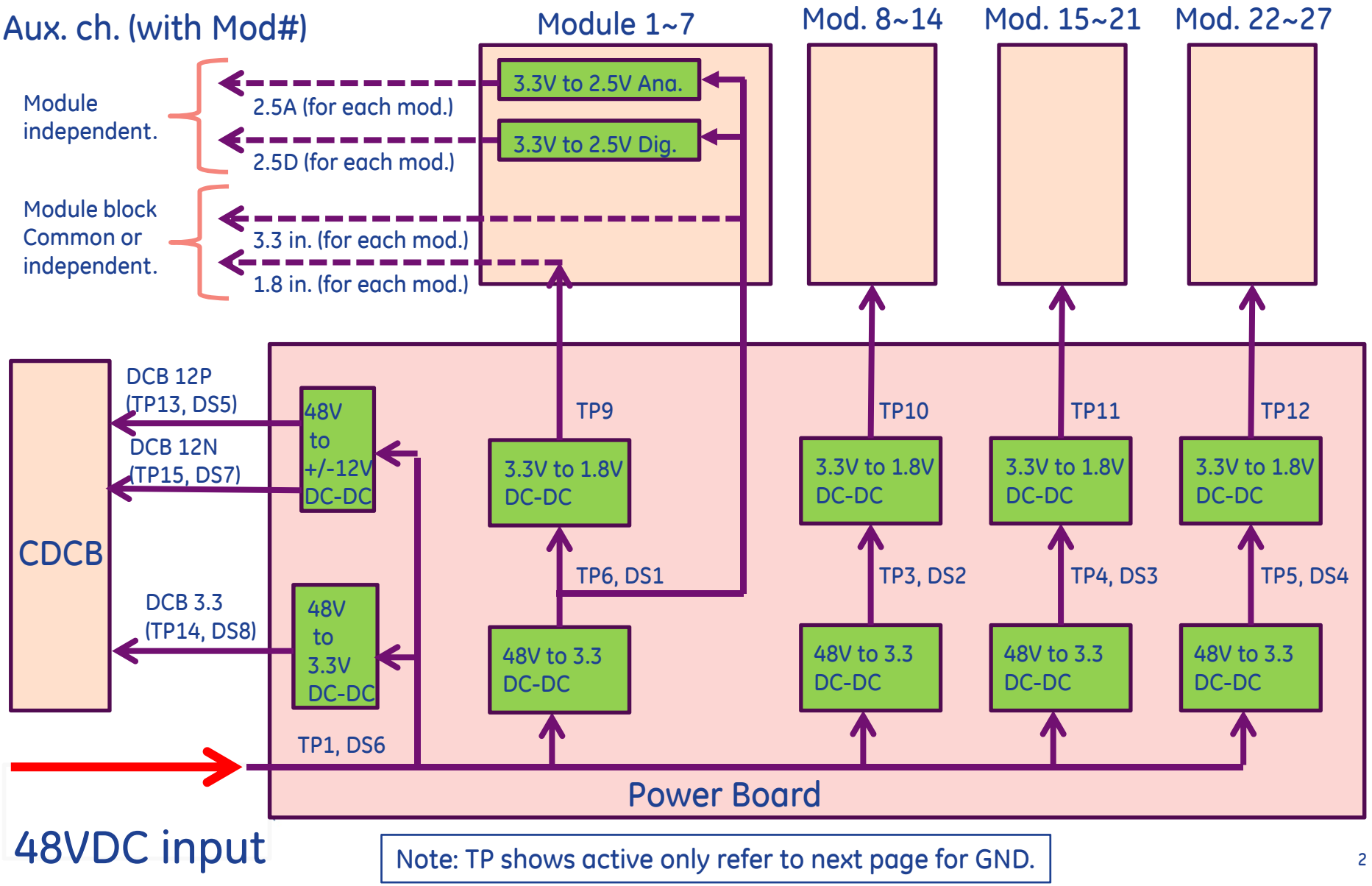
Merc40 Power distribution and monitoring

Troubleshooting guide

H. Miyajima
Hino CT Eng.

Block Diagram



Note: TP shows active only refer to next page for GND.

Troubleshooting

Power Board (PB) Failure Isolation.

Run DAS Tool with Aux. channel.

If failure found on 2.5V Digital or 2.5V Analog, PB is normal. Focus on module # in `ssw.dastools.hist`

If failure found on 3.3V or 1.8V, check if the error is found multiple module or single module. If single, focus on module# in .hist.
If multiple, check if the modules are block of 1~7, 8~15, 16~21 or 22~27. If so, PB is defective.

If error is found on P12, N12 or DCB3.3, PB is defective. If all of them are out of spec., check 48VDC power cable connector or CDCB connector to Back plane.

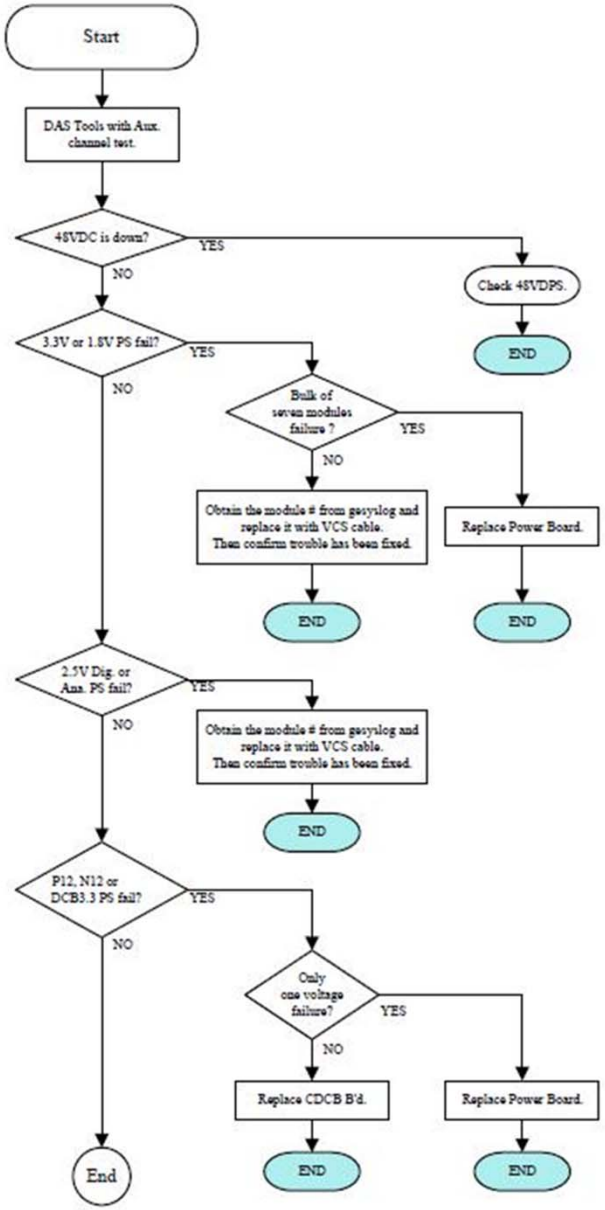
To determine PB failure, the following check is also required.
a.) Bulk of 7 modules were lost in QIF tool. (i.e. 8~15 modules were lost).
b.) LED is NOT lit at Power Board. (DS1 ~ 8)

Next page shows example of log.

Troubleshooting

Power failure
Isolation flowchart.

Refer to separate PDF file. for more clear one.



imagination at work

Troubleshooting

Example:

```
Tue Nov 25 15:09:34 2014          dastools >>> Power Supply Voltages <<<
Tue Nov 25 15:09:34 2014          dastools    DCB                Low      High     Actual   Result
Tue Nov 25 15:09:34 2014          dastools                       Spec     Spec     Value
Tue Nov 25 15:09:34 2014          dastools    VCS                Low      High     Actual   Result
Tue Nov 25 15:09:34 2014          dastools                       Spec     Spec     Value
Tue Nov 25 15:09:34 2014          dastools +2.5_DIG_Mod(11)      2.30     2.70     1.81     FAIL
```

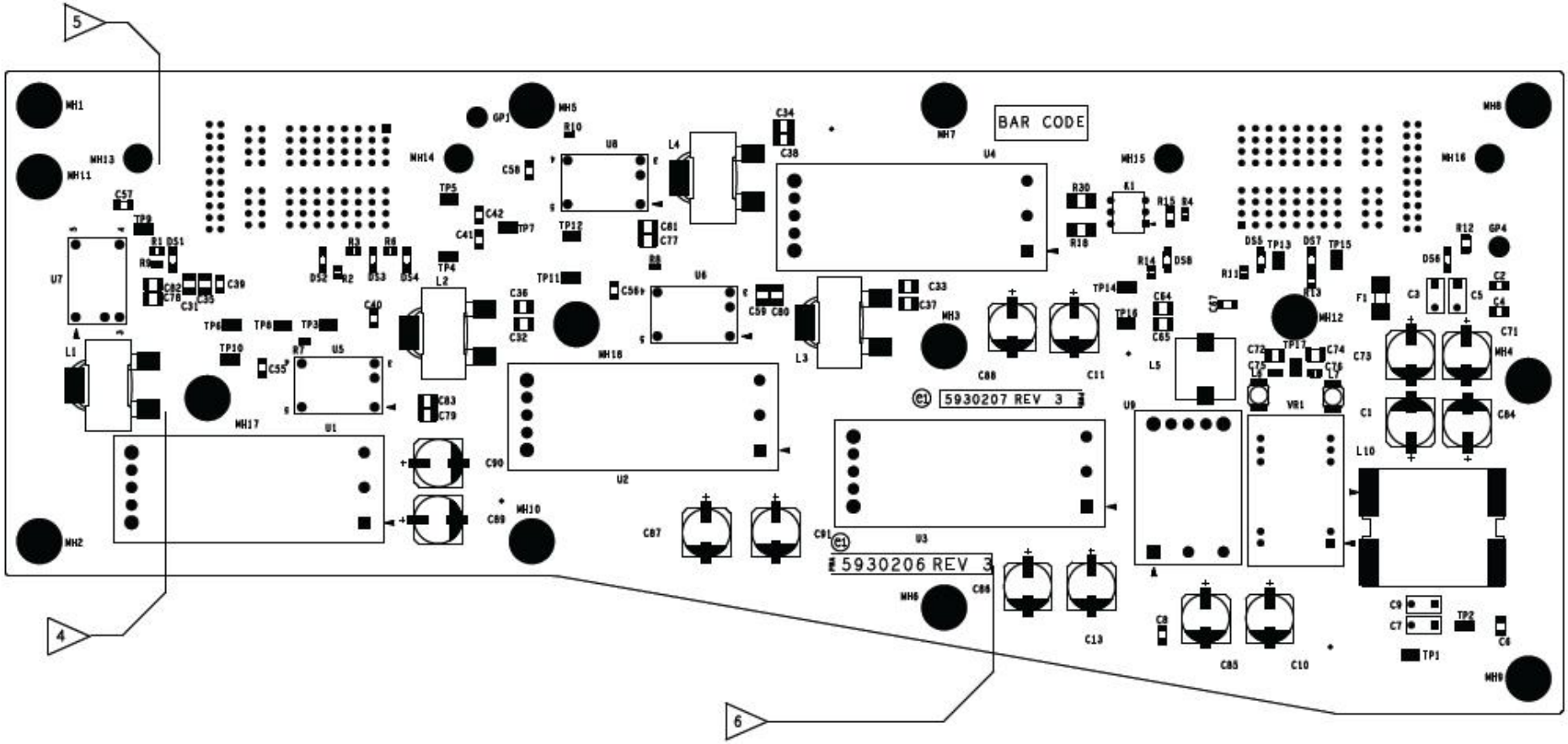
In this case, identifier shows +2.5_DIG_Mod(11). That means +2.5V Digital voltage from Module #11. From Table in page 4, that is generated within module, then Power Board has no issue,. but Module #11 has defect.

Sometimes DAS Tool will fail at Mod#1. (HCSDM00376377), that issue will be fixed on SP2.2 release.

TP and DS mapping (Table)

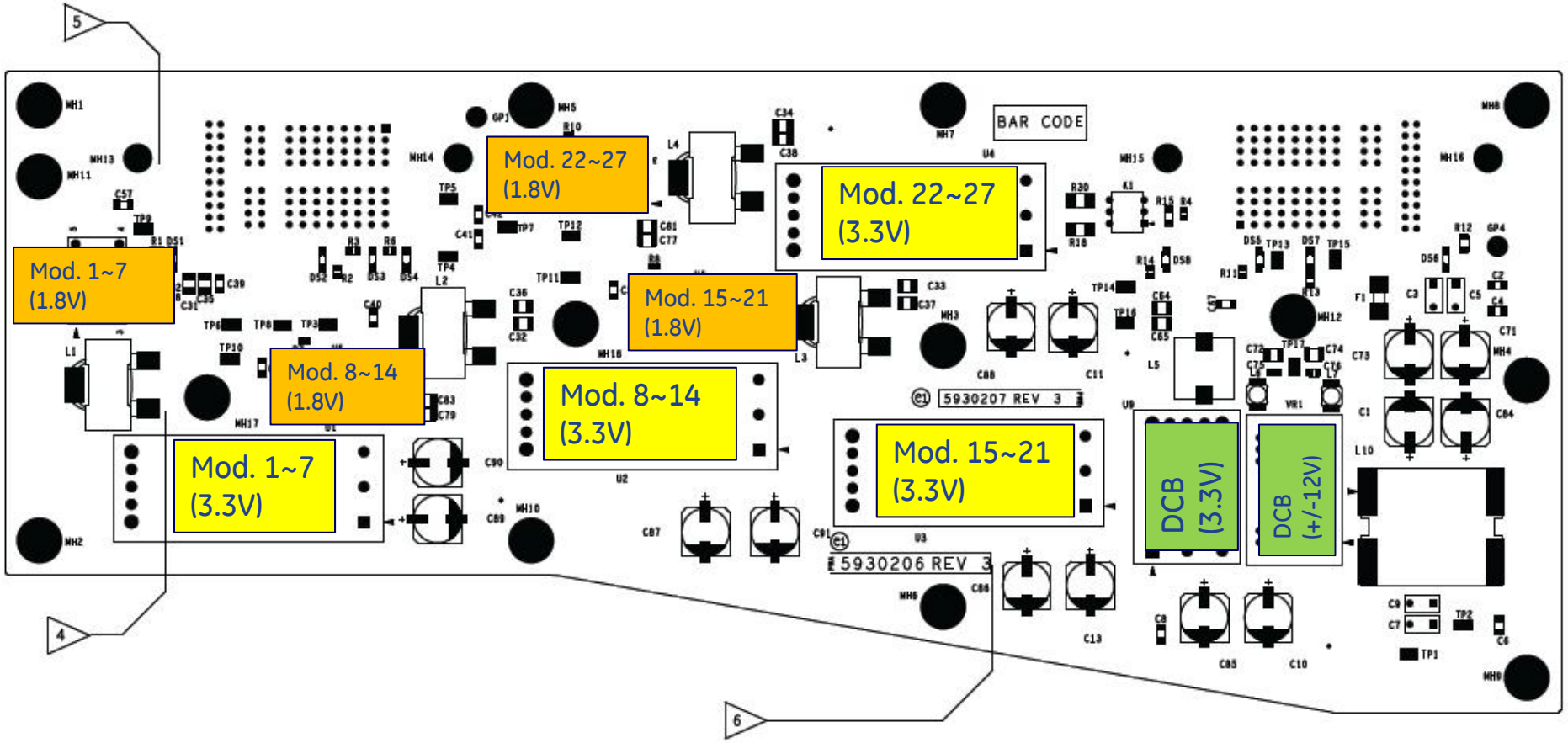
Reference	Test Point	GND TP	Spec.	LED
Source Input	TP1 (P48V)	TP2	48V ±10% (43.2~52.8)	DS6
Modulde 1-7	TP6 (3V3_1)	TP8	3.3V ±1.5% (3.25~3.35)	DS1
	TP9 (1V8_1)		1.8V ±3% (1.74~1.86)	
Module 8-14	TP3 (3V3_2)		3.3V ±1.5% (3.25~3.35)	DS2
	TP10 (1V8_1)		1.8V ±3% (1.74~1.86)	
Module 15-21	TP4 (3V3_3)	TP7	3.3V ±1.5% (3.25~3.35)	DS3
	TP11 (1V8_1)		1.8V ±3% (1.74~1.86)	
Module 22-27	TP5 (3V3_4)		3.3V ±1.5% (3.25~3.35)	DS4
	TP12 (1V8_1)		1.8V ±3% (1.74~1.86)	
DCB	TP14 (DCB3V3)	TP16	3.46V ± 5%(3.28~3.64)	DS8
	TP13 (P12V)	TP17	12V ± 4% (11.52~12.48)	DS5
	TP15 (N12V)		-12V ± 4% (11.52~12.48)	DS7

DC-DC Location on PB (bare)



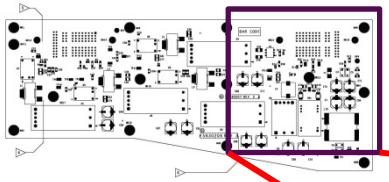
imagination at work

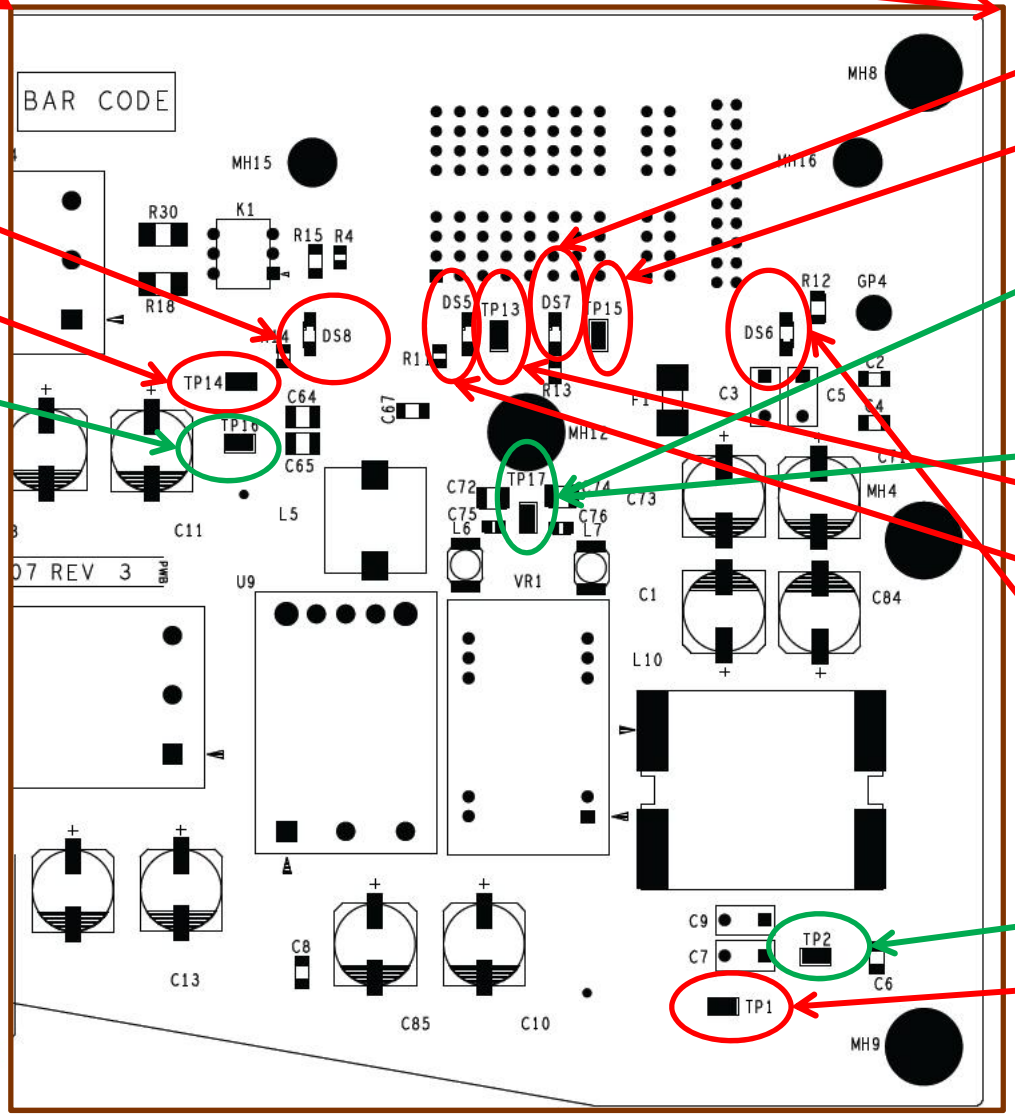
DC-DC Location on PB



imagination at work

TP and DS location (CDCB side).





DCB 3.3V

- DCB 3.3V (DS8)
- DCB 3.3V
- DCB 3.3V (GND)

DCB N12V

- DCB N12V (DS7)
- DCB N12V (TP15)
- DCB N12V (GND)

DCB P12V

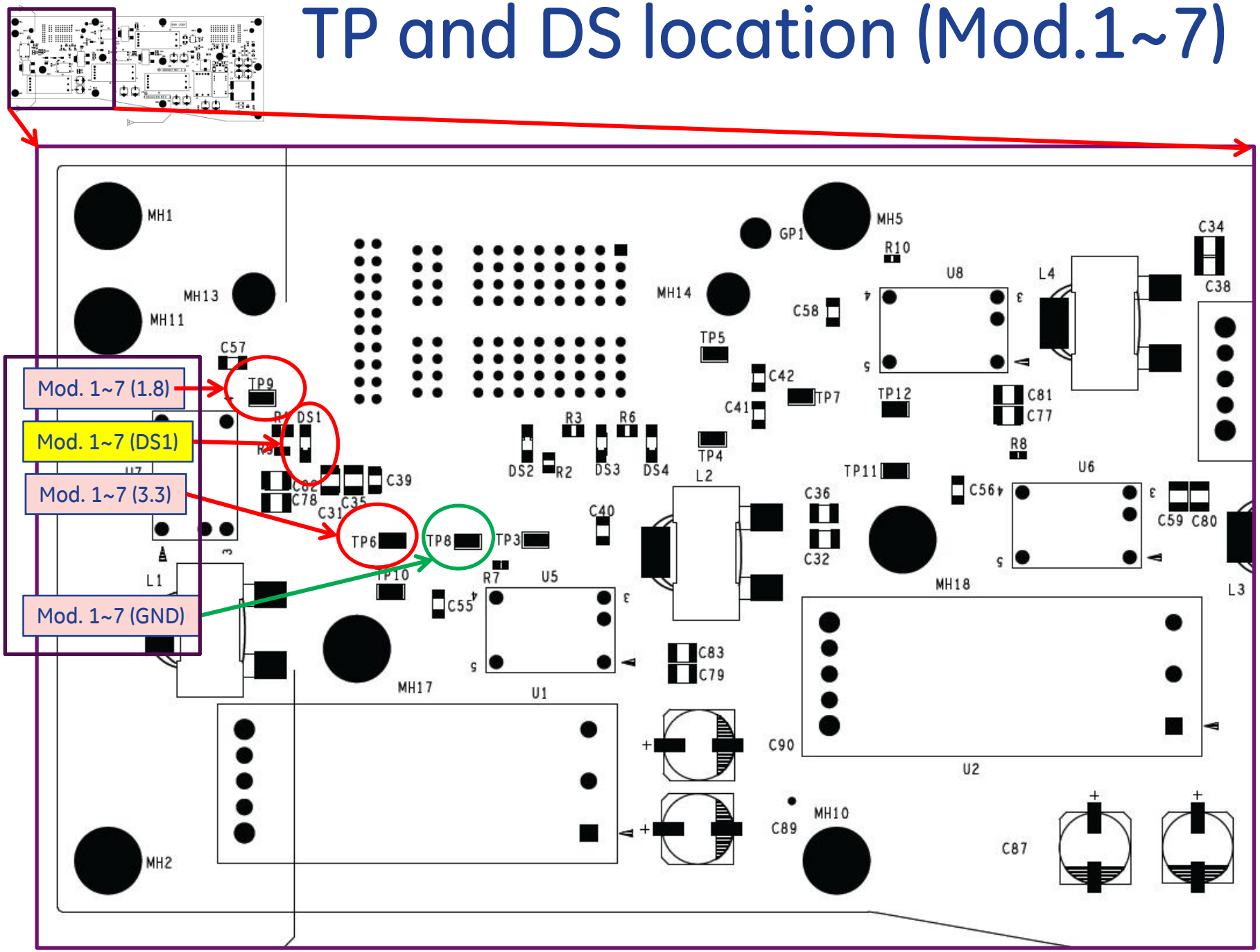
- DCB P12V (GND)
- DCB P12V (TP13)
- DCB P12V (DS5)

48V In

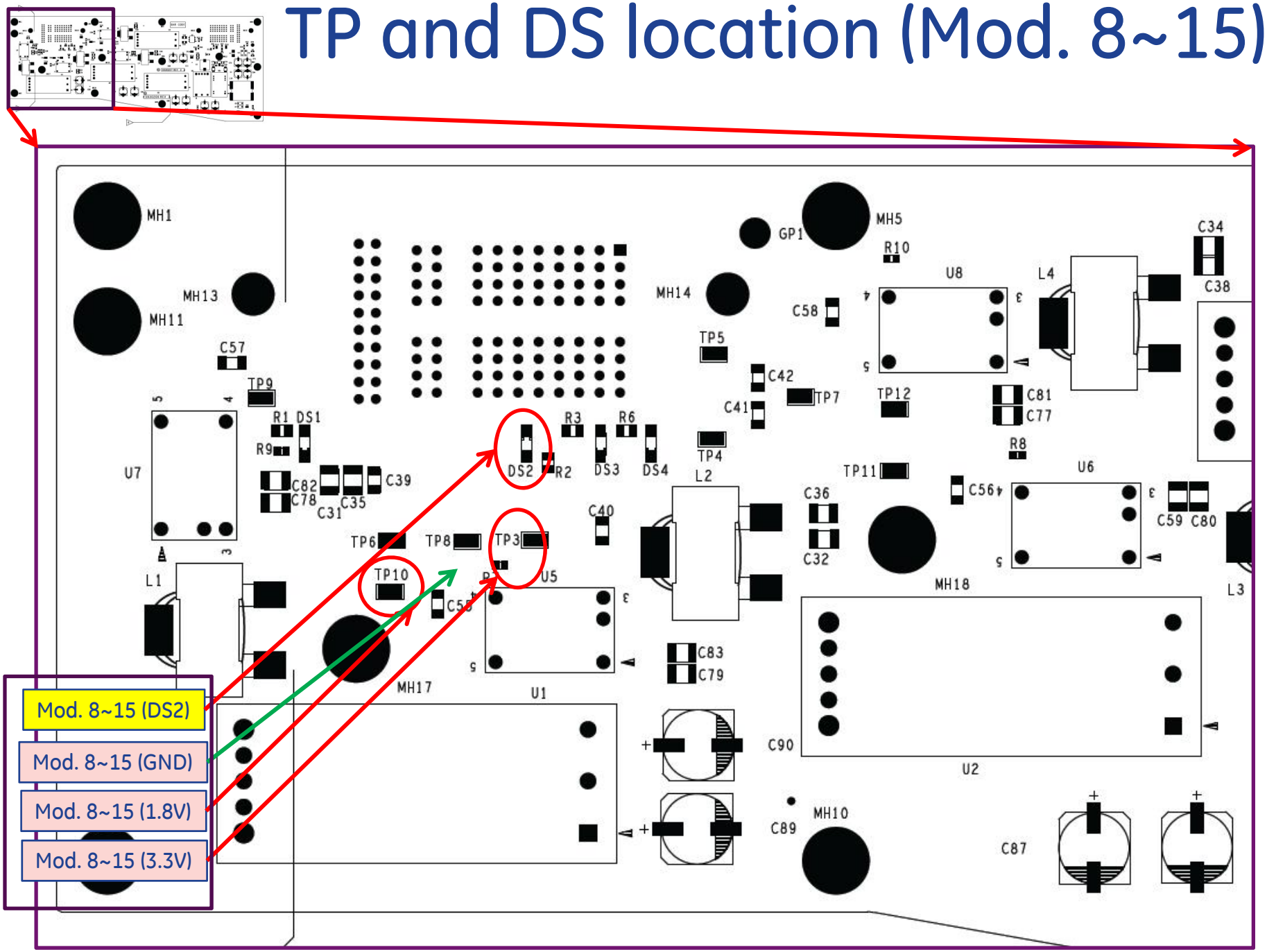
- 48V In (DS6)
- 48V In (GND)
- 48V In

imagination at work

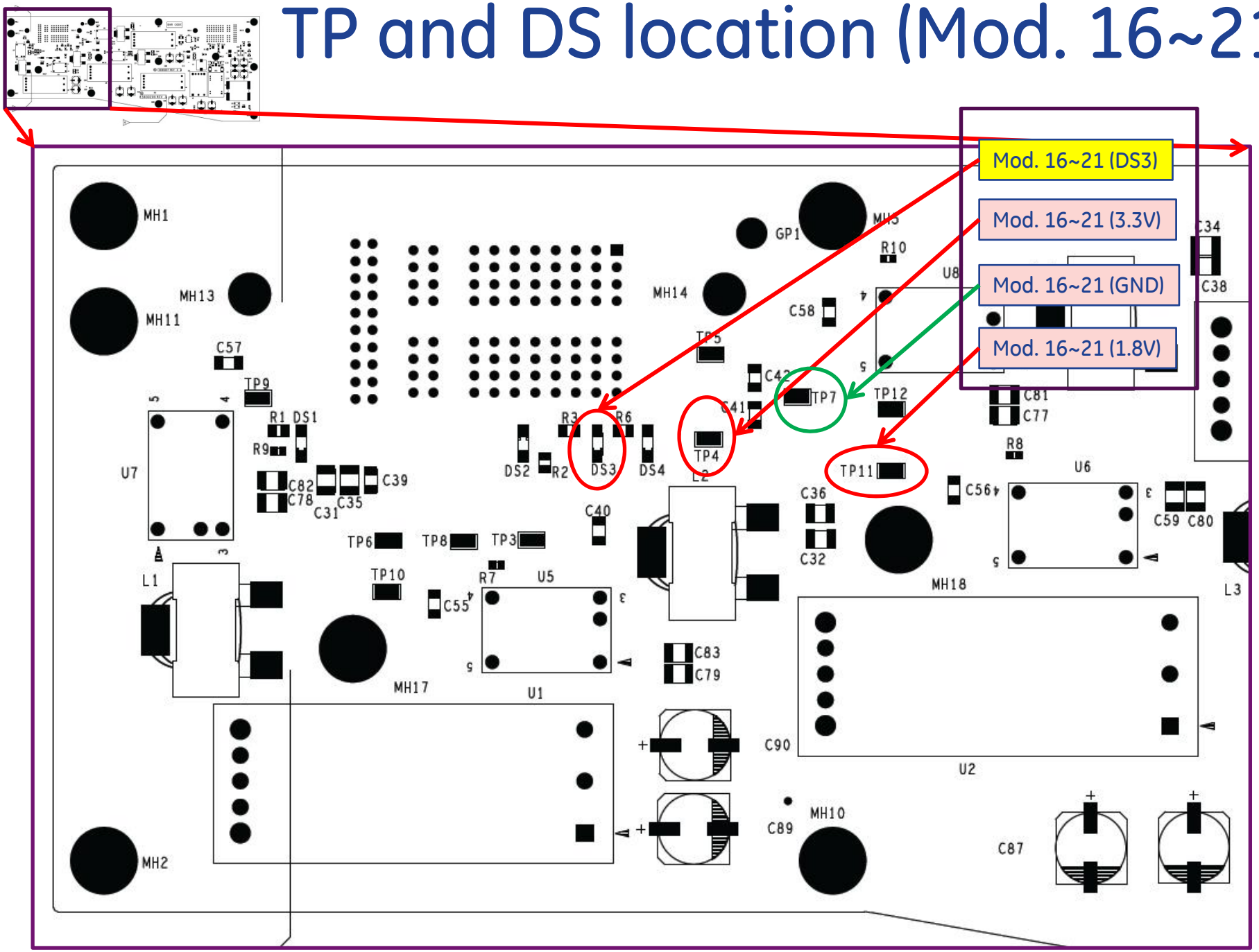
TP and DS location (Mod.1~7)



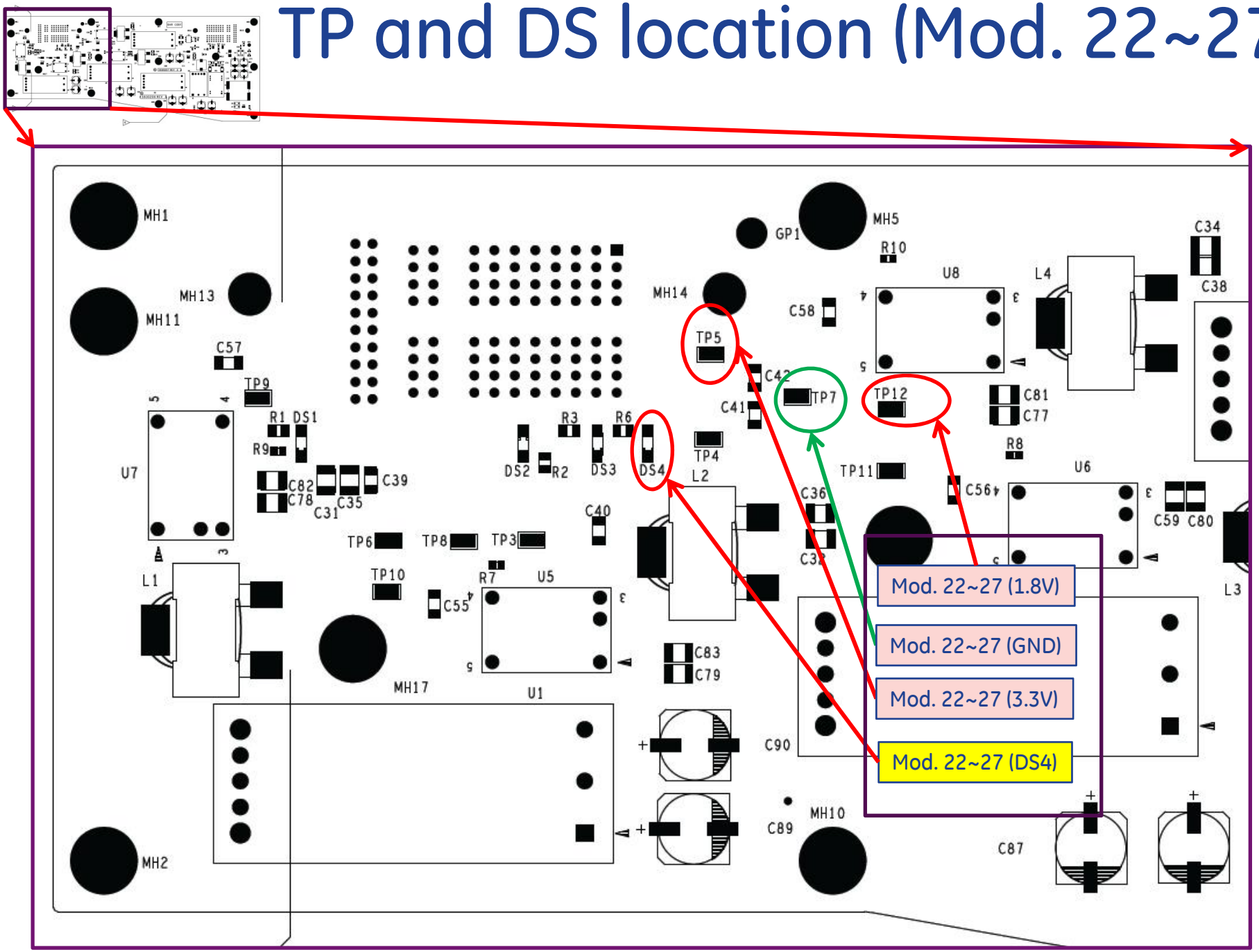
TP and DS location (Mod. 8~15)



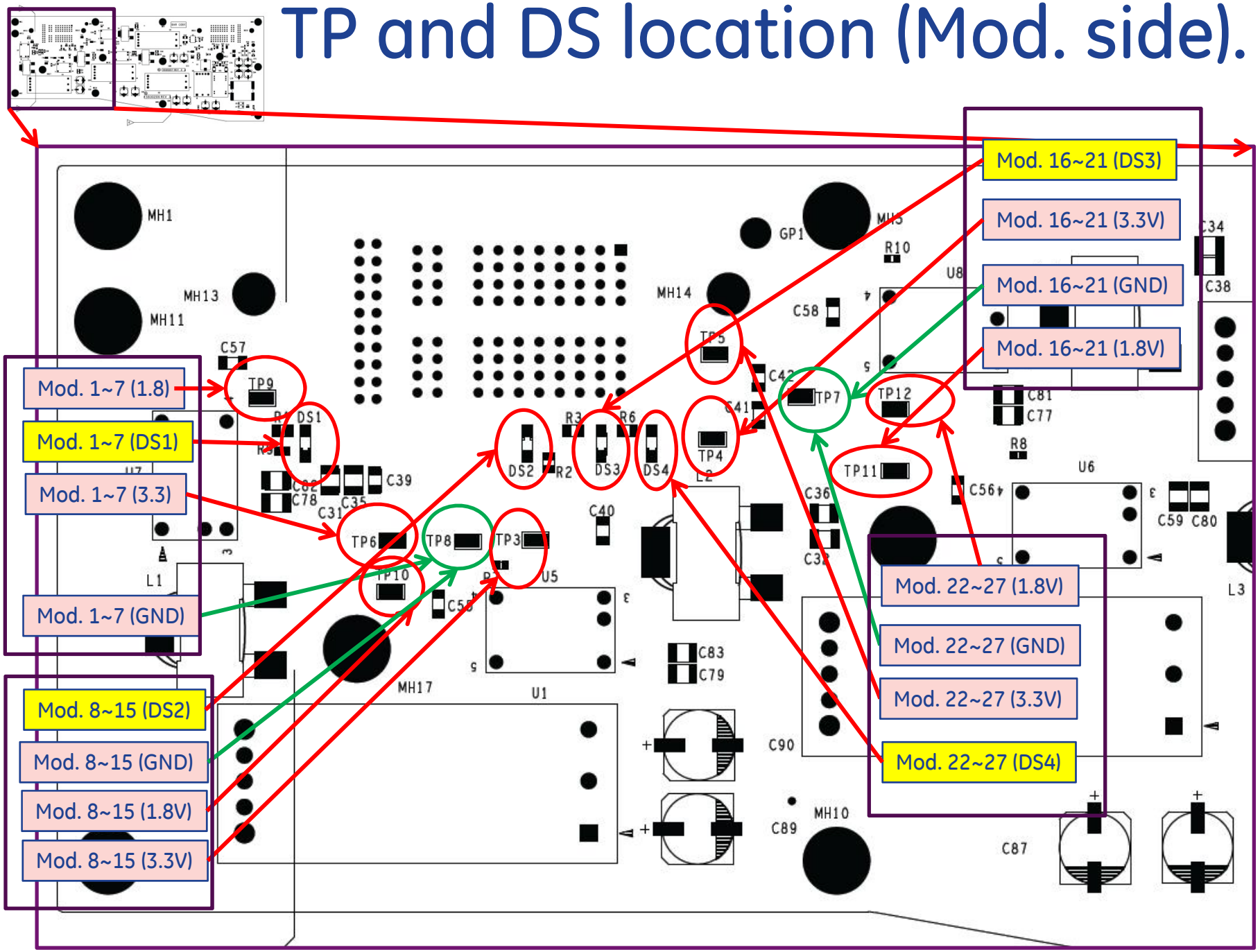
TP and DS location (Mod. 16~21)



TP and DS location (Mod. 22~27)



TP and DS location (Mod. side).



Next:
FRDM Module Troubleshooting

Power Board (PB) Failure Isolation has been done now.

Then FRDM shall be defective and need to confirm if the module number in gesyslog is correct before module replacement.
(The scenario is assumed that the issue is permanent)

The following shows an example of Module # message in gesyslog.

```
Error : 230007004      4
ct01 badchanmgr
/vobs/iungo_steps/cal/steps/DetectBadChan        762
Exclusion Test - Row 32:1A, Channel 432, Module 27 Short to ground* FAILED X-AXI
S EXCLUSION CRITERIA *.
```

imagination at work

Method

There are some methods to confirm defect.

A) Known Software issue (This is NOT hardware issue).
B) DAS Tools.
C) Module swap.

(a) Known software issue 1/2.

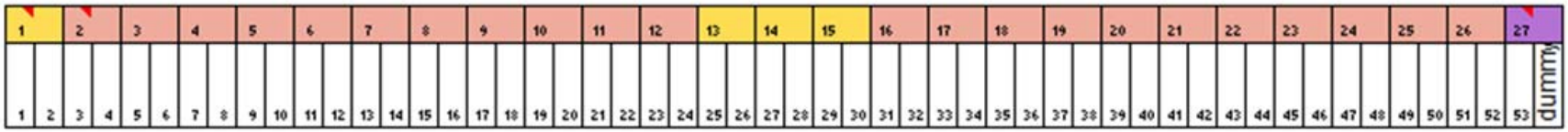
Known issue about Module# in gesyslog .

Software version: 13HW38.14 SP2.2 or older for Optima CT660 M40.
Software version: 14HW17.4 for Revolution EVO.

Detector Module# information on gesyslog shows wrong module # information. It's correct on other Tools. Because the module# calculation for gesyslog uses not module # but Chiclet #.
The following is example of gesyslog. The physical module# is 14 in this case.

Error : 230007004 4
ct01 badchanmgr
/vobs/iungo_steps/cal/steps/DetectBadChan 762
Exclusion Test - Row 32:1A, Channel 432, **Module 27** Short to ground* FAILED X-AXI
S EXCLUSION CRITERIA *.

This issue has already been fixed on 15HW13.7



imagination at work

(a) Known software issue 2/2.

Known issue as the followings (Service Note was released as SN1655244).

Software version: 13HW38.14

Reference spr#: HCSDM00322982.
mA Ratio test on DAS Tool sometimes fails due to software issue, and this issue is affected on Module#1 only.

Solution: Ignore the result if FastCal passed.

This issue has already been fixed on 13HW38.14 SP2.2

(b) DAS Tools.

There is no Merc40 unique technique compare to previous Detector Troubleshooting (Sherlock, HALO, Saturn) regarding DAS Tools.

QIF Visualization Tool may be useful for visual finding.

(c) Module Swap.

Swap the module temporarily and confirm if the module # in gesyslog moves to another.

This method requires to align module position and full calibration even if module is NOT defective. This is disadvantage.

End.