
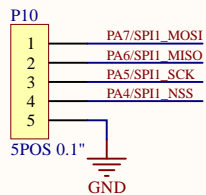



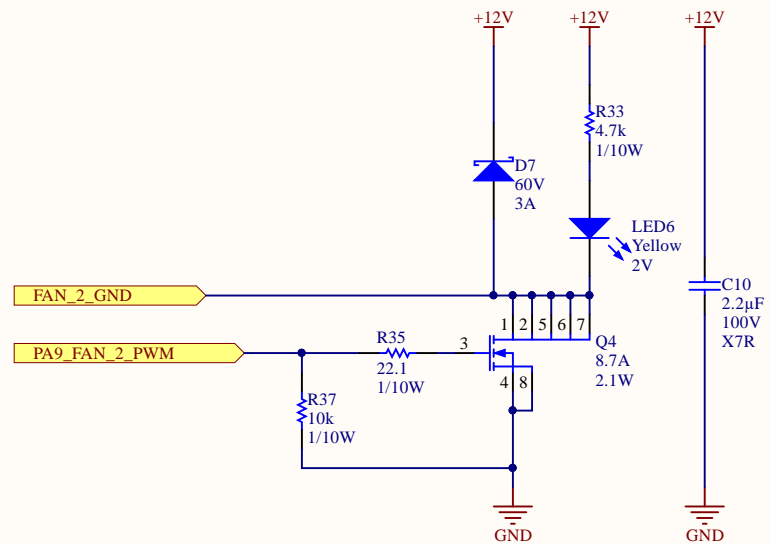
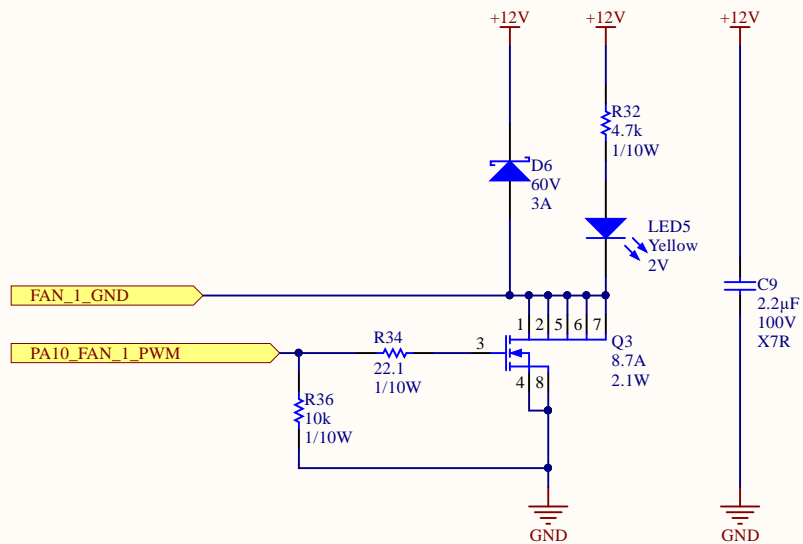
| | | |
|--|----------------------|--|
| Project: <i>BMS_Carrier_Board.PrjPcb</i> | |  |
| Title: Controller Board Interface | | |
| Project Lead: Taiping Li | | University of Waterloo 200 University Ave W Waterloo, ON, Canada N2L 3E9 Website: www.uwmidsun.com |
| Size: Letter | Revision: 3.1 | |
| Date: 5/21/2018 | Sheet 1 of 4 | |


| MODE | POL | PHA | DESCRIPTION |
|------|-----|-----|---|
| 0 | 0 | 0 | SCK Idles Low, Latches on Rising (1st) Edge |
| 1 | 0 | 1 | SCK Idles Low, Latches on Falling (2nd) Edge |
| 2 | 1 | 0 | SCK Idles High, Latches on Falling (1st) Edge |
| 3 | 1 | 1 | SCK Idles High, Latches on Rising (2nd) Edge |

Bias Current I_BIAS can be adjusted from 0.1mA to 1mA
Currently set to 1mA

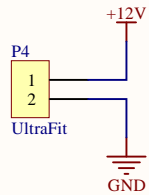
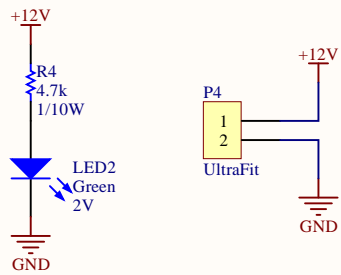


| | | |
|--|----------------------------|--|
| Project: BMS_Carrier_Board.PrjPcb | |  |
| Title: BMS Interface | | |
| Project Lead: Taiping Li | | University of Waterloo 200 University Ave W Waterloo, ON, Canada N2L 3E9 Website: www.uwmidsun.com |
| Size: Letter | Revision: 3.1 | |
| Date: 5/21/2018 | Sheet 3 of 4 | |

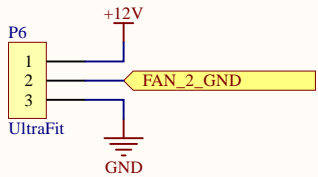
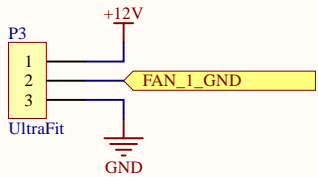


| | | |
|--|---------------|---|
| Project: BMS_Carrier_Board.PrjPcb | |  |
| Title: BMS Fan and Relay Control | | |
| Project Lead: Taiping Li | | University of Waterloo 200 University Ave W Waterloo, ON, Canada N2L 3E9 |
| Size: Letter | Revision: 3.1 | |
| Date: 5/21/2018 | Sheet4 of 4 | |
| | | Website: www.uwmidsun.com |

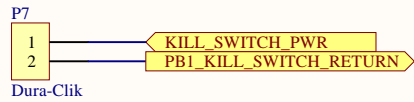
12V Power



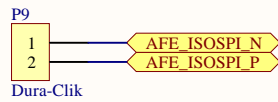
Fan & Relays



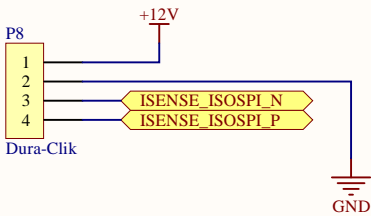
Kill Switch




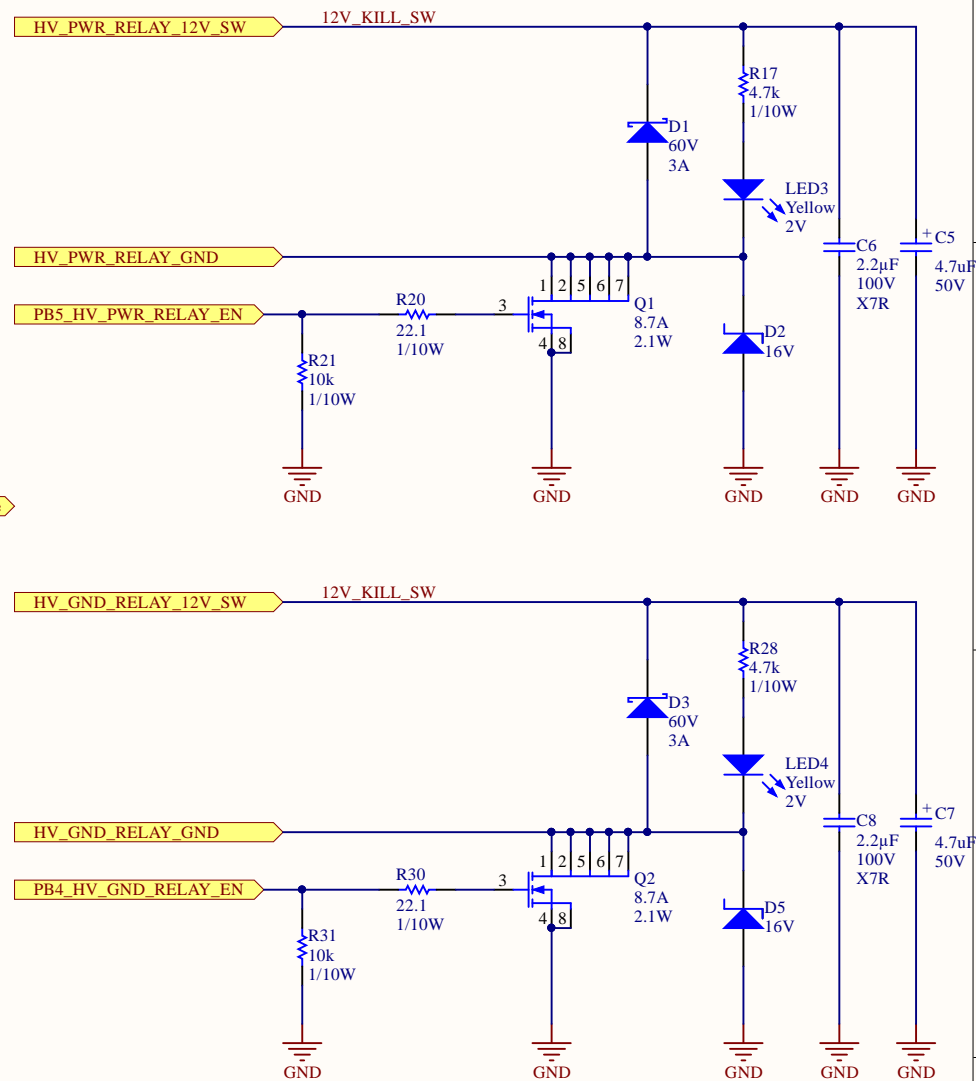
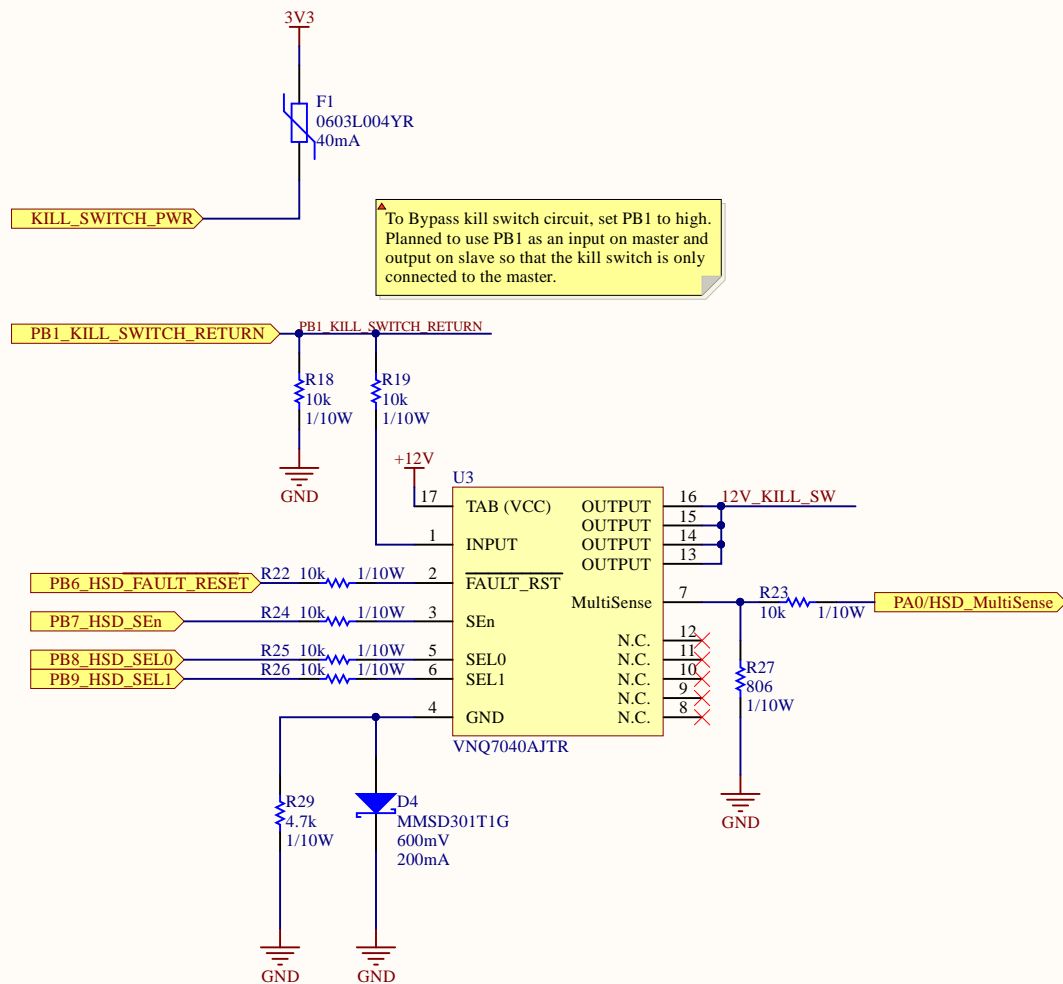
AFE isoSPI




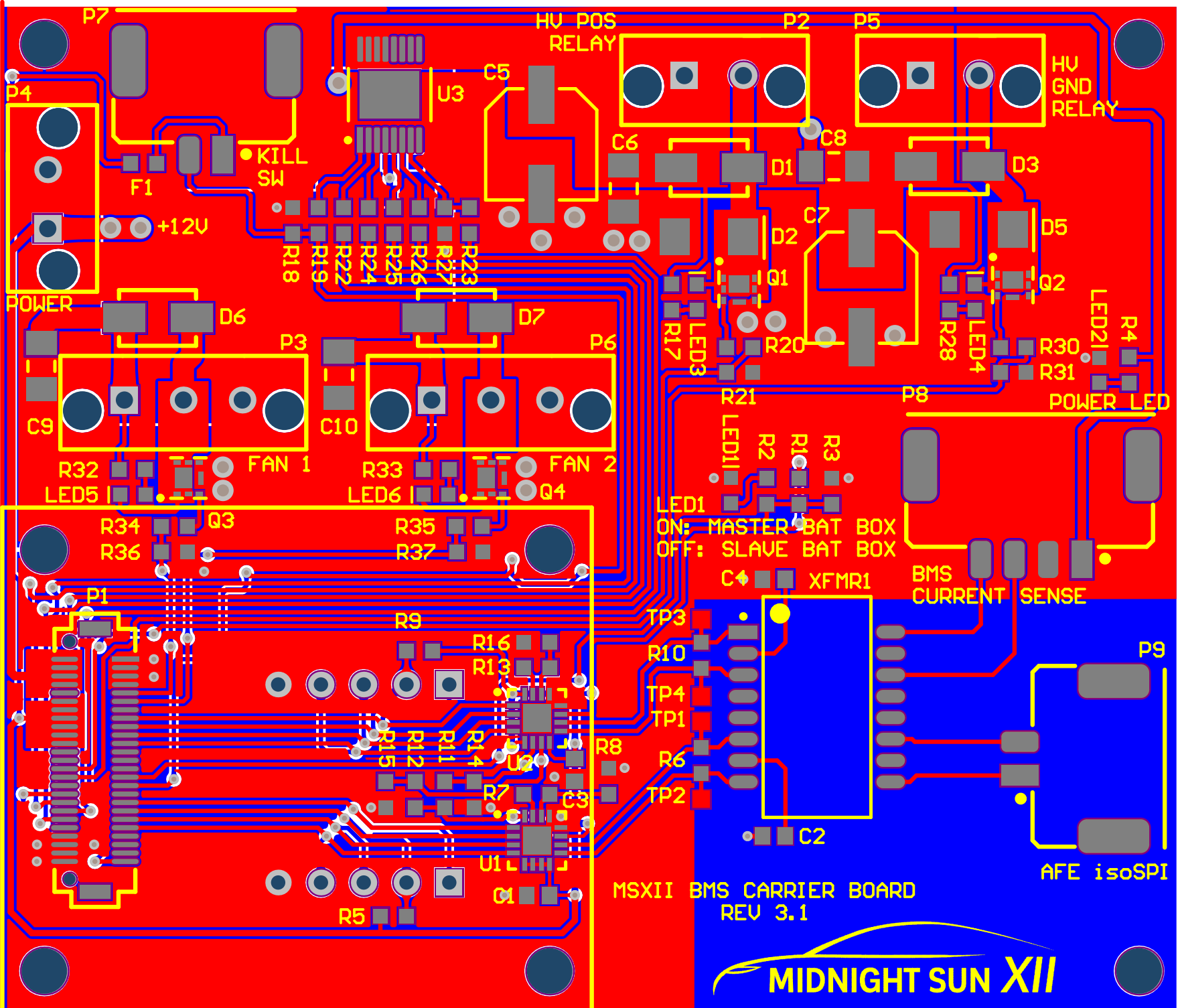
BMS Current Sense

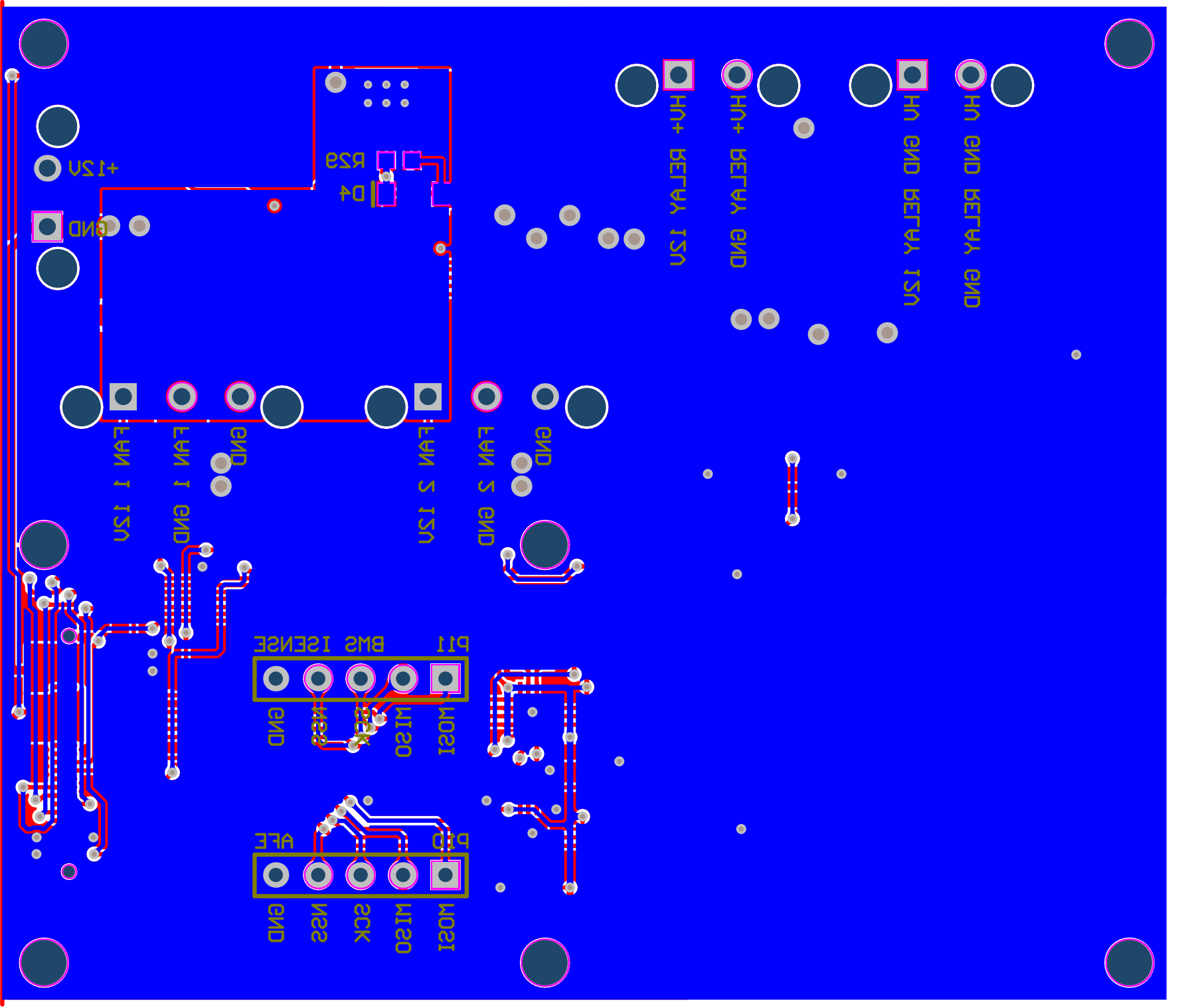


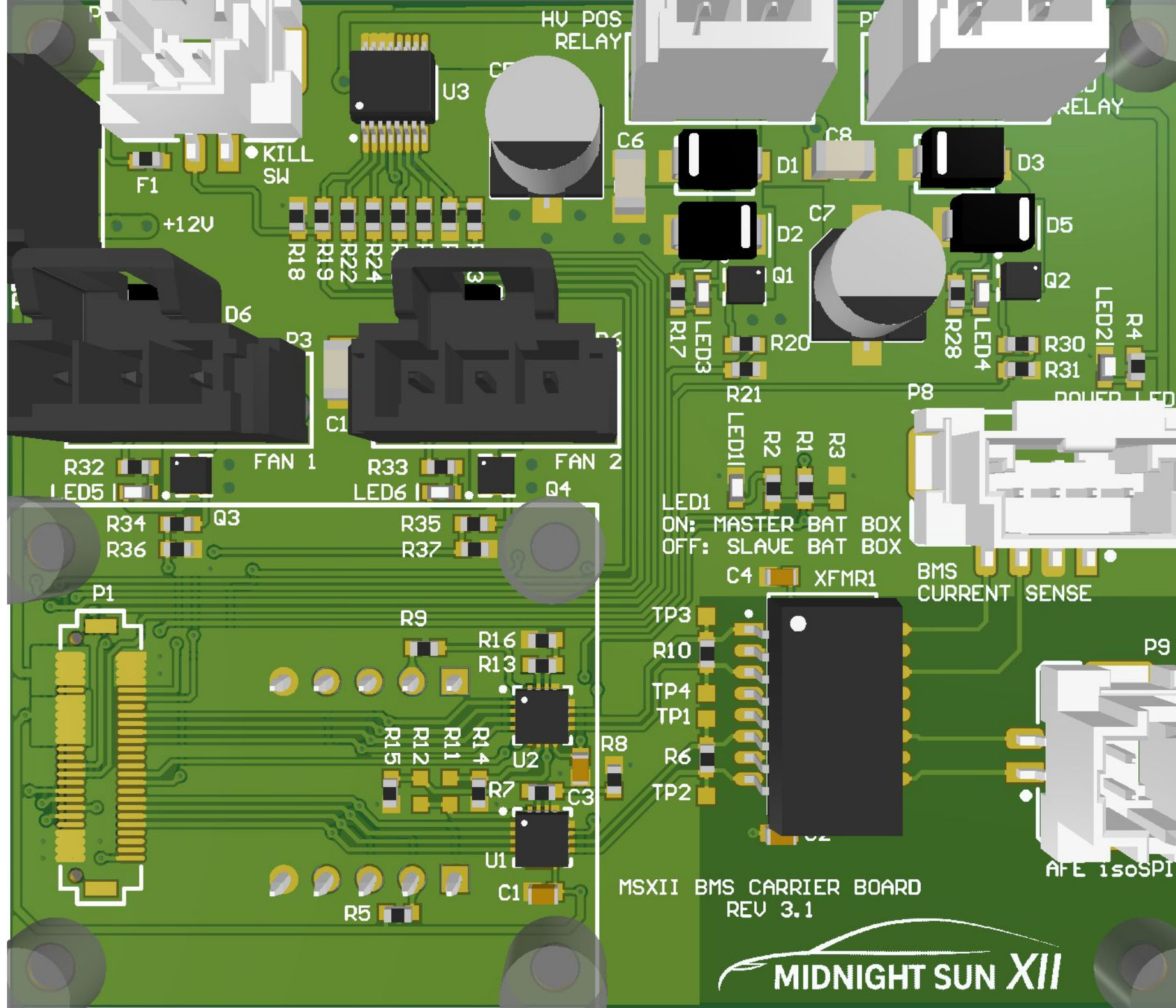
| | | |
|--|---------------|--|
| Project: BMS_Carrier_Board.PrjPcb | | <div><div>MIDNIGHT</div><div></div><div>SUN</div></div> |
| Title: BMS Fan and Relay Control | | |
| Project Lead: Taiping Li | | University of Waterloo 200 University Ave W Waterloo, ON, Canada N2L 3E9 Website: www.uwmidsun.com |
| Size: Letter | Revision: 3.1 | |
| Date: 5/21/2018 | Sheet4 of 4 | |



| | | |
|--|----------------------------|--|
| Project: BMS_Carrier_Board.PrjPcb | |  |
| Title: BMS Fan and Relay Control | | |
| Project Lead: Taiping Li | | University of Waterloo 200 University Ave W Waterloo, ON, Canada N2L 3E9 Website: www.uwmidsun.com |
| Size: Letter | Revision: 3.1 | |
| Date: 5/21/2018 | Sheet 4 of 4 | |







Electrical Rules Check Report

| Class | Document | Message |
|-------|---|---|
| Error | BMS Carrier - Connectors.SchDoc | Net 12V_KILL_SW contains multiple Input Ports (Port HV_GND_RELAY_12V_SW,Port HV_GND_RELAY_12V_SW,Port HV_PWR_RELAY_12V_SW,Port HV_PWR_RELAY_12V_SW) |
| Error | BMS Carrier - Battery Relay Controls.SchDoc | Net 12V_KILL_SW contains multiple Input Ports (Port HV_GND_RELAY_12V_SW,Port HV_PWR_RELAY_12V_SW) |
| Error | BMS Carrier - Battery Relay Controls.SchDoc | Net NetD1_1 contains multiple Input Ports (Port HV_PWR_RELAY_GND,Port HV_PWR_RELAY_GND) |
| Error | BMS Carrier - Battery Relay Controls.SchDoc | Net NetD3_1 contains multiple Input Ports (Port HV_GND_RELAY_GND,Port HV_GND_RELAY_GND) |
| Error | BMS Carrier - Fan Controls.SchDoc | Net NetD6_1 contains multiple Input Ports (Port FAN_1_GND,Port FAN_1_GND) |
| Error | BMS Carrier - Fan Controls.SchDoc | Net NetD7_1 contains multiple Input Ports (Port FAN_2_GND,Port FAN_2_GND) |
| Error | BMS Carrier - Connectors.SchDoc | Net NetF1_2 contains multiple Input Ports (Port KILL_SWITCH_PWR,Port KILL_SWITCH_PWR) |
| Error | BMS Carrier - Fan Controls.SchDoc | Net PA9_FAN_2_PWM contains multiple Input Ports (Port PA9_FAN_2_PWM,Port PA9_FAN_2_PWM) |
| Error | BMS Carrier - Fan Controls.SchDoc | Net PA10_FAN_1_PWM contains multiple Input Ports (Port PA10_FAN_1_PWM,Port PA10_FAN_1_PWM) |
| Error | BMS Carrier - Connectors.SchDoc | Net PB1_KILL_SWITCH_RETURN contains multiple Input Ports (Port PB1_KILL_SWITCH_RETURN,Port PB1_KILL_SWITCH_RETURN) |

Design Rules Verification Report

Filename : C:\Users\Taiping\Documents\MidnightSun\hardware\MSXII_BMS_Carrier_Board\

Warnings 0
Rule Violations 95

| Warnings | |
|----------|---|
| Total | 0 |

| Rule Violations | |
|--|----|
| Clearance Constraint (Gap=0.152mm) (All),(All) | 0 |
| Short-Circuit Constraint (Allowed=No) (All),(All) | 0 |
| Un-Routed Net Constraint ((All)) | 0 |
| Modified Polygon (Allow modified: No), (Allow shelved: No) | 0 |
| Width Constraint (Min=0.203mm) (Max=2.54mm) (Preferred=0.203mm) (All) | 0 |
| Power Plane Connect Rule(Direct Connect)(Expansion=0.508mm) (Conductor Width=0.254mm) (Air Gap=0.254mm) | 0 |
| Hole Size Constraint (Min=0.025mm) (Max=5.08mm) (All) | 0 |
| Hole To Hole Clearance (Gap=0.254mm) (All),(All) | 0 |
| Minimum Solder Mask Sliver (Gap=0.254mm) (All),(All) | 95 |
| Silk To Solder Mask (Clearance=0.254mm) (Disabled)(IsPad),(All) | 0 |
| Silk to Silk (Clearance=0.254mm) (Disabled)(All),(All) | 0 |
| Net Antennae (Tolerance=0mm) (All) | 0 |
| Height Constraint (Min=0mm) (Max=25.4mm) (Preferred=12.7mm) (All) | 0 |
| Total | 95 |

| |
|--|
| Minimum Solder Mask Sliver (Gap=0.254mm) (All),(All) |
| Minimum Solder Mask Sliver Constraint: (0.105mm < 0.254mm) Between Pad P1-1(1.5mm,19.55mm) on Multi-Layer And Pad P1-(3mm,20.3mm) on Top |
| Minimum Solder Mask Sliver Constraint: (0.105mm < 0.254mm) Between Pad P1-1(1.5mm,5.45mm) on Multi-Layer And Pad P1-(3mm,4.7mm) on Top Layer |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q1-1(40.325mm,41.1mm) on Top Layer And Pad Q1-2(40.325mm,40.45mm) |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q1-2(40.325mm,40.45mm) on Top Layer And Pad Q1-3(40.325mm,39.8mm) |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q1-3(40.325mm,39.8mm) on Top Layer And Pad Q1-7(41.25mm,40.75mm) |
| Minimum Solder Mask Sliver Constraint: (0.202mm < 0.254mm) Between Pad Q1-3(40.325mm,39.8mm) on Top Layer And Pad Q1-8(41.25mm,39.71mm) |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q1-4(42.175mm,39.8mm) on Top Layer And Pad Q1-5(42.175mm,40.45mm) |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q1-4(42.175mm,39.8mm) on Top Layer And Pad Q1-7(41.25mm,40.75mm) |
| Minimum Solder Mask Sliver Constraint: (0.202mm < 0.254mm) Between Pad Q1-4(42.175mm,39.8mm) on Top Layer And Pad Q1-8(41.25mm,39.71mm) |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q1-5(42.175mm,40.45mm) on Top Layer And Pad Q1-6(42.175mm,41.1mm) |
| Minimum Solder Mask Sliver Constraint: (0.187mm < 0.254mm) Between Pad Q1-7(41.25mm,40.75mm) on Top Layer And Pad Q1-8(41.25mm,39.71mm) |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q2-1(56.575mm,41.351mm) on Top Layer And Pad |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q2-2(56.575mm,40.701mm) on Top Layer And Pad |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q2-3(56.575mm,40.051mm) on Top Layer And Pad |
| Minimum Solder Mask Sliver Constraint: (0.202mm < 0.254mm) Between Pad Q2-3(56.575mm,40.051mm) on Top Layer And Pad |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q2-4(58.425mm,40.051mm) on Top Layer And Pad |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q2-4(58.425mm,40.051mm) on Top Layer And Pad |
| Minimum Solder Mask Sliver Constraint: (0.202mm < 0.254mm) Between Pad Q2-4(58.425mm,40.051mm) on Top Layer And Pad |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q2-5(58.425mm,40.701mm) on Top Layer And Pad |
| Minimum Solder Mask Sliver Constraint: (0.187mm < 0.254mm) Between Pad Q2-7(57.5mm,41.001mm) on Top Layer And Pad Q2-8(57.5mm,39.961mm) |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q3-1(7.9mm,28.325mm) on Top Layer And Pad Q3-2(8.55mm,28.325mm) on |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q3-2(8.55mm,28.325mm) on Top Layer And Pad Q3-3(9.2mm,28.325mm) on |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q3-3(9.2mm,28.325mm) on Top Layer And Pad Q3-7(8.25mm,29.25mm) on |
| Minimum Solder Mask Sliver Constraint: (0.202mm < 0.254mm) Between Pad Q3-3(9.2mm,28.325mm) on Top Layer And Pad Q3-8(9.29mm,29.25mm) on |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q3-4(9.2mm,30.175mm) on Top Layer And Pad Q3-5(8.55mm,30.175mm) on |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q3-4(9.2mm,30.175mm) on Top Layer And Pad Q3-7(8.25mm,29.25mm) on |
| Minimum Solder Mask Sliver Constraint: (0.202mm < 0.254mm) Between Pad Q3-4(9.2mm,30.175mm) on Top Layer And Pad Q3-8(9.29mm,29.25mm) on |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q3-5(8.55mm,30.175mm) on Top Layer And Pad Q3-6(7.9mm,30.175mm) on |
| Minimum Solder Mask Sliver Constraint: (0.187mm < 0.254mm) Between Pad Q3-7(8.25mm,29.25mm) on Top Layer And Pad Q3-8(9.29mm,29.25mm) on |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q4-1(25.9mm,28.325mm) on Top Layer And Pad Q4-2(26.55mm,28.325mm) |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q4-2(26.55mm,28.325mm) on Top Layer And Pad Q4-3(27.2mm,28.325mm) |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q4-3(27.2mm,28.325mm) on Top Layer And Pad Q4-7(26.25mm,29.25mm) |
| Minimum Solder Mask Sliver Constraint: (0.202mm < 0.254mm) Between Pad Q4-3(27.2mm,28.325mm) on Top Layer And Pad Q4-8(27.29mm,29.25mm) |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q4-4(27.2mm,30.175mm) on Top Layer And Pad Q4-5(26.55mm,30.175mm) |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q4-4(27.2mm,30.175mm) on Top Layer And Pad Q4-7(26.25mm,29.25mm) |
| Minimum Solder Mask Sliver Constraint: (0.202mm < 0.254mm) Between Pad Q4-4(27.2mm,30.175mm) on Top Layer And Pad Q4-8(27.29mm,29.25mm) |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad Q4-5(26.55mm,30.175mm) on Top Layer And Pad Q4-6(25.9mm,30.175mm) |
| Minimum Solder Mask Sliver Constraint: (0.187mm < 0.254mm) Between Pad Q4-7(26.25mm,29.25mm) on Top Layer And Pad Q4-8(27.29mm,29.25mm) |
| Minimum Solder Mask Sliver Constraint: (0.246mm < 0.254mm) Between Pad R10-1(39mm,19.5mm) on Top Layer And Pad TP3-TP(39mm,20.874mm) on |
| Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U1-1(27.825mm,8.5mm) on Top Layer And Pad U1-17(29.25mm,7.75mm) on |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U1-1(27.825mm,8.5mm) on Top Layer And Pad U1-2(27.825mm,8mm) on |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U1-10(30.675mm,7.5mm) on Top Layer And Pad U1-11(30.675mm,8mm) on |
| Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U1-10(30.675mm,7.5mm) on Top Layer And Pad U1-17(29.25mm,7.75mm) |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U1-10(30.675mm,7.5mm) on Top Layer And Pad U1-9(30.675mm,7mm) on |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U1-11(30.675mm,8mm) on Top Layer And Pad U1-12(30.675mm,8.5mm) on |
| Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U1-11(30.675mm,8mm) on Top Layer And Pad U1-17(29.25mm,7.75mm) on |
| Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U1-12(30.675mm,8.5mm) on Top Layer And Pad U1-17(29.25mm,7.75mm) |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U1-13(30mm,9.175mm) on Top Layer And Pad U1-14(29.5mm,9.175mm) on |
| Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U1-13(30mm,9.175mm) on Top Layer And Pad U1-17(29.25mm,7.75mm) on |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U1-14(29.5mm,9.175mm) on Top Layer And Pad U1-15(29mm,9.175mm) on |
| Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U1-14(29.5mm,9.175mm) on Top Layer And Pad U1-17(29.25mm,7.75mm) |
| Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U1-15(29mm,9.175mm) on Top Layer And Pad U1-16(28.5mm,9.175mm) on |

Minimum Solder Mask Sliver (Gap=0.254mm) (All), (All)

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U1-15(29mm, 9.175mm) on Top Layer And Pad U1-17(29.25mm, 7.75mm) on

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U1-16(28.5mm, 9.175mm) on Top Layer And Pad U1-17(29.25mm, 7.75mm)

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U1-17(29.25mm,7.75mm) on Top Layer And Pad U1-2(27.825mm,8mm) on

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U1-17(29.25mm, 7.75mm) on Top Layer And Pad U1-3(27.825mm, 7.5mm) o

Minimum Solder Mask Sliver Constraint: (0.022mm ≤ 0.254mm) Between Pad 11-17(29.25mm ± 7.75mm) on Top Layer And Pad 11-4(27.825mm ± 7mm) on

Minimum Solder Mask Sliver Constraint: (0.022mm ≤ 0.254mm) Between Pad 11-17(27.25mm, 7.75mm) on Top Layer And Pad 11-4(27.625mm, 7mm) on

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad 11 17/38 25mm 7.75mm on Top Layer And Pad 11 6/28mm 6.325mm on

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad 11-17(27.25mm, 7.75mm) on Top Layer And Pad 11-17(27.25mm, 6.325mm) on

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U1-17(29.25mm, 7.75mm) on Top Layer And Pad U1-7(29.5mm, 8.525mm) on

Minimum Solder Mask Silver Constraint: (0.022mm < 0.254mm) Between Pad U1-17(29.25mm, 7.75mm) on Top Layer And Pad U1-8(30mm, 6.325mm) on

Minimum Solder Mask Silver Constraint: (0.022mm < 0.254mm) Between Pad U I-17(29.25mm, 1.15mm) on Top Layer And Pad U I-9(30.675mm, 1mm) on

Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U1-2(27.825mm,8mm) on Top Layer And Pad U1-3(27.825mm,7.5mm) on

Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U1-3(27.825mm,7.5mm) on Top Layer And Pad U1-4(27.825mm,7mm) on

Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U1-5(28.5mm,6.325mm) on Top Layer And Pad U1-6(29mm,6.325mm) on

Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U1-6(29mm,6.325mm) on Top Layer And Pad U1-7(29.5mm,6.325mm) on

Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U1-7(29.5mm,6.325mm) on Top Layer And Pad U1-8(30mm,6.325mm) on

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U2-1(27.825mm, 15.75mm) on Top Layer And Pad U2-17(29.25mm, 15mm)

Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U-2(27.825mm, 15.75mm) on Top Layer And Pad

Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U2-10(30.675mm,14.75mm) on Top Layer And Pad

Minimum Solder Mask Sliver Constraint: $(0.022\text{mm} < 0.254\text{mm})$ Between Pad U2-10(30.675mm, 14.75mm) on Top Layer And Pad U2-17(29.25mm, 15mm)

Minimum Solder Mask Sliver Constraint: (0.047mm ≤ 0.254mm) Between Pad 112-10(30.675mm/14.75mm) on Top Layer And Pad

Minimum Solder Mask Sliver Constraint: (0.047mm ≤ 0.254mm) Between Pad 12-11(30.675mm, 14.75mm) on Top Layer And Pad

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad 112 11(30.675mm, 15.25mm) on Top Layer And Pad 112 17(29.25mm, 15mm)

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U2-11(30.675mm, 15.25mm) on Top Layer And Pad U2-17(29.25mm, 15mm)

Minimum Solder Mask Silver Constraint: (0.022mm < 0.254mm) Between Pad U2-12(30.675mm, 15.75mm) on Top Layer And Pad U2-17(29.25mm, 15mm)

Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U2-13(30mm, 16.425mm) on Top Layer And Pad U2-14(29.5mm, 16.425mm)

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U2-13(30mm, 16.425mm) on Top Layer And Pad U2-17(29.25mm, 15mm) on

Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U2-14(29.5mm, 16.425mm) on Top Layer And Pad U2-15(29mm, 16.425mm)

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U2-14(29.5mm,16.425mm) on Top Layer And Pad U2-17(29.25mm,15mm)

Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U2-15(29mm,16.425mm) on Top Layer And Pad U2-16(28.5mm,16.425mm)

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U2-15(29mm,16.425mm) on Top Layer And Pad U2-17(29.25mm,15mm) on

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U2-16(28.5mm,16.425mm) on Top Layer And Pad U2-17(29.25mm,15mm)

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U2-17(29.25mm,15mm) on Top Layer And Pad U2-2(27.825mm,15.25mm)

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U2-17(29.25mm, 15mm) on Top Layer And Pad U2-3(27.825mm, 14.75mm)

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U2-17(29.25mm, 15mm) on Top Layer And Pad U2-4(27.825mm, 14.25mm)

Minimum Solder Mask Sliver Constraint: (0.022mm ≤ 0.254mm) Between Pad U2-17(29.25mm, 15mm) on Top Layer And Pad U2-5(28.5mm, 13.575mm) on

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad 112-17(27.29mm, 15mm) on Top Layer And Pad 112-5(28.5mm, 15.575mm) on

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U2-17(27.29mm, 15mm) on Top Layer And Pad U2-6(27mm, 15.375mm) on

Minimum Solder Mask Sliver Constraint: (0.022mm < 0.254mm) Between Pad U2-17(29.25mm, 15mm) on Top Layer And Pad U2-8(29.5mm, 13.575mm) on

Minimum Solder Mask Silver Constraint: (0.022mm \leq 0.254mm) Between Pad U2-17(29.25mm, 15mm) on Top Layer And Pad U2-8(30mm, 13.5/5mm) on

Minimum Solder Mask Silver Constraint: (0.022mm < 0.254mm) Between Pad U2-17(29.25mm, 15mm) on Top Layer And Pad U2-9(30.675mm, 14.25mm)

Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U2-2(27.825mm, 15.25mm) on Top Layer And Pad

Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U-2(27.825mm,14.75mm) on Top Layer And Pad

Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U2-5(28.5mm,13.575mm) on Top Layer And Pad U2-6(29mm,13.575mm) on

Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U2-6(29mm,13.575mm) on Top Layer And Pad U2-7(29.5mm,13.575mm) on

Minimum Solder Mask Sliver Constraint: (0.047mm < 0.254mm) Between Pad U2-7(29.5mm,13.575mm) on Top Layer And Pad U2-8(30mm,13.575mm) on