

Source: TSG CN WG 1
Title: CRs to R99 Work Item EGPRS
Agenda item: 7.5
Document for: APPROVAL

Introduction:

This document contains 2 CRs on **R99** Work Item "**EGPRS**", that have been agreed by **TSG CN WG1**, and are forwarded to TSG CN Plenary meeting #10 for approval.

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
24.008	263	1	N1-001333	R99	Introduction of EGPRS for DTM	F	3.5.0
24.008	311		N1-001334	REL-4	Introduction of EGPRS for DTM	A	4.0.0

CR-Form-v3

CHANGE REQUEST

⌘ **24.008 CR 263** ⌘ rev **1** ⌘ Current version: **3.5.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ME/UE Radio Access Network Core Network

Title:	⌘ Introduction of EGPRS for DTM		
Source:	⌘ Nokia		
Work item code:	⌘ EGPRS	Date:	⌘ 22 Nov 2000
Category:	⌘ F	Release:	⌘ R99
Use <u>one</u> of the following categories: F (essential correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		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)	

Reason for change:	⌘ Separate DTM Multislot Sub-classes are needed for DTM GPRS and DTM EGPRS operation, since the MS capability is different for GPRS and EGPRS operation.
Summary of change:	⌘ In chapter 10.5.1.7 the field DTM Multi Slot Sub-Class is changed to DTM GPRS Multi Slot Sub-Class and the field DTM EGPRS Multi Slot Sub-Class is added. In chapter 10.5.5.12a the field DTM Multi Slot Sub-Class is changed to DTM GPRS Multi Slot Sub-Class and the field DTM EGPRS Multi Slot Sub-Class is added.
Consequences if not approved:	⌘ 24.008 is inconsistent with other specification where EGPRS for DTM has been introduced.

Clauses affected:	⌘ 10.5.1.7; 10.5.5.12a	
Other specs affected:	⌘ <input checked="" type="checkbox"/> Other core specifications	⌘ 44.018-017, 03.64-A074, 05.01-A029, 04.18-A140
	<input type="checkbox"/> Test specifications	
	<input type="checkbox"/> O&M Specifications	
Other comments:	⌘	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under <ftp://www.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

10.5.1.7 Mobile Station Classmark 3

The purpose of the *Mobile Station Classmark 3* information element is to provide the network with information concerning aspects of the mobile station. The contents might affect the manner in which the network handles the operation of the mobile station. The Mobile Station Classmark information indicates general mobile station characteristics and it shall therefore, except for fields explicitly indicated, be independent of the frequency band of the channel it is sent on.

The *MS Classmark 3* is a type 4 information element with a maximum of 14 octets length.

The value part of a *MS Classmark 3* information element is coded as shown in figure 10.5.7/TS 24.008 and table 10.5.7/TS 24.008.

NOTE: The 14 octet limit is so that the CLASSMARK CHANGE message will fit in one layer 2 frame.

SEMANTIC RULE : a multiband mobile station shall provide information about all frequency bands it can support. A single band mobile station shall not indicate the band it supports in the *Multiband Supported*, *GSM 400 Bands Supported*, *GSM 850 Associated Radio Capability* or *PCS 1900 Associated Radio Capability* fields in the MS Classmark 3. Due to shared radio frequency channel numbers between DCS 1800 and PCS 1900, the mobile should indicate support for either DCS 1800 band OR PCS 1900 band.

SEMANTIC RULE : a mobile station shall include the MS Measurement Capability field if the *Multi Slot Class* field contains a value of 19 or greater (see GSM 05.02).

Typically, the number of spare bits at the end is the minimum to reach an octet boundary. The receiver may add any number of bits set to "0" at the end of the received string if needed for correct decoding.

```

<Classmark 3 Value part> ::=
  < spare bit >
  {
    < Multiband supported : { 000 } >
    < A5 bits >
    < Multiband supported : { 101 | 110 } >
    < A5 bits >
    < Associated Radio Capability 2 : bit(4) >
    < Associated Radio Capability 1 : bit(4) >
    < Multiband supported : { 001 | 010 | 100 } >
    < A5 bits >
    < spare bit >(4)
    < Associated Radio Capability 1 : bit(4) > }
  { 0 | 1 < R Support > }
  { 0 | 1 < Multi Slot Capability > }
  < UCS2 treatment: bit >
  < Extended Measurement Capability : bit >
  { 0 | 1 < MS measurement capability > }
  { 0 | 1 < MS Positioning Method Capability > }
  { 0 | 1 < EDGE Multi Slot Capability > }
  { 0 | 1 < EDGE Struct > }
  { 0 | 1 < GSM 400 Bands Supported : { 01 | 10 | 11 } >
    < GSM 400 Associated Radio Capability: bit(4) > }

  { 0 | 1 <GSM 850 Associated Radio Capability : bit(4) > }
  { 0 | 1 <PCS 1900 Associated Radio Capability : bit(4) > }
  < UMTS FDD Radio Access Technology Capability : bit >
  < UMTS TDD Radio Access Technology Capability : bit >
  < CDMA 2000 Radio Access Technology Capability : bit >

  { 0 | 1 < DTM GPRS Multi Slot Sub-Class : bit(2) >
    < MAC Mode Support : bit >
    { 0 | 1 < EGPRS Support : bit(2) >
      < DTM EGPRS Multi Slot Sub-Class : bit(2) > }
    < spare bit > ;

  < A5 bits > ::=
    < A5/7 : bit > < A5/6 : bit > < A5/5 : bit > < A5/4 : bit > ;

  <R Support>::=
    < R-GSM band Associated Radio Capability : bit(3) > ;

  < Multi Slot Capability > ::=
    < Multi Slot Class : bit(5) > ;

  < MS Measurement capability > ::=
    < SMS_VALUE : bit (4) >
    < SM_VALUE : bit (4) > ;

  < MS Positioning Method Capability > ::=
    < MS Positioning Method : bit(5) > ;

  < EDGE Multi Slot Capability > ::=
    < EDGE Multi Slot Class : bit(5) > ;

  <EDGE Struct> ::=
    < Modulation Capability : bit >
    { 0 | 1 < EDGE RF Power Capability 1: bit(2) > }
    { 0 | 1 < EDGE RF Power Capability 2: bit(2) > }

```

Figure 10.5.7/TS 24.008 Mobile Station Classmark 3 information element

Table 10.5.7/TS 24.008: Mobile Station Classmark 3 information element

Multiband Supported (3 bit field)	
Band 1 supported (third bit of the field)	
<u>Bit</u>	<u>3</u>
0	P-GSM not supported
1	P-GSM supported
Band 2 supported (second bit of the field)	
<u>BIT</u>	<u>2</u>
0	E-GSM or R-GSM not supported
1	E-GSM or R-GSM supported
Band 3 supported (first bit of the field)	
<u>Bit</u>	<u>1</u>
0	DCS 1800 not supported
1	DCS 1800 supported
The indication of support of P-GSM band or E-GSM or R-GSM band is mutually exclusive.	
When the 'Band 2 supported' bit indicates support of E-GSM or R-GSM, the presence of the <R Support> field, see below, indicates if the E-GSM or R-GSM band is supported.	
In this version of the protocol, the sender indicates in this field either none, one or two of these 3 bands supported. If only one band is indicated, the receiver shall ignore the Associated Radio Capability 2.	
For single band mobile station all bits are set to 0.	
A5/4	
<u>Bit</u>	<u>1</u>
0	Encryption algorithm A5/4 not available
1	Encryption algorithm A5/4 available
A5/5	
<u>Bit</u>	<u>1</u>
0	Encryption algorithm A5/5 not available
1	Encryption algorithm A5/5 available
A5/6	
<u>Bit</u>	<u>1</u>
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
Associated Radio capability 1 and 2 (4 bit fields)	
If either of P-GSM or E-GSM or R-GSM is supported, the radio capability 1 field indicates the radio capability for P-GSM, E-GSM or R-GSM, and the radio capability 2 field indicates the radio capability for DCS1800 if supported, and is spare otherwise.	
If none of P-GSM or E-GSM or R-GSM are supported, the radio capability 1 field indicates the radio capability for DCS1800, and the radio capability 2 field is spare.	
The radio capability contains the binary coding of the power class associated with the band indicated in multiband support bits (see GSM 05.05).	

(continued...)

Table 10.5.1.7/TS 24.008 (continued): MS Classmark 3 information element

R Support

In case where the R-GSM band is supported the R-GSM band associated radio capability field contains the binary coding of the power class associated (see GSM 05.05). A mobile station supporting the R-GSM band shall also when appropriate, (see 10.5.1.6) indicate its support in the 'FC' bit in the Mobile Station Classmark 2 information element.

Note: the coding of the power class for P-GSM, E-GSM, R-GSM and DCS 1800 in radio capability 1 and/or 2 is different to that used in the Mobile Station Classmark 1 and Mobile Station Classmark 2 information elements.

Multi Slot Class (5 bit field)

In case the MS supports the use of multiple timeslots then the Multi Slot Class field is coded as the binary representation of the multislots class defined in TS GSM 05.02.

UCS2 treatment (1 bit field)

This information field indicates the likely treatment by the mobile station of UCS2 encoded character strings. If not included, the value 0 shall be assumed by the receiver.

Bit 1

0 the ME has a preference for the default alphabet (defined in GSM 03.38) over UCS2.

1 the ME has no preference between the use of the default alphabet and the use of UCS2.

Extended Measurement Capability (1 bit field)

This bit indicates whether the mobile station supports 'Extended Measurements' or not

Bit 1

0 the MS does not support Extended Measurements

1 the MS supports Extended Measurements

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.

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.

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)

MS Positioning Method Capability (1 bit field)

This bit indicates whether the MS supports Positioning Method or not for the provision of Location Services.

MS Positioning Method (5 bit field)

This field indicates the Positioning Method(s) supported by the mobile station.

MS assisted E-OTD

Bit 5

0 MS assisted E-OTD not supported

1 MS assisted E-OTD supported

Table 10.5.1.7/TS 24.008 (continued): MS Classmark 3 information element

MS based E-OTD

Bit 4
0 MS based E-OTD not supported
1 MS based E-OTD supported

MS assisted GPS

Bit 3
0 MS assisted GPS not supported
1 MS assisted GPS supported

MS based GPS

Bit 2
0 MS based GPS not supported
1 MS based GPS supported

MS conventional GPS

Bit 1
0 conventional GPS not supported
1 conventional GPS supported

EDGE Multi Slot class (5 bit field)

In case the EDGE MS supports the use of multiple timeslots and the number of supported time slots is different from number of time slots supported for GMSK then the EDGE Multi Slot class field is included and is coded as the binary representation of the multislot class defined in TS GSM 05.02.

Modulation Capability

Modulation Capability field indicates the supported modulation scheme by MS in addition to GMSK

Bit 1
0 8-PSK supported for downlink reception only
1 8-PSK supported for uplink transmission and downlink reception

EDGE RF Power Capability 1 (2 bit field)

If 8-PSK is supported for both uplink and downlink, the **EDGE RF Power Capability 1** field indicates the radio capability for GSM900.

The radio capability contains the binary coding of the EDGE power class(see GSM05.05).

EDGE RF Power Capability 2 (2 bit field)

If 8-PSK is supported for both uplink and downlink, the **EDGE RF Power Capability 2** field indicates the radio capability for DCS1800 or PCS1900 if supported, and is not included otherwise.
The radio capability contains the binary coding of the EDGE power class (see GSM 05.05).

Table 10.5.1.7/TS 24.008 (continued): MS Classmark 3 information element

GSM 400 Bands Supported (2 bit field)

Bits

2 1

0 1 GSM 480 supported, GSM 450 not supported

1 0 GSM 450 supported, GSM 480 not supported

1 1 GSM 450 supported, GSM 480 supported

GSM 400 Associated Radio Capability (4 bit field)

If either GSM 450 or GSM 480 or both is supported, the GSM 400 Associated Radio Capability field indicates the radio capability for GSM 450 and/or GSM 480.

The radio capability contains the binary coding of the power class associated with the band indicated in GSM 400 Bands Supported bits (see GSM 05.05).

Note: the coding of the power class for GSM 450 and GSM 480 in GSM 400 Associated Radio Capability is different to that used in the Mobile Station Classmark 1 and Mobile Station Classmark 2 information elements.

GSM 850 Associated Radio Capability (4 bit field)

This field indicates whether GSM 850 band is supported and its associated radio capability.

The radio capability contains the binary coding of the power class associated with the GSM 850 band (see GSM 05.05).

Note: the coding of the power class for GSM 850 in GSM 850 Associated Radio Capability is different to that used in the Mobile Station Classmark 1 and Mobile Station Classmark 2 information elements.

PCS 1900 Associated Radio Capability (4 bit field)

This field indicates whether PCS 1900 band is supported and its associated radio capability.

The radio capability contains the binary coding of the power class associated with the PCS 1900 band (see GSM 05.05).

Note: the coding of the power class for PCS 1900 in PCS 1900 Associated Radio Capability is different to that used in the Mobile Station Classmark 1 and Mobile Station Classmark 2 information elements.

Table 10.5.1.7/TS 24.008 (continued): MS Classmark 3 information element

UMTS FDD Radio Access Technology Capability (1 bit field)

Bit 1
 0 UMTS FDD not supported
 1 UMTS FDD supported

UMTS TDD Radio Access Technology Capability (1 bit field)

Bit 1
 0 UMTS TDD not supported
 1 UMTS TDD supported

CDMA 2000 Radio Access Technology Capability (1 bit field)

Bit 1
 0 CDMA2000 not supported
 1 CDMA2000 supported

DTM GPRS Multi Slot Sub-Class (2 bit field)

This field indicates the GPRS DTM capabilities of the MS. The DTM GPRS Multi Slot Sub-Class is independent from the Multi Slot Capabilities field. It is coded as follows:

Bit 2 1
 0 0 Sub-Class 1 supported
 0 1 Sub-Class 5 supported
 1 0 Sub-Class 9 supported
 1 1 Reserved for future extension. If received, the network shall interpret this as '00'

DTM EGPRS Multi Slot Sub-Class (2 bit field)

This field indicates the EGPRS DTM capabilities of the MS. The 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 field is coded as the DTM GPRS Multi Slot Sub-Class field.

MAC Mode Support (1 bit field)

This field indicates whether the MS supports Dynamic and Fixed Allocation or only supports Exclusive Allocation. It is coded as follows:

Bit 1
 0 Dynamic and Fixed Allocation not supported
 1 Dynamic and Fixed allocation supported

EGPRS Support (1 bit field)

~~This field indicates whether or not the MS supports EGPRS. It is coded as follows:~~

~~Bit 1
 0 EGPRS not supported
 1 EGPRS supported~~

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/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.
- 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 more details about error handling of MS radio access capability in 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.

Table 10.5.146/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) >
< Access capabilities : <Access capabilities struct> >
{ 0 | 1 <MS RA capability value part struct> } ;

< 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
preceeding Access capabilities field within this IE
  -- The presence of the A5 bits is mandatory in the 1st Access capabilities struct 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
  { 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 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 technolgy

```

Table 10.5.146/TS 24.008 (continued): Mobile Station Radio Access Capability Information Element

```

< 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) > } ;
  { 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-ClassDTM Multi Slot Sub Class: bit(2)>
    <MAC Mode Support : bit>
    <EGPRS Support : bit> { 0 | 1 < DTM EGPRS Multi Slot Sub-Class : bit(2)> } } ;

<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

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
All other values are treated as unknown by the receiver.

RF Power Capability
This field is coded as radio capability in Classmark 3 for the indicated band: it contains the binary coding of the power
class associated (see GSM 05.05 paragraph 4.1 output power and paragraph 4.1.1 Mobile Station).

8PSK Power Capability
This field is coded according to the definition in GSM 05.05. The presence of this field indicates also 8PSK
modulation capability in uplink.

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/TS 24.008 (concluded): Mobile Station Radio Access Capability Information Element

<p>PS – (Pseudo Synchronisation) 0 PS capability not present 1 PS capability present</p> <p>VGCS – (Voice Group Call Service) 0 no VGCS capability or no notifications wanted 1 VGCS capability and notifications wanted.</p> <p>VBS – (Voice Broadcast Service) 0 no VBS capability or no notifications wanted 1 VBS capability and notifications wanted</p> <p>HSCSD Multi Slot Class The Multi Slot Class field is coded as the binary representation of the multislot class defined in TS GSM 05.02. Range 1 to 18, all other values are reserved.</p> <p>GPRS Multi Slot Class The GPRS Multi Slot Class field is coded as the binary representation of the multislot class defined in TS GSM 05.02.</p> <p>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 TS GSM 05.02. Range 1 to 18, all other values are reserved.</p> <p>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 TS GSM 05.02.</p> <p>GPRS Extended Dynamic Allocation Capability 0 Extended Dynamic Allocation Capability for GPRS is not implemented 1 Extended Dynamic Allocation Capability for GPRS is implemented</p> <p>EGPRS Extended Dynamic Allocation Capability 0 Extended Dynamic Allocation Capability for EGPRS is not implemented 1 Extended Dynamic Allocation Capability for EGPRS is implemented</p> <p>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. 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)</p> <p>(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. 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)</p>

DTM GPRS Multi Slot Sub-Class (2 bit field)~~DTM Multi Slot Sub-Class (2 bit field)~~

This field indicates the GPRS DTM capabilities of the MS. The DTM GPRS Multi Slot Sub-Class is independent from the Multi Slot Capabilities field.

Bits

2 1

0 0 Sub-Class 1 supported

0 1 Sub-Class 5 supported

1 0 Sub-Class 9 supported

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

DTM EGPRS Multi Slot Sub-Class (2 bit field)

This field indicates the EGPRS DTM capabilities of the MS. The 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 field is coded as the DTM GPRS Multislot Sub-Class 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

1 Dynamic and Fixed allocation supported

EGPRS Support (1 bit field)

~~This field indicates whether or not the MS supports EGPRS~~

~~Bit~~

~~4~~

~~0 EGPRS not supported~~

~~1 EGPRS supported~~

COMPACT Interference Measurement Capability

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 TDD Radio Access Technology Capability (1 bit field)

Bit

0 UMTS TDD not supported

1 UMTS TDD supported

CDMA 2000 Radio Access Technology Capability (1 bit field)

Bit

0 CDMA2000 not supported

1 CDMA2000 supported

CR-Form-v3

CHANGE REQUEST

⌘ **24.008 CR 311** ⌘ rev ⌘ Current version: **4.0.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ME/UE Radio Access Network Core Network

Title:	⌘ Introduction of EGPRS for DTM		
Source:	⌘ Nokia		
Work item code:	⌘ EGPRS	Date:	⌘ 22 Nov 2000
Category:	⌘ A	Release:	⌘ REL-4
Use <u>one</u> of the following categories: F (essential correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		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)	

Reason for change:	⌘ Separate DTM Multislot Sub-classes are needed for DTM GPRS and DTM EGPRS operation, since the MS capability is different for GPRS and EGPRS operation.
Summary of change:	⌘ In chapter 10.5.1.7 the field DTM Multi Slot Sub-Class is changed to DTM GPRS Multi Slot Sub-Class and the field DTM EGPRS Multi Slot Sub-Class is added. In chapter 10.5.5.12a the field DTM Multi Slot Sub-Class is changed to DTM GPRS Multi Slot Sub-Class and the field DTM EGPRS Multi Slot Sub-Class is added.
Consequences if not approved:	⌘ 24.008 is inconsistent with other specification where EGPRS for DTM has been introduced.

Clauses affected:	⌘ 10.5.1.7; 10.5.5.12a		
Other specs affected:	⌘ <input checked="" type="checkbox"/> Other core specifications	⌘ 44.018-017, 03.64-A074, 05.01-A029, 04.18-A140	
	<input type="checkbox"/> Test specifications		
	<input type="checkbox"/> O&M Specifications		
Other comments:	⌘		

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under <ftp://www.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

10.5.1.7 Mobile Station Classmark 3

The purpose of the *Mobile Station Classmark 3* information element is to provide the network with information concerning aspects of the mobile station. The contents might affect the manner in which the network handles the operation of the mobile station. The Mobile Station Classmark information indicates general mobile station characteristics and it shall therefore, except for fields explicitly indicated, be independent of the frequency band of the channel it is sent on.

The *MS Classmark 3* is a type 4 information element with a maximum of 14 octets length.

The value part of a *MS Classmark 3* information element is coded as shown in figure 10.5.7/TS 24.008 and table 10.5.7/TS 24.008.

NOTE: The 14 octet limit is so that the CLASSMARK CHANGE message will fit in one layer 2 frame.

SEMANTIC RULE : a multiband mobile station shall provide information about all frequency bands it can support. A single band mobile station shall not indicate the band it supports in the *Multiband Supported, GSM 400 Bands Supported, GSM 850 Associated Radio Capability* or *PCS 1900 Associated Radio Capability* fields in the MS Classmark 3. Due to shared radio frequency channel numbers between DCS 1800 and PCS 1900, the mobile should indicate support for either DCS 1800 band OR PCS 1900 band.

SEMANTIC RULE : a mobile station shall include the MS Measurement Capability field if the *Multi Slot Class* field contains a value of 19 or greater (see GSM 05.02).

Typically, the number of spare bits at the end is the minimum to reach an octet boundary. The receiver may add any number of bits set to "0" at the end of the received string if needed for correct decoding.

```

<Classmark 3 Value part> ::=
  < spare bit >
  {
    < Multiband supported : { 000 } >
    < A5 bits >
    < Multiband supported : { 101 | 110 } >
    < A5 bits >
    < Associated Radio Capability 2 : bit(4) >
    < Associated Radio Capability 1 : bit(4) >
    < Multiband supported : { 001 | 010 | 100 } >
    < A5 bits >
    < spare bit >(4)
    < Associated Radio Capability 1 : bit(4) > }
  { 0 | 1 < R Support > }
  { 0 | 1 < Multi Slot Capability > }
  < UCS2 treatment: bit >
  < Extended Measurement Capability : bit >
  { 0 | 1 < MS measurement capability > }
  { 0 | 1 < MS Positioning Method Capability > }
  { 0 | 1 < EDGE Multi Slot Capability > }
  { 0 | 1 < EDGE Struct > }
  { 0 | 1 < GSM 400 Bands Supported : { 01 | 10 | 11 } >
    < GSM 400 Associated Radio Capability: bit(4) > }

  { 0 | 1 <GSM 850 Associated Radio Capability : bit(4) > }
  { 0 | 1 <PCS 1900 Associated Radio Capability : bit(4) > }
  < UMTS FDD Radio Access Technology Capability : bit >
  < UMTS TDD Radio Access Technology Capability : bit >
  < CDMA 2000 Radio Access Technology Capability : bit >

  { 0 | 1 < DTM GPRS Multi Slot Sub-Class : bit(2) >
    < MAC Mode Support : bit >
    { 0 | 1 < EGPRS Support : bit >
      < DTM EGPRS Multi Slot Sub-Class : bit(2) > }
    < spare bit > ;

  < A5 bits > ::=
    < A5/7 : bit > < A5/6 : bit > < A5/5 : bit > < A5/4 : bit > ;

  <R Support>::=
    < R-GSM band Associated Radio Capability : bit(3) > ;

  < Multi Slot Capability > ::=
    < Multi Slot Class : bit(5) > ;

  < MS Measurement capability > ::=
    < SMS_VALUE : bit (4) >
    < SM_VALUE : bit (4) > ;

  < MS Positioning Method Capability > ::=
    < MS Positioning Method : bit(5) > ;

  < EDGE Multi Slot Capability > ::=
    < EDGE Multi Slot Class : bit(5) > ;

  <EDGE Struct> ::=
    < Modulation Capability : bit >
    { 0 | 1 < EDGE RF Power Capability 1: bit(2) > }
    { 0 | 1 < EDGE RF Power Capability 2: bit(2) > }

```

Figure 10.5.7/TS 24.008 Mobile Station Classmark 3 information element

Table 10.5.7/TS 24.008: Mobile Station Classmark 3 information element

Multiband Supported (3 bit field)	
Band 1 supported (third bit of the field)	
<u>Bit</u>	<u>3</u>
0	P-GSM not supported
1	P-GSM supported
Band 2 supported (second bit of the field)	
<u>BIT</u>	<u>2</u>
0	E-GSM or R-GSM not supported
1	E-GSM or R-GSM supported
Band 3 supported (first bit of the field)	
<u>Bit</u>	<u>1</u>
0	DCS 1800 not supported
1	DCS 1800 supported
The indication of support of P-GSM band or E-GSM or R-GSM band is mutually exclusive.	
When the 'Band 2 supported' bit indicates support of E-GSM or R-GSM, the presence of the <R Support> field, see below, indicates if the E-GSM or R-GSM band is supported.	
In this version of the protocol, the sender indicates in this field either none, one or two of these 3 bands supported. If only one band is indicated, the receiver shall ignore the Associated Radio Capability 2.	
For single band mobile station all bits are set to 0.	
A5/4	
<u>Bit</u>	<u>1</u>
0	Encryption algorithm A5/4 not available
1	Encryption algorithm A5/4 available
A5/5	
<u>Bit</u>	<u>1</u>
0	Encryption algorithm A5/5 not available
1	Encryption algorithm A5/5 available
A5/6	
<u>Bit</u>	<u>1</u>
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
Associated Radio capability 1 and 2 (4 bit fields)	
If either of P-GSM or E-GSM or R-GSM is supported, the radio capability 1 field indicates the radio capability for P-GSM, E-GSM or R-GSM, and the radio capability 2 field indicates the radio capability for DCS1800 if supported, and is spare otherwise.	
If none of P-GSM or E-GSM or R-GSM are supported, the radio capability 1 field indicates the radio capability for DCS1800, and the radio capability 2 field is spare.	
The radio capability contains the binary coding of the power class associated with the band indicated in multiband support bits (see GSM 05.05).	

(continued...)

Table 10.5.1.7/TS 24.008 (continued): MS Classmark 3 information element

R Support

In case where the R-GSM band is supported the R-GSM band associated radio capability field contains the binary coding of the power class associated (see GSM 05.05). A mobile station supporting the R-GSM band shall also when appropriate, (see 10.5.1.6) indicate its support in the 'FC' bit in the Mobile Station Classmark 2 information element.

Note: the coding of the power class for P-GSM, E-GSM, R-GSM and DCS 1800 in radio capability 1 and/or 2 is different to that used in the Mobile Station Classmark 1 and Mobile Station Classmark 2 information elements.

Multi Slot Class (5 bit field)

In case the MS supports the use of multiple timeslots then the Multi Slot Class field is coded as the binary representation of the multislots class defined in TS GSM 05.02.

UCS2 treatment (1 bit field)

This information field indicates the likely treatment by the mobile station of UCS2 encoded character strings. If not included, the value 0 shall be assumed by the receiver.

Bit 1

0 the ME has a preference for the default alphabet (defined in GSM 03.38) over UCS2.

1 the ME has no preference between the use of the default alphabet and the use of UCS2.

Extended Measurement Capability (1 bit field)

This bit indicates whether the mobile station supports 'Extended Measurements' or not

Bit 1

0 the MS does not support Extended Measurements

1 the MS supports Extended Measurements

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.

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.

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)

MS Positioning Method Capability (1 bit field)

This bit indicates whether the MS supports Positioning Method or not for the provision of Location Services.

MS Positioning Method (5 bit field)

This field indicates the Positioning Method(s) supported by the mobile station.

MS assisted E-OTD

Bit 5

0 MS assisted E-OTD not supported

1 MS assisted E-OTD supported

Table 10.5.1.7/TS 24.008 (continued): MS Classmark 3 information element

MS based E-OTD

Bit 4
0 MS based E-OTD not supported
1 MS based E-OTD supported

MS assisted GPS

Bit 3
0 MS assisted GPS not supported
1 MS assisted GPS supported

MS based GPS

Bit 2
0 MS based GPS not supported
1 MS based GPS supported

MS conventional GPS

Bit 1
0 conventional GPS not supported
1 conventional GPS supported

EDGE Multi Slot class (5 bit field)

In case the EDGE MS supports the use of multiple timeslots and the number of supported time slots is different from number of time slots supported for GMSK then the EDGE Multi Slot class field is included and is coded as the binary representation of the multislot class defined in TS GSM 05.02.

Modulation Capability

Modulation Capability field indicates the supported modulation scheme by MS in addition to GMSK

Bit 1
0 8-PSK supported for downlink reception only
1 8-PSK supported for uplink transmission and downlink reception

EDGE RF Power Capability 1 (2 bit field)

If 8-PSK is supported for both uplink and downlink, the **EDGE RF Power Capability 1** field indicates the radio capability for GSM900.

The radio capability contains the binary coding of the EDGE power class(see GSM05.05).

EDGE RF Power Capability 2 (2 bit field)

If 8-PSK is supported for both uplink and downlink, the **EDGE RF Power Capability 2** field indicates the radio capability for DCS1800 or PCS1900 if supported, and is not included otherwise.

The radio capability contains the binary coding of the EDGE power class (see GSM 05.05).

Table 10.5.1.7/TS 24.008 (continued): MS Classmark 3 information element

GSM 400 Bands Supported (2 bit field)

Bits

2 1

0 1 GSM 480 supported, GSM 450 not supported

1 0 GSM 450 supported, GSM 480 not supported

1 1 GSM 450 supported, GSM 480 supported

GSM 400 Associated Radio Capability (4 bit field)

If either GSM 450 or GSM 480 or both is supported, the GSM 400 Associated Radio Capability field indicates the radio capability for GSM 450 and/or GSM 480.

The radio capability contains the binary coding of the power class associated with the band indicated in GSM 400 Bands Supported bits (see GSM 05.05).

Note: the coding of the power class for GSM 450 and GSM 480 in GSM 400 Associated Radio Capability is different to that used in the Mobile Station Classmark 1 and Mobile Station Classmark 2 information elements.

GSM 850 Associated Radio Capability (4 bit field)

This field indicates whether GSM 850 band is supported and its associated radio capability.

The radio capability contains the binary coding of the power class associated with the GSM 850 band (see GSM 05.05).

Note: the coding of the power class for GSM 850 in GSM 850 Associated Radio Capability is different to that used in the Mobile Station Classmark 1 and Mobile Station Classmark 2 information elements.

PCS 1900 Associated Radio Capability (4 bit field)

This field indicates whether PCS 1900 band is supported and its associated radio capability.

The radio capability contains the binary coding of the power class associated with the PCS 1900 band (see GSM 05.05).

Note: the coding of the power class for PCS 1900 in PCS 1900 Associated Radio Capability is different to that used in the Mobile Station Classmark 1 and Mobile Station Classmark 2 information elements.

Table 10.5.1.7/TS 24.008 (continued): MS Classmark 3 information element

UMTS FDD Radio Access Technology Capability (1 bit field)

Bit 1
 0 UMTS FDD not supported
 1 UMTS FDD supported

UMTS TDD Radio Access Technology Capability (1 bit field)

Bit 1
 0 UMTS TDD not supported
 1 UMTS TDD supported

CDMA 2000 Radio Access Technology Capability (1 bit field)

Bit 1
 0 CDMA2000 not supported
 1 CDMA2000 supported

DTM GPRS Multi Slot Sub-Class (2 bit field)

This field indicates the GPRS DTM capabilities of the MS. The GPRS DTM Multi Slot Sub-Class is independent from the Multi Slot Capabilities field. It is coded as follows:

Bit 2 1
 0 0 Sub-Class 1 supported
 0 1 Sub-Class 5 supported
 1 0 Sub-Class 9 supported
 1 1 Reserved for future extension. If received, the network shall interpret this as '00'

DTM EGPRS Multi Slot Sub-Class (2 bit field)

This field indicates the EGPRS DTM capabilities of the MS. The 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 field is coded as the DTM GPRS Multi Slot Sub-Class field.

MAC Mode Support (1 bit field)

This field indicates whether the MS supports Dynamic and Fixed Allocation or only supports Exclusive Allocation. It is coded as follows:

Bit 1
 0 Dynamic and Fixed Allocation not supported
 1 Dynamic and Fixed allocation supported

EGPRS Support (1 bit field)

~~This field indicates whether or not the MS supports EGPRS. It is coded as follows:~~

~~Bit 1
 0 EGPRS not supported
 1 EGPRS supported~~

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/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.
- 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 more details about error handling of MS radio access capability in 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.

Table 10.5.146/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) >
< Access capabilities : <Access capabilities struct> >
{ 0 | 1 <MS RA capability value part struct> } ;

< 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
preceeding Access capabilities field within this IE
  -- The presence of the A5 bits is mandatory in the 1st Access capabilities struct 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
  { 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 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 technolgy

```

Table 10.5.146/TS 24.008 (continued): Mobile Station Radio Access Capability Information Element

```

< 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) > } ;
  { 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 DTM Multi Slot Sub Class : bit(2) >
    < MAC Mode Support : bit >
    < EGPRS Support : bit > { 0 | 1 < DTM EGPRS Multi Slot Sub-Class : bit(2) > } } ;

< 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

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
All other values are treated as unknown by the receiver.

RF Power Capability
This field is coded as radio capability in Classmark 3 for the indicated band: it contains the binary coding of the power
class associated (see GSM 05.05 paragraph 4.1 output power and paragraph 4.1.1 Mobile Station).

8PSK Power Capability
This field is coded according to the definition in GSM 05.05. The presence of this field indicates also 8PSK
modulation capability in uplink.

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/TS 24.008 (concluded): Mobile Station Radio Access Capability Information Element

<p>PS – (Pseudo Synchronisation) 0 PS capability not present 1 PS capability present</p> <p>VGCS – (Voice Group Call Service) 0 no VGCS capability or no notifications wanted 1 VGCS capability and notifications wanted.</p> <p>VBS – (Voice Broadcast Service) 0 no VBS capability or no notifications wanted 1 VBS capability and notifications wanted</p> <p>HSCSD Multi Slot Class The Multi Slot Class field is coded as the binary representation of the multislot class defined in TS GSM 05.02. Range 1 to 18, all other values are reserved.</p> <p>GPRS Multi Slot Class The GPRS Multi Slot Class field is coded as the binary representation of the multislot class defined in TS GSM 05.02.</p> <p>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 TS GSM 05.02. Range 1 to 18, all other values are reserved.</p> <p>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 TS GSM 05.02.</p> <p>GPRS Extended Dynamic Allocation Capability 0 Extended Dynamic Allocation Capability for GPRS is not implemented 1 Extended Dynamic Allocation Capability for GPRS is implemented</p> <p>EGPRS Extended Dynamic Allocation Capability 0 Extended Dynamic Allocation Capability for EGPRS is not implemented 1 Extended Dynamic Allocation Capability for EGPRS is implemented</p> <p>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. 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)</p> <p>(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. 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)</p>

DTM GPRS Multi Slot Sub-Class (2 bit field)~~DTM Multi Slot Sub-Class (2 bit field)~~

This field indicates the GPRS DTM capabilities of the MS. The DTM GPRS Multi Slot Sub-Class is independent from the Multi Slot Capabilities field.

Bits

2 1

0 0 Sub-Class 1 supported

0 1 Sub-Class 5 supported

1 0 Sub-Class 9 supported

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

DTM EGPRS Multi Slot Sub-Class (2 bit field)

This field indicates the EGPRS DTM capabilities of the MS. The 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 field is coded as the DTM GPRS Multislot Sub-Class 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

1 Dynamic and Fixed allocation supported

EGPRS Support (1 bit field)

~~This field indicates whether or not the MS supports EGPRS~~

~~Bit~~

~~4~~

~~0 EGPRS not supported~~

~~1 EGPRS supported~~

COMPACT Interference Measurement Capability

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 TDD Radio Access Technology Capability (1 bit field)

Bit

0 UMTS TDD not supported

1 UMTS TDD supported

CDMA 2000 Radio Access Technology Capability (1 bit field)

Bit

0 CDMA2000 not supported

1 CDMA2000 supported