

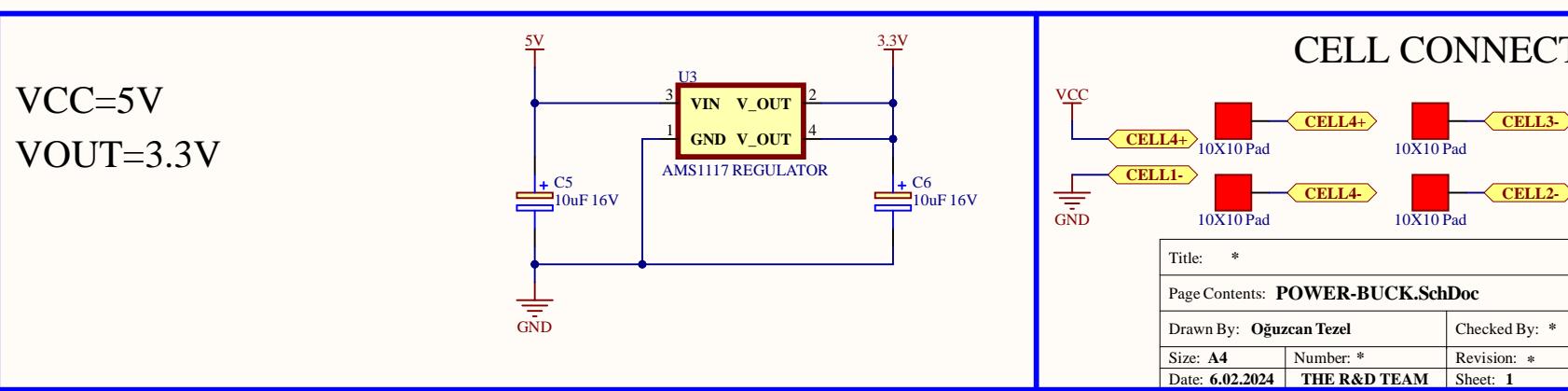
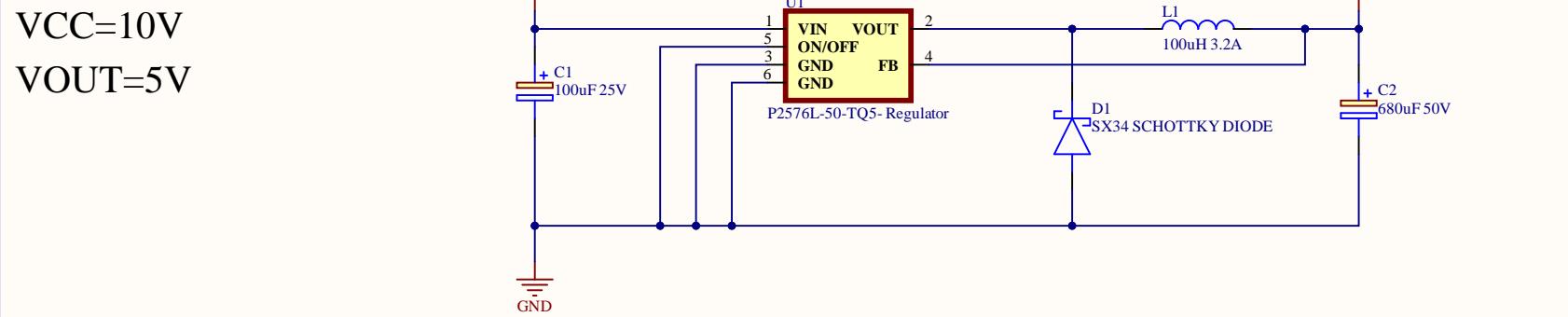
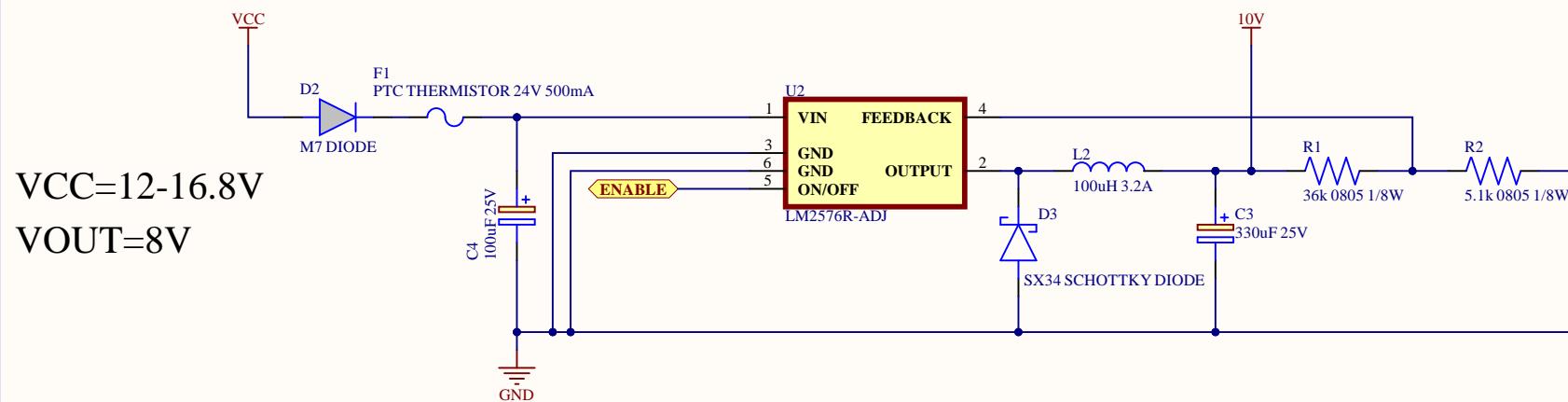
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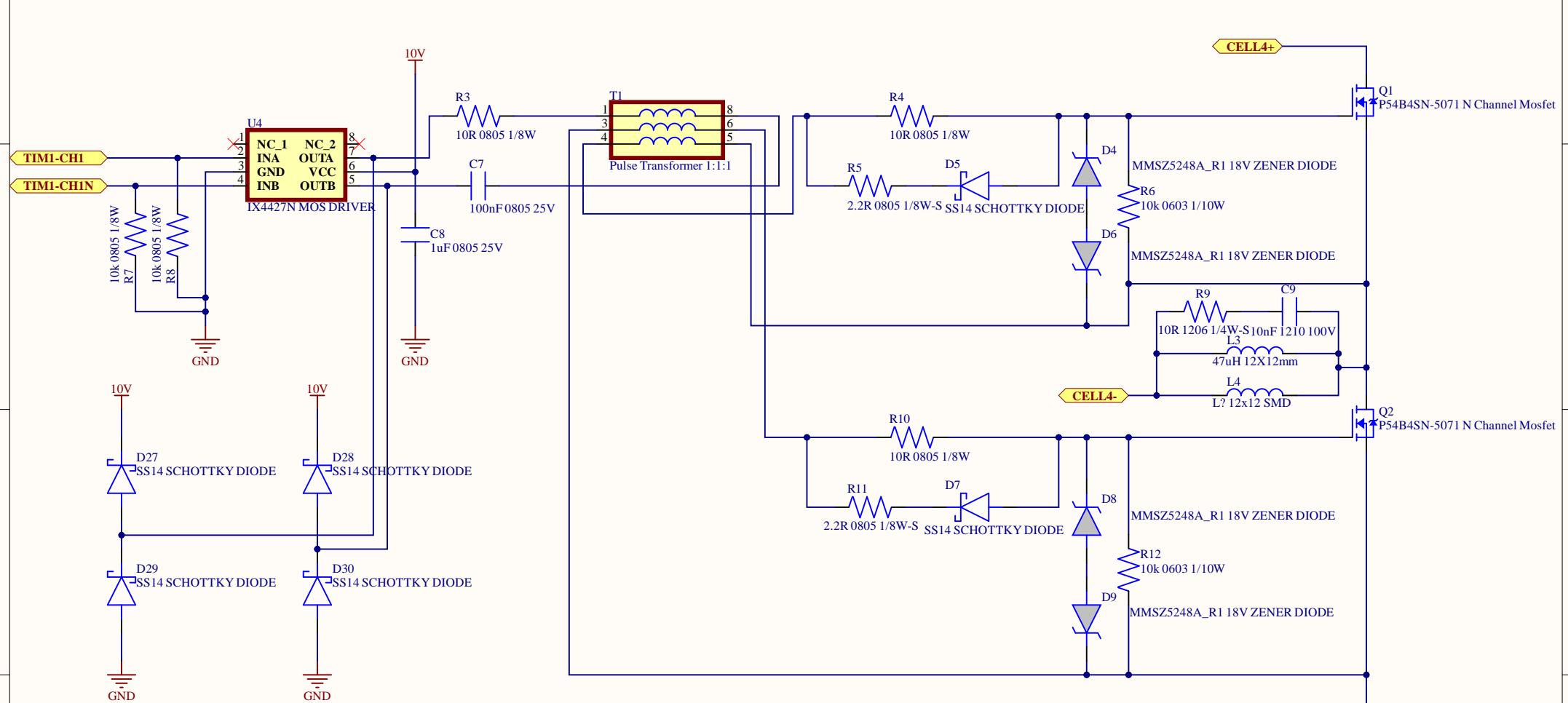
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## BUCK CONVERTER



|                                  |                                |
|----------------------------------|--------------------------------|
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| Page Contents: POWER-BUCK.SchDoc |                                |
| Drawn By: Öğuzcan Tezel          | Checked By: *                  |
| Size: A4                         | Number: *                      |
| Date: 6.02.2024                  | Revision: *                    |
| THE R&D TEAM                     | Company Name: Assan Elektronik |
| Sheet: 1                         |                                |

## THIRD INDUCTOR CHARGE-DISCHARGE CIRCUIT



Title: \*

Page Contents: CELL4-CELL3.SchDoc

Drawn By: Öğuzcan Tezel

Checked By: \*

Size: A4

Number: \*

Revision: \*

Company Name:

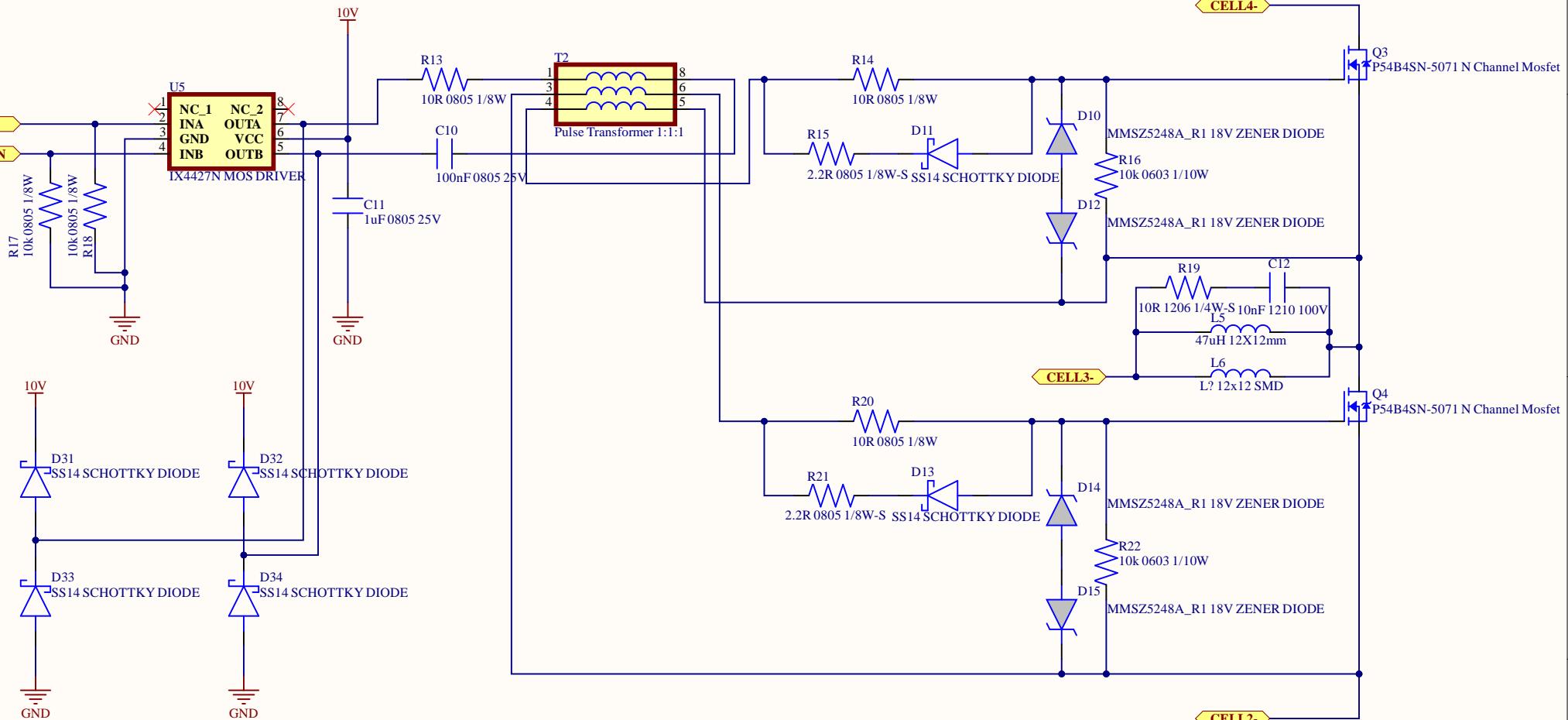
Date: 29.02.2024

THE R&amp;D TEAM

Sheet: 2



## SECOND INDUCTOR CHARGE-DISCHARGE CIRCUIT



Title: \*

Page Contents: CELL3-CELL2.SchDoc

Drawn By: Öğuzcan Tezel

Checked By: \*

Size: A4

Number: \*

Revision: \*

Company Name: Assan Elektronik

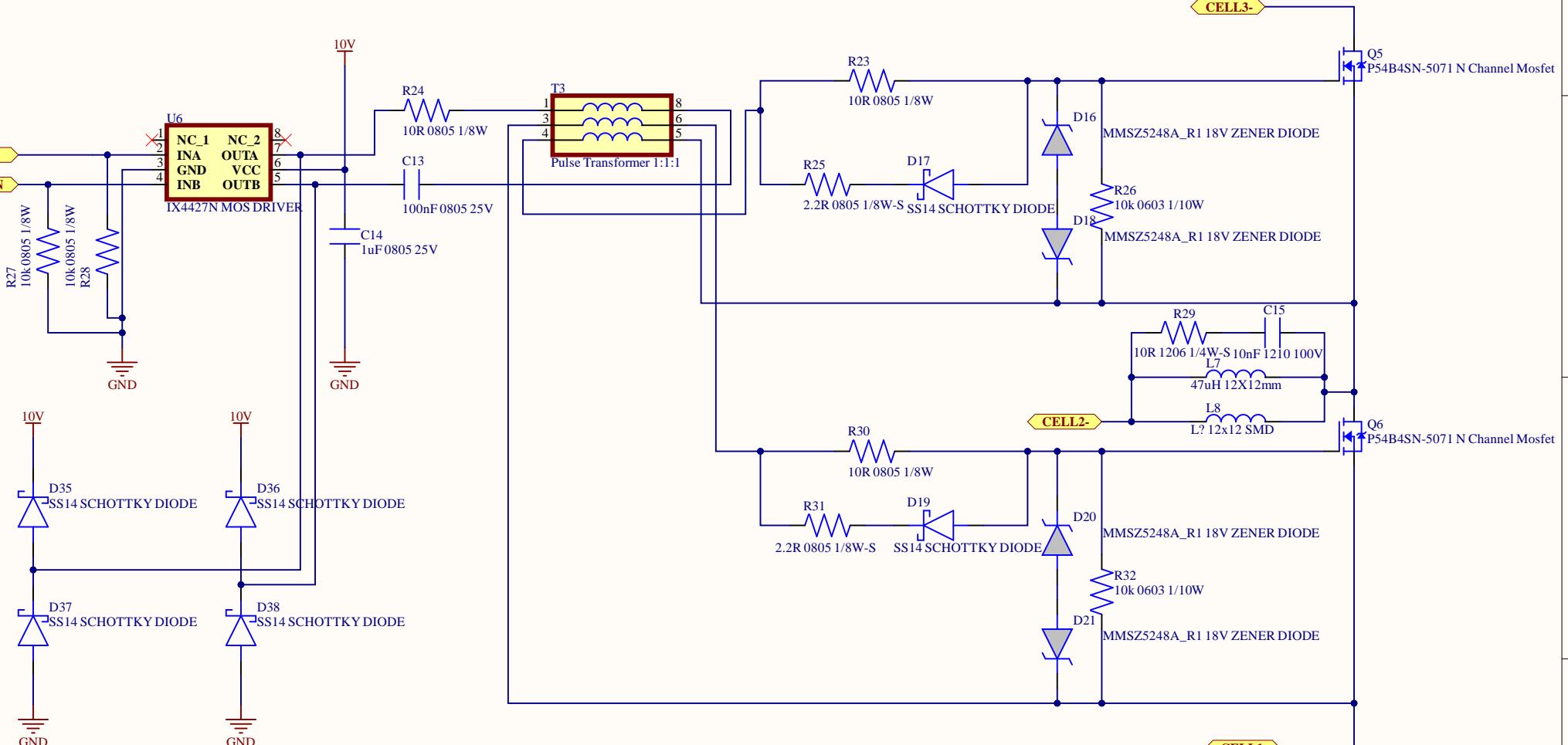
Date: 29.02.2024

THE R&amp;D TEAM

Sheet: 3



# FIRST INDUCTOR CHARGE-DISCHARGE CIRCUIT



Title: \*

Page Contents: CELL2-CELL1.SchDoc

Drawn By: Öğuzcan Tezel

Checked By: \*

Size: A4

Number: \*

Revision: \*

Company Name: Assan Elektronik

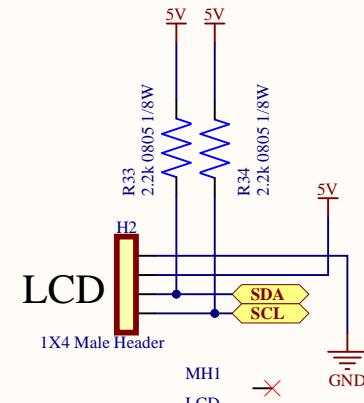
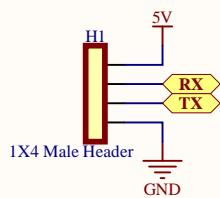
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THE R&amp;D TEAM

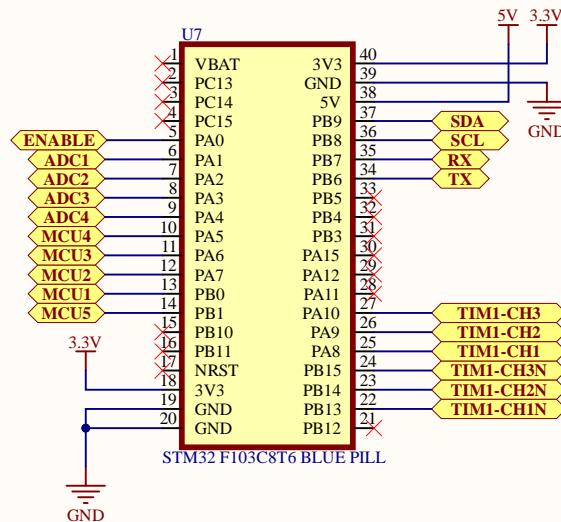
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## UART CONNECTION



MCU



Title: \*

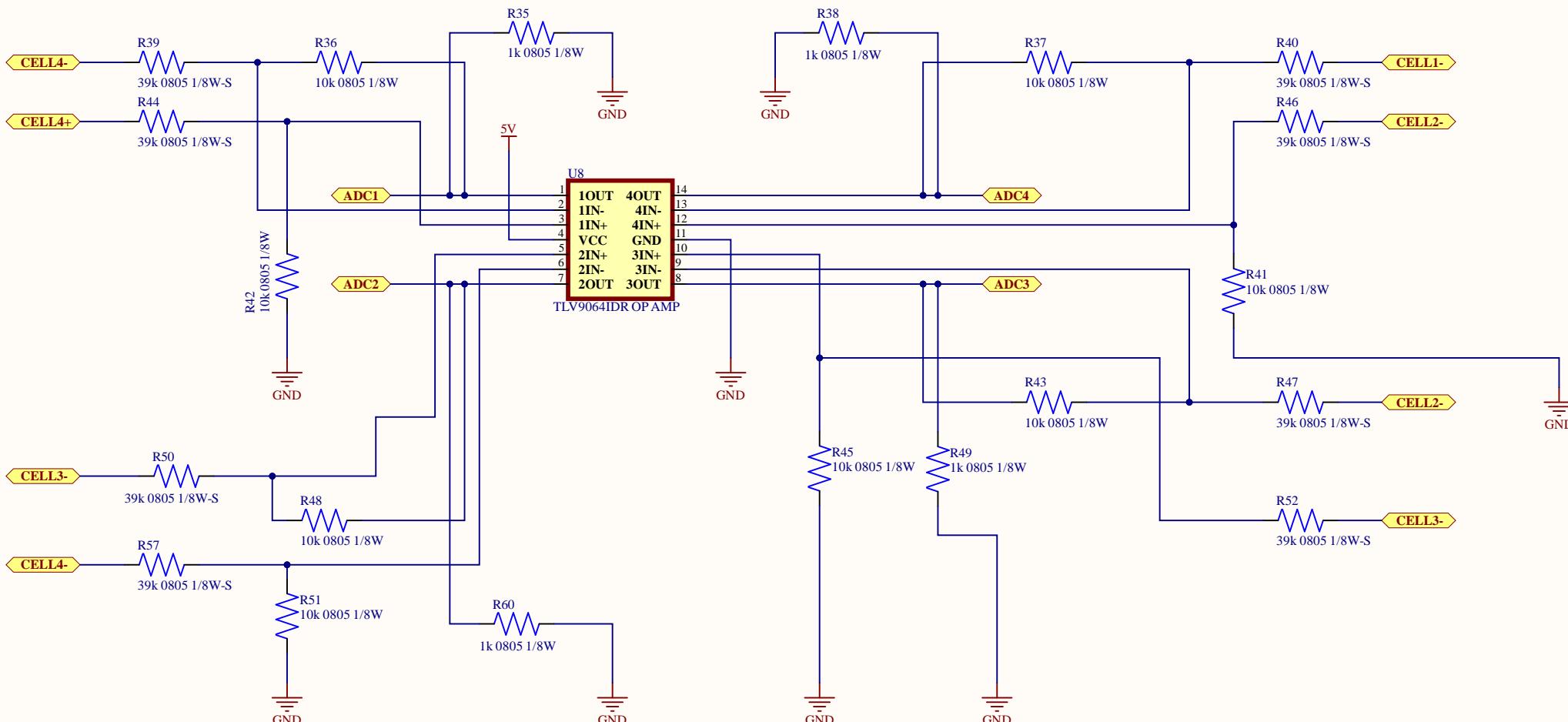
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Drawn By: Oğuzcan Tezel

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| Date: <b>5.02.2024</b> | <b>THE R&amp;D TEAM</b> | Sheet: <b>5</b> |  |



# ADC CELL READ



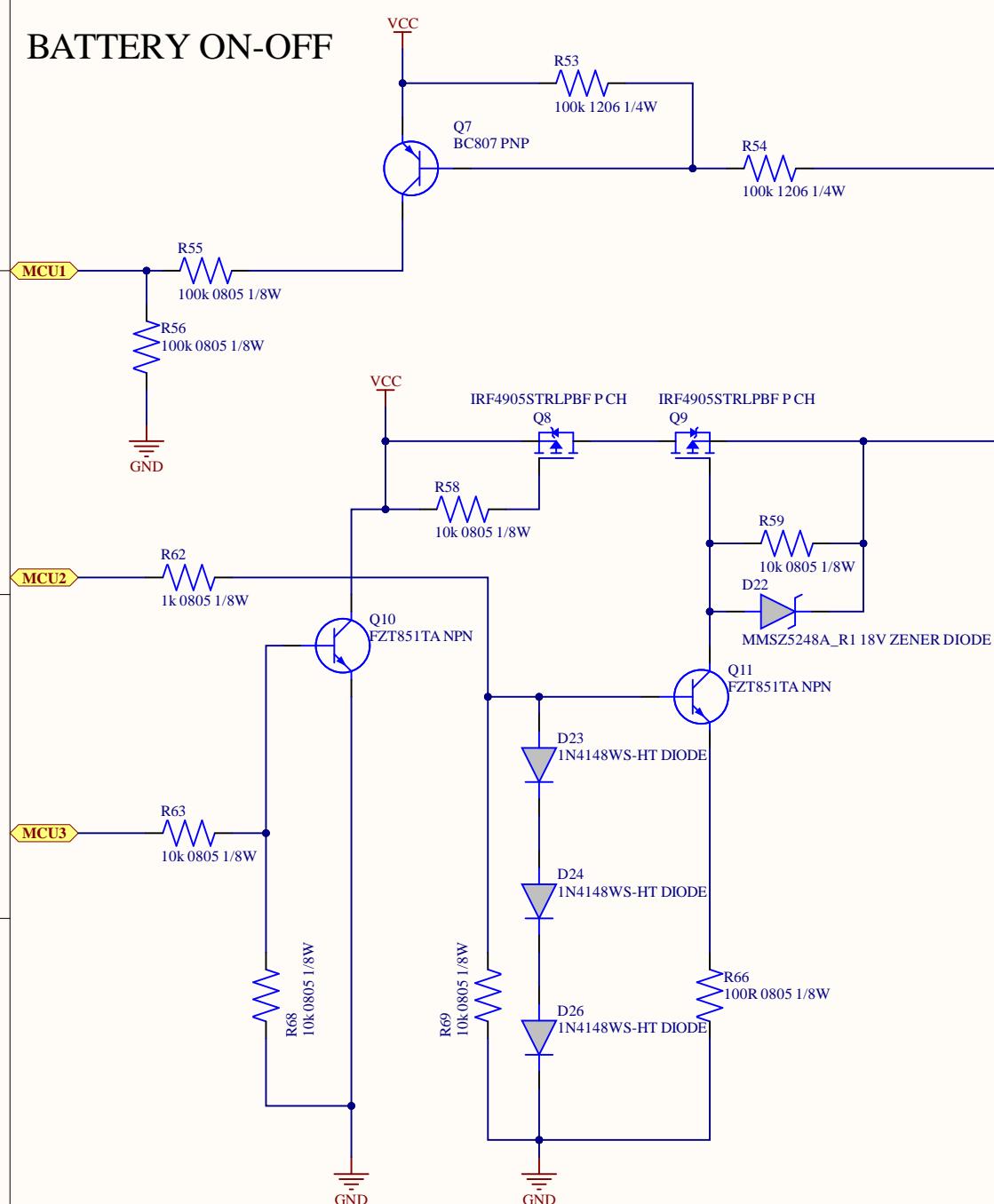
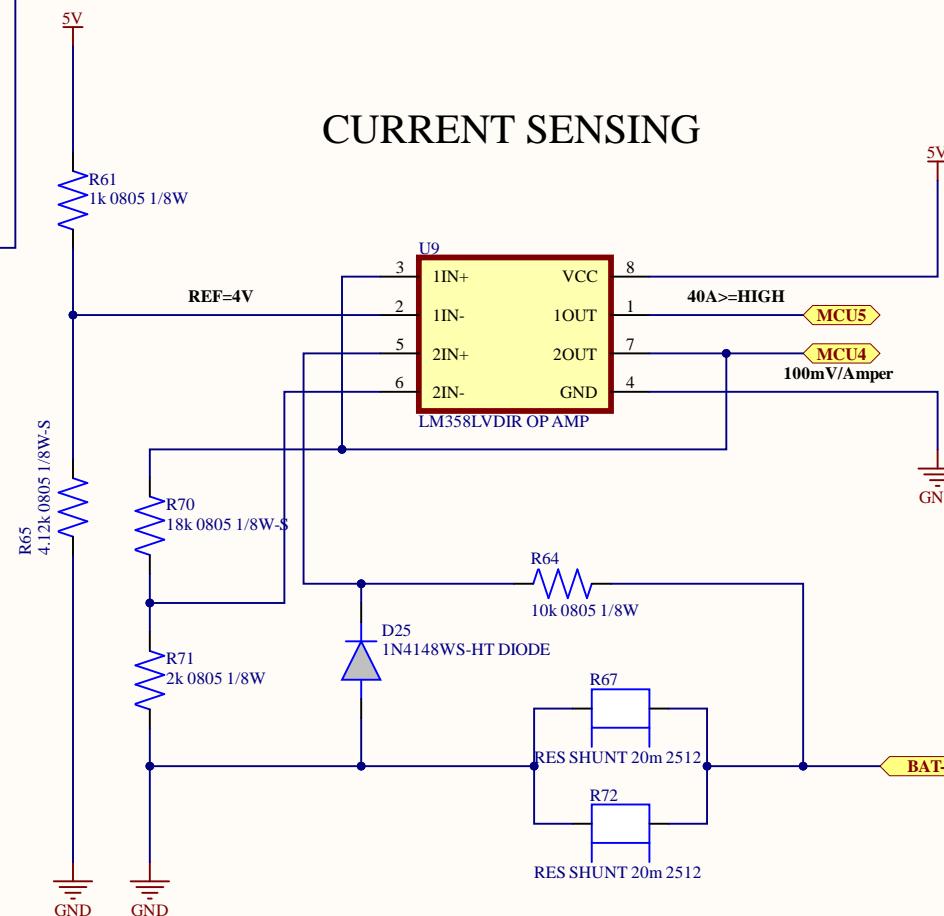
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| Size: A4                               | Number: *    | Revision: *   | Company Name:    |
| Date: 8.02.2024                        | THE R&D TEAM | Sheet: 6      | Assan Elektronik |



1 2 3 4

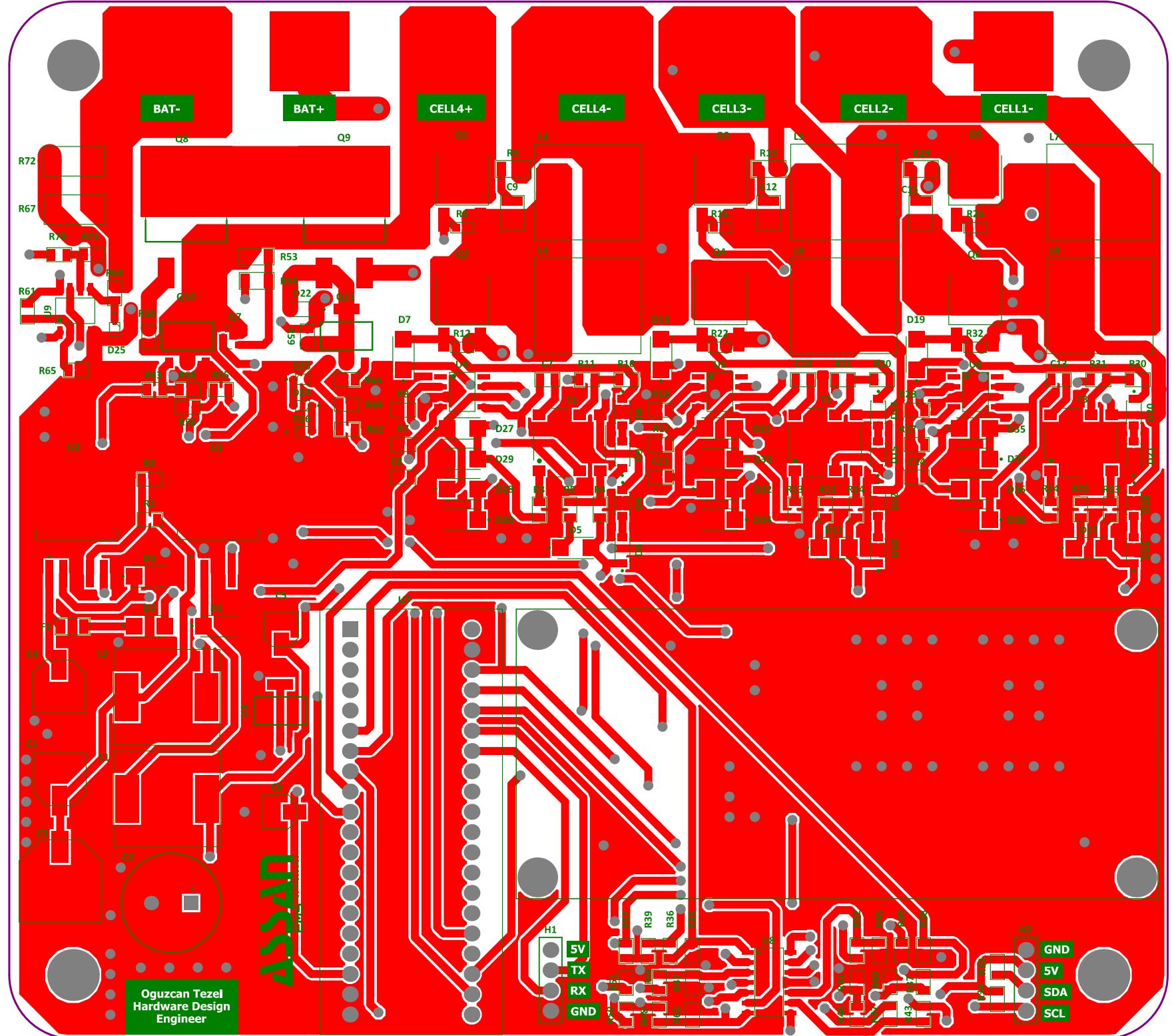
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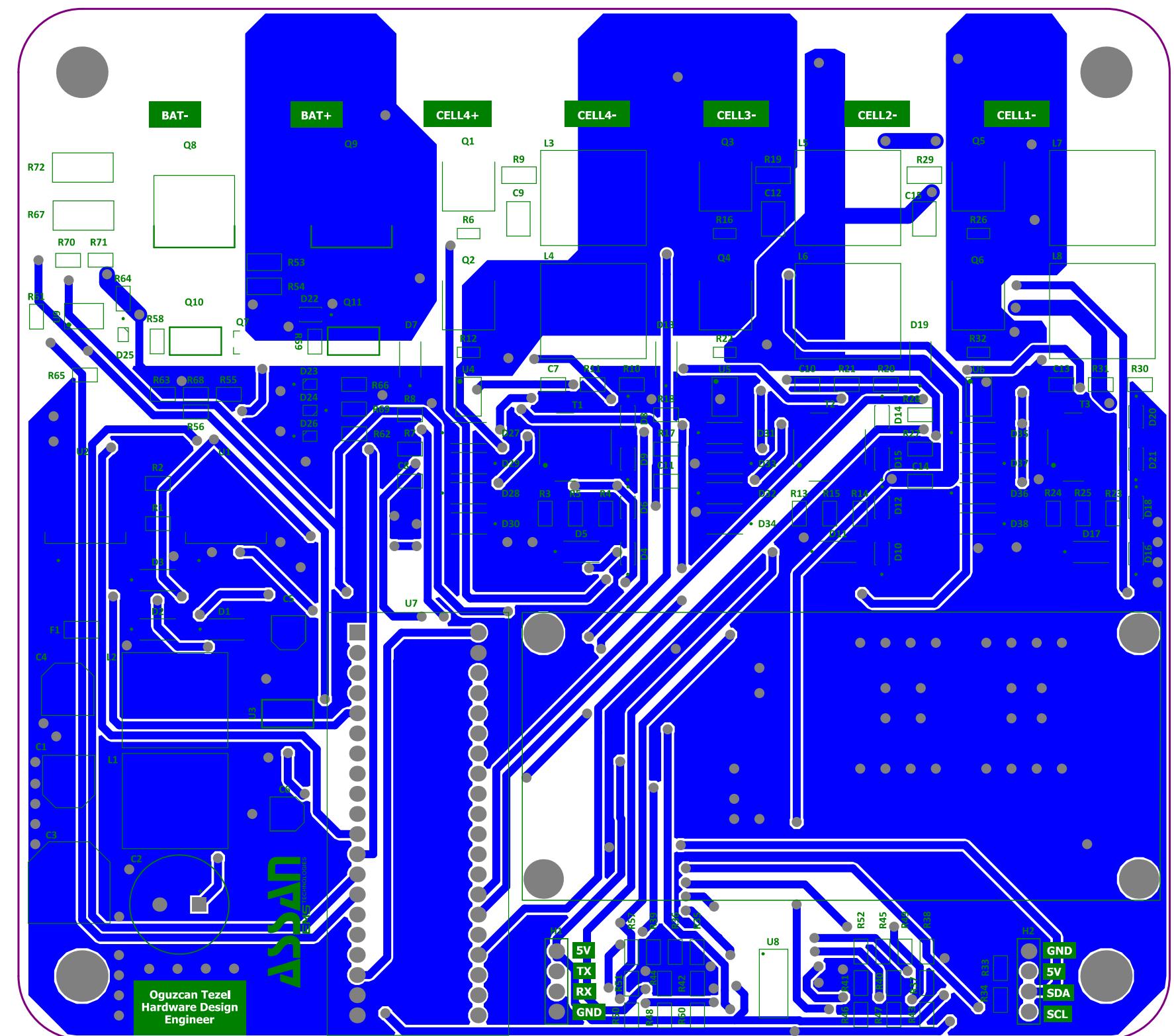
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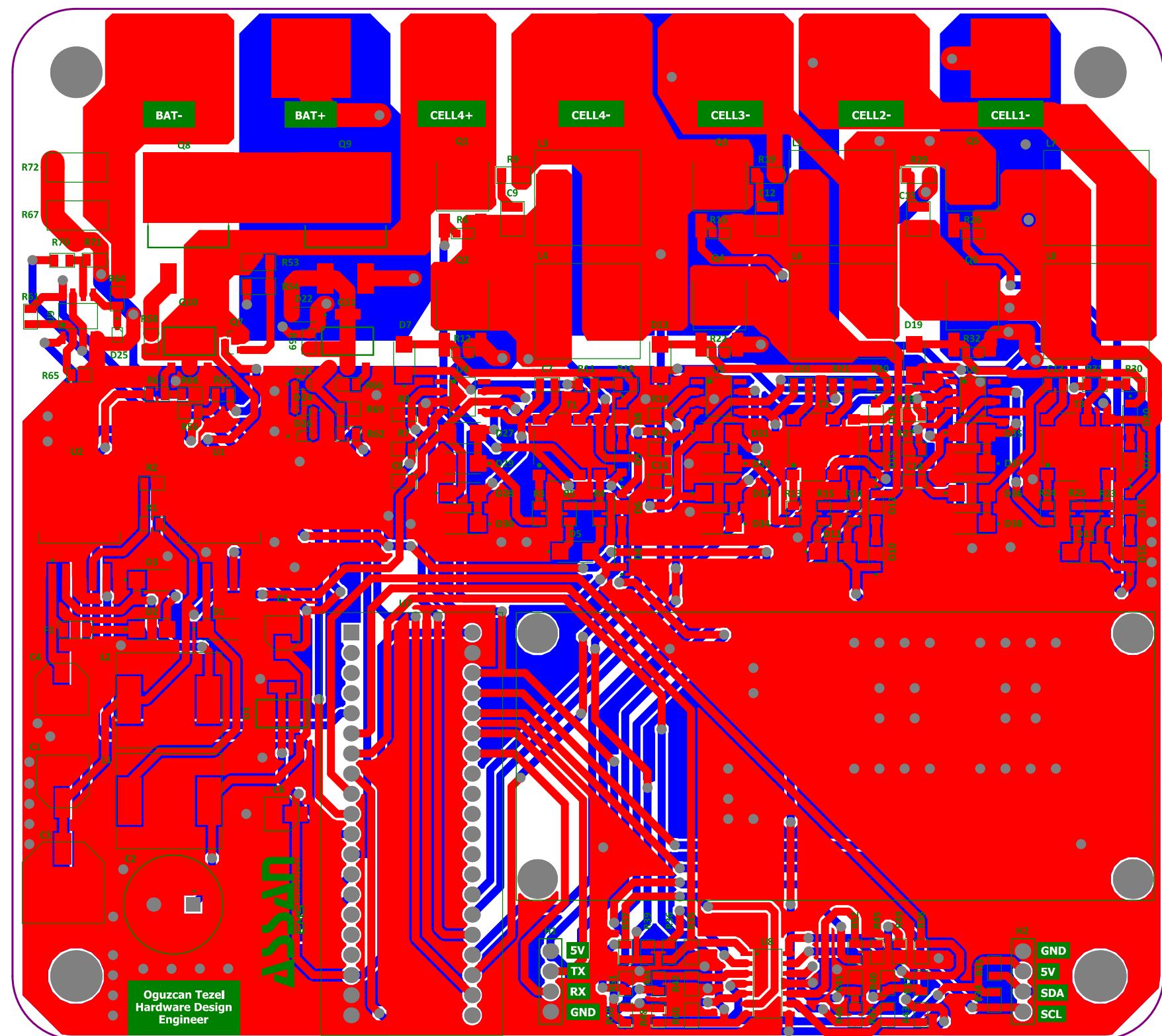
**CURRENT SENSING**

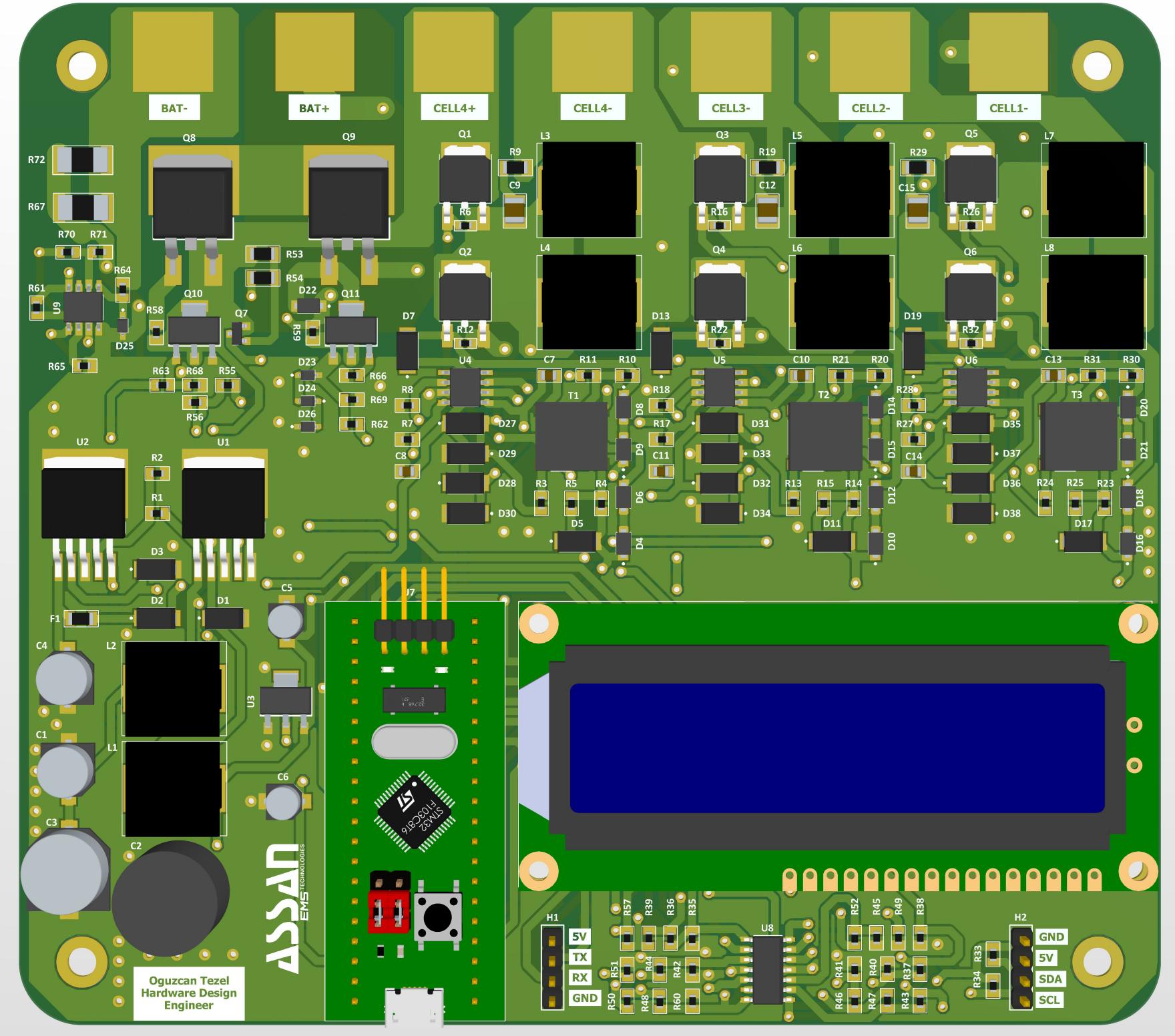
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| Drawn By: <b>Öğuzcan Tezel</b>                                  |                         | Checked By: *   |                                       |
| Size: <b>A4</b>   | Number: *               | Revision: *     | Company Name: <b>Assan Elektronik</b> |
| Date: <b>5.02.2024</b>  | <b>THE R&amp;D TEAM</b> | Sheet: <b>7</b> | <b>ASSAN</b><br>EMS TECHNOLOGIES      |

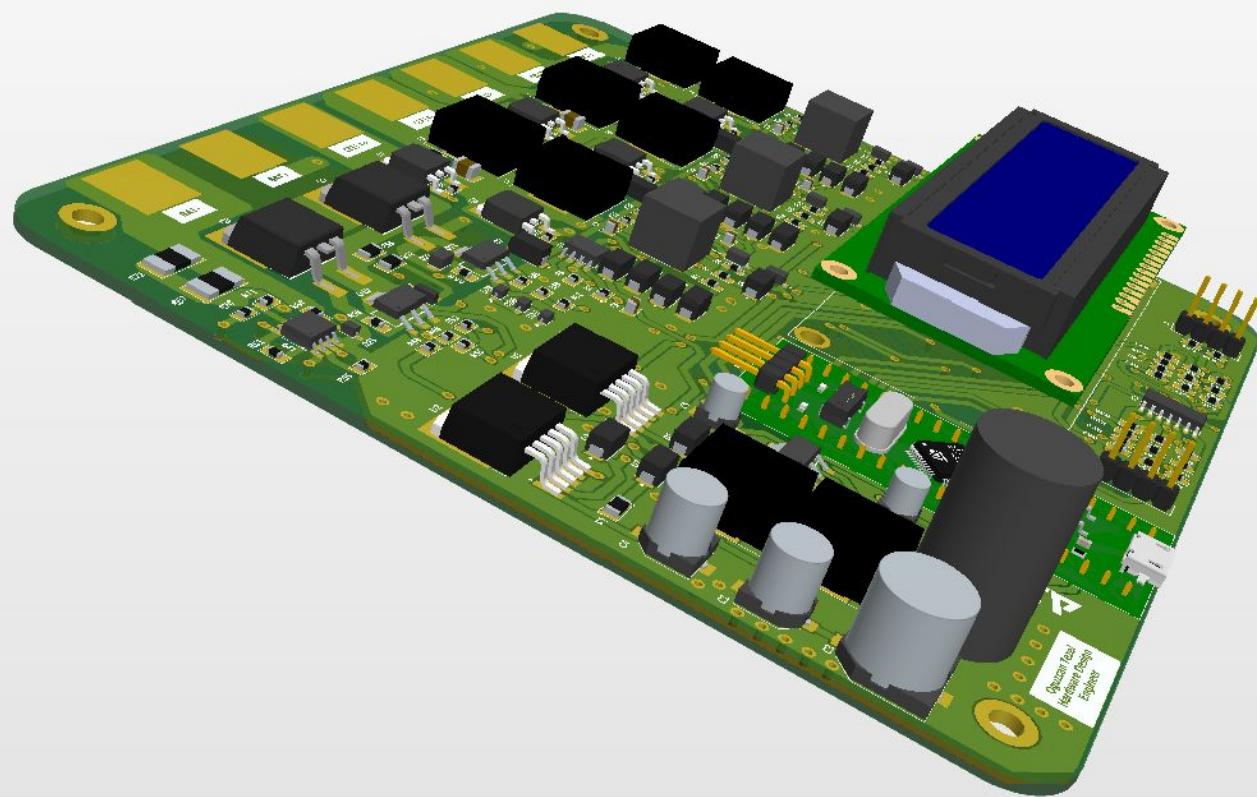
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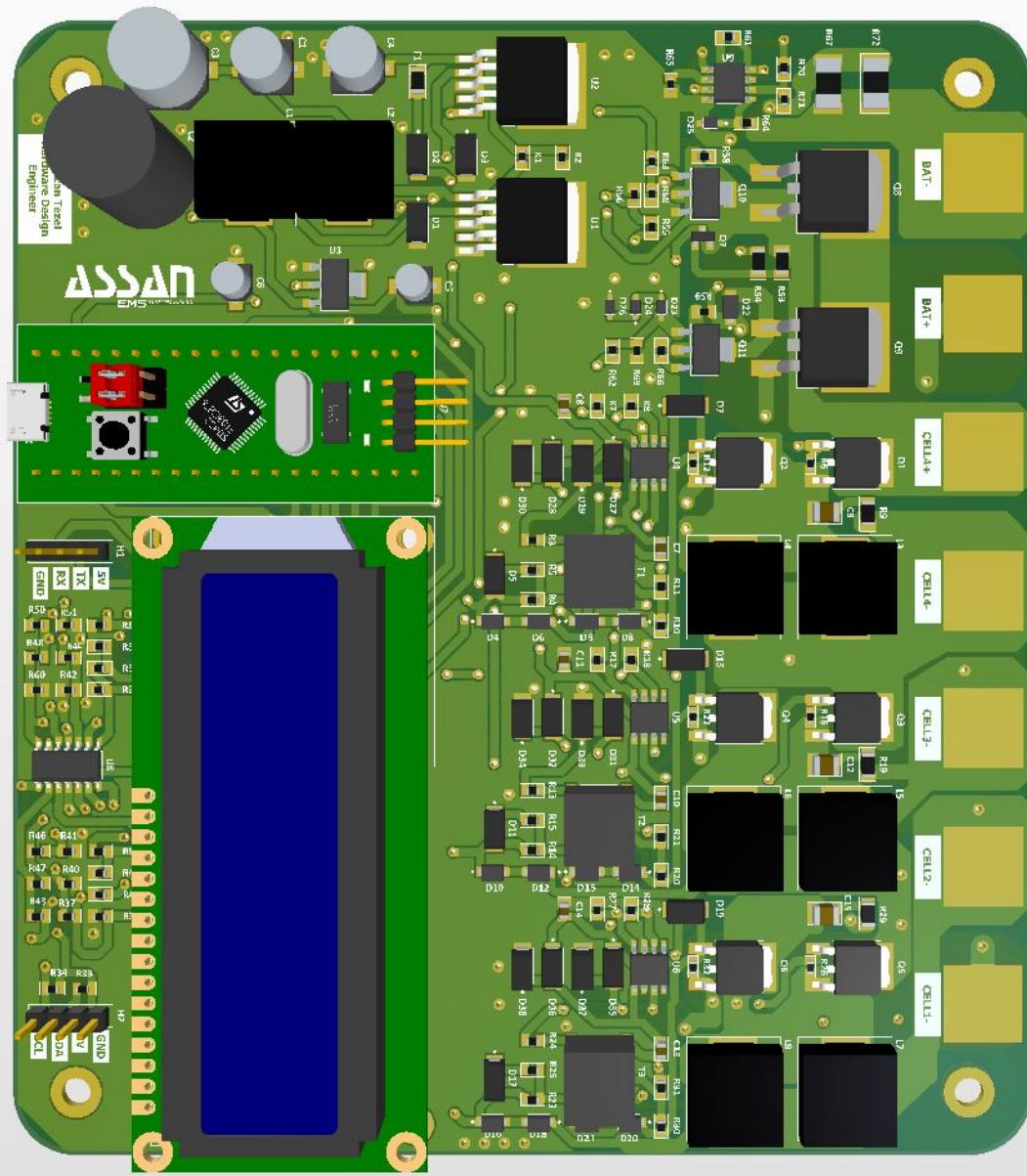


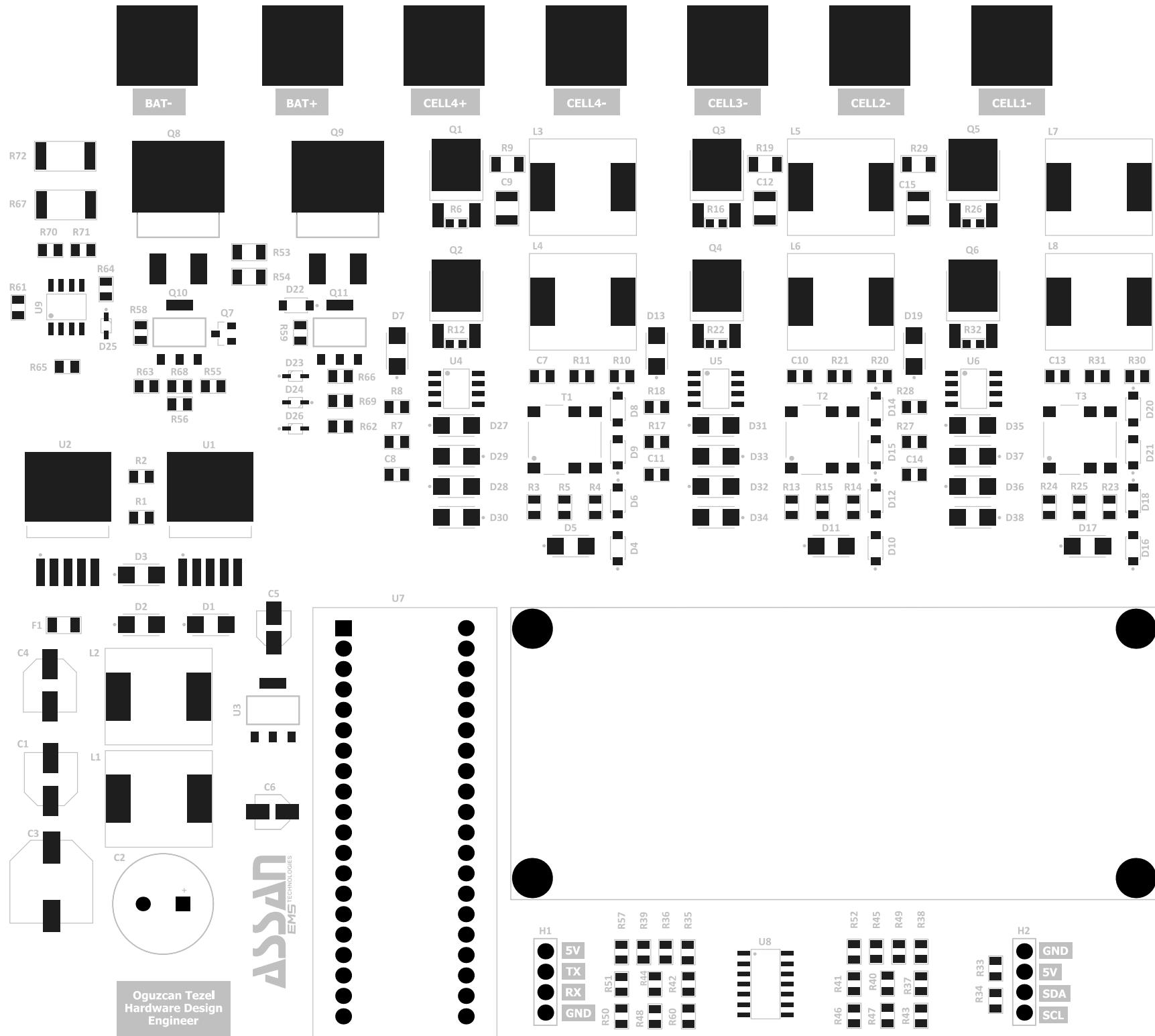




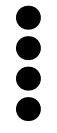
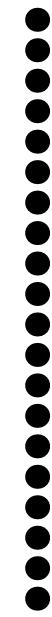
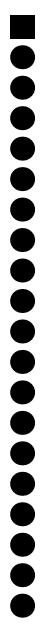
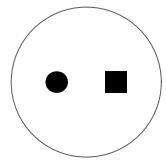








Oguzcan Tezel  
Hardware Design  
Engineer



## Bill of Materials *Altium*

Project Title: Bill of Materials for BMS INDUCTOR-BASED  
 Project File Name: BMS\_INDUCTOR-BASED.PTPB  
 Assembly Variant: 2020

| Product Name             | Description                                      | Designator   | Quantity |
|--------------------------|--|--|----------|
| MWU-059191ME071.7/B      | CAP_EL_100uF_25V_6x3x7105C_2000Hs SMD            | C1_C4  | 2        |
| PCH-0591481M4001.1/A/5.0 | CAP_EL_0.05uF_50V_12.5x20.9MM_105C_ESR_500m1_T8K | C2   | 1        |
| MWU-0591731MC305.7/B     | CAP_EL_330uF_25V_10X10_105C_2000Hs SMD           | C3   | 1        |
| BLA19W/C10ND05P          | CAP_EL_10uF_16V_4x5.2_105C_5000HRS_SMD           | C5_C6  | 2        |
| GJ2B19M4K2NNNC           | MLCC_(2012) 0805 100nF_25VDC ±10% X7R            | C7_C10_C13   | 3        |
| GJ2B19M4K2NNNE           | MLCC_(2012) 0805 1uF_25VDC ±10% X7R              | C8_C11_C14   | 3        |
| GJ2B19M4K2NNNAE          | MLCC_(3225) 1210_10uF_100VDC ±10% X7R            | C9_C12_C15   | 3        |
| SK34-HF                  | DIODE SCHOTTKY 3A 40V DO214AC SMA                | D1_03  | 2        |
| M7_R2_00001              | DIODE ZENER 500mW 16V ±2% SOD123 SMT             | D2   | 1        |
| MUNIS2524BA_R1           | DIODE SCHOTTKY 1A 40V DO-214AC SMA CASE PNP/T    | D4_D4_D8_D9_D10_D12_D14_D15_D16_D18_D20_D21_D22  | 12       |
| S314_R1_00001            | DIODE FAST SWITCHING Single 150mA PIV SMT SOD223 | D5_D7_D11_D13_D17_D19_D27_D28_D29_D30_D31_D32_D33_D34_D35_D36_D37_D38  | 10       |
| 1N4148WS-HF              | TRANSISTOR PTC RESETTABLE FUSE 1.206 500mA 24V   | D23_D24_D25_D26  | 4        |
| F3M0059-24-1206R         | PIN HEADER 4PIN(1x4) 2.54mm TH/T                 | F1   | 1        |
| DS1021.1X4F111.B         | INDUCTOR POWER 100uH 12x12x7MM SMD               | H1_H2  | 2        |
| DS11209-101M             | INDUCTOR POWER 47uH 12x12x5MM SMD                | I1_I2  | 2        |
| DS11204-470M             | INDUCTOR POWER 100uH 12x12x5MM SMD               | I3_I5_I7   | 3        |
| DS1074ad                 | TRANSISTOR N-CH TO252AA                          | P1_P2_P3_P4_P5_P6_P7   | 7        |
| PS6485-5071              | MOSFET POWER 5A/40V N-CH TO252AA                 | P1_02_03_04_05_06  | 6        |
| BC807-40-215             | TRANSISTOR DIS 500mA 45V PNP SOT23 SMT           | P7   | 1        |
| BS4905STRLPB             | MOSFET DIS 42A 55V P-CH TO263(D2PAK) SMT         | Q8_Q9  | 2        |
| E77951TA                 | TRANSISTOR DIS 6A-6V NPN SOT23 SMT               | R10_R11  | 2        |
| DS10805.R-0710B          | RES.0201 0805 36k Ohms 1% 1/W-S 100PPM           | R1_84_R10_R13_R14_R20_R23_R24_R30  | 9        |
| DS10509F3402TSE          | RES.0201 0805 5.1k Ohms 5% 1/W-S 100PPM          | R1_85_R11_R15_R21_R25_R31  | 6        |
| DS10508E05171E           | RES.0201 0805 10 Ohms 5% 1/W-S 100PPM SMT        | R2_82  | 1        |
| DS10805.R-0710B          | RES.0201 0805 2.2 Ohms 5% 1/W-S 100PPM           | R3_84_R4_R10_R13_R14_R20_R23_R24_R30   | 9        |
| DS10508E022715E          | RES.1408 0603 10k Ohms 5% 1/W-10W S 100PPM SMT   | R5_85_R11_R15_R21_R25_R31  | 6        |
| DS10603.R-0710K          | RES.10408 0603 10k Ohms 5% 1/W-10W S 100PPM SMT  | R6_86_R12_R16_R22_R26_R32  | 6        |
| DS10805.R-0710B          | RES.0201 0805 10k Ohms 5% 1/W-S 100PPM           | R7_88_R17_R18_R27_R28_R36_R37_R41_R42_R43_R45_R48_R51_R58_R59_R63_R64_R68_R69  | 20       |
| DS10508E030175E          | RES.1216 1206 10 Ohms 5% 1/W-5 S 100PPM          | R9_89_R29  | 2        |
| DS10504R100175E          | RES.0201 0805 2.2k Ohms 5% 1/W-S 100PPM          | R9_91_R19_R21_R25_R31  | 6        |
| DS10805.R-0728K          | RES.1408 0603 10k Ohms 5% 1/W-10W S 100PPM SMT   | R10_83_R14   | 2        |
| DS10805.R-0710K          | RES.0201 0805 10k Ohms 5% 1/W-S 100PPM           | R10_85_R38_R49_R60_R61_R62   | 6        |
| DS10508E050175E          | RES.0201 0805 39k Ohms 5% 1/W-S 100PPM           | R11_86   | 1        |
| DS10508E030175E          | RES.1216 1206 100k Ohms 5% 1/W-5 S 100PPM        | R12_89_R40_R44_R46_R47_R50_R52_R57   | 8        |
| DS10504R100175E          | RES.0201 0805 100k Ohms 5% 1/W-5 S 100PPM        | R13_85_R54   | 2        |
| DS10805.R-07100K         | RES.0201 0805 100k Ohms 5% 1/W-5 S 100PPM SMT    | R15_85_R56   | 2        |
| DS10508E142175E          | RES.0201 0805 4.10k Ohms 1% 1/W-S 100PPM         | R16_86   | 1        |
| DS10508E030175E          | RES.0201 0805 100 Ohms 5% 1/W-S 100PPM SMT       | R17_87_R18_R20_R21_R23_R24_R25_R26_R27_R28_R29_R30_R31_R32_R33_R34_R35_R36_R37_R38_R39_R40_R41_R42_R43_R44_R45_R46_R47_R48_R49_R50_R51_R52_R53_R54_R55_R56_R57_R58_R59_R60_R61_R62_R63_R64_R65_R66_R67_R68_R69_R69_R70_R71_R72_R73_R74_R75_R76_R77_R78_R79_R79_R80_R81_R82_R83_R84_R85_R86_R87_R88_R89_R89_R90_R91_R92_R93_R94_R95_R96_R97_R98_R99_R99_R100_R101_R102_R103_R104_R105_R106_R107_R108_R109_R109_R110_R111_R112_R113_R114_R115_R116_R117_R118_R119_R119_R120_R121_R122_R123_R124_R125_R126_R127_R128_R129_R129_R130_R131_R132_R133_R134_R135_R136_R137_R137_R138_R139_R139_R140_R141_R142_R143_R144_R145_R145_R146_R147_R147_R148_R148_R149_R149_R150_R151_R151_R152_R153_R153_R154_R154_R155_R155_R156_R156_R157_R157_R158_R158_R159_R159_R160_R160_R161_R161_R162_R162_R163_R163_R164_R164_R165_R165_R166_R166_R167_R167_R168_R168_R169_R169_R170_R170_R171_R171_R172_R172_R173_R173_R174_R174_R175_R175_R176_R176_R177_R177_R178_R178_R179_R179_R180_R180_R181_R181_R182_R182_R183_R183_R184_R184_R185_R185_R186_R186_R187_R187_R188_R188_R189_R189_R190_R190_R191_R191_R192_R192_R193_R193_R194_R194_R195_R195_R196_R196_R197_R197_R198_R198_R199_R199_R200_R200_R201_R201_R202_R202_R203_R203_R204_R204_R205_R205_R206_R206_R207_R207_R208_R208_R209_R209_R210_R210_R211_R211_R212_R212_R213_R213_R214_R214_R215_R215_R216_R216_R217_R217_R218_R218_R219_R219_R220_R220_R221_R221_R222_R222_R223_R223_R224_R224_R225_R225_R226_R226_R227_R227_R228_R228_R229_R229_R230_R230_R231_R231_R232_R232_R233_R233_R234_R234_R235_R235_R236_R236_R237_R237_R238_R238_R239_R239_R240_R240_R241_R241_R242_R242_R243_R243_R244_R244_R245_R245_R246_R246_R247_R247_R248_R248_R249_R249_R250_R250_R251_R251_R252_R252_R253_R253_R254_R254_R255_R255_R256_R256_R257_R257_R258_R258_R259_R259_R260_R260_R261_R261_R262_R262_R263_R263_R264_R264_R265_R265_R266_R266_R267_R267_R268_R268_R269_R269_R270_R270_R271_R271_R272_R272_R273_R273_R274_R274_R275_R275_R276_R276_R277_R277_R278_R278_R279_R279_R280_R280_R281_R281_R282_R282_R283_R283_R284_R284_R285_R285_R286_R286_R287_R287_R288_R288_R289_R289_R290_R290_R291_R291_R292_R292_R293_R293_R294_R294_R295_R295_R296_R296_R297_R297_R298_R298_R299_R299_R300_R300_R301_R301_R302_R302_R303_R303_R304_R304_R305_R305_R306_R306_R307_R307_R308_R308_R309_R309_R310_R310_R311_R311_R312_R312_R313_R313_R314_R314_R315_R315_R316_R316_R317_R317_R318_R318_R319_R319_R320_R320_R321_R321_R322_R322_R323_R323_R324_R324_R325_R325_R326_R326_R327_R327_R328_R328_R329_R329_R330_R330_R331_R331_R332_R332_R333_R333_R334_R334_R335_R335_R336_R336_R337_R337_R338_R338_R339_R339_R340_R340_R341_R341_R342_R342_R343_R343_R344_R344_R345_R345_R346_R346_R347_R347_R348_R348_R349_R349_R350_R350_R351_R351_R352_R352_R353_R353_R354_R354_R355_R355_R356_R356_R357_R357_R358_R358_R359_R359_R360_R360_R361_R361_R362_R362_R363_R363_R364_R364_R365_R365_R366_R366_R367_R367_R368_R368_R369_R369_R370_R370_R371_R371_R372_R372_R373_R373_R374_R374_R375_R375_R376_R376_R377_R377_R378_R378_R379_R379_R380_R380_R381_R381_R382_R382_R383_R383_R384_R384_R385_R385_R386_R386_R387_R387_R388_R388_R389_R389_R390_R390_R391_R391_R392_R392_R393_R393_R394_R394_R395_R395_R396_R396_R397_R397_R398_R398_R399_R399_R3100_R3100_R3101_R3101_R3102_R3102_R3103_R3103_R3104_R3104_R3105_R3105_R3106_R3106_R3107_R3107_R3108_R3108_R3109_R3109_R3110_R3110_R3111_R3111_R3112_R3112_R3113_R3113_R3114_R3114_R3115_R3115_R3116_R3116_R3117_R3117_R3118_R3118_R3119_R3119_R3120_R3120_R3121_R3121_R3122_R3122_R3123_R3123_R3124_R3124_R3125_R3125_R3126_R3126_R3127_R3127_R3128_R3128_R3129_R3129_R3130_R3130_R3131_R3131_R3132_R3132_R3133_R3133_R3134_R3134_R3135_R3135_R3136_R3136_R3137_R3137_R3138_R3138_R3139_R3139_R3140_R3140_R3141_R3141_R3142_R3142_R3143_R3143_R3144_R3144_R3145_R3145_R3146_R3146_R3147_R3147_R3148_R3148_R3149_R3149_R3150_R3150_R3151_R3151_R3152_R3152_R3153_R3153_R3154_R3154_R3155_R3155_R3156_R3156_R3157_R3157_R3158_R3158_R3159_R3159_R3160_R3160_R3161_R3161_R3162_R3162_R3163_R3163_R3164_R3164_R3165_R3165_R3166_R3166_R3167_R3167_R3168_R3168_R3169_R3169_R3170_R3170_R3171_R3171_R3172_R3172_R3173_R3173_R3174_R3174_R3175_R3175_R3176_R3176_R3177_R3177_R3178_R3178_R3179_R3179_R3180_R3180_R3181_R3181_R3182_R3182_R3183_R3183_R3184_R3184_R3185_R3185_R3186_R3186_R3187_R3187_R3188_R3188_R3189_R3189_R3190_R3190_R3191_R3191_R3192_R3192_R3193_R3193_R3194_R3194_R3195_R3195_R3196_R3196_R3197_R3197_R3198_R3198_R3199_R3199_R31100_R31100_R31101_R31101_R31102_R31102_R31103_R31103_R31104_R31104_R31105_R31105_R31106_R31106_R31107_R31107_R31108_R31108_R31109_R31109_R31110_R31110_R31111_R31111_R31112_R31112_R31113_R31113_R31114_R31114_R31115_R31115_R31116_R31116_R31117_R31117_R31118_R31118_R31119_R31119_R31120_R31120_R31121_R31121_R31122_R31122_R31123_R31123_R31124_R31124_R31125_R31125_R31126_R31126_R31127_R31127_R31128_R31128_R31129_R31129_R31130_R31130_R31131_R31131_R31132_R31132_R31133_R31133_R31134_R31134_R31135_R31135_R31136_R31136_R31137_R31137_R31138_R31138_R31139_R31139_R31140_R31140_R31141_R31141_R31142_R31142_R31143_R31143_R31144_R31144_R31145_R31145_R31146_R31146_R31147_R31147_R31148_R31148_R31149_R31149_R31150_R31150_R31151_R31151_R31152_R31152_R31153_R31153_R31154_R31154_R31155_R31155_R31156_R31156_R31157_R31157_R31158_R31158_R31159_R31159_R31160_R31160_R31161_R31161_R31162_R31162_R31163_R31163_R31164_R31164_R31165_R31165_R31166_R31166_R31167_R31167_R31168_R31168_R31169_R31169_R31170_R31170_R31171_R31171_R31172_R31172_R31173_R31173_R31174_R31174_R31175_R31175_R31176_R31176_R31177_R31177_R31178_R31178_R31179_R31179_R31180_R31180_R31181_R31181_R31182_R31182_R31183_R31183_R31184_R31184_R31185_R31185_R31186_R31186_R31187_R31187_R31188_R31188_R31189_R31189_R31190_R31190_R31191_R31191_R31192_R31192_R31193_R31193_R31194_R31194_R31195_R31195_R31196_R31196_R31197_R31197_R31198_R31198_R31199_R31199_R311100_R311100_R311101_R311101_R311102_R311102_R311103_R311103_R311104_R311104_R311105_R311105_R311106_R311106_R311107_R311107_R311108_R311108_R311109_R311109_R311110_R311110_R311111_R311111_R311112_R311112_R311113_R311113_R311114_R311114_R311115_R311115_R311116_R311116_R311117_R311117_R311118_R311118_R311119_R311119_R311120_R311120_R311121_R311121_R311122_R311122_R311123_R311123_R311124_R311124_R311125_R311125_R311126_R311126_R311127_R311127_R311128_R311128_R311129_R311129_R311130_R311130_R311131_R311131_R311132_R311132_R311133_R311133_R311134_R311134_R311135_R311135_R311136_R311136_R311137_R311137_R311138_R311138_R311139_R311139_R311140_R311140_R311141_R311141_R311142_R311142_R311143_R311143_R311144_R311144_R311145_R311145_R311146_R311146_R311147_R311147_R311148_R311148_R311149_R311149_R311150_R311150_R311151_R311151_R311152_R311152_R311153_R311153_R311154_R311154_R311155_R311155_R311156_R311156_R311157_R311157_R311158_R311158_R311159_R311159_R311160_R311160_R311161_R311161_R311162_R311162_R311163_R311163_R311164_R311164_R311165_R311165_R311166_R311166_R311167_R311167_R311168_R311168_R311169_R311169_R311170_R311170_R311171_R311171_R311172_R311172_R311173_R311173_R311174_R311174_R311175_R311175_R311176_R311176_R311177_R311177_R311178_R311178_R311179_R311179_R311180_R311180_R311181_R311181_R311182_R311182_R311183_R311183_R311184_R311184_R311185_R311185_R311186_R311186_R311187_R311187_R311188_R311188_R311189_R311189_R311190_R311190_R311191_R311191_R311192_R311192_R311193_R311193_R311194_R311194_R311195_R311195_R311196_R311196_R311197_R311197_R311198_R311198_R311199_R311199_R3111100_R3111100_R3111101_R3111101_R3111102_R3111102_R3111103_R3111103_R3111104_R3111104_R3111105_R3111105_R3111106_R3111106_R3111107_R3111107_R3111108_R3111108_R3111109_R3111109_R3111110_R3111110_R3111111_R3111111_R3111112_R3111112_R3111113_R3111113_R3111114_R3111114_R3111115_R3111115_R3111116_R3111116_R3111117_R3111117_R3111118_R3111118_R3111119_R3111119_R3111120_R3111120_R3111121_R3111121_R3111122_R3111122_R3111123_R3111123_R3111124_R3111124_R3111125_R3111125_R3111126_R3111126_R3111127_R3111127_R3111128_R3111128_R3111129_R3111129_R3111130_R3111130_R3111131_R3111131_R3111132_R3111132_R3111133_R3111133_R3111134_R3111134_R3111135_R3111135_R3111136_R3111136_R3111137_R3111137_R3111138_R3111138_R3111139_R3111139_R3111140_R3111140_R3111141_R3111141_R3111142_R3111142_R3111143_R3111143_R3111144_R3111144_R3111145_R3111145_R3111146_R3111146_R3111147_R3111147_R3111148_R3111148_R3111149_R3111149_R3111150_R3111150_R3111151_R3111151_R3111152_R3111152_R3111153_R3111153_R3111154_R3111154_R3111155_R3111155_R3111156_R3111156_R3111157_R3111157_R3111158_R3111158_R3111159_R3111159_R3111160_R3111160_R3111161_R3111161_R3111162_R3111162_R3111163_R3111163_R3111164_R3111164_R3111165_R3111165_R3111166_R3111166_R3111167_R3111167_R3111168_R3111168_R3111169_R3111169_R3111170_R3111170_R3111171_R3111171_R3111172_R3111172_R3111173_R3111173_R3111174_R3111174_R3111175_R3111175_R3111176_R3111176_R3111177_R3111177_R3111178_R3111178_R3111179_R3111179_R3111180_R3111180_R3111181_R3111181_R3111182_R3111182_R3111183_R3111183_R3111184_R3111184_R3111185_R3111185_R3111186_R3111186_R3111187_R3111187_R3111188_R3111188_R3111189_R3111189_R3111190_R3111190_R3111191_R3111191_R3111192_R3111192_R3111193_R3111193_R3111194_R3111194_R3111195_R3111195_R3111196_R3111196_R3111197_R3111197_R3111198_R3111198_R3111199_R3111199_R31111100_R31111100_R31111101_R31111101_R31111102_R31111102_R31111103_R31111103_R31111104_R31111104_R31111105_R31111105_R31111106_R31111106_R31111107_R31111107_R31111108_R31111108_R311 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