

Category 8 Limits and modeling tutorial

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Sources:

•Limits:

Liaison to IEEE 802.3 from TIA TR-42 with Attachments:

1. TR42.7-2012-12-115-Category-8-Cabling_d0.5.pdf
2. TR42.7-2012-10-106b-Category-8-Channel.pdf

•Modeling:

–TR42.7-2012-08-083-ChannelModels Wayne Larsen

1. All results 1-3-1 Graphs.xls
2. All results 5-40-5 Graphs.xls



Matrix of backward compatibility

Table 1 - Matrix of backward compatible mated component performance

		Category of Modular Connecting Hardware Performance				
		Cat 3 ¹⁾	Cat 5e	Cat 6	Cat 6A	100Ω Category 8
Modular Plug & Cord Performance	Cat 3 ¹⁾	Cat 3	Cat 3	Cat 3	Cat 3	Cat 3
	Cat 5e	Cat 3	Cat 5e	Cat 5e	Cat 5e	Cat 5e
	Cat 6	Cat 3	Cat 5e	Cat 6	Cat 6	Cat 6
	Cat 6A	Cat 3	Cat 5e	Cat 6	Cat 6A	Cat 6A
	100Ω Category 8	Cat 3	Cat 5e	Cat 6	Cat 6A	100Ω Category 8

¹⁾ Category 3 plug performance requirements not specified and are assumed to be less restrictive than category 5e.



Channel Topology

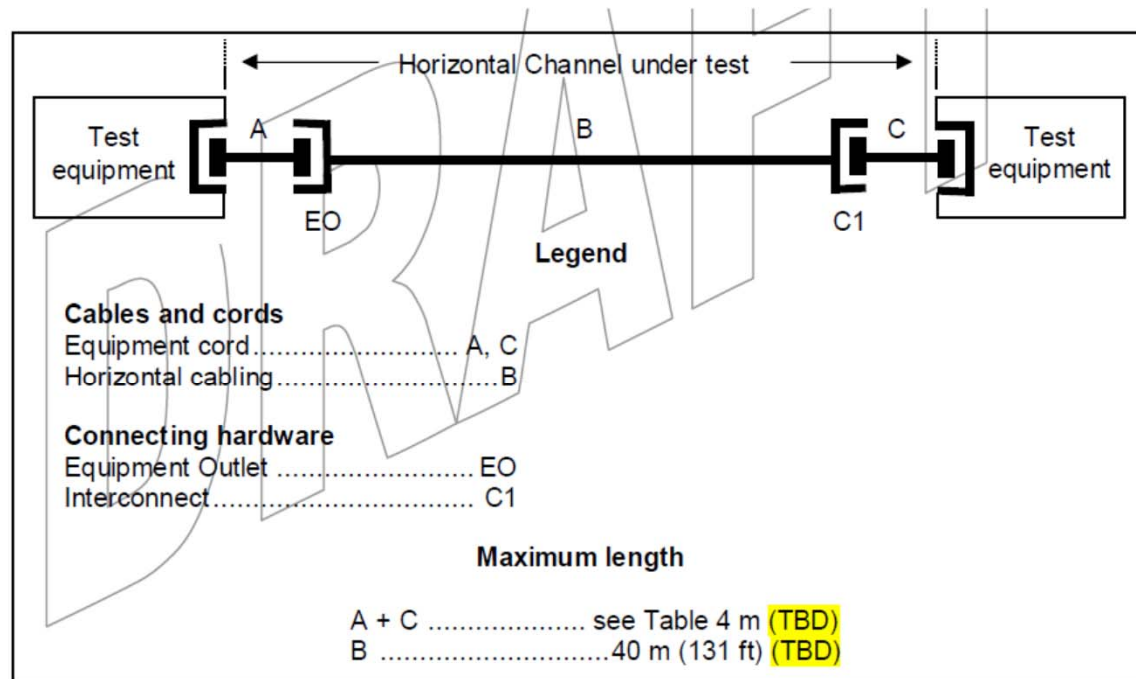


Figure 6-1 - Supplemental schematic representation of a horizontal channel test configuration

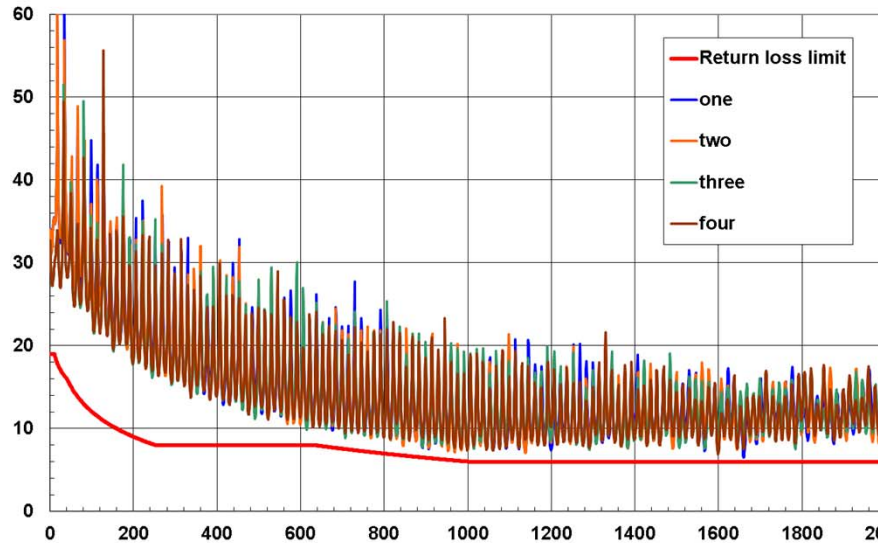
Limits are based upon a 50m maximum channel length

Modeling is shown for 5m (1A, 3B, 1C) and 50m (5A, 40B, 5C) channels

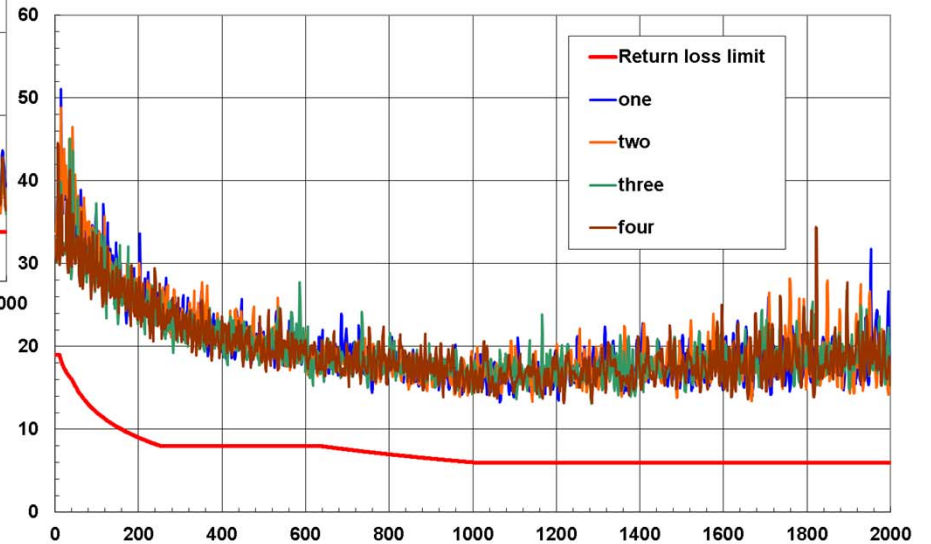


Channel Return Loss

return loss model 5 m channel 1-3-1

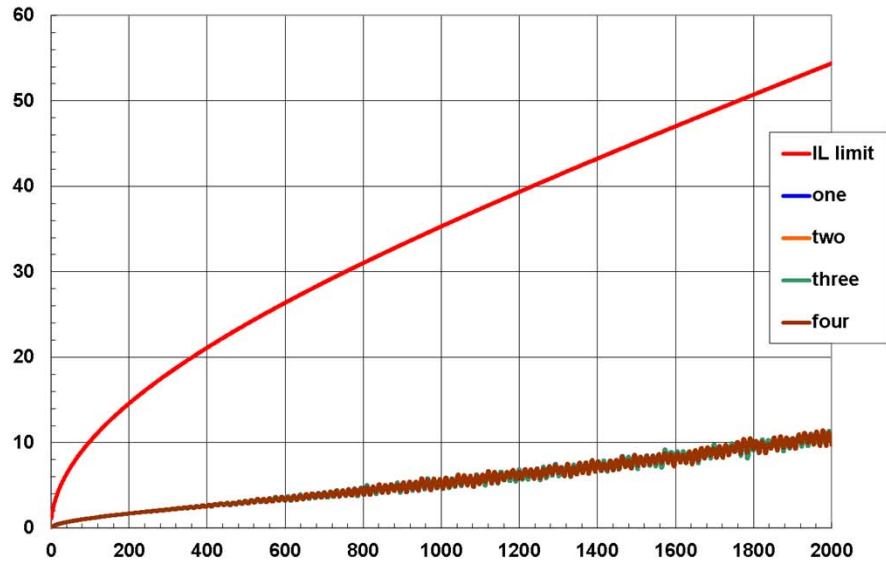


return loss model 50 m channel 5-40-5

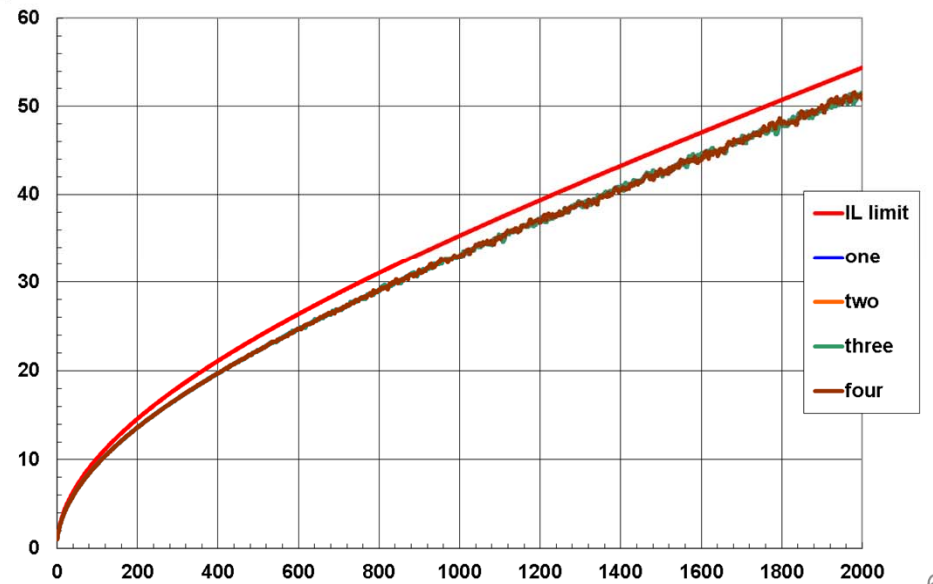


Insertion Loss

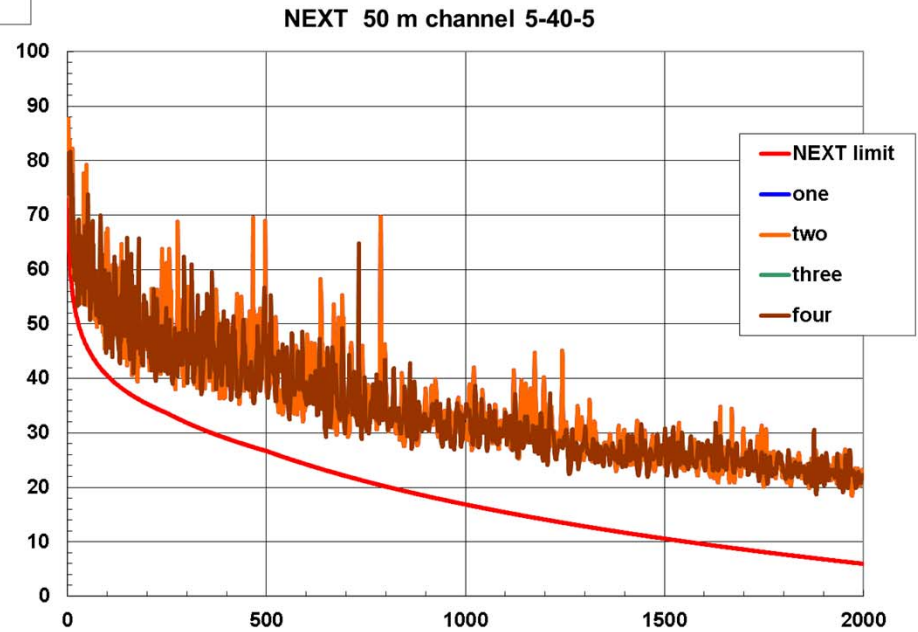
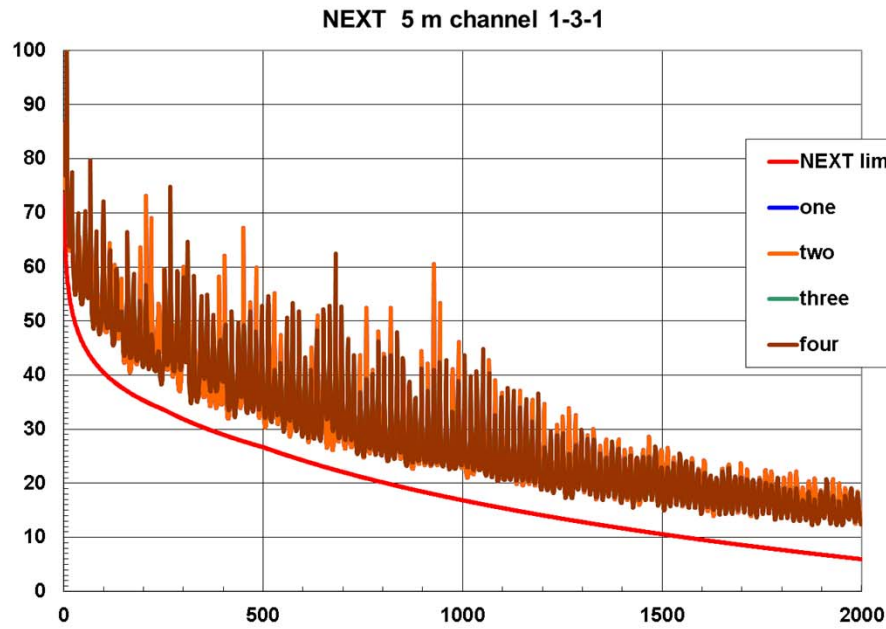
insertion loss 5 m channel 1-3-1



insertion loss 50 m channel 5-40-5



Near End Crosstalk

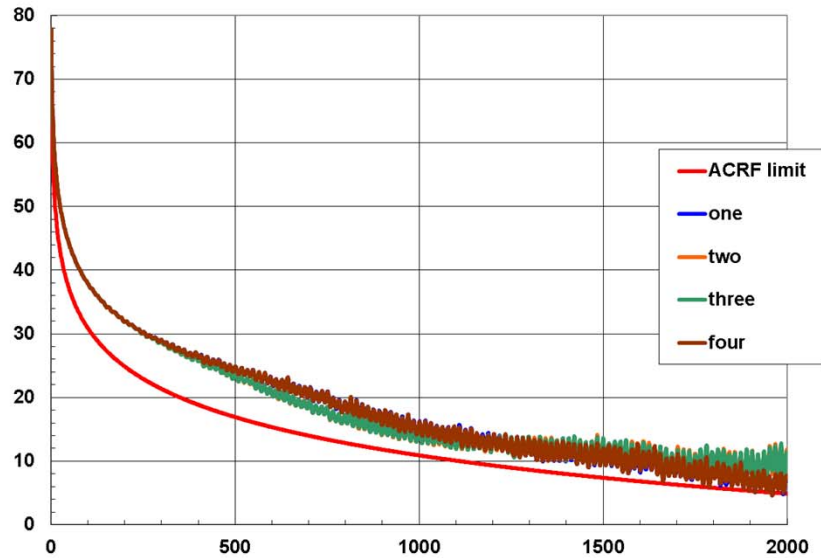


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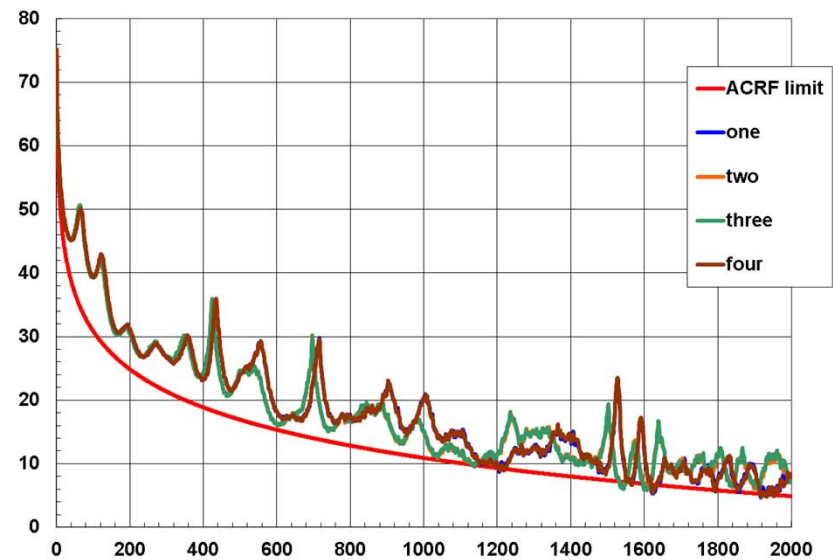


ACRF (Attenuation crosstalk ratio far end)

ACRF 5 m channel 1-3-1



ACRF 50 m channel 5-40-5



Additional parameters specified

- DC Loop Resistance
- DC Resistance Unbalance
- PSNEXT loss
- PSACRF
- TCL, ELTCTL
- Coupling Attenuation
- Propagation Delay
- Propagation Delay Skew
- PSANEXT Loss
- PSAACRF



Measurement methods and nomenclature

- ANSI/TIA 1183 “Measurement Methods and Test Fixtures for Balun-Less Measurements of Balanced Components and Systems

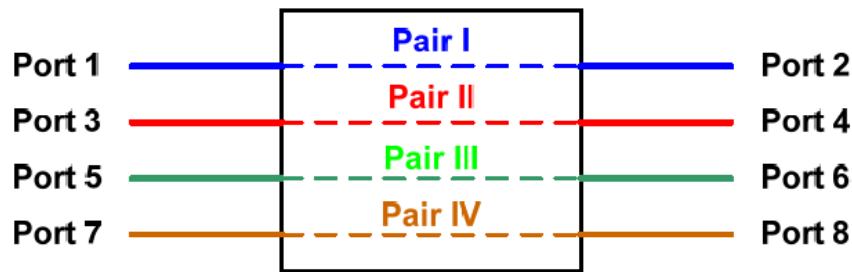
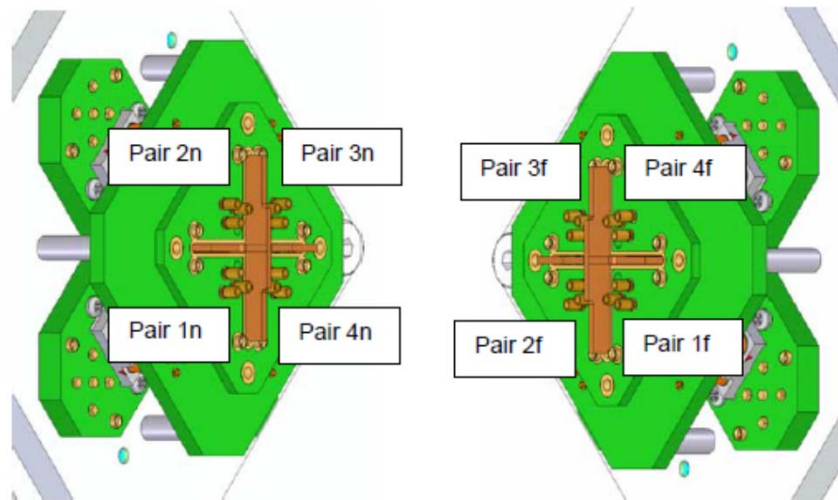


Figure 37 Example Four pair DUT port numbering



Nomenclature for an 8 port device.

Table 8 S-parameter and TIA nomenclature for 8 port parameters

Port		Port 1		Port 2		Port 3		Port 4		Port 5		Port 6		Port 7		Port 8	
1	dd	Sdd11	RLdd11	Sdd12	ILdd12	Sdd13	NEXTdd13	Sdd14	FEXTdd14	Sdd15	NEXTdd15	Sdd16	FEXTdd16	Sdd17	NEXTdd17	Sdd18	FEXTdd18
2	dd	Sdd21	ILdd21	Sdd22	RLdd22	Sdd23	FEXTdd23	Sdd24	NEXTdd24	Sdd25	FEXTdd25	Sdd26	NEXTdd26	Sdd27	FEXTdd27	Sdd28	NEXTdd28
3	dd	Sdd31	NEXTdd31	Sdd32	FEXTdd32	Sdd33	RLdd33	Sdd34	ILdd34	Sdd35	NEXTdd35	Sdd36	FEXTdd36	Sdd37	NEXTdd37	Sdd38	FEXTdd38
4	dd	Sdd41	FEXTdd41	Sdd42	NEXTdd42	Sdd43	ILdd43	Sdd44	RLdd44	Sdd45	FEXTdd45	Sdd46	NEXTdd46	Sdd47	FEXTdd47	Sdd48	NEXTdd48
5	dd	Sdd51	NEXTdd51	Sdd52	FEXTdd52	Sdd53	NEXTdd53	Sdd54	FEXTdd54	Sdd55	RLdd55	Sdd56	ILdd56	Sdd57	NEXTdd57	Sdd58	FEXTdd58
6	dd	Sdd61	FEXTdd61	Sdd62	NEXTdd62	Sdd63	FEXTdd63	Sdd64	NEXTdd64	Sdd65	ILdd65	Sdd66	RLdd66	Sdd67	FEXTdd67	Sdd68	NEXTdd68
7	dd	Sdd71	NEXTdd71	Sdd72	FEXTdd72	Sdd73	NEXTdd73	Sdd74	FEXTdd74	Sdd75	NEXTdd75	Sdd76	FEXTdd76	Sdd77	RLdd77	Sdd78	ILdd78
8	dd	Sdd81	FEXTdd81	Sdd82	NEXTdd82	Sdd83	FEXTdd83	Sdd84	NEXTdd84	Sdd85	FEXTdd85	Sdd86	NEXTdd86	Sdd87	ILdd87	Sdd88	RLdd88
1	dc	Sdc11	LCLdc11	Sdc12	LCTLdc12	Sdc13	NEXTdc13	Sdc14	FEXTdc14	Sdc15	NEXTdc15	Sdc16	FEXTdc16	Sdc17	NEXTdc17	Sdc18	FEXTdc18
2	dc	Sdc21	LCTLdc21	Sdc22	LCLdc22	Sdc23	FEXTdc23	Sdc24	NEXTdc24	Sdc25	FEXTdc25	Sdc26	NEXTdc26	Sdc27	FEXTdc27	Sdc28	NEXTdc28
3	dc	Sdc31	NEXTdc31	Sdc32	NEXTdc32	Sdc33	LCLdc33	Sdc34	LCTLdc34	Sdc35	NEXTdc35	Sdc36	FEXTdc36	Sdc37	NEXTdc37	Sdc38	FEXTdc38
4	dc	Sdc41	FEXTdc41	Sdc42	FEXTdc42	Sdc43	LCTLdc43	Sdc44	LCLdc44	Sdc45	FEXTdc45	Sdc46	NEXTdc46	Sdc47	FEXTdc47	Sdc48	NEXTdc48
5	dc	Sdc51	NEXTdc51	Sdc52	FEXTdc52	Sdc53	NEXTdc53	Sdc54	FEXTdc54	Sdc55	LCLdc55	Sdc56	LCTLdc56	Sdc57	NEXTdc57	Sdc58	FEXTdc58
6	dc	Sdc61	FEXTdc61	Sdc62	NEXTdc62	Sdc63	FEXTdc63	Sdc64	NEXTdc64	Sdc65	LCTLdc65	Sdc66	LCLdc66	Sdc67	FEXTdc67	Sdc68	NEXTdc68
7	dc	Sdc71	NEXTdc71	Sdc72	FEXTdc72	Sdc73	NEXTdc73	Sdc74	FEXTdc74	Sdc75	NEXTdc75	Sdc76	FEXTdc76	Sdc77	LCLdc77	Sdc78	LCTLdc78
8	dc	Sdc81	FEXTdc81	Sdc82	NEXTdc82	Sdc83	FEXTdc83	Sdc84	NEXTdc84	Sdc85	FEXTdc85	Sdc86	NEXTdc86	Sdc87	LCTLdc87	Sdc88	LCLdc88
1	cd	Scd11	TCLcd11	Scd12	TCTLcd12	Scd13	NEXTcd13	Scd14	FEXTcd14	Scd15	NEXTcd15	Scd16	FEXTcd16	Scd17	NEXTcd17	Scd18	FEXTcd18
2	cd	Scd21	TCTLcd21	Scd22	TCLcd22	Scd23	FEXTcd23	Scd24	NEXTcd24	Scd25	FEXTcd25	Scd26	NEXTcd26	Scd27	FEXTcd27	Scd28	NEXTcd28
3	cd	Scd31	NEXTcd31	Scd32	NEXTcd32	Scd33	TCLcd33	Scd34	TCTLcd34	Scd35	NEXTcd35	Scd36	FEXTcd36	Scd37	NEXTcd37	Scd38	FEXTcd38
4	cd	Scd41	FEXTcd41	Scd42	FEXTcd42	Scd43	TCTLcd43	Scd44	TCLcd44	Scd45	FEXTcd45	Scd46	NEXTcd46	Scd47	FEXTcd47	Scd48	NEXTcd48
5	cd	Scd51	NEXTcd51	Scd52	FEXTcd52	Scd53	NEXTcd53	Scd54	FEXTcd54	Scd55	TCLcd55	Scd56	TCTLcd56	Scd57	NEXTcd57	Scd58	FEXTcd58
6	cd	Scd61	FEXTcd61	Scd62	NEXTcd62	Scd63	FEXTcd63	Scd64	NEXTcd64	Scd65	TCTLcd65	Scd66	TCLcd66	Scd67	FEXTcd67	Scd68	NEXTcd68
7	cd	Scd71	NEXTcd71	Scd72	FEXTcd72	Scd73	NEXTcd73	Scd74	FEXTcd74	Scd75	NEXTcd75	Scd76	FEXTcd76	Scd77	TCLcd77	Scd78	TCTLcd78
8	cd	Scd81	FEXTcd81	Scd82	NEXTcd82	Scd83	FEXTcd83	Scd84	NEXTcd84	Scd85	FEXTcd85	Scd86	NEXTcd86	Scd87	TCTLcd87	Scd88	TCLcd88
1	cc	Scd11	RLcc11	Scd12	ILcc12	Scd13	NEXTcc13	Scd14	FEXTcc14	Scd15	NEXTcc15	Scd16	FEXTcc16	Scd17	NEXTcc17	Scd18	FEXTcc18
2	cc	Scd21	ILcc21	Scd22	RLcc22	Scd23	FEXTcc23	Scd24	NEXTcc24	Scd25	FEXTcc25	Scd26	NEXTcc26	Scd27	FEXTcc27	Scd28	NEXTcc28
3	cc	Scd31	NEXTcc31	Scd32	NEXTcc32	Scd33	RLcc33	Scd34	ILcc34	Scd35	NEXTcc35	Scd36	FEXTcc36	Scd37	NEXTcc37	Scd38	FEXTcc38
4	cc	Scd41	FEXTcc41	Scd42	FEXTcc42	Scd43	ILcc43	Scd44	RLcc44	Scd45	FEXTcc45	Scd46	NEXTcc46	Scd47	FEXTcc47	Scd48	NEXTcc48
5	cc	Scd51	NEXTcc51	Scd52	FEXTcc52	Scd53	NEXTcc53	Scd54	FEXTcc54	Scd55	RLcc55	Scd56	ILcc56	Scd57	NEXTcc57	Scd58	FEXTcc58
6	cc	Scd61	FEXTcc61	Scd62	NEXTcc62	Scd63	FEXTcc63	Scd64	NEXTcc64	Scd65	ILcc65	Scd66	RLcc66	Scd67	FEXTcc67	Scd68	NEXTcc68
7	cc	Scd71	NEXTcc71	Scd72	FEXTcc72	Scd73	NEXTcc73	Scd74	FEXTcc74	Scd75	NEXTcc75	Scd76	FEXTcc76	Scd77	RLcc77	Scd78	ILcc78
8	cc	Scd81	FEXTcc81	Scd82	NEXTcc82	Scd83	FEXTcc83	Scd84	NEXTcc84	Scd85	FEXTcc85	Scd86	NEXTcc86	Scd87	ILcc87	Scd88	RLcc88



Questions and Comments

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