Convert Gimli_TML to SOC_TML for BBRx Testing

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CONFIDENTIAL

PRELIMINARY

Steps in Applying SOC_TML

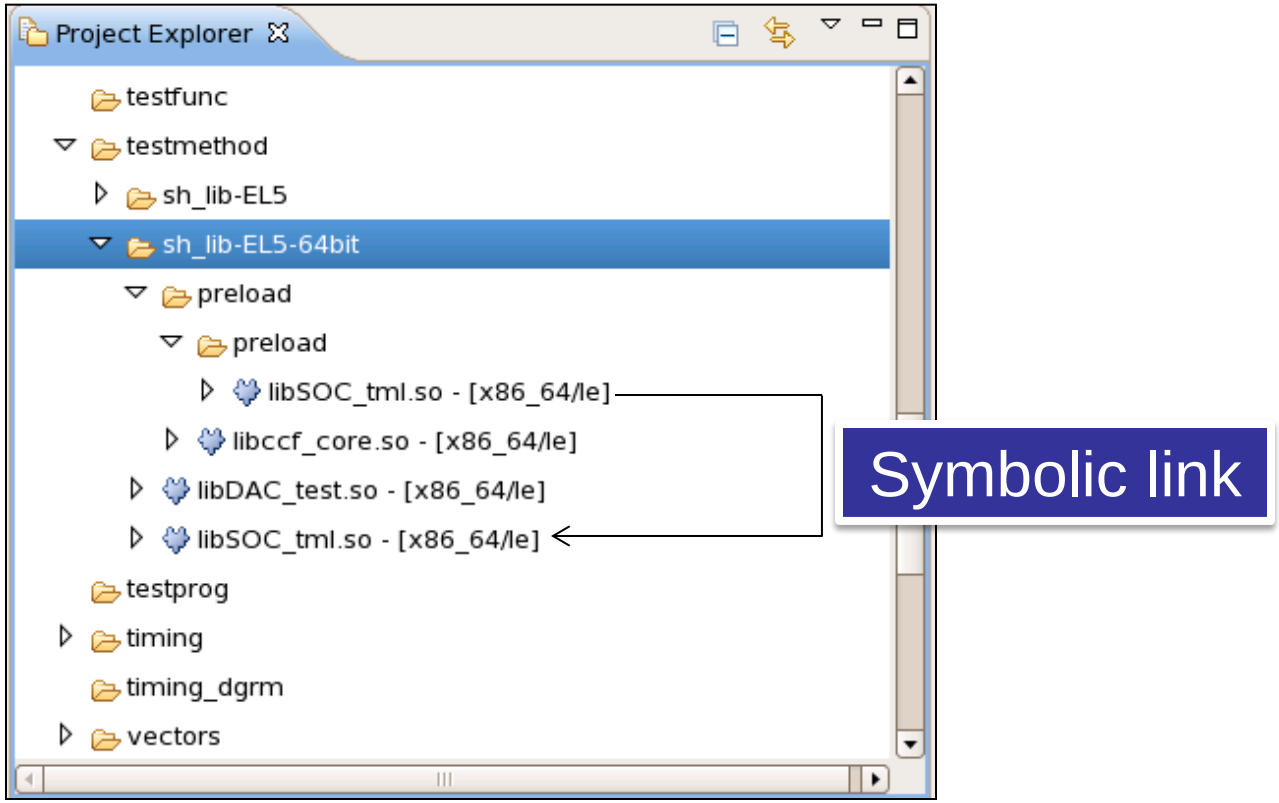
- Using correct TMLs
- Using SOC_tml and MSM_SOC_tml
- Vector differences
- Testmethod Codes

Using Correct SOC_TML

- 2 different TMLs are required
- Import the correct TML:
  - SOC_tml
  - MSM_SOC_tml
- From C++ Perspective select ‘Project → Build All’
- From terminal navigate to
  - MyDevice/testmethod/sh_lib-EL5-64bit
- Make ‘preload’ directory
  - mkdir preload
- Copy libccf_core.so into preload
  - This can be copied from:
    - SOC_tml/core/Concurrency/lib/7.2.0/

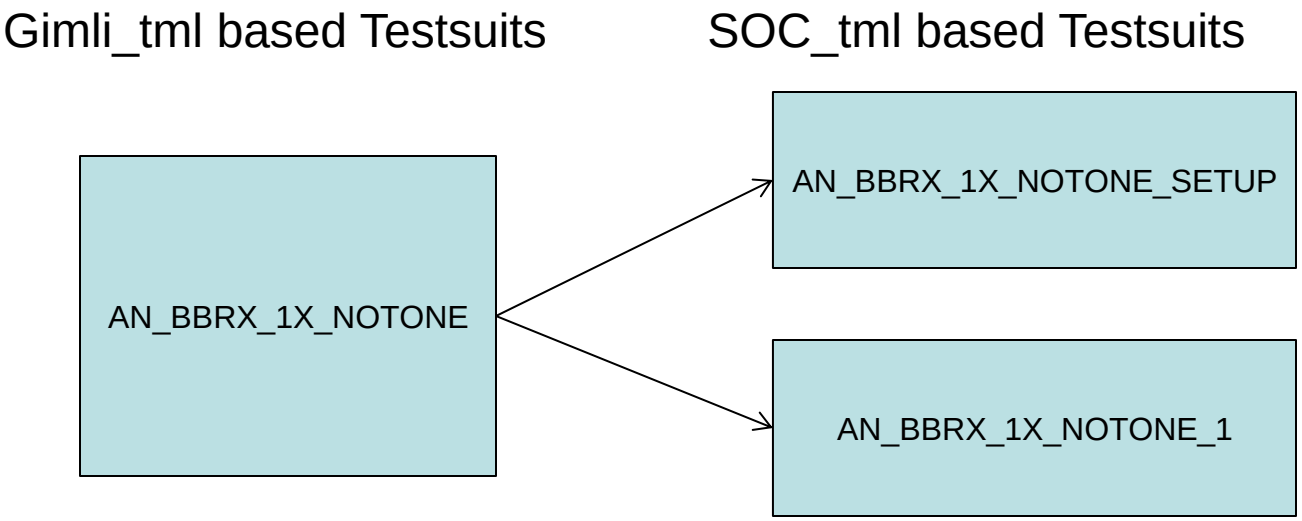
Using Correct SOC_TML

- Inside the preload directory create another preload directory
- Create symbolic link to the SOC Library.
  - cd preload
    - Should now be in the directory:
      - MyDevice/testmethod/sh_lib-EL5-64bit/preload/preload
      - ln –sf ../../libSOC_tml.so .



Using SOC_tml and MSM_SOC_tml

- New testsuits needs to be created
- New testsuits uses SOC_TML and MSM_SOC_TML
- The original Gimli BBRx testsuits is split into 2 separate testsuits
- “xxx_SETUP” setup the device in correct testmode, creates AnalogSet, execute test, digital capture at ADC output and store captured data in Mempool
- “xxx” retrieves the captured data from Mempool, perform calculation and datalog



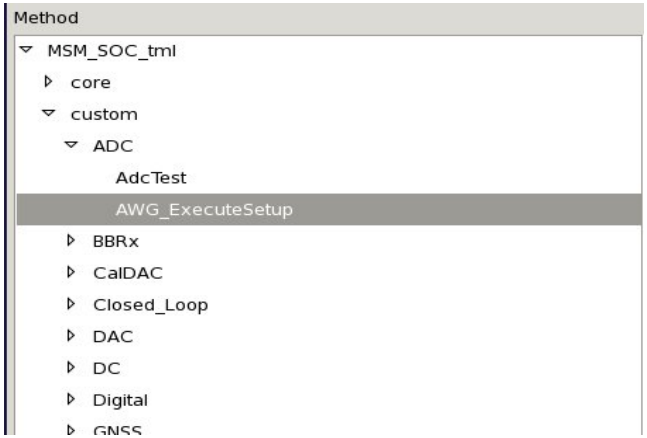
Using SOC_tml and MSM_SOC_tml

- Both “xxx_SETUP” and “xxx” are using SOC_tml/MSM_SOC_tml.
- “xxx_SETUP” testsuit:
  - MSM_SOC_tml.custom.ADC.AWG_ExecuteSetup
- “xxx” testsuit:
  - MSM_SOC_tml.custom.BBRx.XTest

  XTest can be: Gain, IRN, Attenuation, SNR, IRDCOffset, Jammer.
- Both test methods have new parameters: *Bebug*, *Development Mode and SMC Mode*. Please refer to training material “SOC_Library_Training” on how to set these parameters.
- Refer to the original testsuit to set up the other test parameters.

Using SOC_tml and MSM_SOC_tml

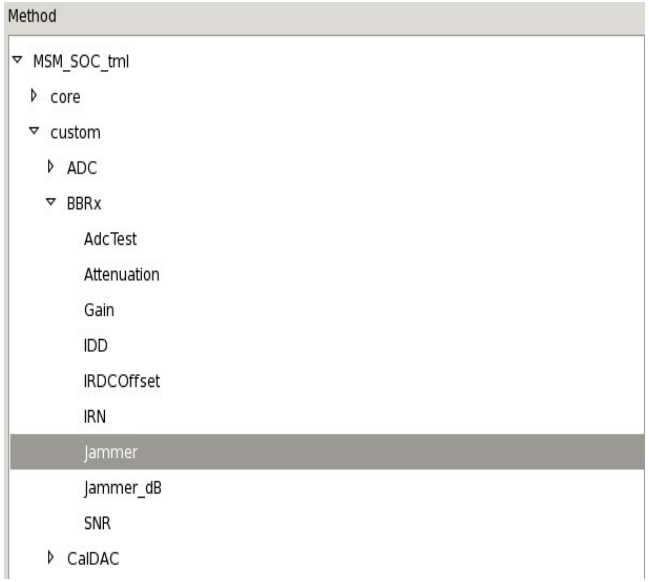
- MSM_SOC_tml.custom.ADC.AWG_ExecuteSetup for “xxx_SETUP”



AWG_ExecuteSetup

Creates AnalogSet, execute test, digital capture at ADC output and store captured data in Mempool

- MSM_SOC_tml.custom.BBRx.Xtest for “xxx” testsuit



Xtest can be the following:

AdcTest
Attenuation
Gain
IDD
IRDCoffset
IRN
jammer
jammer_dB
SNR

Using SOC_tml and MSM_SOC_tml

- Refer to the original testsuit to set up the other test parameters.

AN_BBRX_1X_NOTONE

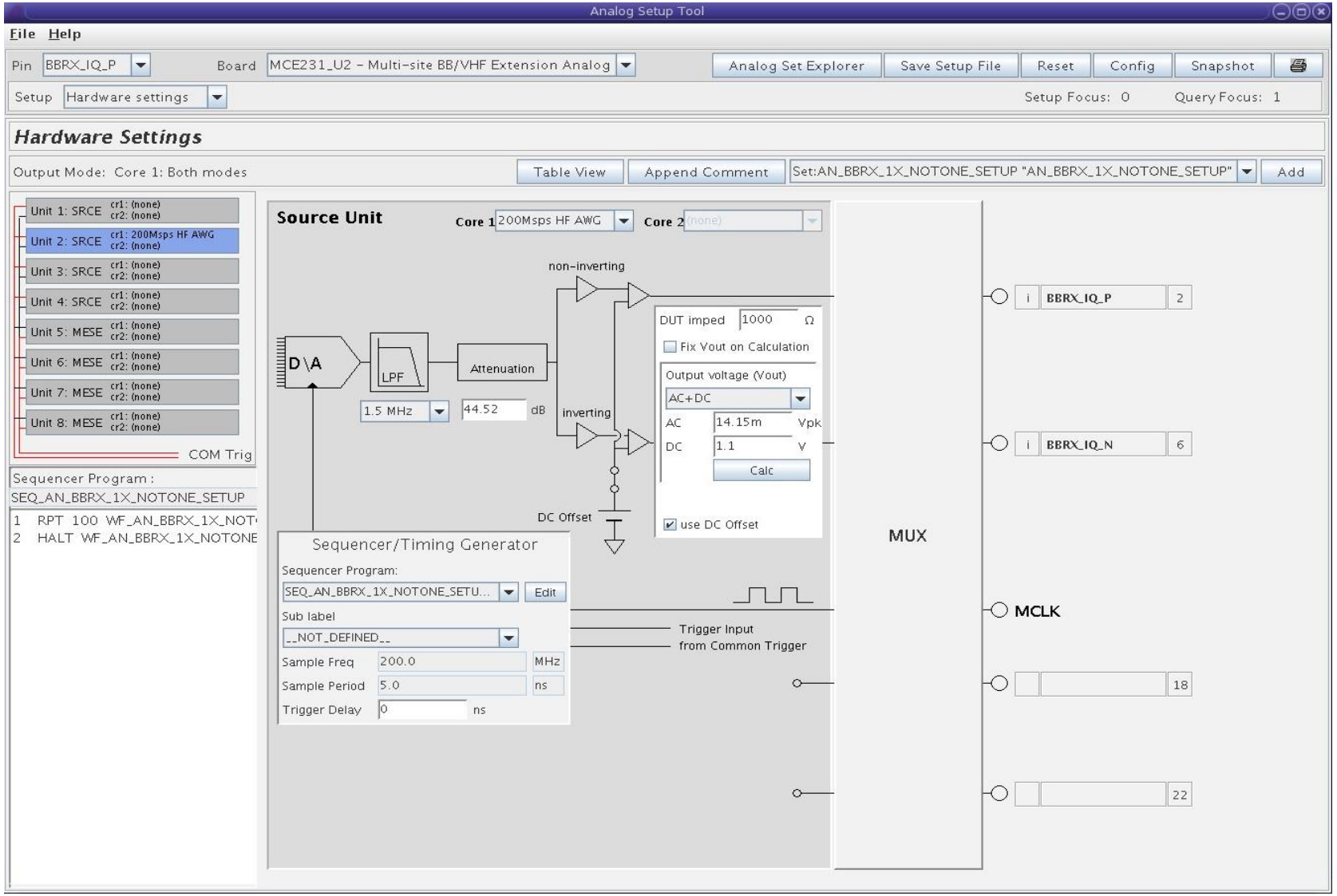
Property	Value
Test Suite	AN_BBRX_1X_NOTONE
Comment	
Primaries	...
Test Method	gimli_tml.BBRx.Combo_generic
Parameters	DAPHNIS, combo, 1X, @bbrx_channel, bbrx_cap_32k_v
BBRX Design	DAPHNIS
testmode	combo
Operating Mode	1X
which_adc	@bbrx_channel
Vect_Var_Name	bbrx_cap_32k_vv
capt_pts	@N
smc_capt_pts	@captPts
DAC_ref_voltage (Vdc	1.2
capture only	0
adc_pin	BBRX_IQ_P
Analog Set Name	bbrx_dc_8192
Connect	OPEN
AWG Wfm Name	bbrx_dc_8192.txt
AWG M	-1
AWG N	-1
AWG type	HF
AWG Sample Rate (Hz	200000000
AWG Swing (Vrms)	0.01
AWG DC Offset (Vdc)	1.1
Number of AWG loops	100
Dut Impedance	1000
AWG filter	1.5M
IRDCoffset	OFF
Offline File Name	/waste/example.txt
Limits	...

AN_BBRX_1X_NOTONE_SETUP

Test Suite	AN_BBRX_1X_NOTONE_SETUP
Comment	
Primaries	...
Test Type	M
Test Method	MSM_SOC_tml.custom.ADC.AWG_ExecuteSetup
Parameters	...
Debug	0
Development Mode	2 -- Development
SMC Mode	3 -- Upload
Protocol	
Instruction File	
AWG	
Pin	BBRX_IQ_P
Connection Type	OPEN
Core Function	HF
Sample Rate	200 MHz
AC Swing RMS	0.01
DC Offset	1.1
Filter	1.5M
Impedance	1000
Waveform	
I Waveform File	bbrx_dc_8192.txt
Loop Count	100
Infinite Repeat	FALSE
Waveform Type	FILE

Using SOC_tml and MSM_SOC_tml

- Analog Setup was created by AN_BBRX_1X_NOTONE_SETUP



Using SOC_tml and MSM_SOC_tml

ADVANTEST

- Refer to the original testsuit to set up the other test parameters.

AN_BBRX_1X_NOTONE

Property	Value
Test Suite	AN_BBRX_1X_NOTONE
Comment	
Primaries	...
Test Type	M
Test Method	gimli_tml.BBRx.Combo_generic
Parameters	DAPHNIS, combo, 1X, @bbrx_channel, bbrx_cap_32k_v
BBRX Design	DAPHNIS
testmode	combo
Operating Mode	1X
which_adc	@bbrx_channel
Vect_Var_Name	bbrx_cap_32k_vv
capt_pts	@N
smc_capt_pts	@captPts
DAC_ref_voltage (Vdc	1.2
capture only	0
Fundamental_bin	-1
Fundamental_Freq (KH	-1
second_bin	-1
second_Freq (KHz)	-1
Fundamental Leakage	5
Fs (Mhz)	57.6
noise_bw_l1 (Khz)	1
noise_bw_h1 (Khz)	630
noise_bw_l2 (Khz)	-1
noise_bw_h2 (Khz)	-1

AN_BBRX_1X_NOTONE_1

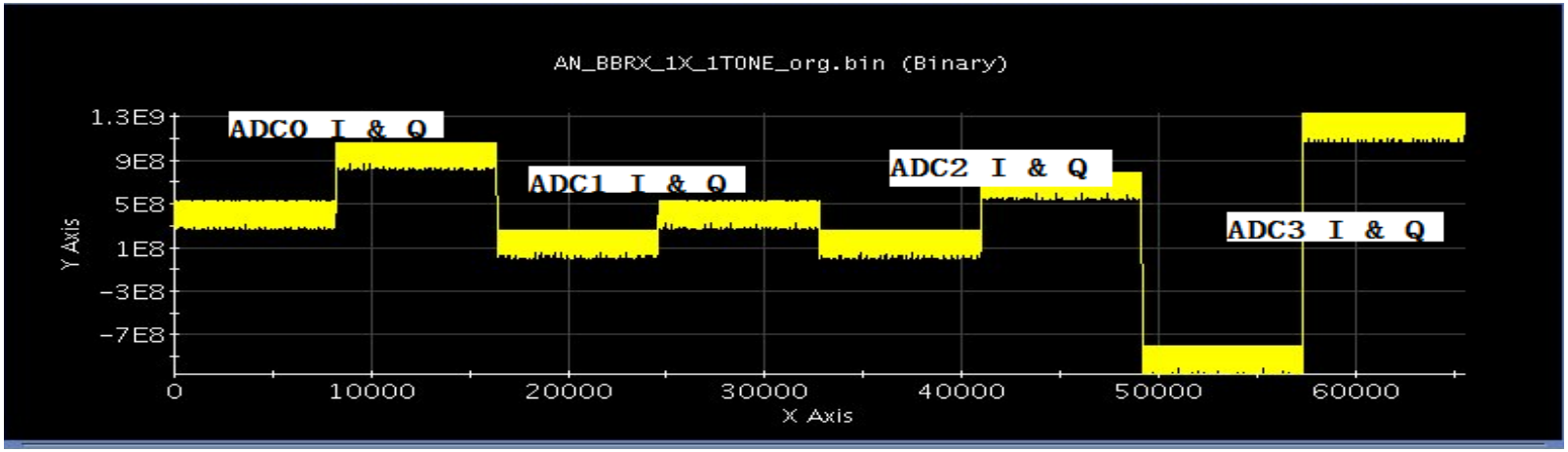
Property	Value
Test Suite	AN_BBRX_1X_NOTONE
Comment	
Primaries	...
Test Method	MSM_SOC_tml.custom.BBRx.IRN
Parameters	...
Debug	0x32
Development Mode	2 -- Development
SMC Mode	3 -- Upload
DIGITAL	
Pins	tic_port
Capture Variable I	bbrx_cap_32k_vv
Samples	65536
BBRx	
AWG Setup Testsuit	AN_BBRX_1X_NOTONE_SETUP
ADCs to Test	0;1;2;3
ADC Reference Vol	1.2
Number of Spread I	5
Fs	57.6 MHz
Number of Noise Ba	1
Noise BW 1 Low	1
Noise BW 1 High	630
Limits	...

Using SOC_tml and MSM_SOC_tml

- AN_BBRX_1X_NOTONE_1 read the captured data from Mempool, perform calculation and datalogging.

  The BBRx parameters are used for calculation and datalogging:

  ADCs to Test:



  Test items will be added in the test table if needed:

Suite name	Test name
AN_BBRX_1X_NOTONE	
Test mode	
AN_BBRX_1X_NOTONE	AN_BBRX_1X_NOTONE_ADC0_IRN_I_1Khz_630Khz_LV
AN_BBRX_1X_NOTONE	AN_BBRX_1X_NOTONE_ADC0_IRN_Q_1Khz_630Khz_LV
AN_BBRX_1X_NOTONE	AN_BBRX_1X_NOTONE_ADC0_ORN_I_1Khz_630Khz_LV
AN_BBRX_1X_NOTONE	AN_BBRX_1X_NOTONE_ADC0_ORN_Q_1Khz_630Khz_LV
AN_BBRX_1X_NOTONE	AN_BBRX_1X_NOTONE_ADC1_IRN_I_1Khz_630Khz_LV
AN_BBRX_1X_NOTONE	AN_BBRX_1X_NOTONE_ADC1_IRN_Q_1Khz_630Khz_LV

Vector Differences

- The original digital pattern now breaks into 2 portions:
  - Setup
  - Read
- “xxx_SETUP” uses Setup digital pattern
- “xxx” uses the Read digital pattern
  - Original vector

Signal	dac_adc_port (Instructions)	tic_port (Instructions)	
Call# | Grp	DEFAULT	DEFAULT	
0	CALL cdac_sigen_dac_adc	CALL bbrx_32k_tic_setup	
1	BEND	CALL bbrx_32k_tic_read	
2		BEND	

Vector Differences

- Setup vector for “xxx_SETUP” testsuit

Signal	dac_adc_port (Instructions)	tic_port (Instructions)	
Call# | Grp	DEFAULT	DEFAULT	
0	CALL cdac_sigen_dac_adc	CALL bbrx_32k_tic_setup	
1	BEND	BEND	

- Read vector for “xxx” testsuit

Signal	dac_adc_port (Instructions)	tic_port (Instructions)	
Call# | Grp	DEFAULT	DEFAULT	
0	CALL cdac_sigen_dac_adc	CALL bbrx_32k_tic_read	
1	BEND	BEND	

Testmethod Codes Details

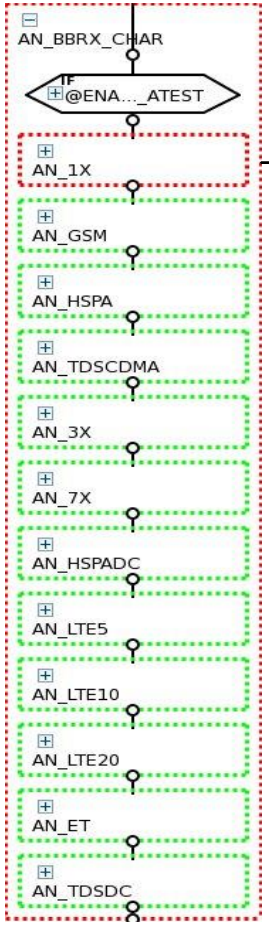
- _read_pll & pll_status
  - Comment out the line “INT offset = (_read_pll) ? 1 : 0;” and set offset = 0 and pll_status = 0, otherwise result is not correct for Gain testing.
  - Need to find out what is the purpose of _read_pll and pll_status.

- unpackAndErrorCorrect_gimli
  - The ADC design mode for Gimli is ATLAS, New decoding method “unpackAndErrorCorrect_gimli” is generated for ATLAS. But seems the decoding method is the same with DAPHNIS, we can keep using unpackAndErrorCorrect function in MSM_SOC_TML.

- log_PTR
  - CR QCOM-385 “ [SOC Lib] Wrong generation of Test Name for BBRx test in SOC TML “ has been created.

Testmethod Codes Details

- The following tests have been created and verified and results are correlated to original tests.



» AN_BBRX_1X_1TONE_BYPASS_AAF (TM: BBRx.Gain)
» AN_BBRX_1X_NOTONE_BYPASS_AAF (TM: BBRx.IRN)
» AN_BBRX_1X_ATTN_BYPASS_AAF (TM: BBRx.Attenuation)
» AN_BBRX_1X_NOTONE (TM: BBRx.IRN)
» AN_BBRX_1X_Y1Y2 (TM: BBRx.IRDCOffset)
» AN_BBRX_1X_1TONE (TM: BBRx.SNR)
» AN_BBRX_1X_1TONE2 (TM: BBRx.SNR)
» AN_BBRX_1X_1TONE3 (TM: BBRx.SNR)
» AN_BBRX_1X_ATTN (TM: BBRx.Attenuation)
» AN_BBRX_1X_p9Mhz (TM: BBRx.jammer)
» AN_BBRX_1X_10Mhz (TM: BBRx.jammer)
» AN_BBRX_1X_9p7Mhz_10p2Mhz (TM: BBRx.jammer)
» AN_BBRX_1X_p9Mhz_1p7Mhz (TM: BBRx.jammer)
» AN_BBRX_1X_2p5Mhz_2p71Mhz (TM: BBRx.jammer)
» AN_BBRX_1X_5Mhz_5p21Mhz (TM: BBRx.jammer)
» AN_BBRX_1X_0p9Mhz_9p7Mhz_10p2Mhz (TM: BBRx.jammer)

Testmethod Codes Details

ADVANTEST

- AN_BBRX_1X_1TONE_BYPASS_AAF (TM: BBRx.Gain)

BBRx Test Suits Name	Test Name	Limits Low	Limits High	Unit	Test Resut		Diff	
					Gimli_TML	SOC_TML	Delta	%diff
AN_BBRX_1X_1TONE_BYPASS_AAF	AN_BBRX_1X_1TONE_BYPASS_AAF_ADC0_100kHz_ADC_GAIN_I_LV	-1.99	1.99	dB	-0.0594291	-0.063154	0.003725	0.09%
	AN_BBRX_1X_1TONE_BYPASS_AAF_ADC0_100kHz_ADC_GAIN_Q_LV	-1.99	1.99	dB	0.0115947	0.008099	0.003496	0.09%
	AN_BBRX_1X_1TONE_BYPASS_AAF_ADC1_100kHz_ADC_GAIN_I_LV	-1.99	1.99	dB	-0.257536	-0.259507	0.001971	0.05%
	AN_BBRX_1X_1TONE_BYPASS_AAF_ADC1_100kHz_ADC_GAIN_Q_LV	-1.99	1.99	dB	-0.190457	-0.192482	0.002025	0.05%
	AN_BBRX_1X_1TONE_BYPASS_AAF_ADC2_100kHz_ADC_GAIN_I_LV	-1.99	1.99	dB	-0.110329	-0.110711	0.000382	0.01%
	AN_BBRX_1X_1TONE_BYPASS_AAF_ADC2_100kHz_ADC_GAIN_Q_LV	-1.99	1.99	dB	-0.0471708	-0.047962	0.000791	0.02%
	AN_BBRX_1X_1TONE_BYPASS_AAF_ADC3_100kHz_ADC_GAIN_I_LV	-1.99	1.99	dB	0.0107457	0.009251	0.001495	0.04%
	AN_BBRX_1X_1TONE_BYPASS_AAF_ADC3_100kHz_ADC_GAIN_Q_LV	-1.99	1.99	dB	0.095826	0.09479	0.001036	0.03%

Testmethod Codes Details

ADVANTEST

- AN_BBRX_1X_NOTONE_BYPASS_AAF (TM: BBRx.IRN)

BBRx Test Suits Name	Test Name	Limits Low	Limits High	Unit	Test Resut		Diff	
					Gimli_TML	SOC_TML	Delta	%diff
AN_BBRX_1X_NOTONE_BYPASS_AAF	AN_BBRX_1X_NOTONE_BYPASS_AAF_ADC0_IRN_I_1Khz_630Khz_LV	1	40.5	uVrms	31.0193	31.60394	-0.58464	-1.48%
	AN_BBRX_1X_NOTONE_BYPASS_AAF_ADC0_IRN_Q_1Khz_630Khz_LV	1	40.5	uVrms	33.9277	30.38681	3.540893	8.96%
	AN_BBRX_1X_NOTONE_BYPASS_AAF_ADC0_ORN_I_1Khz_630Khz_LV	1	40.5	uVrms	30.5978	33.86424	-3.26644	-8.27%
	AN_BBRX_1X_NOTONE_BYPASS_AAF_ADC0_ORN_Q_1Khz_630Khz_LV	1	40.5	uVrms	34.0184	32.56005	1.45835	3.69%
	AN_BBRX_1X_NOTONE_BYPASS_AAF_ADC1_IRN_I_1Khz_630Khz_LV	1	40.5	uVrms	32.8347	28.48851	4.34619	11.00%
	AN_BBRX_1X_NOTONE_BYPASS_AAF_ADC1_IRN_Q_1Khz_630Khz_LV	1	40.5	uVrms	33.6618	28.59478	5.06702	12.83%
	AN_BBRX_1X_NOTONE_BYPASS_AAF_ADC1_ORN_I_1Khz_630Khz_LV	1	40.5	uVrms	30.9442	30.52599	0.418211	1.06%
	AN_BBRX_1X_NOTONE_BYPASS_AAF_ADC1_ORN_Q_1Khz_630Khz_LV	1	40.5	uVrms	32.2175	30.63986	1.577641	3.99%
	AN_BBRX_1X_NOTONE_BYPASS_AAF_ADC2_IRN_I_1Khz_630Khz_LV	1	40.5	uVrms	29.8992	28.83004	1.069165	2.71%
	AN_BBRX_1X_NOTONE_BYPASS_AAF_ADC2_IRN_Q_1Khz_630Khz_LV	1	40.5	uVrms	31.7327	27.47984	4.252859	10.77%
	AN_BBRX_1X_NOTONE_BYPASS_AAF_ADC2_ORN_I_1Khz_630Khz_LV	1	40.5	uVrms	29.1492	30.89194	-1.74274	-4.41%
	AN_BBRX_1X_NOTONE_BYPASS_AAF_ADC2_ORN_Q_1Khz_630Khz_LV	1	40.5	uVrms	31.3899	29.44518	1.94472	4.92%
	AN_BBRX_1X_NOTONE_BYPASS_AAF_ADC3_IRN_I_1Khz_630Khz_LV	1	40.5	uVrms	29.646	28.6503	0.995704	2.52%
	AN_BBRX_1X_NOTONE_BYPASS_AAF_ADC3_IRN_Q_1Khz_630Khz_LV	1	40.5	uVrms	30.4858	29.31833	1.167472	2.96%
	AN_BBRX_1X_NOTONE_BYPASS_AAF_ADC3_ORN_I_1Khz_630Khz_LV	1	40.5	uVrms	29.7195	30.69935	-0.97985	-2.48%
	AN_BBRX_1X_NOTONE_BYPASS_AAF_ADC3_ORN_Q_1Khz_630Khz_LV	1	40.5	uVrms	31.1659	31.41516	-0.24925	-0.63%

Testmethod Codes Details

ADVANTEST

- AN_BBRX_1X_ATTN_BYPASS_AAF (TM: BBRx.Attenuation)

BBRx Test Suits Name	Test Name	Limits Low	Limits High	Unit	Test Resut		Diff	
					Gimli_TML	SOC_TML	Delta	%diff
AN_BBRX_1X_ATTN_BYPASS_AAF	AN_BBRX_1X_ATTN_BYPASS_AAF_ADC0_I_LV	-1	1	dB	0.287578	0.287337	0.000241	0.01%
	AN_BBRX_1X_ATTN_BYPASS_AAF_ADC0_Q_LV	-1	1	dB	0.285244	0.282957	0.002287	0.11%
	AN_BBRX_1X_ATTN_BYPASS_AAF_ADC1_I_LV	-1	1	dB	0.288374	0.290221	-0.00185	-0.09%
	AN_BBRX_1X_ATTN_BYPASS_AAF_ADC1_Q_LV	-1	1	dB	0.286669	0.284377	0.002292	0.11%
	AN_BBRX_1X_ATTN_BYPASS_AAF_ADC2_I_LV	-1	1	dB	0.285248	0.286533	-0.00128	-0.06%
	AN_BBRX_1X_ATTN_BYPASS_AAF_ADC2_Q_LV	-1	1	dB	0.283547	0.280649	0.002898	0.14%
	AN_BBRX_1X_ATTN_BYPASS_AAF_ADC3_I_LV	-1	1	dB	0.28394	0.285695	-0.00175	-0.09%
	AN_BBRX_1X_ATTN_BYPASS_AAF_ADC3_Q_LV	-1	1	dB	0.279559	0.283694	-0.00414	-0.21%

Testmethod Codes Details

ADVANTEST

- AN_BBRX_1X_p9Mhz_1p7Mhz (TM: BBRx.jammer)

BBRx Test Suits Name	Test Name	Limits Low	Limits High	Unit	Test Resut		Diff	
					Gimli_TML	SOC_TML	Delta	%diff
AN_BBRX_1X_p9Mhz_1p7Mhz	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC0_IQ_LV	1	83	uVrms	47.8611	48.3325	-0.4714	-0.57%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC0_IRN_I_1Khz_630Khz_LV	1	83	uVrms	47.7483	47.22196	0.526339	0.64%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC0_IRN_Q_1Khz_630Khz_LV	1	83	uVrms	47.9735	49.4181	-1.4446	-1.76%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC0_JAM1_AMP_I_LV	100	400	mVrms	302.552	302.4101	0.141877	0.05%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC0_JAM1_AMP_Q_LV	100	400	mVrms	305.403	305.2617	0.141331	0.05%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC0_JAM2_AMP_I_LV	100	400	mVrms	201.069	200.9774	0.091562	0.03%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC0_JAM2_AMP_Q_LV	100	400	mVrms	203.345	203.2413	0.10366	0.03%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC1_IQ_LV	1	83	uVrms	44.3827	46.473	-2.0903	-2.55%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC1_IRN_I_1Khz_630Khz_LV	1	83	uVrms	42.5781	42.65188	-0.07378	-0.09%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC1_IRN_Q_1Khz_630Khz_LV	1	83	uVrms	46.1168	50.00348	-3.88668	-4.74%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC1_JAM1_AMP_I_LV	100	400	mVrms	294.483	294.5067	-0.02365	-0.01%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC1_JAM1_AMP_Q_LV	100	400	mVrms	297.476	297.4987	-0.02265	-0.01%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC1_JAM2_AMP_I_LV	100	400	mVrms	195.54	195.5267	0.01333	0.00%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC1_JAM2_AMP_Q_LV	100	400	mVrms	198.107	198.1154	-0.00841	0.00%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC2_IQ_LV	1	83	uVrms	48.5283	50.21102	-1.68272	-2.05%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC2_IRN_I_1Khz_630Khz_LV	1	83	uVrms	45.5613	48.80709	-3.24579	-3.96%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC2_IRN_Q_1Khz_630Khz_LV	1	83	uVrms	51.3241	51.57675	-0.25265	-0.31%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC2_JAM1_AMP_I_LV	100	400	mVrms	300.567	300.5502	0.016793	0.01%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC2_JAM1_AMP_Q_LV	100	400	mVrms	304.123	304.1146	0.008374	0.00%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC2_JAM2_AMP_I_LV	100	400	mVrms	199.746	199.734	0.011984	0.00%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC2_JAM2_AMP_Q_LV	100	400	mVrms	203.227	203.2079	0.019126	0.01%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC3_IQ_LV	1	83	uVrms	46.9902	45.918	1.072198	1.31%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC3_IRN_I_1Khz_630Khz_LV	1	83	uVrms	46.5034	45.91633	0.587068	0.72%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC3_IRN_Q_1Khz_630Khz_LV	1	83	uVrms	47.471	45.91967	1.551328	1.89%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC3_JAM1_AMP_I_LV	100	400	mVrms	305.285	305.2152	0.069777	0.02%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC3_JAM1_AMP_Q_LV	100	400	mVrms	308.418	308.3416	0.076391	0.03%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC3_JAM2_AMP_I_LV	100	400	mVrms	203.279	203.2122	0.06682	0.02%
	AN_BBRX_1X_p9Mhz_1p7Mhz_ADC3_JAM2_AMP_Q_LV	100	400	mVrms	205.7	205.6333	0.066724	0.02%

Questions?

- Thank You!