

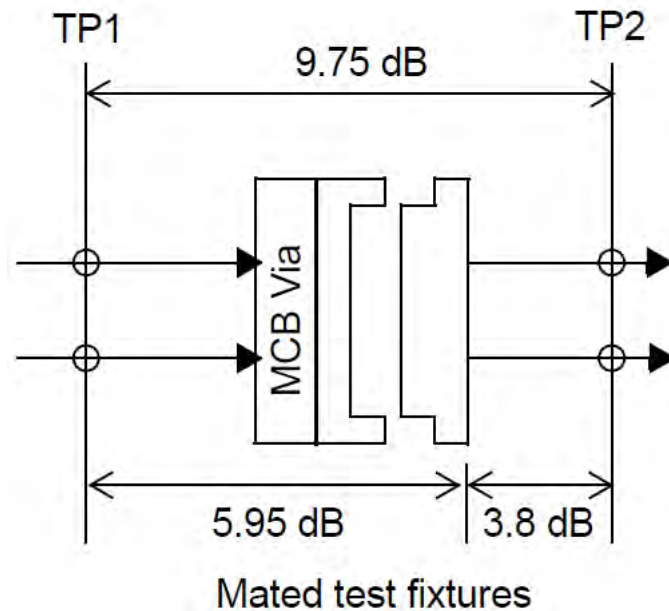
MTF Performance Evaluation

Sam Kocsis, Hansel D'Silva Amphenol

May 2025

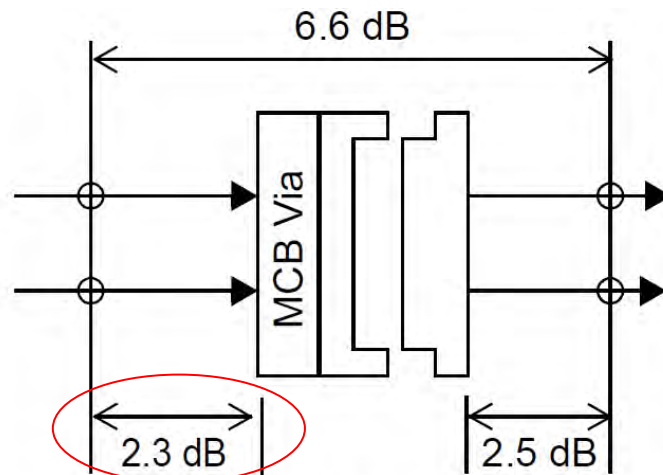
Motivation

- (64) data points of MTF Measurements ([sekel 3dj 02 2503](#))
 - What expectations should the TF (or WG) have for the data?

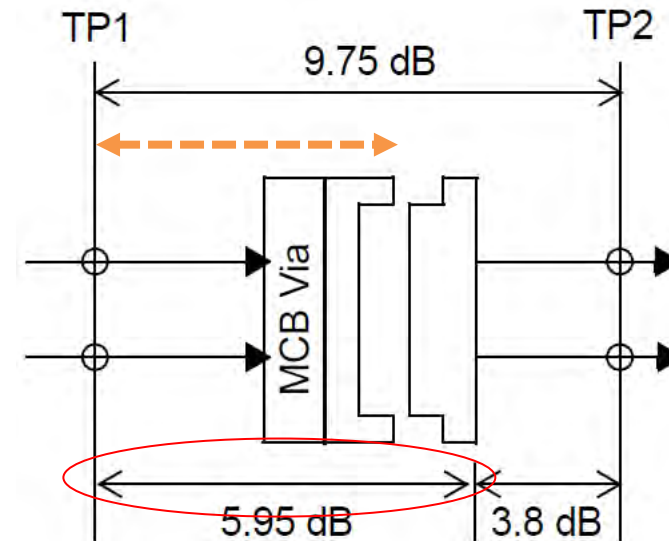


Background

- MTF Prototype Measurements ([sekel 3dj 02 2407](#))
 - Older data, but provided direction for spec definition in D1P5



Mated cable assembly
and test point test fixture



Mated test fixtures

*Previous projects have supported a
“2x-THRU” calibration approach*

*To be correct, D2P1 should adjust the
line representing 5.95dB to include only
the MCB + un-mated MDI connector*

Cable Assembly Test Fixture (MCB+?)

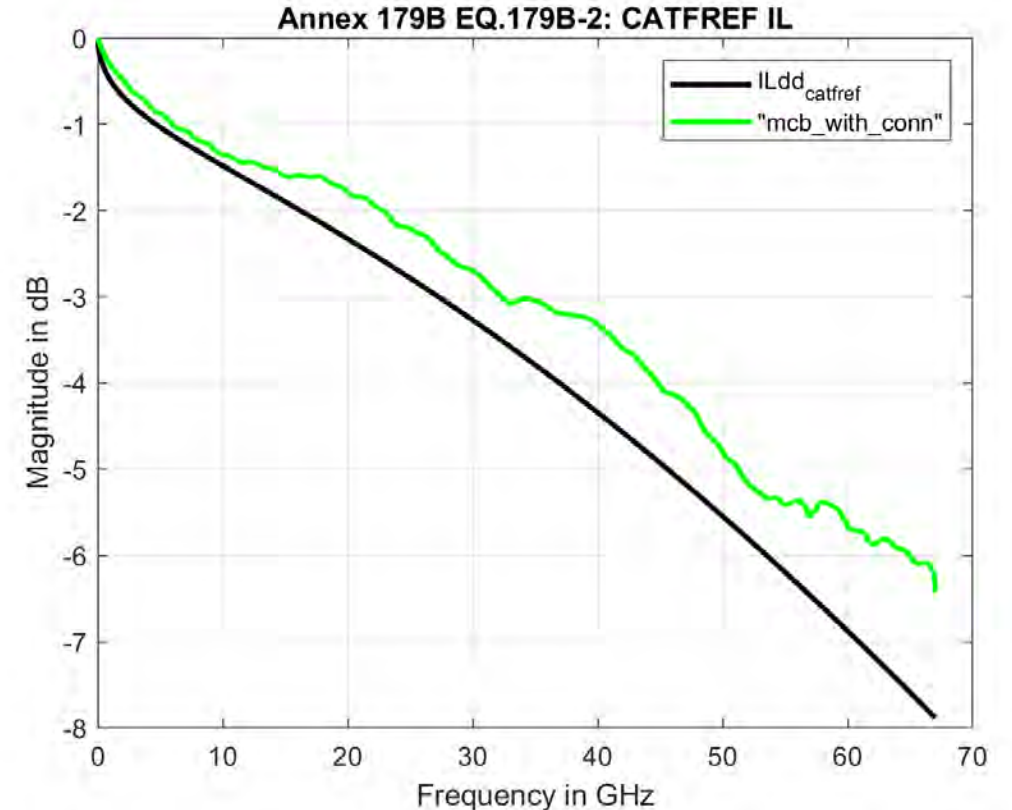
179B.3.1 Cable assembly test fixture insertion loss

The insertion loss of the cable assembly test fixture PCB, test point, connector and any associated vias determined using Equation (179B-2) shall be used as the test fixture reference insertion loss. The effects of differences between the insertion loss of an actual test fixture and the reference insertion loss are to be accounted for in the measurements.

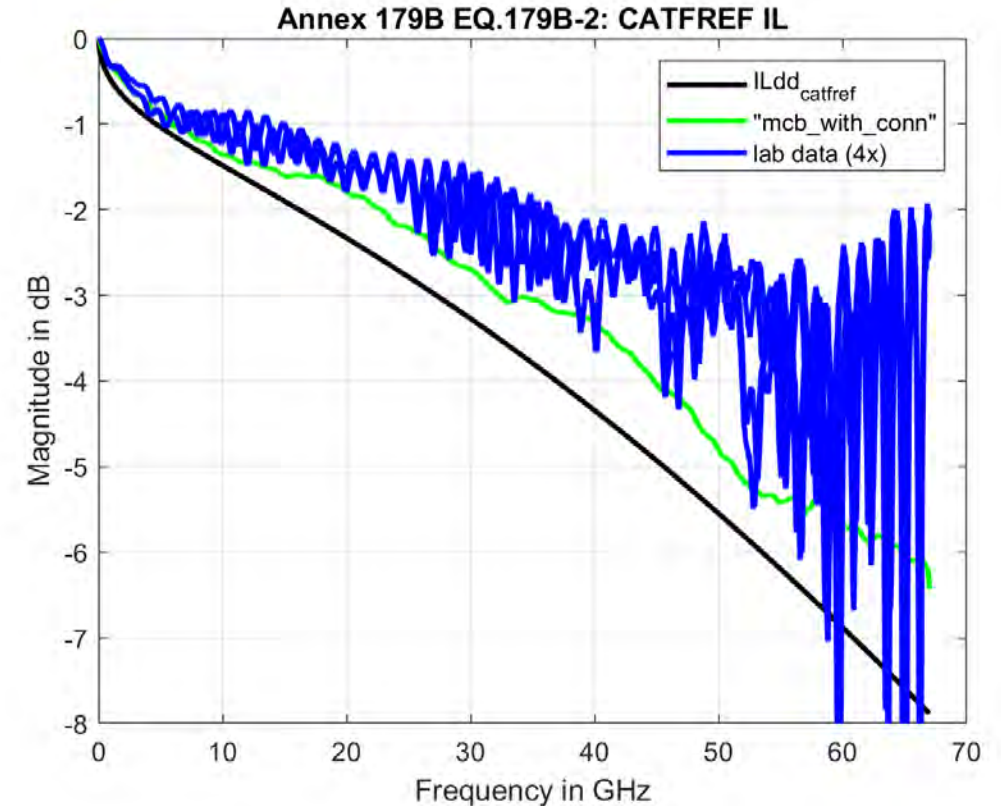
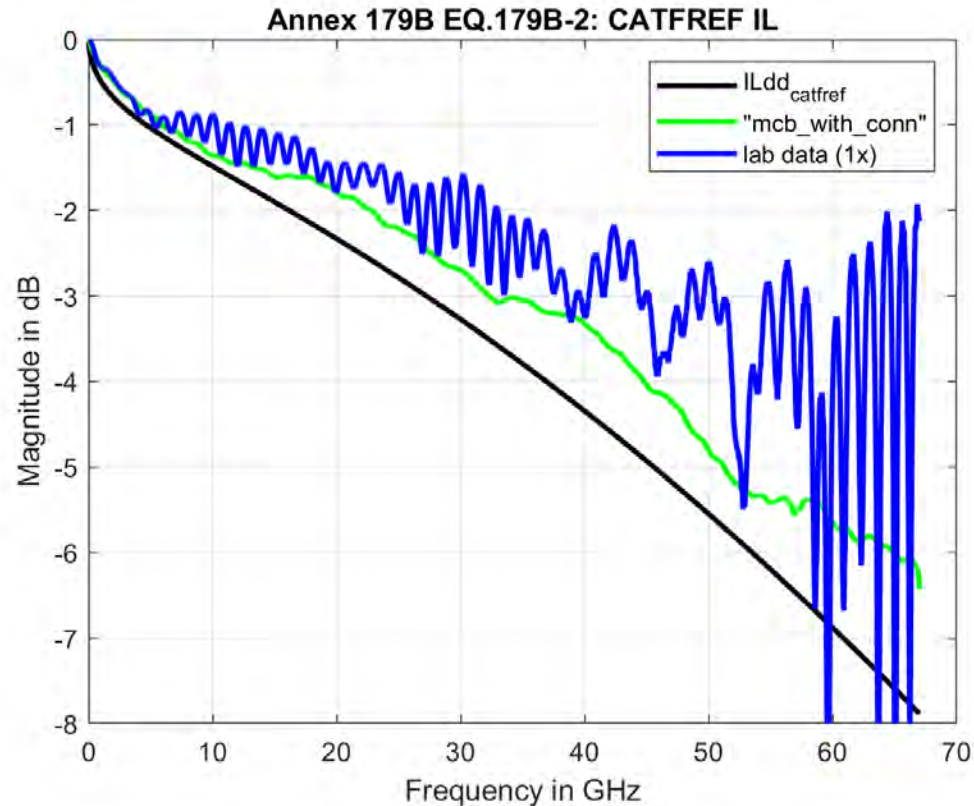
$$ILdd_{catfref}(f) = 0.016f^{1.5} - 0.0841f + 0.5829\sqrt{f} - 0.0269 \quad (179B-2)$$

where

$ILdd_{catfref}(f)$ is the test fixture PCB reference insertion loss in dB at frequency f
 f is the frequency in GHz



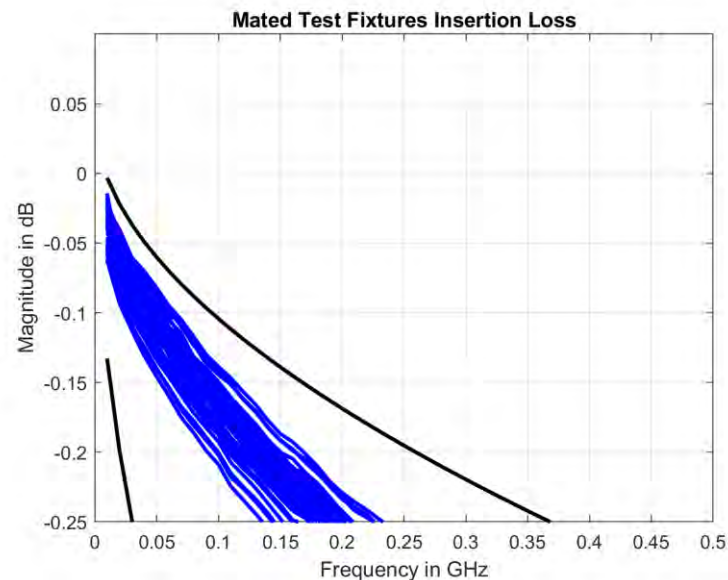
Cable Assembly Test Fixture (MCB+?)



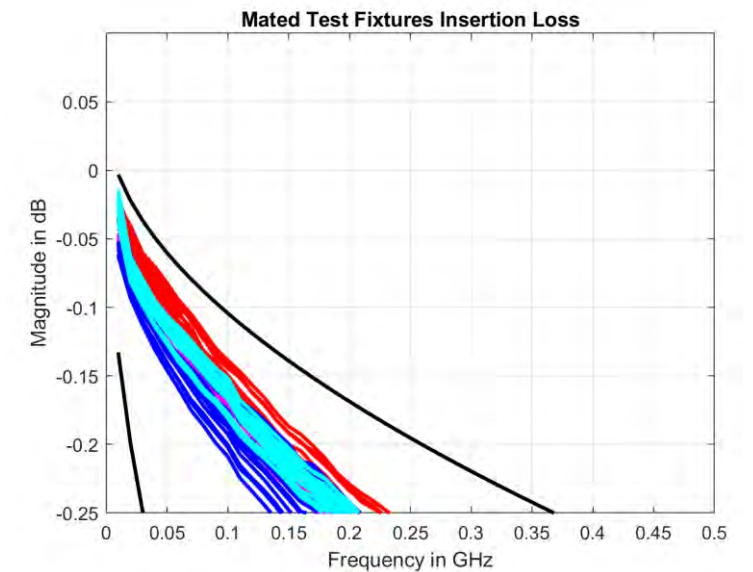
Open circuit reference method in D1P5 may be difficult to maintain across different fixture and MDI connector implementations

ILdd Masks (w/ 110 GHz BW data)

MCB	HCB	Lane	End Freq. [GHz]	ILdd_min	ILdd_max
WT29449	WT29563	TX1	110	PASS!	PASS!
WT29449	WT29563	TX2	110	PASS!	FAIL!
WT29449	WT29563	TX3	110	PASS!	FAIL!
WT29449	WT29563	TX4	110	PASS!	PASS!
WT29449	WT29563	TX5	110	PASS!	PASS!
WT29449	WT29563	TX6	110	PASS!	FAIL!
WT29449	WT29563	TX7	110	PASS!	FAIL!
WT29449	WT29563	TX8	110	PASS!	PASS!
WT29449	WT29563	RX1	110	PASS!	PASS!
WT29449	WT29563	RX2	110	PASS!	FAIL!
WT29449	WT29563	RX3	110	PASS!	FAIL!
WT29449	WT29563	RX4	110	PASS!	FAIL!
WT29449	WT29563	RX5	110	PASS!	PASS!
WT29449	WT29563	RX6	110	PASS!	FAIL!
WT29449	WT29563	RX7	110	PASS!	FAIL!
WT29449	WT29563	RX8	110	PASS!	FAIL!
WT29796	WT29563	TX1	110	PASS!	PASS!
WT29796	WT29563	TX2	110	PASS!	PASS!
WT29796	WT29563	TX3	110	PASS!	FAIL!
WT29796	WT29563	TX4	110	PASS!	PASS!
WT29796	WT29563	TX5	110	PASS!	PASS!
WT29796	WT29563	TX6	110	PASS!	PASS!
WT29796	WT29563	TX7	110	PASS!	PASS!
WT29796	WT29563	TX8	110	PASS!	PASS!
WT29796	WT29563	RX1	110	PASS!	PASS!
WT29796	WT29563	RX2	110	PASS!	FAIL!
WT29796	WT29563	RX3	110	PASS!	PASS!
WT29796	WT29563	RX4	110	PASS!	FAIL!
WT29796	WT29563	RX5	110	PASS!	PASS!
WT29796	WT29563	RX6	110	PASS!	PASS!
WT29796	WT29563	RX7	110	PASS!	PASS!
WT29796	WT29563	RX8	110	PASS!	FAIL!



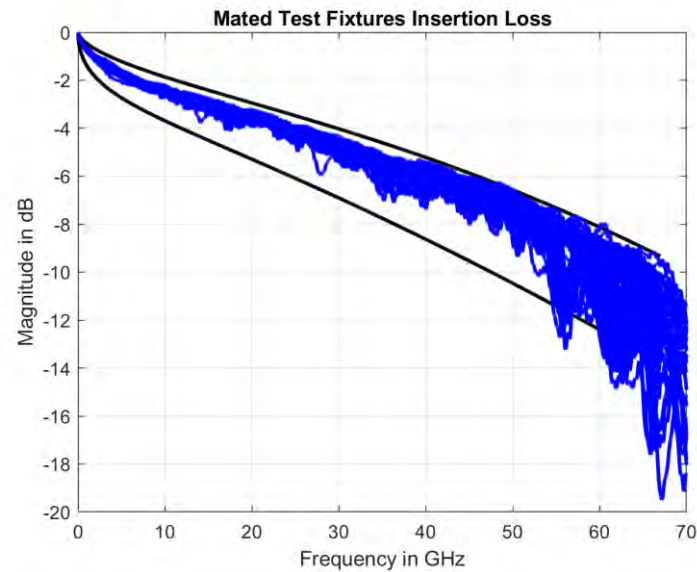
All (64) Files



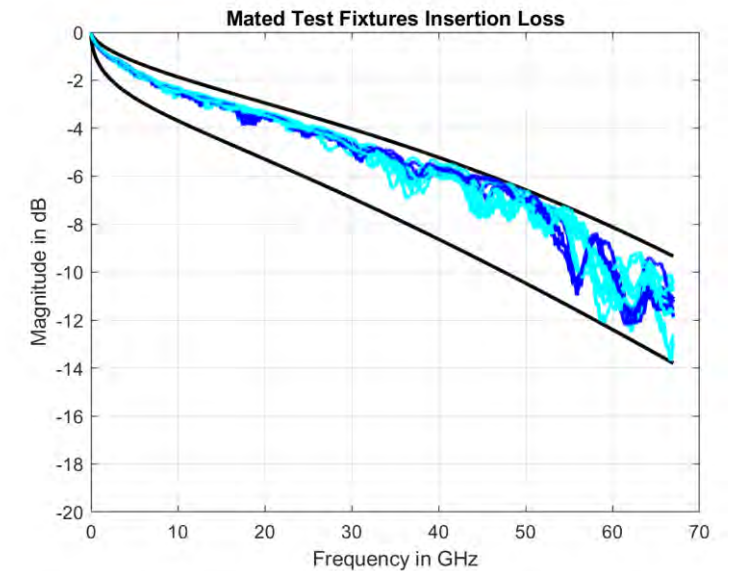
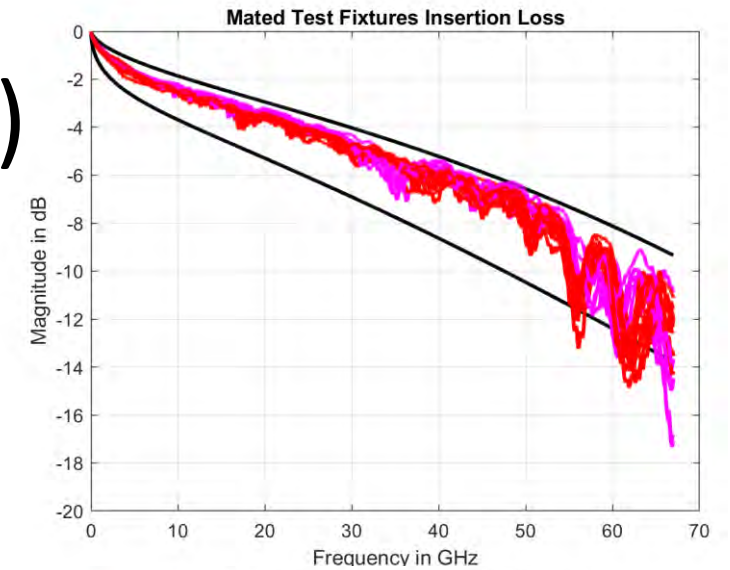
**Data grouped by
MTF Pair (MCB-HCB)**

ILdd Masks (w/ 67 GHz)

MCB	HCB	Lane	End Freq. [GHz]	ILdd_min	ILdd_max
WT29577	WT28997	TX1	67	PASS!	FAIL!
WT29577	WT28997	TX2	67	PASS!	FAIL!
WT29577	WT28997	TX3	67	PASS!	FAIL!
WT29577	WT28997	TX4	67	PASS!	PASS!
WT29577	WT28997	TX5	67	PASS!	FAIL!
WT29577	WT28997	TX6	67	PASS!	FAIL!
WT29577	WT28997	TX7	67	PASS!	FAIL!
WT29577	WT28997	TX8	67	PASS!	PASS!
WT29577	WT28997	RX1	67	PASS!	PASS!
WT29577	WT28997	RX2	67	PASS!	FAIL!
WT29577	WT28997	RX3	67	PASS!	FAIL!
WT29577	WT28997	RX4	67	PASS!	FAIL!
WT29577	WT28997	RX5	67	PASS!	FAIL!
WT29577	WT28997	RX6	67	PASS!	FAIL!
WT29577	WT28997	RX7	67	PASS!	FAIL!
WT29577	WT28997	RX8	67	PASS!	FAIL!
WT29940	WT29904	TX1	67	PASS!	PASS!
WT29940	WT29904	TX2	67	PASS!	PASS!
WT29940	WT29904	TX3	67	PASS!	FAIL!
WT29940	WT29904	TX4	67	PASS!	PASS!
WT29940	WT29904	TX5	67	PASS!	PASS!
WT29940	WT29904	TX6	67	PASS!	FAIL!
WT29940	WT29904	TX7	67	PASS!	FAIL!
WT29940	WT29904	TX8	67	PASS!	PASS!
WT29940	WT29904	RX1	67	PASS!	PASS!
WT29940	WT29904	RX2	67	PASS!	FAIL!
WT29940	WT29904	RX3	67	PASS!	FAIL!
WT29940	WT29904	RX4	67	PASS!	PASS!
WT29940	WT29904	RX5	67	PASS!	PASS!
WT29940	WT29904	RX6	67	PASS!	PASS!
WT29940	WT29904	RX7	67	PASS!	PASS!
WT29940	WT29904	RX8	67	PASS!	FAIL!



All (64) Files



**67GHz Data grouped by
PASS / FAIL and MDI "path"**

ERL (w/ 110 GHz)

MCB	HCB	Lane	End Freq. [GHz]	ERL22 (MCB) [dB]	ERL11 (HCB) [dB]
WT29449	WT29563	TX1	110	10.71	11.01
WT29449	WT29563	TX2	110	9.83	10.47
WT29449	WT29563	TX3	110	10.04	10.67
WT29449	WT29563	TX4	110	9.15	10.52
WT29449	WT29563	TX5	110	10.94	11.62
WT29449	WT29563	TX6	110	9.94	10.52
WT29449	WT29563	TX7	110	10.47	11.03
WT29449	WT29563	TX8	110	9.72	10.90
WT29449	WT29563	RX1	110	9.60	11.08
WT29449	WT29563	RX2	110	10.84	11.53
WT29449	WT29563	RX3	110	10.59	11.25
WT29449	WT29563	RX4	110	10.50	11.17
WT29449	WT29563	RX5	110	10.52	11.54
WT29449	WT29563	RX6	110	10.14	10.68
WT29449	WT29563	RX7	110	10.78	11.72
WT29449	WT29563	RX8	110	10.95	11.48
WT29796	WT29563	TX1	110	10.30	11.24
WT29796	WT29563	TX2	110	9.27	10.20
WT29796	WT29563	TX3	110	9.56	10.57
WT29796	WT29563	TX4	110	9.57	10.70
WT29796	WT29563	TX5	110	9.63	10.87
WT29796	WT29563	TX6	110	8.84	9.90
WT29796	WT29563	TX7	110	10.39	11.11
WT29796	WT29563	TX8	110	9.61	10.91
WT29796	WT29563	RX1	110	9.53	11.00
WT29796	WT29563	RX2	110	9.68	11.07
WT29796	WT29563	RX3	110	9.60	10.94
WT29796	WT29563	RX4	110	10.78	11.48
WT29796	WT29563	RX5	110	9.97	11.18
WT29796	WT29563	RX6	110	10.02	10.79
WT29796	WT29563	RX7	110	10.03	11.08
WT29796	WT29563	RX8	110	9.86	10.92

179B.4.2 Mated test fixtures effective return loss (ERL)

The values of the mated test fixtures ERL are computed using the procedure in 93A.5 with the parameter values in Table 179B–1. Parameters that do not appear in Table 179B–1 take values from Table 179–18.

The reference differential impedance for the mated test fixtures ERL computation shall be 92.5 Ω . The mated test fixtures ERL shall be greater than or equal to 10.3 dB.

Table 179B–1—Mated test fixtures ERL parameter values

Parameter	Symbol	Value	Units
Transition time associated with a pulse	T_r	0.005	ns
Incremental available signal loss factor	β_x	0	GHz
Permitted reflection from a transmission line external to the device under test	ρ_x	0.618	—
Length of the reflection signal	N	1600	UI
Equalizer length associated with reflection signal	N_{bx}	0	UI
Time-gated propagation delay	T_{fx}	0	ns
Tukey window flag	nw	1	—
Target detector error ratio	DER_0	2×10^{-5}	—
NOTE—The mated test fixtures test connector and transmission line are not time-gated (by setting T_{fx} to 0) in order to include the entire test fixture.			

ERL (w/ 67 GHz)

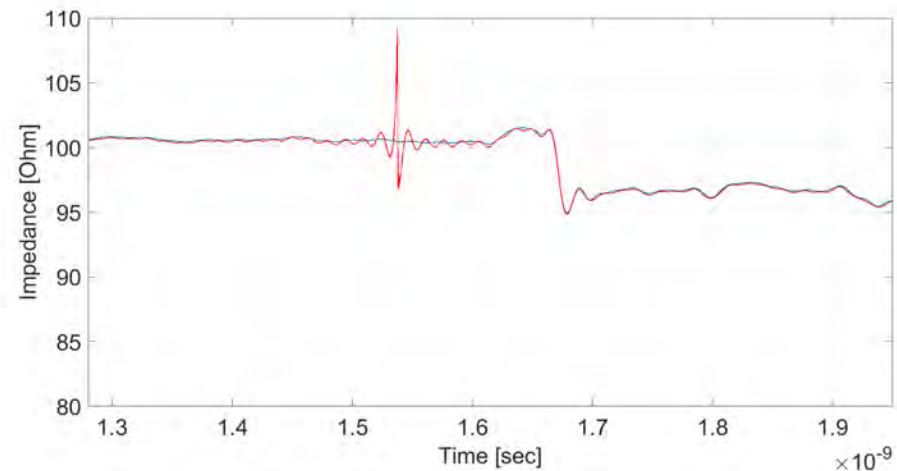
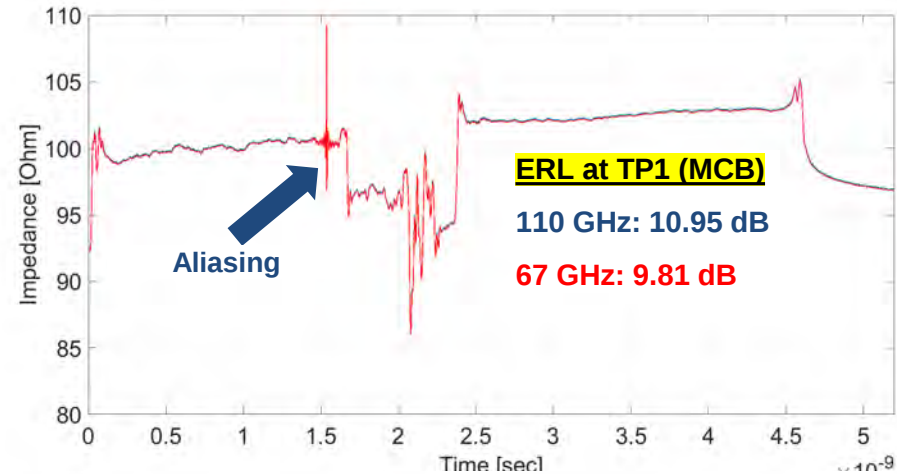
MCB	HCB	Lane	End Freq. [GHz]	ERL22 (MCB) [dB]	ERL11 (HCB) [dB]
WT29577	WT28997	TX1	67	9.42	9.37
WT29577	WT28997	TX2	67	8.91	8.98
WT29577	WT28997	TX3	67	8.56	9.07
WT29577	WT28997	TX4	67	9.25	9.85
WT29577	WT28997	TX5	67	9.50	9.52
WT29577	WT28997	TX6	67	8.00	8.30
WT29577	WT28997	TX7	67	8.54	10.04
WT29577	WT28997	TX8	67	8.42	9.36
WT29577	WT28997	RX1	67	7.72	9.29
WT29577	WT28997	RX2	67	8.97	10.59
WT29577	WT28997	RX3	67	8.48	8.08
WT29577	WT28997	RX4	67	9.96	10.33
WT29577	WT28997	RX5	67	7.77	8.54
WT29577	WT28997	RX6	67	9.07	9.37
WT29577	WT28997	RX7	67	8.44	8.69
WT29577	WT28997	RX8	67	9.96	9.95
WT29940	WT29904	TX1	67	9.05	10.02
WT29940	WT29904	TX2	67	10.10	10.58
WT29940	WT29904	TX3	67	8.74	9.03
WT29940	WT29904	TX4	67	9.71	10.47
WT29940	WT29904	TX5	67	9.75	10.16
WT29940	WT29904	TX6	67	9.91	9.47
WT29940	WT29904	TX7	67	9.04	9.55
WT29940	WT29904	TX8	67	9.73	10.62
WT29940	WT29904	RX1	67	8.67	9.50
WT29940	WT29904	RX2	67	9.45	9.16
WT29940	WT29904	RX3	67	8.11	8.10
WT29940	WT29904	RX4	67	9.55	10.28
WT29940	WT29904	RX5	67	8.97	9.69
WT29940	WT29904	RX6	67	9.06	9.35
WT29940	WT29904	RX7	67	9.07	9.83
WT29940	WT29904	RX8	67	9.74	10.08

TDR and ERL options		
TDR	1	logical
ERL	1	logical
ERL_ONLY	1	logical
TR_TDR	0.005	ns
N	1600	logical
TDR_Butterworth	1	
beta_x	0	
rho_x	0.618	
TDR_W_TXPKG	0	UI
N_bx	0	
fixture delay time	[0 0]	
Tukey_Window	1	
Z_t	46.25	Ohm

Bandwidth Impact on ERL

MCB	HCB	Lane	End Freq. [GHz]	ERL22 (MCB) [dB]	ERL11 (HCB) [dB]
WT29449	WT29563	TX1	110	10.71	11.01
WT29449	WT29563	TX2	110	9.83	10.47
WT29449	WT29563	TX3	110	10.04	10.67
WT29449	WT29563	TX4	110	9.15	10.52
WT29449	WT29563	TX5	110	10.94	11.62
WT29449	WT29563	TX6	110	9.94	10.52
WT29449	WT29563	TX7	110	10.47	11.03
WT29449	WT29563	TX8	110	9.72	10.90
WT29449	WT29563	RX1	110	9.60	11.08
WT29449	WT29563	RX2	110	10.84	11.53
WT29449	WT29563	RX3	110	10.59	11.25
WT29449	WT29563	RX4	110	10.50	11.17
WT29449	WT29563	RX5	110	10.52	11.54
WT29449	WT29563	RX6	110	10.14	10.68
WT29449	WT29563	RX7	110	10.78	11.72
WT29449	WT29563	RX8	110	10.95	11.48
WT29796	WT29563	TX1	110	10.30	11.24
WT29796	WT29563	TX2	110	9.27	10.20
WT29796	WT29563	TX3	110	9.56	10.57
WT29796	WT29563	TX4	110	9.57	10.70
WT29796	WT29563	TX5	110	9.63	10.87
WT29796	WT29563	TX6	110	8.84	9.90
WT29796	WT29563	TX7	110	10.39	11.11
WT29796	WT29563	TX8	110	9.61	10.91
WT29796	WT29563	RX1	110	9.53	11.00
WT29796	WT29563	RX2	110	9.68	11.07
WT29796	WT29563	RX3	110	9.60	10.94
WT29796	WT29563	RX4	110	10.78	11.48
WT29796	WT29563	RX5	110	9.97	11.18
WT29796	WT29563	RX6	110	10.02	10.79
WT29796	WT29563	RX7	110	10.03	11.08
WT29796	WT29563	RX8	110	9.86	10.92

per COM v4.8



ERL Computation Modifications (to COM v4.8)

- Recommended reversing the order of the filtering and interpolation & extrapolation.
- The change in the COM tool will need to be done in considering both COM and ERL.

COM v4.8

Call **get_TDR()**

Step 1. **Renormalized** Return Loss= $RL_Z(f)$

Step 2. **Filtered** Renormalized Return Loss= $RL_Z_f(f)$
- Apply low-pass Butterworth and Bessel Thompson filter.

Step 3. Call **s21_to_impulse_DC()**

Step A. **Interpolate and Extrapolate** the Filtered
Renormalized Return Loss= $RL_Z_f_interp_extr(f)$

Step B. **IFFT: f-domain to t-domain**= $RL_Z_f_interp_extr(t)$

...

Recommended change

Call **get_TDR()**

Step 1. **Renormalized** Return Loss= $RL_Z(f)$

Step 2. Call **s21_to_impulse_DC()**

Step A. **Interpolate and Extrapolate** the
Renormalized Return Loss= $RL_Z_interp_extr(f)$

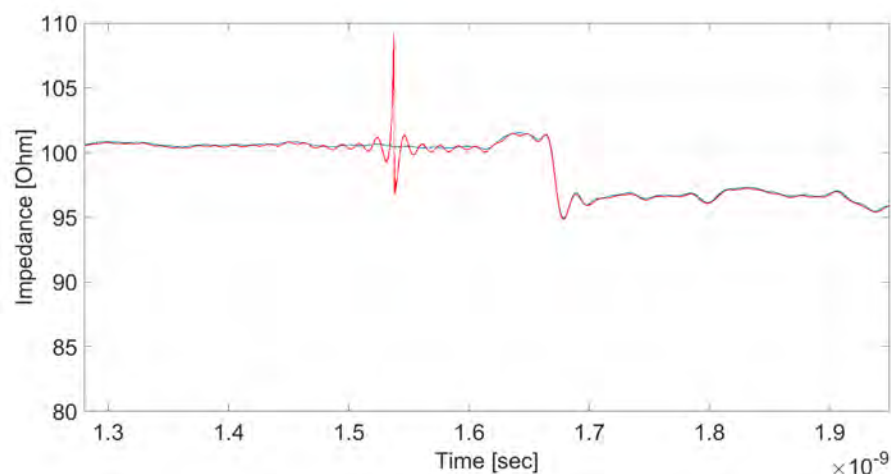
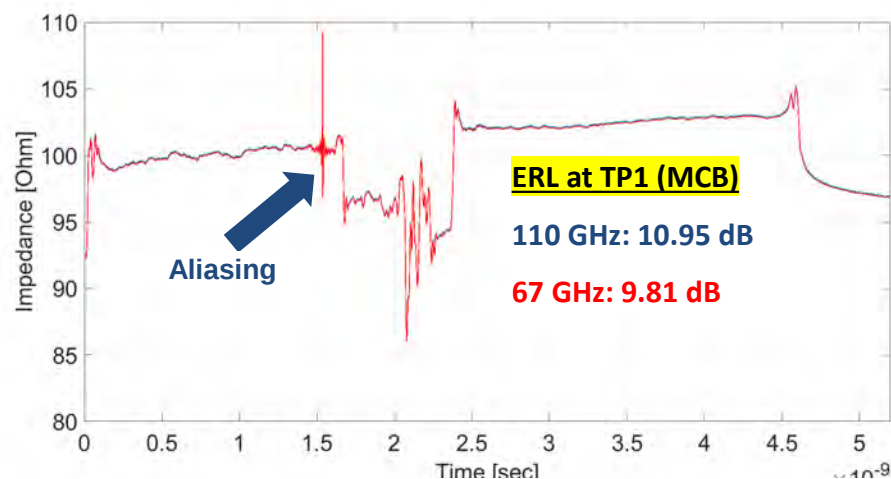
Step B. **Filtered** Renormalized Interpolated & Extrapolated
Return Loss= $RL_Z_interp_extr_f(f)$
- Apply low-pass Butterworth and Bessel Thompson filter.

Step C. **IFFT: f-domain to t-domain**= $RL_Z_interp_extr_f(t)$

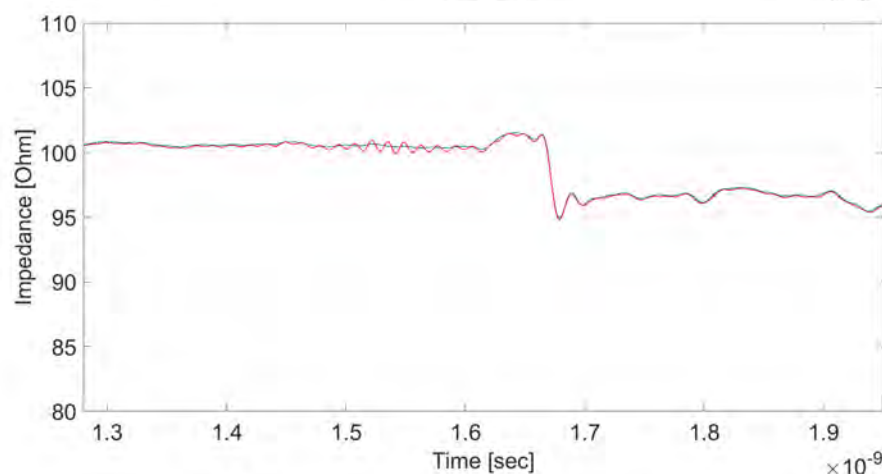
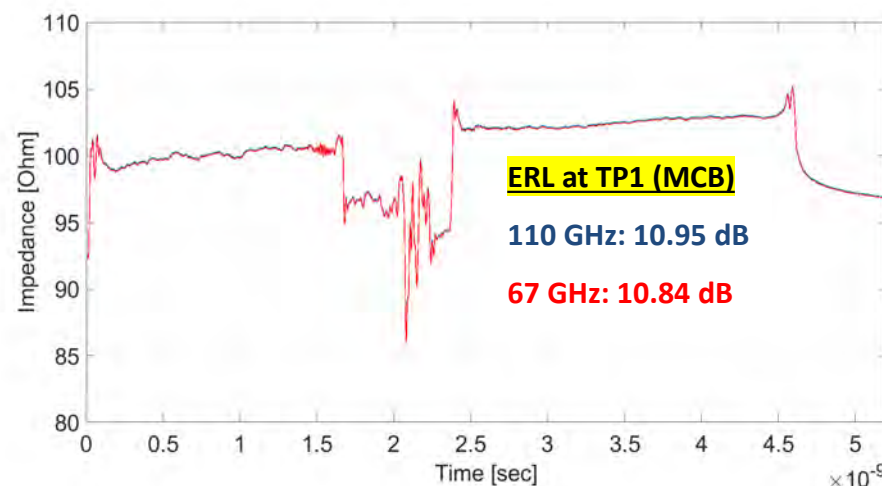
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Illustration of Recommended Change

per COM v4.8

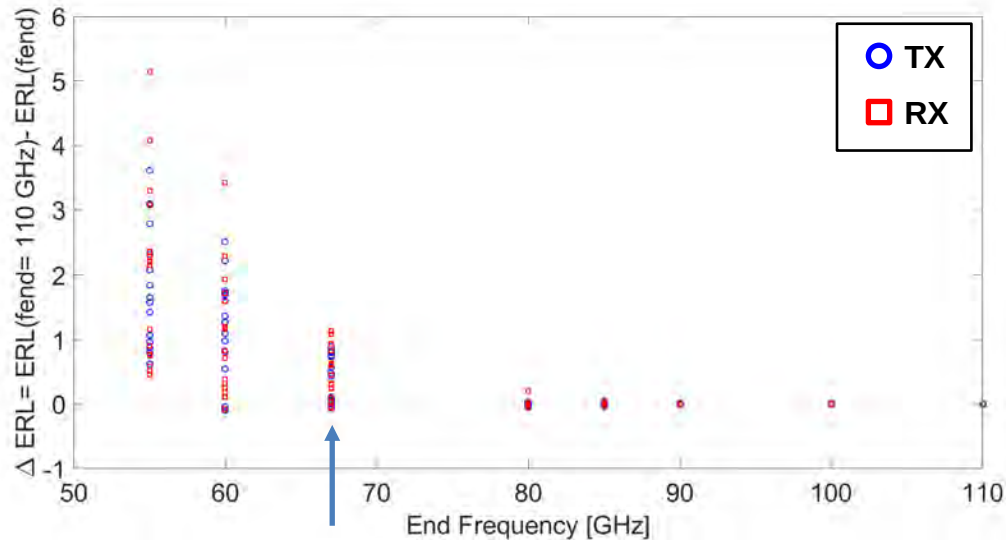


w/ Recommended Change



Summary of Recommended Change

per COM v4.8

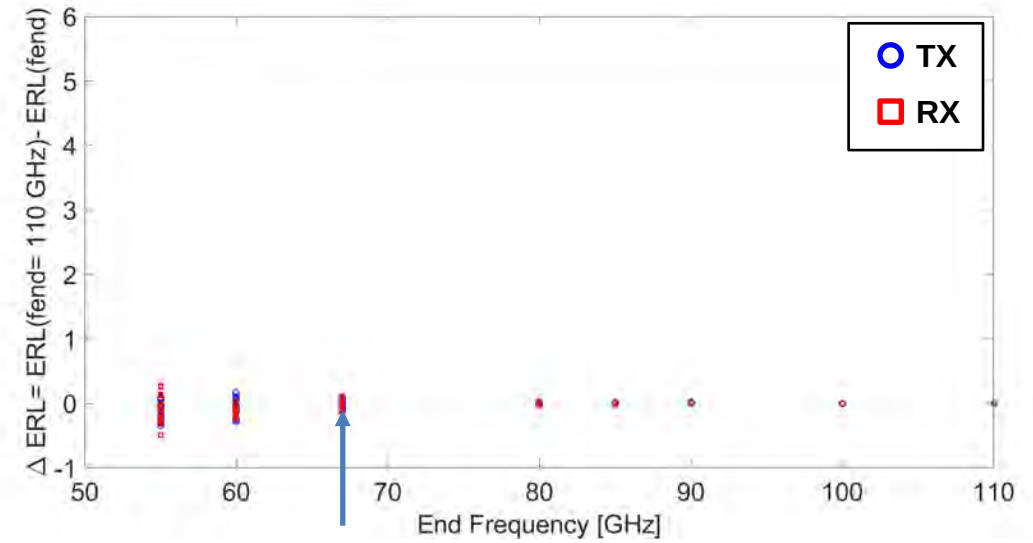


67 GHz

Min: -0.0633

Max: +1.1299

w/ Recommended Change



67 GHz

Min: -0.1364

Max: +0.1068

Files used (Total= 32),

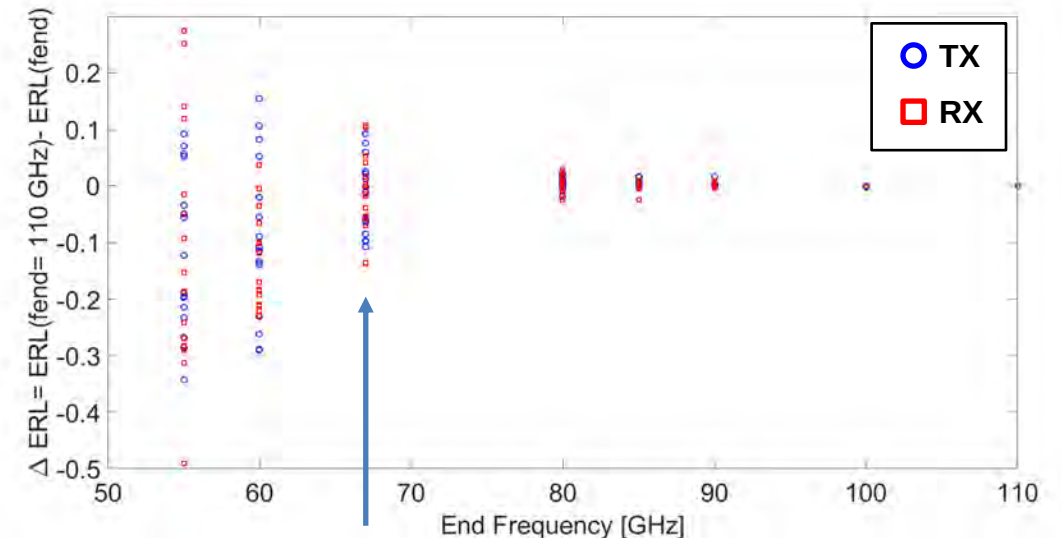
1. OSFP1p6T_Mated_File_HCB-WT29563_MCB-WT29449_TX1 to TX8.
2. OSFP1p6T_Mated_File_HCB-WT29563_MCB-WT29449_RX1 to RX8.
3. OSFP1p6T_Mated_File_HCB-WT29563_MCB-WT29796_TX1 to TX8.
4. OSFP1p6T_Mated_File_HCB-WT29563_MCB-WT29796_RX1 to RX8.

■ The recommended change keeps ΔERL small (± 0.1 dB) between 67 GHz and 110 GHz.

Results Summary with Recommended Change

MCB	HCB	Lane	End Freq. [GHz]	ERL22 (MCB) [dB]	ERL11 (HCB) [dB]
WT29449	WT29563	TX1	110 --> 67*	10.65	11.10
WT29449	WT29563	TX2	110 --> 67*	9.93	10.58
WT29449	WT29563	TX3	110 --> 67*	10.01	10.71
WT29449	WT29563	TX4	110 --> 67*	9.26	10.60
WT29449	WT29563	TX5	110 --> 67*	10.95	11.65
WT29449	WT29563	TX6	110 --> 67*	10.03	10.65
WT29449	WT29563	TX7	110 --> 67*	10.38	11.06
WT29449	WT29563	TX8	110 --> 67*	9.81	11.00
WT29449	WT29563	RX1	110 --> 67*	9.62	11.17
WT29449	WT29563	RX2	110 --> 67*	10.85	11.56
WT29449	WT29563	RX3	110 --> 67*	10.73	11.36
WT29449	WT29563	RX4	110 --> 67*	10.50	11.16
WT29449	WT29563	RX5	110 --> 67*	10.59	11.63
WT29449	WT29563	RX6	110 --> 67*	10.09	10.76
WT29449	WT29563	RX7	110 --> 67*	10.83	11.82
WT29449	WT29563	RX8	110 --> 67*	10.84	11.51
WT29796	WT29563	TX1	110 --> 67*	10.36	11.34
WT29796	WT29563	TX2	110 --> 67*	9.19	10.29
WT29796	WT29563	TX3	110 --> 67*	9.55	10.63
WT29796	WT29563	TX4	110 --> 67*	9.58	10.78
WT29796	WT29563	TX5	110 --> 67*	9.69	10.92
WT29796	WT29563	TX6	110 --> 67*	8.84	9.97
WT29796	WT29563	TX7	110 --> 67*	10.37	11.15
WT29796	WT29563	TX8	110 --> 67*	9.67	11.01
WT29796	WT29563	RX1	110 --> 67*	9.53	11.07
WT29796	WT29563	RX2	110 --> 67*	9.69	11.12
WT29796	WT29563	RX3	110 --> 67*	9.59	11.04
WT29796	WT29563	RX4	110 --> 67*	10.79	11.54
WT29796	WT29563	RX5	110 --> 67*	10.01	11.27
WT29796	WT29563	RX6	110 --> 67*	9.98	10.85
WT29796	WT29563	RX7	110 --> 67*	9.92	11.13
WT29796	WT29563	RX8	110 --> 67*	9.92	11.00

w/ Recommended Change



67 GHz

Min: -0.1364

Max: +0.1068

Detailed Results Summary with Recommended Change

MCB	HC	Lane	End Freq. [GHz]	ERL22 (MCB) [dB]	ERL11 (HC) [dB]
WT29449	WT29563	TX1	110 --> 67*	10.65	11.10
WT29449	WT29563	TX2	110 --> 67*	9.93	10.58
WT29449	WT29563	TX3	110 --> 67*	10.01	10.71
WT29449	WT29563	TX4	110 --> 67*	9.26	10.60
WT29449	WT29563	TX5	110 --> 67*	10.95	11.65
WT29449	WT29563	TX6	110 --> 67*	10.03	10.65
WT29449	WT29563	TX7	110 --> 67*	10.38	11.06
WT29449	WT29563	TX8	110 --> 67*	9.81	11.00
WT29449	WT29563	RX1	110 --> 67*	9.62	11.17
WT29449	WT29563	RX2	110 --> 67*	10.85	11.56
WT29449	WT29563	RX3	110 --> 67*	10.73	11.36
WT29449	WT29563	RX4	110 --> 67*	10.50	11.16
WT29449	WT29563	RX5	110 --> 67*	10.59	11.63
WT29449	WT29563	RX6	110 --> 67*	10.09	10.76
WT29449	WT29563	RX7	110 --> 67*	10.83	11.82
WT29449	WT29563	RX8	110 --> 67*	10.84	11.51
WT29796	WT29563	TX1	110 --> 67*	10.36	11.34
WT29796	WT29563	TX2	110 --> 67*	9.19	10.29
WT29796	WT29563	TX3	110 --> 67*	9.55	10.63
WT29796	WT29563	TX4	110 --> 67*	9.58	10.78
WT29796	WT29563	TX5	110 --> 67*	9.69	10.92
WT29796	WT29563	TX6	110 --> 67*	8.84	9.97
WT29796	WT29563	TX7	110 --> 67*	10.37	11.15
WT29796	WT29563	TX8	110 --> 67*	9.67	11.01
WT29796	WT29563	RX1	110 --> 67*	9.53	11.07
WT29796	WT29563	RX2	110 --> 67*	9.69	11.12
WT29796	WT29563	RX3	110 --> 67*	9.59	11.04
WT29796	WT29563	RX4	110 --> 67*	10.79	11.54
WT29796	WT29563	RX5	110 --> 67*	10.01	11.27
WT29796	WT29563	RX6	110 --> 67*	9.98	10.85
WT29796	WT29563	RX7	110 --> 67*	9.92	11.13
WT29796	WT29563	RX8	110 --> 67*	9.92	11.00

MCB	HC	Lane	End Freq. [GHz]	ERL22 (MCB) [dB]	ERL11 (HC) [dB]
WT29577	WT28997	TX1	67 --> 67*	9.40	9.38
WT29577	WT28997	TX2	67 --> 67*	9.34	9.48
WT29577	WT28997	TX3	67 --> 67*	8.82	9.46
WT29577	WT28997	TX4	67 --> 67*	9.26	9.88
WT29577	WT28997	TX5	67 --> 67*	10.00	10.07
WT29577	WT28997	TX6	67 --> 67*	8.75	9.18
WT29577	WT28997	TX7	67 --> 67*	9.38	10.05
WT29577	WT28997	TX8	67 --> 67*	8.45	9.36
WT29577	WT28997	RX1	67 --> 67*	8.39	9.30
WT29577	WT28997	RX2	67 --> 67*	10.02	10.63
WT29577	WT28997	RX3	67 --> 67*	8.51	9.02
WT29577	WT28997	RX4	67 --> 67*	9.97	10.38
WT29577	WT28997	RX5	67 --> 67*	7.81	8.55
WT29577	WT28997	RX6	67 --> 67*	9.57	9.78
WT29577	WT28997	RX7	67 --> 67*	8.79	9.19
WT29577	WT28997	RX8	67 --> 67*	9.97	10.04
WT29940	WT29904	TX1	67 --> 67*	9.90	10.03
WT29940	WT29904	TX2	67 --> 67*	10.85	10.95
WT29940	WT29904	TX3	67 --> 67*	9.53	9.72
WT29940	WT29904	TX4	67 --> 67*	10.12	10.64
WT29940	WT29904	TX5	67 --> 67*	10.17	10.19
WT29940	WT29904	TX6	67 --> 67*	10.50	10.57
WT29940	WT29904	TX7	67 --> 67*	9.05	9.95
WT29940	WT29904	TX8	67 --> 67*	9.74	10.64
WT29940	WT29904	RX1	67 --> 67*	8.67	9.52
WT29940	WT29904	RX2	67 --> 67*	9.59	10.09
WT29940	WT29904	RX3	67 --> 67*	8.59	9.22
WT29940	WT29904	RX4	67 --> 67*	10.07	10.39
WT29940	WT29904	RX5	67 --> 67*	9.12	10.08
WT29940	WT29904	RX6	67 --> 67*	9.68	10.06
WT29940	WT29904	RX7	67 --> 67*	10.00	10.35
WT29940	WT29904	RX8	67 --> 67*	10.08	10.35

FOM ILD (w/ 110 GHz)

Only (4) files meet
ALL, D1P5 criteria

MCB	HCB	Lane	End Freq. [GHz]	lLdd_min	lLdd_max	ERL22 (MCB) [dB]	ERL11 (HCB) [dB]	FOMild [dB]
WT29449	WT29563	TX1	110	PASS!	PASS!	10.71	11.01	0.162
WT29449	WT29563	TX2	110	PASS!	FAIL!	9.83	10.47	0.153
WT29449	WT29563	TX3	110	PASS!	FAIL!	10.04	10.67	0.138
WT29449	WT29563	TX4	110	PASS!	PASS!	9.15	10.52	0.117
WT29449	WT29563	TX5	110	PASS!	PASS!	10.94	11.62	0.132
WT29449	WT29563	TX6	110	PASS!	FAIL!	9.94	10.52	0.142
WT29449	WT29563	TX7	110	PASS!	FAIL!	10.47	11.03	0.134
WT29449	WT29563	TX8	110	PASS!	PASS!	9.72	10.90	0.100
WT29449	WT29563	RX1	110	PASS!	PASS!	9.60	11.08	0.121
WT29449	WT29563	RX2	110	PASS!	FAIL!	10.84	11.53	0.131
WT29449	WT29563	RX3	110	PASS!	FAIL!	10.59	11.25	0.132
WT29449	WT29563	RX4	110	PASS!	FAIL!	10.50	11.17	0.174
WT29449	WT29563	RX5	110	PASS!	PASS!	10.52	11.54	0.080
WT29449	WT29563	RX6	110	PASS!	FAIL!	10.14	10.68	0.143
WT29449	WT29563	RX7	110	PASS!	FAIL!	10.78	11.72	0.126
WT29449	WT29563	RX8	110	PASS!	FAIL!	10.95	11.48	0.146
WT29796	WT29563	TX1	110	PASS!	PASS!	10.30	11.24	0.117
WT29796	WT29563	TX2	110	PASS!	PASS!	9.27	10.20	0.132
WT29796	WT29563	TX3	110	PASS!	FAIL!	9.56	10.57	0.123
WT29796	WT29563	TX4	110	PASS!	PASS!	9.57	10.70	0.096
WT29796	WT29563	TX5	110	PASS!	PASS!	9.63	10.87	0.140
WT29796	WT29563	TX6	110	PASS!	PASS!	8.84	9.90	0.145
WT29796	WT29563	TX7	110	PASS!	PASS!	10.39	11.11	0.114
WT29796	WT29563	TX8	110	PASS!	PASS!	9.61	10.91	0.112
WT29796	WT29563	RX1	110	PASS!	PASS!	9.53	11.00	0.131
WT29796	WT29563	RX2	110	PASS!	FAIL!	9.68	11.07	0.135
WT29796	WT29563	RX3	110	PASS!	PASS!	9.60	10.94	0.094
WT29796	WT29563	RX4	110	PASS!	FAIL!	10.78	11.48	0.196
WT29796	WT29563	RX5	110	PASS!	PASS!	9.97	11.18	0.104
WT29796	WT29563	RX6	110	PASS!	PASS!	10.02	10.79	0.119
WT29796	WT29563	RX7	110	PASS!	PASS!	10.03	11.08	0.115
WT29796	WT29563	RX8	110	PASS!	FAIL!	9.86	10.92	0.180

MCB	HCB	Lane	End Freq. [GHz]	lLdd_min	lLdd_max	ERL22 (MCB) [dB]	ERL11 (HCB) [dB]	FOMild [dB]
WT29449	WT29563	TX1	110 --> 67*	PASS!	PASS!	10.65	11.10	0.162
WT29449	WT29563	TX2	110 --> 67*	PASS!	FAIL!	9.93	10.58	0.153
WT29449	WT29563	TX3	110 --> 67*	PASS!	FAIL!	10.01	10.71	0.138
WT29449	WT29563	TX4	110 --> 67*	PASS!	PASS!	9.26	10.60	0.117
WT29449	WT29563	TX5	110 --> 67*	PASS!	PASS!	10.95	11.65	0.132
WT29449	WT29563	TX6	110 --> 67*	PASS!	FAIL!	10.03	10.65	0.142
WT29449	WT29563	TX7	110 --> 67*	PASS!	FAIL!	10.38	11.06	0.134
WT29449	WT29563	TX8	110 --> 67*	PASS!	PASS!	9.81	11.00	0.100
WT29449	WT29563	RX1	110 --> 67*	PASS!	PASS!	9.62	11.17	0.121
WT29449	WT29563	RX2	110 --> 67*	PASS!	FAIL!	10.85	11.56	0.131
WT29449	WT29563	RX3	110 --> 67*	PASS!	FAIL!	10.73	11.36	0.132
WT29449	WT29563	RX4	110 --> 67*	PASS!	FAIL!	10.50	11.16	0.174
WT29449	WT29563	RX5	110 --> 67*	PASS!	PASS!	10.59	11.63	0.080
WT29449	WT29563	RX6	110 --> 67*	PASS!	FAIL!	10.09	10.76	0.143
WT29449	WT29563	RX7	110 --> 67*	PASS!	FAIL!	10.83	11.82	0.126
WT29449	WT29563	RX8	110 --> 67*	PASS!	FAIL!	10.84	11.51	0.146
WT29796	WT29563	TX1	110 --> 67*	PASS!	PASS!	10.36	11.34	0.117
WT29796	WT29563	TX2	110 --> 67*	PASS!	PASS!	9.19	10.29	0.132
WT29796	WT29563	TX3	110 --> 67*	PASS!	FAIL!	9.55	10.63	0.123
WT29796	WT29563	TX4	110 --> 67*	PASS!	PASS!	9.58	10.78	0.096
WT29796	WT29563	TX5	110 --> 67*	PASS!	PASS!	9.69	10.92	0.140
WT29796	WT29563	TX6	110 --> 67*	PASS!	PASS!	8.84	9.97	0.145
WT29796	WT29563	TX7	110 --> 67*	PASS!	PASS!	10.37	11.15	0.114
WT29796	WT29563	TX8	110 --> 67*	PASS!	PASS!	9.67	11.01	0.112
WT29796	WT29563	RX1	110 --> 67*	PASS!	PASS!	9.53	11.07	0.131
WT29796	WT29563	RX2	110 --> 67*	PASS!	FAIL!	9.69	11.12	0.135
WT29796	WT29563	RX3	110 --> 67*	PASS!	PASS!	9.59	11.04	0.094
WT29796	WT29563	RX4	110 --> 67*	PASS!	FAIL!	10.79	11.54	0.196
WT29796	WT29563	RX5	110 --> 67*	PASS!	PASS!	10.01	11.27	0.104
WT29796	WT29563	RX6	110 --> 67*	PASS!	PASS!	9.98	10.85	0.119
WT29796	WT29563	RX7	110 --> 67*	PASS!	PASS!	9.92	11.13	0.115
WT29796	WT29563	RX8	110 --> 67*	PASS!	FAIL!	9.92	11.00	0.180

FOM ILD (w/ 67 GHz)

Only (1)* files meet
ALL, D1P5 criteria

MCB	HCB	Lane	End Freq. [GHz]	lLdd_min	lLdd_max	ERL22 (MCB) [dB]	ERL11 (HCB) [dB]	FOMild [dB]
WT29577	WT28997	TX1	67	PASS!	FAIL!	9.42	9.37	0.172
WT29577	WT28997	TX2	67	PASS!	FAIL!	8.91	8.98	0.199
WT29577	WT28997	TX3	67	PASS!	FAIL!	8.56	9.07	0.186
WT29577	WT28997	TX4	67	PASS!	PASS!	9.25	9.85	0.132
WT29577	WT28997	TX5	67	PASS!	FAIL!	9.50	9.52	0.164
WT29577	WT28997	TX6	67	PASS!	FAIL!	8.00	8.30	0.221
WT29577	WT28997	TX7	67	PASS!	FAIL!	8.54	10.04	0.145
WT29577	WT28997	TX8	67	PASS!	PASS!	8.42	9.36	0.168
WT29577	WT28997	RX1	67	PASS!	PASS!	7.72	9.29	0.177
WT29577	WT28997	RX2	67	PASS!	FAIL!	8.97	10.59	0.123
WT29577	WT28997	RX3	67	PASS!	FAIL!	8.48	8.08	0.234
WT29577	WT28997	RX4	67	PASS!	FAIL!	9.96	10.33	0.150
WT29577	WT28997	RX5	67	PASS!	FAIL!	7.77	8.54	0.178
WT29577	WT28997	RX6	67	PASS!	FAIL!	9.07	9.37	0.160
WT29577	WT28997	RX7	67	PASS!	FAIL!	8.44	8.69	0.202
WT29577	WT28997	RX8	67	PASS!	FAIL!	9.96	9.95	0.152
WT29940	WT29904	TX1	67	PASS!	PASS!	9.05	10.02	0.158
WT29940	WT29904	TX2	67	PASS!	PASS!	10.10	10.58	0.134
WT29940	WT29904	TX3	67	PASS!	FAIL!	8.74	9.03	0.131
WT29940	WT29904	TX4	67	PASS!	PASS!	9.71	10.47	0.108
WT29940	WT29904	TX5	67	PASS!	PASS!	9.75	10.16	0.161
WT29940	WT29904	TX6	67	PASS!	FAIL!	9.91	9.47	0.167
WT29940	WT29904	TX7	67	PASS!	FAIL!	9.04	9.55	0.137
WT29940	WT29904	TX8	67	PASS!	PASS!	9.73	10.62	0.130
WT29940	WT29904	RX1	67	PASS!	PASS!	8.67	9.50	0.143
WT29940	WT29904	RX2	67	PASS!	FAIL!	9.45	9.16	0.129
WT29940	WT29904	RX3	67	PASS!	FAIL!	8.11	8.10	0.218
WT29940	WT29904	RX4	67	PASS!	PASS!	9.55	10.28	0.163
WT29940	WT29904	RX5	67	PASS!	PASS!	8.97	9.69	0.128
WT29940	WT29904	RX6	67	PASS!	PASS!	9.06	9.35	0.122
WT29940	WT29904	RX7	67	PASS!	PASS!	9.07	9.83	0.185
WT29940	WT29904	RX8	67	PASS!	FAIL!	9.74	10.08	0.177

MCB	HCB	Lane	End Freq. [GHz]	lLdd_min	lLdd_max	ERL22 (MCB) [dB]	ERL11 (HCB) [dB]	FOMild [dB]
WT29577	WT28997	TX1	67 --> 67*	PASS!	FAIL!	9.40	9.38	0.172
WT29577	WT28997	TX2	67 --> 67*	PASS!	FAIL!	9.34	9.48	0.199
WT29577	WT28997	TX3	67 --> 67*	PASS!	FAIL!	8.82	9.46	0.186
WT29577	WT28997	TX4	67 --> 67*	PASS!	PASS!	9.26	9.88	0.132
WT29577	WT28997	TX5	67 --> 67*	PASS!	FAIL!	10.00	10.07	0.164
WT29577	WT28997	TX6	67 --> 67*	PASS!	FAIL!	8.75	9.18	0.221
WT29577	WT28997	TX7	67 --> 67*	PASS!	FAIL!	9.38	10.05	0.145
WT29577	WT28997	TX8	67 --> 67*	PASS!	PASS!	8.45	9.36	0.168
WT29577	WT28997	RX1	67 --> 67*	PASS!	PASS!	8.39	9.30	0.177
WT29577	WT28997	RX2	67 --> 67*	PASS!	FAIL!	10.02	10.63	0.123
WT29577	WT28997	RX3	67 --> 67*	PASS!	FAIL!	8.51	9.02	0.234
WT29577	WT28997	RX4	67 --> 67*	PASS!	FAIL!	9.97	10.38	0.150
WT29577	WT28997	RX5	67 --> 67*	PASS!	FAIL!	7.81	8.55	0.178
WT29577	WT28997	RX6	67 --> 67*	PASS!	FAIL!	9.57	9.78	0.160
WT29577	WT28997	RX7	67 --> 67*	PASS!	FAIL!	8.79	9.19	0.202
WT29577	WT28997	RX8	67 --> 67*	PASS!	FAIL!	9.97	10.04	0.152
WT29940	WT29904	TX1	67 --> 67*	PASS!	PASS!	9.90	10.03	0.158
WT29940	WT29904	TX2	67 --> 67*	PASS!	PASS!	10.85	10.95	0.134
WT29940	WT29904	TX3	67 --> 67*	PASS!	FAIL!	9.53	9.72	0.131
WT29940	WT29904	TX4	67 --> 67*	PASS!	PASS!	10.12	10.64	0.108
WT29940	WT29904	TX5	67 --> 67*	PASS!	PASS!	10.17	10.19	0.161
WT29940	WT29904	TX6	67 --> 67*	PASS!	FAIL!	10.50	10.57	0.167
WT29940	WT29904	TX7	67 --> 67*	PASS!	FAIL!	9.05	9.95	0.137
WT29940	WT29904	TX8	67 --> 67*	PASS!	PASS!	9.74	10.64	0.130
WT29940	WT29904	RX1	67 --> 67*	PASS!	PASS!	8.67	9.52	0.143
WT29940	WT29904	RX2	67 --> 67*	PASS!	FAIL!	9.59	10.09	0.129
WT29940	WT29904	RX3	67 --> 67*	PASS!	FAIL!	8.59	9.22	0.218
WT29940	WT29904	RX4	67 --> 67*	PASS!	PASS!	10.07	10.39	0.163
WT29940	WT29904	RX5	67 --> 67*	PASS!	PASS!	9.12	10.08	0.128
WT29940	WT29904	RX6	67 --> 67*	PASS!	PASS!	9.68	10.06	0.122
WT29940	WT29904	RX7	67 --> 67*	PASS!	PASS!	10.00	10.35	0.185
WT29940	WT29904	RX8	67 --> 67*	PASS!	FAIL!	10.08	10.35	0.177

Summary

- Test Fixture References/Calibration
 - Proposal: Bring 2x-THRU method back, or consider short-circuit method
- ILdd masks
 - Proposal: Maintain existing ILddmin mask, Adjust ILddmax mask with must pass data
- ERL
 - Proposal: Implement modifications to the ERL computation on slide 11, and incorporate appropriate updates in Annex 93A, or Annex 179B to highlight the required implementation of “Z_t”, or similar parameter
- FOM ILD
 - Proposal: Align rise time with other requirements in Annex 179B, FOM ILD should not be an outlier for compliance assessment
- General
 - Proposal: Maintain 67GHz measurement / mask methodology