R306

Stereo Radio clam

Preface

Purpose of this document

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

Sony Ericsson Developer World

On 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.2008

Document history

Change history		
2008-01-24	Version1	R1A
2008-04-25	Version 2	R2A
2008-05-08	Version 2	R3A
2008-07-01	Vesion 2	R4A
2008-10-16	Vesion 2	R5A

Contents

Product overview

R306 is establishing an energized radio experience by addressing the design, function and user experience. It is a sleek clamshell phone with only 15.8 mm in thickness, and offers easy and quick radio access with its radio-inspired design. By having sub-display and radio dedicated keys for preset radio channels and quick frequency adjustment on the outside, you can manage the radio without even opening the clamshell.

After plugging in the portable handsfree, which acts as the FM/AM radio antenna, the user has access to up to 20 saved channels. The three favourite channels, either AM or FM, can be linked to the three radio keys on the front where the user also finds two tuning keys and a display for channel information. The sub-display is hidden under the chrome lens and lets you have easy operation with the lid on, such as viewing the radio channel, caller ID and so on. The stereo speakers let you share the fun with others. If you are in a noisy environment, you can turn on the volume boost to maximize the sound. With the audio enhancer key, you can choose to activate the volume boost or 3D sound enhancer for an even better listening experience. You can also set your wake up alarm on your favourite channel.

R306 also includes a lot of other handy features, such as TrackID™, 1.3 megapixel camera, video recording and playback, MP3 ringtones and playback, Bluetooth, Alarm, Calculator, Calendar, Predictive text input, SMS, MMS, Phonebook and Java MIDP 2.0.

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

Key features

AM/FM Radio

The AM/FM radio offers instant and easy access to AM/FM radio channels. Just plug in the handsfree that works as an antenna and start listening to your music. The radio can also be used as an alarm signal.

FM Radio with RDS

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. Just plug in the handsfree that works as an antenna and start listening to desired music. The radio can also be used as an alarm signal.

TrackID™

TrackID™ enables the user to identify a track playing in the room. A few seconds of the song is sampled, the phone connects to an online database which identifies the song and returns Title, Artist and Album information.

Stereo speakers

The high-quality stereo speakers offer a wide sound effect and enjoyable and easy-to-share radio experience.

Enhanced audio experience

To support very loud volume in noisy environment there is an audio enhancer for the end user to maximize the volume from the stereo loudspeakers. With the audio enhancer key, you can choose to activate volume boost in speaker mode or 3D sound enhancement in PHF mode, for an even better listening experience.

Radio recording

You can record your favourite songs or programs on the radio while you are listening. The recorded radio clips can be played back and set as ringtones.

1.3 megapixel camera

A built-in 1.3 megapixel camera makes it easy to take momentary pictures and videos of everyday life and then view the pictures and video clips at any time on the screen. The pictures and video clips can also quickly be shared with friends using Bluetooth™.

Picture messaging

Multimedia Messaging Service (MMS) is a logical extension of SMS and EMS. MMS lets you combine sound and image into multimedia messages.

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. Images can be wirelessly sent to another phone. The phone and a computer can exchange data such as images, vCards, music files and calendar data. Bluetooth version 2.0 is supported.

1.9 inch colour screen

The 128x160 pixel 65k colour screen enhances viewing and facilitates high-quality entertainment.

Sub-display

A sub-display shows information such as incoming calls, messages and silent mode.

Alarm

Set a time and your phone will ring at that time. Choose a favourite station to be your alarm ringtone and wake up to your favourite radio station.

Picture phonebook

R306 lets you assign a picture or an icon saved in the phone to an entry in the Phonebook. When that person calls, a picture or an icon of your choice is shown in the display as well as the name. It is also possible to assign a ringtone to an entry in the phonebook. When that person calls, a particular ringtone is heard, and the name of the person calling is shown in the display.

USB 1.1

With a USB cable, you can exchange information between your phone and your PC, using USB mass storage. Windows standard drivers are used so there is no need to install any extra software on the PC.

WAP 2.0 XHTML™

A mobile Internet standard enabling you to access specially designed Internet sites. WAP 2.0 supports colour and interactive lists.

Java™

Download additional applications which are information- and entertainment-based. This gives users a chance to personalize the functions and features in their phones, and developers the opportunity to create new applications.

Gaming

Gaming is a very popular feature in mobile phones, and with Java™, users can download new games and skill levels to further enhance their entertainment experience. Several embedded games are included in the phone at purchase.

Polyphonic sound

Polyphonic ringtones, 32 simultaneous sounds.

Calendar

Full function calendar with day, week and month views and reminders.

Vibrating alert

The phone vibrates and you feel when a call comes in.

Images

Technologies in detail

This chapter includes short descriptions of the technologies available in this product compared to two other Sony Ericsson products.

Functions and features

The following includes short descriptions of the technologies available in R306 compared to Z320 and T250.

Feature	R306	Z320	T250
Alarm clock	Yes	Yes	Yes
Antenna Built-in	Yes	Yes	Yes
Backlight Illuminates your phone screen	Yes	Yes, white	Yes
Battery	3.6V, 930 mAh, Lithium Polymer	3.6V, 950 mAh, Lithium Polymer	3.6V, 780mAh, Lithium Polymer
Battery charging time	At least 90% charged within 2 hours	At least 90% charged within 2 hours	At least 90% charged within 2 hours
Bluetooth™ wireless technology Wireless connectivity between devices. Support for specification of the Bluetooth System, version 2.0	Yes	No	No
Business card exchange Exchange contact information	Yes	Yes	No
Calculator	Yes	Yes	Yes
Calendar	Yes, fully functional calendar with day, week and month views and reminders	Yes, fully functional calendar with day, week and month views and reminders	Yes, fully functional calendar with Today and All view. Reminder can be set. No synchronisation
Call list View calls made and calls received	Yes	Yes	Yes
Camera 1.3 megapixel camera	Yes, 1.3 megapixel	Yes, 1.3 megapixel	No, VGA standard camera
Camera key	No	Yes, navigation key up	Yes, shortcut on the navigation key
Camera album	Yes	Yes	No
Camera file browser	Yes	Yes	Yes

Feature	R306	Z320	T250
Chinese input method Text input methods based on Simplified or Traditional Chinese; Bopomofo, Pinyin or Stroke	Yes	Yes	Yes
Clock Visible clock on the screen	Yes	Yes	Yes
Co-branding area	7 x 22 mm	39 x 9 mm	8 x 22 mm
Colour	Coffee Black, or Lustrous White	Crimson red, or Atlantic blue	Black, or Silver
Contacts	Yes, phonebook with fields for name, number, email address, Web address, picture, ringtone, title, address info, personal info and birthday. Save up to 1000 contacts.	Yes, phonebook with fields for name, number, email address, Web address, picture, ringtone, title, address info, personal info and birthday. Save up to 1000 contacts.	Yes, phonebook with fields for phone number, and name. Save up to 300 contacts (900 phone numbers in total)
Conference calls Support for multi-party calling	Yes	Yes	Yes
Content online Downloadable pictures and ringtones are available online	Yes	Yes	Yes
Copyright protection - DRM DRM (Digital Rights Management) features the rights and copy protection of downloaded content (audio, pictures, music tones, entertainment features such as games etc.)	Yes, DRM v1.0 forward lock	Yes, OMA DRM v1.0	Level 1 forward lock
CSS Cascading Style Sheets, the de facto standard style sheet language on the Web, specified by W3C	No	Yes	No
Design	Clamshell, with hidden sub-display in front	Clamshell, exchangeable front and battery cover	Stick phone, gloss finish front, painted back cover

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Feature	R306	Z320	T250
Device Management (DM) DM utilizes GPRS as bearer of the provisioning data (basic network connectivity needs to be in place) and allows the operator to access the phone and check and set different settings such as Network connectivity (GPRS), MMS, and WAP. DM is achieved by supporting Over The Air provisioning 7.1 (OTA), OMA Client Provisioning 1.1 (CP) and OMA DM 1.1.2	No	Yes	Yes
Digital zoom	Yes, up to 4x	Up to 4x	No
DOM2 Document Object Model (DOM) Level 2 HTML Specification, specified by W3C	No	Yes	No
EMS (Enhanced Messaging Service) Text messaging (SMS) with pictures and sounds	Yes	Yes	Yes
Exterior description Length (mm): Width (mm): Thickness (mm):	 90 47.9 15.8	 87 47 19.8	 100.2 44.7 12.7
Fast port A system connector which enables faster data transfer from phone to computer and computer to phone	Yes (no computer connection support)	Yes	Yes (no computer connection support)
File manager Folder structure storage to help you save and organize pictures, sounds and other phone content	Yes	Yes	Yes
FM radio with RDS FM radio with presets, auto and manual search. The handsfree is used as an antenna. The radio can also be used as an alarm signal.	Yes	Yes	Yes
Games download Replace your in-phone games with new ones	Yes	Yes	No
Games embedded	Yes	Yes	Yes

Feature	R306	Z320	T250
GPRS 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	Yes Multislot class 8 supported (4+2)	Yes Multislot class 8 (4+2)	Yes Multislot class 8 supported (4+2)
Icon Desktop A graphic icon desktop with interactive icons	Yes	Yes	Yes
Icon display The front display lights up and shows information about new events	Yes	Yes	No
Internet security Encrypts confidential information such as credit card and bank account numbers. Necessary for mobile banking and shopping	Yes	Yes	No
Java™ Support for Java technology	Yes, Java 2, Micro Edition	Java 2, Micro Edition (J2ME™)	No
Keys - Dedicated radio keys	3 preset channel keys 2 radio frequency search keys	No	No
Keys - Navigation and more	4+1 way navigation key 2 selection keys C (Clear) key Call Key End/on/off Key Shortcut key Radio button (navigation key up)	4+1 way navigation key 2 selection keys Back C (Clear) key On/off (combined with C key) Internet/operator key Camera button (navigation key up)	4 way navigation with preset shortcuts 2 selection keys Call key End/on/off key
Keys - Keypad	12 alphanumeric keys	12 alphanumeric keys	12 alphanumeric keys

Feature	R306	Z320	T250
Keys - side	Volume key Audio enhancer key	Volume key	No
Keypad lock Lock the phone keys to prevent activation of a function in the phone	No	Yes	Yes
Lunar calendar 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
Memory (built-in) Phone memory that is free for the user to use for pictures, sounds, and more	Up to 5.0 MB	Up to 10 MB	Up to 3.0 MB
Menu shortcuts Support for dedicating shortcuts to frequently used phone functions	Yes	Yes	Yes, fixed shortcuts
MMS (Multimedia Messaging Service) Picture messaging with text and sound	Yes	Yes	Yes
Networks	GSM (R97) Tri band a variant: GSM 850, GSM 1800, GSM 1900 i and c variant: e-GSM 900, GSM 1800, GSM 1900	GSM (R97) Tri band a variant: GSM 850, GSM 1800, GSM 1900 i and c variant: e-GSM 900, GSM 1800, GSM 1900	GSM (R97) Dual-band: • 900/1800 • 850/1900
OTA settings WAP and other settings can be sent over-the-air to the phone	Yes	Yes	Yes
Picture gallery A thumbnail image gallery	Yes	No	No

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Feature	R306	Z320	T250
Picture phonebook Add a picture to a saved contact. The picture appears on the screen when the saved contact calls	Yes	Yes	No
Picture wallpaper Background picture seen on the screen when the phone is in standby mode	Yes	Yes	Yes
Polyphonic ringtones	32	32	32
Predictive text input 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	Yes	Yes
Radio listening time With PHF With speaker	Concert sound mode (volume=8/8) is 11.7 hr(69.2mA); Medium volume(volume=5/8) is 12.6 hr(64.5mA) Volume boost (volume=8/8) is 2.4hr (342mA); Medium volume (volume=5/8) is 5.6hr (146mA)		
Radio shortcut	Yes, Navigation key up	No	No
Redial Identify and redial the most recent caller	Yes	Yes	No
Screen Type: Size: Resolution: Technology: Colours displayed together: Backlight colour:	Full graphical 1.9 inches 128x160 pixels TFT 65,000 (16 bit) White	Full graphical 1.8 inches 128x160 pixels TFT 65,000 (16 bit) White	Full graphical 1.7 inches 128x160 pixels TFT 65,000 (16 bit) Blue

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Feature	R306	Z320	T250
Screen saver When the phone has not been used for a while, a screen saver activates and the phone goes into 'sleep mode'	Yes	Yes	No
Shut down menu Shut down the phone, lock the keys, turn on silent or activate a profile	No	Yes	No
SIM card lock Protect your SIM card with a four-digit PIN code	Yes	Yes	Yes
Sleep mode A power saving feature that minimizes battery power consumed when the phone is in standby	Yes	Yes	Yes
SMS, long (Text messaging) Concatenated SMS text messaging	Yes, up to 6 concatenations	Yes	Yes, up to 6 concatenations
Sony Ericsson Update Service Download the latest operator approved version of the mobile phone software via a computer	Yes	No	No
Speakerphone Loudspeaker suitable for using the phone as an office handsfree	Yes	Yes	Yes
Speed dialling Allocating contacts in your phonebook to specific keys on the keypad	Yes	Yes	Yes
Standby time	Up to 410 hours	Up to 300 hours	Up to 300 hours
Status view The screen shows the network being used, the time and other status information	Yes	Yes	Yes
Stereo speakers	Yes	No	No
Stopwatch	Yes	Yes	Yes
Talk time	Up to 9 hours	Up to 10 hours	Up to 7 hours
Tasks Keeps track of important things you have to do	Yes	Yes	No

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Feature	R306	Z320	T250
Theme Phone menu texts and background graphics	Yes	Yes	Yes
Timer	Yes	Yes	Yes
TrackID™ Identify tracks sounds	Yes	No	No
USB connectivity support Connect the phone to a computer using a USB cable. The memory in the phone appears on the computer screen as a mass storage device	Yes	Yes	No
Vibrating alert The phone vibrates when a call comes in	Yes	Yes	Yes
Video viewing	Yes		
Viewfinder Use the camera to preview a picture before it is taken	Yes	Yes	No
Voicemail Support for voicemail operator service including automatic answering and message recording	Yes	Yes	Yes
Voice memo A mini recording device in your phone that lets you record voice messages or other sounds	Yes	No	No
WAP A mobile Internet standard to access specially designed Internet sites	Yes	Yes	Yes, 1.2.1
WAP 2.0 XHTML A mobile Internet standard to access specially designed Internet sites. WAP 2.0 supports colour and interactive lists	Yes, limited	Yes	No
Weight With battery:	93 g	90 g	82 g

Facts and figures

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	GSM/GPRS, Tri-band 900/1800/1900 or 850/1800/1900 MHz
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 5.0 MB
Data transfer speeds	Up to 85.6 Kbps (downlink) Up to 21.4 Kbps (uplink)

Performance and technical characteristics

Dimension	GSM 850	GSM 900	GSM 1800	GSM 1900
Frequency range (MHz)	TX: 824–849 RX: 869–894	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	GMSK	GMSK	GMSK	GMSK
TX Phase Accuracy	< 5º RMS Phase error (burst)	< 5º RMS Phase error (burst)	< 5º RMS Phase error (burst)	< 5º RMS Phase error (burst)
Duplex spacing	45 MHz	45 MHz	95 MHz	80 MHz
Frequency stability	+/- 0.1ppm	+/- 0.1ppm	+/- 0.1ppm	+/- 0.1ppm
Voltage operation (nominal)	3.7 V	3.7 V	3.7V	3.7 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
Transmitter Spurious emission (according to specification)	< -36 dBm up to 1 GHz < -30 dBm over 1 GHz	< -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	Better than – 102 dBm	Better than – 102 dBm
Receiver RX Bit error rate	< 2.4%	< 2.4%	< 2.4%	< 2.4%

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USSD technical data

Feature	Support
USSD support	GSM Phase 1/2 (Cross-phase compatibility) GPRS behaviour according to class 8
Mode support mode	UI-mode supported SAT initiated USSD supported
UI-mode details	It is possible to scroll up and down in USSD messages.

GPRS technical data

Dimension	Support
Compatible GPRS and SMG specifications	Release 97 according to ETSI specification
Data rates	Multislot class 8 supported (4+2). CS-1, CS-2, CS-3, CS-4. 9.05 Kbps, 13.4 Kbps, 15.6 Kbps, 21.4 Kbps supported (network-dependent)
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	No
Medium Access Modes	Dynamic allocation
Support of Packet Control Channels (PBCCH/PCCCH)	Yes
Network operation mode	NOM I, II, III
Support of GPRS 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	No
Support of the QoS modification procedure	Yes, when initiated by the network (not by the mobile phone)

Dimension	Support
Downlink data rate	Up to 85.6 Kbps for packet data communication, using 4 time slots in coding scheme CS-4
Uplink data rate	Up to 21.4 Kps for packet data communication, using 1 time slots in coding scheme CS-4
Mode of operation	Class B and Class C modes of operation supported
IP connectivity	PDP type IP is supported. IP termination in mobile or TE (laptop, PDA) supported
Application	WAP over GPRS supported (UDP/IP and GPRS-SMS)
QoS	QoS negotiation supported. Default requested QoS sent by the mobile phone at PDP context activation is reliability Class 3. Peak/Mean/Delay/Precedence. Class: subscribed. Precedence class supported (1,2,3). Reliability class 1-5 supported. Delay classes supported (1,2,3,4). Mean and peak throughput rate limited by multi slot class 4 and CS-4
PDP context	10 PDP context descriptions are saved in the phone. PDP context description is edited via application in mobile, AT-command or via OTA. Simultaneous PDP contexts are supported, maximum 2
SIM	GPRS aware, as well as non-GPRS aware, SIM cards are supported

SIM AT services supported

Service		Mode	Support
CALL CONTROL BY SIM			Yes
DATA DOWNLOAD TO SIM		Cell Broadcast SMS	No Yes
DISPLAY TEXT		Text of up to 240 characters (120 UCS2 coded)	No
	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

Service	Mode		Support
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
GET INPUT		General: No. 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 screen	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	No
LAUNCH BROWSER			No
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	No

Service		Mode	Support
		'05' - Timing advanced	No
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	No
		'03' = SIM Initialization	Yes
		'04' = SIM Reset	Yes
SELECT ITEM			Yes
SEND DTMF			Yes
SEND SHORT MESSAGE	bit 1:	0 = packing not required	No
		1 = SMS packing by the ME required	No
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	No
		'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	No
		'04' = set up call, disconnecting all other calls (if any)	Yes
		'05' = set up call, disconnecting all other calls (if any), with redial	No
SET UP EVENT LIST		'00' = MT call	Yes
		'01' = Call connected	Yes
		'02' = Call disconnected	Yes
		'03' = Location status	Yes
		'04' = User activity	Yes

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Service	Mode	Support
	'05' = Idle screen available	Yes
	'06' = Card reader status	N/A
	'07' = Language selection	Yes
	'08' = Browser termination	Yes
	'09' = Data available	Yes
	'OA' = Channel status	Yes
SET UP IDLE MODE		Yes, 1 row of text is supported
SET UP MENU		Yes
TIMER MANAGEMENT		No
OPEN CHANNEL		No
CLOSE CHANNEL		No
RECEIVE DATA		No
SEND DATA		No
GET CHANNEL STATUS		No

User Interaction with SIM AT

Display text

Text clearing times are 2-35 seconds and a 30-second time-out limit for the user to clear the text. 'Key' responses:

- 'Back' – Backward move in proactive session.

'OK'/'Back' clears the screen 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:

- '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:

- 'Clear' – Clear current character.
- '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.
- '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:

- 'Back' – End the proactive session.

Set up menu

Incorporates a SIM Application Toolkit Menu Item into the 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 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 will be available for selection, in the same way as the Select Item command.

Audio and Video

File types	Formats	Extensions
Audio (All listed audio file formats are supported ringtone file formats)	MP3 AMR-NB General MIDI (GM) SP-MIDI iMelody	.mp3 .amr .mid .mid .imy
Video (including audio part.)	MPEG4 H.263 (AMR-NB sound encoding only)	.mp4 .3gp
Streaming transport	RTSP according to 3GPP™	
Video encoding	No	
Video decoding	MPEG-4 H.263 Profile 0, Levels 10, 20, 45 (AMR-NB sound encoding only)	
Audio encoding	AMR-NB	
Audio decoding	AMR-NB	

Java™

Feature	Functionalities
Java™ Platform, Micro Edition	• JSR-75 PDA Optional Packages , FILE API ONLY • JSR 118 MIDP 2.0 J2ME Mobile Information Device Profile • JSR-120 J2ME Wireless Messaging API • JSR-135 J2ME Mobile Media API • JSR 139 CLDC 1.1 Connected Limited Device Configuration • JSR 185 JTWI Java™ Technology for the Wireless Industry • Nokia UI API

1.3 Megapixel camera

Facts and figures	
Picture sizes (resolution)	1.3 megapixel
Digital zoom	4.0x zoom
Colour depth	24 bit (8 bit per RGB channel), 65k colours
Camera memory	Phone memory, no memory dedicated to the camera only
Formats	JPEG, PNG, GIF (including animated)
Sharing via	MMS, EMS, WAP, Bluetooth™
Reset file number	Yes
Video recorder	
Video size (resolution)	128x96
Frame rate	15 fps (frames per second)
Video camera settings bar	
Video clip length	depending on memory
Turn on/off microphone	Off, On
Video camera setup	
Reset file number	Yes, same as camera

Pictures and animations

Image decoders

Decoder	Details	Size	Colour depth	File format
GIF	87a/89a	128x160 pixels	256	GIF
JPEG	ISO/IEC JPEG Baseline DCT Progressive DCT Non-differential Huffman coding Symbol 'SOF2'	1.3 megapixel		JFIF v1.02 EXIF
BMP	The bitmap image format used by Windows®	XRAM dependent, default is VGA	24 bit	
WBMP				

Image encoders

Decoder	Details	Size	Colour depth	File format
GIF	89a			
JPEG	ISO/IEC JPEG Baseline DCT Non-differential Huffman coding Symbol 'SOF0'	1.3 megapixel		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	Zi input
Reply to messages	It is possible to reply to received messages by SMS or phone call
Message creation methods support	Predictive writing and multitap
Possibilities when creating a message:	
save a sent message in a "Sent messages" folder	Yes
insert a line in the message	Yes
Possibilities when receiving a message:	
reply to the sender	Yes
forward the message	Yes
save the message on the SIM card	Yes
get delivery time and date	Yes
Possibilities of the previously sent message:	
delivery report of the message	Yes
forward the message	Yes
save the message on the SIM card	Yes
know the remaining capacity storage	No, but notification when 95% full

Feature	Support
Possibilities of the previously received message:	
reply to the sender	Yes
save the message on the SIM card	Yes
forward the message	Yes
know the remaining capacity storage	No, but notification when 95% full
Supported ways of replying to a received text message:	
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 (go to the WAP address contained in the message body)	Yes
via USSD session	No
Possibility to send a text message to a list of recipients	Yes
Possibility to write an email address as a recipient address	Yes
SMS storage	On the SIM card and in the phone, up to 250 units
Nokia Picture Messaging	No, only support receiving and forwarding

Enhanced Messaging Service

Feature	Support
Number of messages that the mobile phone is able to handle to generate a concatenated message	6
Capacity storage	250 and the space left on the SIM card
Outgoing messages	It is possible to: • See how many short messages an EMS message consists of before sending. • Choose whether to send the message or not after writing.
Incoming messages	• A signal is heard once all parts of the message have been received or when a timeout occurs. • It is possible 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.

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Feature	Support
Concatenated messages	A receipt is received in the mobile 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
I-melody	Yes, version 1.2
Melodies	It is possible to: • Send and receive melodies via EMS, if the melodies are not protected by ODI. • Download melodies and commercial tunes from WAP portals. • Create melodies on WAP portals.
WBMP	Yes
Picture sizes	16x16 pixels, 32x32 pixels, variable size in black and white.
Pictures	It is possible to: • Send and receive pictures via EMS, if the pictures are not protected by ODI. • Create pictures on WAP portals. • Download pictures from WAP portals. • Receive pictures in enhanced messages originated by service providers.
Animations	The mobile phone supports the following animations: Angry, Confused, Crying, Devil, Flirty, Glasses, Happy, Indifferent, Kiss, Laughter, Love, Sad, Sceptical, Tongue, Wink and Wow as defined in 3GPP™ TS 23.040 v4.4.0. It is possible to: • Send and receive colour animations.
TP-PID field value given by the mobile phone before sending an EMS message	0 x 00

Multimedia Messaging Service

Feature	Support
MMS/GPRS parameters placement	MMS is connected to an Internet profile. An Internet profile is connected to a Data Account. A Data Account contains GPRS parameters
Capacity storage	up to 50 units
Possibility to pre-configure the MMS parameters in factory	MMS/GPRS: Yes

Feature	Support
Possibility to configure the MMS parameters by OTA provisioning	MMS/GPRS: Yes
Possibility for all the parameters from the parameters set to be OTA provisioned at the same time	MMS/GPRS: Yes
Possibility for only one parameter from the parameters set to be OTA provisioned	MMS/GPRS: No
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
Functionalities that the user is able to set during message composition:	• Email recipient address • Message Cc recipient(s) address(es) • MSISDN recipient address
The user can insert multimedia elements into multimedia messages from:	• File Manager • Camera • Contacts • Calendar • Sound recorder
Possibility for sent messages to be memorized into a folder in the phone memory	Yes
Actions that the user can perform after message notification:	• Always download • Roaming • Always ask
Actions that the user can perform after message retrieval:	• Reply to the sender of the message (MMS) • Forward the message (SMS/MMS) • Delete the message • Call the sender of a message • View details • Save items
Multimedia codecs/formats supported for audio	SP-Midi, G-Midi, SMF0, SMF1, AMR, MP3, iMelody
Multimedia codecs/formats supported for image	JPEG, GIF87, GIF89A, WBMP, BMP
Supported formats for message presentation:	• Message body + attachments • SMIL version as described in OMA MMS IOP document version 1.0

Feature	Support
Maximum message size that can be handled by the phone for a message	Maximum size is possible to customize
MMS User Agent will report problems to the user in case of:	• Message not sent causes no user subscription to service, if included in ResponseText • Message not sent causes required functionality not supported by MMS Relay/Server, if included in ResponseText • Message not sent causes insufficient credit (in case of prepaid charging), if included in ResponseText

Bluetooth™ technical data

Dimension	Support
Bluetooth capability statement	This phone supports Bluetooth Specification, version 2.0
Bluetooth profiles	Generic Access Profile Headset Profile Handsfree Profile Object Push Profile
Connectable devices	All products supporting Bluetooth spec. 1.1, or higher, and at least one of the profiles above
Coverage area	Varies due to radio performance on remote device and the occurrence of obstacles. Up to 10 metres (33 feet)
Transmission power	Class 2, typical +3 dBm or 2mW
Frequency band	2.4 GHz – the unlicensed ISM band
Power consumption	GSM host processor excluded: • Standby, Bluetooth On mode: <0.6 mA • Voice to headset (HV3 master): 11 mA (7 mA with EDR functionality, 2EV3 master). Dependent on various parameters such as if the phone is master or slave • Data mode average: 27mA at 172.8 Kbps symmetrical (DH1)

Browser technical data

Feature	Support in the browser
Back to previous page	Yes
Bearer type GPRS (IP)	Yes
Bookmarks	Yes, up to 20 named bookmarks for easy access to frequently visited pages, with folders supported
Bookmark Export/Import	Yes, can be sent and received using SMS
Cache	Yes

Feature	Support in the browser
Character sets*	UTF-8 (Default), USASCII, Latin1, UCS2. *) When creating WML applications, it is recommended to always save the page content as UTF-8, and that this is clearly indicated in the pages before publishing. This ensures that the application content can be viewed, regardlesson 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
Clear cache	Yes
Colour	Colour screen
Home page	Yes, up to 10 different; one for each WAP profile
HTML version for browser	Mobile Profile 1.0, WML 1.3
Hyperlinks in Text	Yes, highlighted as blue text
Hyperlinks in Images	Yes, indicated by a frame
Image Animation	Yes
Image Formats	GIF (including animated) WBMP, no transparent layers, JPEG, BMP
Network Settings	Up to 10 different settings available by selecting WAP profile
OTA Support	Yes
PPP Authentication	PAP supported
Reload page	Yes
User Agent Profiles	Yes, list of client characteristics - for example, screen size
WAP/WML	WAP 2.0/WML 1.3
Internet profiles	Up to 10 Internet profiles, each with its own settings

Operator technical data

Feature	Support for WAP	
WAP Browser		
Version	2 baseline	
Security mechanism		
Bearer	**The Ericsson-Nokia solution**	**OMA Client Provisioning**

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Feature	Support for WAP	
OTA via SMS	Operator verification through a code that can be included in the OTA configuration data. This code is shown to the user who can choose to install or not	Uses security mechanism (SEC) methods according to WAP-183-ProvCont-20010724-a. See www.openmobilealliance.org
Interface		
Bearer	**The Ericsson-Nokia solution**	**OMA Client Provisioning**
OTA via SMS	A question whether to install, with the code if available is asked. The user may have to choose to create a new profile or to replace an existing profile	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
Re-provisioning Interface	**The Ericsson-Nokia solution**	**OMA Client Provisioning**
OTA via SMS	Same interface as above	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
Carrier reset/provisioning	Yes, but not if the set is pre-configured in the factory and locked	
Applicative provisioning		
Preferred bearer customization	No	
Email customization	No	
Other applications/features	Yes (MMS)	
Technologies		
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)	
PUSH		
Content types		
Service Indication (SI)	Yes	
Service Loading (SL)	Yes	
Cache Operation (CO) content type	Yes	

Feature	Support for WAP
Session Initiation Application (SIA)	Yes
Man Machine Interface	
SI/content retrieval postponing	Yes
SI menu structure accessibility	Internet, push inbox
SL reception warning	The user can make a choice if a dialogue is wanted or not before loading the SL
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
Dynamic push menu changes	No, there are no changes in the menus when activating or deactivating push
Security	
Mechanisms for push	No
WSP push sessions	No
HTTP push session	No
User agent profile	
UA profile content sent at beginning of WSP session	Yes
URL sent pointing to the UA profile at the beginning of a WSP session	Yes
URL location	On the manufacturer WAP site
WTAI	
WTA Make Call	Yes
WTA Send DTMF	No
WTA Add Phonebook	Yes
DOWNLOAD	
WAP solutions	
HTTP GET solution to download content over WAP	Yes
Download Fun from Openwave	No
Other download content over WAP	Yes, download limit (HTTP protocol)

Feature	Support for WAP
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
GRAPHICAL USER INTERFACE	
Man Machine Interface	
Selection keys	Yes
Separate/dedicated back or delete keys	Yes
Screen backlight on when browsing	Yes
Predictive writing	Yes
"http://" string displayed automatically when entering URLs	Yes
Elements	
Pop-up menus	Yes, in XHTML
Radio buttons	Yes, in XHTML
Check boxes	Yes, in XHTML
Buttons	Available as XHTML form controls

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.

AMR

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

API

Application Programming Interface

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 14.4 Kbps.

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), MMS and WAP.

DRM

Digital Rights Management; controlling copying and distribution of content, with respect to intellectual property rights.

DTMF

Dual Tone Multi Frequency. A method of coding digits as a combination of two audible tones.

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.

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.

HR

Half Rate, speech coding

HSCSD

High Speed Circuit Switched Data

HTML

HyperText Markup Language

HTTP

HyperText Transfer Protocol

IETF

Internet Engineering Task Force

JPEG

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

MIDI

Musical Instrument Digital Interface

ME

Mobile Equipment (phone excluding SIM card)

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 and images to be combined into multimedia messages.

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.

ODI

Object Distribution Indicator. Part of EMS release 4.3, ODI is a mechanism for controlling distribution of content (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.

OTA

Over-the Air Configuration. To provide settings for the phone by sending a text message using 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 and Tasks

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.

SS

Supplementary Services

SSL

Secure Socket Layer

UI

User interface

URL

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

USSD

Unstructured Supplementary Services Data. Narrowband GSM data service.

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.

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

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

Links

- www.sonyericsson.com/
- www.ericsson.com/mobilityworld/
- www.midi.org
- www.extendedsystems.com
- www.gsmworld.com/
- www.imc.org
- www.imc.org/pdi/
- www.etsi.fr
- www.wapforum.org
- www.w3.org/TR/xhtml-basic/
- www.cognimatics.com

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