## **3GPP TSG CN Plenary Meeting #16** 5<sup>th</sup> - 7<sup>th</sup> June 2002. Marco Island, USA.

Source:	TSG CN WG 1
Title:	CR to R99, Rel-4 and Rel-5 on Work Item GPRS towards 24.008
Agenda item:	7.3
Document for:	APPROVAL

### Introduction:

This document contains **3** CRs on **R99**, **Rel-4** and **Rel-5** on Work Item "**GPRS**", that have been agreed by **TSG CN WG1**, and are forwarded to TSG CN Plenary meeting #16 for approval.

Spec	CR	Rev	Phase	Subject	Cat	Version Current		Meeting- 2nd-Level	Doc-2nd- Level
24.008	637	1	R99	Alternative coding of radio access capabilities	F	3.11.0	3.12.0	N1-24	N1-021396
24.008	638	1	Rel-4	Alternative coding of radio access capabilities	A	4.6.0	4.7.0	N1-24	N1-021397
24.008	639	1	Rel-5	Alternative coding of radio access capabilities	A	5.3.0	5.4.0	N1-24	N1-021398

# 3GPP TSG-CN1 Meeting #24

revised N1-021345

Budapest, Hungary, 13. – 17. May 2002

æ	<b>24.008</b> CR 637 <b># rev</b> 1 <sup># Current version:</sup> <b>3.11.0</b> <sup>#</sup>
For <u>HELP</u> on u	sing this form, see bottom of this page or look at the pop-up text over the $#$ symbols.
Proposed change a	affects: % (U)SIM ME/UE X Radio Access Network X Core Network
Title: #	Alternative coding of radio access capabilities
Source: ೫	Siemens AG
Work item code: Ж	GPRS Date: # 14.05.02
Category: ⊮	FRelease: %R99Use one of the following categories: F (correction)Use one of the following releases: 2(GSM Phase 2)A (corresponds to a correction in an earlier release)R96(Release 1996)B (addition of feature), C (functional modification of feature)R97(Release 1997)C (functional modification)R98(Release 1998)D (editorial modification)R99(Release 1999)Detailed explanations of the above categories can be found in 3GPP TR 21.900.REL-4(Release 5)
Reason for change	<ul> <li>The MS Radio Access capability IE is included in GMM messages and in RLC/MAC control messages. Due to the introduction of new fields in R99 which are included for each supported band, the overall length of the binary coded IE has significantly increased. If the MS Radio Access Capabilities have to be included in the Packet Resource Request message for RLC/MAC in GPRS mode, there are only <b>78</b> bits left for the coding of the MS RA capability value part (for Rel99, Rel-4 and Rel-5). This leads to the problem that maximal two bands could be included.</li> <li>In order to decrease this length an alternative coding for the indication of the supported bands is proposed.</li> <li>Furthermore the conditions under which bands must be included in the IE are clarified.</li> <li>It has been found that there is a number of CS parameters that the CS specific parameters A5bits, HSCSD, ECSD, SMS_VALUE and SM_VALUE included in the MS RAC IE are neither used by the BSS nor by the SGSN. In the current specification, it is not obvious that the MS is allowed to exclude those parameters. If these parameters are excluded, it will be possible to report more bands to the network.</li> </ul>
Summary of chang	<ul> <li>A new list of Additional access technologies struct is introduced. It contains just those capabilities which are different from Access technology to Access Technology. This structure contains always the Access Technology Type, the GMSK Power Capability and the 8PSK Power Capability.</li> <li>It is proposed to define that the MS is allowed to exclude the CS parameters: A5bits, HSCSD, ECSD, SMS_VALUE and SM_VALUE.</li> </ul>

Consequences if not approved: In GPRS the MS will from R99 onwards be able to include in maximum two of its supported bands during the TBF establishment and in consequence the network can't assign certain radio resources even the MS would support these.

Clauses affected:	# 10.5.5.12a
Other specs affected:	%       Other core specifications       %         Test specifications       O&M Specifications
Other comments:	x

## 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 a shown table 10.5.146/3GPP TS 24.008.

 SEMANTIC RULE : Among the three Access Type Technologies GSM 900 P, GSM 900 E and GSM 900 R only one shall be present.

- The MS shall indicate supported Access Technology Types. e.g. [450, 480, 900, 1800, UMTS] or [850, 1900] MHz bands during a single MM procedure.

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

- Among the three Access Technology Types 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:

- Error handling : 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.
- See For more details about error handling of MS radio access capability in see 3GPP TS GSM 08.18.
- Due to shared radio frequency channel numbers between 1800 and 1900, the mobile should provide the relevant MS Radio Access capability for either 1800 band OR 1900 band, not both.
- NOTE: The MS should not add spare bits following the <Content> field for the Access capabilities of an Access Technology Type, i.e. the MS should encode the <Length> field of the < Access capabilities struct > as the length in bits of <Content> only.

### 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  $\{ 1 < Additional access technologies: < Additional access technologies struct >> \} ** 0$  $\langle \text{spare bits} \rangle$ { 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) >  $\{0 \mid 1 < A5 \text{ bits} : < A5 \text{ bits} > \}$  -- zero means that the same values apply for parameters as in the immediately preceeding Access capabilities field within this IE The presence of the A5 bits is mandatory in the 1<sup>st</sup> Access capabilities struct within this IE. < **ES IND** : bit > < **PS** : bit > < VGCS : bit > < **VBS** : bit > $\{0 \mid 1 <$ **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  $\{ 0 \mid 1 <$ **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 error: struct too short, assume features do not exist -- error: struct too long, ignore data and jump to next Access technology

< Multislot capability struct > ::= { 0   1 < HSCSD multislot class : bit (5) > } { 0   1 < GPRS multislot class : bit (5) > < GPRS Extended Dynamic Allocation Capability : bit > }
$\{0 \mid 1 < GPRS \text{ multislot class } bit (5) > < GPRS Extended Dynamic Allocation Canability bit > b$
$1 \circ 1 \circ$
$\{0 \mid 1 < SMS_VALUE : bit (4) > < SM_VALUE : bit (4) > \}$
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 Sub-Class: bit(2)>
<mac :="" bit="" mode="" support=""></mac>
{0   1 < <b>DTM EGPRS Multi Slot Sub-Class</b> : bit(2)> } } ;
error: struct too short, assume features do not exist
<a5 bits=""> ::= &lt; A5/1 : bit&gt; <a5 2="" :="" bit=""> <a5 3="" :="" bit=""> <a5 4="" :="" bit=""> <a5 5="" :="" bit=""> <a5 6="" :="" bit=""> <a5 7="" :="" bit="">; bits for circle</a5></a5></a5></a5></a5></a5></a5>
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
4321
0000 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
0110 GSM 480
0 1 1 1 GSM 850
1111 Indicates the presence of a list of Additional access technologies
All other values are treated as unknown by the receiver.
RF Power Capability, GMSK Power Class (3 bit field)
This field is coded as radio capability in Classmark 3 for the indicated band: it contains the binary coding of he-the
power class <u>used for GMSK</u> associated with the indicated Access Technology Type (see 3GPP TS 05.05). (see G
05.05 paragraph 4.1 output power and paragraph 4.1.1 Mobile Station).
oo.oo parayrapit 1. i oulpul power and parayrapit 1. i. i Mobile Əlallotij.
8PSK Power Capability (2 bit field)
<b>8PSK Power Capability</b> (2 bit field) If 8-PSK modulation is supported for uplink, this field indicates the radio capability for 8-PSK modulation. The
<b>8PSK Power Capability</b> (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 05.05):
<b>8PSK Power Capability</b> (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 05.05): Bits 2 1
<ul> <li>8PSK Power Capability (2 bit field)</li> <li>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 05.05):</li> <li>Bits 2 1</li> <li>0 0 Reserved</li> </ul>
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 05.05): Bits 2 1 0 0 Reserved 0 1 Power class E1
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 05.05): Bits 2 1 0 0 Reserved 0 1 Power class E1 1 0 Power class E2
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 05.05): Bits 2 1 0 0 Reserved 0 1 Power class E1
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 05.05): Bits 21 00 Reserved 01 Power class E1 10 Power class E2 11 Power class E3
<ul> <li>8PSK Power Capability (2 bit field)</li> <li>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 05.05):</li> <li>Bits 21 <ul> <li>00</li> <li>Reserved</li> <li>01</li> <li>Power class E1</li> <li>10</li> <li>Power class E2</li> <li>11</li> <li>Power class E3</li> </ul> </li> <li>8PSK Power Class (2 bit field)</li> </ul>
<ul> <li>8PSK Power Capability (2 bit field)</li> <li>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 05.05):</li> <li>Bits 21 00 Reserved 01 Power class E1 10 Power class E2 11 Power class E3</li> <li>8PSK Power Class (2 bit field)</li> <li>This field indicates the radio capability for 8-PSK modulation. The following coding is used (see 3GPP TS 05.05):</li> </ul>
<ul> <li>8PSK Power Capability (2 bit field)</li> <li>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 05.05):</li> <li>Bits 21</li> <li>00 Reserved</li> <li>01 Power class E1</li> <li>10 Power class E2</li> <li>11 Power class E3</li> </ul> 8PSK Power Class (2 bit field) This field indicates the radio capability for 8-PSK modulation. The following coding is used (see 3GPP TS 05.05):
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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 05.05): Bits 21 00 Reserved 01 Power class E1 10 Power class E2 11 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 05.05): Bits 21 00 8PSK modulation not supported for uplink 01 Power class E1
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 05.05): Bits 21 00 Reserved 01 Power class E1 10 Power class E2 11 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 05.05): Bits 21 00 8PSK modulation not supported for uplink 01 Power class E1 10 Power class E1 10 Power class E1 10 Power class E1 10 Power class E1
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 05.05): 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 05.05): Bits 2 1 0 0 8PSK modulation not supported for uplink 0 1 Power class E1
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 05.05): Bits 21 00 Reserved 01 Power class E1 10 Power class E2 11 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 05.05): Bits 21 00 8PSK modulation not supported for uplink 01 Power class E1 10 Power class E1 01 Power class E1 10 Power class E1 10 Power class E1
SPSK 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 05.05):         Bits       2 1         00       Reserved         01       Power class E1         10       Power class E2         11       Power class E3         SPSK Power Class (2 bit field)         This field indicates the radio capability for 8-PSK modulation. The following coding is used (see 3GPP TS 05.05):         Bits       2 1         0       8PSK modulation not supported for uplink         01       Power class E1         10       Power class E3         Bits 2 1         0       8PSK modulation not supported for uplink         01       Power class E1         10       Power class E2         11       Power class E3
<b>BPSK Power Capability</b> (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 05.05):         Bits       21         00       Reserved         01       Power class E1         10       Power class E2         11       Power class E3 <b>BPSK Power Class</b> (2 bit field)         This field indicates the radio capability for 8-PSK modulation. The following coding is used (see 3GPP TS 05.05):         Bits       21         00       8PSK Power Class (2 bit field)         This field indicates the radio capability for 8-PSK modulation. The following coding is used (see 3GPP TS 05.05):         Bits       21         00       8PSK modulation not supported for uplink         01       Power class E1         10       Power class E2         11       Power class E2         11       Power class E3
<b>BPSK Power Capability</b> (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 05.05):         Bits       21         00       Reserved         01       Power class E1         10       Power class E2         11       Power class E3 <b>BYSK Power Class</b> (2 bit field)         This field indicates the radio capability for 8-PSK modulation. The following coding is used (see 3GPP TS 05.05):         Bits       21         0       8PSK Power Class (2 bit field)         This field indicates the radio capability for 8-PSK modulation. The following coding is used (see 3GPP TS 05.05):         Bits       21         0       8PSK modulation not supported for uplink         01       Power class E1         10       Power class E2         11       Power class E2         11       Power class E3         Additional access technologies struct         This structure contains the GMSK Power Class and 8PSK Power Class for an additional Access Technology. All
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 05.05):         Bits       2 1         0       Reserved         01       Power class E1         10       Power class E2         11       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 05.05):         Bits       2 1         0       8PSK modulation not supported for uplink         0       8PSK modulation not supported for uplink         0       1       Power class E1         10       Power class E1         1       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
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 05.05):         Bits       2 1         0       Reserved         01       Power class E1         10       Power class E2         11       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 05.05):         Bits       2 1         0       8PSK modulation not supported for uplink         01       Power class E1         10       Power class E1         11       Power class E2         11       Power class E2         11       Power class E1         01       Power class E1         10       Power class E2         11       Power class E2         11       Power class E2         11       Power class E3
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 05.05):         Bits       2 1         0       Reserved         01       Power class E1         10       Power class E2         11       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 05.05):         Bits       2.1         0       8PSK modulation not supported for uplink         0       8PSK modulation not supported for uplink         0       8PSK modulation not supported for uplink         0       1       Power class E1         1       0       8PSK modulation not supported for uplink         0       1       Power class E2         1       1       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
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<ul> <li>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 05.05):</li> <li>Bits 21 00 Reserved 01 Power class E1 10 Power class E2 11 Power class E3</li> <li>8PSK Power Class (2 bit field) This field indicates the radio capability for 8-PSK modulation. The following coding is used (see 3GPP TS 05.05): Bits 21 0 0 8PSK modulation not supported for uplink 01 Power class E1 10 Power class E1 10 Power class E2 11 Power class E2 11 Power class E3</li> <li>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.</li> <li>A5/1</li> </ul>
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 05.05):         Bits       21         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 05.05):         Bits       2.1         0.0       8PSK modulation not supported for uplink         0.1       Power class E1         1.0       Power class E1         1.1       Power class E1         1.1       Power class E1         1.1       Power class E2         1.1       Power class E2         1.1       Power class E3
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 05.05):         Bits       2 1         0       Reserved         01       Power class E1         10       Power class E2         11       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 05.05):         Bits       2 1         0       8PSK modulation not supported for uplink         0       8PSK modulation not supported for uplink         0       90         0       8PSK modulation not supported for uplink         1       Power class E1         10       Power class E2         11       Power class E2         11       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.         Asystem class E1         0       encryption algorithm A5/1 not available

I

1

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 Information Element

**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 GSM 05.02. 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 GSM 05.02.

### **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 GSM 05.02. 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 GSM 05.02.

### **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 neighbour 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		
4321		
0000	1/4 timeslot (~144 microseconds)	
0001	2/4 timeslot (~288 microseconds)	
0010	3/4 timeslot (~433 microseconds)	
1111	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		
	neighbour cell power measurement. This field is not used by the network and may be excluded by the MS.	
Bits		
4321		
0000	1/4 timeslot (~144 microseconds)	
0001	2/4 timeslot (~288 microseconds)	
0010	3/4 timeslot (~433 microseconds)	
1111	16/4 timeslot (~2307 microseconds)	

DTM	GPRS Multi Slot Sub-Class (2 bit field)
	GPRS Multi Slot Sub-Class (2 bit field)
	field indicates the GPRS DTM capabilities of the MS. The GPRS DTM Multi Slot Sub-Class is independent
	the Multi Slot Capabilities field.
Bits	
21	
00	Sub-Class 1 supported
01	Sub-Class 5 supported
10	Sub-Class 9 supported
11	Reserved for future extensionIf received, the network shall interpret this as '00'.
DTM	EGPRS Multi Slot Sub-Class (2 bit field)
	EGPRS Multi Slot Sub-Class (2 bit field)
	field indicates the EGPRS DTM capabilities of the MSThe DTM EGPRS Multi Slot Sub-Class is independent
from	the Multi Slot Capabilities field. This field shall be included only if the mobile station supports EGPRS DTM.
This f	ield is coded as the DTM GPRS Multislot Sub-Class field.
	Mode Support (1 bit field)
	Mode Support (1 bit field)
This f	field indicates whether the MS supports Dynamic and Fixed Allocation or only supports Exclusive Allocation.
Bit <del>s</del>	
4	
0	Dynamic and Fixed Allocation not supported
1	Dynamic and Fixed allocation supported
COM	PACT Interference Measurement Capability (1 bit field)
	PACT Interference Measurement Capability
<u>Bit</u>	
0	COMPACT Interference Measurement Capability is not implemented
1	COMPACT Interference Measurement Capability is implemented
0	COMPACT Interference Measurement Capability is not implemented
	COMPACT Interference Measurement Capability is implemented
Revis	sion Level Indicator_(1 bit field)
Bit	
0	The ME is Release '98 or older
-	
1	The ME is Release '99 onwards
UMT	S FDD Radio Access Technology Capability (1 bit field)
Bit	
0	UMTS FDD not supported
-	
1	UMTS FDD supported
118479	S 3.84 Mcps TDD Radio Access Technology Capability (1 bit field)
	S 3.04 MICHS I DO RAUIO ACCESS TECHNOLOGY CAPADILITY (T DIT LIEIA)
Bit	
0	UMTS <u>3.84 Mcps</u> TDD not supported
1	UMTS 3.84 Mcps TDD supported
	A 2000 Radio Accors Tashnalagy Canability (1 bit field)
	A 2000 Radio Access Technology Capability (1 bit field)
Bit	CDMA2000 pat supported
	CDMA2000 not supported CDMA2000 supported

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# 3GPP TSG-CN1 Meeting #24

revised N1-021346

Budapest, Hungary, 13. – 17. May 2002

	CHANGE REQUES	CR-Form-v5
æ	24.008 CR 638 <b># rev</b> 1	# Current version: <b>4.6.0</b> <sup>     #</sup>
For <u>HELP</u> on U	using this form, see bottom of this page or look a	at the pop-up text over the X symbols.
Proposed change	affects: % (U)SIM ME/UE X Radio	D Access Network X Core Network
Title: #	Alternative coding of radio access capabilities	3
Source: #	Siemens AG	
Work item code: ₩	GPRS	<i>Date:</i> ೫ <u>14.05.02</u>
Category: ₩	<ul> <li>A</li> <li>Use <u>one</u> of the following categories:</li> <li>F (correction)</li> <li>A (corresponds to a correction in an earlier rele</li> <li>B (addition of feature),</li> <li>C (functional modification of feature)</li> <li>D (editorial modification)</li> <li>Detailed explanations of the above categories can be found in 3GPP <u>TR 21.900</u>.</li> </ul>	Release: %REL-4Use oneof the following releases:2(GSM Phase 2)lease)R96(Release 1996)R97(Release 1997)R98(Release 1998)R99(Release 1999)REL-4(Release 4)REL-5(Release 5)
Reason for chang	<ul> <li>e: # The MS Radio Access capability IE is inclu RLC/MAC control messages. Due to the ir are included for each supported band, the has significantly increased. If the MS Radii included in the Packet Resource Request there are only 78 bits left for the coding of Rel99, Rel-4 and Rel-5). This leads to the be included.</li> <li>In order to decrease this length an alternar supported bands is proposed.</li> <li>Furthermore the conditions under which be clarified.</li> <li>It has been found that there is a number of parameters A5bits, HSCSD, ECSD, SMS_ MS RAC IE are neither used by the BSS r specification, it is not obvious that the MS If these parameters are excluded, it will be network.</li> </ul>	ntroduction of new fields in R99 which e overall length of the binary coded IE io Access Capabilities have to be message for RLC/MAC in GPRS mode, the MS RA capability value part (for problem that maximal two bands could ative coding for the indication of the pands must be included in the IE are of CS parameters that the CS specific _VALUE and SM_VALUE included in the hor by the SGSN. In the current is allowed to exclude those parameters.
Summary of chan	ge: # A new list of Additional access technologie those capabilities which are different from Technology. This structure contains alway GMSK Power Capability and the 8PSK Po It is proposed to define that the MS is allow A5bits, HSCSD, ECSD, SMS_VALUE and	Access technology to Access ys the Access Technology Type, the ower Capability. wed to exclude the CS parameters:

Consequences if not approved: In GPRS the MS will from R99 onwards be able to include in maximum two of its supported bands during the TBF establishment and in consequence the network can't assign certain radio resources even the MS would support these.

Clauses affected:	# 10.5.5.12a
Other specs affected:	%       Other core specifications       %         Test specifications       O&M Specifications
Other comments:	x

## 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 a shown table 10.5.146/3GPP TS 24.008.

- SEMANTIC RULE: Among the three Access Type Technologies GSM 900 P, GSM 900 E and GSM 900 R only one shall be present.
- The MS shall indicate supported Access Technology Types. e.g. [450, 480, 900, 1800, UMTS] or [700, 850, 1900] MHz bands during a single MM procedure.

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:

- Error handling: 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.
- See For more details about error handling of MS radio access capability in see 3GPP TS 48.018 [86].
- Due to shared radio frequency channel numbers between 1800 and 1900, the mobile should provide the relevant MS Radio Access capability for either 1800 band OR 1900 band, not both.

### 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 >>  $\langle$  spare bits $\rangle$   $\bar{*}$   $\bar{*}$ ; -- may be used for future enhancements <MS RA capability value part struct >::= --recursive structure allows any number of Access technologies < 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  $\{ 1 < Additional access technologies: < Additional access technologies struct >> \} ** 0$  $\langle \text{spare bits} \rangle \}$ \_{ 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) >  $\{0 \mid 1 < A5 \text{ bits} : < A5 \text{ bits} > \}$  -- zero means that the same values apply for parameters as in the immediately preceeding Access capabilities field within this IE The presence of the A5 bits is mandatory in the 1<sup>st</sup> Access capabilities struct within this IE. < **ES IND** : bit > < **PS** : bit > < VGCS : bit >  $\langle VBS : bit \rangle$  $\{ 0 \mid 1 <$ **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  $\{ 0 \mid 1 <$ **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 Additions in release 4 < GERAN Feature Package 1 : bit >  $\{ 0 \mid 1 < Extended DTM GPRS Multi Slot Class : bit(2) >$ < Extended DTM EGPRS Multi Slot Class : bit(2) > }: -- error: struct too short, assume features do not exist -- error: struct too long, ignore data and jump to next Access technology

< 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
<pre>{ 0   1 &lt; ECSD multislot class : bit (5) &gt; } { 0   1 &lt; EGPRS multislot class : bit (5) &gt; &lt; EGPRS Extended Dynamic Allocation Capability : bit &gt; } { 0   1 &lt; DTM GPRS Multi Slot Class: bit(2)&gt;</pre>
error: struct too short, assume features do not exist <a5 bits=""> ::= &lt; A5/1 : bit&gt; <a5 2="" :="" bit=""> <a5 3="" :="" bit=""> <a5 4="" :="" bit=""> <a5 5="" :="" bit=""> <a5 6="" :="" bit=""> <a5 7="" :="" bit="">; bits for circui mode ciphering algorithms. These fields are not used by the network and may be excluded by the MS.</a5></a5></a5></a5></a5></a5></a5>
Access Technology Type This field indicates the access technology type to be associated with the following access capabilities.
Bits 4321 0000 GSM P 0001 CSM F poto that CSM F course CSM 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       Indicates the presence of a list of Additional access technologies         All other values are treated as unknown by the receiver.
RF Power Capability, <u>GMSK Power Class (3 bit field)</u> This field is coded as radio capability in Classmark 3 for the indicated band: it contains the binary coding of hethe power class <u>used for GMSK</u> associated with the indicated Access Technology Type (see 3GPP TS 45.005). (see 3GPP TS 45.005 [33] paragraph 4.1 output power and paragraph 4.1.1 Mobile Station).
<b>8PSK Power Capability</b> (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
<ul> <li>0 0 Reserved</li> <li>0 1 Power class E1</li> <li>1 0 Power class E2</li> <li>1 1 Power class E3</li> </ul>
<b><u>8PSK Power Class (2 bit field)</u></b> This field indicates the radio capability for 8-PSK modulation. The following coding is used (see 3GPP TS 05.05): <u>Bits 21</u> <b>BITS 10</b> <b>BITS 10</b>
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
   encryption algorithm A5/3 available
1
A5/4
0 encryption algorithm A5/4 not available
   encryption algorithm A5/4 available
1
A5/5
0 encryption algorithm A5/5 not available
1 encryption algorithm A5/5 available
A5/6
0 encryption algorithm A5/6 not available
   encryption algorithm A5/6 available
1
A5/7
  encryption algorithm A5/7 not available
0
   encryption algorithm A5/7 available
1
ES IND - (Controlled early Classmark Sending)
   "controlled early Classmark Sending" option is not implemented
"controlled early Classmark Sending" option is implemented
0
1
```

# Table 10.5.146/3GPP TS 24.008 (concluded): Mobile Station Radio Access Capability Information Element

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<ul> <li>1 PS capability present</li> <li>VGCS - (Voice Group Call Service)</li> <li>on VGCS capability or on ontifications wanted.</li> <li>VGCS capability or on ontifications wanted.</li> <li>VGS capability or on ontifications wanted.</li> <li>VGS capability or on ontifications wanted.</li> <li>VBS capability on ontifications wanted.</li> <li>CBPS Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32].</li> <li>CEOD Multi Slot Class</li> <li>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 EGPRS Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32].</li> <li>CBPRS Multi Slot Class</li> <li>The presence of Hils 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 for GPRS is inplemented.</li> <li>Extended Dynamic Allocation Capability for GPRS is not implemented.</li> <li>Exte</li></ul>	
9) PS capability not present 1) 19 Capability not present 10 CCS - (Voice Group Call Service) 10 ro VGCS capability or no notifications wanted 1) VGCS capability or no notifications wanted 1) VGS capability or no notifications wanted 1) VBS capability and notifications wanted 1) VBS capability or no notifications wanted 1) VBS capability and notifications wanted 1) VBS capability and notifications wanted 1) VBS capability or used by the network and may be excluded by the MS. Range 1 to 18, all other values are reserved. 1) CFS Multi Slot Class 1) The 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. The Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32]. 1) 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]. 1) This field indicates ECPRS 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]. 1) This field indicates EGPRS 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]. 2) Extended Dynamic Allocation Capability for GPRS is in implemented 1) Extended Dynamic Allocation Capability for GPRS is in plemented 2) Ex	PS – (Pseudo Synchronisation)
VGCS - (Victor Group Call Service)         1       NGCS capability or no notifications wanted         VGCS capability or no notifications wanted         VGS - (Victor Broadcast Service)         1       VBS capability and notifications wanted         VBS capability and notifications wanted         HSCSD Multi Slot Class         File Multi Slot Class         File Multi Slot Class         File Multi Slot Class         GRS Multi Slot Class         File GPRS Multi Slot Class         File Presence of this field indicates ECSD capability field. The Multi Slot Class field is coded as the binary expresentation of the multislot class defined in 3GPP TS 45.002 [32].         - Additions in release 99         ECSD Multi Slot Class         File 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 for CPRS S is not implemented         The presence of this field indicates ECPRS capability for GPRS is in not implemented	D PS capability not present
<ul> <li>no VCCS capability or no notifications wanted</li> <li>VGCS capability or no notifications wanted.</li> <li>VBS capability and notifications wanted</li> <li>VBS capability on no notifications wanted</li> <li>VBS capability for the multislot class defined in 3GPP TS 45.002 [32].</li> <li>- Additions in release 99</li> <li>CSD Multi Slot Class</li> <li>The presence of this field indicates ECSD capability field. The Multi Slot Class field is not used by the network and may be excluded by the MS.</li> <li>Range 1 to 18, all other values are reserved.</li> <li>CSPRS Multi Slot Class</li> <li>For presence of this field indicates ECPRS capability (Field The EQPRS Multi Slot Class field is coded as the binary epresentation of the multislot class defined in 3GPP TS 45.002 [32].</li> <li>SPRS Extended Dynamic Allocation Capability for GPRS is inplemented</li> <li>Extended Dynamic Allocation Capability for GPRS is not implemented</li> <li>Extended Dynamic Allocation Capability for GPRS is into implemented</li> <li>Extended Dynamic Allocation Capability for GPRS is into implemented</li> <li>Extended Dynamic Allocation Capability for GPRS is into implemented</li> <li>Extended Dynamic Allocation Capability for GPRS is into implemen</li></ul>	PS capability present
<ul> <li>no VCCS capability or no notifications wanted</li> <li>VGCS capability and notifications wanted.</li> <li>VGS capability and notifications wanted</li> <li>VBS capability and notifications wanted</li> <li>VBS capability and notifications wanted</li> <li>VSCSD Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002</li> <li>23]. This field is not used by the network and may be excluded by the MS.</li> <li>targe 1 to 18, all other values are reserved.</li> <li>PRS Multi Slot Class</li> <li>FRS Multi Slot Class</li> <li>Field in class field is coded as the binary representation of the multislot class defined in 3GPP TS 15.002 [32].</li> <li>- Additions in release 99</li> <li>2CSD Multi Slot Class</li> <li>The presence of this field indicates ECSD capability. Whether the MS is capable of 8-PSK modulation in uplink is factade by the presence of 8-PSK Power Capability field. The Multi Slot Class field is coded as the binary epresentation of the multislot class defined in 3GPP TS 45.002 [32].</li> <li>- Additions in release 99</li> <li>2CSD Multi Slot Class</li> <li>The presence of this field indicates ECSD capability. Whether the MS is capable of 8-PSK modulation in uplink is noticated by the presence of 8-PSK Power Capability field. The EQRS Multi Slot Class field is coded as the binary epresentation of the multislot class defined in 3GPP TS 45.002 [32].</li> <li>SPRS Extended Dynamic Allocation Capability for GPRS is not implemented Extended Dynamic Allocation Capability for GPRS is into implemented Extended Dynamic Allocation Capability for GPRS is into implemented Extended Dynamic Allocation Capability for GPRS is into implemented Extended Dynamic Allocation Capability (or GPRS is into implemented Extended Dynamic Allocation Capability (or GPRS is into implemented Stot Class field is channel to another, perform neighbour cell power measurement, and the switch from that radio channel to another, neform ineighboure cell power measurement. This field is n</li></ul>	/GCS – (Voice Group Call Service)
BS - (Voice Broadcast Service)         In o VBS capability or no notifications wanted         VBS capability and notifications wanted         VBS capability and notifications wanted         VBS capability and notifications wanted         VBS capability is not used by the network and may be excluded by the MS.         tange 1 to 18, all other values are reserved.         PRES Multi Slot Class         File GPRS Multi Slot Class         File GPRS Multi Slot Class         The presence of this field indicates ECSD capability. Whether the MS is capable of 8-PSK modulation in uplink is dicated by the presence of 8-PSK Power Capability field. The Multi Slot Class field is coded as the binary epresentation 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.         target 1 to 18, all other values are reserved.         GPRS Multi Slot Class         the presence of this field indicates ECGRS capability. Whether the MS is capable of 8-PSK modulation in uplink is nicated by the presence of this field indicates EGPRS capability for GPRS is not implemented Extended Dynamic Allocation Capability for GPRS is not implemented Extended Dynamic Allocation Capability for GPRS is not implemented Extended Dynamic Allocation Capability for GPRS is not implemented Extended Dynamic Allocation Capability for GPRS is not implemented Extended Dynamic Allocation Capability	
<ul> <li>no VBS capability or no notifications wanted</li> <li>VBS capability and notifications wanted</li> <li>Instified is not used by the network and may be excluded by the MS.</li> <li>tange 1 to 18, all other values are reserved.</li> <li><b>2PRS Multi Slot Class</b></li> <li>the GPRS Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 6.002 [32].</li> <li>- Additions in release 99</li> <li><b>3CSD Multi Slot Class</b></li> <li>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 a-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].</li> <li>- Additions in release 99</li> <li><b>3CSD Multi Slot Class</b></li> <li>The presence of A-PSK Power Capability Field. The Multi Slot Class field is coded as the binary egresentation 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.</li> <li>tange 1 to 18, all other values are reserved.</li> <li><b>3GPRS Multi Slot Class</b></li> <li>The presence of A-PSK Power Capability. Whether the MS is capable of 8-PSK modulation in uplink is indicated by the presence of A-PSK power Capability field. The EGPRS Multi Slot Class field is coded as the binary egresentation of the multislot class defined in 3GPP TS 45.002 [32].</li> <li><b>SPRS Extended Dynamic Allocation Capability</b> for GPRS is not implemented Extended Dynamic Allocation Capability for GPRS is into implemented Extended Dynamic Allocation Capability for GPRS is implemented Extended Dynamic Allocation Capability for GPRS is implemented Extended Dynamic Allocation Capability for GPRS is into implemented Extended Dynamic Allocation Capability for GPRS is implemented Extended Dynamic Allocation Capability for GPRS is into implemented Extended Dynamic Allocation Capability for G</li></ul>	
<ul> <li>no VBS capability or no notifications wanted</li> <li>VBS capability and notifications wanted</li> <li>Instified is not used by the network and may be excluded by the MS.</li> <li>tange 1 to 18, all other values are reserved.</li> <li><b>2PRS Multi Slot Class</b></li> <li>the GPRS Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 6.002 [32].</li> <li>- Additions in release 99</li> <li><b>3CSD Multi Slot Class</b></li> <li>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 a-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].</li> <li>- Additions in release 99</li> <li><b>3CSD Multi Slot Class</b></li> <li>The presence of A-PSK Power Capability Field. The Multi Slot Class field is coded as the binary egresentation 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.</li> <li>tange 1 to 18, all other values are reserved.</li> <li><b>3GPRS Multi Slot Class</b></li> <li>The presence of A-PSK Power Capability. Whether the MS is capable of 8-PSK modulation in uplink is indicated by the presence of A-PSK power Capability field. The EGPRS Multi Slot Class field is coded as the binary egresentation of the multislot class defined in 3GPP TS 45.002 [32].</li> <li><b>SPRS Extended Dynamic Allocation Capability</b> for GPRS is not implemented Extended Dynamic Allocation Capability for GPRS is into implemented Extended Dynamic Allocation Capability for GPRS is implemented Extended Dynamic Allocation Capability for GPRS is implemented Extended Dynamic Allocation Capability for GPRS is into implemented Extended Dynamic Allocation Capability for GPRS is implemented Extended Dynamic Allocation Capability for GPRS is into implemented Extended Dynamic Allocation Capability for G</li></ul>	<b>/BS</b> – (Voice Broadcast Service)
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0 0 1 0 3/4 timeslot (~433 microseconds)	0 0 0 1 2/4 timeslot (~288 microseconds)
I 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 21 00 Multislot class 1 supported 01 Multislot class 5 supported 10 Multislot class 9 supported 11 Reserved for future extension. If received, the network shall interpret this as '00' MAC Mode Support (1 bit field) MAC Mode Support (1 bit field) This field indicates whether the MS supports Dynamic and Fixed Allocation or only supports Exclusive Allocation Bits 1 0 Dynamic and Fixed Allocation not supported Dynamic and Fixed allocation supported 1 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) COMPACT Interference Measurement Capability Bit 0 COMPACT Interference Measurement Capability is not implemented COMPACT Interference Measurement Capability is implemented 1 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) Rit UMTS FDD not supported 0 1 UMTS FDD supported UMTS 3.84 Mcps TDD Radio Access Technology Capability (1 bit field) Bit Λ UMTS 3.84 Mcps TDD not supported UMTS 3.84 Mcps TDD supported 1 CDMA 2000 Radio Access Technology Capability (1 bit field) Bit CDMA2000 not supported 0 CDMA2000 supported 1 UMTS 1.28 Mcps TDD Radio Access Technology Capability (1 bit field) Bit UMTS 1.28 Mcps TDD not supported 0 UMTS 1.28 Mcps TDD supported 1 **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 GERAN feature package 1 not supported. 0 GERAN feature package 1 supported. 1 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 21 Bit 21

Multislot class 2 supported

00

0 0	0 1	Multislot class 3 supported
0 0	10	Multislot class 4 supported
0 0	11	Multislot class 8 supported
0 1	00	Multislot class 5 supported
0 1	0 1	Multislot class 6 supported
0 1	10	Multislot class 7 supported
0 1	11	Spare. If received, the network shall interpret it as '01 00'.
10	00	Multislot class 9 supported
10	01	Multislot class 10 supported
10	10	Multislot class 11 supported
10	11	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.

# 3GPP TSG-CN1 Meeting #24

revised N1-021347

Budapest, Hungary, 13. – 17. May 2002

CHANGE REQUEST						
ж	24.008 CR 639 <b># rev</b> 1 <sup># Current version: 5.3.0 <sup>#</sup></sup>					
For <u>HELP</u> on usi	ing this form, see bottom of this page or look at the pop-up text over the $#$ symbols.					
Proposed change affects: # (U)SIM ME/UE X Radio Access Network X Core Network						
Title: ೫	Alternative coding of radio access capabilities					
Source: ೫	Siemens AG					
Work item code: #	GPRS         Date: # 14.05.02					
	ARelease: %REL-5Jse one of the following categories:Use one of the following releases:F (correction)2A (corresponds to a correction in an earlier release)R96B (addition of feature),R97C (functional modification of feature)R98D (editorial modification)R99D (editorial modifications of the above categories canREL-4Pe found in 3GPP TR 21.900.REL-5					
Reason for change:	<ul> <li># The MS Radio Access capability IE is included in GMM messages and in RLC/MAC control messages. Due to the introduction of new fields in R99 which are included for each supported band, the overall length of the binary coded IE has significantly increased. If the MS Radio Access Capabilities have to be included in the Packet Resource Request message for RLC/MAC in GPRS mode, there are only <b>78</b> bits left for the coding of the MS RA capability value part (for Rel99, Rel-4 and Rel-5). This leads to the problem that maximal two bands could be included.</li> <li>In order to decrease this length an alternative coding for the indication of the supported bands is proposed.</li> <li>Furthermore the conditions under which bands must be included in the IE are clarified.</li> <li>It has been found that there is a number of CS parameters that the CS specific parameters A5bits, HSCSD, ECSD, SMS_VALUE and SM_VALUE included in the MS RAC IE are neither used by the BSS nor by the SGSN. In the current specification, it is not obvious that the MS is allowed to exclude those parameters. If these parameters are excluded, it will be possible to report more bands to the network.</li> </ul>					
Summary of change	<ul> <li>A new list of Additional access technologies struct is introduced. It contains just those capabilities which are different from Access technology to Access Technology. This structure contains always the Access Technology Type, the GMSK Power Capability and the 8PSK Power Capability.</li> <li>It is proposed to define that the MS is allowed to exclude the CS parameters: A5bits, HSCSD, ECSD, SMS_VALUE and SM_VALUE.</li> </ul>					

Consequences if not approved: In GPRS the MS will from R99 onwards be able to include in maximum two of its supported bands during the TBF establishment and in consequence the network can't assign certain radio resources even the MS would support these.

Clauses affected:	# 10.5.5.12a
Other specs affected:	%       Other core specifications       %         Test specifications       O&M Specifications
Other comments:	x

## 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 a shown table 10.5.146/3GPP TS 24.008.

- SEMANTIC RULE: Among the three Access Type Technologies GSM 900 P, GSM 900 E and GSM 900 R only one shall be present.
- The MS shall indicate supported Access Technology Types. e.g. [450, 480, 900, 1800, UMTS] or [700, 850, 1900] MHz bands during a single MM procedure.

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:

- Error handling: 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.
- See For more details about error handling of MS radio access capability in see 3GPP TS 48.018 [86].
- Due to shared radio frequency channel numbers between 1800 and 1900, the mobile should provide the relevant MS Radio Access capability for either 1800 band OR 1900 band, not both.

### 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 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  $\{ 1 < Additional access technologies: < Additional access technologies struct >> \} ** 0$  $\langle \text{spare bits} \rangle \}$ \_{ 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) >  $\{0 \mid 1 < A5 \text{ bits} : < A5 \text{ bits} > \}$  -- zero means that the same values apply for parameters as in the immediately preceeding Access capabilities field within this IE *The presence of the A5 bits is mandatory in the 1<sup>st</sup> Access capabilities struct* within this IE. < **ES IND** : bit > < **PS** : bit > < VGCS : bit >  $\langle VBS : bit \rangle$  $\{ 0 \mid 1 <$ **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  $\{ 0 \mid 1 <$ **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 Additions in release 4 < GERAN Feature Package 1 : bit > { 0 | 1 < Extended DTM GPRS Multi Slot Class : bit(2) > < Extended DTM EGPRS Multi Slot Class : bit(2) > }: -- error: struct too short, assume features do not exist -- error: struct too long, ignore data and jump to next Access technology

<pre>&lt; Multislot capability struct &gt; ::= { 0   1 &lt; HSCSD multislot class : bit (5) &gt; } { 0   1 &lt; GPRS multislot class : bit (5) &gt; &lt; GPRS Extended Dynamic Allocation Capability : bit &gt; } { 0   1 &lt; SMS_VALUE : bit (4) &gt; &lt; SM_VALUE : bit (4) &gt; } Additions in release 99 { 0   1 &lt; ECSD multislot class : bit (5) &gt; } { 0   1 &lt; ECSD multislot class : bit (5) &gt; } { 0   1 &lt; EGPRS multislot class : bit (5) &gt; &lt; EGPRS Extended Dynamic Allocation Capability : bit { 0   1 &lt; ECSD multislot class : bit (5) &gt; } { 0   1 &lt; EGPRS multislot class : bit (5) &gt; &lt; EGPRS Extended Dynamic Allocation Capability : bit { 0   1 &lt; EGPRS Multi Slot Class: bit(2) &gt;</pre>	:> }
<pre><a5 bits=""> ::= &lt; A5/1 : bit&gt; <a5 2="" :="" bit=""> <a5 3="" :="" bit=""> <a5 4="" :="" bit=""> <a5 5="" :="" bit=""> <a5 6="" :="" bit=""> <a5 7="" :="" bit="">; bits for mode ciphering algorithms. These fields are not used by the network and may be excluded by the MS.</a5></a5></a5></a5></a5></a5></a5></pre>	r circuit
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 Enote that GSM E covers GSM P         0 0 1 0       GSM Rnote 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 1       GSM 450         0 1 1 1       GSM 850         1 0 0 0       GSM 700         1 1 1       Indicates the presence of a list of Additional access technologies         All other values are treated as unknown by the receiver. <b>RF Power Capability, GMSK Power Class</b> (3 bit field)         This field is coded as radio capability in Classmark 3 for the indicated band: it contains the binary coding of h power class used for GMSK associated with the indicated Access Technology Type (see 3GPP TS 45.005), 4 3GPP TS 45.005 [33] paragraph 4.1 output power and paragraph 4.1.1 Mobile Station). <b>8PSK Power Capability</b> (2 bit field)	<del>(soo</del>
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	!
11       Power class E3 <b>BPSK Power Class</b> (2 bit field)         This field indicates the radio capability for 8-PSK modulation. The following coding is used (see 3GPP TS 05)         Bits       2 1         00       8PSK modulation not supported for uplink         01       Power class E1         10       Power class E2         11       Power class E3	<u>.05):</u>
Additional access technologies struct This structure contains the GMSK Power Class and 8PSK Power Class for an additional Access Technology other capabilities for this indicated Access Technology are the same as the capabilities indicated by the prece Access capabilities struct.	
<ul> <li>A5/1</li> <li>0 encryption algorithm A5/1 not available</li> <li>1 encryption algorithm A5/1 available</li> <li>A5/2</li> <li>0 encryption algorithm A5/2 not available</li> </ul>	

```
1 encryption algorithm A5/2 available
A5/3
0 encryption algorithm A5/3 not available
   encryption algorithm A5/3 available
1
A5/4
0 encryption algorithm A5/4 not available
   encryption algorithm A5/4 available
1
A5/5
0 encryption algorithm A5/5 not available
1 encryption algorithm A5/5 available
A5/6
0 encryption algorithm A5/6 not available
   encryption algorithm A5/6 available
1
A5/7
  encryption algorithm A5/7 not available
0
   encryption algorithm A5/7 available
1
ES IND - (Controlled early Classmark Sending)
   "controlled early Classmark Sending" option is not implemented
"controlled early Classmark Sending" option is implemented
0
1
```

# Table 10.5.146/3GPP TS 24.008 (concluded): Mobile Station Radio Access Capability Information Element

I

	Element
<b>PS</b> – (Pse	audo Synchronisation)
) PS ca	pability not present
I PS ca	pability present
	Voice Group Call Service)
	CS capability or no notifications wanted
	capability and notifications wanted.
	pice Broadcast Service) S capability or no notifications wanted
	apability and notifications wanted
HSCSD	Multi Slot Class
	Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002
	field is not used by the network and may be excluded by the MS.
	o 18, all other values are reserved.
CPRS M	ulti Slot Class
	S Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS
45.002 [3	
Additio	ns in release 99
	ulti Slot Class
	nce of this field indicates ECSD capability. Whether the MS is capable of 8-PSK modulation in uplink is
	by the presence of 8-PSK Power Capability field. The Multi Slot Class field is coded as the binary
	ation of the multislot class defined in 3GPP TS 45.002 [32]. This field is not used by the network and may
	ed by the MS. o 18, all other values are reserved.
Kange I t	J 18, all other values are reserved.
	Iulti Slot Class
	ence of this field indicates EGPRS capability. Whether the MS is capable of 8-PSK modulation in uplink is
	by the presence of 8-PSK Power Capability field. The EGPRS Multi Slot Class field is coded as the binary ation of the multislot class defined in 3GPP TS 45.002 [32].
represent	allon of the multislot class defined in SGFT 13 43.002 [32].
	tended Dynamic Allocation Capability
	nded Dynamic Allocation Capability for GPRS is not implemented
	Ided Dynamic Allocation Capability for GPRS is implemented
	Ided Dynamic Allocation Capability for EGPRS is not implemented
	Ided Dynamic Allocation Capability for EGPRS is implemented
	LUE (Switch-Measure-Switch) (4 bit field)
	field indicates the time needed for the mobile station to switch from one radio channel to another, perform r cell power measurement, and the switch from that radio channel to another radio channel. This field is not
	he network and may be excluded by the MS.
Bits	
4321	
0000	1/4 timeslot (~144 microseconds)
0001	2/4 timeslot (~288 microseconds)
0010	3/4 timeslot (~433 microseconds)
1111	16/4 timeslot (~2307 microseconds)
	UE) Switch-Measure (4 bit field)
	eld indicates the time needed for the mobile station to switch from one radio channel to another and neighbour cell power measurement. This field is not used by the network and may be excluded by the MS.
Bits	noighead an power measurement. This heid is not used by the network and may be excluded by the Mo.
4321	
0000	1/4 timeslot (~144 microseconds)
0001	2/4 timeslot (~288 microseconds)
	3/4 timeslot (~433 microseconds)
0010	
0010	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)MAC Mode Support (1 bit field)

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

- ы 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)

COMPACT Interference Measurement Capability

- 0 COMPACT Interference Measurement Capability is not implemented
- 1 COMPACT Interference Measurement Capability is implemented
- 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:

- 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 Bit 2.1

DOMOC DI	<u> </u>		
	00	00	Multislot class 2 supported
	00	0 1	Multislot class 3 supported
	00	10	Multislot class 4 supported
	00	11	Multislot class 8 supported

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