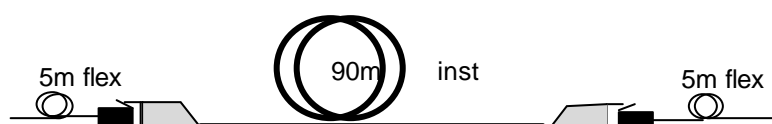


## Identification:

Dok. Nr: TE 016.925 Datum: 16.01.02 File: TE16925  
Filing: TE Author: cm/Rt

Test: Measure a Channel according to class D,5e & E for 4 pairs.

Set up:



	Inst. cable	Patch-cable	plug	Module
Trade mark	Draka	R&M freenet	R&M freenet Star System	R&M freenet
Model, Type	UC 400 HS24 S-STP	S-STP Cat6	Cat6	DCM
Characteristics	Cat6	4 x 2 x 0.14mm <sup>2</sup> PVC	1 x RJ45 shielded	1 x RJ45 shielded
Productnr.	200882	301		R925370
Prod.Date	2001	KW28 2000		00143

## Applied Standards:

ISO/IEC 11801 Edition 1.2: Jan 2000  
FCD 11801 2<sup>nd</sup> edition: Okt. 2001<sup>1)</sup>

Information technology - Generic Cabling for customer premises  
SC25/WG3 N739

EN 50173/A1: Jan 2000  
prEN 50173 2<sup>nd</sup> edition: Aug 2001<sup>2)</sup>

Information technology – Generic Cabling Systems

ANSI EIA/TIA 568B.1: April. 2001  
ANSI EIA/TIA 568B.2: April 2001<sup>1)</sup>  
ANSI EIA/TIA 568B.2-1: June 2001

General requirements  
Balanced Twisted Pair Cabling Components (5e)  
Cat. 6 Draft 9

## Measurements/ Results:

		Class D <sup>1)</sup>	Cat 5e <sup>2)</sup>	Class E
DC- Loop Resistance	M	Complies	Complies	Complies
Propagation Delay	M	Complies	Complies	Complies
Delay Skew	C	Complies	Complies	Complies
Return Loss	M	Complies	Complies	Complies
Attenuation	M	Complies	Complies	Complies
NEXT	(Near End Cross Talk) M	Complies	Complies	Complies
PS-NEXT	C	Complies	Complies	Complies
ACR	C	Complies	Complies	Complies
PS-ACR	C	Complies	Complies	Complies
FEXT	(Far End Cross Talk) M	Complies	Complies	Complies
PS-FEXT	C	Complies	Complies	Complies
ELFEXT	C	Complies	Complies	Complies
PS-ELFEXT	C	Complies	Complies	Complies

M: Measurements from 1...250 MHz for all pairs or pair combinations

C: Calculated values

**Measure equipment:**

HP Network Analyzer Typ 8753D  
BH Balun, Typ 040 – 0055, 3 – 350 MHz  
Ohmmeter

**Test Results:****DC-Resistance**

Pair	Measured [ $\Omega$ ]	Limit [ $\Omega$ ]
4/5	16.8	<25
3/6	16.9	<25
1/2	17.0	<25
7/8	16.6	<25

**Propagation Delay**

Pair	measured [ $\mu$ s]	Limit [ $\mu$ s] of 1...200MHz
4/5	<0.418	<0.54
3/6	<0.427	<0.54
1/2	<0.419	<0.54
7/8	<0.421	<0.54

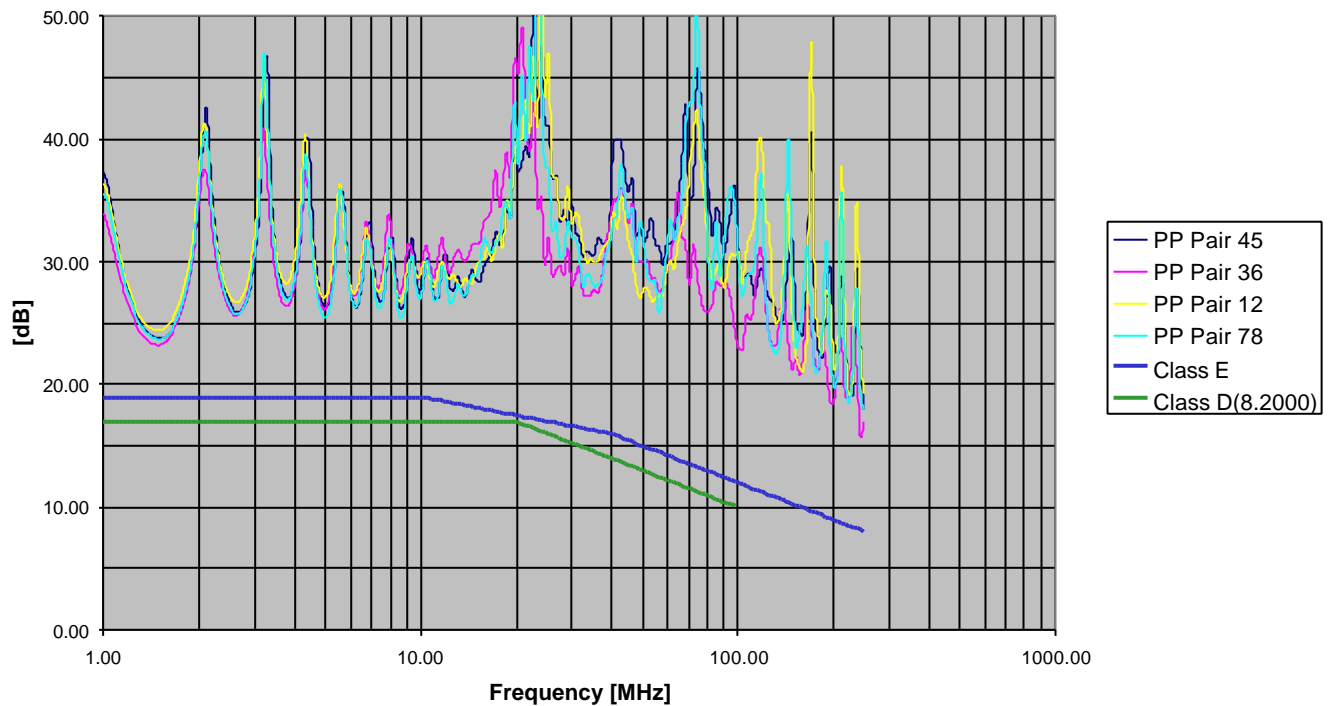
**Delay Skew**

all combinations < 9ns                      limit < 50ns

### Return Loss

Frequency [MHz]				Return Loss in dB			
	Limit			Pair 4/5	Pair 3/6	Pair 1/2	Pair 7/8
class	D	De	E				
1	17	17	19	37.32	33.92	36.43	35.63
4	17	17	19	28.03	27.82	29.98	28.17
10	17	17	19	28.09	30.46	29.91	28.10
16	17	17	18	30.16	33.64	31.27	31.27
20	17	17	17.5	37.29	45.30	40.05	38.06
31.25	15.1	15.6	16.5	32.03	29.59	33.46	30.66
62.5	12	13.5	14	31.96	33.11	29.48	31.74
100	10	12.1	12	30.31	22.87	30.75	29.42
125			11	27.04	24.00	32.89	23.76
155			10.1	24.28	20.76	21.46	24.28
175			9.6	26.37	21.76	27.55	20.93
200			9	23.57	18.59	21.26	19.76
250			8	17.90	16.96	19.20	17.95

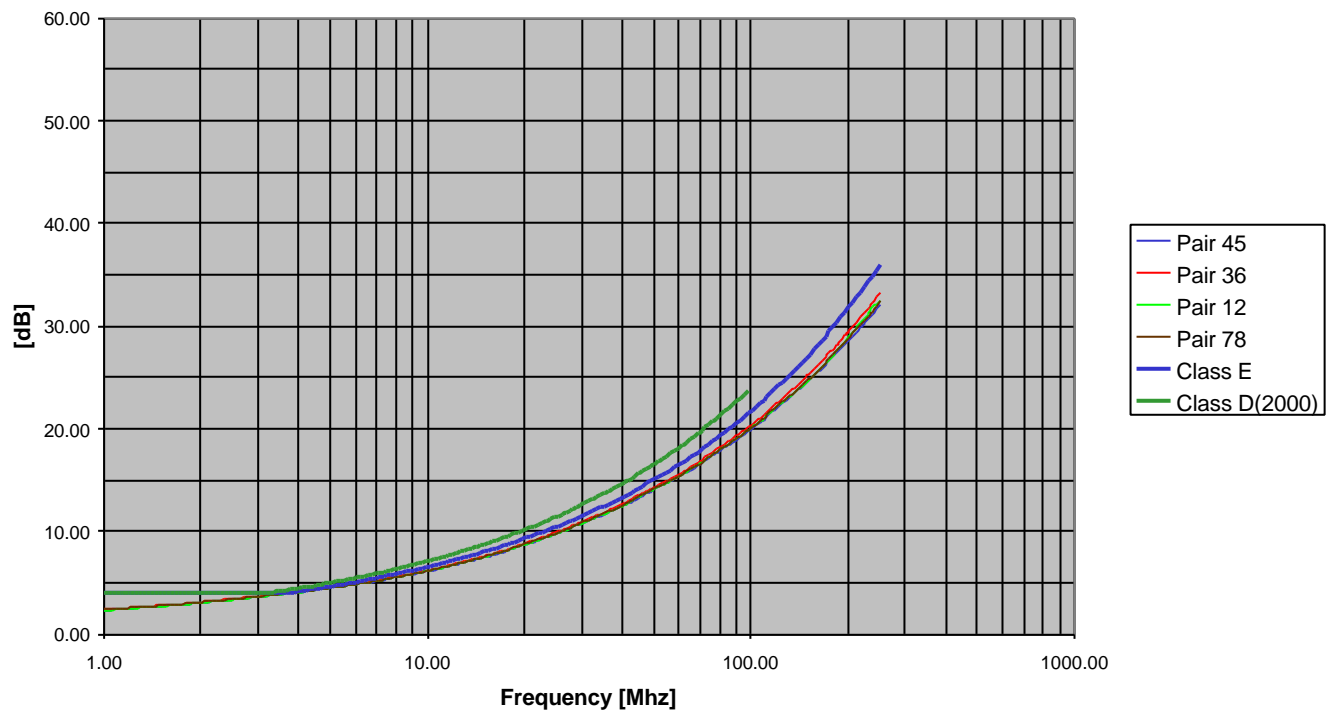
### Return Loss



### Attenuation:

Frequency [MHz]				Attenuation in dB			
	limit			Pair 4/5	Pair 3/6	Pair 1/2	Pair 7/8
class	D	De	E				
1	4	2.5	4	2.31	2.36	2.28	2.37
4	4.5	4.5	4.2	4.06	4.12	4.06	4.09
10	7.1	7	6.5	6.11	6.18	6.13	6.14
16	9.1	9.2	8.3	7.72	7.83	7.75	7.77
20	10.2	10.3	9.3	8.66	8.80	8.70	8.73
31.25	12.9	12.8	11.7	10.97	11.14	10.98	11.05
62.5	18.6	18.5	16.9	15.68	15.93	15.74	15.75
100	24	24	21.7	19.94	20.40	20.09	20.09
125			24.5	22.43	22.94	22.54	22.59
155			27.6	25.09	25.67	25.10	25.17
175			29.5	26.68	27.34	26.72	26.81
200			31.7	28.52	29.44	28.84	28.79
250			36	32.10	33.19	32.42	32.37

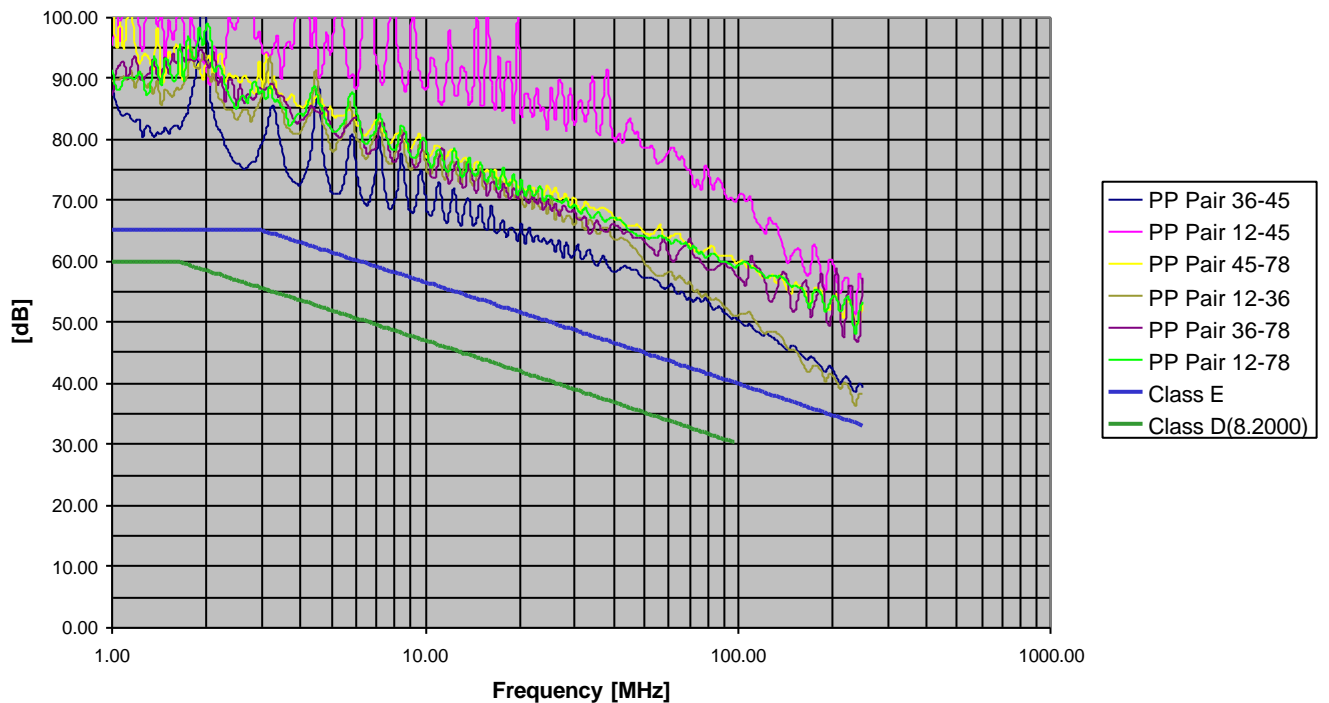
### Attenuation



**NEXT:**

Frequency [MHz]	Limit [dB]			NEXT in dB					
				Pair 4/5-3/6	Pair 4/5-1/2	Pair 4/5-7/8	Pair 3/6-1/2	Pair 3/6-7/8	Pair 1/2-7/8
class	D	De	E						
1	60	60	65	88.23	95.32	103.83	89.49	86.93	91.31
4	53.5	53.6	63	72.48	108.15	85.41	80.90	83.16	84.28
10	47	47	56.6	67.86	88.59	76.93	74.42	77.45	77.43
16	43.6	43.6	53.2	69.05	88.77	74.29	74.49	73.05	74.92
20	42	42	51.6	66.23	83.86	72.04	70.45	71.98	73.23
31.25	38.7	38.7	48.4	60.36	86.27	68.18	66.40	66.84	67.80
62.5	33.6	33.6	43.4	55.02	77.95	64.34	56.96	60.12	63.45
100	30.1	30.1	39.9	50.25	70.77	59.87	51.21	57.27	59.37
125			38.3	47.91	67.11	57.39	48.55	53.53	57.48
155			36.7	45.02	61.97	55.95	44.46	54.66	55.66
175			35.8	44.04	62.90	55.37	42.90	52.87	55.06
200			34.8	42.11	59.79	54.01	41.13	53.20	54.31
250			33.1	39.27	56.26	53.03	38.21	57.28	53.39

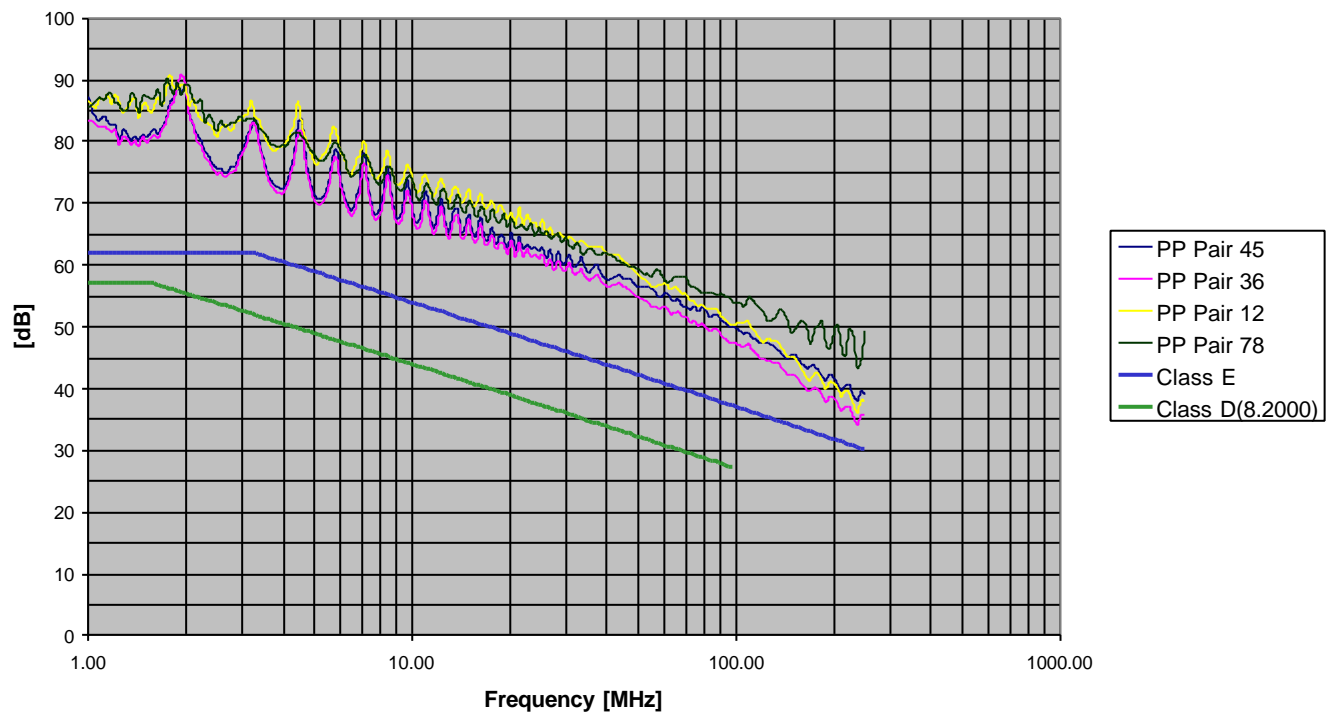
**NEXT**



### PS-NEXT:

Frequency [MHz]	Limit [dB]			PS-NEXT in dB			
				Pair 4/5	Pair 3/6	Pair 1/2	Pair 7/8
class	D	De	E				
1	57	57	62	87.36	83.32	86.66	85.52
4	50.5	50.9	60.5	72.26	71.58	79.25	79.41
10	44	44.1	54	67.32	66.62	72.55	72.49
16	40.6	40.6	50.6	67.88	66.79	71.60	69.25
20	39	39	49	65.16	64.07	68.48	67.61
31.25	35.7	35.7	45.7	59.69	58.68	64.01	62.80
62.5	30.6	30.6	40.6	54.52	52.12	56.05	57.47
100	27.1	27.1	37.1	49.77	47.24	50.55	53.91
125			35.4	47.40	44.61	47.97	50.94
155			33.8	44.60	41.51	44.07	50.62
175			32.9	43.68	40.18	42.60	49.51
200			31.9	41.77	38.44	40.87	49.04
250			30.2	39.01	35.66	38.01	49.42

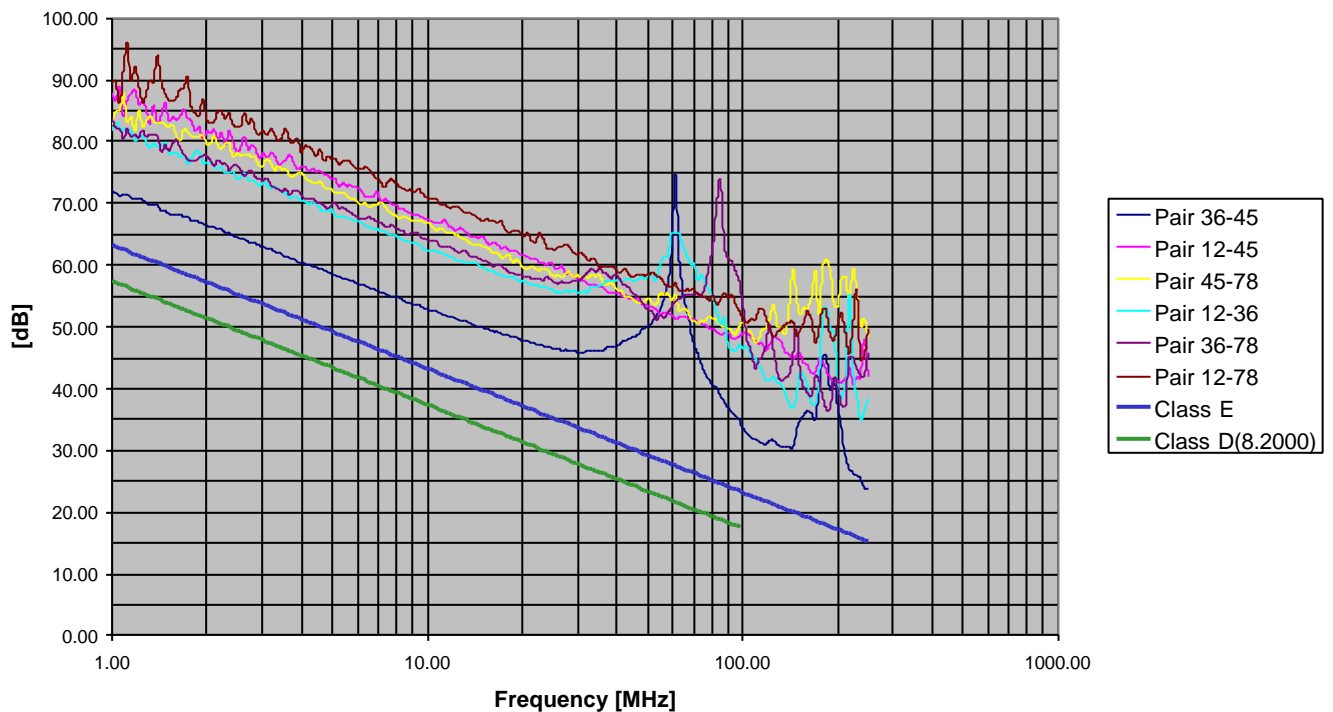
### PS-NEXT



### ELFEXT:

Frequency [MHz]	Limit [dB]			ELFEXT in dB					
				Pair 4/5-3/6	Pair 4/5-1/2	Pair 4/5-7/8	Pair 3/6-1/2	Pair 3/6-7/8	Pair 1/2-7/8
class	D	De	E						
1	57.4	57.4	63.3	72.09	87.85	82.66	81.63	83.92	89.29
4	45.4	45.3	51.2	60.48	75.77	75.04	70.46	71.55	78.34
10	37.4	37.4	43.3	52.65	67.25	66.70	62.47	64.00	70.66
16	33.3	33.3	39.2	49.24	63.66	61.88	59.06	59.80	67.28
20	31.4	31.4	37.2	47.90	61.66	59.55	57.37	58.16	64.54
31.25	27.5	27.5	33.4	45.91	57.44	58.09	55.77	58.42	61.46
62.5	21.5	21.5	27.3	61.35	51.51	52.71	65.27	54.49	56.00
100	17.4	17.4	23.3	33.57	48.92	50.79	46.41	53.13	51.54
125			21.3	31.67	48.34	53.57	42.01	45.84	48.34
155			19.5	35.84	44.19	53.06	41.99	40.25	50.81
175			18.4	39.60	44.64	51.87	41.89	41.61	49.57
200			17.2	37.16	41.24	53.46	40.19	40.04	50.37
250			15.3	23.69	41.89	48.41	38.34	45.83	49.74

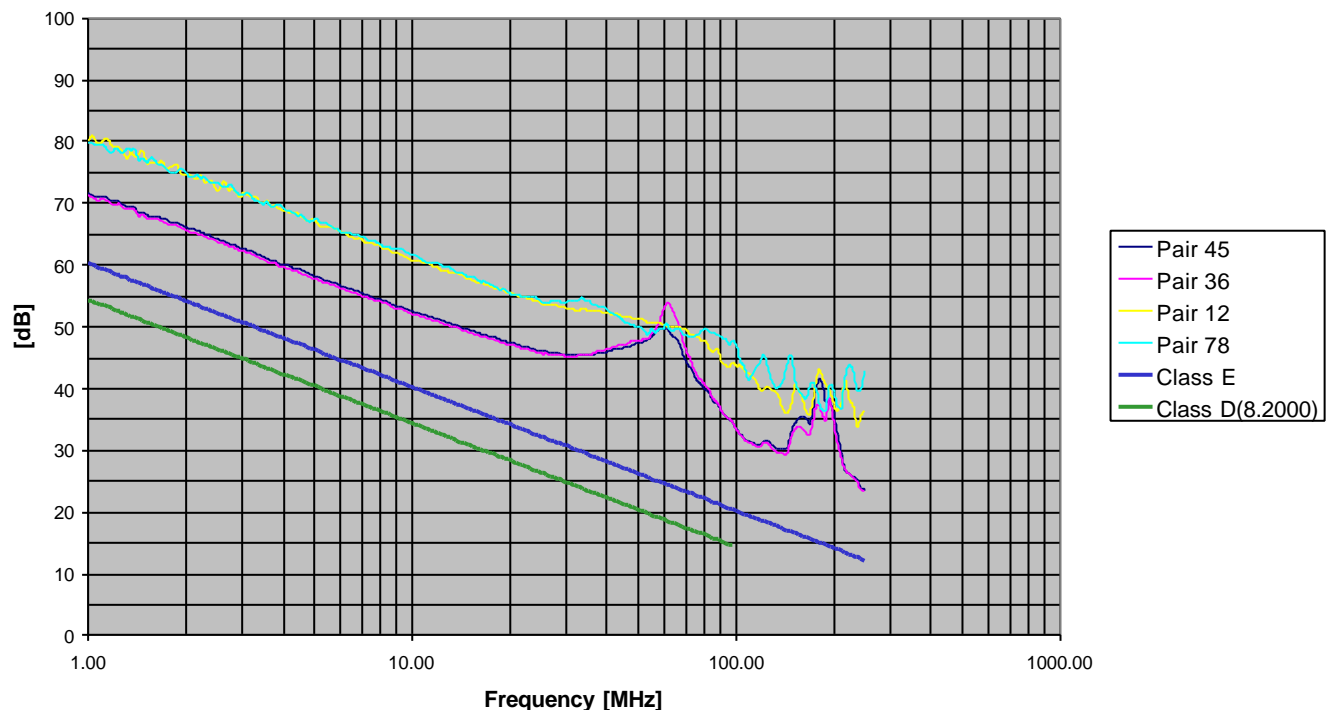
### EL-FEXT



**PS-ELFEXT:**

Frequency [MHz]	Limit [dB]			PS-ELFEXT in dB			
				Pair 4/5	Pair 3/6	Pair 1/2	Pair 7/8
class	D	De	E				
1	54.4	54.4	60.3	71.62	71.38	80.14	79.73
4	42.4	42.4	48.2	60.21	59.77	68.83	69.36
10	34.4	34.4	40.3	52.34	51.94	60.75	61.56
16	30.3	30.3	36.2	48.86	48.47	57.30	57.25
20	28.4	28.4	34.2	47.44	47.08	55.43	55.24
31.25	24.5	24.5	30.4	45.37	45.26	52.87	54.31
62.5	18.5	18.5	24.3	48.81	53.38	50.05	49.42
100	14.4	14.4	20.3	33.36	33.30	43.70	46.94
125			18.3	31.55	31.13	40.35	43.46
155			16.5	35.17	33.78	39.60	39.68
175			15.4	38.22	36.14	39.58	40.63
200			14.2	35.65	34.12	37.45	39.48
250			12.3	23.61	23.52	36.54	42.91

**PS EL-FEXT**

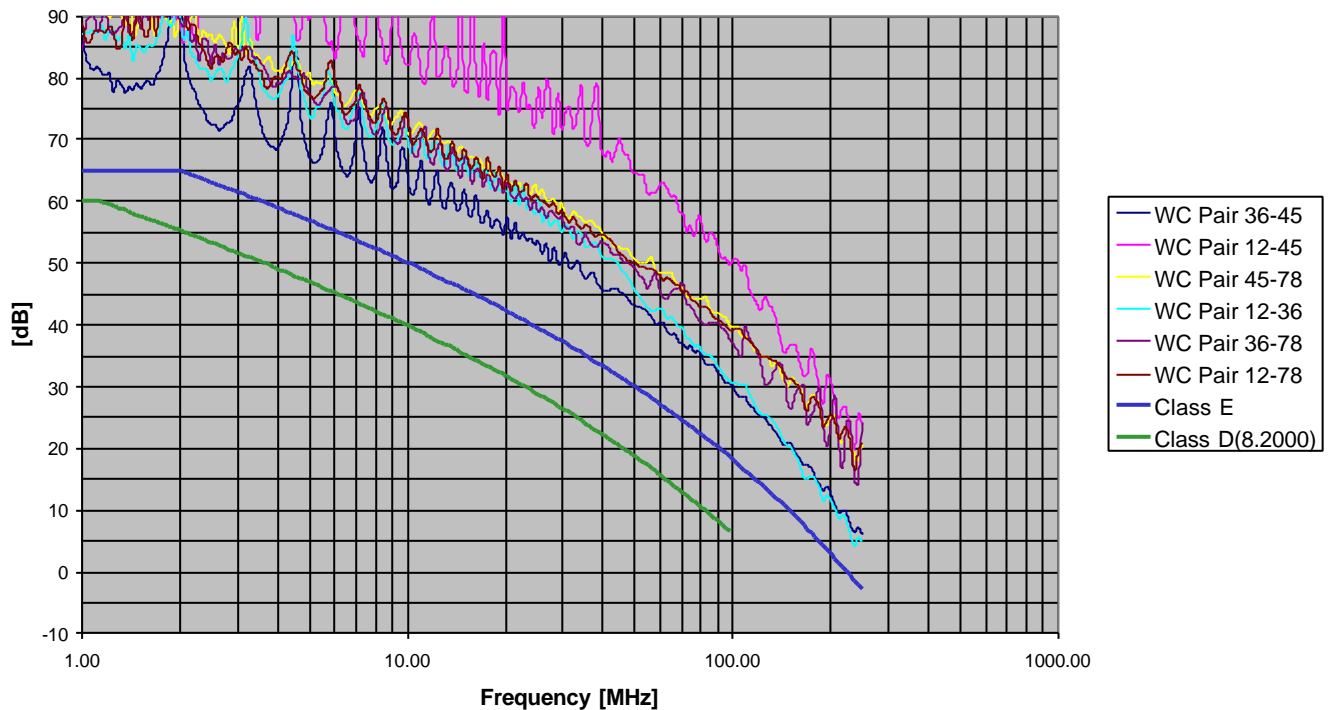




ACR:

				ACR in dB					
Frequency [MHz]	Limit [dB]			Pair 4/5-3/6	Pair 4/5-1/2	Pair 4/5-7/8	Pair 3/6-1/2	Pair 3/6-7/8	Pair 1/2-7/8
class	D	De	E						
1	60		65	85.87	93.00	101.46	87.13	84.56	88.94
4	49.1		59	68.38	104.10	81.32	76.79	79.06	80.19
10	39.9		50.1	61.63	82.41	70.75	68.19	71.22	71.25
16	34.5		45	61.16	80.95	66.46	66.60	65.16	67.09
20	31.8		42.4	57.36	75.10	63.25	61.59	63.11	64.44
31.25	25.9		36.7	49.16	75.23	57.08	55.21	55.64	56.70
62.5	15		26.5	39.04	62.17	48.54	40.98	44.14	47.65
100	6.1		18.2	29.80	50.62	39.73	30.76	36.82	39.22
125			13.8	24.92	44.54	34.76	25.56	30.55	34.85
155			9.1	19.24	36.76	30.68	18.68	28.88	30.39
175			6.3	16.73	36.22	28.58	15.58	25.55	28.28
200			3.1	12.64	30.92	25.18	11.66	23.73	25.44
250			-2.8	6.08	23.84	20.66	5.02	24.09	20.97

ACR



### PS-ACR:

Frequency [MHz]	Limit [dB]			PS-ACR in dB			
	Pair 4/5	Pair 3/6	Pair 1/2	Pair 7/8			
class	D	De	E				
1	57		62	85.04	80.96	84.38	83.15
4	46.1		56.5	68.22	67.48	75.20	75.33
10	36.9		47.5	61.17	60.39	66.37	66.31
16	31.5		42.3	60.10	58.89	63.79	61.42
20	28.8		39.7	56.43	55.20	59.73	58.82
31.25	22.9		34	48.66	47.48	52.97	51.69
62.5	12		23.7	38.80	36.14	40.27	41.67
100	3.1		15.4	29.77	26.79	30.41	33.77
125			10.9	24.93	21.63	25.40	28.31
155			6.2	19.41	15.72	18.86	25.35
175			3.4	17.03	12.87	15.92	22.73
200			0.1	13.23	8.96	11.99	20.22
250			-5.8	6.91	2.48	5.59	17.05

### PS-ACR

