Torino Fairlane FTx12 RevB Loadboard Troubleshooting

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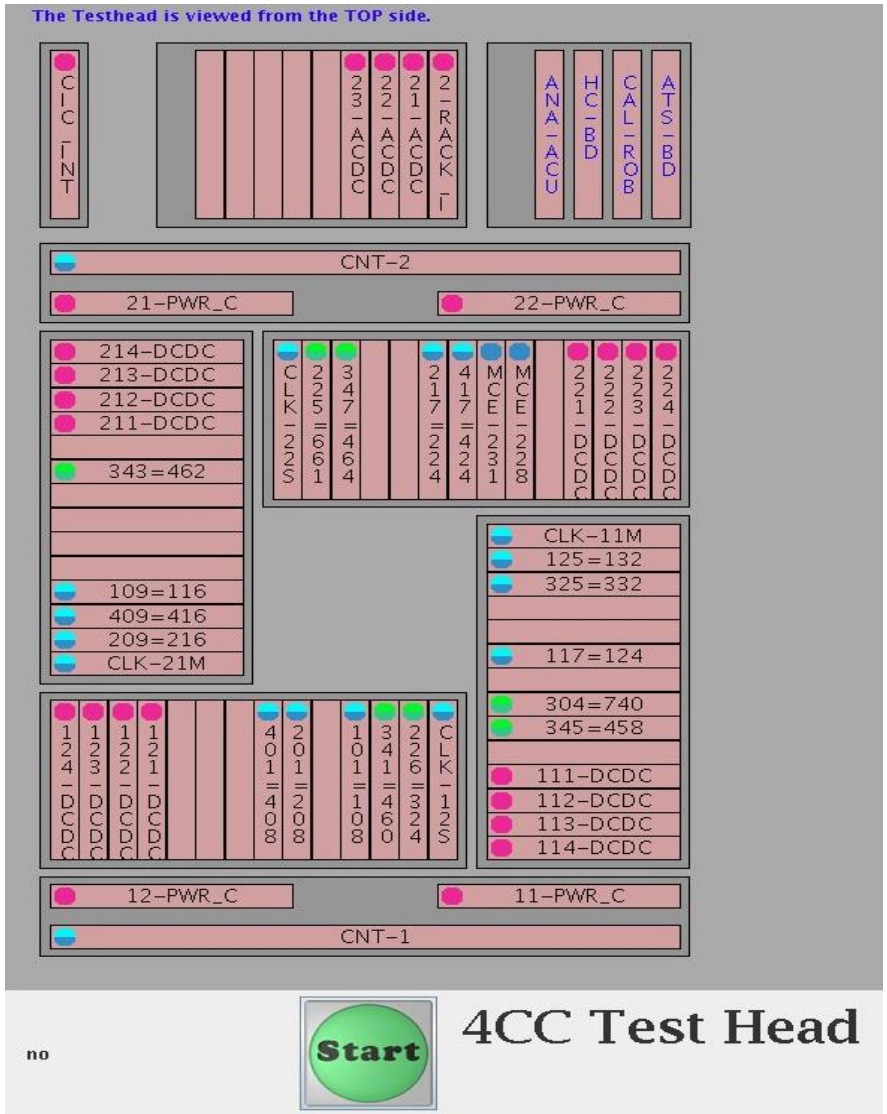
CONFIDENTIAL

PRELIMINARY

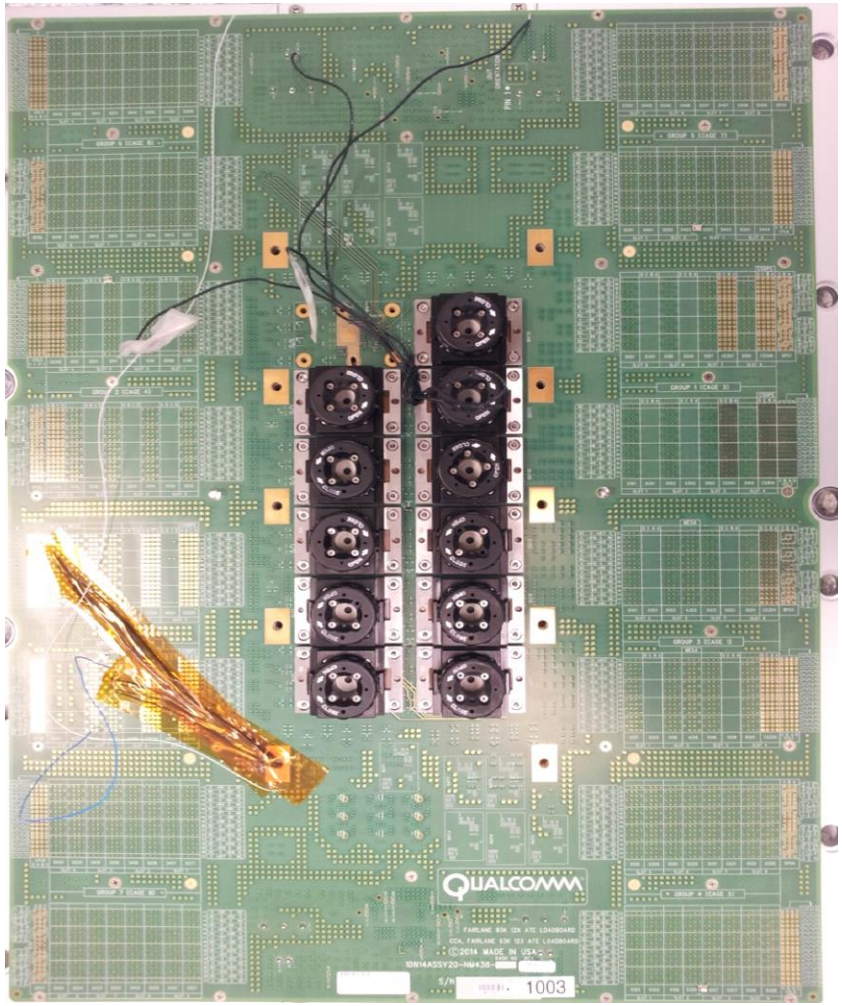
System Config And Loadboard

ADVANTEST

Jumbu Tester Config layout

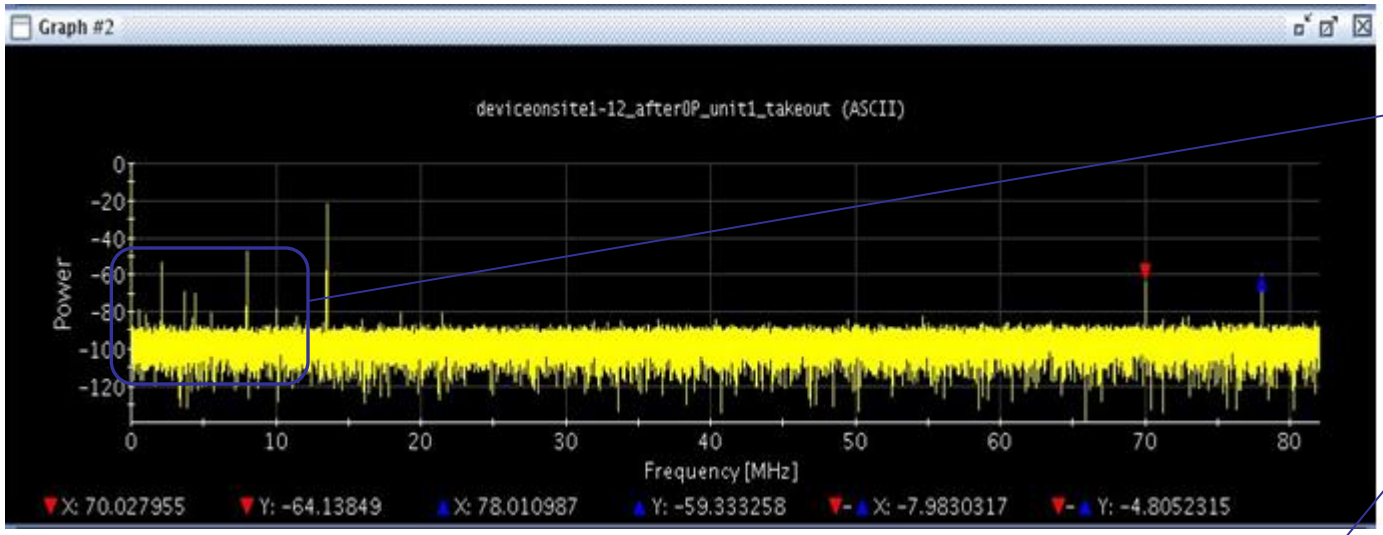


Fairlane FTx12 RevB Loadboard



GNSS SNR Fail On Jumbu

Waveform Spectrums are captured on Jambu.

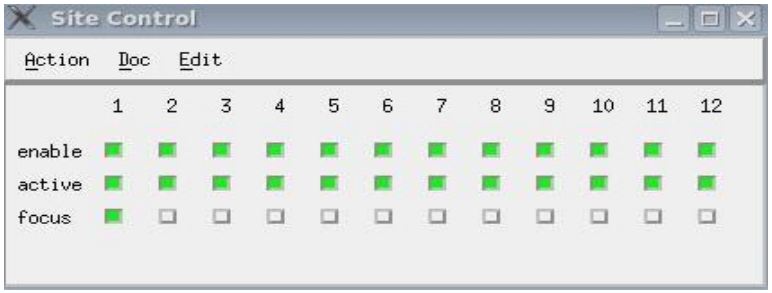


Spectrums captured on Jambu shows some spurs between DC to tone, which cause the GNSS SNR test fail.

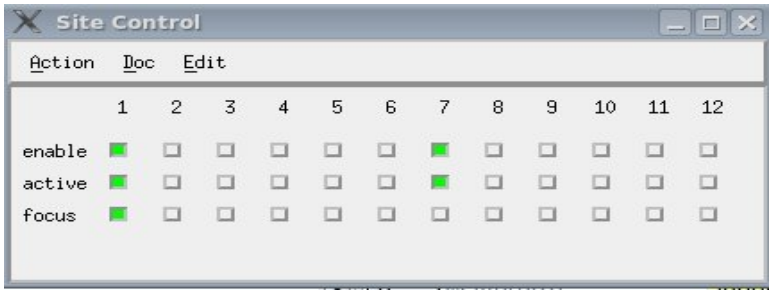
```
test=AN_GNSS_MODE5_SE_SNR_13p5Mhz_0p55_LV_SNR_I, pin=, testNum=302022700, site=1, limit=[37.000000 <= x <= 150.000000], x=25.615176 dB, overon=true, softbin=3310, result=FAIL
test=AN_GNSS_MODE5_SE_SNR_13p5Mhz_0p55_LV_SNR_Q, pin=, testNum=302022800, site=1, limit=[37.000000 <= x <= 150.000000], x=25.582040 dB, overon=true, softbin=3310, result=FAIL
test=AN_GNSS_MODE5_SE_SNR_13p5Mhz_0p55_LV_SIG_PWR_I, pin=, testNum=302022900, site=1, limit=[0.000000 <= x <= 250.000000], x=199.484903 mVrms, overon=true, softbin=3310, result=PASS
test=AN_GNSS_MODE5_SE_SNR_13p5Mhz_0p55_LV_SIG_PWR_Q, pin=, testNum=302023000, site=1, limit=[0.000000 <= x <= 250.000000], x=199.766200 mVrms, overon=true, softbin=3310, result=PASS
test=AN_GNSS_MODE5_SE_SNR_13p5Mhz_0p55_LV_SIG_PWR_I_dB, pin=, testNum=302023100, site=1, limit=[0.000000 <= x <= 100.000000], x=45.998201 dBmV, overon=true, softbin=3310, result=PASS
test=AN_GNSS_MODE5_SE_SNR_13p5Mhz_0p55_LV_SIG_PWR_Q_dB, pin=, testNum=302023200, site=1, limit=[0.000000 <= x <= 100.000000], x=46.010440 dBmV, overon=true, softbin=3310, result=PASS
test=AN_GNSS_MODE5_SE_SNR_13p5Mhz_0p55_LV_PHASE_MISMATCH, pin=, testNum=302023300, site=1, limit=[-999.000000 <= x <= 999.000000], x=-0.222157 Deg, overon=true, softbin=3310, result=PASS
test=AN_GNSS_MODE5_SE_SNR_13p5Mhz_0p55_LV_MAG_MISMATCH, pin=, testNum=302023400, site=1, limit=[-3.000000 <= x <= 3.000000], x=-0.012239 dB, overon=true, softbin=3310, result=PASS
test=AN_GNSS_MODE5_SE_SNR_13p5Mhz_0p55_LV_RSSB, pin=, testNum=302023500, site=1, limit=[25.000000 <= x <= 999.000000], x=53.700322 dB, overon=true, softbin=3310, result=PASS
```

GNSS SNR Testing On Yuzu

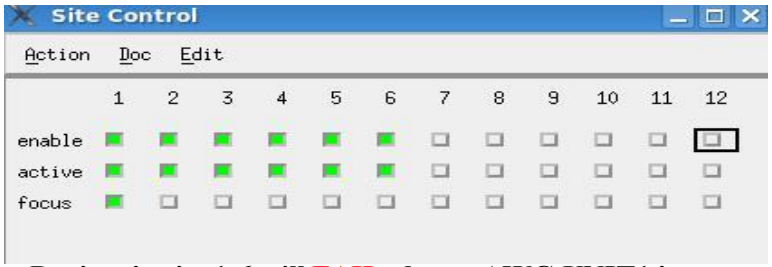
Assume 12 sites are all good devices.



Devices in site 1-12 will PASS, due to AWG UNIT1 and UNIT3 is activated.

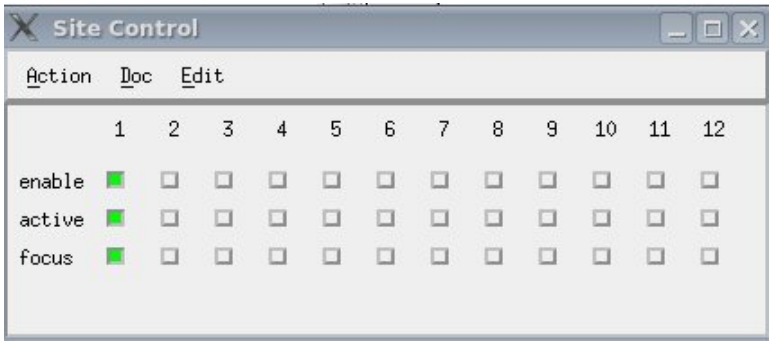


Devices in site 1 and site 7 will PASS, due to AWG UNIT1 and UNIT3 is activated.

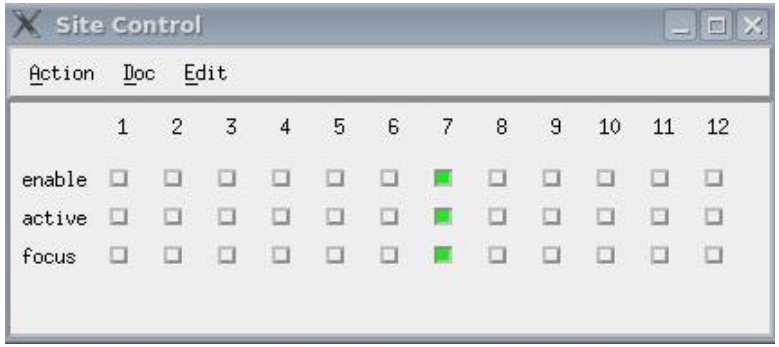


Devices in site 1-6 will FAIL, due to AWG UNIT1 is activated, but UNIT3 is not activated.

Devices in site 7-12 will FAIL, due to AWG UNIT3 is activated, but UNIT1 is not activated.

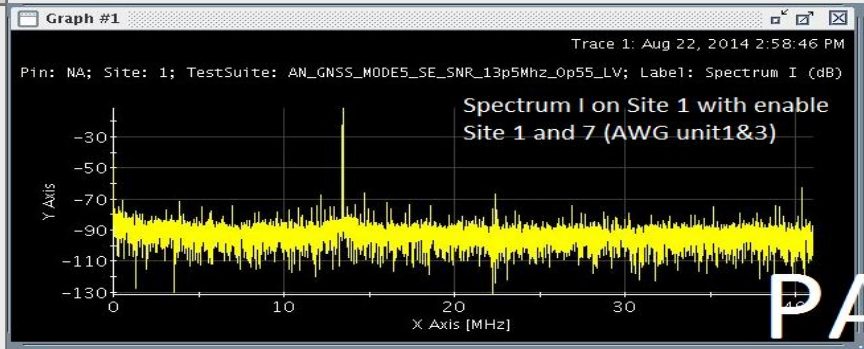


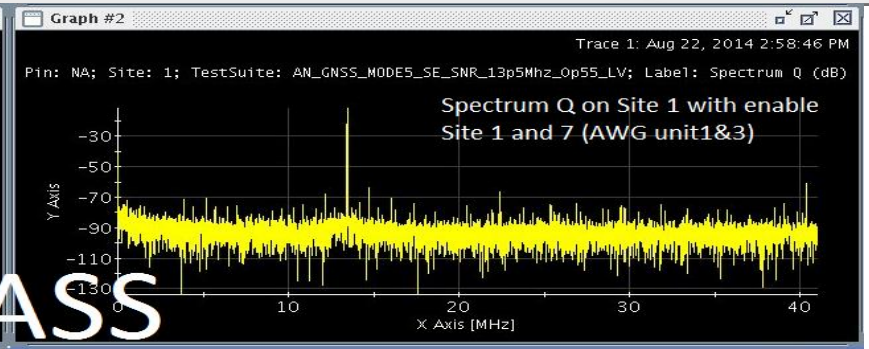
Devices in site 1 will FAIL, due to AWG UNIT1 is activated, but UNIT3 is not activated.



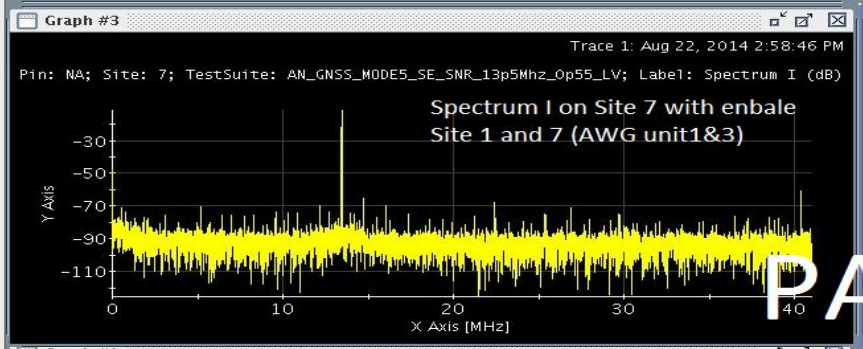
Devices in site 7 will FAIL, due to AWG UNIT3 is activated, but UNIT1 is not activated.

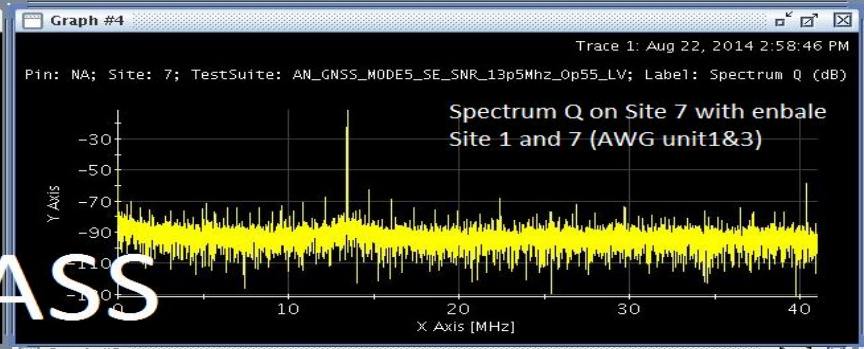
GNSS SNR Testing On Yuzu



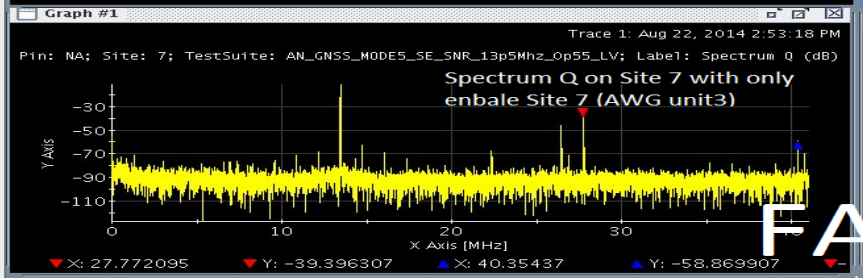


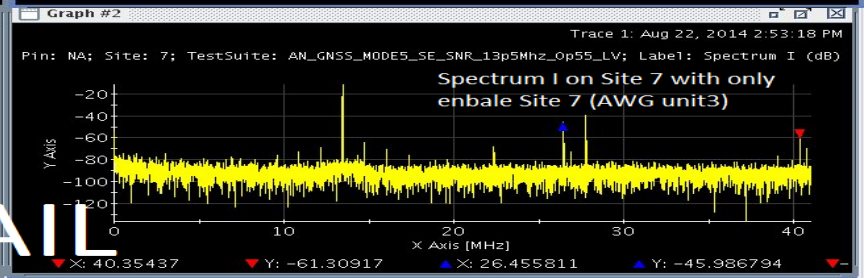
PASS



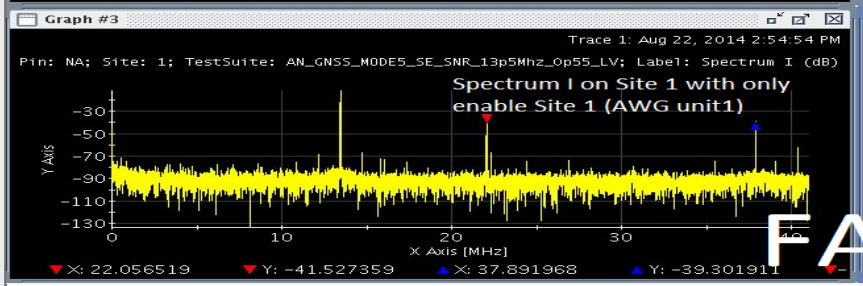


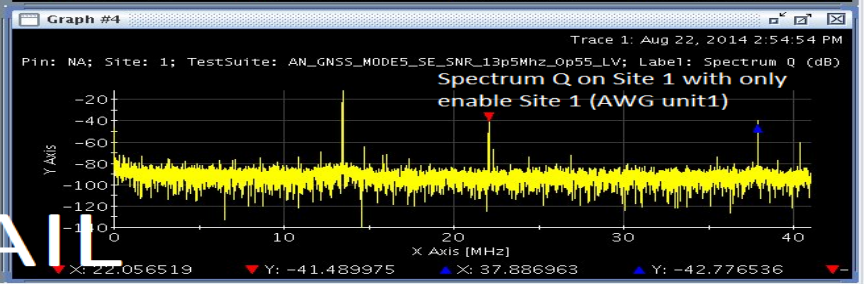
PASS





FAIL





FAIL

Tester Resource Assign and Schematic

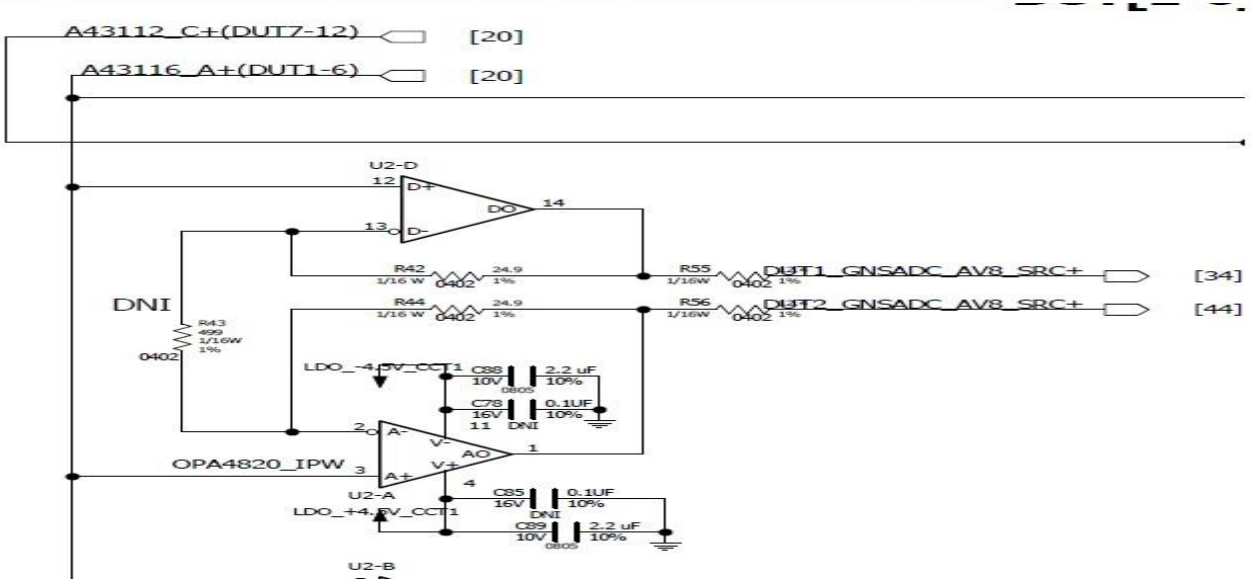
ADVANTEST

Pin Config for GNSS:

(AWG UNIT1 to drive signal on site 1,2,3,4,5,6; AWG UNIT3 to drive signal on site7,8,9,10,11,12)

	Name	No	Type	HW	Comment	Tester Channel																		
						Site 1			Site 2			Site 3			Site 4			Site 5			Site 6			Site
						Pogo	Pad	Unit	Pogo	Pad	Unit	Pogo	Pad	Unit	Pogo	Pad	Unit	Pogo	Pad	Unit	Pogo	Pad	Unit	Pog
1	bbrx_iq-		i	MCE		23113	S2	2	23113	S2	2	23113	S2	2	23113	S2	2	23113	S2	2	23113	S2	2	231
2	bbrx_iq+		i	MCE		23114	S2	2	23114	S2	2	23114	S2	2	23114	S2	2	23114	S2	2	23114	S2	2	231
3	etdac_iq-		o	MCE		23101	S1	8	23105	S1	6	23107	S1	5	22805	S1	6	22801	S1	8	22801	S2	4	231
4	etdac_iq+		o	MCE		23102	S1	8	23106	S1	6	23108	S1	5	22806	S1	6	22802	S1	8	22802	S2	4	231
5	gpsadc_iq+		i	MCE		23116	S2	1	23116	S2	1	23116	S2	1	23116	S2	1	23116	S2	1	23116	S2	1	231
6	txdac_iq-		o	MCE		22815	S1	5	22809	S1	8	23109	S1	8	22811	S2	3	22813	S2	2	22815	S2	1	231
7	txdac_iq+		o	MCE		22816	S1	5	22810	S1	8	23110	S1	8	22812	S2	3	22814	S2	2	22816	S2	1	231

	Name			Site 7			Site 8			Site 9			Site 10			Site 11			Site 12		
		Pad	Unit	Pogo	Pad	Unit	Pogo	Pad	Unit	Pogo	Pad	Unit	Pogo	Pad	Unit	Pogo	Pad	Unit	Pogo	Pad	Unit
1	bbrx_iq-	S2	2	23109	S2	4	23109	S2	4	23109	S2	4	23109	S2	4	23109	S2	4	23109	S2	4
2	bbrx_iq+	S2	2	23110	S2	4	23110	S2	4	23110	S2	4	23110	S2	4	23110	S2	4	23110	S2	4
3	etdac_iq-	S2	4	23103	S1	7	22807	S2	1	22805	S2	2	22807	S1	5	22803	S1	7	22803	S2	3
4	etdac_iq+	S2	4	23104	S1	7	22808	S2	1	22806	S2	2	22808	S1	5	22804	S1	7	22804	S2	3
5	gpsadc_iq+	S2	1	23112	S2	3	23112	S2	3	23112	S2	3	23112	S2	3	23112	S2	3	23112	S2	3
6	txdac_iq-	S2	1	23111	S1	7	23113	S1	6	23115	S1	5	22811	S1	7	22813	S1	6	22809	S2	4
7	txdac_iq+	S2	1	23112	S1	7	23114	S1	6	23116	S1	5	22812	S1	7	22814	S1	6	22810	S2	4



Issue Summary

ADVANTEST

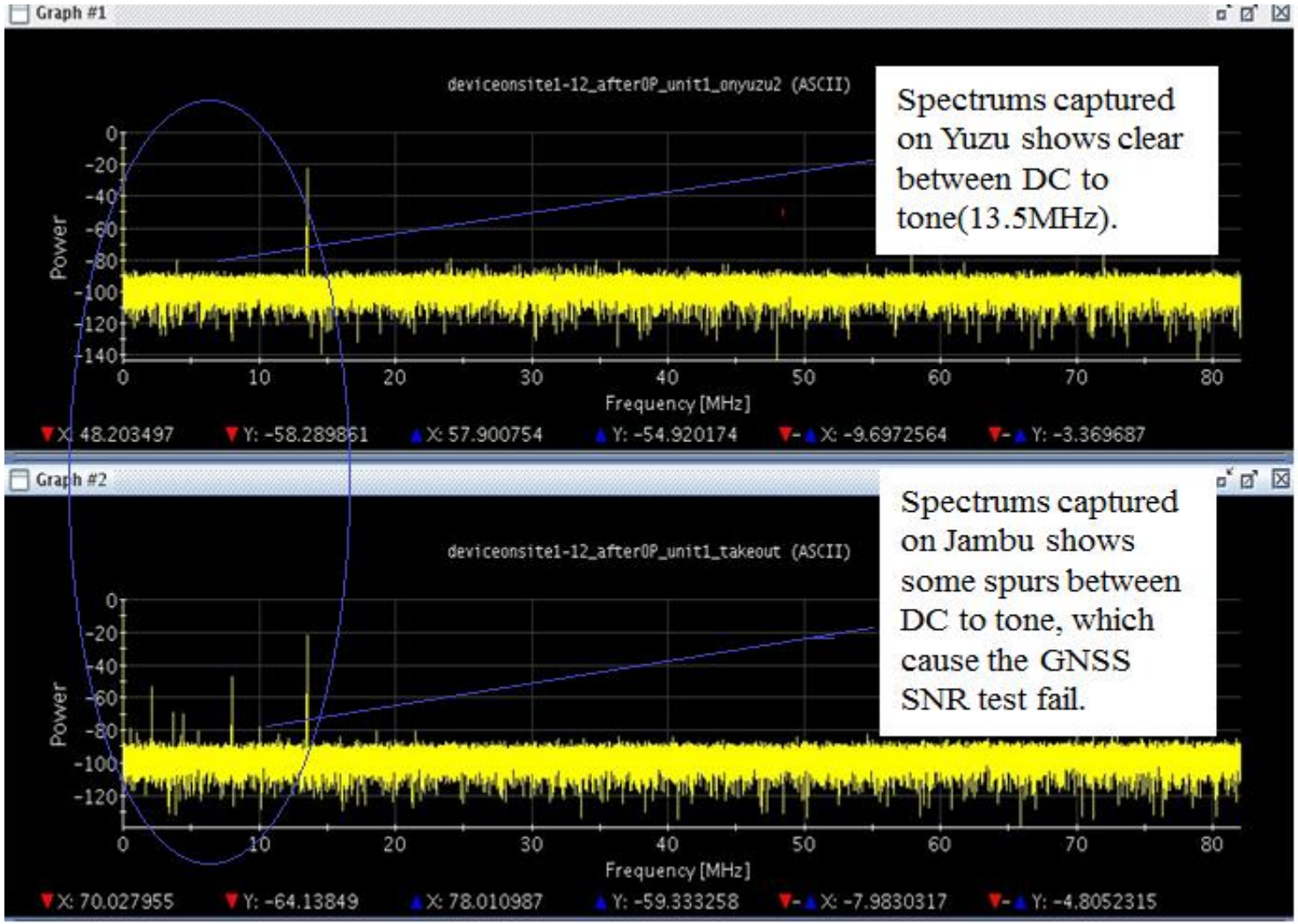
1. The Spur (high frequency spur on Yuzu and low frequency spur on Jambu) can only be observed with Torino FTx12 loadbaod, and cann't capture these spur with Verigy loopback board and diagnostic board.

2. High frequency spur (above tone 13.5MHz) can be observed on multiple systems (Yuzu, Brut, Jambu..), customer acknowledge these spur are caused by OPAMP on loadboard.

3. The Spur between DC to tone (13.5MHz) only can be observed on Jambu and the Spur are changing with devices in socket.

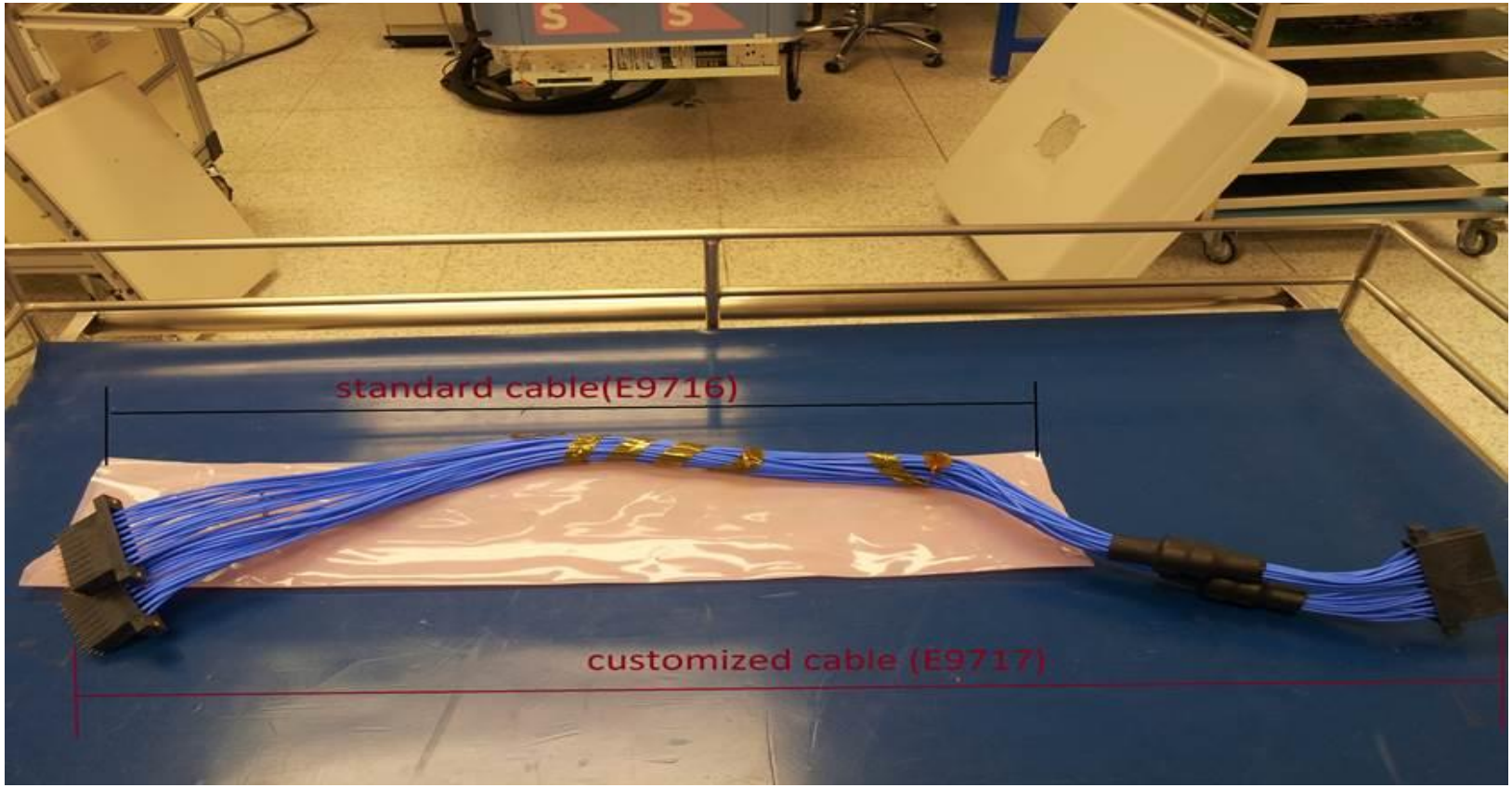
Captured Spectrum with FTx12 Board

The different spectrum was observed by loopback test program on different systems with Torino FTx12 Rev B loadboard.



Replace MCE PogoCable on Jambu

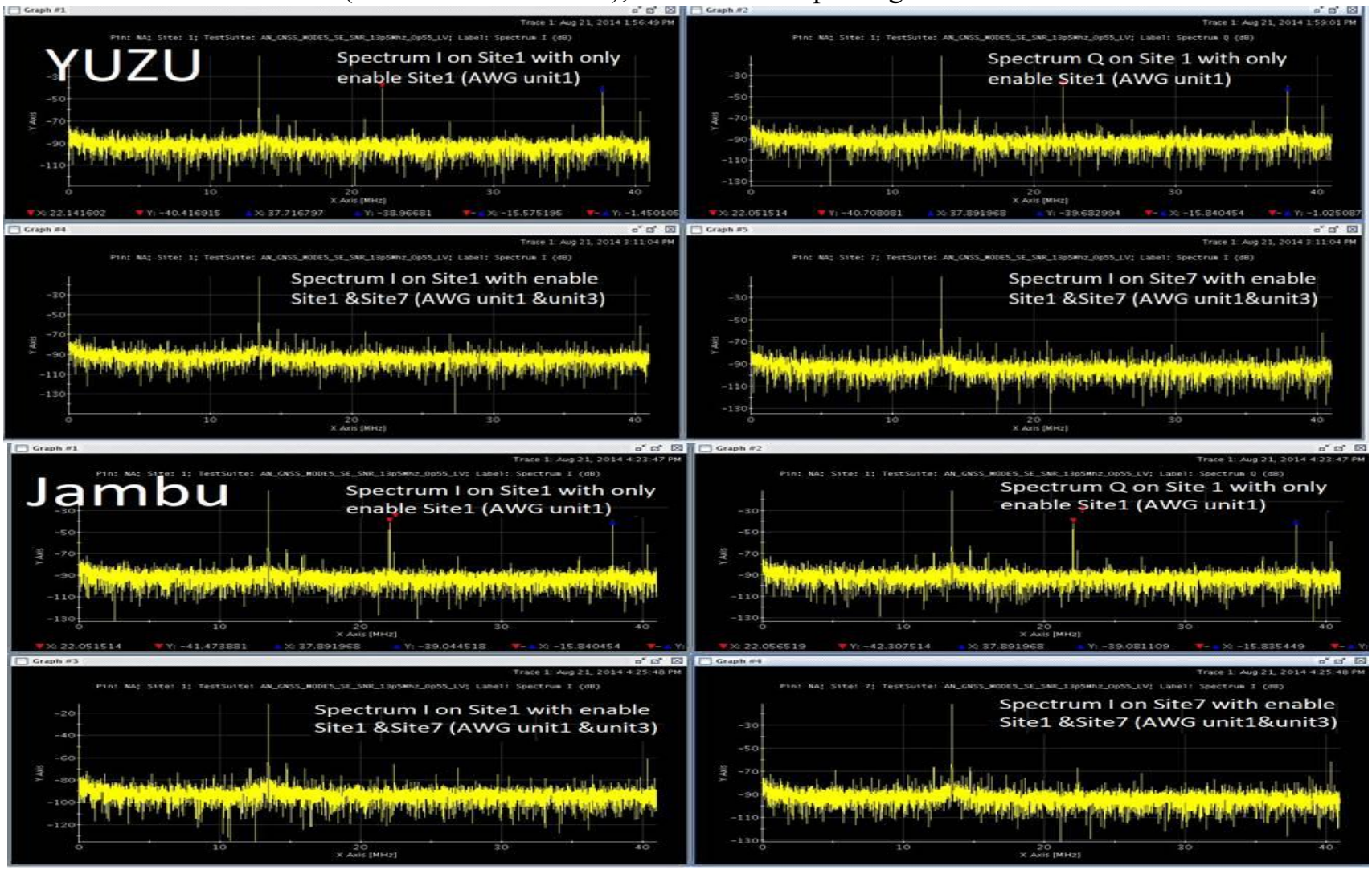
Noticed that MCE(S/M) pogocable on Jambu is customized cable (E9717A) which is longer than standard cable(E9716A).



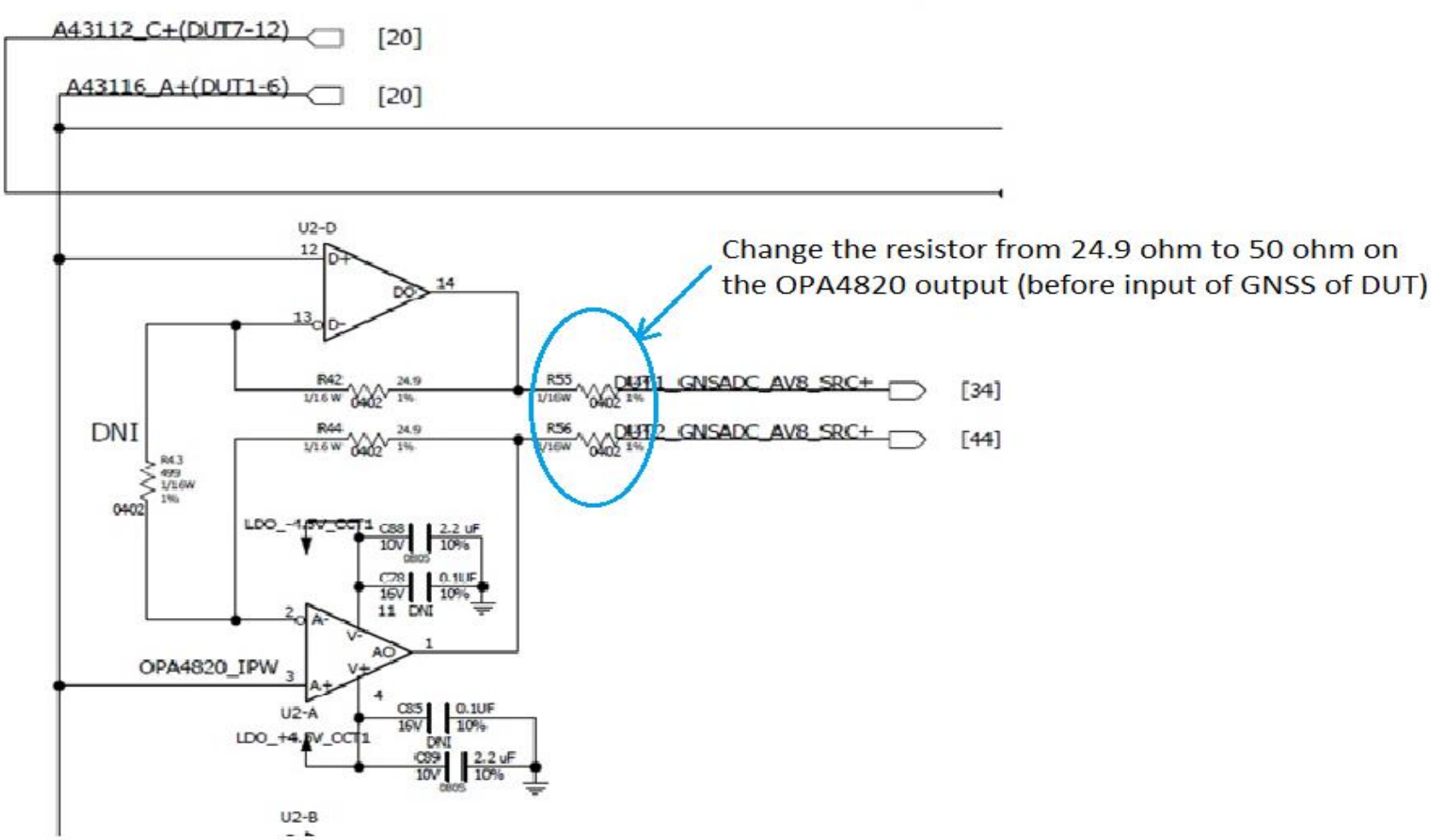
After replacement of E9717A with E9716A on Jumbu, The low frequency Spur between DC to tone (13.5MHz) has gone. Now observed the same spectrum and same behavior of GNSS testing on Jumbu and Yuzu with customer test program. Pls refer to next slides for detail.

Replace MCE PogoCable on Jambu

Same behavior observed on both system now:
When only enable site 1(AWG unit1) or only enable site 7(AWG unit 3), GNSS SNR is failing.
When enable site1 and site 7(AWG unit1 and unit3), GNSS SNR is passing on both sites.



Reviewed FTx12 Board Schematic



After change the resistor on the OPA4820 output (before input of GNSS of DUT), The high frequency Spur (above tone 13.5MHz) has gone. And **Devices will PASS, whatever AWG UNIT1 , UNIT3 or both are activated.**

End of Slides