Cabling Transmission Parameters

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Supporters

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Outline

- NEXT
- PSNEXT
- ACRF
- Delay

NEXT

Table 5 – Equations for pair-to-pair NEXT limits for a channel

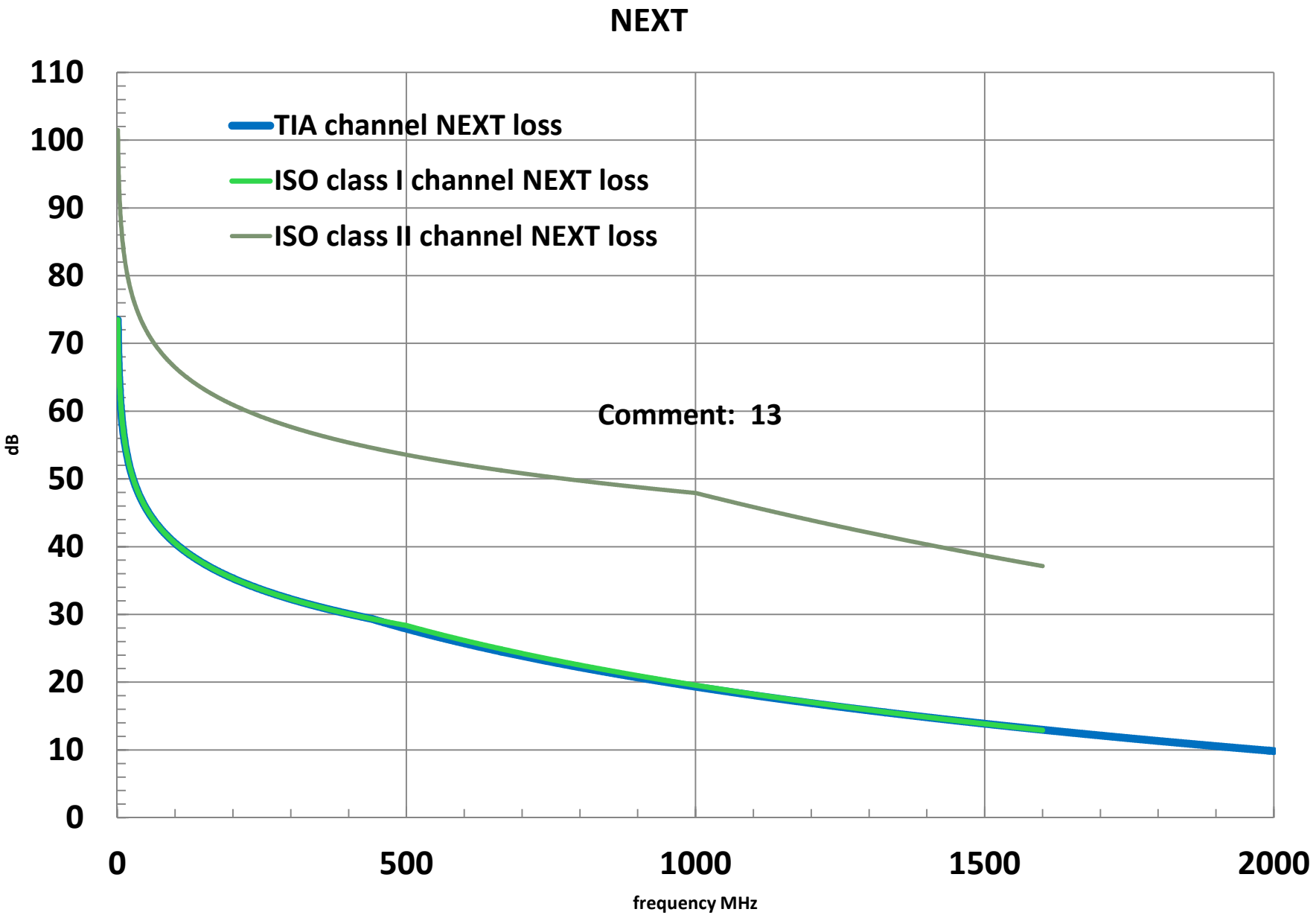
	Frequency MHz	Minimum NEXT dB
Class I	$1 \le f \le 500$	$-20\lg\left(10^{\frac{75{,}3-15\lg(f)}{-20}}+2\times10^{\frac{94-20\lg(f)}{-20}}\right)$ For measurements 65,0 ffs max
	$500 < f \le 1\,600$ $1\,600 < f \le 2\,000$ ffs	$-20\lg\left(10^{\frac{75{,}3-15\lg(f)}{-20}}+2\times10^{\frac{40-38\lg(f/500)}{-20}}\right)$ For measurements 65,0 ffs max
Class II	$1 \le f \le 1\,000$	$-20\lg\left(10^{\frac{105{,}4-15\lg(f)}{-20}}+2\times10^{\frac{116{,}3-20\lg(f)}{-20}}\right)$ For measurements 65,0 ffs max
	$1\,000 < f \le 1\,600$ $1\,600 < f \le 2\,000$ ffs	$-20\lg\left(10^{\frac{105{,}4-15\lg(f)}{-20}}+2\times10^{\frac{56{,}3-60\lg(f/1000)}{-20}}\right)$ For measurements 65,0 ffs max

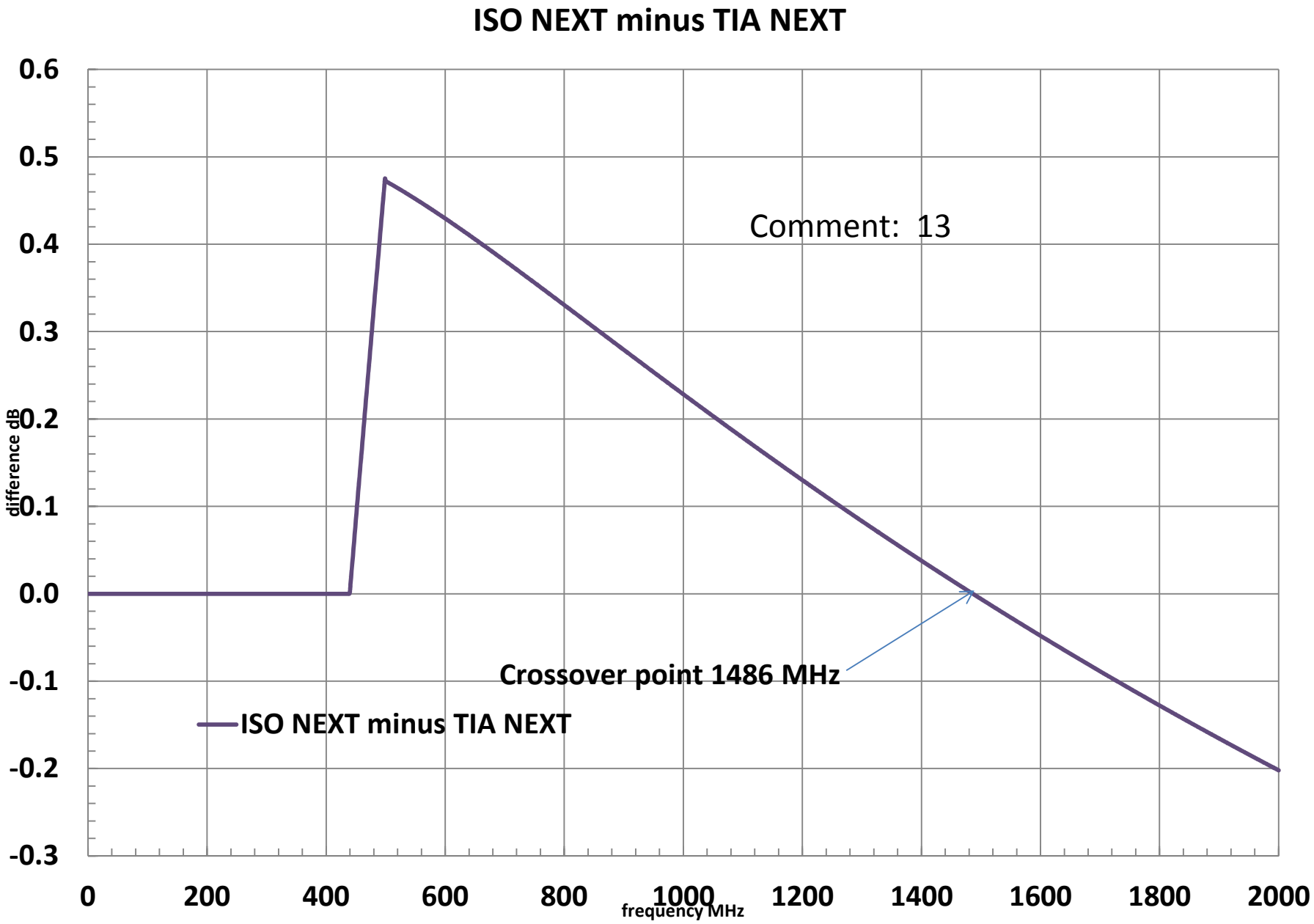
Table 9 - Channel NEXT loss

	Frequency (MHz)	NEXT loss (dB)[1]
Category 8	$1 \le f \le 440$	$-20\log\left(10^{\frac{(45.3-15\log(f/100))}{-20}}+2\cdot10^{\frac{(54-20\log(f/100))}{-20}}\right)$
	$440 < f \le 2000$	$-20\log\left(10^{\frac{(45.3-15\log(f/100))}{-20}}+2\cdot10^{\frac{(39.12-36.14\log(f/500))}{-20}}\right)$

1 Calculations that result in category 8 channel NEXT loss values greater than 65 dB shall revert to a requirement of 65 dB minimum.

Comment: 13


NEXT
TIA channel NEXT loss
ISO class I channel NEXT loss
ISO class II channel NEXT loss
Comment: 13
dB
110
100
90
80
70
60
50
40
30
20
10
0
0
500
1000
1500
2000
frequency MHz


ISO NEXT minus TIA NEXT
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
difference dB
Comment: 13
Crossover point 1486 MHz
ISO NEXT minus TIA NEXT
0
200
400
600
800
1000
1200
1400
1600
1800
2000
frequency MHz

NEXT: Comment: 13

- TIA limit up to 0.5 dB lower than ISO in the middle range
- ISO limit up to 0.2 dB lower than TIA in the upper range
- Crossover point is 1486 MHz
- Choose TIA from 1-1486 MHz, ISO from 1486-2000 MHz

PSNEXT

Table 7 – Equations for PS NEXT limits for a channel

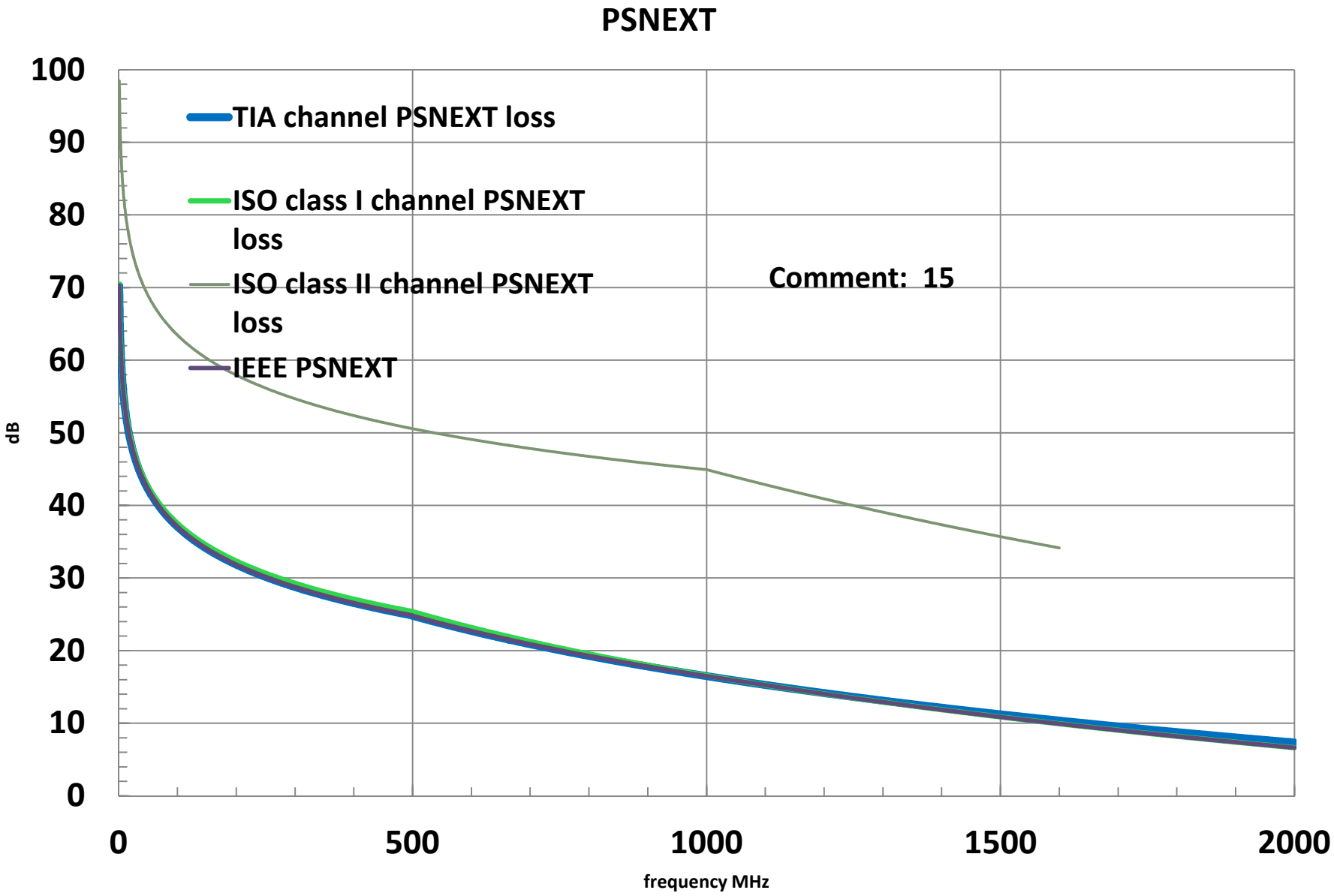
	Frequency MHz	Minimum PS NEXT dB
Class I	$1 \le f \le 500$	$-20\lg\left(10^{\frac{72{,}3-15\lg(f)}{-20}}+2\times10^{\frac{91-20\lg(f)}{-20}}\right)$ For measurements 62,0 ffs max
	$500 < f \le 1\,600$ $1\,600 < f \le 2\,000$ ffs	$-20\lg\left(10^{\frac{72{,}3-15\lg(f)}{-20}}+2\times10^{\frac{37-38\lg(f/500)}{-20}}\right)$ For measurements 62,0 ffs max
Class II	$1 \le f \le 1\,000$	$-20\lg\left(10^{\frac{102{,}4-15\lg(f)}{-20}}+2\times10^{\frac{113{,}3-20\lg(f)}{-20}}\right)$ For measurements 62,0 ffs max
	$1\,000 < f \le 1\,600$ $1\,600 < f \le 2\,000$ ffs	$-20\lg\left(10^{\frac{102{,}4-15\lg(f)}{-20}}+2\times10^{\frac{53{,}3-60\lg(f/1000)}{-20}}\right)$ For measurements 62,0 ffs max

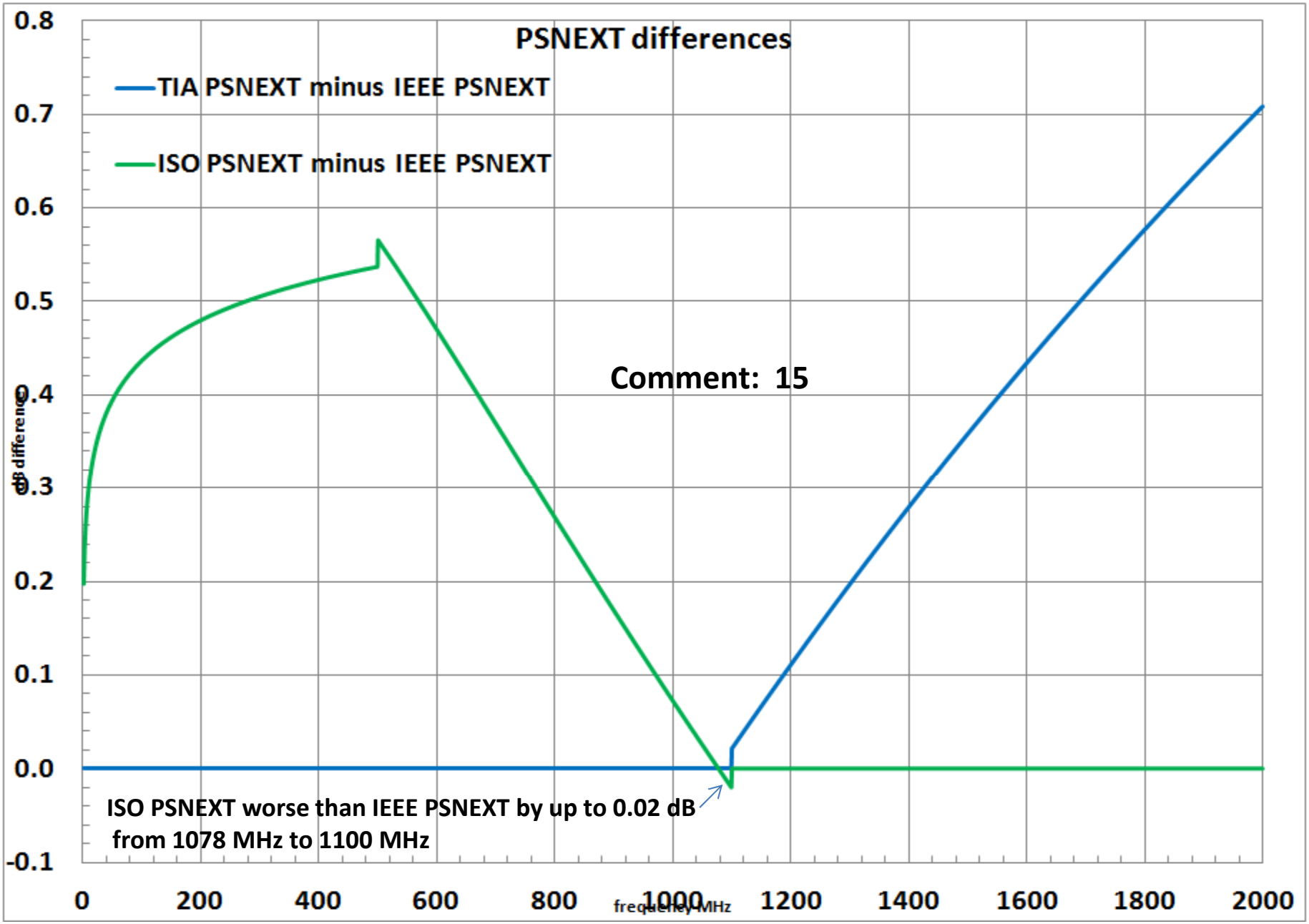
Table 11 - Channel PSNEXT loss

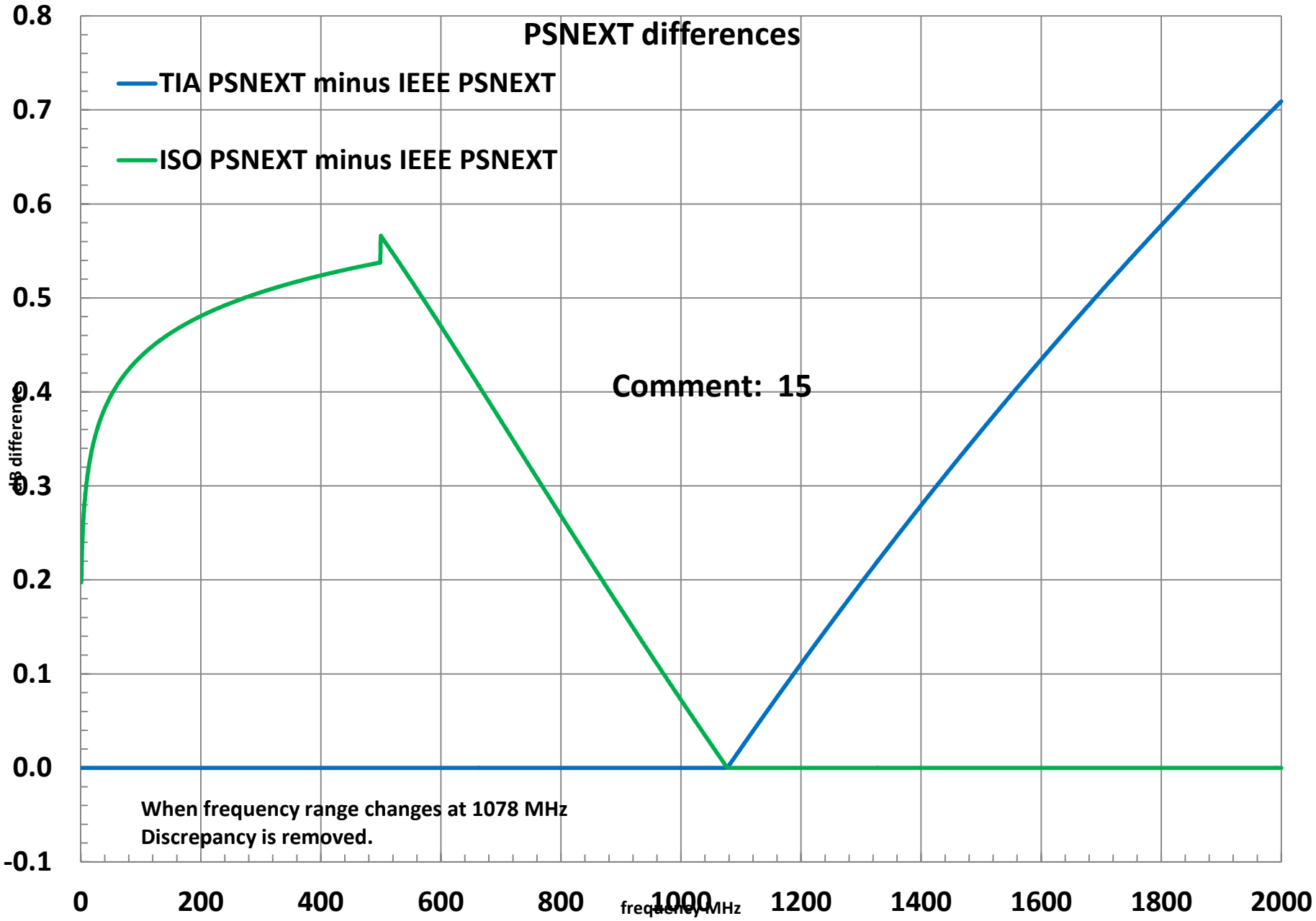
	Frequency (MHz)	PSNEXT loss (dB) [1]
Category 8	$1 \le f \le 500$	$-20\log\left(10^{\frac{(42.3-15\log(f/100))}{-20}}+2\cdot10^{\frac{(50.0-20\log(f/100))}{-20}}\right)$
	$500 < f \le 2000$	$-20\log\left(10^{\frac{(42.3-15\log(f/100))}{-20}}+2\cdot10^{\frac{(35.95-34.85\log(f/500))}{-20}}\right)$

1 Calculations that result in category 8 channel PSNEXT loss values greater than 62 dB shall revert to a requirement of 62 dB minimum.

Comment: 15


PSNEXT
TIA channel PSNEXT loss
ISO class I channel PSNEXT loss
ISO class II channel PSNEXT loss
IEEE PSNEXT
Comment: 15
dB
100
90
80
70
60
50
40
30
20
10
0
0
500
1000
1500
2000
frequency MHz


PSNEXT differences
TIA PSNEXT minus IEEE PSNEXT
ISO PSNEXT minus IEEE PSNEXT
Comment: 15
dB difference
frequency MHz
ISO PSNEXT worse than IEEE PSNEXT by up to 0.02 dB
from 1078 MHz to 1100 MHz
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
0
200
400
600
800
1000
1200
1400
1600
1800
2000


PSNEXT differences
TIA PSNEXT minus IEEE PSNEXT
ISO PSNEXT minus IEEE PSNEXT
Comment: 15
When frequency range changes at 1078 MHz
Discrepancy is removed.
dB difference
frequency MHz
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
0
200
400
600
800
1000
1200
1400
1600
1800
2000

Delay – Should have used equation, or a different value

Table 23 - Channel propagation delay

	Frequency (MHz)	Propagation delay (ns)
Category 8	$1 \le f \le 2000$	$32/30(160+\frac{11}{\sqrt{f}})+(2\times 2.5)$

Comment: 20

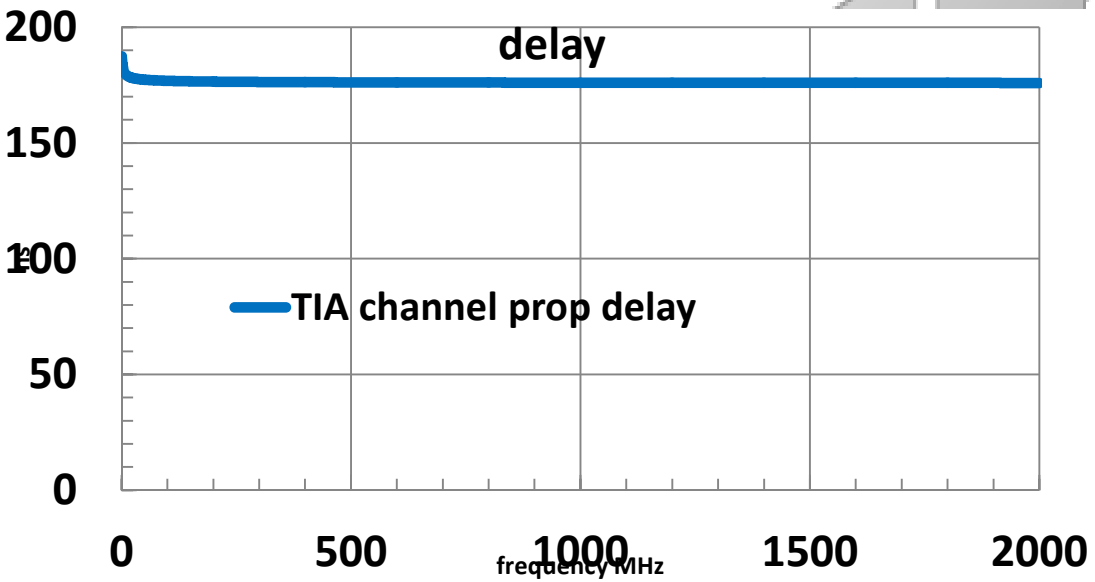


Table 24 - Maximum channel propagation delay

Frequency (MHz)	Category 8 (ns)
1.00	187
4.00	182
8.00	180
10.00	179
16.00	179
20.00	178
25.00	178
31.25	178
62.50	177
100.00	177
200.00	176
250.00	176
300.00	176
400.00	176
500.00	176
600.00	176
1000.00	176
1500.00	176
2000.00	176