Agenda Item: 8.2

Source: Ericsson

Title: Measurement channels for the downlink

Document for: Discussion and Approval

1.   Introduction

In accordance with the harmonisation, the measurement channel used for the downlink performance specifications must be updated with the new slot format.

This document provides measurement channels for the downlink[1]: an updated 12.2 kbps channel and additional 64, 144 and 384 kbps measurement channels. These measurement channels are required to perform link level simulations.

2.   Proposal for specification

The measurement channels are based on the measurement channel currently defined for the 4.096Mcps chip rate in [1]. All these channels use 20ms interleaving, a 8kbps control channel and rate 1/3 encoding. The rate matching is working with equal importance on the control channel and the data channel. The TFCI is also transmitted in the format.

References

[1]. 25.101 "UE Radio transmission and Reception (FDD), V2.1.0"

3.   Text Proposal

The following changes are proposed to TS 25.101:

A.2.2   DL reference measurement channels for 12.2 kbps

The parameters for the DL reference measurement channel for 12.2 kbpsare specified in Table A2 and the channel coding is detailed in figure A2

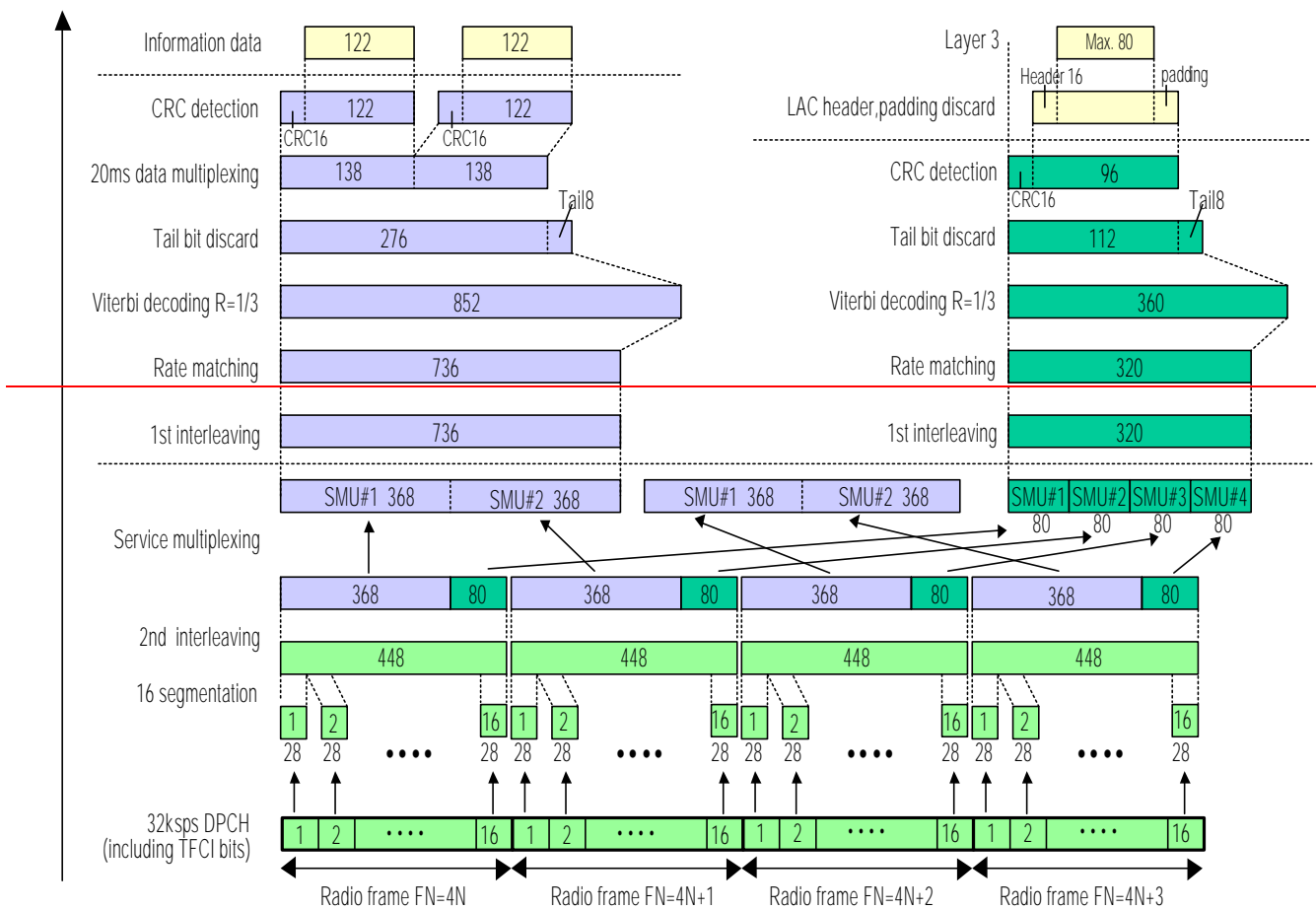**Table A2: DL reference measurement channel**

Parameter	Level	Unit
Information bit rate	12.2	Kbps
DPCH	30~~2~~	Ksps
Power control	Off	
TFCI	On	
Puncturing	14.5	%

Downlink

DTCH

Information data	122	122
CRC detection	CRC16 122	CRC16 122
20ms data multiplexing	138	138
Tail bit discard	276	Tail8
Viterbi decoding R=1/3	852	
Rate matching	736	
1st interleaving	736	

Service multiplexing

SMU#1 368	SMU#2 368	SMU#1 368	SMU#2 368

| 368 | 80 | 368 | 80 | 368 | 80 | 368 | 80 |

2nd interleaving

| 448 | 448 | 448 | 448 |

16 segmentation

1 2 •••• 16 | 1 2 •••• 16 | 1 2 •••• 16 | 1 2 •••• 16
28 28 28 28 28 28 28 28 28 28 28 28

32ksps DPCH (including TFCI bits)

| 1 2 •••• 16 | 1 2 •••• 16 | 1 2 •••• 16 | 1 2 •••• 16 |

Radio frame FN=4N | Radio frame FN=4N+1 | Radio frame FN=4N+2 | Radio frame FN=4N+3

DCCH

Layer 3	Max. 80
	Header 16 padding
LAC header,padding discard	
CRC detection	CRC16 96 Tail8
Tail bit discard	112 Tail8
Viterbi decoding R=1/3	360
Rate matching	320
1st interleaving	320

SMU#1	SMU#2	SMU#3	SMU#4
80	80	80	80

Downlink

DTCH

Stage	Value
Information data	244
CRC detection	244
Tail bit discard	260
Viterbi decoding R=1/3	804
Rate matching	686
1st interleaving	686

CRC16 — Tail8

Radio Frame segmentation: #1 343 | #2 343 | #1 343 | #2 343

2nd interleaving: 343 | 77 | 343 | 77 | 343 | 77 | 343 | 77

slot segmentation: 420 | 420 | 420 | 420

1 2 •••• 15 / 28 28 ... 28

30ksps DPCH (including TFCI bits): 1 2 •••• 15 | 1 2 •••• 15 | 1 2 •••• 15 | 1 2 •••• 15

Radio frame FN=4N | Radio frame FN=4N+1 | Radio frame FN=4N+2 | Radio frame FN=4N+3

DCCH

Layer 3

Max. 80

Header 16 — padding

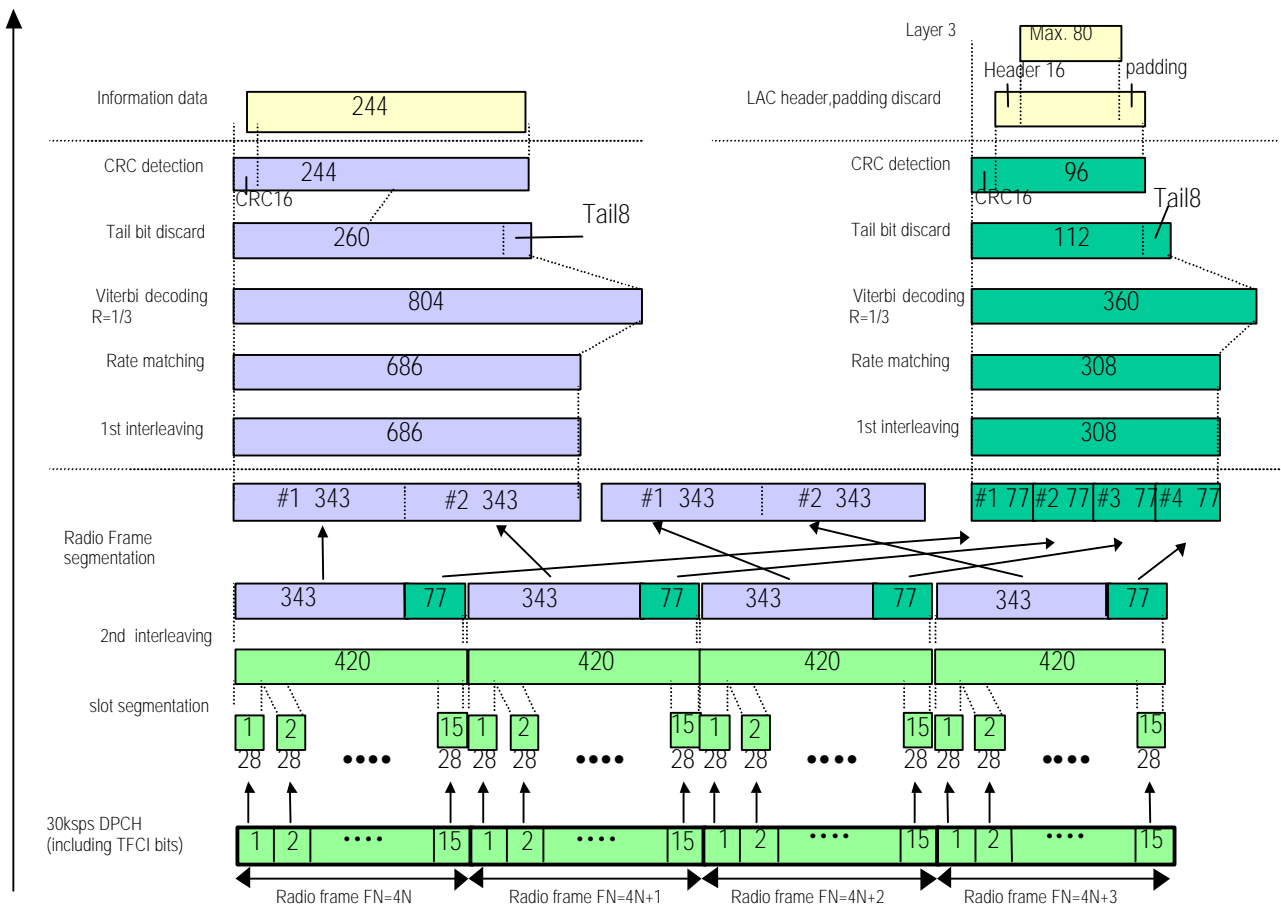| Stage	Value
LAC header, padding discard	
CRC detection	96
Tail bit discard	112
Viterbi decoding R=1/3	360
Rate matching	308
1st interleaving	308

CRC16 — Tail8

#1 77 #2 77 #3 77 #4 77

A.2.3 DL reference measurement channel for 64 kbps

The parameters for the DL reference measurement channel for 64 kbpsare specified in Table A3 and the channel coding is detailed in figure A3
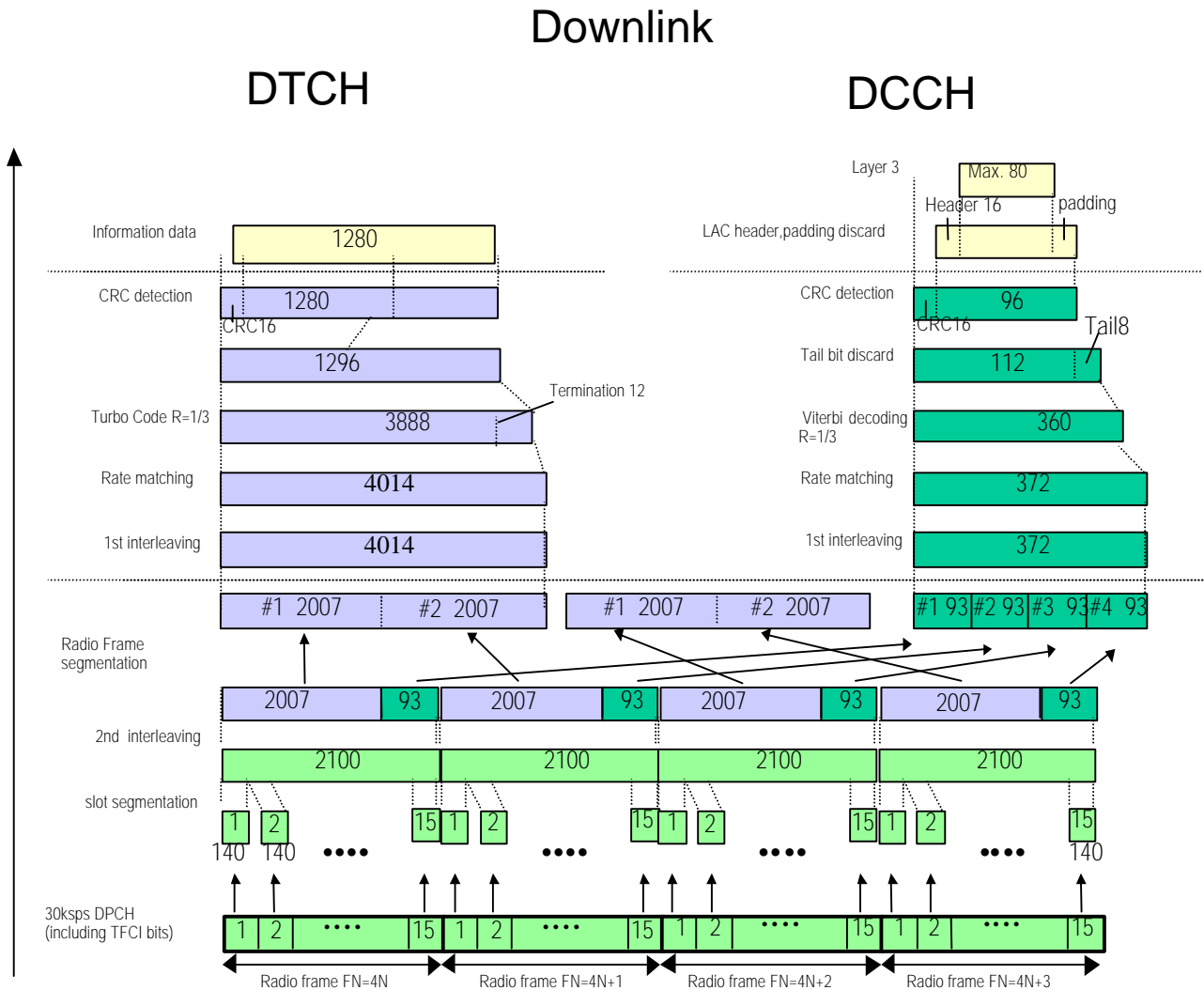
Downlink

DTCH

DCCH

Information data	1280
CRC detection	1280 CRC16
	1296
Turbo Code R=1/3	3888 Termination 12
Rate matching	4014
1st interleaving	4014
Radio Frame segmentation	#1 2007 #2 2007
2nd interleaving	2007 93 2007 93 2007 93 2007 93
	2100 2100 2100 2100
slot segmentation	1 2 15 1 2 15 1 2 15 1 2 15
	140 140 140
30ksps DPCH (including TFCI bits)	1 2 •••• 15 1 2 •••• 15 1 2 •••• 15 1 2 •••• 15

DCCH:
Layer 3	Max. 80
LAC header,padding discard	Header 16 padding
CRC detection	96 CRC16 Tail8
Tail bit discard	112
Viterbi decoding R=1/3	360
Rate matching	372
1st interleaving	372
	#1 93 #2 93 #3 93 #4 93

Radio frame FN=4N   Radio frame FN=4N+1   Radio frame FN=4N+2   Radio frame FN=4N+3

Table A3: DL reference measurement channel (64kbps)

Parameter	Level	Unit
Information bit rate	64	Kbps
DPCH	120	Ksps
Power control	Off	
TFCI	On	
Repetition	2.9	%

The parameters for the DL reference measurement channel for 144 kbps are specified in Table A4 and the channel coding is detailed in figure A4

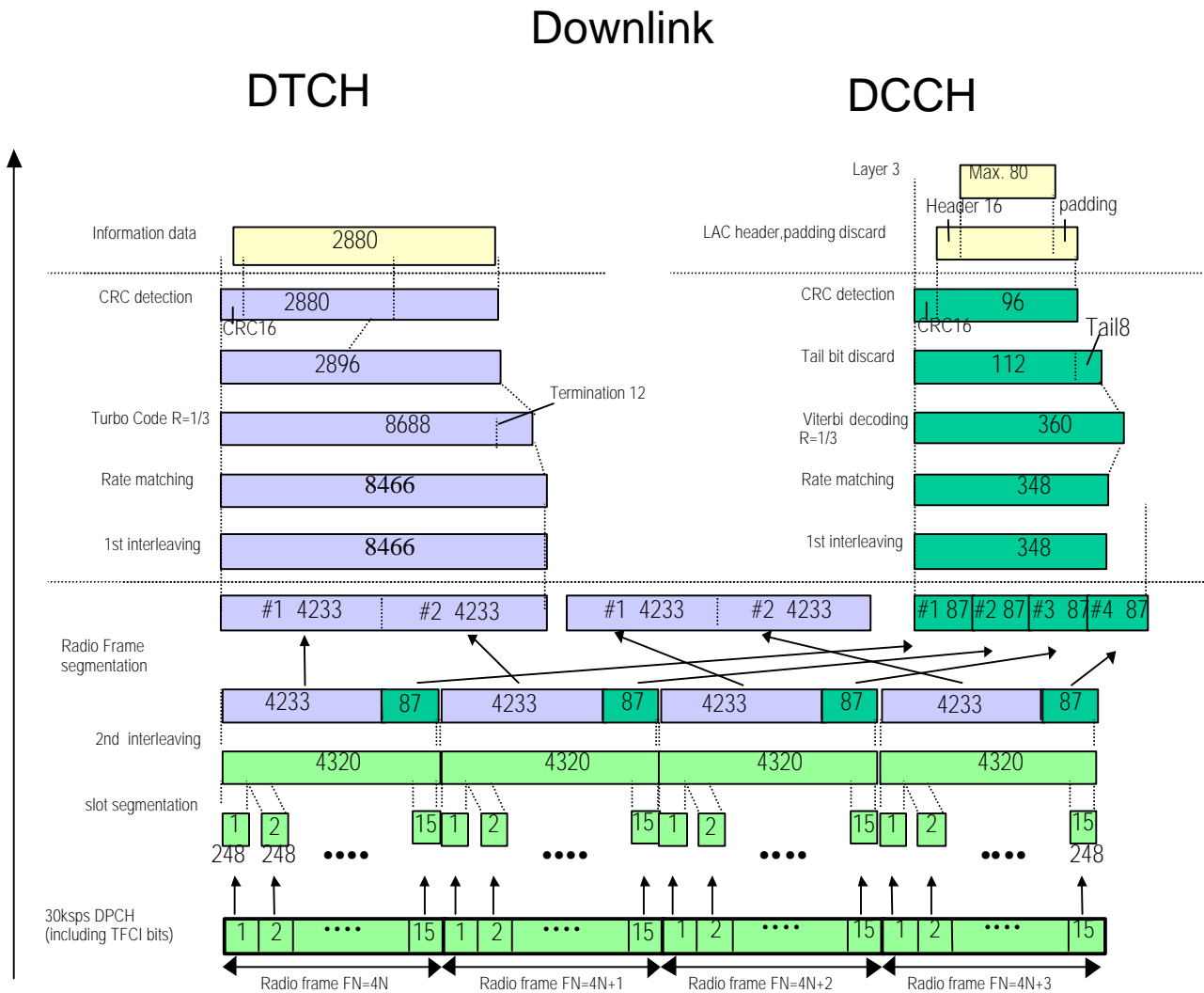## Downlink

DTCH   DCCH

	Information data	2880			Layer 3	Max. 80

				Header 16	padding

LAC header,padding discard		

CRC detection — 2880 — CRC16

CRC detection — 96 — CRC16 — Tail8

2896

Tail bit discard — 112

Turbo Code R=1/3 — 8688 — Termination 12

Viterbi decoding R=1/3 — 360

Rate matching — 8466

Rate matching — 348

1st interleaving — 8466

1st interleaving — 348

Radio Frame segmentation: #1 4233 | #2 4233 | #1 4233 | #2 4233 | #1 87 #2 87 #3 87 #4 87

2nd interleaving: 4233 | 87 | 4233 | 87 | 4233 | 87 | 4233 | 87

4320 | 4320 | 4320 | 4320

slot segmentation: 1 2 ... 15 | 1 2 ... 15 | 1 2 ... 15 | 1 2 ... 15
248 248 ... 248

30ksps DPCH (including TFCI bits): 1 2 ···· 15 | 1 2 ···· 15 | 1 2 ···· 15 | 1 2 ···· 15

Radio frame FN=4N | Radio frame FN=4N+1 | Radio frame FN=4N+2 | Radio frame FN=4N+3

Table A4: DL reference measurement channel (144kbps)

Parameter	Level	Unit
Information bit rate	144	Kbps
DPCH	240	Ksps
Power control	Off	
TFCI	On	
Puncturing	2.7	%

A.2.5   DL reference measurement channel for 384 kbps

The parameters for the DL reference measurement channel for 384 kbpsare specified in Table A5 and the channel coding is detailed in figure A5
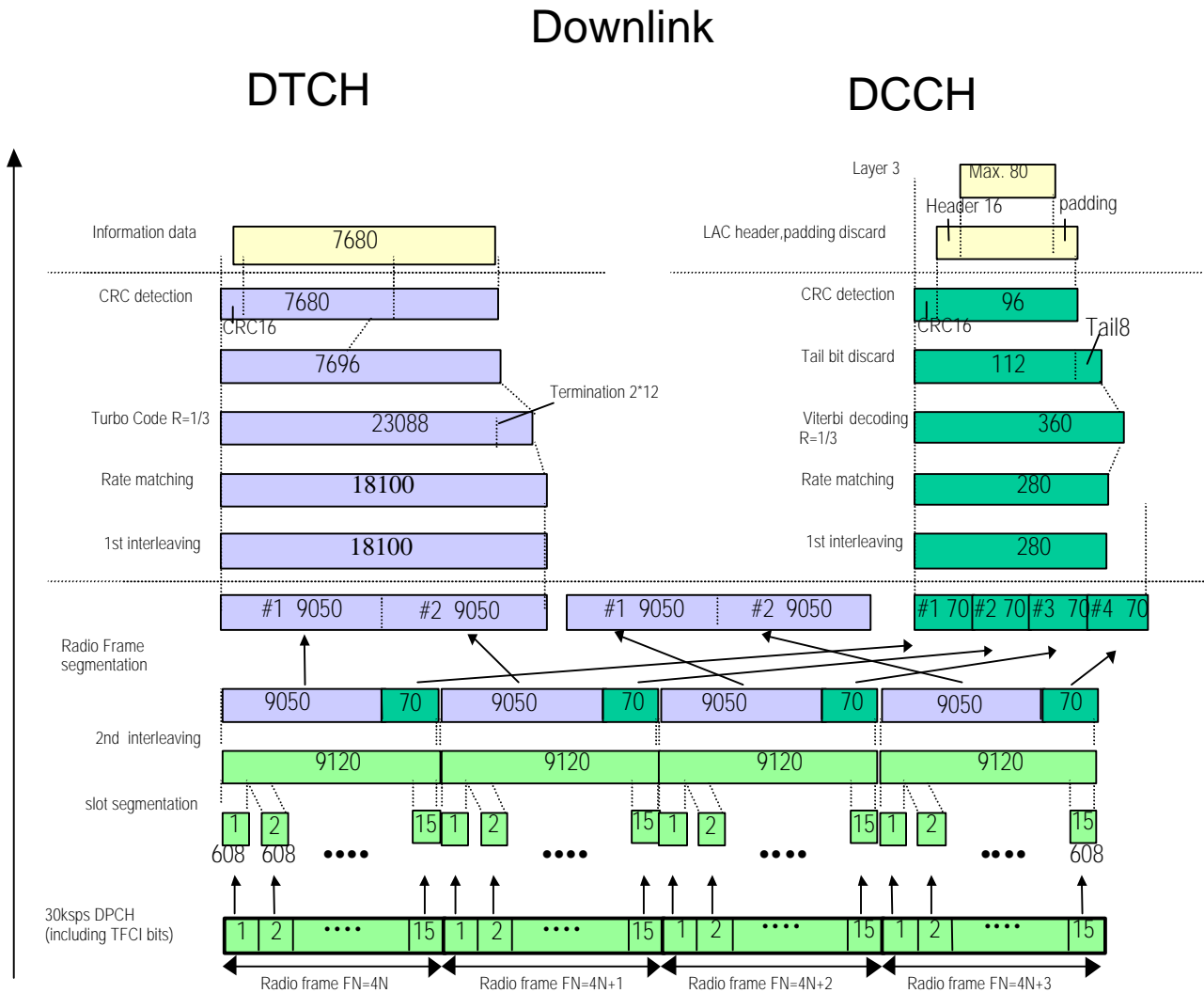
Downlink

DTCH   DCCH

Table A5: DL reference measurement channel (384kbps)

Parameter	Level	Unit
Information bit rate	384	Kbps
DPCH	480	Ksps
Power control	Off	
TFCI	On	
Puncturing	22	%