

**Source:** TSG CN WG 1  
**Title:** CR to Rel-4 (with mirror CRs) on Work Item TEI4 towards 24.008  
**Agenda item:** 7.12  
**Document for:** APPROVAL

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**Introduction:**

This document contains 3 CRs, **R99** to Work Item "TEI4", that have been agreed by **TSG CN WG1**, and are forwarded to TSG CN Plenary meeting #20 for approval.

Spec	CR	Rev	Cat	Phase	Subject	Version-Current	Version-New	Meeting-2nd-Level	Doc-2nd-Level
24.008	765	1	F	Rel-4	Indication of the MS support of "Modulation based multislots class"	4.10.0	4.11.0	N1-30	N1-030824
24.008	766	1	A	Rel-5	Indication of the MS support of "Modulation based multislots class"	5.7.0	5.8.0	N1-30	N1-030825
24.008	767	1	A	Rel-6	Indication of the MS support of "Modulation based multislots class"	6.0.0	6.1.0	N1-30	N1-030826

CR-Form-v7

## CHANGE REQUEST

⌘ **24.008 CR 765** ⌘ rev **1** ⌘ Current version: **4.10.0** ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

**Proposed change affects:** UICC apps  ME  Radio Access Network  Core Network

<b>Title:</b>	⌘ Indication of the MS support of "Modulation based multislot class"		
<b>Source:</b>	⌘ Siemens AG		
<b>Work item code:</b>	⌘ TEI-4	<b>Date:</b>	⌘ 20.05.2003
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ Rel-4
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)

<b>Reason for change:</b>	⌘ With the 44.060 CR 31 r1 (GP-010900) the possibility that the GPRS multislot capability is applied in case of a EGPRS-GMSK only TBF was introduced. This feature was agreed as an optional feature for the MS. The support of this feature was planned to be indicated in a separate bit in the " Mobile Station Classmark 3" and " MS Radio Access capability" IE, see LS in GP-010977. Unfortunately the inclusion of this bit was never agreed in CN1.
<b>Summary of change:</b>	⌘ The flag "Modulation based multislot class support" is introduced in the MS RAC IE.
<b>Consequences if not approved:</b>	⌘ It is not explicitly specified which multislot capability shall be applied for a Rel-4 EGPRS MS in case of EGPRS TBF with GMSK modulation. In consequence there is the risk of different assumptions in the MS and the network implementation and thus that a EGPRS TBF with a GMSK modulation will not work properly.

<b>Clauses affected:</b>	⌘ 10.5.5.12a										
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">N</td> </tr> <tr> <td style="padding: 2px;">X</td> <td style="padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;">X</td> <td style="padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px;">X</td> </tr> </table>	Y	N	X		X			X	Other core specifications	⌘ 44.060
	Y	N									
	X										
X											
	X										
Test specifications	⌘ 51.010										
O&M Specifications											
<b>Other comments:</b>	⌘										

### 10.5.5.12a MS Radio Access capability

The purpose of the *MS RA capability* information element is to provide the radio part of the network with information concerning radio aspects of the mobile station. The contents might affect the manner in which the network handles the operation of the mobile station.

The *MS RA capability* is a type 4 information element, with a maximum length of 52 octets.

The value part of a *MS RA capability* information element is coded as shown in table 10.5.146/3GPP TS 24.008.

For the indication of the Access Technology Types the following conditions shall apply:

- Among the three Access Type Technologies GSM 900-P, GSM 900-E and GSM 900-R only one shall be present.
- Due to shared radio frequency channel numbers between GSM 1800 and GSM 1900, the mobile station should provide the relevant radio access capability for either GSM 1800 band OR GSM 1900 band, not both.
- The MS shall indicate its supported Access Technology Types during a single MM procedure.
- If the alternative coding by using the Additional access technologies struct is chosen by the mobile station, the mobile station shall indicate its radio access capability for the serving BCCH frequency band in the first included Access capabilities struct.
- The first Access Technology Type shall not be set to "1111".

For error handling the following shall apply:

- If a received Access Technology Type is unknown to the receiver, it shall ignore all the corresponding fields.
- If within a known Access Technology Type a receiver recognizes an unknown field it shall ignore it.
- For more details about error handling of MS radio access capability see 3GPP TS 48.018 [86].

Table 10.5.146/3GPP TS 24.008: *Mobile Station Radio Access Capability* Information Element

```

<MS Radio Access capability IE > ::=
<MS Radio Access capability IEI : 00100100 >
<Length of MS RA capability: <octet>> -- length in octets of MS RA capability value part and spare bits
<MS RA capability value part : <MS RA capability value part struct >>
<spare bits>**; -- may be used for future enhancements

<MS RA capability value part struct > ::= --recursive structure allows any number of Access technologies
{ { < Access Technology Type: bit (4) exclude 1111 >
  < Access capabilities : <Access capabilities struct > > }

  | { < Access Technology Type: bit (4) == 1111 > -- structure adding Access technologies with same
capabilities
  < Length : bit (7) > -- length in bits of list of Additional access technologies and spare bits
  { 1 < Additional access technologies: < Additional access technologies struct > > } ** 0
  <spare bits>** } }

{ 0 | 1 <MS RA capability value part struct > } ;

< Additional access technologies struct > ::=
  < Access Technology Type : bit (4) >
  < GMSK Power Class : bit (3) >
  < 8PSK Power Class : bit (2) > ;

< Access capabilities struct > ::=
  < Length : bit (7) > -- length in bits of Content and spare bits
  <Access capabilities : <Content>>
  <spare bits>** ; -- expands to the indicated length
  -- may be used for future enhancements

< Content > ::=
  < RF Power Capability : bit (3) >
  { 0 | 1 <A5 bits : <A5 bits> > } -- zero means that the same values apply for parameters as in the immediately
preceding Access capabilities field within this IE
  < ES IND : bit >
  < PS : bit >
  < VGCS : bit >
  < VBS : bit >
  { 0 | 1 < Multislot capability : Multislot capability struct > } -- zero means that the same values for multislot
parameters as given in an earlier Access capabilities field within this IE apply also here
-- Additions in release 99
  { 0 | 1 < 8PSK Power Capability : bit(2)> } -- '1' also means 8PSK modulation capability in uplink.
  < COMPACT Interference Measurement Capability : bit >
  < Revision Level Indicator : bit >
  < UMTS FDD Radio Access Technology Capability : bit > -- 3G RAT
  < UMTS 3.84 Mcps TDD Radio Access Technology Capability : bit > -- 3G RAT
  < CDMA 2000 Radio Access Technology Capability : bit > -- 3G RAT
-- Additions in release 4
  < UMTS 1.28 Mcps TDD Radio Access Technology Capability: bit > -- 3G RAT
  < GERAN Feature Package 1 : bit >
  { 0 | 1 < Extended DTM GPRS Multi Slot Class : bit(2) >
    < Extended DTM EGPRS Multi Slot Class : bit(2) > } ;
  < Modulation based multislot class support : bit >;
  -- error: struct too short, assume features do not exist
  -- error: struct too long, ignore data and jump to next Access technology

```

Table 10.5.146/3GPP TS 24.008 (continued): *Mobile Station Radio Access Capability IE*

```

< Multislot capability struct > ::=
  { 0 | 1 < HSCSD multislot class : bit (5) > }
  { 0 | 1 < GPRS multislot class : bit (5) > < GPRS Extended Dynamic Allocation Capability : bit > }
  { 0 | 1 < SMS_VALUE : bit (4) > < SM_VALUE : bit (4) > }
-- Additions in release 99
  { 0 | 1 < ECSD multislot class : bit (5) > }
  { 0 | 1 < EGPRS multislot class : bit (5) > < EGPRS Extended Dynamic Allocation Capability : bit > }
  { 0 | 1 < DTM GPRS Multi Slot Class: bit(2)>
    <MAC Mode Support : bit>
    { 0 | 1 <EGPRS DTM Multi Slot Class : bit(2)> } } ;
-- error: struct too short, assume features do not exist

<A5 bits> ::= < A5/1 : bit> <A5/2 : bit> <A5/3 : bit> <A5/4 : bit> <A5/5 : bit> <A5/6 : bit> <A5/7 : bit>; -- bits for circuit
mode ciphering algorithms. These fields are not used by the network and may be excluded by the MS.

Access Technology Type
This field indicates the access technology type to be associated with the following access capabilities.
Bits
4 3 2 1
0 0 0 0 GSM P
0 0 0 1 GSM E --note that GSM E covers GSM P
0 0 1 0 GSM R --note that GSM R covers GSM E and GSM P
0 0 1 1 GSM 1800
0 1 0 0 GSM 1900
0 1 0 1 GSM 450
0 1 1 0 GSM 480
0 1 1 1 GSM 850
1 0 0 0 GSM 700
1 1 1 1 Indicates the presence of a list of Additional access technologies
All other values are treated as unknown by the receiver.

A MS which does not support any GSM access technology type shall set this field to '0000'.

RF Power Capability, GMSK Power Class (3 bit field)
This field contains the binary coding of the power class used for GMSK associated with the indicated Access
Technology Type (see 3GPP TS 45.005).

A MS which does not support any GSM access technology type shall set this field to '000'.

8PSK Power Capability (2 bit field)
If 8-PSK modulation is supported for uplink, this field indicates the radio capability for 8-PSK modulation. The
following coding is used (see 3GPP TS 45.005 [33]):
Bits 2 1
0 0 Reserved
0 1 Power class E1
1 0 Power class E2
1 1 Power class E3

8PSK Power Class (2 bit field)
This field indicates the radio capability for 8-PSK modulation. The following coding is used (see 3GPP TS 45.005):
Bits 2 1
0 0 8PSK modulation not supported for uplink
0 1 Power class E1
1 0 Power class E2
1 1 Power class E3

Additional access technologies struct
This structure contains the GMSK Power Class and 8PSK Power Class for an additional Access Technology. All
other capabilities for this indicated Access Technology are the same as the capabilities indicated by the preceding
Access capabilities struct.

A5/1
0 encryption algorithm A5/1 not available
1 encryption algorithm A5/1 available

A5/2

```

0 encryption algorithm A5/2 not available  
1 encryption algorithm A5/2 available

**A5/3**

0 encryption algorithm A5/3 not available  
1 encryption algorithm A5/3 available

**A5/4**

0 encryption algorithm A5/4 not available  
1 encryption algorithm A5/4 available

**A5/5**

0 encryption algorithm A5/5 not available  
1 encryption algorithm A5/5 available

**A5/6**

0 encryption algorithm A5/6 not available  
1 encryption algorithm A5/6 available

**A5/7**

0 encryption algorithm A5/7 not available  
1 encryption algorithm A5/7 available

**ES IND** – (Controlled early Classmark Sending)

0 "controlled early Classmark Sending" option is not implemented  
1 "controlled early Classmark Sending" option is implemented

**Table 10.5.146/3GPP TS 24.008 (concluded): Mobile Station Radio Access Capability IE****PS** – (Pseudo Synchronisation)

- 0 PS capability not present
- 1 PS capability present

**VGCS** – (Voice Group Call Service)

- 0 no VGCS capability or no notifications wanted
- 1 VGCS capability and notifications wanted.

**VBS** – (Voice Broadcast Service)

- 0 no VBS capability or no notifications wanted
- 1 VBS capability and notifications wanted

**HSCSD Multi Slot Class**

The Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32]. This field is not used by the network and may be excluded by the MS. Range 1 to 18, all other values are reserved.

**GPRS Multi Slot Class**

The GPRS Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32].

*—Additions in release 99*

**ECSD Multi Slot Class**

The presence of this field indicates ECSD capability. Whether the MS is capable of 8-PSK modulation in uplink is indicated by the presence of 8-PSK Power Capability field. The Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32]. This field is not used by the network and may be excluded by the MS. Range 1 to 18, all other values are reserved.

**EGPRS Multi Slot Class**

The presence of this field indicates EGPRS capability. Whether the MS is capable of 8-PSK modulation in uplink is indicated by the presence of 8-PSK Power Capability field. The EGPRS Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32].

**GPRS Extended Dynamic Allocation Capability**

- 0 Extended Dynamic Allocation Capability for GPRS is not implemented
- 1 Extended Dynamic Allocation Capability for GPRS is implemented

**EGPRS Extended Dynamic Allocation Capability**

- 0 Extended Dynamic Allocation Capability for EGPRS is not implemented
- 1 Extended Dynamic Allocation Capability for EGPRS is implemented

**SMS\_VALUE (Switch-Measure-Switch)** (4 bit field)

The SMS field indicates the time needed for the mobile station to switch from one radio channel to another, perform a neighbor cell power measurement, and the switch from that radio channel to another radio channel. This field is not used by the network and may be excluded by the MS.

Bits

- |     |   |   |   |                                    |
|-----|---|---|---|------------------------------------|
| 4   | 3 | 2 | 1 |                                    |
| 0   | 0 | 0 | 0 | 1/4 timeslot (~144 microseconds)   |
| 0   | 0 | 0 | 1 | 2/4 timeslot (~288 microseconds)   |
| 0   | 0 | 1 | 0 | 3/4 timeslot (~433 microseconds)   |
| ... |   |   |   |                                    |
| 1   | 1 | 1 | 1 | 16/4 timeslot (~2307 microseconds) |

**(SM\_VALUE) Switch-Measure** (4 bit field)

The SM field indicates the time needed for the mobile station to switch from one radio channel to another and perform a neighbour cell power measurement. This field is not used by the network and may be excluded by the MS.

Bits

- |     |   |   |   |                                    |
|-----|---|---|---|------------------------------------|
| 4   | 3 | 2 | 1 |                                    |
| 0   | 0 | 0 | 0 | 1/4 timeslot (~144 microseconds)   |
| 0   | 0 | 0 | 1 | 2/4 timeslot (~288 microseconds)   |
| 0   | 0 | 1 | 0 | 3/4 timeslot (~433 microseconds)   |
| ... |   |   |   |                                    |
| 1   | 1 | 1 | 1 | 16/4 timeslot (~2307 microseconds) |

**DTM GPRS Multi Slot Class** (2 bit field)

This field indicates the GPRS DTM multislot capabilities of the MS. It is coded as follows:

Bits

2 1

0 0 Multislot class 1 supported

0 1 Multislot class 5 supported

1 0 Multislot class 9 supported

1 1 Reserved for future extension. If received, the network shall interpret this as '00'

**MAC Mode Support** (1 bit field)

This field indicates whether the MS supports Dynamic and Fixed Allocation or only supports Exclusive Allocation

Bit

1

0 Dynamic and Fixed Allocation not supported

1 Dynamic and Fixed allocation supported

**EGPRS DTM Multi Slot Class** (2 bit field)

This field indicates the EGPRS DTM multislot capabilities of the MS. This field shall be included only if the mobile station supports EGPRS DTM. This field is coded as the DTM GPRS multislot Class field.

**COMPACT Interference Measurement Capability** (1 bit field)

Bit

0 COMPACT Interference Measurement Capability is not implemented

1 COMPACT Interference Measurement Capability is implemented

**Revision Level Indicator** (1 bit field)

Bit

0 The ME is Release '98 or older

1 The ME is Release '99 onwards

**UMTS FDD Radio Access Technology Capability** (1 bit field)

Bit

0 UMTS FDD not supported

1 UMTS FDD supported

**UMTS 3.84 Mcps TDD Radio Access Technology Capability** (1 bit field)

Bit

0 UMTS 3.84 Mcps TDD not supported

1 UMTS 3.84 Mcps TDD supported

**CDMA 2000 Radio Access Technology Capability** (1 bit field)

Bit

0 CDMA2000 not supported

1 CDMA2000 supported

**UMTS 1.28 Mcps TDD Radio Access Technology Capability** (1 bit field)

Bit

0 UMTS 1.28 Mcps TDD not supported

1 UMTS 1.28 Mcps TDD supported

**GERAN Feature Package 1** (1 bit field)

This field indicates whether the MS supports the GERAN Feature Package 1 (see 3GPP TS 44.060). It is coded as follows:

Bit

0 GERAN feature package 1 not supported.

1 GERAN feature package 1 supported.

**Extended GPRS DTM Multi Slot Class** (2 bit field)

This field indicates the extended GPRS DTM capabilities of the MS and shall be interpreted in conjunction with the GPRS DTM Multi Slot Class field. It is coded as follows, where 'DGMSC' denotes the DTM GPRS multislot class field:

DGMSC Bit	2 1	<b>Bit 2 1</b>	
	0 0	<b>0 0</b>	Multislot class 2 supported
	0 0	<b>0 1</b>	Multislot class 3 supported
	0 0	<b>1 0</b>	Multislot class 4 supported



0 0	1 1	Multislot class 8 supported
0 1	0 0	Multislot class 5 supported
0 1	0 1	Multislot class 6 supported
0 1	1 0	Multislot class 7 supported
0 1	1 1	Spare. If received, the network shall interpret it as '01 00'.
1 0	0 0	Multislot class 9 supported
1 0	0 1	Multislot class 10 supported
1 0	1 0	Multislot class 11 supported
1 0	1 1	Multislot class 12 supported

The presence of this field indicates that the MS supports combined fullrate and halfrate GPRS channels in the downlink. When this field is not present, the MS supports the multislot class indicated by the *DTM GPRS Multi Slot Class* field.

**Extended EGPRS DTM Multislot Class** (2 bit field)

This field is not considered when the EGPRS DTM Multislot Class field is not included. This field indicates the extended EGPRS DTM multislot capabilities of the MS and shall be interpreted in conjunction with the EGPRS DTM Multislot Class field. This field is coded as the Extended DTM GPRS Multislot Class field. The presence of this field indicates that the MS supports combined fullrate and halfrate GPRS channels in the downlink. When this field is not present, the MS supports the multislot class indicated by the *DTM GPRS Multi Slot Class* field.

**Modulation based multislot class support** (1 bit field)

Bit

0 "Modulation based multislot class" not supported

1 "Modulation based multislot class" supported

## CHANGE REQUEST

⌘ **24.008 CR 766** ⌘ rev **1** ⌘ Current version: **5.7.0** ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

**Proposed change affects:** UICC apps  ME  Radio Access Network  Core Network

<b>Title:</b>	⌘ Indication of the MS support of "Modulation based multislot class"		
<b>Source:</b>	⌘ Siemens AG		
<b>Work item code:</b>	⌘ TEI-4	<b>Date:</b>	⌘ 20.05.2003
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ Rel-5
	Use <u>one</u> of the following categories: <i>F</i> (correction) <i>A</i> (corresponds to a correction in an earlier release) <i>B</i> (addition of feature), <i>C</i> (functional modification of feature) <i>D</i> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)

<b>Reason for change:</b>	⌘ With the 44.060 CR 31 r1 (GP-010900) the possibility that the GPRS multislot capability is applied in case of a EGPRS-GMSK only TBF was introduced. This feature was agreed as an optional feature for the MS. The support of this feature was planned to be indicated in a separate bit in the " Mobile Station Classmark 3" and " MS Radio Access capability" IE, see LS in GP-010977. Unfortunately the inclusion of this bit was never agreed in CN1.
<b>Summary of change:</b>	⌘ The flag "Modulation based multislot class support" is introduced in the MS RAC IE.
<b>Consequences if not approved:</b>	⌘ It is not explicitly specified which multislot capability shall be applied for a Rel-4 EGPRS MS in case of EGPRS TBF with GMSK modulation. In consequence there is the risk of different assumptions in the MS and the network implementation and thus that a EGPRS TBF with a GMSK modulation will not work properly.

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Y	N										
X											
X											
	X										
<b>Other comments:</b>	⌘										

### 10.5.5.12a MS Radio Access capability

The purpose of the *MS RA capability* information element is to provide the radio part of the network with information concerning radio aspects of the mobile station. The contents might affect the manner in which the network handles the operation of the mobile station.

The *MS RA capability* is a type 4 information element, with a maximum length of 52 octets.

The value part of a *MS RA capability* information element is coded as shown in table 10.5.146/3GPP TS 24.008.

For the indication of the Access Technology Types the following conditions shall apply:

- Among the three Access Type Technologies GSM 900-P, GSM 900-E and GSM 900-R only one shall be present.
- Due to shared radio frequency channel numbers between GSM 1800 and GSM 1900, the mobile station should provide the relevant radio access capability for either GSM 1800 band OR GSM 1900 band, not both.
- The MS shall indicate its supported Access Technology Types during a single MM procedure.
- If the alternative coding by using the Additional access technologies struct is chosen by the mobile station, the mobile station shall indicate its radio access capability for the serving BCCH frequency band in the first included Access capabilities struct.
- The first Access Technology Type shall not be set to "1111".

For error handling the following shall apply:

- If a received Access Technology Type is unknown to the receiver, it shall ignore all the corresponding fields.
- If within a known Access Technology Type a receiver recognizes an unknown field it shall ignore it.
- For more details about error handling of MS radio access capability see 3GPP TS 48.018 [86].

Table 10.5.146/3GPP TS 24.008: *Mobile Station Radio Access Capability Information Element*

```

<MS Radio Access capability IE > ::=
<MS Radio Access capability IEI : 00100100 >
<Length of MS RA capability: <octet>> -- length in octets of MS RA capability value part and spare bits
<MS RA capability value part : <MS RA capability value part struct >>
<spare bits>**; -- may be used for future enhancements

<MS RA capability value part struct > ::= --recursive structure allows any number of Access technologies
{ { < Access Technology Type: bit (4) > exclude 1111
  < Access capabilities : <Access capabilities struct > }

  | { < Access Technology Type: bit (4) == 1111 > -- structure adding Access technologies with same
capabilities
  < Length : bit (7) > -- length in bits of list of Additional access technologies and spare bits
  { 1 < Additional access technologies: < Additional access technologies struct > } ** 0
  <spare bits>** } }

{ 0 | 1 <MS RA capability value part struct > } ;

< Additional access technologies struct > ::=
  < Access Technology Type : bit (4) >
  < GMSK Power Class : bit (3) >
  < 8PSK Power Class : bit (2) > ;

< Access capabilities struct > ::=
  < Length : bit (7) > -- length in bits of Content and spare bits
  <Access capabilities : <Content>>
  <spare bits>** ; -- expands to the indicated length
  -- may be used for future enhancements

< Content > ::=
  < RF Power Capability : bit (3) >
  { 0 | 1 <A5 bits : <A5 bits> > } -- zero means that the same values apply for parameters as in the immediately
preceding Access capabilities field within this IE
  < ES IND : bit >
  < PS : bit >
  < VGCS : bit >
  < VBS : bit >
  { 0 | 1 < Multislot capability : Multislot capability struct > } -- zero means that the same values for multislot
parameters as given in an earlier Access capabilities field within this IE apply also here
-- Additions in release 99
  { 0 | 1 < 8PSK Power Capability : bit(2)> } -- '1' also means 8PSK modulation capability in uplink.
  < COMPACT Interference Measurement Capability : bit >
  < Revision Level Indicator : bit >
  < UMTS FDD Radio Access Technology Capability : bit > -- 3G RAT
  < UMTS 3.84 Mcps TDD Radio Access Technology Capability : bit > -- 3G RAT
  < CDMA 2000 Radio Access Technology Capability : bit > -- 3G RAT
-- Additions in release 4
  < UMTS 1.28 Mcps TDD Radio Access Technology Capability: bit > -- 3G RAT
  < GERAN Feature Package 1 : bit >
  { 0 | 1 < Extended DTM GPRS Multi Slot Class : bit(2)>
  < Extended DTM EGPRS Multi Slot Class : bit(2) > }
  < Modulation based multislot class support : bit >
-- Additions in release 5
  { 0 | 1 < High Multislot Capability : bit(2) > }
  < GERAN Iu Mode Capability : bit >;
  -- error: struct too short, assume features do not exist
  -- error: struct too long, ignore data and jump to next Access technology

```

Table 10.5.146/3GPP TS 24.008 (continued): *Mobile Station Radio Access Capability IE*

```

< Multislot capability struct > ::=
  { 0 | 1 < HSCSD multislot class : bit (5) > }
  { 0 | 1 < GPRS multislot class : bit (5) > < GPRS Extended Dynamic Allocation Capability : bit > }
  { 0 | 1 < SMS_VALUE : bit (4) > < SM_VALUE : bit (4) > }
-- Additions in release 99
  { 0 | 1 < ECSD multislot class : bit (5) > }
  { 0 | 1 < EGPRS multislot class : bit (5) > < EGPRS Extended Dynamic Allocation Capability : bit > }
  { 0 | 1 < DTM GPRS Multi Slot Class: bit(2)>
    <MAC Mode Support : bit>
    { 0 | 1 <DTM EGPRS Multi Slot Class : bit(2)> } } ;
-- error: struct too short, assume features do not exist

<A5 bits> ::= < A5/1 : bit> <A5/2 : bit> <A5/3 : bit> <A5/4 : bit> <A5/5 : bit> <A5/6 : bit> <A5/7 : bit>; -- bits for circuit
mode ciphering algorithms. These fields are not used by the network and may be excluded by the MS.

Access Technology Type
This field indicates the access technology type to be associated with the following access capabilities.

Bits
4 3 2 1
0 0 0 0 GSM P
0 0 0 1 GSM E --note that GSM E covers GSM P
0 0 1 0 GSM R --note that GSM R covers GSM E and GSM P
0 0 1 1 GSM 1800
0 1 0 0 GSM 1900
0 1 0 1 GSM 450
0 1 1 0 GSM 480
0 1 1 1 GSM 850
1 0 0 0 GSM 700
1 1 1 1 Indicates the presence of a list of Additional access technologies
All other values are treated as unknown by the receiver.

A MS which does not support any GSM access technology type shall set this field to '0000'.

RF Power Capability, GMSK Power Class (3 bit field)
This field contains the binary coding of the power class used for GMSK associated with the indicated Access
Technology Type (see 3GPP TS 45.005).

A MS which does not support any GSM access technology type shall set this field to '000'.

8PSK Power Capability (2 bit field)
If 8-PSK modulation is supported for uplink, this field indicates the radio capability for 8-PSK modulation. The
following coding is used (see 3GPP TS 45.005 [33]):
Bits 2 1
0 0 Reserved
0 1 Power class E1
1 0 Power class E2
1 1 Power class E3

8PSK Power Class (2 bit field)
This field indicates the radio capability for 8-PSK modulation. The following coding is used (see 3GPP TS 45.005):
Bits 2 1
0 0 8PSK modulation not supported for uplink
0 1 Power class E1
1 0 Power class E2
1 1 Power class E3

Additional access technologies struct
This structure contains the GMSK Power Class and 8PSK Power Class for an additional Access Technology. All
other capabilities for this indicated Access Technology are the same as the capabilities indicated by the preceding
Access capabilities struct.

A5/1
0 encryption algorithm A5/1 not available
1 encryption algorithm A5/1 available

```

**A5/2**

- 0 encryption algorithm A5/2 not available
- 1 encryption algorithm A5/2 available

**A5/3**

- 0 encryption algorithm A5/3 not available
- 1 encryption algorithm A5/3 available

**A5/4**

- 0 encryption algorithm A5/4 not available
- 1 encryption algorithm A5/4 available

**A5/5**

- 0 encryption algorithm A5/5 not available
- 1 encryption algorithm A5/5 available

**A5/6**

- 0 encryption algorithm A5/6 not available
- 1 encryption algorithm A5/6 available

**A5/7**

- 0 encryption algorithm A5/7 not available
- 1 encryption algorithm A5/7 available

**ES IND** – (Controlled early Classmark Sending)

- 0 "controlled early Classmark Sending" option is not implemented
- 1 "controlled early Classmark Sending" option is implemented

**Table 10.5.146/3GPP TS 24.008 (concluded): Mobile Station Radio Access Capability IE****PS** – (Pseudo Synchronisation)

- 0 PS capability not present
- 1 PS capability present

**VGCS** – (Voice Group Call Service)

- 0 no VGCS capability or no notifications wanted
- 1 VGCS capability and notifications wanted.

**VBS** – (Voice Broadcast Service)

- 0 no VBS capability or no notifications wanted
- 1 VBS capability and notifications wanted

**HSCSD Multi Slot Class**

The Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32]. This field is not used by the network and may be excluded by the MS. Range 1 to 18, all other values are reserved.

**GPRS Multi Slot Class**

The GPRS Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32].

~~—Additions in release 99~~

**ECSD Multi Slot Class**

The presence of this field indicates ECSD capability. Whether the MS is capable of 8-PSK modulation in uplink is indicated by the presence of 8-PSK Power Capability field. The Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32]. This field is not used by the network and may be excluded by the MS. Range 1 to 18, all other values are reserved.

**EGPRS Multi Slot Class**

The presence of this field indicates EGPRS capability. Whether the MS is capable of 8-PSK modulation in uplink is indicated by the presence of 8-PSK Power Capability field. The EGPRS Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32].

**GPRS Extended Dynamic Allocation Capability**

- 0 Extended Dynamic Allocation Capability for GPRS is not implemented
- 1 Extended Dynamic Allocation Capability for GPRS is implemented

**EGPRS Extended Dynamic Allocation Capability**

- 0 Extended Dynamic Allocation Capability for EGPRS is not implemented
- 1 Extended Dynamic Allocation Capability for EGPRS is implemented

**SMS\_VALUE (Switch-Measure-Switch)** (4 bit field)

The SMS field indicates the time needed for the mobile station to switch from one radio channel to another, perform a neighbor cell power measurement, and the switch from that radio channel to another radio channel. This field is not used by the network and may be excluded by the MS.

Bits

4 3 2 1

0 0 0 0 1/4 timeslot (~144 microseconds)

0 0 0 1 2/4 timeslot (~288 microseconds)

0 0 1 0 3/4 timeslot (~433 microseconds)

...

1 1 1 1 16/4 timeslot (~2307 microseconds)

**(SM\_VALUE) Switch-Measure** (4 bit field)

The SM field indicates the time needed for the mobile station to switch from one radio channel to another and perform a neighbour cell power measurement. This field is not used by the network and may be excluded by the MS.

Bits

4 3 2 1

0 0 0 0 1/4 timeslot (~144 microseconds)

0 0 0 1 2/4 timeslot (~288 microseconds)

0 0 1 0 3/4 timeslot (~433 microseconds)

...

1 1 1 1 16/4 timeslot (~2307 microseconds)

**DTM GPRS Multi Slot Class** (2 bit field)

This field indicates the GPRS DTM multislot capabilities of the MS. It is coded as follows:

Bits

2 1

0 0 Multislot class 1 supported

0 1 Multislot class 5 supported

1 0 Multislot class 9 supported

1 1 Reserved for future extension. If received, the network shall interpret this as '00'

**MAC Mode Support** (1 bit field)

This field indicates whether the MS supports Dynamic and Fixed Allocation or only supports Exclusive Allocation

Bit

0 Dynamic and Fixed Allocation not supported

1 Dynamic and Fixed allocation supported

**DTM EGPRS Multi Slot Class** (2 bit field)

This field indicates the DTM EGPRS multislot capabilities of the MS. This field shall be included only if the mobile station supports EGPRS DTM. This field is coded as the DTM GPRS multislot Class field.

**COMPACT Interference Measurement Capability** (1 bit field)

0 COMPACT Interference Measurement Capability is not implemented

1 COMPACT Interference Measurement Capability is implemented

**Revision Level Indicator** (1 bit field)

Bit

0 The ME is Release '98 or older

1 The ME is Release '99 onwards

**UMTS FDD Radio Access Technology Capability** (1 bit field)

Bit

0 UMTS FDD not supported

1 UMTS FDD supported

**UMTS 3.84 Mcps TDD Radio Access Technology Capability** (1 bit field)

Bit

0 UMTS 3.84 Mcps TDD not supported

1 UMTS 3.84 Mcps TDD supported

**CDMA 2000 Radio Access Technology Capability** (1 bit field)

Bit

0 CDMA 2000 not supported

1 CDMA 2000 supported

**UMTS 1.28 Mcps TDD Radio Access Technology Capability** (1 bit field)

Bit

0 UMTS 1.28 Mcps TDD not supported

1 UMTS 1.28 Mcps TDD supported

**GERAN Feature Package 1** (1 bit field)

This field indicates whether the MS supports the GERAN Feature Package 1 (see 3GPP TS 44.060). It is coded as follows:

0 GERAN feature package 1 not supported.

1 GERAN feature package 1 supported.

**Extended DTM GPRS Multi Slot Class** (2 bit field)

This field indicates the extended DTM GPRS capabilities of the MS and shall be interpreted in conjunction with the DTM GPRS Multi Slot Class field. It is coded as follows, where 'DGMSC' denotes the DTM GPRS multislot class field:

DGMSC Bit	2 1	Bit 2 1	
	0 0	0 0	Multislot class 2 supported
	0 0	0 1	Multislot class 3 supported
	0 0	1 0	Multislot class 4 supported
	0 0	1 1	Multislot class 8 supported
	0 1	0 0	Multislot class 5 supported
	0 1	0 1	Multislot class 6 supported



0 1	1 0	Multislot class 7 supported
0 1	1 1	Not used. If received, the network shall interpret it as '01 00'.
1 0	0 0	Multislot class 9 supported
1 0	0 1	Multislot class 10 supported
1 0	1 0	Multislot class 11 supported
1 0	1 1	Multislot class 12 supported

The presence of this field indicates that the MS supports combined fullrate and half-rate GPRS channels in the downlink. When this field is not present, the MS supports the multislot class indicated by the *DTM GPRS Multi Slot Class* field.

#### Extended DTM EGPRS Multislot Class (2 bit field)

This field is not considered when the DTM EGPRS Multislot Class field is not included. This field indicates the extended DTM EGPRS multislot capabilities of the MS and shall be interpreted in conjunction with the DTM EGPRS Multislot Class field. This field is coded as the Extended DTM GPRS Multislot Class field. The presence of this field indicates that the MS supports combined fullrate and half-rate GPRS channels in the downlink. When this field is not present, the MS supports the multislot class indicated by the DTM GPRS Multi Slot Class field.

#### Modulation based multislot class support (1 bit field)

Bit

0 "Modulation based multislot class" not supported

1 "Modulation based multislot class" supported

#### High Multislot Capability (2 bit field)

The High Multislot Capability is individually combined with each multislot class field sent by the MS (the possible multislot class fields are: HSCSD multislot class, ECSD multislot class, GPRS multislot class, EGPRS multislot class, DTM GPRS multislot class, DTM EGPRS multislot class, extended DTM GPRS multislot class and extended DTM EGPRS multislot class) to extend the related multislot class to multislot classes 30 to 45, see 3GPP TS 45.002.

For each multislot class, the following mapping is done:

Bits

2 1	coded multislot class field	actual multislot class
0 0	8	30
0 0	10, 23, 28, 29	39
0 0	11, 20, 25	32
0 0	12, 21, 22, 26, 27	33
0 0	Any other	Multislot Class field value
0 1	8	35
0 1	10, 19, 24	36
0 1	11, 23, 28, 29	45
0 1	12, 21, 22, 26, 27	38
0 1	Any other	Multislot Class field value
1 0	8	40
1 0	10, 19, 24	41
1 0	11, 20, 25	42
1 0	12, 23, 28, 29	44
1 0	Any other	Multislot Class field value
1 1	12, 21, 22, 26, 27	43
1 1	11, 20, 25	37
1 1	10, 19, 24	31
1 1	9, 23, 28, 29	34
1 1	Any other	Multislot Class field value

#### GERAN lu Mode Capability (1 bit field)

Bit

0 GERAN lu mode not supported

1 GERAN lu mode supported

CR-Form-v7

## CHANGE REQUEST

⌘ **24.008 CR 767** ⌘ rev **1** ⌘ Current version: **6.0.0** ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

**Proposed change affects:** UICC apps  ME  Radio Access Network  Core Network

<b>Title:</b>	⌘ Indication of the MS support of "Modulation based multislot class"		
<b>Source:</b>	⌘ Siemens AG		
<b>Work item code:</b>	⌘ TEI-4	<b>Date:</b>	⌘ 20.05.2003
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ Rel-6
	Use <u>one</u> of the following categories: <i>F</i> (correction) <i>A</i> (corresponds to a correction in an earlier release) <i>B</i> (addition of feature), <i>C</i> (functional modification of feature) <i>D</i> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)

<b>Reason for change:</b>	⌘ With the 44.060 CR 31 r1 (GP-010900) the possibility that the GPRS multislot capability is applied in case of a EGPRS-GMSK only TBF was introduced. This feature was agreed as an optional feature for the MS. The support of this feature was planned to be indicated in a separate bit in the " Mobile Station Classmark 3" and " MS Radio Access capability" IE, see LS in GP-010977. Unfortunately the inclusion of this bit was never agreed in CN1.
<b>Summary of change:</b>	⌘ The flag "Modulation based multislot class support" is introduced in the MS RAC IE.
<b>Consequences if not approved:</b>	⌘ It is not explicitly specified which multislot capability shall be applied for a Rel-4 EGPRS MS in case of EGPRS TBF with GMSK modulation. In consequence there is the risk of different assumptions in the MS and the network implementation and thus that a EGPRS TBF with a GMSK modulation will not work properly.

<b>Clauses affected:</b>	⌘ 10.5.5.12a										
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr> <td>Y</td> <td>N</td> </tr> <tr> <td>X</td> <td></td> </tr> <tr> <td>X</td> <td></td> </tr> <tr> <td></td> <td>X</td> </tr> </table> Other core specifications Test specifications O&M Specifications	Y	N	X		X			X	⌘ 44.060	⌘ 51.010
Y	N										
X											
X											
	X										
<b>Other comments:</b>	⌘										

### 10.5.5.12a MS Radio Access capability

The purpose of the *MS RA capability* information element is to provide the radio part of the network with information concerning radio aspects of the mobile station. The contents might affect the manner in which the network handles the operation of the mobile station.

The *MS RA capability* is a type 4 information element, with a maximum length of 52 octets.

The value part of a *MS RA capability* information element is coded as shown in table 10.5.146/3GPP TS 24.008.

For the indication of the Access Technology Types the following conditions shall apply:

- Among the three Access Type Technologies GSM 900-P, GSM 900-E and GSM 900-R only one shall be present.
- Due to shared radio frequency channel numbers between GSM 1800 and GSM 1900, the mobile station should provide the relevant radio access capability for either GSM 1800 band OR GSM 1900 band, not both.
- The MS shall indicate its supported Access Technology Types during a single MM procedure.
- If the alternative coding by using the Additional access technologies struct is chosen by the mobile station, the mobile station shall indicate its radio access capability for the serving BCCH frequency band in the first included Access capabilities struct.
- The first Access Technology Type shall not be set to "1111".

For error handling the following shall apply:

- If a received Access Technology Type is unknown to the receiver, it shall ignore all the corresponding fields.
- If within a known Access Technology Type a receiver recognizes an unknown field it shall ignore it.
- For more details about error handling of MS radio access capability see 3GPP TS 48.018 [86].

Table 10.5.146/3GPP TS 24.008: *Mobile Station Radio Access Capability Information Element*

```

<MS Radio Access capability IE > ::=
<MS Radio Access capability IEI : 00100100 >
<Length of MS RA capability: <octet>> -- length in octets of MS RA capability value part and spare bits
<MS RA capability value part : <MS RA capability value part struct >>
<spare bits>**; -- may be used for future enhancements

<MS RA capability value part struct > ::= --recursive structure allows any number of Access technologies
{ { < Access Technology Type: bit (4) > exclude 1111
  < Access capabilities : <Access capabilities struct > }

  | { < Access Technology Type: bit (4) == 1111 > -- structure adding Access technologies with same
capabilities
  < Length : bit (7) > -- length in bits of list of Additional access technologies and spare bits
  { 1 < Additional access technologies: < Additional access technologies struct > } ** 0
  <spare bits>** } }

{ 0 | 1 <MS RA capability value part struct > } ;

< Additional access technologies struct > ::=
  < Access Technology Type : bit (4) >
  < GMSK Power Class : bit (3) >
  < 8PSK Power Class : bit (2) > ;

< Access capabilities struct > ::=
  < Length : bit (7) > -- length in bits of Content and spare bits
  <Access capabilities : <Content>>
  <spare bits>** ; -- expands to the indicated length
  -- may be used for future enhancements

< Content > ::=
  < RF Power Capability : bit (3) >
  { 0 | 1 <A5 bits : <A5 bits> > } -- zero means that the same values apply for parameters as in the immediately
preceding Access capabilities field within this IE
  < ES IND : bit >
  < PS : bit >
  < VGCS : bit >
  < VBS : bit >
  { 0 | 1 < Multislot capability : Multislot capability struct > } -- zero means that the same values for multislot
parameters as given in an earlier Access capabilities field within this IE apply also here
-- Additions in release 99
  { 0 | 1 < 8PSK Power Capability : bit(2)> } -- '1' also means 8PSK modulation capability in uplink.
  < COMPACT Interference Measurement Capability : bit >
  < Revision Level Indicator : bit >
  < UMTS FDD Radio Access Technology Capability : bit > -- 3G RAT
  < UMTS 3.84 Mcps TDD Radio Access Technology Capability : bit > -- 3G RAT
  < CDMA 2000 Radio Access Technology Capability : bit > -- 3G RAT
-- Additions in release 4
  < UMTS 1.28 Mcps TDD Radio Access Technology Capability: bit > -- 3G RAT
  < GERAN Feature Package 1 : bit >
  { 0 | 1 < Extended DTM GPRS Multi Slot Class : bit(2)>
  < Extended DTM EGPRS Multi Slot Class : bit(2) > }
  < Modulation based multislot class support : bit >
-- Additions in release 5
  { 0 | 1 < High Multislot Capability : bit(2) > }
  < GERAN Iu Mode Capability : bit >;
  -- error: struct too short, assume features do not exist
  -- error: struct too long, ignore data and jump to next Access technology

```

Table 10.5.146/3GPP TS 24.008 (continued): *Mobile Station Radio Access Capability IE*

```

< Multislot capability struct > ::=
  { 0 | 1 < HSCSD multislot class : bit (5) > }
  { 0 | 1 < GPRS multislot class : bit (5) > < GPRS Extended Dynamic Allocation Capability : bit > }
  { 0 | 1 < SMS_VALUE : bit (4) > < SM_VALUE : bit (4) > }
-- Additions in release 99
  { 0 | 1 < ECSD multislot class : bit (5) > }
  { 0 | 1 < EGPRS multislot class : bit (5) > < EGPRS Extended Dynamic Allocation Capability : bit > }
  { 0 | 1 < DTM GPRS Multi Slot Class: bit(2)>
    <MAC Mode Support : bit>
    { 0 | 1 < DTM EGPRS Multi Slot Class : bit(2)> } } ;
-- error: struct too short, assume features do not exist

<A5 bits> ::= < A5/1 : bit> <A5/2 : bit> <A5/3 : bit> <A5/4 : bit> <A5/5 : bit> <A5/6 : bit> <A5/7 : bit>; -- bits for circuit
mode ciphering algorithms. These fields are not used by the network and may be excluded by the MS.

Access Technology Type
This field indicates the access technology type to be associated with the following access capabilities.

Bits
4 3 2 1
0 0 0 0 GSM P
0 0 0 1 GSM E --note that GSM E covers GSM P
0 0 1 0 GSM R --note that GSM R covers GSM E and GSM P
0 0 1 1 GSM 1800
0 1 0 0 GSM 1900
0 1 0 1 GSM 450
0 1 1 0 GSM 480
0 1 1 1 GSM 850
1 0 0 0 GSM 700
1 0 0 1 GSM T 380
1 0 1 0 GSM T 410
1 0 1 1 GSM T 900
1 1 1 1 Indicates the presence of a list of Additional access technologies
All other values are treated as unknown by the receiver.

A MS which does not support any GSM access technology type shall set this field to '0000'.

RF Power Capability, GMSK Power Class (3 bit field)
This field contains the binary coding of the power class used for GMSK associated with the indicated Access
Technology Type (see 3GPP TS 45.005).

A MS which does not support any GSM access technology type shall set this field to '000'.

8PSK Power Capability (2 bit field)
If 8-PSK modulation is supported for uplink, this field indicates the radio capability for 8-PSK modulation. The
following coding is used (see 3GPP TS 45.005 [33]):
Bits 2 1
0 0 Reserved
0 1 Power class E1
1 0 Power class E2
1 1 Power class E3

8PSK Power Class (2 bit field)
This field indicates the radio capability for 8-PSK modulation. The following coding is used (see 3GPP TS 45.005):
Bits 2 1
0 0 8PSK modulation not supported for uplink
0 1 Power class E1
1 0 Power class E2
1 1 Power class E3

Additional access technologies struct
This structure contains the GMSK Power Class and 8PSK Power Class for an additional Access Technology. All
other capabilities for this indicated Access Technology are the same as the capabilities indicated by the preceding
Access capabilities struct.

```

**A5/1**

0 encryption algorithm A5/1 not available  
1 encryption algorithm A5/1 available

**A5/2**

0 encryption algorithm A5/2 not available  
1 encryption algorithm A5/2 available

**A5/3**

0 encryption algorithm A5/3 not available  
1 encryption algorithm A5/3 available

**A5/4**

0 encryption algorithm A5/4 not available  
1 encryption algorithm A5/4 available

**A5/5**

0 encryption algorithm A5/5 not available  
1 encryption algorithm A5/5 available

**A5/6**

0 encryption algorithm A5/6 not available  
1 encryption algorithm A5/6 available

**A5/7**

0 encryption algorithm A5/7 not available  
1 encryption algorithm A5/7 available

**ES IND** – (Controlled early Classmark Sending)

0 "controlled early Classmark Sending" option is not implemented  
1 "controlled early Classmark Sending" option is implemented

**Table 10.5.146/3GPP TS 24.008 (concluded): Mobile Station Radio Access Capability IE****PS** – (Pseudo Synchronisation)

- 0 PS capability not present
- 1 PS capability present

**VGCS** – (Voice Group Call Service)

- 0 no VGCS capability or no notifications wanted
- 1 VGCS capability and notifications wanted.

**VBS** – (Voice Broadcast Service)

- 0 no VBS capability or no notifications wanted
- 1 VBS capability and notifications wanted

**HSCSD Multi Slot Class**

The Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32]. This field is not used by the network and may be excluded by the MS. Range 1 to 18, all other values are reserved.

**GPRS Multi Slot Class**

The GPRS Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32].

~~—Additions in release 99~~

**ECSD Multi Slot Class**

The presence of this field indicates ECSD capability. Whether the MS is capable of 8-PSK modulation in uplink is indicated by the presence of 8-PSK Power Capability field. The Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32]. This field is not used by the network and may be excluded by the MS. Range 1 to 18, all other values are reserved.

**EGPRS Multi Slot Class**

The presence of this field indicates EGPRS capability. Whether the MS is capable of 8-PSK modulation in uplink is indicated by the presence of 8-PSK Power Capability field. The EGPRS Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32].

**GPRS Extended Dynamic Allocation Capability**

- 0 Extended Dynamic Allocation Capability for GPRS is not implemented
- 1 Extended Dynamic Allocation Capability for GPRS is implemented

**EGPRS Extended Dynamic Allocation Capability**

- 0 Extended Dynamic Allocation Capability for EGPRS is not implemented
- 1 Extended Dynamic Allocation Capability for EGPRS is implemented

**SMS\_VALUE (Switch-Measure-Switch)** (4 bit field)

The SMS field indicates the time needed for the mobile station to switch from one radio channel to another, perform a neighbor cell power measurement, and the switch from that radio channel to another radio channel. This field is not used by the network and may be excluded by the MS.

Bits

4 3 2 1

0 0 0 0 1/4 timeslot (~144 microseconds)

0 0 0 1 2/4 timeslot (~288 microseconds)

0 0 1 0 3/4 timeslot (~433 microseconds)

...

1 1 1 1 16/4 timeslot (~2307 microseconds)

**(SM\_VALUE) Switch-Measure** (4 bit field)

The SM field indicates the time needed for the mobile station to switch from one radio channel to another and perform a neighbour cell power measurement. This field is not used by the network and may be excluded by the MS.

Bits

4 3 2 1

0 0 0 0 1/4 timeslot (~144 microseconds)

0 0 0 1 2/4 timeslot (~288 microseconds)

0 0 1 0 3/4 timeslot (~433 microseconds)

...

1 1 1 1 16/4 timeslot (~2307 microseconds)

**DTM GPRS Multi Slot Class** (2 bit field)

This field indicates the GPRS DTM multislot capabilities of the MS. It is coded as follows:

Bits

2 1

0 0 Multislot class 1 supported

0 1 Multislot class 5 supported

1 0 Multislot class 9 supported

1 1 Reserved for future extension. If received, the network shall interpret this as '00'

**MAC Mode Support** (1 bit field)

This field indicates whether the MS supports Dynamic and Fixed Allocation or only supports Exclusive Allocation

Bit

0 Dynamic and Fixed Allocation not supported

1 Dynamic and Fixed allocation supported

**DTM EGPRS Multi Slot Class** (2 bit field)

This field indicates the DTM EGPRS multislot capabilities of the MS. This field shall be included only if the mobile station supports EGPRS DTM. This field is coded as the DTM GPRS multislot Class field.

**COMPACT Interference Measurement Capability** (1 bit field)

0 COMPACT Interference Measurement Capability is not implemented

1 COMPACT Interference Measurement Capability is implemented

**Revision Level Indicator** (1 bit field)

Bit

0 The ME is Release '98 or older

1 The ME is Release '99 onwards

**UMTS FDD Radio Access Technology Capability** (1 bit field)

Bit

0 UMTS FDD not supported

1 UMTS FDD supported

**UMTS 3.84 Mcps TDD Radio Access Technology Capability** (1 bit field)

Bit

0 UMTS 3.84 Mcps TDD not supported

1 UMTS 3.84 Mcps TDD supported

**CDMA 2000 Radio Access Technology Capability** (1 bit field)

Bit

0 CDMA 2000 not supported

1 CDMA 2000 supported

**UMTS 1.28 Mcps TDD Radio Access Technology Capability** (1 bit field)

Bit

0 UMTS 1.28 Mcps TDD not supported

1 UMTS 1.28 Mcps TDD supported

**GERAN Feature Package 1** (1 bit field)

This field indicates whether the MS supports the GERAN Feature Package 1 (see 3GPP TS 44.060). It is coded as follows:

0 GERAN feature package 1 not supported.

1 GERAN feature package 1 supported.

**Extended DTM GPRS Multi Slot Class** (2 bit field)

This field indicates the extended DTM GPRS capabilities of the MS and shall be interpreted in conjunction with the DTM GPRS Multi Slot Class field. It is coded as follows, where 'DGMSC' denotes the DTM GPRS multislot class field:

DGMSC Bit	2 1	Bit 2 1	
	0 0	0 0	Multislot class 2 supported
	0 0	0 1	Multislot class 3 supported
	0 0	1 0	Multislot class 4 supported
	0 0	1 1	Multislot class 8 supported
	0 1	0 0	Multislot class 5 supported
	0 1	0 1	Multislot class 6 supported



0 1	1 0	Multislot class 7 supported
0 1	1 1	Not used. If received, the network shall interpret it as '01 00'.
1 0	0 0	Multislot class 9 supported
1 0	0 1	Multislot class 10 supported
1 0	1 0	Multislot class 11 supported
1 0	1 1	Multislot class 12 supported

The presence of this field indicates that the MS supports combined fullrate and halfrate GPRS channels in the downlink. When this field is not present, the MS supports the multislot class indicated by the *DTM GPRS Multi Slot Class* field.

#### Extended DTM EGPRS Multislot Class (2 bit field)

This field is not considered when the DTM EGPRS Multislot Class field is not included. This field indicates the extended DTM EGPRS multislot capabilities of the MS and shall be interpreted in conjunction with the DTM EGPRS Multislot Class field. This field is coded as the Extended DTM GPRS Multislot Class field. The presence of this field indicates that the MS supports combined fullrate and halfrate GPRS channels in the downlink. When this field is not present, the MS supports the multislot class indicated by the DTM GPRS Multi Slot Class field.

#### Modulation based multislot class support (1 bit field)

Bit

0 "Modulation based multislot class" not supported

1 "Modulation based multislot class" supported

#### High Multislot Capability (2 bit field)

The High Multislot Capability is individually combined with each multislot class field sent by the MS (the possible multislot class fields are: HSCSD multislot class, ECSD multislot class, GPRS multislot class, EGPRS multislot class, DTM GPRS multislot class, DTM EGPRS multislot class, extended DTM GPRS multislot class and extended DTM EGPRS multislot class) to extend the related multislot class to multislot classes 30 to 45, see 3GPP TS 45.002.

For each multislot class, the following mapping is done:

Bits

2 1	coded multislot class field	actual multislot class
0 0	8	30
0 0	10, 23, 28, 29	39
0 0	11, 20, 25	32
0 0	12, 21, 22, 26, 27	33
0 0	Any other	Multislot Class field value
0 1	8	35
0 1	10, 19, 24	36
0 1	11, 23, 28, 29	45
0 1	12, 21, 22, 26, 27	38
0 1	Any other	Multislot Class field value
1 0	8	40
1 0	10, 19, 24	41
1 0	11, 20, 25	42
1 0	12, 23, 28, 29	44
1 0	Any other	Multislot Class field value
1 1	12, 21, 22, 26, 27	43
1 1	11, 20, 25	37
1 1	10, 19, 24	31
1 1	9, 23, 28, 29	34
1 1	Any other	Multislot Class field value

#### GERAN lu Mode Capability (1 bit field)

Bit

0 GERAN lu mode not supported

1 GERAN lu mode supported