International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

G.8251

Amendment 1

(04/2011)

SERIES G: TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS

Packet over Transport aspects – Quality and availability targets

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The control of jitter and wander within the optical transport network (OTN)

Amendment 1

Recommendation ITU-T G.8251 (2010) – Amendment 1

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ITU-T G-SERIES RECOMMENDATIONS

TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS

INTERNATIONAL TELEPHONE CONNECTIONS AND CIRCUITS	G.100–G.199
GENERAL CHARACTERISTICS COMMON TO ALL ANALOGUE CARRIER-TRANSMISSION SYSTEMS	G.200–G.299
INDIVIDUAL CHARACTERISTICS OF INTERNATIONAL CARRIER TELEPHONE SYSTEMS ON METALLIC LINES	G.300–G.399
GENERAL CHARACTERISTICS OF INTERNATIONAL CARRIER TELEPHONE SYSTEMS ON RADIO-RELAY OR SATELLITE LINKS AND INTERCONNECTION WITH METALLIC LINES	G.400–G.449
COORDINATION OF RADIOTELEPHONY AND LINE TELEPHONY	G.450–G.499
TRANSMISSION MEDIA AND OPTICAL SYSTEMS CHARACTERISTICS	G.600–G.699
DIGITAL TERMINAL EQUIPMENTS	G.700–G.799
DIGITAL NETWORKS	G.800–G.899
DIGITAL SECTIONS AND DIGITAL LINE SYSTEM	G.900–G.999
MULTIMEDIA QUALITY OF SERVICE AND PERFORMANCE – GENERIC AND USER-RELATED ASPECTS	G.1000–G.1999
TRANSMISSION MEDIA CHARACTERISTICS	G.6000–G.6999
DATA OVER TRANSPORT – GENERIC ASPECTS	G.7000–G.7999
PACKET OVER TRANSPORT ASPECTS	G.8000–G.8999
Ethernet over Transport aspects	G.8000–G.8099
MPLS over Transport aspects	G.8100–G.8199
Quality and availability targets	**G.8200–G.8299**
Service Management	G.8600–G.8699
ACCESS NETWORKS	G.9000–G.9999

For further details, please refer to the list of ITU-T Recommendations.

Recommendation ITU-T G.8251

The control of jitter and wander within the optical transport network (OTN)

Amendment 1

Summary

Amendment 1 to Recommendation ITU-T G.8251 (2010) provides the values for high-band jitter of the OTU3 and OTU4 multilane interfaces.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T G.8251	2001-11-29	15
1.1	ITU-T G.8251 (2001) Cor. 1	2002-06-13	15
1.2	ITU-T G.8251 (2001) Amend. 1	2002-06-13	15
1.3	ITU-T G.8251 (2001) Cor. 2	2008-05-22	15
1.4	ITU-T G.8251 (2001) Amend.2	2010-01-13	15
2.0	ITU-T G.8251	2010-09-22	15
2.1	ITU-T G.8251 (2010) Amend. 1	2011-04-13	15

FOREWORD

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Recommendation ITU-T G.8251

The control of jitter and wander within the optical transport network (OTN)

Amendment 1

1) Scope

This amendment contains material to be added to Recommendation ITU-T G.8251, *The control of jitter and wander within the optical transport network (OTN)*, to fully specify the jitter of the multilane OTU3 and OTU4 interfaces.

2) Corrected material for ITU-T G.8251

The following clauses of ITU-T G.8251 are to be corrected by the given entries.

2.1) Clause 5, Network limits for the maximum output jitter and wander at an OTUk interface

In Table 5.1-1, modify the FFS entries for the multilane interface as shown below:

Table 5.1-1 – Maximum permissible jitter at OTUk interfaces

Interface	Measurement bandwidth, –3 dB frequencies (Hz)	Peak-to-peak amplitude (UIpp)
OTU1	5 k to 20 M	1.5
	1 M to 20 M	0.15
OTU2	20 k to 80 M	1.5
	4 M to 80 M	0.15
OTU3	20 k to 320 M	6.0
	16 M to 320 M	0.18
OTL3.4 (OTU3 Multilane) per lane	20 k to 80 M~~FFS~~	6.0~~FFS~~
	4 M measured up to fourth-order Bessel-Thomson filter defined in clause 87.8.9 of [IEEE 802.3ba]	Each lane according to clause 87.7.2, Table 87-8, and clause 87.8.11 of [IEEE 802.3ba]
OTL4.4 (OTU4 Multilane) per lane	50 k to 200 M~~FFS~~	6.0~~FFS~~
	10 M measured up to fourth-order Bessel-Thomson filter defined in clause 88.8.8 of [IEEE 802.3ba]	Each lane according to clause 88.8.10, Table 88-13 of [IEEE 802.3ba]

Table 5.1-1 – Maximum permissible jitter at OTUk interfaces

Interface	Measurement bandwidth, –3 dB frequencies (Hz)	Peak-to-peak amplitude (UIpp)
NOTE – OTU1 1 UI = $\frac{238}{(255)(2.48832)}$ ns = 375.1 ps OTU2 1 UI = $\frac{237}{(255)(9.95328)}$ ns = 93.38 ps OTU3 1 UI = $\frac{236}{(255)(39.81312)}$ ns = 23.25 ps OTL3.4 1 UI = $\frac{4 \times 236}{(255)(39.81312)}$ ns = 92.98 ps per lane OTL4.4 1 UI = $\frac{4 \times 227}{(255)(99.5328)}$ ns = 35.77 ps per lane		

2.2) Clause 6.1.3, OTU3 jitter and wander tolerance

In Table 6.1-4 and Figure 6.1-4, modify the entries for the multilane interface as shown below:

Table 6.1-4 – OTL3.4 per lane input sinusoidal jitter tolerance limit

Frequency *f* (Hz)	Peak-to-peak amplitude (UIpp)
~~FFS~~2 k < *f* ≤ 20 k	~~FFS~~$1.2 \times 10^5 f^{-1}$
~~FFS~~20 k < *f* ≤ 33 k	~~FFS~~6.0
~~4 M~~33 k < *f* ≤ measured up to fourth-order Bessel-Thomson filter defined in [IEEE 802.3ba], clause 87.8.9.	Each lane according to clause 87.7.2, Table 87-8, and clause 87.8.11 of [IEEE 802.3ba]

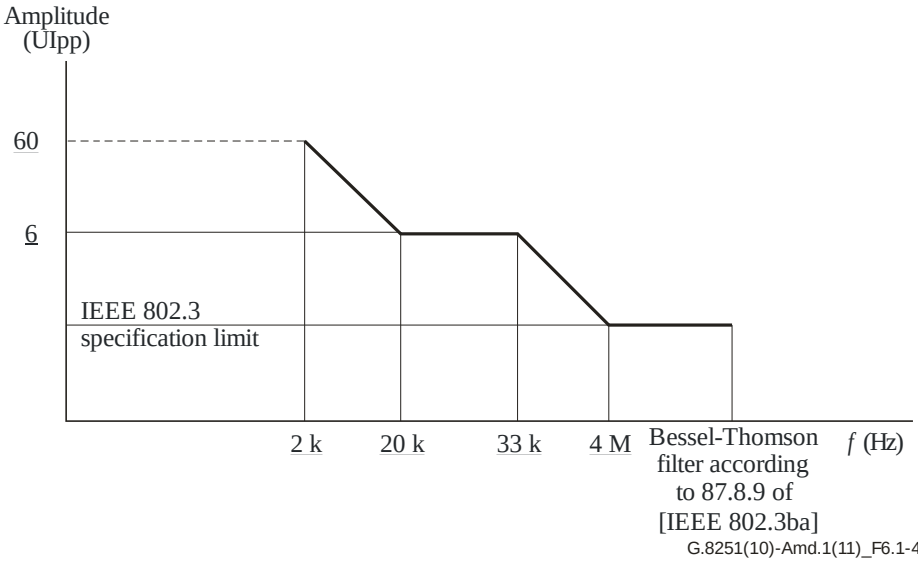

Figure 6.1-4 – OTL3.4 per lane input sinusoidal jitter tolerance limit

2.3) Clause 6.1.4, OTU4 jitter and wander tolerance

In Table 6.1-5 and Figure 6.1-5, modify the entries for the multilane interface as shown below:

Table 6.1-5 – OTL4.4 per lane input sinusoidal jitter tolerance limit

Frequency *f* (Hz)	**Peak-to-peak amplitude (UIpp)**
~~FFS~~20 k < *f* ≤ 50 k	~~FFS~~$3 \times 10^5 f^{-1}$
~~FFS~~50 k < *f* ≤ 83 k	~~FFS~~6.0
~~10 M~~83 k < *f* ≤ measured up to fourth-order Bessel-Thomson filter defined in clause 88.8.8 of [IEEE 802.3ba]	Each lane according to clause 88.7.2, Table 88-8 and clause 88.8.10 of [IEEE 802.3ba]

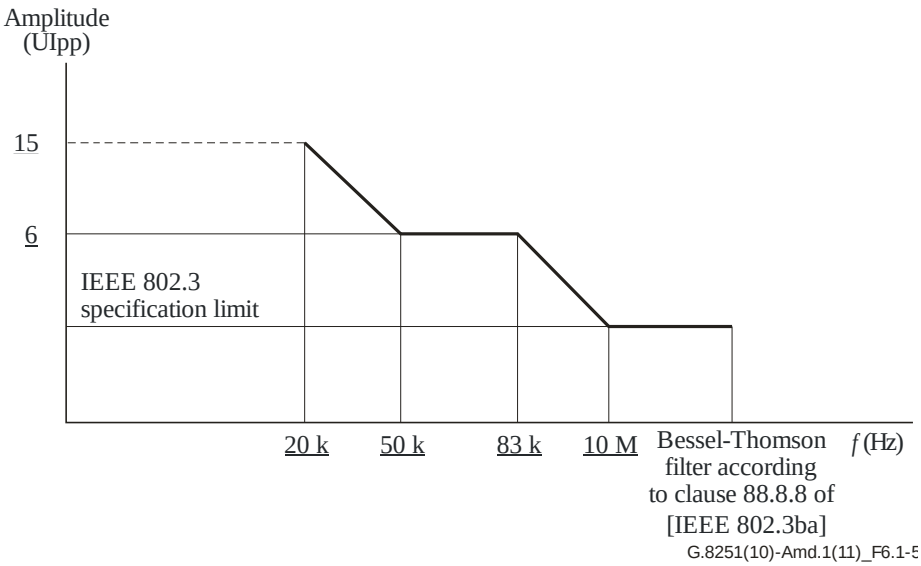

Figure 6.1-5 – OTL4.4 per lane input sinusoidal jitter tolerance limit

2.4) Annex A clause A.5.1.1, ODCa, ODCb, and ODCr jitter generation

In Table A.5-1, modify the entries as shown below:

Table A.5-1 – ODCa, ODCb, and ODCr jitter generation requirements

Interface	**Measurement bandwidth, –3 dB frequencies (Hz)**	**Peak-to-peak amplitude (UIpp) (Note 2)**
ODU0	2.5 k to 10 M	0.3
	0.5 M to 10 M	0.1
ODU1, OTU1	5 k to 20 M	0.3
	1 M to 20 M	0.1
ODU2, OTU2	20 k to 80 M	0.3
	4 M to 80 M	0.1
ODU2e	20 k to 80 M	0.3
	4 M to 80 M	0.1

Table A.5-1 – ODCa, ODCb, and ODCr jitter generation requirements

Interface	Measurement bandwidth, –3 dB frequencies (Hz)	Peak-to-peak amplitude (UIpp) (Note 2)
ODU3, OTU3	20 k to 320 M	1.2 (Note 1)
	16 M to 320 M	0.14
OTL3.4	~~FFS~~20 k to 80 M	~~FFS~~1.2 (Note 1)
	4 M measured up to fourth-order Bessel-Thomson filter defined in clause 87.8.9 of [IEEE 802.3ba]	Each lane as defined in clause 87.7.1, Table 87-7, and clause 87.8.9 of [IEEE 802.3ba]
OTL4.4	~~FFS~~50 k to 200 M	~~FFS~~1.2 (Note 1)
	10 M to fourth-order Bessel-Thomson filter defined in clause 88.8.8 of [IEEE 802.3ba]	Each lane as defined in clause 88.7.1, Table 88-7, and clause 88.8.8 of [IEEE 802.3ba]
ODUflex	FFS	FFS

NOTE 1 – See clause IV.4 for additional information.

NOTE 2 – ODU0 1 UI = $\frac{1}{1.24416}\,\text{ns} = 803.8\,\text{ps}$

ODU1 1 UI = $\frac{238}{(239)(2.48832)}\,\text{ns} = 400.2\,\text{ps}$

ODU2 1 UI = $\frac{237}{(239)(9.95328)}\,\text{ns} = 99.63\,\text{ps}$

ODU3 1 UI = $\frac{236}{(239)(39.81312)}\,\text{ns} = 24.80\,\text{ps}$

OTU1 1 UI = $\frac{238}{(255)(2.48832)}\,\text{ns} = 375.1\,\text{ps}$

OTU2 1 UI = $\frac{237}{(255)(9.95328)}\,\text{ns} = 93.38\,\text{ps}$

OTU3 1 UI = $\frac{236}{(255)(39.81312)}\,\text{ns} = 23.25\,\text{ps}$

OTL3.4 1 UI = $\frac{4 \times 236}{(255)(39.81312)}\,\text{ns} = 92.98\,\text{ps}$ per lane

OTL4.4 1 UI = $\frac{4 \times 227}{(255)(99.5328)}\,\text{ns} = 35.77$ ps per lane

2.5) Annex A clause A.5.1.2, ODCp jitter generation

In Table A.5-2, modify the entries as shown below:

Table A.5-2 – ODCp jitter generation requirements

Interface	Measurement bandwidth, –3 dB frequencies (Hz)	Peak-to-peak amplitude (UIpp) (Note 3)
CBR0G155	0.5 k to 1.3 M	1.0
	65 k to 1.3 M	0.1
CBR0G622	1 k to 5 M	1.0
	250 k to 5 M	0.1
1GE	2.52 k to 10 M	1.0
	0.673 M to f_4 (Note 1)	TP2, according to clause 38.5, Table 38-10 of [IEEE 802.3]
ODU0	2.5 k to 10 M	1.0
	0.673 M to 10 M	0.1
CBR2G5, ODU1	5 k to 20 M	1.0
	1 M to 20 M	0.1
CBR10G, ODU2	20 k to 80 M	1.0
	4 M to 80 M	0.1
10GE, ODU2e	20 k to 80 M	1.0
	4 M to f_4 (Note 2)	Transmit eye mask, defined in clause 52.7.1, Table 52-16 of [IEEE 802.3]
CBR40G, ODU3	80 k to 320 M	1.0
	16 M to 320 M	0.14
40GE, ODU3 Multilane	~~FFS~~20 k to 80 M	~~FFS~~1.0
	4 M measured up to fourth-order Bessel-Thomson filter defined in clause 87.8.9 of [IEEE 802.3ba]	Each lane as defined in clause 87.7.1, Table 87-7, and clause 87.8.9 of [IEEE 802.3ba]
100GE	~~FFS~~50 k to 200 M	~~FFS~~1.0
	10 M to fourth-order Bessel-Thomson filter defined in clause 88.8.8 of [IEEE 802.3ba]	Each lane as defined in clause 88.7.1, Table 88-7, and clause 88.8.8 of [IEEE 802.3ba]
ODUflex and its CBRx clients	FFS	FFS

Table A.5-2 – ODCp jitter generation requirements

Interface	Measurement bandwidth, –3 dB frequencies (Hz)	Peak-to-peak amplitude (UIpp) (Note 3)
NOTE 1 – f_4 = bandwidth of fourth-order Bessel-Thomson filter defined in clause 38.6.5 of [IEEE 802.3]. NOTE 2 – f_4 = bandwidth of fourth-order Bessel-Thomson filter defined in clause 52.9.7 of [IEEE 802.3]. NOTE 3 – 1GE 1 UI = $\frac{1}{1.25}$ [ns] = 800 ps CBR2G5 1 UI = $\frac{1}{2.48832}$ [ns] = 401.9 ps CBR10G 1 UI = $\frac{1}{9.95328}$ [ns] = 100.5 ps CBR40G 1 UI = $\frac{1}{39.81312}$ [ns] = 25.12 ps ODU0 $1\,\mathrm{UI} = \frac{1}{1.24416}[\mathrm{ns}] = 803.8\,\mathrm{ps}$ ODU1 1 UI = $\frac{238}{(239)(2.48832)}$ [ns] = 400.2 ps ODU2 1 UI = $\frac{237}{(239)(9.95328)}$ [ns] = 99.63 ps ODU2e 1 UI = $\frac{237}{(239)(10.31250)}$ [ns] = 97.78 ps ODU3 1 UI = $\frac{236}{(239)(39.81312)}$ [ns] = 25.43 ps ODU3 (Multilane) 1 UI = $\frac{236 \times 4}{(239)(39.81312)}$ [ns] = 99.21 ps ODU4 (Multilane) 1 UI = $\frac{227 \times 4}{(239)(99.53280)}$ [ns] = 38.17 ps		

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