12VDC-5VDC REGULATOR

C1 — Not Fitted
R2 1k
U2 — VIN / POWER / Feedback / Output / ON/OFF / GND
12V
5V
L1 330uH
R5 330R
D3 SS54
C5 220uF
C6 100nF
C4 220uF
GND

5VDC-3.3VDC REGULATOR

5V
U1 ESP32 REG — VIN / GND / VOUT
3V3
R3 1k
C3 22uF
C2 22uF
D4 LED
GND

TERMINALS & HEADERS

12V — J1 — POWER
GND

J2 — PROGRAMMING HEADER
GND 1
5V 2
UART_TXD0 3
UART_RXD0 4
IO0 5
GND 6

J3 — RELAY1 TERMINAL
NO1 1
COM1 2
NC1 3

J4 — RELAY2 TERMINAL
NO2 1
COM2 2
NC2 3

J5 — RELAY3 TERMINAL
NO3 1
COM3 2
NC3 3

J6 — RELAY4 TERMINAL
NO4 1
COM4 2
NC4 3

J7 — RS485
B 1
A 2
3

J8 — HAVA SICAKLIK
5V 1
2
SCL 3
SDA 4
GND

J9 — SENSOR & PINS 1
5V 1
2
IO27_TN 3
IO25_TS 4
IO13 5
IO2 6
GND

J11 — PINS 2 HEADER
5V 1
2
IO4 3
IO5 4
IO15 5
IO23 6
GND

J10 — BLANK HEADER
S_VP 1
S_VN 2
SD0 3
SD1 4
CMD 5
CLK 6

MICROCONTROLLER

3V3
C7 100nF
U3 — ESP32-WROOM-32D
3V3 2
EN 3
SENSOR_VP 4 — S_VP
SENSOR_VN 5 — S_VN
RXD0 34 — UART_RXD0
TXD0 35 — UART_TXD0
SD0 21
SD1 22
SD2 17 — RS_TX
SD3 18 — RS_RX
CMD 19
CLK 20
NC 32
GND 15
GND 38
GND 39

IO0 25
IO2 24
IO4 26
IO5 29
IO12 14 — RE
IO13 16
IO14 13 — DE
IO15 23
IO16 27 — LoRa_TX
IO17 28 — LoRa_RX
IO18 30 — LoRa_AUX
IO19 31 — LoRa_M1
IO21 33 — SDA
IO22 36 — SCL
IO23 37
IO25 10 — IO25_TS
IO26 11 — LoRa_M0
IO27 12 — IO27_TN
IO32 8 — RELAY1
IO33 6 — RELAY2
IO34 9 — RELAY3
IO35 7 — RELAY4
GND

LoRa COMMUNICATION

5V
R10 4.7k
R12 4.7k
U4 — LoRa E22-900T22D
VCC 6
GND 7
M0 1 — LoRa_M0
M1 2 — LoRa_M1
RXD 3 — LoRa_RX
TXD 4 — LoRa_TX
AUX 5 — LoRa_AUX
D11
R22 1k
GND

ESP32 RESET & BOOT SWITCH

3V3
R11 10k
SW2
C11 100nF
EN
GND

SW1
IO0
C10 100nF
GND

RS485 PROTOCOL

5V
C8 10uF
C9 100nF
R15 10k
R16 10k
R17 10k
R18 10k
R14 20k
U5 — RS485
RO 1 — RS_RX
RE 2
DE 3
DI 4 — RS_TX
VCC 8
B 6
A 7
GND 5
R19 120R
R20 20k
B
A
GND

RELAYS

RELAY 1
5V
R1 1k
D2
SS14 D1
RL1
NC1 / NO1 / NC / NO / COM / COM1
RELAY1
R4 1k
Q1
GND

RELAY 2
5V
R6 1k
D6
SS14 D5
RL2
NC2 / NO2 / NC / NO / COM / COM2
RELAY2
R7 1k
Q2
GND

RELAY 3
5V
R8 1k
D8
SS14 D7
RL3
NC3 / NO3 / NC / NO / COM / COM3
RELAY3
R9 1k
Q3
GND

RELAY 4
5V
R13 1k
D10
SS14 D9
RL4
NC4 / NO4 / NC / NO / COM / COM4
RELAY4
R21 1k
Q4
GND

Açıklama: Cloud & LoRa Based IoT Hub v1.0
Sayfa Boyutu: A3
Tasarım: SELCUK ELECTRONICS
Mühendis: Selcuk Cinar
Tarih: 8.06.2023
Dosya Adı: Sch_Form.SchDoc
Sayfa No: 1

J9
J7

U3

U4

LORA

S & M !
ELECTRONICS
by S.K.

J3 J4
J5 J6

J3

J4

J5

J6

IO2
IO13
IO27
GND

S_VP
S_VN
SDO
SDS
CMD
CLK

R10 R12

M0
M1
RXD
TXD
RX
GND

RL1

GND
R14 R20
R18
R17
R16
R15
R19

RS-485

SDA
SCL
GND
5V

FID
U2

GND   3V3

SYNAPSE IoT
IoT HUB v1.0

GND
VDC

L1

C4

NC
COM
NO

Electrical Info.

Name	Min.	Max.	Unit
Power	12V	24V	VDC
	–	10A	A
Relay	28V	30V	VDC
	125V	250V	VAC

RELAY
STATUS

RL12
RL20
RL0
RL1

Bill of Materials

Bill of Materials for Project [IoT_Board_LoRa v1.1.PrjPcb] (No PCB Document S

Source Data From:	**IoT_Board_LoRa v1.1.PrjPcb**
Project:	**IoT_Board_LoRa v1.1.PrjPcb**
Variant:	**None**

Creation Date:	8.06.2023	22:54
Print Date:	08-Jun-23	10:54:49 PM

Footprint	Comment	LibRef	Designator	Description	Quantity
0805 FITTED CAP	Not Fitted	FITTED 0805 CAP	C1	Filter Cap(No Value) for Power Module POWER	1
0805 22uF CAP	22uF	22uF 0805 CAP	C2, C3	22uF 0805 CAP AMS1117	2
220/35V/VT ECAP-0810	220uF	220/35V/VT ECAP-0810	C4	Power Module 0810 Electrolyte Cap POWER	1
100/50V/VT ECAP-0810	220uF	100/50V/VT ECAP-0810	C5	Power Module 0810 Electrolyte Cap POWER	1
0805 100nF CAP	100nF	100nF 0805 CAP	C6, C7, C9, C10, C11	100nF CAP POWER	5
1206 10uF CAP	10uF	10uF 1206 CAP	C8	10uF Cap - RS485	1
SS14-DO-214AC	SS14	SS14-DO-214AC	D1, D5, D7, D9	1A 40V Schottky Diode	4
1206 LED	LED	1206 LED	D2, D4, D6, D8, D10, D11		6
SS34	SS54	SS34 Schottky Diode	D3	SS34 SCHOTTKY DIODE MODULE POWER	1
Terminal 2	POWER	TERMINAL 2	J1	2-PIN KLEMENS	1
1x6 HEADER	PROGRAMMING HEADER	1x6 Header	J2	1X6 HEADER	1
TERMINAL 3	RELAY1 TERMINAL	TERMINAL 3	J3	3-PIN KLEMENS	1
TERMINAL 3	RELAY2 TERMINAL	TERMINAL 3	J4	3-PIN KLEMENS	1
TERMINAL 3	RELAY3 TERMINAL	TERMINAL 3	J5	3-PIN KLEMENS	1
TERMINAL 3	RELAY4 TERMINAL	TERMINAL 3	J6	3-PIN KLEMENS	1
TERMINAL 3	RS485	TERMINAL 3	J7	3-PIN KLEMENS	1
TERMINAL 4	HAVA SICAKLIK	TERMINAL 4	J8	4-PIN KLEMENS	1
TERMINAL 6	SENSOR & PINS 1	TERMINAL 6	J9	6-PIN 90 DEGREE	1
1x6 HEADER	BLANK HEADER	1x6 Header	J10	1X6 HEADER	1
1x6 HEADER	PINS 2 HEADER	1x6 Header	J11	1X6 HEADER	1
330uH/470 - INDUCTOR	POWER IND	330uH/470 INDUCTOR	L1	Power Module 0810 Inductor 12.3mmx12.3mm POWER	1
BC847 NPN	RELAY TRANSISTOR	BC487 TRANSISTOR	Q1, Q2, Q3, Q4	BC847 Transistör Npn Smd Sot-23100mA, 45V NPN	4
0805 1K RES	1k	1K 0805 RES	R1, R2, R3, R4, R6, R7, R8, R9, R13, R21, R22	1K 0805 SMD RES POWER	11
0805 330R RES	330R	330R 0805 RES	R5	330R 0805 SMD RES POWER	1
0805 4.7k RES	4.7k	4.7k 0805 RES	R10, R12	4.7k RES for LoRa Pull-Up	2
0805 10k RES	10k	10k 0805 RES	R11, R15, R16, R17, R18	10k Resistor-RS485, 10k Resistor - RS485	5
0805 20k RES	20k	20k 0805 RES	R14, R20	20k Resistor - RS485	2
0805 120R RES	120R	120R 0805 RES	R19	120R Resistor - RS485	1
SONGLE SRD-03VDC-SL-C	3V3 RELAY	SRD-03VDC-SL-C	RL1, RL2, RL3, RL4	3.3V Relay	4
BUTTON	SWITCH	BUTTON	SW1, SW2	Switch For ESP32	2
AMS1117	ESP32 REG	AMS1117-3.3V REG	U1	5V to 3V3 Reg. for ESP32	1
LM2596S	POWER	LM2596S	U2	5V REGULATOR	1
ESP32-WROOM-32D	ESP32-WROOM-32D	ESP32-WROOM-32D	U3	SMD MODULE, ESP32-D0WDQ6, 32MBIT (FootPrint ölçüleri doğru 3D 'ye takılma)	1
E22-900T22D	LoRa E22-900T22D	E22-900T22D	U4	Ebyte LoRa 22dBm 5-7km Communication Module	1
MAX485	RS485	MAX485	U5	RS485 Chip	1
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Approved	Notes	