INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

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STANDARDIZATION SECTOR
OF ITU

G.992.2

Amendment 2
(10/2003)

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Digital sections and digital line system – Access networks

Splitterless asymmetric digital subscriber line (ADSL) transceivers

Amendment 2: New Appendix IV – Example overlapped PSD masks for use in a TCM-ISDN crosstalk environment

ITU-T Recommendation G.992.2 (1999) – Amendment 2

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ITU-T Recommendation G.992.2

Splitterless asymmetric digital subscriber line (ADSL) transceivers

Amendment 2

New Appendix IV

Example overlapped PSD masks for use in a TCM-ISDN crosstalk environment

Summary

This amendment contains Appendix IV, titled "Example overlapped PSD masks for use in a TCM-ISDN crosstalk environment" to ITU-T Rec. G.992.2, giving an example of overlapped PSD masks for use in a TCM-ISDN crosstalk environment.

Source

Amendment 2 to ITU-T Recommendation G.992.2 (1999) was agreed by ITU-T Study Group 15 (2001-2004) on 31 October 2003.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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As of the date of approval of this Recommendation, ITU had received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

ITU-T Recommendation G.992.2

Splitterless asymmetric digital subscriber line (ADSL) transceivers

Amendment 2

New Appendix IV

Example overlapped PSD masks for use in a TCM-ISDN crosstalk environment

This appendix defines example-shaped overlapped downstream PSD masks for use in a TCM-ISDN crosstalk environment. These masks may be used with Annex C modes of operation that use overlapped PSDs.

IV.1 Example downstream PSD masks for use with Profiles 5 and 6

In this clause, two example downstream PSD masks are described. They may be used for downstream dual bitmap modes with overlapped spectrum. In general, using overlapped spectrum downstream may result in NEXT to the upstream channel. To meet spectrum compatibility requirements, the frequency components overlapping the upstream channel are shaped to reduce the crosstalk. The first example is a spectrally shaped mask used during the NEXT phase of the TTR clock. The second PSD mask has an alternative spectral shaping and is designed for use during the FEXT phase of the TTR clock.

IV.1.1 Downstream shaped overlapped PSD mask for use during NEXT periods

The shaped overlapped spectral mask for use during NEXT periods of the TTR clock is defined in Table IV.1 and shown plotted in Figure IV.1. Spectral shaping is provided in the frequency band overlapping the ADSL upstream channel. Adherence to this mask will result in spectral compatibility with other systems deployed in an access network in a TCM-ISDN crosstalk environment.

Note that the definitions given in Table IV.1 and Figure IV.1 are those of a PSD mask. The corresponding PSD template is 3.5 dB below the mask at all frequencies.

Table IV.1/G.992.2 – Tabulation of a shaped overlapped downstream PSD mask for use during NEXT periods of the TTR clock

Frequency f (kHz)	PSD (dBm/Hz) Peak values
$0 < f < 4$	–97.5, with +15 dBrn power in 0-4 kHz window
$4 < f < 32$	–94.5
$32 < f < 109$	$-94.5 + 20.65 \times \log_2 (f/32)$
$109 < f < 138$	$-58 + 58 \times \log_2 (f/109)$
$138 < f < 200$	$-38.3 + 3.36 \times \log_2 (f/138)$
$200 < f < 552$	–36.5
$552 < f < 956$	$-36.5 - 36 \times \log_2 (f/552)$
$956 < f < 1800$	–65
$1800 < f < 2290$	$-65 - 72 \times \log_2 (f/1800)$
$2290 < f < 3093$	–90
$3093 < f < 4545$	–90, peak with max power in the $[f, f + 1$ MHz] window of $(-36.5 - 36 \times \log_2 (f/1104) + 60)$ dBm
$4545 < f < 11040$	–90 peak, with max power in the $[f, f + 1$ MHz] window of –50 dBm

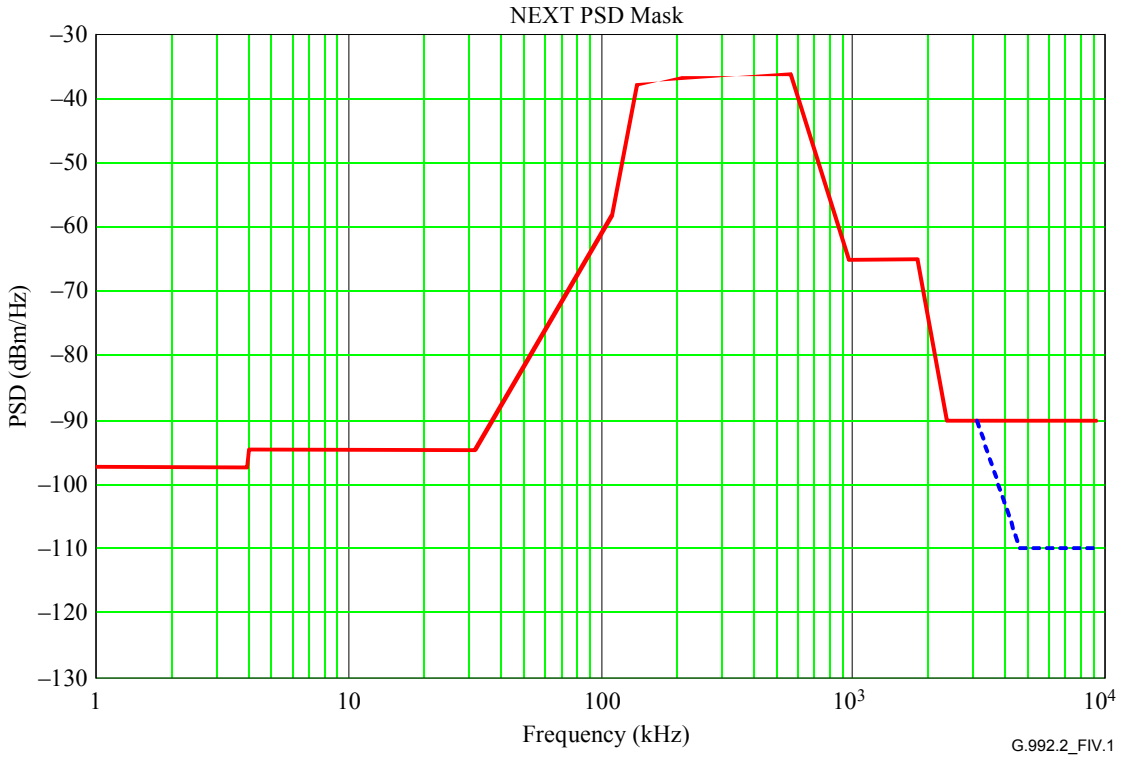

Figure IV.1/G.992.2 – A shaped overlapped downstream PSD mask for use during NEXT periods of the TTR clock

IV.1.2 Downstream shaped overlapped PSD mask for use during FEXT periods

The shaped overlapped spectral mask for use during FEXT periods of the TTR clock is defined in Table IV.2 and shown plotted in Figure IV.2. Spectral shaping is provided in the frequency band overlapping the ADSL upstream channel. Adherence to this mask will result in spectral compatibility with other systems deployed in an access network in a TCM-ISDN crosstalk environment.

Note that the definitions given in Table IV.2 and Figure IV.2 are those of a PSD mask. The corresponding PSD template is 3.5 dB below the mask at all frequencies.

Table IV.2/G.992.2 – Tabulation of a shaped overlapped downstream PSD mask for use during FEXT periods of the TTR clock

Frequency f (kHz)	PSD (dBm/Hz) Peak values
$0 < f < 4$	–97.5, with +15 dBrn power in 0-4 kHz window
$4 < f < 4.8$	–94.5
$4.8 < f < 50$	$-94.5 + 11.0 \times \log_2 (f/4.8)$
$50 < f < 126$	$-57.5 + 15.7 \times \log_2 (f/50)$
$126 < f < 552$	–36.5
$552 < f < 956$	$-36.5 - 36 \times \log_2 (f/552)$
$956 < f < 1800$	–65
$1800 < f < 2290$	$-65 - 72 \times \log_2 (f/1800)$
$2290 < f < 3093$	–90
$3093 < f < 4545$	–90 peak, with max power in the $[f, f + 1$ MHz] window of $(-36.5 - 36 \times \log_2 (f/1104) + 60)$ dBm
$4545 < f < 11040$	–90 peak, with max power in the $[f, f + 1$ MHz] window of –50 dBm

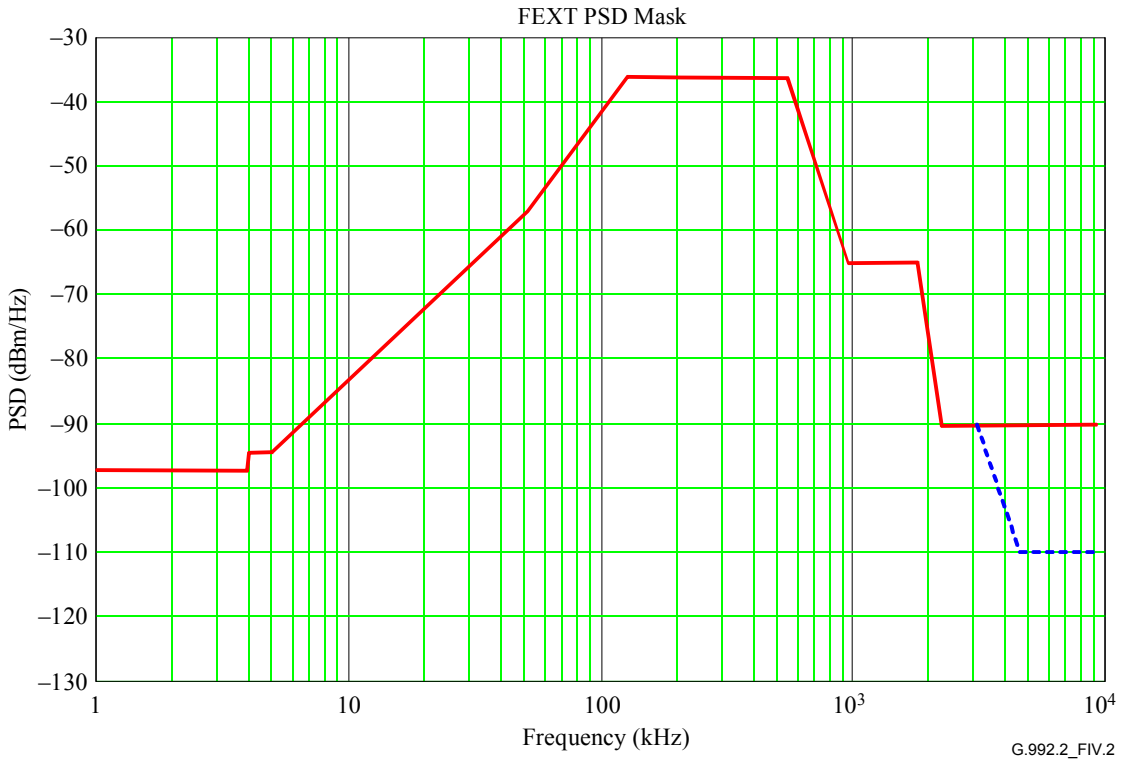

Figure IV.2/G.992.2 – A shaped overlapped downstream PSD mask for use during FEXT periods of the TTR clock

IV.2 Example downstream PSD mask for use with Profile 3

An example shaped overlapped spectral mask for use with Profile 3 is defined in Table IV.3 and shown in Figure IV.3. Spectral shaping is provided in the frequency band overlapping the ADSL upstream channel. Adherence to this mask will result in spectral compatibility with other systems deployed in an access network in a TCM-ISDN crosstalk environment.

Note that the definitions given in Table IV.3 and Figure IV.3 are those of a PSD mask. The corresponding PSD template is 3.5 dB below the mask at all frequencies.

Table IV.3/G.992.2 – Tabulation of a shaped downstream PSD mask for Profile 3

Frequency f (kHz)	PSD (dBm/Hz) Peak values
$0 < f < 4$	–97.5, with +15 dBrn power in 0-4 kHz window
$4 < f < 5$	$-92.5 + 18.64 \times \log_2 (f/4)$
$5 < f < 5.25$	–86.5
$5.25 < f < 16$	$-86.5 + 15.25 \times \log_2 (f/5.25)$
$16 < f < 32$	$-62 + 25.5 \times \log_2 (f/16)$
$32 < f < 552$	–36.5
$552 < f < 956$	$-36.5 - 36 \times \log_2 (f/552)$
$956 < f < 1800$	–65
$1800 < f < 2290$	$-65 - 72 \times \log_2 (f/1800)$
$2290 < f < 3093$	–90
$3093 < f < 4545$	–90 peak, with max power in the $[f, f + 1$ MHz] window of $(-36.5 - 36 \times \log_2 (f/1104) + 60)$ dBm
$4545 < f < 11040$	–90 peak, with max power in the $[f, f + 1$ MHz] window of –50 dBm

G.992.2_FIV.3

Figure IV.3/G.992.2 – A shaped downstream PSD mask for Profile 3

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