

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

G.992.3

Amendment 2

(03/2006)

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

Digital sections and digital line system – Access networks

Asymmetric digital subscriber line transceivers 2
(ADSL2)

Amendment 2

ITU-T Recommendation G.992.3 (2005) – Amendment 2

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ITU-T Recommendation G.992.3

Asymmetric digital subscriber line transceivers 2 (ADSL2)

Amendment 2

Summary

This amendment to ITU-T Rec. G.992.3 updates the electrical characteristics of ADSL2 transceivers and also corrects some inaccuracies and inconsistencies.

Source

Amendment 2 to ITU-T Recommendation G.992.3 (2005) was approved on 29 March 2006 by ITU-T Study Group 15 (2005-2008) under the ITU-T Recommendation A.8 procedure.

FOREWORD

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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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ITU-T Recommendation G.992.3

Asymmetric digital subscriber line transceivers 2 (ADSL2)

Amendment 2

1) Clause 8.5.3.3 During the exchange phase

In 8.12.3.6 the SNRM test parameter format definition is 10-bit 2's complement signed integer while in PARAMS message structures in 8.5.3.3 (Tables 8-15 and 8-16) the parameter is 11 bits.

Correct Tables 8-15 and 8-16 as follows:

C-PARAMS message:

4	SNRM _{us} (LSB)	[xxxx xxxx], bit 7 to 0
5	SNRM _{us} (MSB)	[ssss ss xxx], bit 940 to 8

R-PARAMS message:

4	SNRM _{ds} (LSB)	[xxxx xxxx], bit 7 to 0
5	SNRM _{ds} (MSB)	[ssss ss xxx], bit 940 to 8

2) Clause 8.6.1 Tone ordering

Replace the pseudo-code (21 lines in Courier font) with the following:

```
/** CONSTRUCT THE TONE REORDERING TABLE */
/*
Tone ordering table is denoted as array 't' and tone reordering table
is denoted as array 'tp'. The indices to these tones are denoted as
't_index' and 'tp_index', respectively.
*/
/*
Fill out tone reordering table with entries of tone ordering table
but skip 1-bit tones.
*/
tp_index = 1;
for (t_index = 1; t_index < NSC; t_index++) {
    tone = t[t_index];
    bits = b[tone];
    if (bits != 1) {
        tp[tp_index++] = tone;
    }
}
/*
Add the 1-bit tones to the end of tone reordering table.
*/
for (t_index = 1; t_index < NSC; t_index++) {
    tone = t[t_index];
    bits = b[tone];
    if (bits == 1) {
        tp[tp_index++] = tone;
    }
}
```

```

/* RE-ORDERING THE BIT ARRAY */
/*
The bit table is denoted as array 'b' and the ordered bit table is
denoted as array 'bp'.
The indexes to these arrays are denoted as 'b_index' and 'bp_index',
respectively.
*/
/* First, count the number of loaded tones and also 1-bit tones. */
NCONEBIT = 0; /* NCONEBIT is the number of sub-carriers with 1 bit */
NCUSED = 0; /* NCUSED is the number of loaded sub-carriers */
for (i = 1; i < NSC; i++) {
    if (b[i] > 0) {
        NCUSED++;
    }
    if (b[i] == 1) {
        NCONEBIT++;
    }
}
/* Fill initial zero entries for unloaded tones and half the number of 1-bit
tones */
for (bp_index = 1; bp_index < (NSC - (NCUSED - NCONEBIT/2));
    bp_index++) {
    bp[bp_index] = 0;
}
for (tp_index = 1; tp_index < NSC; tp_index++) {
    tone = tp[tp_index];
    bits = b[tone];
    if (bits == 0) {
        /* skip unloaded tones */
    }
    if (bits == 1) {
        /* pair 2 consecutive 1-bit tones and add a
        single entry with 2 bits */
        bp[bp_index++] = 2;
        tp_index++;
    }
    if (bits > 1) {
        bp[bp_index++] = bits;
    }
}
}

```

3) Clause 8.13.2.4 – Figure 8-25a Flowchart for implementation of tss_i values

Add the following Note inbetween the flowchart and the Figure title, as part of the Figure:

NOTE – For the operating modes according to Annexes J and M, if the G.994.1 MS message has the Npar(2) PSD_Shape_support bit set to 1, then the downstream tss_i value restrictions shown in this figure shall also apply to the upstream tss_i values. The upstream tss_i value restrictions shown in this figure shall not apply.

4) Electrical characteristics

Change A.4.3.2.1 as shown below and add new B.4.1.2.2:

A.4.3.2.1 Input impedance

The imaginary part of the ATU-x input impedance, as measured at the U-x interface, at over the 0-4-kHz frequency range, shall be in the range of 1.1-2.0 k Ω (approximately equivalent to a 20-34-nF capacitor (approximately 1.1-2.0 k Ω at 4 kHz) for the ATU-R (or and the ATU-C that has an integrated splitter and high-pass function (e.g., integrated 120 nF DC blocking capacitors) and in the range of 500 Ω to 1.0 k Ω (approximately shall be equivalent to 40-6830-78 nF (approximately 0.5-1.4 k Ω at 4 kHz) for the ATU-C designed to be used with an external splitter high-pass function

(e.g., external 120 nF DC blocking capacitors). In both cases, the imaginary part of the impedance shall increase monotonically below 4 kHz.

Refer to Annex E for additional information.

NOTE – Depending on vendor discretionary performance related tradeoffs, the actual transceiver input capacitance may be any value in this range.

B.4.1.2.2 Input impedance

The imaginary part of the ATU-x input impedance, as measured at the U-x interface, over the 0-30 kHz frequency range, shall be equivalent to a 6-11 nF capacitor (approximately 480-880 Ω at 30 kHz) for the ATU-R and the ATU-C that has an integrated splitter high-pass function (e.g., integrated 27 nF DC blocking capacitors) shall be equivalent to 10.8-59 nF (approximately 90-490 Ω at 30 kHz) for the ATU-C designed to be used with an external splitter high-pass function (e.g., external 27 nF DC blocking capacitors).

NOTE – Depending on vendor discretionary performance related tradeoffs, the actual transceiver input capacitance may be any value in this range.

The input capacitance range defined for ADSL over ISDN transceivers, shall also apply for ADSL transceivers with PSD starting around 138 kHz (which can have either ISDN or POTS as underlying service, and is referred to as the “universal” ADSL transceiver).

5) Clause K.3.5 PTM-TC transport capabilities

Replace the first paragraph with the following text:

The transport capabilities of the PTM-TC function are described in H.2/G.993.1 [13]. Only the mandatory capabilities that support a single PTM-TC shall be used with this Recommendation.

The net data rate for each PTM-TC function in both upstream and downstream directions may be set independently of each other, and to any eligible value that is less than or equal to the assigned maximum net data rate in the corresponding direction. The maximum net data rate for each PTM-TC function in both upstream and downstream directions is set during the system configuration.

A PTM-TC function may be mapped to either enabled bearer channel, which in turn may or may not be interleaved.

The PTM-TC shall provide full transparent data transfer between γ_O and γ_R interfaces (except non-correctable errors in the PMD sub-layer due to the noise in the loop). The PTM-TC shall provide packet integrity over the bearer channel that it is mapped to.

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