Technical Note

WCDMA/HSPA Scenario Version (3)

MD8480C
W-CDMA Signalling Tester

Details of HSDPA C–Scenario

How to Use Scenario Library and Structure for HSDPA

Version 1.0
Anritsu Corporation

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Radio Bearer for HSDPA Configuration

```
/* Origination arrow diagram in this Scenario     */
/*  MS                                    MD8480  */
/*   |----- RRC Connection Request          --->|  */
/*   |           (TR-Mode PRACH-RACH-CCCH)      |  */
/*   |<---- RRC Connection Setup           -----|  */
/*   |           (UM-Mode S-CCPCH-FACH-CCCH)    |  */
/*   |----- RRC Connection Setup Complete  ---->|  */
/*   |           (AM-Mode DPCH-DCH-DCCH)        |  */
/*   |----- MM CM Service Request          ---->|  */
/*   |           (AM-Mode DPCH-DCH-DCCH)        |  */
/*   |<---- GMM AuthenticAndCiphering Req. -----|  */
/*   |           (AM-Mode DPCH-DCH-DCCH)        |  */
/*   |----- GMM AuthenticAndCiphering Resp.---->|  */
/*   |           (AM-Mode DPCH-DCH-DCCH)        |  */
/*   |<---- Security Mode Command          -----|  */
/*   |           (AM-Mode DPCH-DCH-DCCH)        |  */
/*   |----- Security Mode Complete         ---->|  */
/*   |           (AM-Mode DPCH-DCH-DCCH)        |  */
/*   |---- SM Activate PDP Context Request  --->|  */
/*   |           (AM-Mode DPCH-DCH-DCCH)        |  */
/*   |<---- Radio Bearer Setup             -----|  */
/*   |           (AM-Mode DPCH-DCH-DCCH)        |  */
/* ===== HS & Associated DPCH  Configuration ==== */
/*   |----- Radio Bearer Setup Complete    ---->|  */
/*   |           (AM-Mode DPCH-DCH-DCCH)        |  */
/*   |<--- SM Activate PDP Context Accept   ----|  */
/*   |           (AM-Mode DPCH-DCH-DCCH)        |  */
```

```
INT CFN;    /* Cell Frame Number */
CFN = ((BtsReadCFN(UNIT_BTS1, NO_TIMEOUT) + 150) % 256) & (short)( ~(4–1) );

/* Send Message: Radio Bearer Setup */
UCHAR SndData[] = {/*This "Radio Bearer Setup" message should match to the HSDPA configuration
on the BTS*/}
RlcMUI = 1;
RlcCNF = 1;
SndMessageIntegrity( UNIT_BTS1, RLC_AM_DATA_REQ, D_DCCH, 1, SndData, 743 );
RlcCNF = 0;

CalcRMParameter( D_DPCH, &CphyRlSetup_D_DPCH_HSDPA, &CphyTrchConfig_D_DPCH_HSDPA );
CphyRlSetup( UNIT_BTS1, D_DPCH, 0, &CphyRlSetup_D_DPCH_HSDPA, CFN, … );
CphyTrchConfig(UNIT_BTS1, D_DPCH, 0, &CphyTrchConfig_D_DPCH_HSDPA, CFN, … );
CmacConfig( UNIT_BTS1, D_DPCH, 0, &CmacConfig_D_DPCH_HSDPA, CFN, … );

CalcRMParameter( U_DPCH,    &CphyRlSetup_U_DPCH_HSDPA, &CphyTrchConfig_U_DPCH_HSDPA );
CphyRlSetup( UNIT_BTS1, U_DPCH, 0, &CphyRlSetup_U_DPCH_HSDPA, CFN, … );
CphyTrchConfig(UNIT_BTS1, U_DPCH, 0, &CphyTrchConfig_U_DPCH_HSDPA, CFN, … );
CmacConfig( UNIT_BTS1, U_DPCH, 0, &CmacConfig_U_DPCH_HSDPA, CFN, … );

CrlcConfig( UNIT_BTS1, CRLC_AM_ESTABLISH, DTCH, 0, &Packet_CrlcConfig_DTCH, TE, … );

CphyHsSetup( UNIT_BTS1, D_HS_SCCH,  0, &CphyHsSetupHS_SCCH_C12,  CFN, …);
CphyHsSetup( UNIT_BTS1, D_HS_PDSCH, 0, &CphyHsSetupHS_PDSCH_C12, CFN, …);
CphyHsSetup( UNIT_BTS1, U_HS_DPCCH, 0, &CphyHsSetupHS_DPCCH_C12, CFN, …);
CmacHsConfig( UNIT_BTS1, HSDSCH,     0, &CmacHsConfigHS_DSCH_C12, CFN, …);

/* Receive Message: Radio Bearer Setup Complete */
ret = RcvMessageIntegrity( &BtsNo, &Frame, &Lo_Ch, &Lo_No, RcvData, … );
…if (GetMessageTypeMsgNo (U_DCCH, RcvData) == Dec2005R5_RadioBearerSetupComplete)…
```


Structure Setting for Associated DPCH

TS34.108 6.10.2.4.5.2 Interactive or background/UL: 384 DL: [max bit rate depending on UE category]/PS RAB + UL: 3.4 DL: 3.4 kbps SRBs for DCCH

For Uplink, refer to:
TS34.108 6.10.2.4.1.34 Interactive or Background/UL: 384 DL: 384 kbps/PS RAB + UL: 3.4 DL: 3.4 kbps SRBs for DCCH

Uplink DPCH–Layer 1
Uplink DPCH–MAC, RLC

For Downlink, refer to:
TS34.108 6.10.2.4.1.2 Stand-alone UL: 3.4 DL: 3.4 kbps SRBs for DCCH

Downlink DPCH–Layer 1
Downlink DPCH–MAC, RLC

Uplink DPCH–Layer 1 (TS34.108 6.10.2.4.1.34 Interactive or Background/UL: 384 DL: 384 kbps/PS RAB + UL: 3.4 DL: 3.4 kbps SRBs for DCCH)

DPCH Uplink	Min spreading factor	4
	Max number of DPDCH data bits/radio frame	9 600
	Number of DPDCH	1
	Puncturing Limit	0.64

TFCS size	18 (alt.12
TFCS	(384 kbps RAB, DCCH)= (TF0, TF0), (TF1, TF0), (TF2, TF0), (TF3, TF0), (TF4, TF0), (TF5, TF0), (TF6, TF0), (TF7, TF0), (TF8, TF0), (TF0, TF1), (TF1, TF1), (TF2, TF1), (TF3, TF1), (TF4, TF1), (TF5, TF1), (TF6, TF1), (TF7, TF1), (TF8, TF1) (alt. (TF0, TF0), (TF1, TF0), (TF2, TF0), (TF3, TF0), (TF4, TF0), (TF5, TF0) (TF0, TF1), (TF1, TF1), (TF2, TF1), (TF3, TF1), (TF4, TF1), (NC8, TF1))

Higher layer	RAB/signalling RB	SRB#1	SRB#2	SRB#3	SRB#4
	User of Radio Bearer	RRC	RRC	NAS_DT High prio	NAS_DT Low prio
RLC	Logical channel type	DCCH	DCCH	DCCH	DCCH
	RLC mode	UM	AM	AM	AM
	Payload sizes, bit	136	128	128	128
	Max data rate, bps	3 400	3 200	3 200	3 200
	AMD/UMD PDU header, bit	8	16	16	16
MAC	MAC header, bit	4	4	4	4
	MAC multiplexing	4 logical channel multiplexing			
Layer 1	TrCH type	DCH			
	TB sizes, bit	148 (alt 0, 148)			
	TFS TF0, bits	0x148 (alt 1x0)			
	TFS TF1, bits	1x148			
	TTI, ms	40			
	Coding type	CC 1/3			
	CRC, bit	16			
	Max number of bits/TTI before rate matching	516			
	Uplink: Max number of bits/radio frame before rate matching	129			
	RM attribute	155 to 185			

```
CphyRlSetupPar = &CphyRlSetup_U_DPCH_HSDPA;
memset( CphyRlSetupPar, 0, sizeof(CPHY_RL_SETUP_PAR) );
CphyRlSetupPar->OffSet          = 87047;
CphyRlSetupPar->ScrCode         = 0x01000000;
CphyRlSetupPar->SlotFormat      = SLOT_FORMAT_0;          /* for DPCCH */
CphyRlSetupPar->SymbolRate      = SYMRATE960K;            /* for DPDCH */
CphyRlSetupPar->ChCode          = 0;
CphyRlSetupPar->NumOfDPDCH      = 1;
CphyRlSetupPar->Dpdch[0].ChCode = 1;
CphyRlSetupPar->TxDiversity     = DIVERSITY_OFF;

CphyTrchConfigPar = &CphyTrchConfig_U_DPCH_HSDPA;
memset( CphyTrchConfigPar, 0, sizeof(CPHY_TRCH_CONFIG_PAR) );
CphyTrchConfigPar->DTXPosition;          // Don't care
CphyTrchConfigPar->InterLv2nd  = INTERLEAVE_ON;
CphyTrchConfigPar->PuncLimit   = 64;

CphyTrchConfigPar->TFCS.NumOfTFC  = 12;

CphyTrchConfigPar->TFCS.TFC[0][0] = 0;    /* DCH #0 */        /* TFCI = 0 */
CphyTrchConfigPar->TFCS.TFC[0][1] = 0;    /* DCH #1 */
CphyTrchConfigPar->TFCS.TFC[1][0] = 1;    /* DCH #0 */        /* TFCI = 1 */
CphyTrchConfigPar->TFCS.TFC[1][1] = 0;    /* DCH #1 */
CphyTrchConfigPar->TFCS.TFC[2][0] = 2;    /* DCH #0 */        /* TFCI = 2 */
CphyTrchConfigPar->TFCS.TFC[2][1] = 0;    /* DCH #1 */
CphyTrchConfigPar->TFCS.TFC[3][0] = 3;    /* DCH #0 */        /* TFCI = 3 */
CphyTrchConfigPar->TFCS.TFC[3][1] = 0;    /* DCH #1 */
CphyTrchConfigPar->TFCS.TFC[4][0] = 4;    /* DCH #0 */        /* TFCI = 4 */
CphyTrchConfigPar->TFCS.TFC[4][1] = 0;    /* DCH #1 */
CphyTrchConfigPar->TFCS.TFC[5][0] = 5;    /* DCH #0 */        /* TFCI = 5 */
CphyTrchConfigPar->TFCS.TFC[5][1] = 0;    /* DCH #1 */
CphyTrchConfigPar->TFCS.TFC[6][0] = 0;    /* DCH #0 */        /* TFCI = 6 */
CphyTrchConfigPar->TFCS.TFC[6][1] = 1;    /* DCH #1 */
CphyTrchConfigPar->TFCS.TFC[7][0] = 1;    /* DCH #0 */        /* TFCI = 7 */
CphyTrchConfigPar->TFCS.TFC[7][1] = 1;    /* DCH #1 */
CphyTrchConfigPar->TFCS.TFC[8][0] = 2;    /* DCH #0 */        /* TFCI = 8 */
CphyTrchConfigPar->TFCS.TFC[8][1] = 1;    /* DCH #1 */
CphyTrchConfigPar->TFCS.TFC[9][0] = 3;    /* DCH #0 */        /* TFCI = 9 */
CphyTrchConfigPar->TFCS.TFC[9][1] = 1;    /* DCH #1 */
CphyTrchConfigPar->TFCS.TFC[10][0] = 4;   /* DCH #0 */        /* TFCI = 10 */
CphyTrchConfigPar->TFCS.TFC[10][1] = 1;   /* DCH #1 */
CphyTrchConfigPar->TFCS.TFC[11][0] = 5;   /* DCH #0 */        /* TFCI = 11 */
CphyTrchConfigPar->TFCS.TFC[11][1] = 1;   /* DCH #1 */

CphyTrchConfigPar->NumOfTrch   = 2;

CphyTrchConfigPar->TrchInfo[0].Trch              = U_DCH;
CphyTrchConfigPar->TrchInfo[0].TrchNo            = 07
CphyTrchConfigPar->TrchInfo[0].InterLvlst        = INTERLEAVE_ON;
CphyTrchConfigPar->TrchInfo[0].Static.TTI        = 1;
CphyTrchConfigPar->TrchInfo[0].Static.EPType     = CODING_TURBO;
CphyTrchConfigPar->TrchInfo[0].Static.CodingRate = CODINGRATE1_3;
CphyTrchConfigPar->TrchInfo[0].Static.CRC_Size   = 16;
CphyTrchConfigPar->TrchInfo[0].Static.RM_Attr    = 110;
CphyTrchConfigPar->TrchInfo[0].NumOfDynamic      = 6;
CphyTrchConfigPar->TrchInfo[0].Dynamic[0].NumOfTB = 0;
CphyTrchConfigPar->TrchInfo[0].Dynamic[0].TBSize  = 336;
CphyTrchConfigPar->TrchInfo[0].Dynamic[1].NumOfTB = 1;
CphyTrchConfigPar->TrchInfo[0].Dynamic[1].TBSize  = 336;
CphyTrchConfigPar->TrchInfo[0].Dynamic[2].NumOfTB = 2;
CphyTrchConfigPar->TrchInfo[0].Dynamic[2].TBSize  = 336;
CphyTrchConfigPar->TrchInfo[0].Dynamic[3].NumOfTB = 4;
CphyTrchConfigPar->TrchInfo[0].Dynamic[3].TBSize  = 336;
CphyTrchConfigPar->TrchInfo[0].Dynamic[4].NumOfTB = 8;
CphyTrchConfigPar->TrchInfo[0].Dynamic[4].TBSize  = 336;
CphyTrchConfigPar->TrchInfo[0].Dynamic[5].NumOfTB = 12;
CphyTrchConfigPar->TrchInfo[0].Dynamic[5].TBSize  = 336;

CphyTrchConfigPar->TrchInfo[1].Trch              = U_DCH;
CphyTrchConfigPar->TrchInfo[1].TrchNo            = 17
CphyTrchConfigPar->TrchInfo[1].InterLvlst        = INTERLEAVE_ON;

CphyTrchConfigPar->TrchInfo[1].Static.TTI        = 4;
CphyTrchConfigPar->TrchInfo[1].Static.EPType     = CODING_CONV;
CphyTrchConfigPar->TrchInfo[1].Static.CodingRate = CODINGRATE1_3;
CphyTrchConfigPar->TrchInfo[1].Static.CRC_Size   = 16;
CphyTrchConfigPar->TrchInfo[1].Static.RM_Attr    = 160;

CphyTrchConfigPar->TrchInfo[1].NumOfDynamic      = 2;
CphyTrchConfigPar->TrchInfo[1].Dynamic[0].NumOfTB = 0;
CphyTrchConfigPar->TrchInfo[1].Dynamic[0].TBSize  = 148;
CphyTrchConfigPar->TrchInfo[1].Dynamic[1].NumOfTB = 1;
CphyTrchConfigPar->TrchInfo[1].Dynamic[1].TBSize  = 148;
```


Uplink DPCH–MAC, RLC (TS34.108 6.10.2.4.1.34 Interactive or Background/UL:384 DL: 384 kbps/PS RAB + UL: 3.4 DL: 3.4 kbps SRBs for DCCH)

Higher layer	RAB/signalling RB	SRB#1	SRB#2	SRB#3	SRB#4
	User of Radio Bearer	RRC	RRC	NAS_DT High prio	NAS_DT Low prio
RLC	Logical channel type	DCCH	DCCH	DCCH	DCCH
	RLC mode	UM	AM	AM	AM
	Payload sizes, bit	136	128	128	128
	Max data rate, bps	3 400	3 200	3 200	3 200
	AMD/UMD PDU header, bit	8	16	16	16
MAC	MAC header, bit	4	4	4	4
	MAC multiplexing	4 logical channel multiplexing			
Layer 1	TrCH type	DCH			
	TB sizes, bit	148 (alt 0, 148)			
	TFS TF0, bits	0x148 (alt 1x0)			
	TFS TF1, bits	1x148			
	TTI, ms	40			
	Coding type	CC 1/3			
	CRC, bit	16			
	Max number of bits/TTI before rate matching	516			
	Uplink: Max number of bits/radio frame before rate matching	129			
	RM attribute	155 to 185			

TS25.321–Table 9.2.1.5a: Structure of the C/T field

C/T field	Designation
0000	Logical channel 1
0001	Logical channel 2
...	...
1110	Logical channel 15
1111	Reserved

```
CrlcConfigPar = &CrlcConfig_DCCH;
memset( CrlcConfigPar, 0, sizeof(CRLC_CONFIG_PAR) );

CrlcConfigPar->NumOfPUs            = 1;

CrlcConfigPar->PU_LengthTM         = 0;
CrlcConfigPar->PU_LengthUM         = 136;
CrlcConfigPar->PU_LengthAM         = 128;
```

```
CmacConfigPar = &CmacConfig_U_DPCH_HSDPA;
memset( CmacConfigPar, 0, sizeof(CMAC_CONFIG_PAR) );
CmacConfigPar->ActFlag    = MAC_ACTIVE;

CmacConfigPar->NumOfLoch[0] = 1;
CmacConfigPar->LochInfo[0][0].Loch       = U_DTCH;
CmacConfigPar->LochInfo[0][0].LochNo     = 07
CmacConfigPar->LochInfo[0][0].Priority   = 0;
CmacConfigPar->LochInfo[0][0].CTLength   = 0;
CmacConfigPar->LochInfo[0][0].CTValue    = 0;
CmacConfigPar->LochInfo[0][0].TCTFLength = 0;
CmacConfigPar->LochInfo[0][0].UEIDType   = UEID_NOTUSE;
CmacConfigPar->LochInfo[0][0].UEID       = 0;

CmacConfigPar->NumOfLoch[1] = 4;
CmacConfigPar->LochInfo[1][0].Loch       = U_DCCH;
CmacConfigPar->LochInfo[1][0].LochNo     = 07
CmacConfigPar->LochInfo[1][0].Priority   = 0;
CmacConfigPar->LochInfo[1][0].CTLength   = 4;
CmacConfigPar->LochInfo[1][0].CTValue    = 0;
CmacConfigPar->LochInfo[1][0].TCTFLength = 0;
CmacConfigPar->LochInfo[1][0].UEIDType   = UEID_NOTUSE;
CmacConfigPar->LochInfo[1][0].UEID       = 0;

CmacConfigPar->LochInfo[1][1].Loch       = U_DCCH;
CmacConfigPar->LochInfo[1][1].LochNo     = 17
CmacConfigPar->LochInfo[1][1].Priority   = 0;
CmacConfigPar->LochInfo[1][1].CTLength   = 4;
CmacConfigPar->LochInfo[1][1].CTValue    = 1;
CmacConfigPar->LochInfo[1][1].TCTFLength = 0;
CmacConfigPar->LochInfo[1][1].UEIDType   = UEID_NOTUSE;
CmacConfigPar->LochInfo[1][1].UEID       = 0;

CmacConfigPar->LochInfo[1][2].Loch       = U_DCCH;
CmacConfigPar->LochInfo[1][2].LochNo     = 27
CmacConfigPar->LochInfo[1][2].Priority   = 0;
CmacConfigPar->LochInfo[1][2].CTLength   = 4;
CmacConfigPar->LochInfo[1][2].CTValue    = 2;
CmacConfigPar->LochInfo[1][2].TCTFLength = 0;
CmacConfigPar->LochInfo[1][2].UEIDType   = UEID_NOTUSE;
CmacConfigPar->LochInfo[1][2].UEID       = 0;

CmacConfigPar->LochInfo[1][3].Loch       = U_DCCH;
CmacConfigPar->LochInfo[1][3].LochNo     = 37
CmacConfigPar->LochInfo[1][3].Priority   = 0;
CmacConfigPar->LochInfo[1][3].CTLength   = 4;
CmacConfigPar->LochInfo[1][3].CTValue    = 3;
CmacConfigPar->LochInfo[1][3].TCTFLength = 0;
CmacConfigPar->LochInfo[1][3].UEIDType   = UEID_NOTUSE;
CmacConfigPar->LochInfo[1][3].UEID       = 0;
```

Uplink DPCH–Layer 1, MAC, RLC Traffic CH (TS34.108 6.10.2.4.1.34 Interactive or Background/UL: 384 DL: 384 kbps/PS RAB + UL: 3.4 DL: 3.4 kbps SRBs for DCCH)

Higher layer	RAB/Signalling RB		RAB
RLC	Logical channel type		DTCH
	RLC mode		AM
	Payload sizes, bit		320
	Max data rate, bps		384 000
	AMD PDU header, bit		16
MAC	MAC header, bit		0
	MAC multiplexing		N/A
Layer 1	TrCH type		DCH
	TB sizes, bit		336
	TFS	TF0, bits	0x336
		TF1, bits	1x336
		TF2, bits	2x336
		TF3, bits	4x336
		TF4, bits	8x336
		TF5, bits	12x336
		TF6, bits	16x336(alt. N/A)
		TF7, bits	20x336(alt. N/A)
		TF8, bits	24x336 (alt. N/A)
	TTI, ms		20 (alt. 10)
	Coding type		TC
	CRC, bit		16
	Max number of bits/TTI after channel coding		25 368
	Uplink: Max number of bits/radio frame before rate matching		12 684
	RM attribute		110–180

```
CrlcConfigPar = &Packet_CrlcConfig_DTCH;
memset( CrlcConfigPar, 0, sizeof(CRLC_CONFIG_PAR) );
CrlcConfigPar->NumOfPDUs          = 1;
CrlcConfigPar->PU_LengthTM        = 244;

CrlcConfigPar->PU_LengthUM        = 328;

CrlcConfigPar->PU_LengthAM        = 320;
```

```
CphyTrchConfigPar->TrchInfo[0].Trch              = U_DCH;
CphyTrchConfigPar->TrchInfo[0].TrchNo            = 07
CphyTrchConfigPar->TrchInfo[0].InterLvlst        = INTERLEAVE_ON;

CphyTrchConfigPar->TrchInfo[0].Static.TTI        = 1;
CphyTrchConfigPar->TrchInfo[0].Static.EPType     = CODING_TURBO;
CphyTrchConfigPar->TrchInfo[0].Static.CodingRate = CODINGRATE1_3;
CphyTrchConfigPar->TrchInfo[0].Static.CRC_Size   = 16;
CphyTrchConfigPar->TrchInfo[0].Static.RM_Attr    = 110;

CphyTrchConfigPar->TrchInfo[0].NumOfDynamic      = 6;
CphyTrchConfigPar->TrchInfo[0].Dynamic[0].NumOfTB = 0;
CphyTrchConfigPar->TrchInfo[0].Dynamic[0].TBSize  = 336;
CphyTrchConfigPar->TrchInfo[0].Dynamic[1].NumOfTB = 1;
CphyTrchConfigPar->TrchInfo[0].Dynamic[1].TBSize  = 336;
CphyTrchConfigPar->TrchInfo[0].Dynamic[2].NumOfTB = 2;
CphyTrchConfigPar->TrchInfo[0].Dynamic[2].TBSize  = 336;
CphyTrchConfigPar->TrchInfo[0].Dynamic[3].NumOfTB = 4;
CphyTrchConfigPar->TrchInfo[0].Dynamic[3].TBSize  = 336;
CphyTrchConfigPar->TrchInfo[0].Dynamic[4].NumOfTB = 8;
CphyTrchConfigPar->TrchInfo[0].Dynamic[4].TBSize  = 336;
CphyTrchConfigPar->TrchInfo[0].Dynamic[5].NumOfTB = 12;
CphyTrchConfigPar->TrchInfo[0].Dynamic[5].TBSize  = 336;
```

```
CmacConfigPar->NumOfLoch[0] = 1;

CmacConfigPar->LochInfo[0][0].Loch       = U_DTCH;
CmacConfigPar->LochInfo[0][0].LochNo     = 07
CmacConfigPar->LochInfo[0][0].Priority   = 0;
CmacConfigPar->LochInfo[0][0].CTLength   = 0;
CmacConfigPar->LochInfo[0][0].CTValue    = 0;
CmacConfigPar->LochInfo[0][0].TCTFLength = 0;
CmacConfigPar->LochInfo[0][0].UEIDType   = UEID_NOTUSE;
CmacConfigPar->LochInfo[0][0].UEID       = 0;
```


Downlink DPCH–Layer 1 (TS34.108 6.10.2.4.1.2 Stand-alone UL: 3.4 DL: 3.4 kbps SRBs for DCCH)

DPCH Downlink	DTX position		Fixed
	Spreading factor		256
	DPCCH	Number of TFCI bits/slot	0
		Number of TPC bits/slot	2
		Number of Pilot bits/slot	4
	DPDCH	Number of data bits/slot	14
		Number of data bits/frame	210

TFCS size	2
TFCS	SRBs for DCCH = TF0, TF1

Higher layer	RAB/signalling RB	SRB#1	SRB#2	SRB#3	SRB#4
	User of Radio Bearer	RRC	RRC	NAS_DT High prio	NAS_DT Low prio
RLC	Logical channel type	DCCH	DCCH	DCCH	DCCH
	RLC mode	UM	AM	AM	AM
	Payload sizes, bit	136	128	128	128
	Max data rate, bps	3 400	3 200	3 200	3 200
	AMD/UMD PDU header, bit	8	16	16	16
MAC	MAC header, bit	4	4	4	4
	MAC multiplexing	4 logical channel multiplexing			
Layer 1	TrCH type	DCH			
	TB sizes, bit	148 (alt 0, 148) (note)			
	TFS, TF0, bits	0x148 (alt 1x0) (note)			
	TFS, TF1, bits	1x148			
	TTI, ms	40			
	Coding type	CC 1/3			
	CRC, bit	16			
	Max number of bits/TTI before rate matching	516			
	RM attribute	155 to 230			
NOTE:	Alternative parameters enable the measurement "transport channel BLER" in the UE.				

```
CphyRlSetupPar = &CphyRlSetup_D_DPCH_HSDPA;
memset( CphyRlSetupPar, 0, sizeof(CPHY_RL_SETUP_PAR) );
CphyRlSetupPar->Offset          = 76807;
CphyRlSetupPar->ScrCode         = 0x00000090;

CphyRlSetupPar->SlotFormat      = SLOT_FORMAT_4;          /* for DPCCH */
CphyRlSetupPar->SymbolRate      = SYMRATE15K;             /* for DPDCH */

CphyRlSetupPar->ChCode          = 10;
CphyRlSetupPar->NumOfDPDCH      = 1;
CphyRlSetupPar->Power           = POWER_STEP_01DB(-143);  /* Power = -14.3dB */
CphyRlSetupPar->Dpdch[0].Power  = POWER_STEP_01DB(-143);  /* Power = -14.3dB */
CphyRlSetupPar->Dpdch[0].ChCode = 10;

CphyRlSetupPar->TxDiversity     = DIVERSITY_OFF;
CphyRlSetupPar->MaxDLPower      = 0;
CphyRlSetupPar->MinDLPower      = -99;
```

```
CphyTrchConfigPar = &CphyTrchConfig_D_DPCH_HSDPA;
memset( CphyTrchConfigPar, 0, sizeof(CPHY_TRCH_CONFIG_PAR) );
CphyTrchConfigPar->DTXPosition = DTX_FIXED_POSITION;
CphyTrchConfigPar->InterLvlEnd  = INTERLEAVE_ON;
CphyTrchConfigPar->NumOfTrch    = 1;

CphyTrchConfigPar->TFCS.NumOfTFC  = 2;
CphyTrchConfigPar->TFCS.TFC[0][0] = 0;  /* DCH#0 */ /* TFCI = 0 */
CphyTrchConfigPar->TFCS.TFC[1][0] = 1;  /* DCH#0 */ /* TFCI = 1 */

CphyTrchConfigPar->TrchInfo[0].Trch              = D_DCH;
CphyTrchConfigPar->TrchInfo[0].TrchNo            = 07
CphyTrchConfigPar->TrchInfo[0].InterLvlst        = INTERLEAVE_ON;

CphyTrchConfigPar->TrchInfo[0].Static.TTI        = 4;
CphyTrchConfigPar->TrchInfo[0].Static.EPType     = CODING_CONV;
CphyTrchConfigPar->TrchInfo[0].Static.CodingRate = CODINGRATE1_3;
CphyTrchConfigPar->TrchInfo[0].Static.CRC_Size   = 16;
CphyTrchConfigPar->TrchInfo[0].Static.RM_Attr    = 160;

CphyTrchConfigPar->TrchInfo[0].NumOfDynamic      = 2;
CphyTrchConfigPar->TrchInfo[0].Dynamic[0].NumOfTB = 0;
CphyTrchConfigPar->TrchInfo[0].Dynamic[0].TBSize  = 148;
CphyTrchConfigPar->TrchInfo[0].Dynamic[1].NumOfTB = 1;
CphyTrchConfigPar->TrchInfo[0].Dynamic[1].TBSize  = 148;
```

Downlink DPCH–MAC, RLC (TS34.108 6.10.2.4.1.2 Stand-alone UL: 3.4 DL: 3.4 kbps SRBs for DCCH)

Higher layer	RAB/signalling RB		SRB#1	SRB#2	SRB#3	SRB#4
	User of Radio Bearer		RRC	RRC	NAS_DT High prio	NAS_DT Low prio
RLC	Logical channel type		DCCH	DCCH	DCCH	DCCH
	RLC mode		UM	AM	AM	AM
	Payload sizes, bit		136	128	128	128
	Max data rate, bps		3 400	3 200	3 200	3 200
	AMD/UMD PDU header, bit		8	16	16	16
MAC	MAC header, bit		4	4	4	4
	MAC multiplexing		4 logical channel multiplexing			
Layer 1	TrCH type		DCH			
	TB sizes, bit		148 (alt 0, 148) (note)			
	TFS	TF0, bits	0x148 (alt 1x0) (note)			
		TF1, bits	1x148			
	TTI, ms		40			
	Coding type		CC 1/3			
	CRC, bit		16			
	Max number of bits/TTI before rate matching		516			
	RM attribute		155 to 230			
NOTE:	Alternative parameters enable the measurement "transport channel BLER" in the UE.					

TS25.321–Table 9.2.1.5a: Structure of the C/T field

C/T field	Designation
0000	Logical channel 1
0001	Logical channel 2
...	...
1110	Logical channel 15
1111	Reserved

```
CrlcConfigPar = &CrlcConfig_DCCH;
memset( CrlcConfigPar, 0, sizeof(CRLC_CONFIG_PAR) );
CrlcConfigPar->NumOfPUs             = 1;
CrlcConfigPar->PU_LengthTM          = 0;
CrlcConfigPar->PU_LengthUM          = 136;
CrlcConfigPar->PU_LengthAM          = 128;
```

```
CmacConfigPar = &CmacConfig_D_DPCH_HSDPA;
memset( CmacConfigPar, 0, sizeof(CMAC_CONFIG_PAR) );
CmacConfigPar->ActFlag   = MAC_ACTIVE;

CmacConfigPar->NumOfLoch[0] = 4;
CmacConfigPar->LochInfo[0][0].Loch        = D_DCCH;
CmacConfigPar->LochInfo[0][0].LochNo      = 07
CmacConfigPar->LochInfo[0][0].Priority    = 0;
CmacConfigPar->LochInfo[0][0].CTLength    = 4;
CmacConfigPar->LochInfo[0][0].CTValue     = 0;
CmacConfigPar->LochInfo[0][0].TCTFLength  = 0;
CmacConfigPar->LochInfo[0][0].UEIDType    = UEID_NOTUSE;
CmacConfigPar->LochInfo[0][0].UEID        = 0;

CmacConfigPar->LochInfo[0][1].Loch        = D_DCCH;
CmacConfigPar->LochInfo[0][1].LochNo      = 17
CmacConfigPar->LochInfo[0][1].Priority    = 0;
CmacConfigPar->LochInfo[0][1].CTLength    = 4;
CmacConfigPar->LochInfo[0][1].CTValue     = 1;
CmacConfigPar->LochInfo[0][1].TCTFLength  = 0;
CmacConfigPar->LochInfo[0][1].UEIDType    = UEID_NOTUSE;
CmacConfigPar->LochInfo[0][1].UEID        = 0;

CmacConfigPar->LochInfo[0][2].Loch        = D_DCCH;
CmacConfigPar->LochInfo[0][2].LochNo      = 27
CmacConfigPar->LochInfo[0][2].Priority    = 0;
CmacConfigPar->LochInfo[0][2].CTLength    = 4;
CmacConfigPar->LochInfo[0][2].CTValue     = 2;
CmacConfigPar->LochInfo[0][2].TCTFLength  = 0;
CmacConfigPar->LochInfo[0][2].UEIDType    = UEID_NOTUSE;
CmacConfigPar->LochInfo[0][2].UEID        = 0;

CmacConfigPar->LochInfo[0][3].Loch        = D_DCCH;
CmacConfigPar->LochInfo[0][3].LochNo      = 37
CmacConfigPar->LochInfo[0][3].Priority    = 0;
CmacConfigPar->LochInfo[0][3].CTLength    = 4;
CmacConfigPar->LochInfo[0][3].CTValue     = 3;
CmacConfigPar->LochInfo[0][3].TCTFLength  = 0;
CmacConfigPar->LochInfo[0][3].UEIDType    = UEID_NOTUSE;
CmacConfigPar->LochInfo[0][3].UEID        = 0;
```


TS34.108 6.10.2.4.5.2 Interactive or Background/UL: 384 DL: [max bit rate depending on UE category]/PS RAB + UL: 3.4 DL: 3.4 kbps SRBs for DCCH

HSDPA Channels

–Downlink HS–SCCH
–Downlink HS–PDSCH
–Downlink HS–DSCH
–Uplink HS–DPCCH

HSDPA Channels (TS34.108 6.10.2.4.5.2 Interactive or Background/UL: 384 DL: [max bit rate depending on UE category]/PS RAB + UL: 3.4 DL: 3.4 kbps SRBs for DCCH)

TS25.306 Table 5.1a: FDD HS–DSCH physical layer categories

HS–DSCH category	Maximum number of HS–DSCH codes received	Minimum inter–TTI interval	Maximum number of bits of HS–DSCH transport block received within HS–DSCH TTI	Total number of soft channel bits
Category 1	5	3	7298	19200
Category 2	5	3	7298	28800
Category 3	5	2	7298	28800
Category 4	5	2	7298	38400
Category 5	5	1	7298	57600
Category 6	5	1	7298	67200
Category 7	10	1	14411	115200
Category 8	10	1	14411	134400
Category 9	15	1	20251	172800
Category 10	15	1	27952	172800
Category 11	5	2	3630	14400
Category 12	**5**	**1**	**3630**	**28800**
Category 13	15	1	34800	259200
Category 14	15	1	42196	259200
Category 15	15	1	23370	345600
Category 16	15	1	27952	345600

Higher layer	RAB/Signalling RB	RAB
RLC	Logical channel type	DTCH
	RLC mode	AM
	Payload sizes, bit	320 (alt. 640)
	Max data rate, bps	depends on UE category NOTE1
	AMD PDU header, bit	16
MAC	MAC–d header, bit	0
	MAC multiplexing	N/A
	MAC–d PDU size, bit	**336** (alt. 656)
	MAC–hs header fixed part, bit	21
Layer 1	TrCH type	HS–DSCH
	TTI	2 ms
	Coding type	TC
	CRC, bit	24

NOTE: The peak throughput may be limited by the maximum number of MAC–d PDUs that can be included in a single MAC–hs PDU (see 3GPP TS 25.321 [38]).

```
CphyHsSetupParSCCH    = &CphyHsSetupHS_SCCH;
CphyHsSetupParPDSCH   = &CphyHsSetupHS_PDSCH;
CphyHsSetupParDPCCH   = &CphyHsSetupHS_DPCCH;
CmacHsConfigPar       = &CmacHsConfigHS_DSCH;
InterTTI     = 1;
SMLs         = 4800;          // 28800 bits/6processes
NumOfH_ARQ   = 6;
NumOfCh      = 5;
ChOffset     = 1;
ModScheme    = MOD_QPSK;      // Category 12 supports QPSK only.
Xtbs         = 48;            // 14*(3630bits)*12(QPSK, 5codes)
NumOfTFRI    = 10;
PDUSize      = 336;
```

UE HS–DSCH Physical Layer category 12:

HS–PDSCH	Number of processes	**6**, (alt. 8)
	Process memory size	**Split equally between all processes**
	Max Data Rate	1.8 Mbps, (alt. 1.8 Mbps)

HSDPA Channels (TS34.108 6.10.2.4.5.2 Interactive or Background/UL: 384 DL: [max bit rate depending on UE category]/PS RAB + UL: 3.4 DL: 3.4 kbps SRBs for DCCH)

TS25.321 Table 9.2.3.1: Table 0 of values of $k_{0,i}$ for different numbers of channelization codes and modulation schemes (QPSK and 16QAM)

Combination *i*	Modulation scheme	Number of channelization codes	
0	**QPSK**	1	1
1		2	40
2		3	63
3		4	79
4		**5**	**92**
5		6	102
6		7	111
7		8	118
8		9	125
9		10	131
10		11	136
11		12	141
12		13	145
13		14	150
14		15	153
15	16QAM	1	40
16		2	79
17		3	102
18		4	118
19		5	131
20		6	141
21		7	150
22		8	157
23		9	164
24		10	169
25		11	175
26		12	180
27		13	184
28		14	188
29		15	192

TS25.321 Annex A (normative):
HS–DSCH Transport Block Size Table for FDD

Index	TB Size	Index	TB Size	Index	TB Size						
1	137	86	1380	171	6324	46	674	131	3090	216	14155
2	149	87	1405	172	6438	47	686	132	3145	217	14411
3	161	88	1430	173	6554	48	699	133	3202	218	14671
4	173	89	1456	174	6673	49	711	134	3260	219	14936
5	185	90	1483	175	6793	50	724	135	3319	220	15206
6	197	91	1509	176	6916	51	737	136	3379	221	15481
7	209	**92**	**1537**	177	7041	52	751	137	3440	222	15761
8	221	93	1564	178	7168	53	764	138	3502	223	16045
9	233	94	1593	179	7298	54	778	139	3565	224	16335
10	245	95	1621	180	7430	55	792	**140**	**3630**	225	16630
11	257	96	1651	181	7564	56	806	141	3695	226	16931
12	269	97	1681	182	7700	57	821	142	3762	227	17237
13	281	98	1711	183	7840	58	836	143	3830	228	17548
14	293	99	1742	184	7981	59	851	144	3899	229	17865
15	305	100	1773	185	8125	60	866	145	3970	230	18188
16	317	101	1805	186	8272	61	882	146	4042	231	18517
17	329	102	1838	187	8422	62	898	147	4115	232	18851
18	341	103	1871	188	8574	63	914	148	4189	233	19192
19	353	104	1905	189	8729	64	931	149	4265	234	19538
20	365	105	1939	190	8886	65	947	150	4342	235	19891
21	377	106	1974	191	9047	66	964	151	4420	236	20251
22	389	107	2010	192	9210	67	982	152	4500	237	20617
23	401	108	2046	193	9377	68	1000	153	4581	238	20989
24	413	109	2083	194	9546	69	1018	154	4664	239	21368
25	425	110	2121	195	9719	70	1036	155	4748	240	21754
26	437	111	2159	196	9894	71	1055	156	4834	241	22147
27	449	112	2198	197	10073	72	1074	157	4921	242	22548
28	461	113	2238	198	10255	73	1093	158	5010	243	22955
29	473	114	2279	199	10440	74	1113	159	5101	244	23370
30	485	115	2320	200	10629	75	1133	160	5193	245	23792
31	497	116	2362	201	10821	76	1154	161	5287	246	24222
32	509	117	2404	202	11017	77	1175	162	5382	247	24659
33	521	118	2448	203	11216	78	1196	163	5480	248	25105
34	533	119	2492	204	11418	79	1217	164	5579	249	25558
35	545	120	2537	205	11625	80	1239	165	5680	250	26020
36	557	121	2583	206	11835	81	1262	166	5782	251	26490
37	569	122	2630	207	12048	82	1285	167	5887	252	26969
38	581	123	2677	208	12266	83	1308	168	5993	253	27456
39	593	124	2726	209	12488	84	1331	169	6101	254	27952
40	605	125	2775	210	12713	85	1356	170	6211		
41	616	126	2825	211	12943						
42	627	127	2876	212	13177						
43	639	128	2928	213	13415						
44	650	129	2981	214	13657						
45	662	130	3035	215	13904						

HSDPA Channels (TS34.108 6.10.2.4.5.2 Interactive or background / UL:384 DL: [max bit rate depending on UE category] / PS RAB + UL:3.4 DL:3.4 kbps SRBs for DCCH)

MD8480C easy_to_9.0.pdf A.2.2.7.2 Description of CPHY_HS_SETUP_PAR structure

#1 ----- D_HS_SCCH (CphyHsSetupHS_SCCH)
#2 ----- D_HS_PDSCH (CphyHsSetupHS_PDSCH)
#3 ----- U_HS_DPCCH (CphyHsSetupHS_DPCCH)

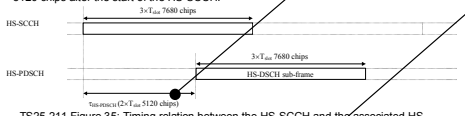
Member	Description	#1	#2	#3
Offset	Specifies the offset of each channel in [chip]. Specify in multiples of 256. HS-SCCH offset = P-CPICH offset (=7680) HS-PDSCH offset = HS-SCCH offset + 5120 (2 slots) HS-DPCCH offset = HS-SCCH offset + 1280	√	√	√

```
/*--- HS-SCCH Configuration ---*/
CphyHsSetupParSCCH->Offset          = CphyRlSetup_P_CPICH_BTS1.Offset;
CphyHsSetupParSCCH->TxDiversity = DIVERSITY_OFF;
CphyHsSetupParSCCH->ScrCode         = 0x00000090;

CphyHsSetupParSCCH->NumOfCh  = 1;
  CphyHsSetupParSCCH->HsCh[0].ChCode = 7;
  CphyHsSetupParSCCH->HsCh[1].ChCode = 0;
  CphyHsSetupParSCCH->HsCh[2].ChCode = 0;
  CphyHsSetupParSCCH->HsCh[3].ChCode = 0;

  for(i=0;i<CphyHsSetupParSCCH->NumOfCh;i++) {
    CphyHsSetupParSCCH->HsCh[i].DataPower = -183;
    CphyHsSetupParSCCH->HsCh[i].DummyPower = CphyHsSetupParSCCH->HsCh[i].DataPower;
  }
  CphyHsSetupParSCCH->UEIDMode = UEID_CODE0; // Refer to "Easy to" 5.4 Selection of HS-SCCH Order Code
  CphyHsSetupParSCCH->HsPowerMode     = EACH_MODE;
```

Figure 35 shows the relative timing between the HS-SCCH and the associated HS-PDSCH for one HS-DSCH sub-frame. The HS-PDSCH starts tHS-PDSCH = 2 Tslot = 5120 chips after the start of the HS-SCCH.



TS25.211 Figure 35: Timing relation between the HS-SCCH and the associated HS-PDSCH.

```
/*--- HS-PDSCH Configuration ---*/
CphyHsSetupParPDSCH->Offset         = CphyHsSetupParSCCH->Offset + 5120;
CphyHsSetupParPDSCH->TxDiversity = DIVERSITY_OFF;
CphyHsSetupParPDSCH->ScrCode        = 0x00000090;

CphyHsSetupParPDSCH->NumOfH_ARQ = NumOfH_ARQ;

for (i=0; i<CphyHsSetupParPDSCH->NumOfH_ARQ; i++){
  CphyHsSetupParPDSCH->H_ARQInfo[i].H_ARQ_ID = i;          /* H-ARQ ID              */
  CphyHsSetupParPDSCH->H_ARQInfo[i].IRBufferSize = SMLs;   /* IR Buffer Size        */
}

CphyHsSetupParPDSCH->MinTTI             = InterTTI;
CphyHsSetupParPDSCH->HsPowerMode        = TOTAL_MODE;

CphyHsSetupParPDSCH->TotalDataPower     = -13;
CphyHsSetupParPDSCH->TotalDummyPower    = -990;

// When sending HS-PDSCH with no data
CphyHsSetupParPDSCH->ModScheme          = MOD_16QAM;
CphyHsSetupParPDSCH->NumOfCh            = NumOfCh;
CphyHsSetupParPDSCH->ChOffset           = ChOffset;
for (i=0;i<CphyHsSetupParPDSCH->NumOfCh;i++){
  CphyHsSetupParPDSCH->HsCh[i].ChCode       = 1 + i;
  CphyHsSetupParPDSCH->HsCh[i].Initial_PN15 = 1 + i;
}

CphyHsSetupParPDSCH->MaxPower           = 0;
CphyHsSetupParPDSCH->MinPower           = -999;
CphyHsSetupParPDSCH->TxDiversity        = DIVERSITY_OFF;
```

TS34.108 Table 5.5.1.2.1: HSDPA Downlink Physical Channels Code Allocation for SF=16 Code=0

Code with SF=256	Code with SF=128	Code with SF=64	Note
0:P-CPICH	0: -	0: -	TS 25.213
1:P-CCPCH			TS 25.213
2:PICH	1: -		Section 6.1.0b (SIB5)
3:AICH			Section 6.1.0b (SIB5)
4: -	2: -	1: S-CCPCH	
5: -			Section 6.1.0b (SIB5)
6: -	3: -		
7: -	4:E-HICH/E-RGCH		Section 9.1.1 RB Setup message
8: -		2: -	Section 9.1.1 RB Setup message
9: E-AGCH	5: -		
10: E-AGCH			Section 9.1.1 RB Setup message
11: -			
12: F-DPCH	6: -		Section 9.1.1 RB Setup message, condition A14
13: -		3: -	
14: -	7: HS-SCCH		Section 9.1.1 RB Setup message
15: -			

The HS-DPCCH shall be spread with code chs as specified in table 1D.

TS25.213 Table 1D: channelisation code of HS-DPCCH

$N_{max-dpdch}$ (as defined in subclause 4.2.1)	Channelisation code c_{hs}
0	$C_{ch,256,33}$
1	$C_{ch,256,64}$
2,4,6	$C_{ch,256,1}$
3,5	$C_{ch,256,32}$

```
/*--- HS-DPCCH Configuration ---*/
CphyHsSetupParDPCCH->Offset         = CphyHsSetupParSCCH->Offset + 1280;
CphyHsSetupParDPCCH->ScrCode        = 0x01000000;
CphyHsSetupParDPCCH->HsDpcchCode    = 64;
CphyHsSetupParDPCCH->HsDpcchThreshold = -200;
    /* -20dB if( UL DPCCH Power + HsDpcchThreshold > HS_DPCCH Power ) :DTX else :ACK/NACK */
CphyHsSetupParDPCCH->AckNackRepFactor = 1;
```


HSDPA Channels (TS34.108 6.10.2.4.5.2 Interactive or Background/UL: 384 DL: [max bit rate depending on UE category]/PS RAB + UL: 3.4 DL: 3.4 kbps SRBs for DCCH)

TS34.121 Table 9.2.4: Node–B Emulator Behavior in response to ACK/NACK/DTX

HS–DPCCH ACK/NACK Field State	Node–B Emulator Behavior
ACK	ACK: new transmission using 1st redundancy and constellation version (RV)
NACK	NACK: retransmission using the next RV (up to the maximum permitted number or RV's)
DTX	DTX: retransmission using the RV previously transmitted to the same H–ARQ process

```
/*--- MAC-hs ---*/
CmacHsConfigPar->NumOfH_ARQ = NumOfH_ARQ;
CmacHsConfigPar->NumOfRetransmission = 3;    /* Maximum Retransmission */

/* Retransmission parameter for NACK    */
CmacHsConfigPar->ReTrans_QPSK[ 0].Nack_Xrv       = 0;  /* Xrv for new Transmission by NACK received            */
CmacHsConfigPar->ReTrans_QPSK[ 1].Nack_Xrv       = 2;  /* Xrv for 1st Retransmission by NACK received          */
CmacHsConfigPar->ReTrans_QPSK[ 2].Nack_Xrv       = 5;  /* Xrv for 2nd Retransmission by NACK received          */
CmacHsConfigPar->ReTrans_QPSK[ 3].Nack_Xrv       = 6;  /* Xrv for 3rd Retransmission by NACK received          */
CmacHsConfigPar->ReTrans_QPSK[ 0].NackDeltaPower = 0;  /* Delta Power for new Transmission by NACK received    */
CmacHsConfigPar->ReTrans_QPSK[ 1].NackDeltaPower = 0;  /* Delta Power for 1st Retransmission by NACK received  */
CmacHsConfigPar->ReTrans_QPSK[ 2].NackDeltaPower = 0;  /* Delta Power for 2nd Retransmission by NACK received  */
CmacHsConfigPar->ReTrans_QPSK[ 3].NackDeltaPower = 0;  /* Delta Power for 3rd Retransmission by NACK received  */

/* Retransmission parameter for DTX     */
CmacHsConfigPar->ReTrans_QPSK[ 0].DTX_Xrv        = 0;  /* not use */
CmacHsConfigPar->ReTrans_QPSK[ 1].DTX_Xrv        = -1; /* Xrv for 1st Retransmission by DTX received, -1 means previous Xrv  */
CmacHsConfigPar->ReTrans_QPSK[ 2].DTX_Xrv        = -1; /* Xrv for 2nd Retransmission by DTX received, -1 means previous Xrv  */
CmacHsConfigPar->ReTrans_QPSK[ 3].DTX_Xrv        = -1; /* Xrv for 3rd Retransmission by DTX received, -1 means previous Xrv  */
CmacHsConfigPar->ReTrans_QPSK[ 0].DTXDeltaPower  = 0;  /* not use */
CmacHsConfigPar->ReTrans_QPSK[ 1].DTXDeltaPower  = 0;  /* Delta Power for 1st Retransmission by DTX received     */
CmacHsConfigPar->ReTrans_QPSK[ 2].DTXDeltaPower  = 0;  /* Delta Power for 2nd Retransmission by DTX received     */
CmacHsConfigPar->ReTrans_QPSK[ 3].DTXDeltaPower  = 0;  /* Delta Power for 3rd Retransmission by DTX received     */

/* Retransmission parameter for NACK    */
CmacHsConfigPar->ReTrans_16QAM[ 0].Nack_Xrv      = 6;  /* Xrv for new Transmission by NACK received            */
CmacHsConfigPar->ReTrans_16QAM[ 1].Nack_Xrv      = 2;  /* Xrv for 1st Retransmission by NACK received          */
CmacHsConfigPar->ReTrans_16QAM[ 2].Nack_Xrv      = 1;  /* Xrv for 2nd Retransmission by NACK received          */
CmacHsConfigPar->ReTrans_16QAM[ 3].Nack_Xrv      = 5;  /* Xrv for 3rd Retransmission by NACK received          */
CmacHsConfigPar->ReTrans_16QAM[ 0].NackDeltaPower= 0;  /* Delta Power for new Transmission by NACK received    */
CmacHsConfigPar->ReTrans_16QAM[ 1].NackDeltaPower= 0;  /* Delta Power for 1st Retransmission by NACK received  */
CmacHsConfigPar->ReTrans_16QAM[ 2].NackDeltaPower= 0;  /* Delta Power for 2nd Retransmission by NACK received  */
CmacHsConfigPar->ReTrans_16QAM[ 3].NackDeltaPower= 0;  /* Delta Power for 3rd Retransmission by NACK received  */

/* Retransmission parameter for DTX     */
CmacHsConfigPar->ReTrans_16QAM[ 0].DTX_Xrv       = 0;  /* not use */
CmacHsConfigPar->ReTrans_16QAM[ 1].DTX_Xrv       = -1; /* Xrv for 1st Retransmission by DTX received, -1 means previous Xrv  */
CmacHsConfigPar->ReTrans_16QAM[ 2].DTX_Xrv       = -1; /* Xrv for 2nd Retransmission by DTX received, -1 means previous Xrv  */
CmacHsConfigPar->ReTrans_16QAM[ 3].DTX_Xrv       = -1; /* Xrv for 3rd Retransmission by DTX received, -1 means previous Xrv  */
CmacHsConfigPar->ReTrans_16QAM[ 0].DTXDeltaPower = 0;  /* not use */
CmacHsConfigPar->ReTrans_16QAM[ 1].DTXDeltaPower = 0;  /* Delta Power for 1st Retransmission by DTX received     */
CmacHsConfigPar->ReTrans_16QAM[ 2].DTXDeltaPower = 0;  /* Delta Power for 2nd Retransmission by DTX received     */
CmacHsConfigPar->ReTrans_16QAM[ 3].DTXDeltaPower = 0;  /* Delta Power for 3rd Retransmission by DTX received     */
```

* Refer to "Easy to" 5.2.5 Settings for retransmission

TS34.121 Table 9.2.1A.1: Test Parameters for Testing QPSK FRCs H–Set 1/H–Set 2/H–Set 3

Parameter	Unit	Test 1	Test 2	Test 3	Test 4
Phase reference	dBm/3.84 MHz	P–CPICH			
		–60			
Redundancy and constellation version coding sequence		{0,2,5,6}			
Maximum number of HARQ transmission		4			
Note: The HS–SCCH–1 and HS–PDSCH shall be transmitted continuously with constant power. HS–SCCH–1 shall only use the identity of the UE under test for those TTI intended for the UE.					

TS34.121 Table 9.2.1A.3: Test Parameters for Testing 16QAM FRCs H–Set 1/H–Set 2/H–Set 3

Parameter	Unit	Test 1	Test 2	Test 3	Test 4
Phase reference	dBm/3.84 MHz	P–CPICH			
		–60			
Redundancy and constellation version coding sequence		{6,2,1,5}			
Maximum number of HARQ transmission		4			
Note: The HS–SCCH–1 and HS–PDSCH shall be transmitted continuously with constant power. HS–SCCH–1 shall only use the identity of the UE under test for those TTI intended for the UE.					

HSDPA Channels (TS34.108 6.10.2.4.5.2 Interactive or Background/UL: 384 DL: [max bit rate depending on UE category]/PS RAB + UL: 3.4 DL: 3.4 kbps Serbs for DCCH)

Higher layer	RAB/Signalling RB	RAB
RLC	Logical channel type	DTCH
	RLC mode	AM
	Payload sizes, bit	320 (alt. 640)
	Max data rate, bps	depends on UE category NOTE1
	AMD PDU header, bit	16
MAC	MAC–d header, bit	0
	MAC multiplexing	N/A
	MAC–d PDU size, bit	336 (alt. 656)
	MAC–hs header fixed part, bit	21
Layer 1	TrCH type	HS–DSCH
	TTI	2 ms
	Coding type	TC
	CRC, bit	24
NOTE: The peak throughput may be limited by the maximum number of MAC–d PDUs that can be included in a single MAC–hs PDU (see 3GPP TS 25.321 [38]).		

```
CrlcConfigPar = &Packet_CrlcConfig_DTCH;
memset( CrlcConfigPar, 0, sizeof(CRLC_CONFIG_PAR) );

CrlcConfigPar->NumOfPUs             = 1;
CrlcConfigPar->PU_LengthTM          = 244;

CrlcConfigPar->PU_LengthUM          = 328;

CrlcConfigPar->PU_LengthAM          = 320;
```

```
CmacHsConfigPar->NumOfPriorityQueue = 1;
CmacHsConfigPar->NumOfLoch[0]       = 1;

/* LoCh Info */
CmacHsConfigPar->LochHsInfo[0][0].Loch     = D_DTCH;
CmacHsConfigPar->LochHsInfo[0][0].LochNo   = 07
CmacHsConfigPar->LochHsInfo[0][0].CTLength = 0;
CmacHsConfigPar->LochHsInfo[0][0].CTValue  = 0;
CmacHsConfigPar->LochHsInfo[0][0].SIDIndex = 0;
CmacHsConfigPar->LochHsInfo[0][0].UEID     = 0x1234; /* UE ID */ // Match to L3 Message
CmacHsConfigPar->LochHsInfo[0][0].UEIDType = UEID_H_RNTI;
```

MD8480C easy_to_9.0.pdf A.2.2.3.2 Description of CMAC_HS_CONFIG_PAR structure

	Specifies parameters of each Logical Channel in Priority Queue. Details of each parameter are described below.	
LochHsInfo [8][8]	Loch	Specifies the type of Logical Channel. DownLink : D_DCCH, D_DTCH
	LochNo	Specifies the channel number of Logical Channel. Specifies 0-7.
	Priority	Specifies the priority of Logical Channel. Currently disabled.
	CTLength	Specifies the length of CT field in MAC Header. Specify 0 or 4. (Set to 0 when not using CT field.)
	CTValue	Specifies the value of CT field in MAC Header. Can be set to 0 - 15.
	SIDIndex	Specifies 0 - 7.
	UEIDType	Specifies the value of UEID Type field. Specifies UEID_H_RNTI.
	UEID	Specifies the value of UEID Field.

```
/* Queue Info */

// Refer to "Easy to.." 5.2.5.2 MAC-hs Tx Window Size
CmacHsConfigPar->QueueInfo[0].MACHsWindowSize    = 16;

CmacHsConfigPar->QueueInfo[0].QueueID            = 0;

CmacHsConfigPar->QueueInfo[0].NumOfTFRI = NumOfTFRI;
for (i=0; i<CmacHsConfigPar->QueueInfo[0].NumOfTFRI; i++){
  CmacHsConfigPar->QueueInfo[0].TFRI[i].NumOfPDU   = 1 + i;
  CmacHsConfigPar->QueueInfo[0].TFRI[i].NumOfCode  = NumOfCh;
  CmacHsConfigPar->QueueInfo[0].TFRI[i].Xms        = ModScheme;
  CmacHsConfigPar->QueueInfo[0].TFRI[i].Xtbs       = Xtbs;
  CmacHsConfigPar->QueueInfo[0].TFRI[i].CodeOffset = CHOffset;
  CmacHsConfigPar->QueueInfo[0].TFRI[i].CQI        = 0;
}

CmacHsConfigPar->QueueInfo[0].PDUSize[0] = PDUSize;
```

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Specifications are subject to change without notice.

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