Charge Port
Ocean Server XP-08SR

1: +V
2: TH
3: SCL
4: SDA
5: GND
6: GND

J1
MDF6-6DP-3.5DSA(05)
3.5MM DIP

To Inspired Energy
NH2034 series battery

Discharge and
Bring-Up buses

CTR-B1
CTR-B2
CTR-B3
CTR-B4

Q1B DMC3028LSD-13 SO-8 · Q2B DMC3028LSD-13 SO-8
Q3B DMC3028LSD-13 SO-8 · Q4B DMC3028LSD-13 SO-8
Q5B DMC3028LSD-13 SO-8 · Q6B DMC3028LSD-13 SO-8
Q7B DMC3028LSD-13 SO-8 · Q8B DMC3028LSD-13 SO-8

Q1A Q2A Q3A Q4A Q5A Q6A Q7A Q8A DMC3028LSD-13 SO-8

R1 R4 R6 R9 R11 R14 R16 R19 100.0K 1% 0603
R2 R7 R12 R17 200.0K 1% 0603
R3 R8 R13 R18 100.0K 1% 0603
R5 R10 R15 R20 100.0K 1% 0603

D1 D5 D9 D13 BAT43W-TPSOD-123 VCC1
D2 D6 D10 D14 BZT52C10-7-F SOD-123

C1 C2 C3 C4 0.1uF 50V 0805

U1 U2 U3 U4 ISL84541IBZ SO-8
V+ IN1 IN2 GND NO1 COM1 NO2 COM2

D3 D7 D11 D15 LX2400ILG 2LGA
D4 D8 D12 D16 SK38A-TP SMA
D148 D149 D150 D151 SBRT15U50SP5-13 PowerDI5

J2 J3 J4 J5 5787446-1 3.5MM DIP

MainBus-BringUp
BackupBus-BringUp
GND
VCC1
MainBus
BackupBus

RevA1
8 pages
31 places

RevB (08/15/2014)
D132 LTST-C150TBKT replace with LTST-C150GKT
R166 15k/0603 replace to 499k/0603
R211 1k/0603 replace to 2.49k/0603
C52 47nF/0805 replace to 0.1uF/0805
C56 680pF/0805 replace to 1500pF/0805
C57 680pF/0805 replace to 4700pF/0805
C58 680pF/0805 replace to 6800pF/0805
U41,U42 CD4011BM96 /SO-14, replace to CD4011BPWR /14-TSSOP

RevA(06/09/2014): Initial Release
RevA1(09/30/2014): LX2400 install 31 parts; SBRT15U50SP5-13 (skip all 31 parts)
RevB(08/15/2014): 8 parts changed

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Engineer: Klimov 831-775-1914	Page Title: BatteryPackController / Port 1
Project: 901400	
Size: B	Doc. or Part Number: <Doc>
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Full path (auto): X:\900739.LRAUV\PROJECT.DRAWINGS\PROJECT.EE.DWGS\BATTERYPACK2013\10021057-BPC1\10021057-BPC1.DSN	

Charge Port
Ocean Server XP-08SR

1: +V
2: TH
3: SCL
4: SDA
5: GND
6: GND

J6
MDF6-6DP-3.5DSA(05)
3.5MM DIP

To Inspired Energy
NH2034 series battery

Discharge and
Bring-Up buses

CTR-B1
CTR-B2
CTR-B3
CTR-B4

4A trace
4A trace charge current =>
4A trace <= return
8A trace
1.5A trace
15A trace

Q9B DMC3028LSD-13 SO-8
Q10B DMC3028LSD-13 SO-8
Q9A DMC3028LSD-13 SO-8
Q10A DMC3028LSD-13 SO-8
R21 100.0K 1% 0603
R22 200.0K 1% 0603
R23 100.0K 1% 0603
R24 100.0K 1% 0603
R25 100.0K 1% 0603
D18 BZT52C10-7-F SOD-123
C5 0.1uF 50V 0805
D17 BAT43W-TPSOD-123
U5 ISL84541IBZ SO-8
V+ IN1 IN2 GND NO1 COM1 NO2 COM2
VCC1

Q11B DMC3028LSD-13 SO-8
Q12B DMC3028LSD-13 SO-8
Q11A DMC3028LSD-13 SO-8
Q12A DMC3028LSD-13 SO-8
R26 100.0K 1% 0603
R27 200.0K 1% 0603
R28 100.0K 1% 0603
R29 100.0K 1% 0603
R30 100.0K 1% 0603
D22 BZT52C10-7-F SOD-123
C6 0.1uF 50V 0805
D21 BAT43W-TPSOD-123
U6 ISL84541IBZ SO-8

Q13B DMC3028LSD-13 SO-8
Q14B DMC3028LSD-13 SO-8
Q13A DMC3028LSD-13 SO-8
Q14A DMC3028LSD-13 SO-8
R31 100.0K 1% 0603
R32 200.0K 1% 0603
R33 100.0K 1% 0603
R34 100.0K 1% 0603
R35 100.0K 1% 0603
D26 BZT52C10-7-F SOD-123
C7 0.1uF 50V 0805
D25 BAT43W-TPSOD-123
U7 ISL84541IBZ SO-8

Q15B DMC3028LSD-13 SO-8
Q16B DMC3028LSD-13 SO-8
Q15A DMC3028LSD-13 SO-8
Q16A DMC3028LSD-13 SO-8
R36 100.0K 1% 0603
R37 200.0K 1% 0603
R38 100.0K 1% 0603
R39 100.0K 1% 0603
R40 100.0K 1% 0603
D30 BZT52C10-7-F SOD-123
C8 0.1uF 50V 0805
D29 BAT43W-TPSOD-123
U8 ISL84541IBZ SO-8

J7 5787446-1 3.5MM DIP
J8 5787446-1 3.5MM DIP
J9 5787446-1 3.5MM DIP
J10 5787446-1 3.5MM DIP
A1 B1 1 + A2 B2 2 C A3 B3 3 D A4 B4 4 T A5 B5 5 -

D19 LX2400ILG 2LGA
D23 LX2400ILG 2LGA
D27 LX2400ILG 2LGA
D31 LX2400ILG 2LGA
A C

D20 SK38A-TP SMA
D24 SK38A-TP SMA
D28 SK38A-TP SMA
D32 SK38A-TP SMA
D152 SBRT15U50SP5-13
D153 SBRT15U50SP5-13
D154 SBRT15U50SP5-13
D155 SBRT15U50SP5-13
PowerDI5

MainBus-BringUp
BackupBus-BringUp
GND
VCC1
MainBus
BackupBus

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Page Title: BatteryPackController / Port 2			Project: see page 1
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Charge Port
Ocean Server XP-08SR

1: +V
2: TH
3: SCL
4: SDA
5: GND
6: GND

J11
MDF6-6DP-3.5DSA(05)
3.5MM DIP

To Inspired Energy
NH2034 series battery

Discharge and
Bring-Up buses

1.5A trace
MainBus-BringUp
BackupBus-BringUp
GND
VCC1

CTR-B1
CTR-B2
CTR-B3
CTR-B4

Q17B DMC3028LSD-13 SO-8
Q18B DMC3028LSD-13 SO-8
Q19B DMC3028LSD-13 SO-8
Q20B DMC3028LSD-13 SO-8
Q21B DMC3028LSD-13 SO-8
Q22B DMC3028LSD-13 SO-8
Q23B DMC3028LSD-13 SO-8
Q24B DMC3028LSD-13 SO-8

Q17A DMC3028LSD-13 SO-8
Q18A DMC3028LSD-13 SO-8
Q19A DMC3028LSD-13 SO-8
Q20A DMC3028LSD-13 SO-8
Q21A DMC3028LSD-13 SO-8
Q22A DMC3028LSD-13 SO-8
Q23A DMC3028LSD-13 SO-8
Q24A DMC3028LSD-13 SO-8

R41 100.0K 1% 0603
R42 200.0K 1% 0603
R43 100.0K 1% 0603
R44 100.0K 1% 0603
R45 100.0K 1% 0603
R46 100.0K 1% 0603
R47 200.0K 1% 0603
R48 100.0K 1% 0603
R49 100.0K 1% 0603
R50 100.0K 1% 0603
R51 100.0K 1% 0603
R52 200.0K 1% 0603
R53 100.0K 1% 0603
R54 100.0K 1% 0603
R55 100.0K 1% 0603
R56 100.0K 1% 0603
R57 200.0K 1% 0603
R58 100.0K 1% 0603
R59 100.0K 1% 0603
R60 100.0K 1% 0603

D33 BAT43W-TPSOD-123
D34 BZT52C10-7-F SOD-123
D37 BAT43W-TPSOD-123
D38 BZT52C10-7-F SOD-123
D41 BAT43W-TPSOD-123
D42 BZT52C10-7-F SOD-123
D45 BAT43W-TPSOD-123
D46 BZT52C10-7-F SOD-123

C9 0.1uF 50V 0805
C10 0.1uF 50V 0805
C11 0.1uF 50V 0805
C12 0.1uF 50V 0805

U9 ISL84541IBZ SO-8
U10 ISL84541IBZ SO-8
U11 ISL84541IBZ SO-8
U12 ISL84541IBZ SO-8
V+ IN1 IN2 GND NO1 COM1 NO2 COM2

J12 5787446-1 3.5MM DIP
J13 5787446-1 3.5MM DIP
J14 5787446-1 3.5MM DIP
J15 5787446-1 3.5MM DIP
1 + 2 C 3 D 4 T 5 -

D35 LX2400ILG 2LGA
D39 LX2400ILG 2LGA
D43 LX2400ILG 2LGA
D47 LX2400ILG 2LGA

D36 SK38A-TP SMA
D40 SK38A-TP SMA
D44 SK38A-TP SMA
D48 SK38A-TP SMA

D156 SBRT15U50SP5-13
D157 SBRT15U50SP5-13
D158 SBRT15U50SP5-13
D159 SBRT15U50SP5-13
PowerDI5

15A trace
MainBus
BackupBus
GND

4A trace
8A trace
charge current =>
<= return
1.5A trace

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Charge Port
Ocean Server XP-08SR

1: +V
2: TH
3: SCL
4: SDA
5: GND
6: GND

J16
MDF6-6DP-3.5DSA(05)
3.5MM DIP

To Inspired Energy
NH2034 series battery

Discharge and
Bring-Up buses

1.5A trace
MainBus-BringUp
BackupBus-BringUp
GND
VCC1

CTR-B1
CTR-B2
CTR-B3
CTR-B4

4A trace
4A trace charge current =>
4A trace <= return
8A trace
15A trace

Q25B DMC3028LSD-13 SO-8
Q26B DMC3028LSD-13 SO-8
Q27B DMC3028LSD-13 SO-8
Q28B DMC3028LSD-13 SO-8
Q29B DMC3028LSD-13 SO-8
Q30B DMC3028LSD-13 SO-8
Q31B DMC3028LSD-13 SO-8
Q32B DMC3028LSD-13 SO-8

Q25A DMC3028LSD-13 SO-8
Q26A DMC3028LSD-13 SO-8
Q27A DMC3028LSD-13 SO-8
Q28A DMC3028LSD-13 SO-8
Q29A DMC3028LSD-13 SO-8
Q30A DMC3028LSD-13 SO-8
Q31A DMC3028LSD-13 SO-8
Q32A DMC3028LSD-13 SO-8

R61 100.0K 1% 0603
R62 200.0K 1% 0603
R63 100.0K 1% 0603
R64 100.0K 1% 0603
R65 100.0K 1% 0603
R66 100.0K 1% 0603
R67 200.0K 1% 0603
R68 100.0K 1% 0603
R69 100.0K 1% 0603
R70 100.0K 1% 0603
R71 100.0K 1% 0603
R72 200.0K 1% 0603
R73 100.0K 1% 0603
R74 100.0K 1% 0603
R75 100.0K 1% 0603
R76 100.0K 1% 0603
R77 200.0K 1% 0603
R78 100.0K 1% 0603
R79 100.0K 1% 0603
R80 100.0K 1% 0603

D50 BZT52C10-7-F SOD-123
D54 BZT52C10-7-F SOD-123
D58 BZT52C10-7-F SOD-123
D62 BZT52C10-7-F SOD-123

D49 BAT43W-TPSOD-123 VCC1
D53 BAT43W-TPSOD-123 VCC1
D57 BAT43W-TPSOD-123 VCC1
D61 BAT43W-TPSOD-123 VCC1

C13 0.1uF 50V 0805
C14 0.1uF 50V 0805
C15 0.1uF 50V 0805
C16 0.1uF 50V 0805

U13 ISL84541IBZ SO-8
U14 ISL84541IBZ SO-8
U15 ISL84541IBZ SO-8
U16 ISL84541IBZ SO-8
V+ IN1 IN2 GND NO1 COM1 NO2 COM2

J17 5787446-1 3.5MM DIP
J18 5787446-1 3.5MM DIP
J19 5787446-1 3.5MM DIP
J20 5787446-1 3.5MM DIP
A1 B1 A2 B2 A3 B3 A4 B4 A5 B5
1 + 2 C 3 D 4 T 5 -

D51 LX2400ILG 2LGA
D55 LX2400ILG 2LGA
D59 LX2400ILG 2LGA
D63 LX2400ILG 2LGA
A C

D52 SK38A-TP SMA
D56 SK38A-TP SMA
D60 SK38A-TP SMA
D64 SK38A-TP SMA
1.5A trace

D160 SBRT15U50SP5-13
D161 SBRT15U50SP5-13
D162 SBRT15U50SP5-13
D163 SBRT15U50SP5-13
PowerDI5

MainBus
BackupBus

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Page Title: BatteryPackController / Port 4			Project: see page 1
Engineer: Klimov 831-775-1914			
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Charge Port
Ocean Server XP-08SR

1: +V
2: TH
3: SCL
4: SDA
5: GND
6: GND

J21
MDF6-6DP-3.5DSA(05)
3.5MM DIP

To Inspired Energy
NH2034 series battery

Discharge and
Bring-Up buses

1.5A trace
MainBus-BringUp
BackupBus-BringUp
GND
VCC1

CTR-B1
CTR-B2
CTR-B3
CTR-B4

4A trace
4A trace charge current =>
4A trace <= return
8A trace
15A trace

Q33B DMC3028LSD-13 SO-8
Q34B DMC3028LSD-13 SO-8
Q35B DMC3028LSD-13 SO-8
Q36B DMC3028LSD-13 SO-8
Q37B DMC3028LSD-13 SO-8
Q38B DMC3028LSD-13 SO-8
Q39B DMC3028LSD-13 SO-8
Q40B DMC3028LSD-13 SO-8

Q33A DMC3028LSD-13 SO-8
Q34A DMC3028LSD-13 SO-8
Q35A DMC3028LSD-13 SO-8
Q36A DMC3028LSD-13 SO-8
Q37A DMC3028LSD-13 SO-8
Q38A DMC3028LSD-13 SO-8
Q39A DMC3028LSD-13 SO-8
Q40A DMC3028LSD-13 SO-8

R81 100.0K 1% 0603
R82 200.0K 1% 0603
R83 100.0K 1% 0603
R84 100.0K 1% 0603
R85 100.0K 1% 0603
R86 100.0K 1% 0603
R87 200.0K 1% 0603
R88 100.0K 1% 0603
R89 100.0K 1% 0603
R90 100.0K 1% 0603
R91 100.0K 1% 0603
R92 200.0K 1% 0603
R93 100.0K 1% 0603
R94 100.0K 1% 0603
R95 100.0K 1% 0603
R96 100.0K 1% 0603
R97 200.0K 1% 0603
R98 100.0K 1% 0603
R99 100.0K 1% 0603
R100 100.0K 1% 0603

D65 BAT43W-TPSOD-123 VCC1
D66 BZT52C10-7-F SOD-123
D69 BAT43W-TPSOD-123 VCC1
D70 BZT52C10-7-F SOD-123
D73 BAT43W-TPSOD-123 VCC1
D74 BZT52C10-7-F SOD-123
D77 BAT43W-TPSOD-123 VCC1
D78 BZT52C10-7-F SOD-123

C17 0.1uF 50V 0805
C18 0.1uF 50V 0805
C19 0.1uF 50V 0805
C20 0.1uF 50V 0805

U17 ISL84541IBZ SO-8
U18 ISL84541IBZ SO-8
U19 ISL84541IBZ SO-8
U20 ISL84541IBZ SO-8
V+ IN1 IN2 GND NO1 COM1 NO2 COM2

J22 1 + 2 C 3 D 4 T 5 - 5787446-1 3.5MM DIP
J23 1 + 2 C 3 D 4 T 5 - 5787446-1 3.5MM DIP
J24 1 + 2 C 3 D 4 T 5 - 5787446-1 3.5MM DIP
J25 1 + 2 C 3 D 4 T 5 - 5787446-1 3.5MM DIP

D67 LX2400ILG 2LGA
D68 SK38A-TP SMA
D164 SBRT15U50SP5-13 PowerDI5
D71 LX2400ILG 2LGA
D72 SK38A-TP SMA
D165 SBRT15U50SP5-13 PowerDI5
D75 LX2400ILG 2LGA
D76 SK38A-TP SMA
D166 SBRT15U50SP5-13 PowerDI5
D79 LX2400ILG 2LGA
D80 SK38A-TP SMA
D167 SBRT15U50SP5-13 PowerDI5

1.5A trace

GND
VCC1

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Charge Port
Ocean Server XP-08SR

1: +V
2: TH
3: SCL
4: SDA
5: GND
6: GND

J26
MDF6-6DP-3.5DSA(05)
3.5MM DIP

To Inspired Energy
NH2034 series battery

Discharge and
Bring-Up buses

1.5A trace
MainBus-BringUp
BackupBus-BringUp
GND
VCC1

CTR-B1
CTR-B2
CTR-B3
CTR-B4

4A trace
4A trace charge current =>
4A trace <= return
8A trace
15A trace

Q41B DMC3028LSD-13 SO-8
Q42B DMC3028LSD-13 SO-8
Q43B DMC3028LSD-13 SO-8
Q44B DMC3028LSD-13 SO-8
Q45B DMC3028LSD-13 SO-8
Q46B DMC3028LSD-13 SO-8
Q47B DMC3028LSD-13 SO-8
Q48B DMC3028LSD-13 SO-8

Q41A DMC3028LSD-13 SO-8
Q42A DMC3028LSD-13 SO-8
Q43A DMC3028LSD-13 SO-8
Q44A DMC3028LSD-13 SO-8
Q45A DMC3028LSD-13 SO-8
Q46A DMC3028LSD-13 SO-8
Q47A DMC3028LSD-13 SO-8
Q48A DMC3028LSD-13 SO-8

R101 100.0K 1% 0603
R102 200.0K 1% 0603
R103 100.0K 1% 0603
R104 100.0K 1% 0603
R105 100.0K 1% 0603
R106 100.0K 1% 0603
R107 200.0K 1% 0603
R108 100.0K 1% 0603
R109 100.0K 1% 0603
R110 100.0K 1% 0603
R111 100.0K 1% 0603
R112 200.0K 1% 0603
R113 100.0K 1% 0603
R114 100.0K 1% 0603
R115 100.0K 1% 0603
R116 100.0K 1% 0603
R117 200.0K 1% 0603
R118 100.0K 1% 0603
R119 100.0K 1% 0603
R120 100.0K 1% 0603

D82 BZT52C10-7-F SOD-123
D86 BZT52C10-7-F SOD-123
D90 BZT52C10-7-F SOD-123
D94 BZT52C10-7-F SOD-123

C21 0.1uF 50V 0805
C22 0.1uF 50V 0805
C23 0.1uF 50V 0805
C24 0.1uF 50V 0805

D81 BAT43W-TPSOD-123 VCC1
D85 BAT43W-TPSOD-123 VCC1
D89 BAT43W-TPSOD-123 VCC1
D93 BAT43W-TPSOD-123 VCC1

U21 ISL84541IBZ SO-8
U22 ISL84541IBZ SO-8
U23 ISL84541IBZ SO-8
U24 ISL84541IBZ SO-8
V+ IN1 IN2 GND NO1 COM1 NO2 COM2

J27 1 + 5787446-1 3.5MM DIP
J28 1 + 5787446-1 3.5MM DIP
J29 1 + 5787446-1 3.5MM DIP
J30 1 + 5787446-1 3.5MM DIP
A1 B1 A2 B2 A3 B3 A4 B4 A5 B5
2 C
3 D
4 T
5 -

D83 LX2400ILG 2LGA A C
D87 LX2400ILG 2LGA A C
D91 LX2400ILG 2LGA A C
D95 LX2400ILG 2LGA A C

D84 SK38A-TP SMA
D88 SK38A-TP SMA
D92 SK38A-TP SMA
D96 SK38A-TP SMA

D168 SBRT15U50SP5-13
D169 SBRT15U50SP5-13
D170 SBRT15U50SP5-13
D171 SBRT15U50SP5-13
PowerDI5
1.5A trace

GND
VCC1

15A trace
MainBus
BackupBus
GND

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Page Title: BatteryPackController / Port 6			Project: see page 1
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Charge Port
Ocean Server XP-08SR

1: +V
2: TH
3: SCL
4: SDA
5: GND
6: GND

J31
MDF6-6DP-3.5DSA(05)
3.5MM DIP

To Inspired Energy
NH2034 series battery

Discharge and
Bring-Up buses

1.5A trace
MainBus-BringUp
BackupBus-BringUp
GND
VCC1

CTR-B1
CTR-B2
CTR-B3
CTR-B4

Q49B DMC3028LSD-13 SO-8
Q50B DMC3028LSD-13 SO-8
Q51B DMC3028LSD-13 SO-8
Q52B DMC3028LSD-13 SO-8
Q53B DMC3028LSD-13 SO-8
Q54B DMC3028LSD-13 SO-8
Q55B DMC3028LSD-13 SO-8
Q56B DMC3028LSD-13 SO-8

Q49A DMC3028LSD-13 SO-8
Q50A DMC3028LSD-13 SO-8
Q51A DMC3028LSD-13 SO-8
Q52A DMC3028LSD-13 SO-8
Q53A DMC3028LSD-13 SO-8
Q54A DMC3028LSD-13 SO-8
Q55A DMC3028LSD-13 SO-8
Q56A DMC3028LSD-13 SO-8

R121 100.0K 1% 0603
R122 200.0K 1% 0603
R123 100.0K 1% 0603
R124 100.0K 1% 0603
R125 100.0K 1% 0603
R126 100.0K 1% 0603
R127 200.0K 1% 0603
R128 100.0K 1% 0603
R129 100.0K 1% 0603
R130 100.0K 1% 0603
R131 100.0K 1% 0603
R132 200.0K 1% 0603
R133 100.0K 1% 0603
R134 100.0K 1% 0603
R135 100.0K 1% 0603
R136 100.0K 1% 0603
R137 200.0K 1% 0603
R138 100.0K 1% 0603
R139 100.0K 1% 0603
R140 100.0K 1% 0603

D98 BZT52C10-7-F SOD-123
D102 BZT52C10-7-F SOD-123
D106 BZT52C10-7-F SOD-123
D110 BZT52C10-7-F SOD-123

C25 0.1uF 50V 0805
C26 0.1uF 50V 0805
C27 0.1uF 50V 0805
C28 0.1uF 50V 0805

D97 BAT43W-TP SOD-123
D101 BAT43W-TP SOD-123
D105 BAT43W-TP SOD-123
D109 BAT43W-TP SOD-123

U25 ISL84541IBZ SO-8
U26 ISL84541IBZ SO-8
U27 ISL84541IBZ SO-8
U28 ISL84541IBZ SO-8
V+ IN1 IN2 GND NO1 COM1 NO2 COM2

D99 D103 D107 D111 LX2400ILG 2LGA
D100 D104 D108 D112 SK38A-TP SMA
D172 D173 D174 D175 PowerDI5 SBRT15U50SP5-13

J32 J33 J34 J35
5787446-1 3.5MM DIP
1 + 2 C 3 D 4 T 5 -

4A trace
8A trace
15A trace
charge current =>
<= return
1.5A trace
MainBus
BackupBus
GND
VCC1

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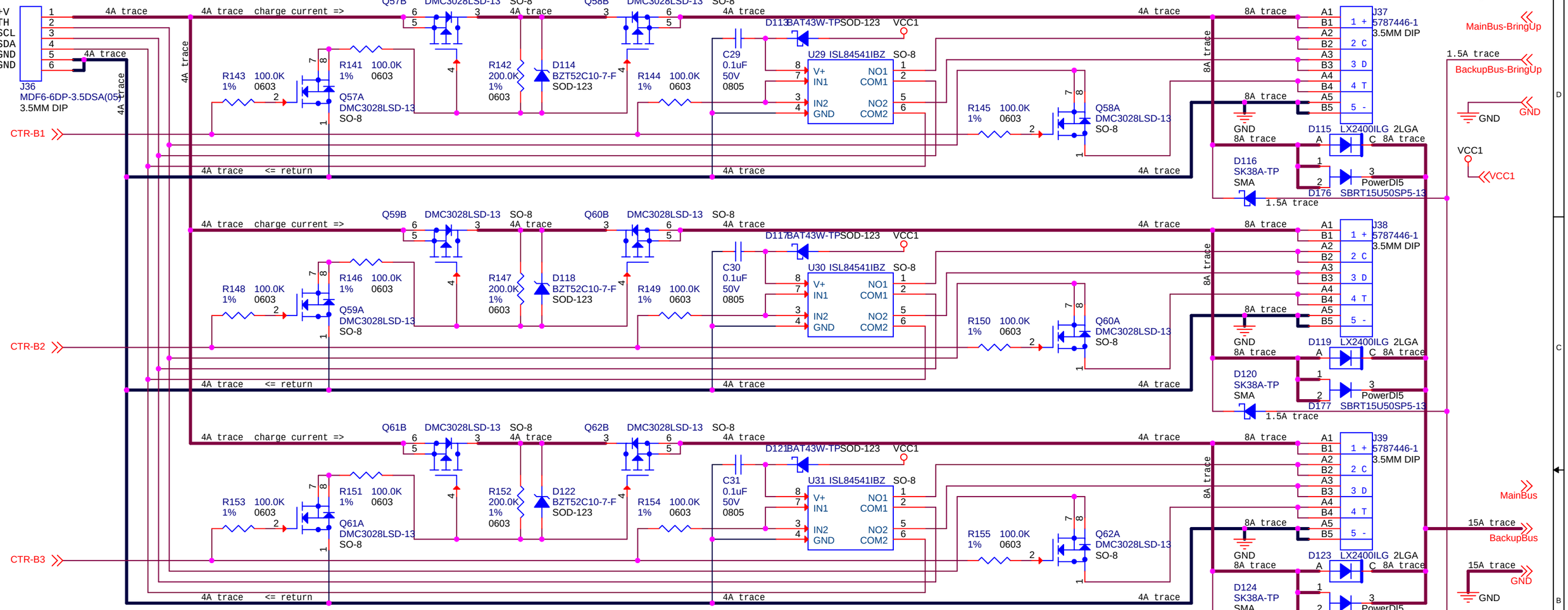

Backup batteries Port 8, banks B1, B2, B3

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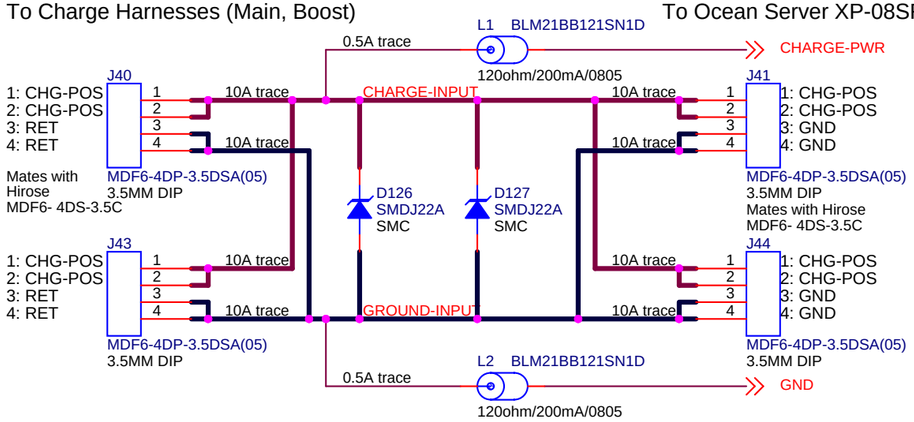
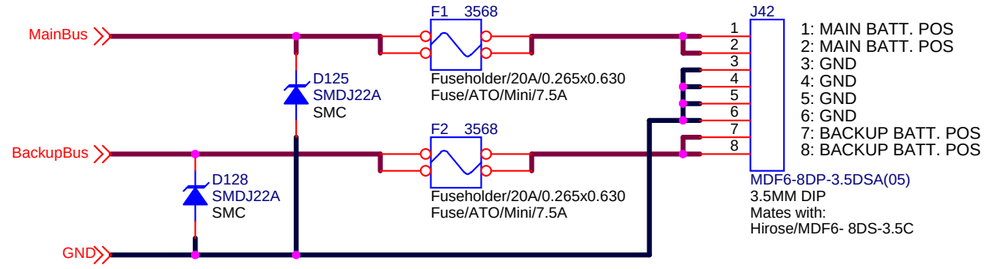
Charge inputs, power distribuition to XP-08SR, charge power to charge flag section

To Charge Harnesses (Main, Boost)

To Ocean Server XP-08SR



Outputs to mother board with ATO Mini fuse holders and 24V TVS protection



Fuses ATO Mini 10.9mm long
Littlefuse 997 Series
7.5A Brown: 099707.5WXN
10A Red: 0997010.WXN
15A Blue: 0997015.WXN
20A Yellow: 0997020.WXN
25A Clear: 0997025.WXN
30A Green: 0997030.WXN

Littlefuse 997 Series time-current specs:
% current || Opening Time min/ max
110% || 360000s / INF
135% || 0.75s / 600sec
200% || 0.15 s/ 5s
350% || 0.080s / 0.250s
600% || 0.030s / 0.100s

RS-232 pass-thru from discharge harness to Ocean Server XP-08SR

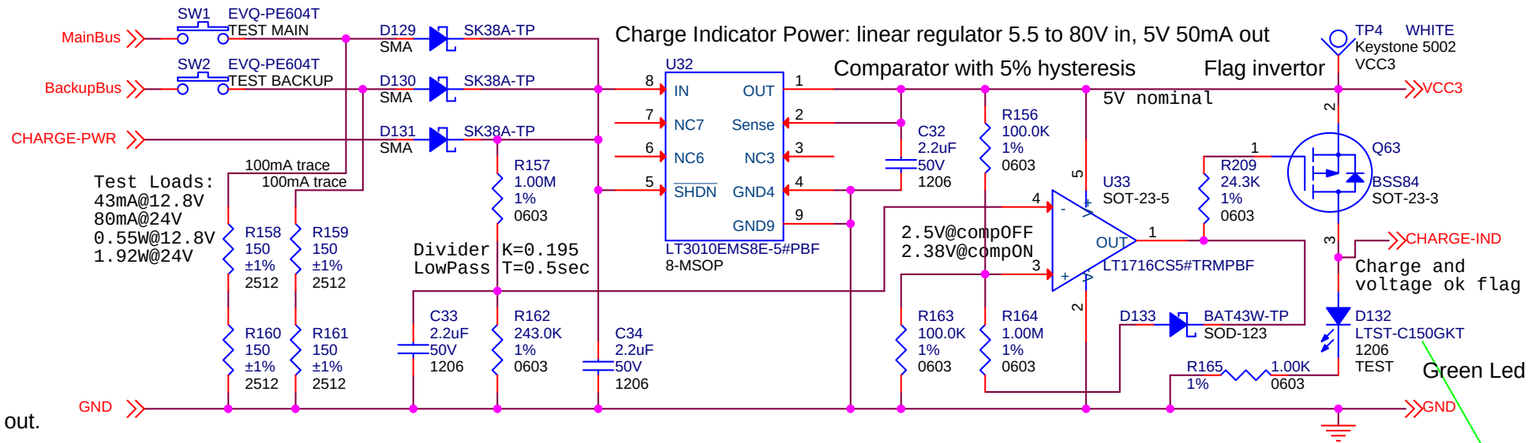
RS-232 port to MB

RS-232 to Ocean Server

Battery bring-up interface

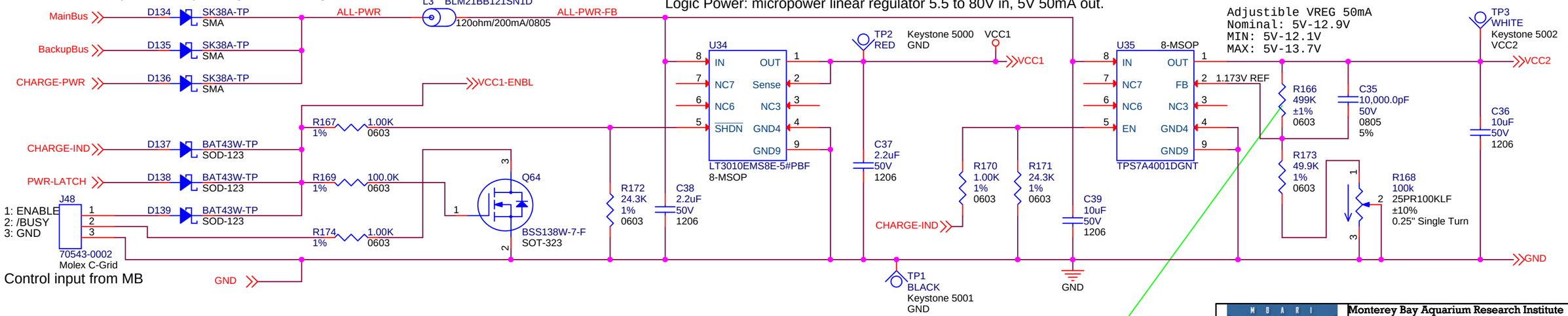
Logic Power: micropower linear regulator 5.5 to 80V in, 5V 50mA out.

If batt. voltage > 12.8V @ 45mA for 0.5sec, OR charge voltage > 12.8V for 0.5sec, LED lights up and scan cycle starts



Any available power generates Logic Power

Logic Power: micropower linear regulator 5.5 to 80V in, 5V 50mA out.



Charging currents required per Half-Pack:
18V: 8A initial, 12A final
20V: 7.9A initial, 11.2A final
22V: 7.2A initial, 10.2A final
24V: 6.6A initial, 9.4A final

Charging time at 24V and full current with cycling loss and top-off:
(6.2 AH x 4 x 2) / 3A x 1.12 x 1.04 = 19.3 hours

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5V power supervisor: 5% tolerance, 1.2s watchdog manul reset and accelearted VCC1 shutdown

RevB

For testing only
hide under cover plate

SW3
EVQ-PE604T
6.00mm x 3.50mm
RESET

U37 SO-8
MIC1232MY TR
PBRST VCC TD ST TOL RST GND RST

R176 2.49K 1% 0603
R177 1.00K 1% 0603
R179 10.0K 1% 0603
R210 1.00K 1% 0603
C43 0.1uF 50V 0805

D140 LTST-C150AKT 1206 RESET

VCC1-ENBL
CHARGE-IND
Q6

SW5
CHS-04TA
100mA SMT
R204 1.00K 1% 0603
R205 1.00K 1% 0603
R206 1.00K 1% 0603
R207 1.00K 1% 0603

D147 1206
LTST-C150TBKT
USER
R211 2.49K 1% 0603

Q1
PRESET

Frequency generator D=50%, T=1.4 RC; C controlled by charge indicator flag

CHARGE-IND
R178 100.0K 1% 0603
C40 0.1uF 50V 0805 ±5%
C41 10,000.0pF 50V 0805 5%
Q65
BSS138W-7-F
SOT-323
R208 100.0K 1% 0603
C42 0.1uF 50V 0805

R175 243.0K 1% 0603
U36 SO-8
ICM7555ISA+
Control Reset Threshold Output Discharge Trigger V+ GND

TP6 WHITE Keystone 5002 CLOCK
CLOCK
TP7 WHITE Keystone 5002 \RESET

VCC1
GND

12 bit Binary Counter 3-18V, 3 MHz, 5uA

CLOCK
R183 1.00K 1% 0603
C44 10,000.0pF 50V 0805 5%
100us filter
C47 0.1uF 50V 0805
PRESET
D141 SOD-123
BAT43W-TP
D142 SOD-123
BAT43W-TP
R187 10.0K 1% 0603

U39 SO-16
CD4040BM96
Vdd Input Pulses Reset Vss
Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10 Q11 Q12

U38D SO-14
CD4001BM96

Decade Counter 3-18V, 5uA with 0.5 ms reset line

C45 10,000.0pF 50V 0805 5%
100us filter
C48 0.1uF 50V 0805
R188 10.0K 1% 0603

U40 SO-16
MC14017BDR2G
VDD CLOCK CE RESET VSS
Q0 Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Cout

R180 1.00K 1% 0603
R181 1.00K 1% 0603
R184 1.00K 1% 0603
R185 1.00K 1% 0603
CNT-Q4
CTR-B1
CTR-B2
CTR-B3
CTR-B4

R189 24.3K 1% 0603
R190 24.3K 1% 0603
R191 24.3K 1% 0603
R192 24.3K 1% 0603

Monostable multivibratorfor to reset counter and latch 5V power

U38E SO-14
CD4001BM96
Vcc Gnd
C46 0.1uF 50V 0805
R182 1.00M 1% 0603

U38C SO-14
CD4001BM96
PWR-LATCH
TP5 WHITE Keystone 5002 END-CYCLE

U38A SO-14
CD4001BM96
C49 0.1uF 50V 0805
R186 1.00K 1% 0603
U38B SO-14
CD4001BM96
END-CYCLE

LED active bank indicator

RevB

CHARGE-IND
R193 100.0K 1% 0603
CTR-B1
CTR-B2
CTR-B3
CTR-B4

U42A SO-8
U42B SO-8
U42C SO-8
U42D SO-8
CD4011BPWR

R195 1.00K 1% 0603
R198 1.00K 1% 0603
R200 1.00K 1% 0603
R203 1.00K 1% 0603

D143 1206 LTST-C150AKT CTR-B1
D144 1206 LTST-C150AKT CTR-B2
D145 1206 LTST-C150AKT CTR-B3
D146 1206 LTST-C150AKT CTR-B4

C54 0.1uF 50V 0805
U42E SO-14
CD4011BPWR
VDD VSS

RevB

U41A SO-8
U41B SO-8
U41C SO-8
U41D SO-8
U41E SO-8
CD4011BPWR

C52 0.1uF 50V 0805
R194 1.00M 1% 0603
R196 1.00K 1% 0603
R197 100.0K 1% 0603
R201 24.3K 1% 0603
R202 100.0K 1% 0603

C51 0.1uF 50V 0805

C53 4700.0pF 50V 0805
C55 680pF 100V 0805
C56 1500pF/ 0805 100V 0805
C57 4700.0pF 50V 0805
C58 6800pF / 0805 100V 0805
SW4
CHS-04TA
100mA SMT

3520.00 Need:
3135.96 680 pF
2793.83 1500 pF
2217.46 4700 pF
1396.91 6800 pF

R199 243.0K 1% 0603

VCC2
C50 2.2uF 50V 1206
U43 SO-8
TC4428ACOA
NC1 NC2 IN A OUT A GND VDD IN B OUT B

BZ1 CMT-1604-SMT-TR 16 mm SMT
BZ2 CMT-1604-SMT-TR 16 mm SMT
BZ-A
BZ-B

RevB

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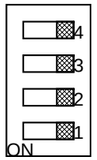
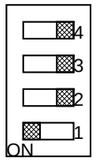
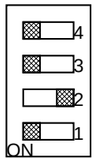
SW5 – multifunctional DIP switch, affects indication of D147 and operating modes based on interconnection of signals
D147, User selectable LED function indicates any or all of following signals:
Bit 4: VCC1, +5V logic power
Bit 3: VCC1 Enable, activates Fast Scan (14 sec/bank, 58 sec total)
Bit 2: Charge Indicator, enables Slow (150 sec/ bank, 10 min total for 4 banks), and all indicator LEDs active
Bit 1: "Hearthbeat" counter data line Q6, flashes 5 times per sec in Fast Scan or 1 per 2.4 sec in Slow Scan mode



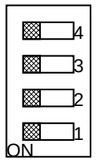
Default configuration
Preferred MB3.0 DEPLOYMENT CONFIGURATION
Slow (150 x4 sec) bank scan in charge mode
Fast (15 x4 sec) in external Enable mode
Once scan started, runs thru banks, then shutdown
LEDs and Beginning-Of-Scan-Beep enabled in Charge Mode



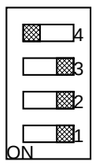
Preferred configuration in the lab, with external Enable signal from MB
Once scan is triggered, it will be finished and go in shutdown
D147 "hearthbit" active indicating active scan process
Rate of blinking indicate slow of fast scan mode.



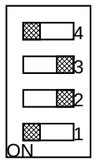
Continous Fast scan without need for external Enable signal
Charge Mode (Vin >13V) enables LEDs and audio indicators
Heartbit LED always active indicating scan process
Rate of blinking indicates slow or fast charge



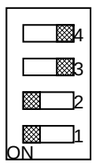
Continous Slow scan without need for external Enable Signal or Charge Voltage >13V
Essentially the same as continous charge mode but without connected charge box
All LEDs and audio indicators enabled
Heartbit LED always active indicating scan process
Rate of blinking (1 in 2.4 sec) indicates Slow scan



Bring-up and debugging mode
"VCC1 Power"
D147 indicates presence of VCC1 logic power and thus active scan process

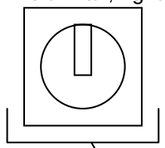


Bring-up and debugging mode
"Faint Hearthbeat"
D147 indicates sum of Q6 data line and logical power

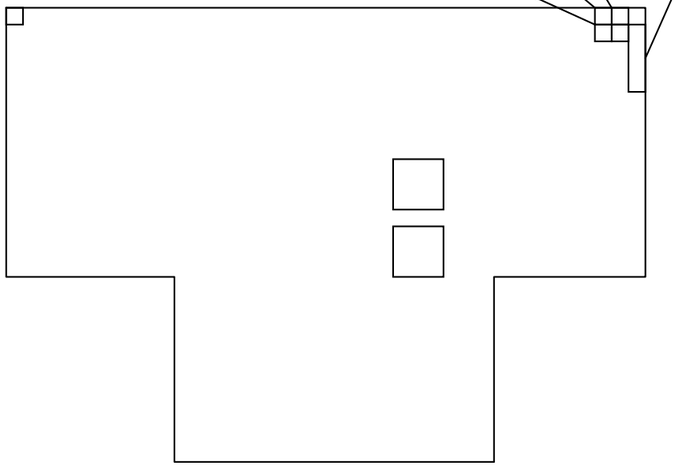


Bring-up and debugging mode
Intermediate scan rate by external enable from MB
By coupling Q6 to Charge Indicator, half of counter time is accelerated to Fast mode
Switch time: 150 sec/ 2 + 14sec /2 = 82 sec per bank
Presense of charge voltage >13V activates normal slow Charge Mode

Audio indicator volume
left- max, right - min



Main and backup Battery Test Pushbuttons
Push and Hold. If battery voltage >13V:
D132 lights up green while button is hold
D140 lights up for 0.6 sec then scan starts



LED Indicators upper right corner of the board

- D143 ORANGE BANK 1
- D144 ORANGE BANK 2
- D145 ORANGE BANK 3
- D146 ORANGE BANK 4
- D132 Green Battery Test / Charge Mode
- D140 ORANGE Reset mode
- D147 BLUE User / miltifunctional

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