

INTEL[®] STRATIX[®] 10 DEVICE E-TILE TRANSCEIVER DEBUG TOOL

Agenda

- Challenges with the current E-Tile transceiver debug process
- Features of the E-Tile Transceiver debug Tool
- Steps to run the E-Tile Transceiver debug Tool

Transceiver Channel Bring-Up Challenges

- Complex tuning flow
- Tuning must be done with the help of scripts
- Transceiver Toolkit has no visibility of channel PMA parameters
- Scalability

Features of E-Tile Transceiver Debug Tool

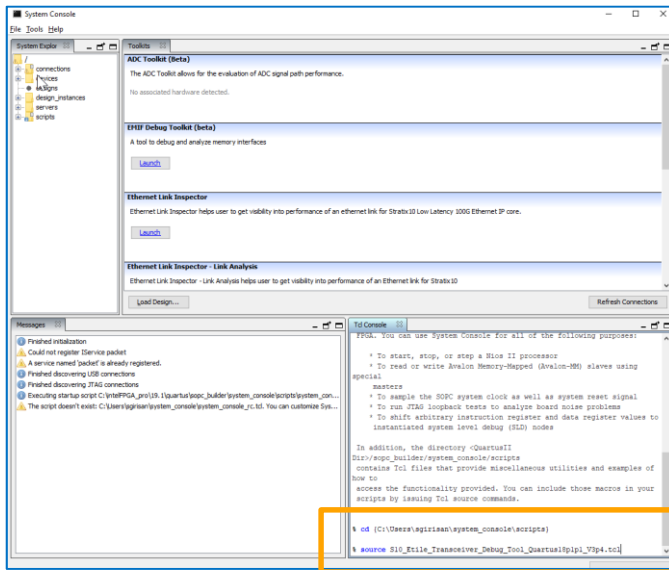
- Single snapshot of all PMA parameters
- Option to reset the PMA parameters
- Perform adaptation and read bit errors
- Pre-loaded PMA configuration (10G_db, 28G_LR, 28G_VSR, 56G_LR, 56G_VSR)
- Ability to modify PMA parameters and Custom tuning
- Logging PMA parameters in a log file (.csv format)
- Recommended tuning flow incorporated in the tool

Three Steps to Run the Transceiver Debug Tool

Step 1: Program the device.

Step 2: Load the design in the system console.

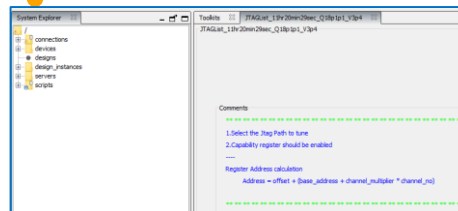
Step 3: Use "cd" to change the directory where you have saved the tools script file and source "S10_Etile_Transceiver_Debug_Tool_Quartus18p1p1_V3p4.tcl"



```
cd (C:\Users\sgirisan\system_console\scripts)
source S10_Etile_Transceiver_Debug_Tool_Quartus18p1p1_V3p4.tcl

** ** ** **
S10_Etile_Transceiver_Tuning_vQ18p1p1_V3p4 Load Start      - Current time- 11hr_20min_29sec
/devices/1ST280EU(1|2|3)|1ST280EY1|..@2#USB-1/(link)/JTAG/(110:132 v1 #0)/phy_0/master
```

User will observe this new tab in the system console



Transceiver Debug Tool – JTAG List

Comments

1. Select the Jtag Path to tune

2. Capability register should be enabled

Register Address calculation

Address = offset + (base_address + channel_multiplier * channel_no)

slave Lookup Table

Path	Info	No_of_Channel	Base Address	Channel Multiplier	Datarate(gbps)	PMA_Status	PMA_Tuning
/devices/4323000@2#USB-1/(link).....lt_slid_fab_0_memfabric_rom	no_info	NA	NA	NA	NA	NA	NA
/devices/4323000@2#USB-1/(link).....avalon_master/master_1_0_slave	eth alt_ehpc3_0 alt_ehpc3_hard_inet SL.....lane alt_xcvr_native_optional_rcfg_logic	1	<input type="text" value="0x0"/>	<input type="text" value="0x80000"/>	25.78125	<input type="button" value="PMA_Status"/>	<input type="button" value="PMA_Tuning"/>
/devices/4323000@2#USB-1/(link).....avalon_master/master_2_0_slave	no_info	NA	NA	NA	NA	NA	NA
{/devices/SM(12702F324 22102) EPM2210@1#USB-1/(link)/JTAG/(110:130 v3 #0)/itagmem_0/slave_0}	no_info	NA	NA	NA	NA	NA	NA
{/devices/SM(12702F324 22102) EPM2210@1#USB-1/(link)/JTAG/(110:130 v3 #0)/itagmem_0/slave_20}	no_info	NA	NA	NA	NA	NA	NA
{/devices/SM(12702F324 22102) EPM2210@1#USB-1/(link)/JTAG/(110:130 v3 #0)/itagmem_0/slave_40}	no_info	NA	NA	NA	NA	NA	NA

master Lookup Table

Jtag Path	No_of_Channel	Base Address	Channel Multiplier	Datarate(gbps)	PMA_Status	PMA_Tuning
/devices/4323000@2#USB-1/(link)/JTAG/alt_slid_fab_0_alt_slid_fab_0_slidfabric.node_4/phy_0/master_0.master	<input type="text" value="1"/>	<input type="text" value="0x00000"/>	<input type="text" value="0x80000"/>	<input type="text" value="28"/>	<input type="button" value="PMA_Status"/>	<input type="button" value="PMA_Tuning"/>
/devices/4323000@2#USB-1/(link)/JTAG/alt_slid_fab_0_alt_slid_fab_0_slidfabric.node_5/phy_1/master_0.master	<input type="text" value="1"/>	<input type="text" value="0x00000"/>	<input type="text" value="0x80000"/>	<input type="text" value="28"/>	<input type="button" value="PMA_Status"/>	<input type="button" value="PMA_Tuning"/>
/devices/4323000@2#USB-1/(link)/JTAG/alt_slid_fab_0_alt_slid_fab_0_slidfabric.node_6/phy_2/master_0.master	<input type="text" value="1"/>	<input type="text" value="0x00000"/>	<input type="text" value="0x80000"/>	<input type="text" value="28"/>	<input type="button" value="PMA_Status"/>	<input type="button" value="PMA_Tuning"/>
/devices/4323000@2#USB-1/(link)/JTAG/alt_slid_fab_0_alt_slid_fab_0_slidfabric.node_7/phy_3/master_0.master	<input type="text" value="1"/>	<input type="text" value="0x00000"/>	<input type="text" value="0x80000"/>	<input type="text" value="28"/>	<input type="button" value="PMA_Status"/>	<input type="button" value="PMA_Tuning"/>
/devices/4323000@2#USB-1/(link)/JTAG/alt_slid_fab_0_alt_slid_fab_0_slidfabric.node_8/phy_4/master_0.master	<input type="text" value="1"/>	<input type="text" value="0x00000"/>	<input type="text" value="0x80000"/>	<input type="text" value="28"/>	<input type="button" value="PMA_Status"/>	<input type="button" value="PMA_Tuning"/>
/devices/4323000@2#USB-1/(link)/JTAG/alt_slid_fab_0_alt_slid_fab_0_slidfabric.node_9/phy_5/master_0.master	<input type="text" value="1"/>	<input type="text" value="0x00000"/>	<input type="text" value="0x80000"/>	<input type="text" value="28"/>	<input type="button" value="PMA_Status"/>	<input type="button" value="PMA_Tuning"/>
{/devices/SM(12702F324 22102) EPM2210@1#USB-1/(link)/JTAG/(110:130 v3 #0)/itagmem_0}	<input type="text" value="1"/>	<input type="text" value="0x00000"/>	<input type="text" value="0x80000"/>	<input type="text" value="28"/>	<input type="button" value="PMA_Status"/>	<input type="button" value="PMA_Tuning"/>

Transceiver Debug Tool – JTAG List

Comments

.....

1.Select the Jtag Path to tune

2.Capability register should be enabled

....

Register Address calculation

Address = offset + (base_address + channel_multiplier * channel_no)

.....

slave Lookup Table

Path	Info	No_of_Channel	Base Address	Channel Multiplier	Datarate(gbps)	PMA_Status	PMA_Tuning
/devices/1ST280EU(1 2 3) 1ST280Y1.....lt_slid_fab_0_memfabric_rom	no_info	NA	NA	NA	NA	NA	NA
/devices/1ST280EU(1 2 3) 1ST280Y1.....avalon_master/master_1_0_slave	av_top alt_ehpc3_0 alt_ehpc3_hard_instlane alt_xcvr_native_optional_cfg_logic	1	<input type="text" value="0x0"/>	<input type="text" value="0x80000"/>	25.78125	<input type="text" value="PMA_Status"/>	<input type="text" value="PMA_Tuning"/>

master Lookup Table

Jtag Path	No_of_Channel	Base Address	Channel Multiplier	Datarate(gbps)	PMA_Status	PMA_Tuning
/devices/1ST280EU(1 2 3) 1ST280Y1.....@2#USB-1/(link)/JTAG/alt_slid_fab_0_alt_slid_fab_0_slidfabric.node_1 phy_0/altera_jtag_avalon_master_0_master	<input type="text" value="1"/>	<input type="text" value="0x100000"/>	<input type="text" value="0x100000"/>	<input type="text" value="28"/>	<input type="text" value="PMA_Status"/>	<input type="text" value="PMA_Tuning"/>
/devices/1ST280EU(1 2 3) 1ST280Y1.....@2#USB-1/(link)/JTAG/alt.....lt_slid_fab_0_alt_slid_fab_0_memfabric_transactio.avalon_master	<input type="text" value="1"/>	<input type="text" value="0x00000"/>	<input type="text" value="0x80000"/>	<input type="text" value="28"/>	<input type="text" value="PMA_Status"/>	<input type="text" value="PMA_Tuning"/>

Slave Lookup Table lists all the IPs in the design that has ADME enabled

Info Includes

- JTAG path, Info
- No_of_Channel
- Base Address
- Channel Multiplier
- Datarate(Gbps)

Master Lookup Table lists all the Jtag Master

Info Includes

- JTAG path
- No_of_Channel
- Base Address
- Channel Multiplier
- Datarate(Gbps)

Transceiver Debug Tool – JTAG List

Comments

.....
1. Select the Jtag Path to tune
2. Capability register should be enabled
.....
Register Address calculation
Address = offset + (base_address + channel_multiplier * channel_no)
.....

slave Lookup Table

Path	Info	No_of_Channel	Base Address	Channel Multiplier	Datarate(gbps)	PMA_Status	PMA_Tuning
/devices/1ST280EU(1 2 3) 1ST280.....lt_slid_fab_0_memfabric_rom_rom	no_info	NA	NA	NA	NA	NA	NA
/devices/1ST280EU(1 2 3) 1ST280.....avalon_master/master_1_0_slave	av_top alt_ehpc3_0 alt_ehpc3_hard_instlane alt_xcvr_native_optional_rcfg_logic	1	0x0	0x80000	25.78125	<input type="button" value="PMA_Status"/>	<input type="button" value="PMA_Tuning"/>

master Lookup Table

Jtag Path	No_of_Channel	Base Address	Channel Multiplier	Datarate(gbps)	PMA_Status	PMA_Tuning
/devices/1ST280EU(1 2 3) 1ST280EY1 ..@2#USB-1/(link)/JTAG/alt_slid_fab_0_alt_slid_fab_0_slidfabric.node_1 phy_0/altera_jtag_avalon_master_0_master	1	0x100000	0x100000	28	<input type="button" value="PMA_Status"/>	<input type="button" value="PMA_Tuning"/>
/devices/1ST280EU(1 2 3) 1ST280EY1 ..@2#USB-1/(link)/JTAG/alt.....lt_slid_fab_0_alt_slid_fab_0_memfabric_transactio.avalon_master	1	0x00000	0x80000	28	<input type="button" value="PMA_Status"/>	<input type="button" value="PMA_Tuning"/>

For ADME Enabled Slave Path, Click on the tool you want to open

For Master JTAG Path, Enter the information in the editable textbox and click on the tool you want to open

In this Ethernet 25G IP example shown,
No_of_Channel = 1
Base Address = 0x100000
Channel Multiplier = 0x100000
Datarate(Gbps)= 28.



INTEL[®] STRATIX[®] 10 DEVICE E-TILE TRANSCEIVER STATUS TOOL

Intel® Stratix® 10 Device E-Tile Transceiver Tool

Comments

- Select the Jtag Path to tune
- Capability register should be enabled

Register Address calculation
Address = offset + Base_address + channel_multiplier * channel_no

Device Lookup Table

Path	Info	No. of Channel	Base Address	Channel Multiplier	Datarate (Gbps)	PMA_Status	PMA_Tuning
(Devices)41220000@24US-1 fclk....._s10_fab_0_mefabric_0pn_rmn	no_yfko	NA	NA	NA	NA	NA	NA
(Devices)41220000@24US-1 fclk....._evolver_master_breaster_1_s_slave	eh alt_shpc3_s10_shpc3_hard_ptrIDL.....lane alt_xcvr_active_optional_rcfg_bpc	1	0x0	0x0000	25.78125	PMA_Status	PMA_Tuning
(Devices)41220000@24US-1 fclk....._evolver_master_breaster_2_s_slave	no_yfko	NA	NA	NA	NA	NA	NA
(Devices)9M1270P124122002 BPM2220@14US-1 9H4 TAG(1:10:130:13) #0 tagmem_0_slave_0	no_yfko	NA	NA	NA	NA	NA	NA
(Devices)9M1270P124122002 BPM2220@14US-1 9H4 TAG(1:10:130:13) #0 tagmem_0_slave_20	no_yfko	NA	NA	NA	NA	NA	NA
(Devices)9M1270P124122002 BPM2220@14US-1 9H4 TAG(1:10:130:13) #0 tagmem_0_slave_40	no_yfko	NA	NA	NA	NA	NA	NA

Master Lookup Table

Jtag Path	No. of Channel	Base Address	Channel Multiplier	Datarate (Gbps)	PMA_Status	PMA_Tuning
(Devices)41220000@24US-1 9H4 TAG(alt_s10_fab_0_sdfabric_node_4fhy_0 master_0_mester	1	0x0000	0x0000	25	PMA_Status	PMA_Tuning
(Devices)41220000@24US-1 9H4 TAG(alt_s10_fab_0_sdfabric_node_5fhy_0 master_0_mester	1	0x0000	0x0000	25	PMA_Status	PMA_Tuning
(Devices)41220000@24US-1 9H4 TAG(alt_s10_fab_0_sdfabric_node_6fhy_0 master_0_mester	1	0x0000	0x0000	25	PMA_Status	PMA_Tuning
(Devices)41220000@24US-1 9H4 TAG(alt_s10_fab_0_sdfabric_node_7fhy_0 master_0_mester	1	0x0000	0x0000	25	PMA_Status	PMA_Tuning
(Devices)41220000@24US-1 9H4 TAG(alt_s10_fab_0_sdfabric_node_8fhy_0 master_0_mester	1	0x0000	0x0000	25	PMA_Status	PMA_Tuning
(Devices)41220000@24US-1 9H4 TAG(alt_s10_fab_0_sdfabric_node_9fhy_0 master_0_mester	1	0x0000	0x0000	25	PMA_Status	PMA_Tuning
(Devices)41220000@24US-1 9H4 TAG(alt_s10_fab_0_sdfabric_node_10fhy_0 master_0_mester	1	0x0000	0x0000	25	PMA_Status	PMA_Tuning
(Devices)9M1270P124122002 BPM2220@14US-1 9H4 TAG(1:10:130:13) #0 tagmem_0	1	0x0000	0x0000	25	PMA_Status	PMA_Tuning

s10_etile_transceiver_debug_vQ18p1_V3p3

Comments

- To use this tool ADME should be Enabled for accessing PMA registers
- Capability register should be enabled for reading CDRLOCK register
- For PAM4 design, consider only even channels. This is fixed from Quartus 18.1 onwards.
- Valid Range - Transmitter. VOD_Attenuation = 0 to 31. Post_tap1, Pre_tap2 = -31 to 31. Pre_tap3 = -1 to +1
- Valid Range - Receiver Adaptation. GS1, GS2 = 0 to 3. RF_B0 = 0 to 5. RF_B1 = 0 to 8. GAINLF, GAINRF = 0 to 15. RF_P2 = -10 to 10. RF_P1 = 0 to 15. RF_P0 = -15 to 15
- Valid Range - RX_Analog_Settings. RF_P2_min, RF_P2_max = -10 to 10. RF_P1_min, RF_P1_max, RF_B0T, CTLE_LF_min, CTLE_LF_max, CTLE_HF_min, CTLE_HF_max = 0 to 15

Instance Table

36	Generate_transceiver_block:0:instx(xcvr_brx_inst xcvr_native_s10_etile_0 alt_xcvr_native_optional_rcfg_logic	Datarate = 30.0 Gbps
37	Generate_transceiver_block:1:instx(xcvr_brx_inst xcvr_native_s10_etile_0 alt_xcvr_native_optional_rcfg_logic	Datarate = 30.0 Gbps
38	Generate_transceiver_block:2:instx(xcvr_brx_inst xcvr_native_s10_etile_0 alt_xcvr_native_optional_rcfg_logic	Datarate = 30.0 Gbps
39	Generate_transceiver_block:3:instx(xcvr_brx_inst xcvr_native_s10_etile_0 alt_xcvr_native_optional_rcfg_logic	Datarate = 30.0 Gbps

Time to test in seconds

1 x 1 = 1 Seconds

jtag_path + Channel

36 37 38 39

Read

channel_0	channel_1	channel_2	channel_3	channel_4	channel_5	channel_6
Reset	Reset	Reset	Reset	Reset	Reset	Reset
Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS
<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB
iADP	iADP	iADP	iADP	iADP	iADP	iADP
Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER
Read BER	Read BER	Read BER	Read BER	Read BER	Read BER	Read BER
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Intel® Stratix® 10 Device E-Tile Transceiver Tool

S10_Etile_transceiver_debug_vQ18p1_V3p3

Comments

- 1.To use this tool ADME should be Enabled for accessing PMA registers
- 2.Capability register should be enabled for reading CDLOCK register
- 3.For PAM4 design, consider only even channels. This is fixed from Quartus 18.1 onwards.
- 4.Valid Range - Transmitter. VOD_Attenuation = 0 to 31. Post_tap1, Pre_tap1, Pre_tap2 = -31 to 31. Pre_tap3 = -1 to +1
- 5.Valid Range - Receiver_Adaptation. GS1, GS2 = 0 to 3. RF_B0 = 0 to 5. RF_B1 = 0 to 8. GAINLF, GAINLF = 0 to 15. RF_P2 = -10 to 10. RF_P1 = 0 to 15. RF_P0 = -15 to 15
- 6.Valid Range - RX_Analog_Settings. RF_P2_min, RF_P2_max = -10 to 10. RF_P1_min, RF_P1_max, RF_B0T, CTLE_LF_min, CTLE_LF_max, CTLE_HF_min, CTLE_HF_max = 0 to 15

Instance Table

36	Generate_transceiver_block:0:instx xcvr_brx_inst xcvr_native_s10_etile_0 alt_xcvr_native_optional_cfg_logic	Datarate = 30.0 Gbps
37	Generate_transceiver_block:1:instx xcvr_brx_inst xcvr_native_s10_etile_0 alt_xcvr_native_optional_cfg_logic	Datarate = 30.0 Gbps
38	Generate_transceiver_block:2:instx xcvr_brx_inst xcvr_native_s10_etile_0 alt_xcvr_native_optional_cfg_logic	Datarate = 30.0 Gbps
39	Generate_transceiver_block:3:instx xcvr_brx_inst xcvr_native_s10_etile_0 alt_xcvr_native_optional_cfg_logic	Datarate = 30.0 Gbps

Time to test in seconds

1 x 1 = 1 Seconds

jtag_path + Channel

36 37 38 39

Read

	channel_0	channel_1	channel_2	channel_3	channel_4	channel_5	channel_6
Reset	Reset	Reset	Reset	Reset	Reset	Reset	Reset
Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS
<input type="checkbox"/> 1LB	<input type="checkbox"/> 1LB	<input type="checkbox"/> 1LB	<input type="checkbox"/> 1LB	<input type="checkbox"/> 1LB	<input type="checkbox"/> 1LB	<input type="checkbox"/> 1LB	<input type="checkbox"/> 1LB
iADP	iADP	iADP	iADP	iADP	iADP	iADP	iADP
Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER
Read BER	Read BER	Read BER	Read BER	Read BER	Read BER	Read BER	Read BER
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Status

CDR_lock_to_data	Unlocked	Unlocked	Unlocked	Unlocked	Unlocked	Unlocked	Unlocked
RX_ready	High	High	High	High	High	High	High
RX_ready	Low	Low	Low	Low	Low	Low	Low

Transmitter

VOD_attenuation	0	0	0	0	0	0	0
post_tap1	0	0	0	0	0	0	0
pre_tap1	0	0	0	0	0	0	0
pre_tap2	0	0	0	0	0	0	0
pre_tap3	0	0	0	0	0	0	0

Default Apply Default Apply Default Apply Default Apply Default Apply Default Apply

Receiver_Adaptation

GS1	0	0	0	0	0	0	0
GS2	0	0	0	0	0	0	0
RF_B0	0	0	0	0	0	0	0
RF_B1	0	0	0	0	0	0	0
GAINLF	0	0	0	0	0	0	0
GAINHF	8	8	8	8	8	8	8
RF_P2	0	0	0	0	0	0	0
RF_P1	0	0	0	0	0	0	0
RF_P0	0	0	0	0	0	0	0

RX_Analog_Settings

RF_P2_min	-10	-10	-10	-10	-10	-10	-10
RF_P2_max	10	10	10	10	10	10	10
RF_P1_min	0	0	0	0	0	0	0
RF_P1_max	15	15	15	15	15	15	15
RF_B0T	0	0	0	0	0	0	0
CTLE_LF_min	0	0	0	0	0	0	0
CTLE_LF_max	15	15	15	15	15	15	15
CTLE_HF_min	0	0	0	0	0	0	0
CTLE_HF_max	15	15	15	15	15	15	15

*For readability in the presentation, Status Tool screenshot broken into two

Intel® Stratix® 10 Device E-Tile Transceiver Tool

The screenshot shows the Intel Stratix 10 Device E-Tile Transceiver Tool interface. It features a 'Comments' section at the top, followed by an 'Instance Table' with a single entry for 'Generate_transceiver_block'. Below this is a 'Time to test in seconds' section with a dropdown set to '3' and a unit dropdown set to 'Seconds'. The 'jtag_path + Channel' section shows '36'. A 'Read' button is present. The main area is a grid of 8 channels (channel_0 to channel_7), each with a 'Reset' button, a 'Start PRBS' button, an 'ILB' checkbox, an 'IADP' button, a 'Reset BER' button, and a 'Read BER' button. The status bar at the bottom shows 'Stratix'.

1. To use this tool ADME should be Enabled for accessing PMA registers
2. Capability register should be enabled for reading CDRLOCK register
3. For PAM4 design, consider only even channels. This is fixed from Quartus 18.1 onwards.
4. Valid Range - Transmitter. VDD_Attenuation = 0 to 31. Post_tap1, Pre_tap1, Pre_tap2 = -31 to 31. Pre_tap3 = -1 to +1
5. Valid Range - Receiver_Adaptation. GS1, GS2 = 0 to 3. RF_B0 = 0 to 5. RF_B1 = 0 to 8. GAINLF, GAINRF = 0 to 15. RF_P2 = -10 to 10. RF_P1 = 0 to 15. RF_P0 = -15 to 15
6. Valid Range - RX_Analog_Settings. RF_P2_min, RF_P2_max = -10 to 10. RF_P1_min, RF_P1_max, RF_B0T, CTLE_LF_min, CTLE_LF_max, CTLE_HF_min, CTLE_HF_max = 0 to 15

Instance Table
36 | Generate_transceiver_block:0|instx|xcvr_brx_inst|xcvr_native_s10_etile_0|alt_xcvr_native_optional_cfg_logic | Datarate = 30.0 Gbps

Time to test in seconds
3 x 1 = 3 Seconds

jtag_path + Channel
36

Read

channel_0	channel_1	channel_2	channel_3	channel_4	channel_5	channel_6	channel_7
Reset	Reset	Reset	Reset	Reset	Reset	Reset	Reset
Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS
<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB
IADP	IADP	IADP	IADP	IADP	IADP	IADP	IADP
Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER
Read BER	Read BER	Read BER	Read BER	Read BER	Read BER	Read BER	Read BER
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Status

1. Comments
2. Instance table
3. Time to test
4. Individual tab for each PHY
5. Read button for each PHY
6. Reset button for each channel in PHY
7. ILB and adaptation
8. Reset and read Bit Error Rate (BER)

Intel® Stratix® 10 Device E-Tile Transceiver Tool

9	Status	Unlocked	Unlocked	Unlocked	Unlocked	Unlocked	Unlocked
	CDR_lock_to_data	Unlocked	Unlocked	Unlocked	Unlocked	Unlocked	Unlocked
	TX_ready	High	High	High	High	High	High
	RX_ready	Low	Low	Low	Low	Low	Low
10	Transmitter						
	VOD_attenuation	0	0	0	0	0	0
	post_tap1	0	0	0	0	0	0
	pre_tap1	0	0	0	0	0	0
	pre_tap2	0	0	0	0	0	0
	pre_tap3	0	0	0	0	0	0
11		Default	Default	Default	Default	Default	Default
		Apply	Apply	Apply	Apply	Apply	Apply
12	Receiver_Adaptation						
	GS1	0	0	0	0	0	0
	GS2	0	0	0	0	0	0
	RF_B0	0	0	0	0	0	0
	RF_B1	0	0	0	0	0	0
	GAINLF	0	0	0	0	0	0
	GAINHF	8	8	8	8	8	8
	RF_P2	0	0	0	0	0	0
	RF_P1	0	0	0	0	0	0
	RF_P0	0	0	0	0	0	0
13	RX_Analog_Settings						
	RF_P2_min	-10	-10	-10	-10	-10	-10
	RF_P2_max	10	10	10	10	10	10
	RF_P1_min	0	0	0	0	0	0
	RF_P1_max	15	15	15	15	15	15
	RF_B0T	0	0	0	0	0	0
	CTLE_LF_min	0	0	0	0	0	0
	CTLE_LF_max	15	15	15	15	15	15
	CTLE_HF_min	0	0	0	0	0	0
	CTLE_HF_max	15	15	15	15	15	15

- 9. PMA status parameters
- 10. PMA Transmitter parameters
- 11. Load recipes
- 12. PMA receiver adaptation parameters
- 13. PMA RX analog settings parameters

Intel® Stratix® 10 Device E-Tile Transceiver Tool

510_etile_transceiver_debug_vQ18p1_V3p2

Comments

- 1.To use this tool ADME should be Enabled for accessing PMA registers
- 2.Capability register should be enabled for reading CDRLCK register
- 3.For PAM4 design, consider only even channels. This is fixed from Quartus 18.1 onwards.
- 4.Valid Range - Transmitter. VOD_Attenuation = 0 to 31. Post_tap1, Pre_tap1, Pre_tap2 = -31 to 31. Pre_tap3 = -1 to +1
- 5.Valid Range - Receiver_Adaptation. GS1, GS2 = 0 to 3. RF_B0 = 0 to 5. RF_B1 = 0 to 8. GAINF, GAINLF = 0 to 15. RF_P2 = -10 to 10. RF_P1 = 0 to 15. RF_P0 = -15 to 15
- 6.Valid Range - RX_Analog_Settings. RF_P2_min, RF_P2_max = -10 to 10. RF_P1_min, RF_P1_max, RF_B0T, CTLE_LF_min, CTLE_LF_max, CTLE_HF_min, CTLE_HF_max = 0 to 15

Instance Table

36	Generate_transceiver_block:Qinstx(xcvr_brx_inst)(xcvr_native_s10_etile_0)(alt_xcvr_native_optional_cfg_logic Datarate = 30.0 Gbps
----	---

Time to test in seconds

3 x 1 = 3 Seconds

Jtag_path + Channel

36

channel_0	channel_1	channel_2	channel_3	channel_4	channel_5	channel_6	channel_7	channel_8	channel_9
Reset	Reset	Reset	Reset	Reset	Reset	Reset	Reset	Reset	Reset
Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS
<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB
IADP	IADP	IADP	IADP	IADP	IADP	IADP	IADP	IADP	IADP
Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER
Read BER	Read BER	Read BER	Read BER	Read BER	Read BER	Read BER	Read BER	Read BER	Read BER
--	--	--	--	--	--	--	--	--	--

Status

Instance table lists all the PHYs that are added to the tool.

Tool automatically finds all the channels in the instantiated PHY instance

Intel® Stratix® 10 Device E-Tile Transceiver Tool

S10_ETile_transceiver_debug_vQ18p1_V3p2

Comments

1.To use this tool ADME should be Enabled for accessing PMA registers
2.Capability register should be enabled for reading CDRLOCK register
3.For PAMA design, consider only even channels. This is fixed from Quartus 18.1 onwards.
4.Valid Range - Transmitter, VOD_Attenuation = 0 to 31. Post_tap1, Pre_tap1, Pre_tap2 = -31 to 31. Pre_tap3 = -1 to +1
5.Valid Range - Receiver_Adaptation: GS1, GS2 = 0 to 3. RF_B0 = 0 to 5. RF_B1 = 0 to 8. GAINLF, GAINLF = 0 to 15. RF_P2 = -10 to 10. RF_P1 = 0 to 15. RF_P0 = -15 to 15
6.Valid Range - RX_Analog_Settings: RF_P2_min, RF_P2_max = -10 to 10. RF_P1_min, RF_P1_max, RF_B0T, CTLE_LF_min, CTLE_LF_max, CTLE_HF_min, CTLE_HF_max = 0 to 15

Instance Table

36 | Generate_transceiver_block0:instb(xcvr_brx_inst)xcvr_native_s10_etile_0|alt_xcvr_native_optional_cfg_logic | Datarate = 30.0 Gbps

Time to test in seconds

3 x 1 = 3 Seconds

Jtag_path + Channel

36

Read

channel_0	channel_1	channel_2	channel_3	channel_4	channel_5	channel_6	channel_7	channel_8	channel_9
Reset	Reset	Reset	Reset	Reset	Reset	Reset	Reset	Reset	Reset
Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS
<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB
iADP	iADP	iADP	iADP	iADP	iADP	iADP	iADP	iADP	iADP
Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER
Read BER	Read BER	Read BER	Read BER	Read BER	Read BER	Read BER	Read BER	Read BER	Read BER
--	--	--	--	--	--	--	--	--	--

Reads the PMA attributes for all the channels in that PHY

Reset PMA parameters of each channel

Intel® Stratix® 10 Device E-Tile Transceiver Tool

S10_Etile_transceiver_debug_vQ18p1_V3p2

Comments

- 1.To use this tool ADME should be Enabled for accessing PMA registers
- 2.Capability register should be enabled for reading CDRLCK register
- 3.For PAM4 design, consider only even channels. This is fixed from Quartus 18.1 onwards.
- 4.Valid Range - Transmitter. VOD_Attenuation = 0 to 31. Post_tap1, Pre_tap1, Pre_tap2 = -31 to 31. Pre_tap3 = -1 to +1
- 5.Valid Range - Receiver_Adaptation. GS1, GS2 = 0 to 3. RF_B0 = 0 to 5. RF_B1 = 0 to 8. GAINLF, GAINRF = 0 to 15. RF_P2 = -10 to 10. RF_P1 = 0 to 15. RF_PO = -15 to 15
- 6.Valid Range - RX_Analog_Settings. RF_P2_min, RF_P2_max = -10 to 10. RF_P1_min, RF_P1_max, RF_B0T, CTLE_LF_min, CTLE_LF_max, CTLE_HF_min, CTLE_HF_max = 0 to 15

Instance Table

36 |Generate_transceiver_block:0|inst:0|xcvr_brx_inst|xcvr_native_s10_etile_0|alt_xcvr_native_optional_rcfg_logic | Datarate = 30.0 Gbps

Time to test in seconds

3 x 1 = 3 Seconds

Jtag_path + Channel

36

Read

channel_0	channel_1	channel_2	channel_3	channel_4	channel_5	channel_6	channel_7	channel_8	channel_9
Reset	Reset	Reset	Reset	Reset	Reset	Reset	Reset	Reset	Reset
Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS	Start PRBS
<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB	<input type="checkbox"/> ILB
IADP	IADP	IADP	IADP	IADP	IADP	IADP	IADP	IADP	IADP
Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER	Reset BER
Read BER	Read BER	Read BER	Read BER	Read BER	Read BER	Read BER	Read BER	Read BER	Read BER

Perform ILB and iADP for each channel.

Option to read and reset Bit Error Rate.

Changing PMA configurations

Dropdown lists all the PMA configuration. To change the PMA configuration, select a configuration from the list and click on Apply button.

Receiver_Adaptation	Custom	Custom
GS1	1	1
GS2	0	0
RF_B0	2	2
RF_B1	8	8
GAINLF	15	15
GAINHF	8	4
RF_P2	-7	-7
RF_P1	7	7
RF_P0	5	9

When custom configuration is selected, parameters GS1, GS2, RF_B0, and RF_B1 becomes editable allowing you to enter custom values.

Log File

Log file is created when you use the tool and it is located in {script_executed_directory}/log

> Girisanakar, Sree Balaji > system_console > scripts > log

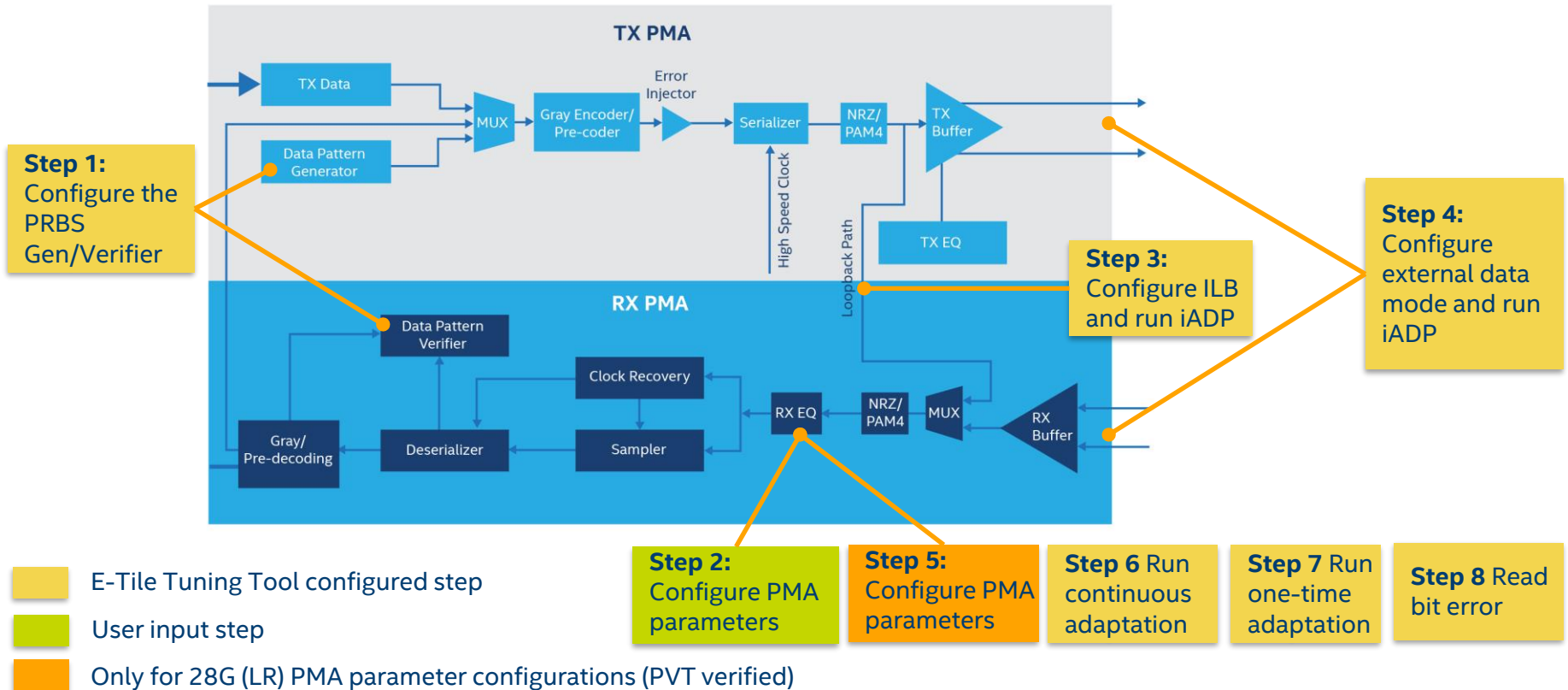
Name	Date modified	Type	Size
etile_transceiver_status_283julian_10hr_59min_58sec_sgirisan-mobl.csv	10/10/2018 11:13 AM	Microsoft Excel Comma Separat...	3 KB
etile_transceiver_status_283julian_14hr_22min_15sec_sgirisan-mobl.csv	10/10/2018 2:35 PM	Microsoft Excel Comma Separat...	2 KB
etile_transceiver_status_283julian_14hr_58min_04sec_sgirisan-mobl.csv	10/10/2018 2:59 PM	Microsoft Excel Comma Separat...	1 KB

TIME	JTAG	PAT	CHAN	CDRLOCK	TX	ready	RX	ready	VOD	Atte	Post	tap1	Pre	tap1	Pre	tap2	Pre	tap3	GS1	GS2	RF_B1	RF_B0	GAINLF	GAINHF	RF_P2	RF_P1	RF_P0	RF_B0T	CTLE_LF	rCTLE_LF	rCTLE_LF	HF_1CTLE	HF_1CTLE	HF_1RF	P2_mii	RF_P2_ma	RF_P1_mii	RF_P1_max
353julian	/	devices	/1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	15	0	15	-10	10	0	15		
353julian	/	devices	/1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	15	0	15	-10	10	0	15		
353julian	/	devices	/1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	15	0	15	-10	10	0	15		

Every time the Read button is clicked, all the PMA parameters are logged as shown in the figure along with time, PHY, and channel number.

E-TILE TRANSCEIVER TUNING TOOL

Intel® Stratix® 10 E-Tile Transceiver Tuning Tool Algorithm



Intel® Stratix® 10 Device E-Tile Transceiver Tuning Tool

Comments

Tool_VQ18p1_Y3p3 based on Q18.0.1

1. To use this tool ADME should be Enabled for accessing PMA registers
2. Capability register should be enabled for reading CDRLCK register

LogFile in the following Location -> C:\Users\logisran\system_console/scripts/fog/Etile_tuning_353julian_09hr_51min_01sec_sgrisan-mobi.csv

Legends

1. IADP : Initial adaptation
2. cADP : Continuous adaptation
3. IVAL : Initial settings for adaptation module
4. Ch_En : Enable the measurement (Doesn't power down the channel)
4. SWP_En : Sweep Enable
 - If checked, parameter will be in the manual mode with value specified in the combo box
 - If not checked, the module will be adapting
5. PRBS_En : If Checked, PRBS31 will be selected, if Unchecked, User traffic will be selected

Profile Lookup Table

	GS1(ADP)	GS2(ADP)	RF_B0(ADP)	RF_B1(ADP)	RF_B1(GADP)	RF_P1_MAX(VAL)	LF_MAX(VAL)	RF_B0T(VAL)
Custom	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3 4 5 6 7 8	adaptive	Default	Default	Default
28G_LR	2	2	1	1	8	6	2	10
28G_VSR	adaptive	adaptive	adaptive	adaptive	adaptive	Default	Default	Default
10G_30db	2	1	1	5	adaptive	6	1	Default
96G_LR	1	1	2	8	adaptive	1	1	40
96G_VSR	0	0	3	3	adaptive	6	Default	10

JTAG_list

36 Generate_transceiver_block0:snstx(xcvr_brx_int)xcvr_native_s10_etile_0|alt_xcvr_native_optional_cfg_logic Datarate = 30.0 Gbps

Time to test in seconds

3 x 1 = 3 Seconds

Jtag_path + Channel

36

Run(Sweep) Kill

	Profile	Power_on	Tuning_en	PRBS31	SWP_En	GS1(min)	GS1(max)	SWP_En	GS2(min)	GS2(max)	SWP_En	RF_B0(min)	RF_B0(max)	SWP_En	RF_B1(min)	RF_B1(max)	RF_P1_MAX	LF_MAX	RF_B0T	IADP	cADP	Status	Time	
Channel_0	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8	ADP	default	default	default	<input checked="" type="checkbox"/> Enabled	<input type="checkbox"/>	--	--
Channel_1	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8	ADP	default	default	default	<input checked="" type="checkbox"/> Enabled	<input type="checkbox"/>	--	--

Intel® Stratix® 10 Device E-Tile Transceiver Tuning Tool

1

Comments

Tool_v01p1_V3p2 based on Q18.0.1

- To use this tool ADME should be Enabled for accessing PMA registers
- Capability register should be enabled for reading CDRLOCK register

LogFile in the following Location --> C:\Users\sgrisan\system_console\logs\log\Etile_tuning_352julian_181r_43min_11sec_sgrisan-mobl.csv

Legends

- IADP : Initial adaptation
- cADP : Continuous adaptation
- IVAL : initial settings for adaptation module
- Ch_En : Enable the measurement (Doesn't power down the channel)
- SWP_En : Sweep Enable

If checked, parameter will be in the manual mode with value specified in the combo box
If not checked, the module will be adapting

5. PRBS_En : If Checked, PRBS31 will be selected, if Unchecked, User traffic will be selected

2

Profile Lookup Table

Custom	GS1(ADP)	GS2(ADP)	RF_B0(ADP)	RF_B1(ADP)	RF_B1(cADP)	RF_P1_MAX(IVAL)	LF_MAX(IVAL)	RF_BOT(IVAL)
0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3 4 5 6 7 8	adaptive	Default	Default	Default
2SG_LR	2	2	1	1	8	6	2	10
2SG_VSR	adaptive	adaptive	adaptive	adaptive	adaptive	Default	Default	Default
100_Sweep	1	1	1	1	5	adaptive	6	1
1SG_LR	1	1	2	1	8	adaptive	1	40
1SG_VSR	0	0	3	3	adaptive	6	Default	10

3

JTAG_List

36 | Generate_transceiver_bldc:0:inbx|xcvr_borx|inbx|xcvr_native_s10_etile_0|alt|xcvr_native_optional_cfg_logic | Datarate = 30.0 Gbps

Time to test in seconds

3 x 1 = 3 Seconds

Jtag_path + Channel

36

4

Run(Sweep) Kill

Channel	Profile	Power_on	Tuning_en	PRBS	SWP_En	GS1(min)	GS1(max)	SWP_En	GS2(min)	GS2(max)	SWP_En	RF_B0(min)	RF_B0(max)	SWP_En	RF_B1(min)	RF_B1(max)	RF_B1	RF_P1_MAX	LF_MAX	RF_BOT	IADP	cADP	Status	Time
Channel_0	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8	ADP	default	default	default	<input checked="" type="checkbox"/>	<input type="checkbox"/>	--	--
Channel_1	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8	ADP	default	default	default	<input checked="" type="checkbox"/>	<input type="checkbox"/>	--	--

- Comments
- Profile look-up table
- JTAG list with data rate
- Button to start measurement
- Preloaded PVT verified profiles
- Initial adaptation PMA parameter
- Continuous adaptation PMA parameter
- Adaptation module initial values
- Enable/disable continuous adaptation

Intel® Stratix® 10 Device E-Tile Transceiver Tuning Tool

Each PHY instance is added to the tool as a separate tab.

Tool automatically finds the channels in the instantiated PHY instance

Channel	Profile	Power_on	Tuning_en	PRBS		SWP_En	GS1(min)	GS1(max)	SWP_En	GS2(min)	GS2(max)	SWP_En	RF_B0(min)	RF_B0(max)
Channel_0	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2
Channel_1	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2
Channel_2	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2
Channel_3	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2
Channel_4	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2
Channel_5	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2
Channel_6	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2
Channel_7	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2
Channel_8	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2
Channel_9	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2
Channel_10	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2

Intel® Stratix® 10 Device E-Tile Transceiver Tuning Tool

The screenshot shows the tuning tool interface with the following parameters for each channel:

Channel	Profile	Power_on	Tuning_en	PRBS	SWP_En	GS1(min)	GS1(max)	SV_P_En	GS2(min)	GS2(max)	SWP_En	RF_B0(min)	RF_B0(max)	SWP_En	RF_B1(min)	RF_B1(max)
Channel_0	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_1	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_2	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_3	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_4	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_5	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_6	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_7	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_8	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_9	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8

Each PMA parameter has:

- Sweep-enable option
- Maximum value
- Minimum value

E-TILE TRANSCEIVER TUNING STEPS

Step 1 : Select the Profile

Step1 : Combo box consist of preloaded profile. Select one.

The screenshot shows a software interface for configuring channels. At the top left, there is a 'Run(Sweep)' button and a 'kill' checkbox. Below this is a table with columns for Channel, Profile, Power_on, Tuning_en, PRBS, and several ADP (Analog Data Path) parameters. The 'Profile' dropdown menu for Channel_0 is open, showing a list of preloaded profiles: Custom, 28G_LR, 28G_VSR, 10G_30db, 56G_LR, and 56G_VSR. A yellow arrow points from the text box on the right to this dropdown menu.

Channel	Profile	Power_on	Tuning_en	PRBS	SWP_En	GS1(min)	GS1(max)	SWP_En	GS2(min)	GS2(max)	SWP_En	RF_B0(min)	RF_B0(max)	SWP_En	RF_B1(min)	RF_B1(max)
Channel_0	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_1	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_2	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_3	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_4	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_5	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_6	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_7	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_8	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_9	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_10	Custom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8

Profiles are validated across PVT (except custom)

Observe the Updated Profile Setting

jtag_path + Channel

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Run(Sweep)

Channel	Profile	Power_on	Tuning_en	PRBS		SWP_En	GS1(min)	GS1(max)	SWP_En	GS2(min)	GS2(max)	SWP_En	RF_B0(min)	RF_B0(max)	SWP_En	RF_B1(min)	RF_B1(max)
Channel_0	28G_LR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_1	28G_VSR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_2	10G_30db	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_3	56G_LR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_4	56G_VSR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_5	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_6	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_7	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_8	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_9	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_10	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8

Observe the changes after applying the profile in channel 0,1,2,3,4,5

Step 3 : (If required) Change the Minimum and Maximum Value of PMA Parameter

Combo box allows you to select the maximum and minimum sweep values

The screenshot shows a software interface for configuring channels. At the top, there is a 'Run(Sweep)' button and a 'Kill' icon. Below this is a table of channel configurations. The table has columns for Channel, Profile, Power_on, Tuning_en, PRBS, SWP_En, GS1(min), GS1(max), SWP_En, GS2(min), GS2(max), SWP_En, RF_B0(min), RF_B0(max), SWP_En, RF_B1(min), and RF_B1(max). The values for the GS and RF_B parameters are shown in dropdown menus. Orange arrows point to these dropdown menus, indicating that they can be used to select the minimum and maximum sweep values.

Channel	Profile	Power_on	Tuning_en	PRBS	SWP_En	GS1(min)	GS1(max)	SWP_En	GS2(min)	GS2(max)	SWP_En	RF_B0(min)	RF_B0(max)	SWP_En	RF_B1(min)	RF_B1(max)
Channel_0	28G_LR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_1	28G_VSR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_2	10G_30db	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_3	56G_LR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_4	56G_VSR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_5	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_6	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_7	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_8	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_9	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_10	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8

Step 4 : (If needed) Check/Uncheck for Manual/Adaptive PMA Parameter

jtag_path + Channel

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Run(Sweep) Kill

Channel	Profile	Power_on	Tuning_en	PRBS	SWP_En	GS1(min)	GS1(max)	SWP_En	GS2(min)	GS2(max)	SWP_En	RF_B0(min)	RF_B0(max)	SWP_En	RF_B1(min)
Channel_0	28G_LR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8
Channel_1	28G_VSR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8
Channel_2	10G_30db	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8
Channel_3	56G_LR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8
Channel_4	56G_VSR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8
Channel_5	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8
Channel_6	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8
Channel_7	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8
Channel_8	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8
Channel_9	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8
Channel_10	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8

If checked, user will be able to sweep PMA parameter that can be edited using the combo box

or

If unchecked, the PMA parameter will be in adaptation mode

Step 4 : Click “Sweep” to Start the Measurement

Step 4 : Click “Sweep” to start the measurement

The screenshot shows a software interface for configuring measurement channels. At the top left, there is a 'Run(Sweep)' button. A yellow callout box points to this button with the text 'Step 4 : Click “Sweep” to start the measurement'. Below the button is a table of channels with various settings.

Channel	Profile	Power_on	Tuning_en	PRBS		SWP_En	GS1(min)	GS1(max)	SWP_En	GS2(min)	GS2(max)	SWP_En	RF_B0(min)	RF_B0(max)	SWP_En	RF_B1(min)	RF_B1(max)
Channel_0	28G_LR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_1	28G_VSR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_2	10G_30db	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_3	56G_LR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_4	56G_VSR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_5	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_6	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_7	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_8	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_9	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel_10	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31		<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8

Step 5 : Check the Status Column

Step 5 : Check for the "Done" status

jtag_path + Channel

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Run(Sweep)

Channel	Profile	Power_on	Tuning_en	PRBS	SWP_En	GS1(min)	GS1(max)	SWP_En	GS2(min)	GS2(max)	SWP_En	RF_B0(max)	SWP_En	RF_B1(min)	RF_B1(max)	RF_B1	RF_P1_MAX	LF_MAX	RF_BOT	IADP	cADP	Status	Time
Channel_0	28G_LR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	8	8	ADP	default	default	default	<input checked="" type="checkbox"/> Enabled	<input type="checkbox"/>	Done	2 sec
Channel_1	28G_VSR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	8	8	ADP	default	default	default	<input checked="" type="checkbox"/> Enabled	<input type="checkbox"/>	Done	3 sec
Channel_2	10G_30db	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	8	8	ADP	default	default	default	<input checked="" type="checkbox"/> Enabled	<input type="checkbox"/>	Done	1 sec
Channel_3	56G_LR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	8	8	ADP	default	default	default	<input checked="" type="checkbox"/> Enabled	<input type="checkbox"/>	Done	2 sec
Channel_4	56G_VSR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	8	8	ADP	default	default	default	<input checked="" type="checkbox"/> Enabled	<input type="checkbox"/>	Done	2 sec
Channel_5	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	8	8	ADP	default	default	default	<input checked="" type="checkbox"/> Enabled	<input type="checkbox"/>	--	--
Channel_6	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	8	8	ADP	default	default	default	<input checked="" type="checkbox"/> Enabled	<input type="checkbox"/>	--	--
Channel_7	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	8	8	ADP	default	default	default	<input checked="" type="checkbox"/> Enabled	<input type="checkbox"/>	--	--
Channel_8	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	8	8	ADP	default	default	default	<input checked="" type="checkbox"/> Enabled	<input type="checkbox"/>	--	--
Channel_9	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	8	8	ADP	default	default	default	<input checked="" type="checkbox"/> Enabled	<input type="checkbox"/>	--	--
Channel_10	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	8	8	ADP	default	default	default	<input checked="" type="checkbox"/> Enabled	<input type="checkbox"/>	--	--

Measurement Log Files

Comments

Tool_v1p0 based on Q18.0.1

1.To use this tool ADME should be Enabled for accessing PMA registers

2.Capability register should be enabled for reading CDRLOCK register

LogFile in the following Location --> C:/Users/kbalakri/system_console/scripts/log/Etile_tuning_196julian_19hr_24min_52sec_sj-appslab6-400.csv

The screenshot shows a Windows File Explorer window with the address bar set to 'Kurrinchi Balakrishnan > system_console > scripts > log'. The file list contains the following entries:

Name	Date modified	Type	Size
Etile_tuning_196julian_19hr_24min_52sec_sj-appslab6-400.csv	7/15/2018 7:45 PM	Microsoft Excel C...	4 KB
Etile_tuning_196julian_19hr_22min_08sec_sj-appslab6-400.csv	7/15/2018 7:22 PM	Microsoft Excel C...	1 KB
Etile_tuning_196julian_18hr_25min_26sec_sj-appslab6-400.csv	7/15/2018 6:25 PM	Microsoft Excel C...	1 KB
Etile_tuning_196julian_18hr_18min_03sec_sj-appslab6-400.csv	7/15/2018 6:18 PM	Microsoft Excel C...	1 KB
Etile_tuning_196julian_18hr_16min_20sec_sj-appslab6-400.csv	7/15/2018 6:16 PM	Microsoft Excel C...	1 KB
Etile_tuning_196julian_18hr_15min_32sec_sj-appslab6-400.csv	7/15/2018 6:15 PM	Microsoft Excel C...	1 KB
Etile_tuning_196julian_18hr_13min_27sec_sj-appslab6-400.csv	7/15/2018 6:13 PM	Microsoft Excel C...	1 KB
Etile_tuning_196julian_18hr_11min_51sec_sj-appslab6-400.csv	7/15/2018 6:11 PM	Microsoft Excel C...	1 KB
Etile_tuning_196julian_18hr_11min_06sec_sj-appslab6-400.csv	7/15/2018 6:11 PM	Microsoft Excel C...	1 KB
Etile_tuning_196julian_18hr_10min_42sec_sj-appslab6-400.csv	7/15/2018 6:10 PM	Microsoft Excel C...	1 KB
Etile_tuning_196julian_18hr_10min_23sec_sj-appslab6-400.csv	7/15/2018 6:10 PM	Microsoft Excel C...	1 KB
Etile_tuning_196julian_18hr_09min_46sec_sj-appslab6-400.csv	7/15/2018 6:09 PM	Microsoft Excel C...	1 KB

Log File

				1	2	3		4	5	6	7	8	9						
TIME	jtag_path	CHAN	PRBS	PROFILE	iADP-cADFiADP_DONE_TIME(ms)	CDRLOCK	TX_ready	RX_ready	BIT_ERROR	LF	HF	GS1	GS2	RF_B1	RF_B0	RF_P1_MAX	LF_MAX	RF_BOT	
352julian_19hr_34\	Generate	0	prbs31	28G_LR	iADP	899.124	0	1	0	304908358	adp_0x08	adp_0x00	fix_1	fix_1	fix_8	fix_2	fix_default	fix_default	fix_default
352julian_19hr_34\	Generate	1	prbs31	28G_VSR	iADP	859.492	0	1	0	231114845	adp_0x08	adp_0x00	fix_1	fix_1	fix_8	fix_2	fix_default	fix_default	fix_default
352julian_19hr_34\	Generate	2	prbs31	10G_30db	iADP	891.195	0	1	0	185447860	adp_0x08	adp_0x00	fix_1	fix_1	fix_8	fix_2	fix_default	fix_default	fix_default
352julian_19hr_34\	Generate	3	prbs31	56G_LR	iADP	914.578	0	1	0	272251744	adp_0x08	adp_0x00	fix_1	fix_1	fix_8	fix_2	fix_default	fix_default	fix_default
352julian_19hr_34\	Generate	4	prbs31	56G_VSR	iADP	891.917	0	1	0	293939161	adp_0x08	adp_0x01	fix_1	fix_1	fix_8	fix_2	fix_default	fix_default	fix_default

Legend	Description
1	The column will contain the name of the profile which user selected before sweeping the PMA parameters
2	Bit error are logged after iADP and after pADP, this columns depicts when the bit error was measured
3	If iADP was successful, it will show the total time taken else, it will show "0"
4	Whether the TX and RX ready is high?
5	Number of accumulated bit error
6	LF and BF value, They will be always in adaptive mode
7	GS1,GS2 , value (Manual sweep value or adapted value)
8	RF_B1,RF_B0 , value (Manual sweep value or adapted value)
9	RF_PI_MAX, LF_max, RF_BOT are either user defined values or sof default values

Steps to Apply the Best PMA Configuration

Step 1: Select the best PMA parameter combination from the log file

Step 2: Apply the values to both maximum and minimum

The screenshot shows a configuration window titled "jtag_path + Channel" with a sub-header "36 | 37". It features a "Run(Sweep)" button on the left. The main area is a table with columns for Channel, Profile, Power_on, Tuning_en, PRBS, SWP_En, GS1(min), GS1(max), SWP_En, GS2(min), GS2(max), SWP_En, RF_B0(min), RF_B0(max), SWP_En, RF_B1(min), and RF_B1(max). The table lists configurations for Channel 0 through Channel 10. Annotations include orange lines pointing from the "Run(Sweep)" button to a yellow box at the bottom, and from various parameter dropdowns (GS1, GS2, RF_B0, RF_B1) to a yellow box at the top right.

Channel	Profile	Power_on	Tuning_en	PRBS	SWP_En	GS1(min)	GS1(max)	SWP_En	GS2(min)	GS2(max)	SWP_En	RF_B0(min)	RF_B0(max)	SWP_En	RF_B1(min)	RF_B1(max)
Channel 0	28G_LR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel 1	28G_VSR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel 2	10G_30db	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel 3	56G_LR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel 4	56G_VSR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel 5	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel 6	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel 7	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel 8	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel 9	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8
Channel 10	Custom	<input type="checkbox"/>	<input type="checkbox"/>	PRBS31	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	1	1	<input checked="" type="checkbox"/>	2	2	<input checked="" type="checkbox"/>	8	8

Step 3: Click the "sweep" button

