

# White paper

February 2009

## W302

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Premium slim Walkman® phone



Sony Ericsson

# Preface

## Purpose of this document

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This White paper will be published in several revisions as the phone is developed. Therefore, some of the headings and tables in this document contain limited information. Additional information and facts will be forthcoming in later revisions.

The aim of this White paper is to give the reader an understanding of the main functions and features of this phone.

People who can benefit from this document include:

- Operators
- Service providers
- Software developers
- Support engineers
- Application developers

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# Sony Ericsson Developer World

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On [www.sonyericsson.com/developer](http://www.sonyericsson.com/developer), developers will find documentation and tools such as phone White papers, Developers guidelines for different technologies, SDKs and relevant APIs. The Web site also contains discussion forums monitored by the Sony Ericsson Developer Support team, an extensive Knowledge Base, Tips & Tricks, example code and news.

Sony Ericsson also offers technical support services to professional developers. For more information about these professional services, visit the Sony Ericsson Developer World Web site.

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# Product overview

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W302 is a step in the Sony Ericsson true music evolution, designed to offer Walkman® for everyone. W302 includes a state of the art Walkman® player, enabling instant and easy access to favourite tracks with just one press on the Walkman® key.

The music experience can be enhanced by using the FM radio with RDS. With PlayNow™, content such as music and games can be previewed before purchase and download.

W302 supports multitasking, which means that you can, for example, browse the Web with the Walkman® player running in the background.

Content such as pictures, music, ringtones, themes, games and video clips can be saved on the memory card, a Memory Stick Micro™ (M2™) which has a capacity of up to 4 GB (512 MB included).

To offer the gaming experience, several Java™ games are already pre-loaded in the phone.

The 2.0 MP camera has an 2 inch 262K colour screen. Pictures and video clips can easily be shared with friends via MMS or email or be transferred to a computer by using Bluetooth™ or the included USB cable.

**Note:** To provide updated information about the implemented technology and functionality of this product, this White paper will be released in updated revisions.

# Key features

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## Walkman® player

The Walkman® player converts the phone into a portable MP3, MPEG-4, H263 player. Play music and video clips, streamed or downloaded. The folder system enables you to, for example, organize your favourite songs into groups and create playlists. The Walkman® key gives you direct access to music files without having to browse the menus. By using flight mode, the Walkman® player can still be used in aeroplanes, hospitals and other situations where using a mobile phone is prohibited.

## RDS FM Radio

The FM radio with RDS (Radio Data System) offers instant and easy access to FM radio channels. The RDS function brings information directly to the screen, which is sent out by the currently tuned in radio station. Plug in the portable handsfree that works as an antenna and start listening to the radio. The radio can also be used as an alarm signal.

## Memory Stick Micro™ (M2™)

A 512 MB memory card is included in the box. Different kinds of content (pictures, audio, video clips and so on) can be saved on the memory card and transferred to other memory card compatible products, such as digital cameras, video cameras, portable music players, TVs, photo printers and computers. The phone can handle memory cards (M2™) up to 4 GB.

## News Reader

Subscribe to and read your favourite RSS feeds with the News Reader application.

## USB 2.0 mass storage

When connecting the phone to a computer using the provided USB cable, the memory card appears on the computer screen as a removable disk together with other computer disks. You can then quickly and easily drag and drop, for example, music and image files between folders in the phone and the computer.

## 2.0-inch colour screen

The 2.0-inch (176 x 220 pixels) full graphic 262K UBC (ultra bright colour) colour screen enhances viewing of high-quality content in the phone.

## 2.0 MP camera

With the 2.0 MP camera, which includes up to 2.5x digital zoom and many user friendly features, taking a picture and sending it as part of a multimedia message or as an email attachment is just a few clicks away.

## Video recording

Recording a video clip and sending it as part of a picture message or as an email attachment is just a few clicks away. A recorded video clip can also be sent via Bluetooth™ or cable to a computer.

## Java™

Additional Java applications gives users a chance to personalize the functions in their phones, and developers the opportunity to create new applications.

### **Bluetooth™ wireless technology**

Several devices (simultaneous Bluetooth™ connections) can be connected up to 10 metres (33 feet) away using Bluetooth wireless technology. For example, when the phone rings, it can be answered with a Bluetooth headset, and images can be sent to another phone at the same time. Several mobile phones can take part in a Bluetooth-supported game. The phone and a computer can exchange data such as images, video clips, vCards, music files and calendar data. Bluetooth version 2.0 is supported.

### **HTML Web browser support**

Browse the Internet and look at the Web sites in a different way with OpenWave 7.2, an HTML browser which supports a complete Web standard suite.

### **PlayNow™**

Content such as music and games may be previewed before purchase. A unique direct-link to download music and games, which is easy to use and promises you best-selling content for mobile download. You can, for example, go straight to a live list of top music hits.

### **3D Gaming**

Gaming is a popular feature in mobile phones, and with Java, users can download new games and skill levels to enhance the entertainment experience. Several games are already included in the phone.

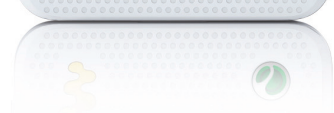
### **Polyphonic sound**

The phone supports polyphonic ringtones with 40 simultaneous voices/instruments.

### **Picture Messaging (MMS)**

MMS (Multimedia Messaging Service) is the logical extension of SMS (Short Messaging Service) and EMS (Enhanced Messaging Service). MMS allows sound, image and video to be combined in a message.

# Images





# Technologies in detail

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This chapter offers a detailed description of the technologies available in this product.

# Functions and features

The following table is a description of the features in this product. It also compares this product with two other Sony Ericsson products.

Feature	W302	W200	W880
<b>3D games</b>	Yes	Yes	Yes
<b>Alarm clock</b> Set a time for simple or recurring weekly alarms	Yes	Yes	Yes
<b>Antenna</b> Built-in	Yes	Yes	Yes
<b>Backlight</b> Illuminates your phone screen	Yes	Yes	Yes
<b>Battery</b>	3.6 V, 950 mAh, Lithium Polymer	3.6 V, 750 mAh, Lithium Polymer	3.6 V, 950 mAh, Lithium Polymer
<b>Battery charging time</b>	At least 90% charged within 2 hours.	At least 90% charged within 2 hours.	At least 90% charged within 2 hours.
<b>Bluetooth™ wireless technology</b> Wireless connectivity between devices. The out of range distance varies and depends on where you are. Support for specification of the Bluetooth System, version 2.0	Yes	Yes	Yes
<b>Business card exchange, vCard</b> Exchange contact information	Yes	Yes	Yes
<b>Calculator</b>	Yes	Yes	Yes
<b>Calendar</b> Fully functional calendar with day, week and month views and reminders	Yes	Yes	Yes
<b>Call list</b> View calls made and calls received.	Yes	Yes	Yes, with enhanced functionality
<b>Camera</b>	2.0 MP	VGA	2.0 MP
<b>Camera activation</b> Dedicated camera activation. Press once and the integrated camera activates	Yes, camera button	Yes, joystick up	Yes, camera button

<b>Feature</b>	<b>W302</b>	<b>W200</b>	<b>W880</b>
<b>Chinese input method</b>  Text input methods based on Simplified or Traditional Chinese; Bopomofo, Pinyin or Stroke	Yes	Yes	Yes
<b>cHTML</b>  A mobile device adapted version of the standard Internet communications protocol HTML	No	Yes	Yes
<b>Clock</b>  Visible clock on the screen	Yes	Yes	Yes
<b>Co-branding area</b>	7 x 22 mm	8 x 22 mm	7 x 41.3 mm
<b>Code memo</b>  A safe place to save all your PIN codes and other information. To access code memo, only one PIN code is needed.	No	Yes	Yes
<b>Colour</b>	Midnight black Sparkling white	Rhythm Black Pulse White	Flame Black Steel Silver
<b>Contacts</b>  Phonebook with fields for name, phone and fax numbers, email addresses, Web address, title, company address info, personal address info and birthday.	Yes	Yes	Yes
<b>Conference calls</b>  Support for multi-party calling	Yes	Yes	Yes
<b>Content online</b>  Downloadable pictures and ringtones available online	Yes	Yes	Yes
<b>Copyright protection - DRM</b>  DRM (Digital Rights Management) features the rights and copy protection of downloaded content (audio, pictures, music tones, video, entertainment features such as games and Java applications).	Yes, OMA DRM v1	Yes, OMA DRM v1	Yes, OMA DRM v2
<b>Design</b>	Stick phone, dual front.	Stick phone, exchangeable front and battery cover.	Stick phone, dual front.

<b>Feature</b>	<b>W302</b>	<b>W200</b>	<b>W880</b>
<b>CSS</b>  Cascading Style Sheets, the de facto standard style sheet language on the Web, specified by W3C	Yes	Yes	Yes
<b>Device Management (DM)</b>  DM uses GPRS as bearer (basic network connectivity needs to be in place) of the provisioning data and allows the operator to access the phone and check and set different settings such as Network connectivity (GPRS), email, MMS, WAP and Java. Device Management is achieved by supporting Over The Air provisioning 7.1 (OTA), OMA Client Provisioning 1.1 (CP).	No	Yes	Yes
<b>Digital camera menu</b>	Yes	Yes	Yes
<b>Digital zoom</b>	2.5x	4x	2.5x
<b>DOM2</b>  Document Object Model (DOM) Level 2 HTML Specification, specified by W3C	Yes	Yes	Yes
<b>Email</b>  Built-in email client with inbox, outbox, compose, send and other functions. Supports attachments.	Yes	Yes	Yes
<b>EMS (Enhanced Messaging Service)</b>  Text messaging (SMS) with pictures and sounds	Yes	Yes	Yes
<b>Exterior description</b>  Length (mm): Width (mm): Thickness (mm): Weight (g):	100 46 10 (screen) 85	101 44 18.2 (screen) 85	103 46.5 9.4 71
<b>Fast port</b>  A system connector which enables faster data transfer between the phone and a computer	Yes	Yes	Yes
<b>File manager</b>  Folder structure storage to help you save and organize pictures, sounds and other phone content	Yes	Yes	Yes, with enhanced functionality for camera content

<b>Feature</b>	<b>W302</b>	<b>W200</b>	<b>W880</b>
<p><b>Flight mode</b></p> <p>All radio transmitters and receivers are deactivated, making it possible to use the phone only as a Walkman® in aeroplanes, hospitals and other situations where using a mobile phone is prohibited.</p>	Yes	Yes	Yes
<p><b>FM radio with RDS</b></p> <p>FM radio with presets, auto and manual search. Portable handsfree is used as an antenna. The radio can also be used as an alarm signal.</p>	Yes	Yes	Yes
<p><b>Frames</b></p> <p>Before you take a picture, you can choose to have a frame surrounding the picture</p>	No	Yes	Yes
<p><b>Games download</b></p> <p>Replace your in-phone games with new ones</p>	Yes	Yes	Yes
<p><b>Games embedded</b></p>	Yes	Yes	Yes
<p><b>GPRS</b></p> <p>General Packet Radio Services — a communications standard enabling packet data transfer similar to Internet at 28.8 kbps-58.6 kbps. It is recommended that you have GPRS to use MMS and content download services.</p>	Yes, multislot class 10 supported (4+2)	Yes, multislot class 10 supported (4+2)	Yes, multislot class 10 supported (4+2)
<p><b>EDGE</b></p> <p>Enhanced Data rates for GSM Evolution, Enhanced GPRS (EGPRS) is a backward-compatible digital mobile phone technology that allows improved data transmission rates, as an extension on top of standard GSM.</p>	Yes, multislot class 10 supported (4+2)	No	No
<p><b>High Speed Data</b></p> <p>HSCSD — a communications standard enabling GSM data transfer 14.4-28.8 kbps</p>	No	Yes	Yes
<p><b>HTML</b></p> <p>HyperText Markup Language, the standard Internet communications protocol</p>	Yes	Yes	Yes

<b>Feature</b>	<b>W302</b>	<b>W200</b>	<b>W880</b>
<b>Icon Desktop</b> A graphic icon desktop with interactive icons	Yes	Yes	Yes
<b>Infrared port</b> A wireless connector enabling connection of the phone to a laptop or other infrared device in order to share pictures, synchronize or use the phone as a modem.	No	Yes	Yes
<b>Instant messaging</b> Chat — several people can take part in a mobile messaging session where each one sees what the other is writing.	No	Yes	Yes
<b>Internet security</b> Encrypts confidential information such as credit card and bank account numbers. Necessary for mobile banking and shopping.	Yes	Yes	Yes, SSL/TLS
<b>Java</b> Support for Java technology	Java 2, Micro Edition (J2ME™), Java 3D™	Java 2, Micro Edition (J2ME™), Java 3D™	Java 2, Micro Edition (J2ME™), Java 3D™
<b>Joystick</b> A four-directional stick navigation control with press function	No	Yes	No
<b>Keypad lock</b> Lock the phone keys so they do not activate a function in the phone	Yes	Yes	Yes

Feature	W302	W200	W880
<b>Keys and buttons</b>	Keypad with 12 keys 2 selection keys Shortcut key C (Clear) 4+1 way navigation key Separate on/off Volume/camera zoom Walkman® key Camera button	Keypad with 12 keys 2 selection keys Back C (Clear) 4+1 way joystick Separate on/off Volume/camera zoom Walkman® key	Keypad with 12 keys 2 selection keys Back C (Clear) 8+1 way navigation key Separate on/off Volume/camera zoom Walkman® key Camera button Activity menu
<b>Lunar calendar</b>  A calendar system used in China and other parts of Asia. A lunar month is determined by the period required for the moon to complete its full cycle of 29.5 days.	Yes	Yes	Yes
<b>Macromedia™ Flash Lite™</b>  For impressive animated wallpapers, menus and other graphic elements.	No	Yes	Yes
<b>Mega Bass™</b>  An audio feature which enhances bass frequencies for better overall music experience.	No	Yes	Yes
<b>Memory (built-in)</b>  Phone memory that is free to use (depending on software configuration/file content).	Up to 20 MB	Up to 25 MB	Up to 16MB
<b>Memory card (included)</b>  Separate memory card for storing of pictures, audio, video clips and so on.	512 MB on Memory Stick Micro™ (M2™)	128 MB on Memory Stick Micro™ (M2™)	1 GB on Memory Stick PRO Duo™

<b>Feature</b>	<b>W302</b>	<b>W200</b>	<b>W880</b>
<b>Memory Stick Micro™ (M2™) slot</b>  Slot for inserting a mini peripheral storage device (up to 4 GB). Compatible with many cameras, computers and other devices.	Yes	Yes	Yes
<b>Menu shortcuts</b>  A function making it possible to dedicate shortcuts to the most-used phone functions	Yes	Yes	Yes
<b>MMS (Multimedia Messaging Service)</b>  Picture messaging with text and sound	Yes, version 1.0	Yes	Yes
<b>MMS video</b>  Support in the phone for sending video using MMS	Yes	Yes	Yes
<b>Modem</b>  GSM Internet dial-up support	Yes	Yes	Yes
<b>MusicDJ™</b>  A sampler music tool with MIDI drum, guitar, keyboard, bass and brass loops in different music styles, which can be combined to create polyphonic ringtones.	No	Yes	Yes
<b>Music tones</b>  Music tones, also called master tones, are DRM (Digital Rights Management) protected music by original artists. Various digital audio formats are supported.	Yes	Yes	Yes
<b>My friends</b>  Wireless Village server community	No	Yes	Yes
<b>Networks</b>	GSM (R99)  GSM 850, GSM 900, GSM 1800, GSM 1900, e-GSM 900	GSM (R99) Tri band  a variant: GSM 850, GSM 1800, GSM 1900  i and c variant: e-GSM 900, GSM 1800, GSM 1900	UMTS 2100  GSM 900 GSM 1800 GSM 1900 e-GSM 900



Feature	W302	W200	W880
<b>OMA Data Synchronization (SyncML)</b> A device communications standard that enables remote synchronization between devices	SyncML 1.1	SyncML 1.2 SyncML 1.1	SyncML 1.2 SyncML 1.1
<b>OTA settings</b> WAP, email and other settings can be sent over-the-air to the phone	Yes	Yes	Yes
<b>PhotoDJ™</b> A drawing tool in the phone where existing pictures and photos can be edited	No	Yes	Yes
<b>Picture effects</b> Add picture effects as fun layers to a saved picture	No	Yes	Yes
<b>Picture gallery</b> A thumbnail image gallery where sections of several pictures can be viewed at the same time	Yes	Yes	Yes
<b>Picture phonebook</b> Add pictures to the contacts. When someone calls, a picture appears on screen	No	Yes	Yes
<b>Picture wallpaper</b> Background picture seen on the screen when the phone is in standby mode	Yes	Yes	Yes
<b>PIM Sync (Personal Information Management)</b> Synchronize the phone with a PC	No	Yes	Yes
<b>PlayNow™ (direct link)</b> Listen to music or preview games before you purchase and download to your phone	Yes	Yes	Yes
<b>Polyphonic ringtones</b>	40 tones	40 tones	72 tones
<b>Predictive text input</b> When you write text, predictive text input software predicts what word you are writing and finishes it for you. The prediction is based on previous words used and a customizable dictionary.	Yes, from Zi corporation.	Yes, T9™ Text Input	Yes, T9™ Text Input

<b>Feature</b>	<b>W302</b>	<b>W200</b>	<b>W880</b>
<b>Push email (IMAP Idle)</b>	No	Yes	Yes
<b>Redial</b> Identify and redial the most recent caller	Yes	Yes	Yes
<b>RSS feeds</b> Use the News Reader application to view the up-to-the-minute news on the subscribed RSS feeds	Yes, only using a Java client	Yes	Yes
<b>Screen</b> Type: Size: Resolution: Technology: Screen colours: Backlight colour (screen): Backlight colour (keypad):	Full graphical 2.0 inches 176 x 220 pixels TFT 262,000 (18 bit) White Orange	Full graphical 1.8 inches 128 x 160 pixels CSTN 65,000 (16 bit) White Orange	Full graphical 1.8 inches 240 x 320 pixels TFT 262,000 (18 bit) White Orange
<b>Screen saver</b> When the phone has not been used for a while, a screen saver activates and the phone goes into "sleep mode".	Yes	Yes	Yes
<b>Shut down menu</b> Shut down the phone, lock the keys, turn on silent or activate a profile	No	Yes	Yes
<b>Side volume keys</b> Controls on the side of the phone that regulate speaker volume	Yes	Yes	Yes
<b>SIM card lock</b> The ability to protect the SIM card with a four-digit PIN code	Yes	Yes	Yes
<b>Sleep mode</b> A power saving feature that minimizes battery power consumed when the phone is in standby	Yes	Yes	Yes
<b>SMS, long (Text Messaging)</b> Concatenated SMS text messaging.	Yes	Yes	Yes

Feature	W302	W200	W880
<b>Sony Ericsson Remote Update Service</b>  Download the latest operator approved version of the mobile phone software over the air	No	Yes	Yes
<b>Sony Ericsson Update Service</b>  Connect the phone to an Internet-connected computer, download the latest operator-approved version of the mobile phone software from the Web, <a href="http://www.sonyericsson.com/support">www.sonyericsson.com/support</a> , and update the mobile phone.	No	Yes	Yes
<b>Sound recorder</b>  A mini recording device in your phone that lets you record voice messages or other sounds	Yes	Yes	Yes
<b>Speakerphone</b>  Loudspeaker suitable for using the phone as an office handsfree	Yes	Yes	Yes
<b>Speed dialling</b>  Allocating contacts in your phonebook to specific keys on the keypad	Yes	Yes	Yes
<b>Standby time</b>	Up to 300 hours	Up to 300 hours	Up to 425 hours
<b>Status view</b>  The screen shows the network being used, time and other status information	Yes	Yes	Yes
<b>Stopwatch</b>	Yes	Yes	Yes
<b>SVG Tiny 1.1</b>  Scalable Vector Graphics for impressive animated wallpapers, menus and other graphic elements.	Yes not in browser	Yes	Yes
<b>Synchronization PC</b>  Synchronize and share phone content with a computer	No	Yes	Yes
<b>Talk time</b>	Up to 7hours	Up to 7 hours	GSM, up to 6 hours 30 minutes UMTS, up to 2 hours 50 minutes

<b>Feature</b>	<b>W302</b>	<b>W200</b>	<b>W880</b>
<b>Tasks</b> Keeps track of important things to do	Yes	Yes	Yes
<b>Themes</b> Phone menu texts and background graphics	Yes	Yes	Yes
<b>Time Line Search (Time View)</b> Search for pictures and videos by month or day	No	Yes	No
<b>Timer</b> Set the phone to alert after a specific time lapse	Yes	Yes	Yes
<b>USB connectivity support</b> Connect the phone to a computer with a USB cable and the memory in the phone appears on the computer screen as a mass storage device.	Yes	Yes	Yes
<b>Vibrating alert</b> The phone vibrates when a call comes in	Yes	Yes	Yes
<b>Video calling</b> When you make a video call, the recipient can be seen in the screen. The service requires UMTS/WCDMA.	No	No	Yes
<b>Video player</b> Record, play and transfer video clips to another phone or a computer via an available transfer method	Yes	Yes	Yes
<b>Video streaming</b> Real time streaming of video, for example, live cam	Yes	Yes	Yes
<b>Voice control</b> Voice answer, reject and call. Assign voice commands to items in the phonebook and when a call is made, the voice command can be used instead of pressing keys.	No	Yes	Yes

<b>Feature</b>	<b>W302</b>	<b>W200</b>	<b>W880</b>
<p><b>Voicemail</b></p> <p>Support for voicemail operator service including automatic answering and message recording</p>	Yes	Yes	Yes
<p><b>Walkman® key</b></p> <p>Get direct access to your music files without having to move between the menus. Press the Walkman® key to gain direct access to the Walkman® player. Press to minimize to use other functions with music still playing.</p>	Yes	Yes	Yes
<p><b>Walkman® player</b></p> <p>Advanced digital music player. Supports playing music, streamed or downloaded</p>	Yes	Yes	Yes
<p><b>WAP 2.0 XHTML</b></p> <p>A mobile Internet standard to access specially designed Internet sites. WAP 2.0 supports colour and interactive lists.</p>	Yes	Yes	Yes

# Facts and figures

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This chapter offers readers a detailed listing of all the technical data relating to the product. Comprehensive descriptions of performance and technical characteristics are presented in table format for quick and easy access.

# Technical specifications

## General technical data

System	Quad band GSM phase 2 recommendations. GSM 850, GSM 900, GSM 1800, GSM 1900 and e-GSM supported
Speech coding	HR, FR, EFR, AMR supported where available, for high speech quality
GSM SIM/USIM card	Small plug-in card, 1.8 V and 3 V
Memory (user free)	Up to 20 MB internal (depending on software configuration/file content). Memory Stick Micro™ (M2™) which has a capacity of up to 4 GB
Data transfer speeds	Up to 85.6 kbps (downlink) Up to 42.8 kbps (uplink)

## Performance and technical characteristics

Dimension	GSM 850 (a variant)	GSM 900/E-GSM 900 (i and c variant)	GSM 1800 (a, i and c variant)	GSM 1900 (a, i and c variant)
Frequency range (MHz)	TX: 824–849 MHz RX: 869–894 MHz	TX: 880–915 RX: 925–960	TX: 1710–1785 RX: 1805–1880	TX: 1850–1910 RX: 1930–1990
Channel spacing	200 kHz	200 kHz	200 kHz	200 kHz
Number of channels	124 Carriers *8 (TDMA)	174 Carriers *8 (TDMA)	374 Carriers *8 (TDMA)	299 Carriers *8 (TDMA)
Modulation	8PSK/GMSK	GMSK	GMSK	GMSK
TX Phase Accuracy	< 5° RMS Phase error (burst)	< 5° RMS Phase error (burst)	< 5° RMS Phase error (burst)	< 5° RMS Phase error (burst)
Duplex spacing	45 MHz	45 MHz	95 MHz	80 MHz
Frequency stability	+/- 0.1 ppm	+/- 0.1 ppm	+/- 0.1 ppm	+/- 0.1 ppm
Voltage operation (nominal)	3.6 V	3.6 V	3.6 V	3.6 V
Transmitter RF power output	33 dBm Class 4 (2 W peak)	33 dBm Class 4 (2 W peak)	30 dBm Class 1 (1 W peak)	30 dBm Class 1 (1 W peak)
Transmitter output impedance	50 ohm	50 ohm	50 ohm	50 ohm

Dimension	GSM 850 (a variant)	GSM 900/E-GSM 900 (i and c variant)	GSM 1800 (a, i and c variant)	GSM 1900 (a, i and c variant)
Transmitter spurious emission (according to specification)	< -36 dBm up to 1 GHz < -30 dBm over 1 GHz (according to specification)	< -36 dBm up to 1 GHz < -30 dBm over 1 GHz	< -30 dBm	< -30 dBm
Receiver RF sensitivity	Better than -102 dBm	Better than -102 dBm	-102 dBm	-102 dBm
Receiver RX Bit error rate	< 2.4%	< 2.4%	< 2.4%	< 2.4%

## USSD technical data

Feature	Support
USSD support	GSM Phase 1/2 (Cross-phase compatibility) GPRS behaviour according to class B
Mode support mode	UI-mode supported SAT initiated USSD supported
UI-mode details	<ul style="list-style-type: none"> <li>Ability to scroll up and down in USSD messages</li> <li>Ability to highlight embedded numbers and take actions accordingly</li> </ul>

## GPRS technical data

Dimension	Support
Compatible GPRS and SMG specifications	Release 99 according to ETSI specification
Data rates	<ul style="list-style-type: none"> <li>Multislot class 10 supported (4+2)</li> <li>CS-1, CS-2, CS-3, CS-4</li> <li>9.050 bps, 13.400 bps, 15.600 bps, 21.400 bps supported (network-dependent)</li> </ul>
Indicator of attachment to the GPRS service	Yes, an icon in the top left corner, a filled triangle if attached
Indicator of PDP context activation	Yes, dynamic from left side. Animated globe
Medium Access Modes	Dynamic allocation
Support of Packet Control Channels (PBCCH/PCCCH)	Yes
Network operation mode	NOM I, II, III



<b>Dimension</b>	<b>Support</b>
Support of GPRS/CS combined procedures	Yes
Network control mode	NC0 and 2
Support of access in 2 phases	Yes
Support of PRACH on 11 bits	Yes
Support of GPRS re-selection C31/C32	Yes
Support of static and dynamic addressing	Yes
Support of power control Uplink and Downlink	Uplink = yes, Downlink is a network feature
Support of ciphering algorithms	GEA1, GEA2
Support of compression algorithms	Yes, IP header compression
Support of the QoS modification procedure	Yes, when initiated by the network (not by the phone)
Downlink data rate	Up to 85.600 bps for packet data communication, using 4 time slots in coding scheme CS-4
Uplink data rate	Up to 42,800 bps for packet data communication, using 2 time slots in coding scheme CS-4
Mode of operation	Class B and Class C modes of operation supported
R Reference point	Physical layer: Support of RS232 PPP is supported as L2 layer in the R reference point
IP connectivity	PDP type IP is supported IP termination in mobile or TE (laptop, PDA) supported
Application	<ul style="list-style-type: none"> <li>• WAP over GPRS supported (UDP/IP and GPRS-SMS)</li> <li>• SMS over GPRS supported (SMS-MT, SMS-MO)</li> </ul>
QoS	<ul style="list-style-type: none"> <li>• QoS negotiation supported. Default requested QoS sent by the phone at PDP context activation is reliability Class 3</li> <li>• Peak/Mean/Delay/Precedence</li> <li>• Class: subscribed</li> <li>• Precedence class supported (1,2,3)</li> <li>• Reliability class 1-5 supported.</li> <li>• Delay classes supported (1,2,3,4)</li> <li>• Mean and peak throughput rate limited by multi slot class 4 and CS-4</li> </ul>

Dimension	Support
PDP context	<ul style="list-style-type: none"> <li>• 10 PDP context descriptions are stored in the phone</li> <li>• PDP context description is edited via application in mobile, AT-command or via OTA</li> <li>• Simultaneous PDP contexts are supported, maximum 2</li> </ul>
SIM	GPRS aware, as well as non-GPRS aware, SIM cards are supported

## EDGE technical data

Dimension	Support
Data rates	Multislot class 10 supported (4+2)
Downlink data rate	Up to 236.8 kbps for packet data communication, using 4 time slots in coding scheme MCS-9.
Uplink data rate	Up to 118.4 kbps for packet data communication, using 2 time slots in coding scheme MCS-9.

## SIM AT services supported

Service	Mode	Support
CALL CONTROL BY SIM		Yes
DATA DOWNLOAD TO SIM	Cell Broadcast	Yes
	SMS	Yes
DISPLAY TEXT	Text of up to 240 characters (120 UCS2 coded)	Yes
	bit 1: 0 = normal priority	Yes
	1 = high priority	Yes
	bit 8: 0 = clear message after a delay	Yes
	1 = wait for user to clear message	Yes
GET INKEY	General: The GET_INKEY requires that the user confirms his/her choice	Yes
	bit 1: 0 = digits (0-9, *, # and +) only	Yes
	1 = alphabet set	Yes
	bit 2: 0 = SMS default alphabet	Yes
	1 = UCS2 alphabet	Yes
	bit 3: 0 = character sets defined by bit 1 and bit 2 are enabled	Yes
1 = character sets defined by bit 1 and bit 2 are disabled and the Yes/No response is requested	Yes	

<b>Service</b>	<b>Mode</b>	<b>Support</b>
GET INPUT	General: Number of hidden input characters	252
	bit 1: 0 = digits (0-9, *, # and +) only	Yes
	1 = alphabet set	Yes
	bit 2: 0 = SMS default alphabet	Yes
	1 = UCS2 alphabet	Yes
	bit 3: 0 = ME may echo user input on the display	Yes
	1 = user input not to be revealed in any way	Yes
	bit 4: 0 = user input to be in unpacked format	Yes
	1 = user input to be in SMS packed format	Yes
	bit 8: 0 = no help information available	Yes
1 = help information available	Yes	
LAUNCH BROWSER		Yes
MORE TIME		Yes
PLAY TONE		Yes
POLLING OFF		Yes
POLL INTERVAL		Yes
PROVIDE LOCAL INFORMATION	“00” = Location Information (MCC, MNC, LAC and Cell Identity)	Yes
	“01” = IMEI of the ME	Yes
	“02” = Network Measurement results	Yes
	“03” = Date, time and time zone (DTTinPLI)	Yes
	“04” - Language setting	Yes
	“05” - Timing setting	Yes
REFRESH	General: The reset option requests the user to wait while the phone restarts	Yes
	“00” =SIM Initialization and Full File Change Notification	Yes
	“01” = File Change Notification	Yes
	“02” = SIM Initialization and File Change Notification	Yes
	“03” = SIM Initialization	Yes
	“04” = SIM Reset	Yes

Service	Mode	Support
SELECT ITEM		Yes
SEND DTMF		Yes
SEND SHORT MESSAGE	bit 1: 0 = packing not required	Yes
	1 = SMS packing by the ME required	Yes
SEND SS		Yes
SEND USSD		Yes
SET UP CALL	General: Capability configuration	Yes
	Set-up speech call CallParty	No
	Sub address DTMF support	Yes
	"00" = set up call, but only if not currently busy on another call	Yes
	"01" = set up call, but only if not currently busy on another call, with redial	Yes
	"02" = set up call, putting all other calls (if any) on hold	Yes
	"03" = set up call, putting all other calls (if any) on hold, with redial	Yes
	"04" = set up call, disconnecting all other calls (if any)	Yes
	"05" = set up call, disconnecting all other calls (if any), with redial	Yes
	SET UP EVENT LIST	"00" = MT call
"01" = Call connected		Yes
"02" = Call disconnected		Yes
"03" = Location status		Yes
"04" = User activity		Yes
"05" = Idle screen available		Yes
"06" = Card reader status		N/A
"07" = Language selection		Yes
"08" = Browser termination		Yes
"09" = Data available		Yes
"0A" = Channel status	Yes	

Service	Mode	Support
SET UP IDLE MODE		Yes, 1 row of text is supported
SET UP MENU		Yes
TIMER MANAGEMENT		Yes
OPEN CHANNEL		Yes
CLOSE CHANNEL		Yes
RECEIVE DATA		Yes
SEND DATA		Yes
GET CHANNEL STATUS		Yes

## User Interaction with SIM AT

### Display text

Text of up to 240 characters (120 UCS coded) is supported.

Text clearing times are 5-20 seconds and a 60-second time-out limit for the user to clear the text. “Key” responses:

- Long “Back” – Proactive session terminated by user
- “Back” – Backward move in proactive session

Any other key clears the display if the command is performed successfully.

### Get inkey

Prompt for a one-character input. Pressing “Ok” without entering a character gives warning message “Minimum 1 character”. “Key” responses:

- “C” clears current character
- Long “Back” terminates the proactive session
- “Back” – Backward move in proactive session
- “OK” – Command performed successfully

### Get input

Prompt for character input. The phone will refuse to accept further input when maximum response length is exceeded. UI Maximum Response lengths:

- Digits Only – 160 characters
- SMS default alphabet characters – 160 characters
- Hidden Characters (digits only) – 20 characters

“Key” responses:

- “C” clears current character.
- Long “Back” terminates the proactive session
- “Back” – Backward move in proactive session
- “OK” – Command performed successfully

### Select item

Scroll to highlight item for selection.

“Key” responses:

- Navigation key press down – Scroll down list
- Navigation key press up – Scroll up list
- Long “Back” terminates proactive session
- “Back” – Backward move in proactive session
- “OK” – Command performed successfully

## Send short message

Default message “Sending message, please wait” can be replaced for the Alpha Identifier text, or suppressed completely if a null text is provided. Default responses are “MESSAGE FAILED” or “MESSAGE SENT”. “Key” responses:

- Long “Back” or “Back” ends the proactive session

## Set up call

If the ME is on a call when the command “Set Up Call”, “putting all other calls on hold” is sent, the user sees the text “Setting up a call current call will be held”. If “OK” is pressed, the current call will be put on hold and the new call set up. If the ME is on a call when the command “Set Up Call,

disconnecting all other calls” is sent, the user sees the text “Setting up a call current call will be disconnected”. If the “OK” key is pressed, the current call is disconnected and the new call set up.

## Set up menu

Incorporates a SIM Application Toolkit Menu Item into the ME’s main menu structure.

If an Alpha Identifier is supplied in the Set Up Menu command, this is used as the SIM AT entry in the ME’s main menu. If no alpha identifier is supplied and several items are found in the menu, a default title is used. If the SIM AT Menu Item is selected by pressing “Select”, all the items sent in the Set Up Menu command are available for selection, in the same way as the Select Item command.

# Entertainment

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## Walkman® player 2.0

File types	Formats	Extensions
Audio	AAC MP3 (192 kbit/s for local playback) MP4 M4A 3GP AMR-NB WAV	.mp4, .3gp .mp3 .mp4 .m4a .3gp .amr .wav
Video (including audio part)	MP4 (video: MPEG-4, audio: AAC)  3GP (video: MPEG-4 or H.263, audio: AAC or AMR)	.mp4  .3gp
Streaming transport	RTSP according to 3GPP™	
Video encoding	H.263	
Video decoding	MPEG-4 Simple Visual Profile Level 0 H.263	
Audio encoding	AMR-NB	
Audio decoding	AAC, AMR-NB, AMR-WB, AAC+, AAC/LC, WAV, mid, 3gp, MP4, M4A, IMY, PMR, MP3	

Feature	Support
Automatic pause on telephone call	Yes
Playlists	Yes
Play mode	Shuffle or Loop
Equalizer	Yes
Sorting by artist or file	No
Minimizing the Walkman® player	Yes

## Ringtone file formats

File types	Formats	Extensions
Ringtones	MIDI (General MIDI 1, SP-MIDI) iMelody AMR-NB MP3 MP 4 3GP M4A WAV	.mid .imy .amr .mp3 .mp4 .3gp .m4a .wav

## Radio with RDS

System	VHF/FM
Output	<ul style="list-style-type: none"> <li>• Portable handsfree</li> <li>• Internal loudspeaker</li> <li>• External loudspeakers</li> </ul>
Save channels	Yes, 10 presets
Tuning method FM	100 KHz
Antenna	Stereo portable handsfree

# Imaging/Messaging

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## 2.0 MP camera

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### Facts and figures

Picture sizes (resolution)	<ul style="list-style-type: none"> <li>• VGA (640 x 480)</li> <li>• 1 MP (1280 x 960)</li> <li>• 1280 x 1024</li> <li>• 2 MP (1600 x 1200)</li> </ul>
Colour depth	18 bit, 262K colours
Camera memory	Phone memory or memory card, no memory dedicated to the camera only
Digital zoom	2.5x
Night mode	Yes
Self-timer	Yes
Effects	Negative/ Sepia/ Black&White/ Off
Picture quality	Choose between High, Medium, Low
Shutter sound	No
Shoot mode	Normal/ Burst
<b>Video recorder</b>	
Video sizes	176 x 144 (large) 128 x 96 (small)
Shoot mode	For picture message/ normal quality video

## Pictures and animations

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Formats	JPEG, BMP, GIF (including animated), PNG and WBMP, SWF and SVG-t
Sharing via	MMS, EMS, WAP, BT, email or cable

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## Image decoders

Decoder	Details	Size	Colour depth	File format
GIF	87a/89a	128 x 128 pixels	256	GIF
JPEG	ISO/IEC JPEG Baseline DCT Progressive DCT Non-differential Huffman coding Symbol "SOF2"	VGA		JFIF v1.02
BMP	The bitmap image format used by Windows®	XRAM dependent, default is VGA	24 bit	
WBMP				
PNG				

## Image encoders

Decoder	Details	Size	Colour depth	File format
GIF	89a			
JPEG	ISO/IEC JPEG Baseline DCT Non-differential Huffman coding Symbol "SOF0"	VGA		JFIF v1.02
BMP	The bitmap image format used by Windows®.	XRAM dependent, default is VGA	24 bit	
WBMP				

## Short Messaging Service

Feature	Support
SMS Centre Number	It is possible to pre-load the SMS Centre Number
Pictures	It is possible to insert a picture or an icon into the text message. EMS compliant mobile phones will be able to see the picture correctly
Input methods	Predictive text input and multitap
Reply to messages	It is possible to reply to received messages by SMS, MMS, phone call or email
<b>Message creation methods support</b>	Predictive writing and multitap
Copy, cut and paste words	No

<b>Feature</b>	<b>Support</b>
Teaching of predictive words that are not in the predictive dictionary	Yes
<b>Options when creating a message</b>	
save a sent message in a "Sent items" folder	Yes
insert a line in the message	Yes
assign a validity period to the message	Yes
use pre-defined messages	Yes
<b>Options when receiving a message</b>	
reply to the sender	Yes
forward the message	Yes
save the message on SIM	No
get delivery time and date	Yes
<b>Options of the previously sent message</b>	
delivery report of the message	Yes (if delivery report was requested at time of sending).
forward the message	Yes
save the message on SIM	No
know the remaining capacity storage	No, but notification when 95% full.
<b>Options of the previously received message</b>	
reply to the sender	Yes
save the message on SIM	No
forward the message	Yes
know the remaining capacity storage	No, but notification when 95% full.
<b>Supported ways of replying to a received SMS message</b>	
via SMS	Yes
via MMS	No
via email	No
via phone call (set up a call to the number contained in the message body)	Yes
via WAP call (go to the WAP address contained in the message body)	No
via USSD session	No
Options to send an SMS message to a list of recipients	Yes

Feature	Support
Options to write an email address as a recipient address	Yes
SMS storage	On the SIM and in the phone.
Nokia Picture Messaging	Yes

## Enhanced Messaging Service

Feature	Support
Level of compliance supported by the phone regarding the specifications described in release 99	Enhanced Messaging Service (EMS) according to the standard 3GPP™ TS 23.040 v4.3.0, with the addition of the ODI feature from 3GPP™ TS 23.040 v5.0.0
Number of messages that the phone is able to handle to generate a concatenated message	20
Capacity storage	200 and the space left on the SIM card
Outgoing messages	<ul style="list-style-type: none"> <li>• See how many short messages an EMS message consists of before sending.</li> <li>• Choose whether to send the message or not after writing.</li> </ul>
Incoming messages	<ul style="list-style-type: none"> <li>• A signal is heard once all parts of the message have been received or when a timeout occurs.</li> <li>• Option to re-use the content of an EMS message. Sounds and pictures can be inserted in a new message, if the object is not protected using ODI</li> </ul>
Concatenated messages	A receipt is received in the phone when all parts of a concatenated message have been delivered
Insert objects	It is possible to add pictures, animations and sounds to an EMS message
Sounds	Chimes high, chimes low, ding, tada, notify, drum, claps, fanfare, chords high, chords low
iMelody	Yes, version 1.2
Melodies	<ul style="list-style-type: none"> <li>• Send and receive melodies via EMS, if the melodies are not protected by ODI</li> <li>• Download melodies and commercial tunes from WAP portals</li> <li>• Create melodies on WAP portals</li> </ul>
WBMP	Yes
Picture sizes	16 x 16 pixels, 32 x 32 pixels, variable size in black and white.

Feature	Support
Pictures	<ul style="list-style-type: none"> <li>Edit pictures by using the phone keypad</li> <li>Send and receive pictures via EMS, if the pictures are not protected by ODI</li> <li>Create pictures on WAP portals</li> <li>Download pictures from WAP portals</li> <li>Receive pictures in enhanced messages originated by service providers</li> </ul>
Animations	The phone supports the following animations: Angry, Crying, Flirty, Happy, Kiss, Sad, Tongue, Wow, Confused, Devil, Glasses, Indifferent, Laughter, Sceptical and Wink as defined in 3GPP™ TS 23.040 v4.3.0. Send and receive colour animations.
TP-PID field value given by the phone before sending an EMS message	0 x 00

## Multimedia Messaging Service

Feature	Support
MMS/CSD parameters and MMS/GPRS parameters placement	MMS is bound to an Internet profile. An Internet profile is bound to a Data Account. A Data Account contains either CSD parameters or GPRS parameters
Option to pre-configure the MMS parameters in factory	<ul style="list-style-type: none"> <li>MMS/CSD: Yes</li> <li>MMS/GPRS: Yes</li> </ul>
Option to configure the MMS parameters by OTA provisioning	<ul style="list-style-type: none"> <li>MMS/CSD: Yes</li> <li>MMS/GPRS: Yes</li> </ul>
Option for all the parameters from the parameters set to be OTA provisioned at the same time	<ul style="list-style-type: none"> <li>MMS/CSD: Yes</li> <li>MMS/GPRS: Yes</li> </ul>
Option for only one parameter from the parameters set to be OTA provisioned	<ul style="list-style-type: none"> <li>MMS/CSD: No</li> <li>MMS/GPRS: No</li> </ul>
OTA provisioning solution	OTA Settings Specification v7.1 © Ericsson and Nokia
Supplier indication of realized interoperability tests between its MMS User Agent and MMS Relay/Server from other suppliers	Yes
Support of a standard or a proprietary procedure for OTA provisioning of MMS parameters	Proprietary

Feature	Support
Functionalities that the user is able to set during message composition	<ul style="list-style-type: none"> <li>• Message subject</li> <li>• Message priority</li> <li>• Email recipient address</li> <li>• Message Cc recipient(s) address(es)</li> <li>• Message Bcc recipient(s) address(es)</li> <li>• Delivery report request</li> <li>• Delivery time</li> <li>• MSISDN recipient address</li> <li>• Validity period</li> </ul>
The user can insert multimedia elements into multimedia messages from	<ul style="list-style-type: none"> <li>• File Manager</li> <li>• Camera</li> <li>• Contacts</li> <li>• Calendar</li> </ul>
Option for sent messages to be memorized into a folder in the phone memory	Yes
Actions that the user can perform after message notification	<ul style="list-style-type: none"> <li>• Auto Download - home/roaming</li> </ul>
Actions that the user can perform after message retrieval	<ul style="list-style-type: none"> <li>• Reply to the sender of the message SMS/MMS/Voice message</li> <li>• Reply to the sender and to Cc people MMS/Voice message</li> <li>• Reply to the sender and to Bcc people MMS/Voice message</li> <li>• Forward the message MMS</li> <li>• Delete the message</li> <li>• Save message in the phone memory</li> <li>• Call the sender of a message</li> <li>• View details</li> <li>• Save items</li> </ul>
Multimedia codecs/formats supported for audio	AMR, WAV, MIDI, iMelody.
Multimedia codecs/formats supported for video	3GPP™
Multimedia codecs/formats supported for images and animations	JPEG, GIF, PNG, WBMP, SVG
Supported formats for message presentation	<ul style="list-style-type: none"> <li>• Message body + attachments (email presentation)</li> <li>• SMIL version as described in OMA MMS IOP document version 1.2</li> </ul>

Feature	Support
Maximum message size that can be handled by the phone for message	Maximum size is possible to customize.
MMS User Agent will report problems to user in case of	<ul style="list-style-type: none"> <li>• Message not sent causes no user subscription to service, if included in ResponseText (please see WAP209)</li> <li>• Message not sent causes required functionality not supported by MMS Relay/Server, if included in ResponseText (please see WAP209)</li> <li>• Message not sent causes insufficient credit (in case of prepaid charging), if included in ResponseText (please see WAP209)</li> </ul>

## Email client technical data

Feature	Support
Bearer type GSM Data (IP)	Yes, ISDN and analog
Character sets	ISO: ISO-8859-1, ISO-8859-2, ISO-8859-5, ISO-8859-7, ISO-8859-9, ISO-8859-10 Windows: Windows-1251, Windows-1252, Windows-1254, Windows-1255, Windows-1258 US-ASCII Unicode: UTF-7, UTF-8, UTF-16 Japanese: Shift_JIS Cyrillic: KOI8-R Simplified Chinese: GB2312 Traditional Chinese: BIG5
OTA provisioning solution	No
Protocols	POP3 and IMAP4
Push email	IMAP Idle (extension of IMAP4Rev1), OMA Email Notification 1.0 and scheduled checking
Remote configuration	OMA Client Provisioning and Nokia Smart Messaging
HTML mail	Yes (tags removed)
Inline images	No
Message management	Window of 20 latest messages Headers only or size limits
ESMTP	No
Background sending	Yes

# Connectivity

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## OMA Data Synchronization (SyncML) technical data

Feature	Support for SyncML
SyncML compliance	The phone is fully SyncML compliant, having passed SyncML Conformance testing. SyncML 1.1.2 is used depending on configuration and both are supported in Server-alerted synchronization
Basic data formats	Contacts: vCard 2.1, Calendar: vCalendar 1.0 (vEvent), Tasks: vCalendar 1.0 (vTodo), Notes: text/plain
Possibility for operators to extend SyncML functionality	The device may be configured to include preset SyncML settings.
Possibility to synchronize other phones using SyncML	No
Transport method for SyncML messages	HTTP
Synchronization application placement	Inside the phone
Possibility for the user to configure login parameters (e.g. username and password) to access the remote database	Yes
Configuration parameters that can be entered/modified by the user	Server URL, Username, User PWD, Paths to databases (Calendar, Contacts, Tasks and Notes), Username and PWD for Databases, Databases to be synchronized (on/off), Internet profile, Synchronization interval, Server ID and Server PWD, and permission to allow server-alerted synchronization. Can be provisioned with Ericsson Nokia OTA Settings Specification v7.1, OMA Client provisioning v1.1, and OMA Device Management 1.1.2
Mechanisms used by the phone to capture changes made by the end user (i.e. how does the SyncML client in the phone know which changes were made to the address book)	It uses a change log where it marks the contact as updated
Ability to deal with multiple servers	Yes
Ability to perform conflict resolution actions	No

## Browser technical data

Feature	Support in the browser
Back to previous page	Yes
Bearer type GPRS (IP)	Yes
Bearer type GSM Data (IP)	Yes, ISDN and analogue.
Bookmarks	Yes, up to 100 named bookmarks for easy access to frequently visited pages, with folders and sorting supported.
Bookmark Export/Import	Partial, can be sent using vBookmark format via SMS.
Cache	Yes (size 300 kB).
Character sets *	<p>ISO: ISO-8859-1, ISO-8859-2, ISO-8859-3, ISO-8859-4, ISO-8859-5, ISO-8859-6, ISO-8859-7, ISO-8859-8, ISO- 8859-8-i, ISO-8859-9, ISO-8859-10</p> <p>Windows: windows-1250, windows-1251, windows-1252, windows-1253, windows-1254, windows-1255, windows-1256, windows-1257</p> <p>US-ASCII</p> <p>Unicode: UTF-8, UTF-16BE, UTF-16LE, ISO-10646-UCS-2, ISO-10646-UCS-2_LE, ISO-10646-UCS-4, ISO-10646-UCS-4_LE</p> <p>Japanese: Shift_JIS, EUC-JP, ISO-2022-JP</p> <p>Simplified Chinese: GB2312, GB_2312-80, GBK</p> <p>Traditional Chinese: BIG5</p> <p>Korean: EUC-KR, KS_C_5601-1987</p> <p>Cyrillic: KOI8-R</p> <p>Thai: windows-874, TIS-620</p> <p>Special: x-euc-jp, x-sjis, ISO8859-1</p> <p>* When creating WML applications, it is recommended to always save the page contents as UTF-8, and that this is clearly indicated in the pages before publishing. This ensures that the contents of the application can be viewed, regardless of character sets used in gateways and the phone. All characters are not supported in all phones. The software version depends on which market the phone is associated to. Also, please note that the phone may not support input on a WAP Service which uses certain characters (languages), even if those characters are supported for browsing in the phone.</p>
Clear cache	Yes
Colour	Colour display
Home page	Yes, up to 10 different; one for each WAP profile
HTML version for WAP browser	XHTML, Mobile Profile 1.2, HTML 4.01, WAP 2.0/WML 1.3, CSS, DOM2, ECMAScript
Hyperlinks in Text	Yes, highlighted as blue text
Hyperlinks in Images	Yes, indicated by a frame
Image Animation	Yes



<b>Feature</b>	<b>Support in the browser</b>
Image and Animation Formats	GIF (including animated) WBMP, no transparent layers, JPEG, PNG, BMP, SWF and SVG-t
Network Settings	Up to 10 different settings available by selecting WAP profile (Internet, Banking, Gateway etc.)
OTA Support	Yes
PPP Authentication	PAP, supported
Reload page	Yes
Security	TLSv1 SSLv3 WIM on SIM ICC X.509 certificate support, WAP Profile
User Agent Profiles	Yes, list of client characteristics - for example display size.
WAP/WML	WAP 2.0/WML 1.3
Internet profiles	Dynamic - up to 10 Internet profiles, each with its own settings.

## Operator technical data

<b>Feature</b>	<b>Support for WAP</b>
<b>Web Browser</b>	OpenWave 7.2
Version	2.0 baseline
HTML	XHTML Mobile Profile
Access NetFront™ 3.3	<ul style="list-style-type: none"> <li>• HTML 4.01, XHTML 1.1 Including mobile profile</li> <li>• CSS 1 &amp; CSS 2 (Partial)</li> <li>• ECMAScript 3rd edition (equal to Java script 1.5)</li> <li>• DOM level1, level2 and Dynamic HTML (Partial)</li> <li>• Graphic Formats: GIF, Animated GIF, JPEG, PNG, BMP, WBMP</li> </ul>
<b>PROVISIONING</b>	
<b>Provisioning types</b>	<b>OMA Client provisioning (v1.1)</b>
Total Parameter sets	10 (shared between the provisioning types). < or = 10 (total number of profiles).

<b>Feature</b>	<b>Support for WAP</b>
Parameter set list	<ul style="list-style-type: none"> <li>• name,</li> <li>• Homepage and homepage title (1st bookmark element),</li> <li>• Proxy/GW address,</li> <li>• Bookmarks (remaining bookmark elements),</li> <li>• CSD phone number,</li> <li>• CSD data rate,</li> <li>• CSD dial type,</li> <li>• GPRS APN,</li> <li>• Protocol authentication,</li> <li>• GW authentication,</li> <li>• Secure connection on/off</li> </ul> <ul style="list-style-type: none"> <li>• Name,</li> <li>• Homepage,</li> <li>• Proxy/GW address,</li> <li>• CSD phone number,</li> <li>• CSD data rate,</li> <li>• CSD dial type,</li> <li>• CSD response timer,</li> <li>• GPRS APN,</li> <li>• Protocol authentication,</li> <li>• GW authentication,</li> <li>• GPRS QoS</li> </ul>
Parameter sets include	CSD, GPRS (different sets)
Factory pre-configuration	CSD (possibility to lock a setting), GPRS
OTA	CSD, GPRS configuration possible
<b>Security mechanism</b>	
<b>Bearer</b>	<b>OMA Client Provisioning</b>
OTA via SMS	Uses security mechanism (SEC) methods according to WAP-183-ProvCont-20010724-a (see <a href="http://www.openmobilealliance.org">www.openmobilealliance.org</a> )
<b>Interface</b>	
<b>Bearer</b>	<b>OMA Client Provisioning</b>
OTA via SMS	For NETWPIN the user is asked to accept to install received settings. For USERPIN, USERNETWPIN and USERPINMAC the user is subsequently asked to enter a PIN code that is a shared secret between the service provider and the user
OTA via Cell Broadcast	–
<b>Re-provisioning Interface</b>	
OTA via SMS	If the settings previously installed were privileged or have higher priority, the settings might not be possible to install again unless the terminal is reset, otherwise as above
OTA via Cell Broadcast	–
Carrier reset/provisioning	Yes, but not if the set is pre-configured in the factory and locked
SWIM	Not used for provisioning. The SWIM is only used for WAP security, both SSI/TLS connections and digital signatures
<b>Applicative provisioning</b>	
Preferred bearer customization	Yes
Email customization	Yes, but not through provisioning.

<b>Feature</b>	<b>Support for WAP</b>
Other applications/features	Yes (MMS, SyncML, Wireless Village)
<b>Technologies</b>	
OMA Client provisioning	Yes, WAP provisioning document v1.1
Openwave OTA	No
Other	Yes, The Ericsson-Nokia solution. OTA Settings Specification v7.1
Provisioning bearer	SMS
Parameter sets available	< or = 10 (total number of Internet profiles)
Parameter sets for OTA modification	< or = 10 (total number of Internet profiles)
<b>PUSH</b>	
<b>Content types</b>	
Service Indication (SI)	Yes
Service Loading (SL)	Yes
Cache Operation (CO) content type	Yes
Session Initiation Application (SIA)	Yes
<b>Man Machine Interface</b>	
SI/content retrieval postponing	Yes
SI menu structure accessibility	Messaging, Inbox
SL reception warning	<ul style="list-style-type: none"> <li>The user can make a choice if a dialogue is wanted or not before loading the SL</li> <li>Messaging/Settings/Push/Allow push msg/Always ask</li> </ul>
SIA reception warning	Yes
Cache size limitations	The oldest push in the inbox will be discarded
Number of push messages	Depending on the size of the push messages. Around 20 push messages with a size of 500 bytes can be saved
Push de-activate	Yes (Messaging/Settings/Push/Allow push msg)
Dynamic push menu changes	No, there are no changes in the menus when activating/deactivating push
<b>Security</b>	
Mechanisms for push	None
Trust with PPG	Sending a SIA is the most trustful
WSP push sessions	No
HTTP push session	Yes

<b>Feature</b>	<b>Support for WAP</b>
White list	Service Centre, IP address
<b>User agent profile</b>	
UA profile content sent at beginning of WSP session	No
URL sent pointing to the UA profile at the beginning of WSP session	No, WSP not supported
URL location	On the manufacturer WAP site
<b>WTAI</b>	
WTA Make Call	Yes
WTA Send DTMF	Yes
WTA Add Phonebook	Yes
<b>DOWNLOAD</b>	
<b>WAP solutions</b>	
HTTP GET solution to download content over WAP	Yes
Download Fun from Openwave	No
Other download content over WAP	Yes, download limit (HTTP protocol).
Download application/product memory check	Yes
Downloaded object solution	Yes. The user is informed where the content is saved and asked if it should be used at once or later
UAP indication for downloading	Yes
Other features	Yes. Save, delete, forward, use and manage
Object formats	All formats that are supported in the phone will be possible to download
<b>GRAPHICAL USER INTERFACE</b>	
<b>Man Machine Interface</b>	
Selection keys	Yes
Separate/dedicated back or delete keys	Yes
Display backlight on when browsing	Yes
Predictive writing	Yes
“http://” string displayed automatically when entering URLs	Yes
<b>Elements</b>	

<b>Feature</b>	<b>Support for WAP</b>
Pop-up menus	Yes, in XHTML
Radio buttons	Yes, in XHTML
Check boxes	Yes, in XHTML
Buttons	Available as XHTML form controls

## Java

<b>Feature</b>	<b>Functionalities</b>
<b>Java 2, Micro Edition (J2ME)</b>	<ul style="list-style-type: none"> <li>• CLDC 1.1 (JSR 139)</li> <li>• MIDP 2.0 (JSR 118)</li> <li>• Wireless Messaging API (JSR 120/205)</li> <li>• Mobile Media API (JSR 135)</li> <li>• Java Technology for the Wireless Industry (JSR 185)</li> <li>• PDA Optional Packages for J2ME Platform (JSR 75)</li> <li>• Web Services (JSR 172)</li> </ul>
<b>Java 3D</b>	<ul style="list-style-type: none"> <li>• Mascot Capsule Micro3D Version 4 API</li> <li>• Mobile 3D Graphics API for J2ME (JSR 184)</li> </ul>
<b>Nokia UI API</b>	<ul style="list-style-type: none"> <li>•</li> </ul>

# Abbreviations

## **3GPP™**

3rd Generation Partnership Project. Collaboration between a number of telecommunications standards bodies to specify 3G. 3GPP™ also maintains and develops the specifications for GSM.

## **AAC**

Advanced Audio Coding

## **AMR**

Adaptive Multi-Rate. 3GPP™ standard for speech coding (compression).

## **API**

Application Programming Interface

## **CLDC**

Connected Limited Device Configuration

## **CS**

Circuit Switched. Connection from A to B which has a fixed bandwidth and is maintained over a period of time, for example a voice telephone call.

## **CS-1 to CS-4**

Coding Scheme. Determines the data rate per timeslot in GPRS.

## **CSD**

Circuit Switched Data. CSD is a GSM service providing a CS data connection at a rate of 9.6 or 14.4kbps.

## **CSS**

Cascading Style Sheet

## **DM**

Device Management. DM utilizes GPRS as bearer (basic network connectivity needs to be in place) of the provisioning data and allows the operator to access the phone and check and set different settings such as Network connectivity (GPRS), email, MMS, WAP and Java.

## **DRM**

Digital Rights Management. Controls copying and distribution of contents, with respect to intellectual property rights.

## **DTMF or Touch Tone**

Dual Tone Multi-Frequency signal. Codes sent as tone signals. Used for telephone banking, accessing an answering machine, etc.

## **e-GSM**

Extended GSM. New frequencies specified by the European Radio Communications Committee (ERC) for GSM use when additional spectrum is needed (network-dependent). It allows operators to transmit and receive just outside GSM's core 900 frequency band. This extension gives increased network capability.

## **EFR**

Enhanced Full Rate. Speech coding.

## **EMS**

Enhanced Messaging Service. An extension of SMS enabling pictures, animations, sound and text formatting to be added to text messages. 3GPP™ has included EMS in the standards for SMS.

## **ETSI**

European Telecommunications Standards Institute

## **FM**

Frequency Modulation of the (radio) carrier wave.

## **FR**

Full Rate. Speech coding.

## **GIF**

Graphics Interchange Format. Format for storing images which also supports animated images. Highly compressed by limiting the colour palette to 16 or 256 colours.

## **GPRS**

General Packet Radio Services

## **GSM**

Global System for Mobile Communications. The GSM system family includes GSM 850, GSM 900, GSM 1800 and GSM 1900. There are different phases of roll-out for the GSM system and GSM phones are either phase 1 or phase 2 compliant.

## **HR**

Half Rate. Speech coding.

## **HSCSD**

High Speed Circuit Switched Data

## **HTML**

HyperText Markup Language

## **HTTP**

HyperText Transfer Protocol

## **IMAP**

Internet Message Access Protocol. A method of accessing email or bulletin board messages that are kept on a mail server. IMAP Idle is an optional expansion of the IMAP email protocol that allows the server to send new message updates to the client in real time.

## **IrDA**

Infrared Data Association

## **JPEG**

Joint Photographic Experts Group, best known for the JPG format for still image compression.

## **MIDI**

Musical Instrument Digital Interface

## **MIDP**

Mobile Information Device Profile.

## **ME**

Mobile Equipment. Phone excluding SIM card.

## **MMAPI**

Mobile Media Application Programming Interface

## **MMI**

Man-Machine Interface. Same as User Interface (UI).

## **MMS**

Multimedia Messaging Service. Logical extension of SMS and EMS, MMS defines a service enabling sound, images and video to be combined into multimedia messages.

## **MP3**

MPEG-1 layer 3, an effective audio coding scheme.

## **MPEG**

Moving Picture Experts Group. A working group of ISO/IEC in charge of the development of standards for coded representation of digital audio and video.

## **MT**

Mobile Termination

## **ODI**

Object Distribution Indicator. Part of EMS release 5, ODI is a mechanism for controlling distribution of contents (pictures, melodies etc.) within short messages.

**OMA**

Open Mobile Alliance. Promotes interoperability and a wireless standard for delivering email, textbased Web pages and data to mobile phones, PDAs, pagers and other mobile terminals. OMA email enables the mobile email client to be notified of a new email using mobile network protocols.

**OTA**

Over-the Air configuration. To provide settings for the phone by way of sending a message, SMS, over the network to the phone. This reduces the need for the user to configure the phone manually.

**PDA**

Personal Digital Assistant

**PDP**

Packet Data Protocol

**PIM**

Personal Information Management. Generic term for applications such as Contacts, Calendar, Tasks etc.

**PNG**

Portable Network Graphic

**Quad band**

GSM 850/900/1800/1900

**QVGA**

Quarter Video Graphics Array

**RDS**

Radio Data System

**RSS**

Really Simple Syndication

**RTSP**

Real Time Streaming Protocol. Serves as a session control.

**SI**

Service Indication

**SL**

Service Loading

**SIM card**

Subscriber Identity Module card. A card that must be inserted in any GSM-based mobile phone. It contains subscriber details, security information and memory for a personal directory of numbers. The card can be a small plug-in type or credit card-sized, but both types have the same functions.

**SMS**

Short Messaging Service. Allows messages of up to 160 characters to be sent and received via the network operator's message centre to a mobile phone.

**SP-MIDI**

Scalable Polyphony MIDI

**SS**

Supplementary Services

**SSL**

Secure Socket Layer

**TLS**

Transport Layer Security

**Tri band**

GSM 850/1800/1900 or GSM 900/1800/1900.

**UI**

User interface

**URL**

Uniform Resource Locator. The global address of documents and other resources on the World Wide Web.



## **USB mass storage**

When connecting a PC to the phone, the phone's memory appears as a removable disk along with other disks and drives in the PC. You can then quickly and easily drag and drop items between folders in the phone and the PC such as images, documents, music and video.

## **USSD**

Unstructured Supplementary Services Data. Narrow-band GSM data service.

## **vCard**

vCard automates the exchange of personal information typically found on a traditional business card, for use in applications such as Internet mail, Voicemail, Web browsers, telephony applications, call centers, conferences, PIMs /PDAs, pagers, fax, office equipment, and smart cards. vCard is specified by IETF.

## **VGA**

Video Graphics Array. Graphics standard introduced by IBM, having a resolution of 640x480 pixels.

## **VHF**

Very High Frequency. A band of radio frequencies falling between 30 and 300 MegaHertz.

## **WAP**

Wireless Application Protocol. Handheld devices, low bandwidth, binary coded, a deck/card metaphor to specify a service. A card is typically a unit of interaction with the user, that is, either presentation of information or request for information from the user. A collection of cards is called a deck, which usually constitutes a service.

## **WAV**

Waveform Audio File

## **WBMP**

Wireless Bitmap. A graphic format optimized for mobile computing devices.

## **WML**

Wireless Markup Language. A markup language used for authoring services, fulfilling the same purpose as HyperText Markup Language (HTML) does on the World Wide Web (WWW). In contrast to HTML, WML is designed to fit small handheld devices.

## **WSP**

Wireless Session Protocol

## **XHTML**

Extensible HyperText Markup Language

# Related information

## Documents

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- Sony Ericsson User guide
- Sony Ericsson FAQ
- AT Command Reference Manual
- WAP 2.0 Specifications

## Links

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- [www.sonyericsson.com](http://www.sonyericsson.com)
- [www.ericsson.com/mobilityworld](http://www.ericsson.com/mobilityworld)
- [www.midi.org](http://www.midi.org)
- [www.ianywhere.com](http://www.ianywhere.com)
- [www.gsmworld.com](http://www.gsmworld.com)
- [www.imc.org](http://www.imc.org)
- [www.imc.org/pdi](http://www.imc.org/pdi)
- [www.3gpp.org](http://www.3gpp.org)
- [www.irda.org](http://www.irda.org)
- [www.etsi.org](http://www.etsi.org)
- [www.wapforum.org](http://www.wapforum.org)
- [www.syncml.org](http://www.syncml.org)
- [www.w3.org/TR/xhtml1-basic](http://www.w3.org/TR/xhtml1-basic)
- [www.java.sun.com](http://www.java.sun.com)
- [www.cognimatics.com](http://www.cognimatics.com)

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