF	CAP CER 22PF 10V NP0 0603	C60, C61	2				DigiKey	399-C0603C220K8GAC7867CT-ND		
	22 µF	CAP CER 22UF 16V X5S 0603	C48	1				DigiKey	490-GRM188C61C226ME01WCT-ND		
	47 pF	CAP CER 47PF 25V C0G/NP0 0402	C56	1				DigiKey	399-C0402C470J3GACAUTOCT-ND		
	47 µF	CAP CER 47UF 25V X5R 1206	C16, C20, C24	3				DigiKey	490-16268-2-ND		
	10000pF	CAP CER 10000PF 16V 0603	C57	1				DigiKey	587-1094-1-ND		
	0022272041	CONN HEADER VERT 4POS 2.54MM	J9	1				DigiKey	WM4113-ND		
	302-S201	CONN HEADER VERT 20POS 2.54MM	J6	1				DigiKey	ED10524-ND		
	10033526-N3212LF	CONN RCPT MINI USB B 5POS SMD RA	J5	1	AMPHENOL ICC (FCI)	10033526-N3212LF	Unknown	DigiKey	609-4700-2-ND		
	0732511290	CONN SMA JACK STR 50OHM EDGE MNT	J7	1				DigiKey	WM9461-ND		
	0732511150	CONN SMA RCPT STR 50OHM EDGE MNT	J8	1				DigiKey	WM5534-ND		
	8MHz	CRYSTAL 8.0000MHZ 20PF SMD	Y1, Y2	2				DigiKey	887-2475-1-ND		
	32.768 kHz	CRYSTAL 32.7680KHZ 12.5PF SMD	Y3	1				DigiKey	535-10104-1-ND		
	MBRS130LT3G	DIODE SCHOTTKY 30V 2A SMB	D3	1				DigiKey	MBRS130LT3GOSCT-ND		
	MMSZ5226C-E3-08	DIODE ZENER 3.3V 500MW SOD123	D4	1				DigiKey	MMSZ5226C-E3-08GICT-ND		
	BZX84C12T-7-F	DIODE ZENER 12V 150MW SOT523	D2	1				DigiKey	BZX84C12T-7-FDICT-ND		
	1 kOhms @100 MHz	FERRITE BEAD 1K OHM 0402 1LN	FB1	1				DigiKey	490-1007-1-ND		
	27 nH	FIXED IND 27NH 350MA 0.46OHM SMD	L1	1				DigiKey	490-LQG15HZ27NJ02DCT-ND		
	RA-02	General ISM < 1GHz LoRa™ Transceiver Module 410MHz ~ 525MHz Antenna Not Included, I-PEX Surface Mount	U7	1							
	LD1117S33TR	IC REG LINEAR 3.3V 800MA SOT223	IC2	1				DigiKey	497-1242-1-ND		
	XT90 Connector	Li-Po battery connector	J1	1							
	MAX-M10S-00B	MAX-M10 RF Receiver BeiDou, Galileo, GLONASS, GPS, GNSS 1.561GHz, 1.575GHz, 1.602GHz -167dBm 921.6kbps Not Included Module	U8	1							
	DMC2700UDM-7	Mosfet Array 20V 1.34A, 1.14A 1.12W Surface Mount SOT-26	U9	1							
	BSC027N04LSGATMA1	MOSFET N-CH 40V 24A/100A TDSON	IC1	1				DigiKey	BSC027N04LSGATMA1CT-ND		
	2.2 kOhms	RES 2.2K OHM 1% 1/16W 0402	R18, R19, R20, R21, R22	5				DigiKey	311-2.20KLRCT-ND		
	10 Ohms	RES 10 OHM 5% 1/16W 0402	R14	1				DigiKey	311-10JRCT-ND		
	10 kOhms	RES 10K OHM 0.1% 1/16W 0402	R6, R13	2				DigiKey	13-RP0402BRD0710KLCT-ND		
	10 kOhms	RES 10K OHM 0.1% 1/16W 0402	R17	1				DigiKey	TNP10.0KDACT-ND		
	10 kOhms	RES 10K OHM 0.5% 1/10W 0402	R5, R7, R9, R10, R16	5				DigiKey	2019-RK73H1ETTP1002DCT-ND		
	30 kOhms	RES 30K OHM 1% 1/16W 0402	R2, R3, R4	3				DigiKey	13-RC0402FR-1330KLCT-ND		
	100 Ohms	RES 100 OHM 0.1% 1/16W 0402	R11	1				DigiKey	13-RP0402BRD07100RLCT-ND		
	100 kOhms	RES 100K OHM 0.1% 1/16W 0402	R8	1				DigiKey	13-RP0402BRD07100KLCT-ND		
	0 Ohms	RES SMD 0 OHM JUMPER 1/4W 1206	R12	1				DigiKey	541-3032-1-ND		
	10 kOhms	RES SMD 10K OHM 1% 1/10W 0603	R1	1				DigiKey	13-AA0603FR-0710KLCT-ND		
	100 kOhms	RES SMD 100K OHM 1% 1/10W 0603	R15	1				DigiKey	13-AA0603FR-07100KLCT-ND		
	RA-08H-915	RF TXRX MODULE 915MHZ LORAWAN	U6	1							
	1-1977223-9	SWITCH TACTILE SPST-NO 0.05A 24V	S1, S2	2				DigiKey	1-1977223-9-ND		
	0395021002	TERM BLOCK HDR 2POS 90DEG 3.5MM	J2, J3, J4	3				DigiKey	WM7770-ND		
	P4SMA18A-E3/61	TVS DIODE 15.3V 25.2V DO214AC	D1	1				DigiKey	P4SMA18A-E3/61GICT-ND		
	DRV8871DDA	Unipolar Motor Driver NMOS PWM 8-SO PowerPad	U1, U2, U3	3							