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paper

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XPERIA™ X1

Premium Energized Communication

Sony Ericsson

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

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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. Also refer to the Microsoft Windows Mobile Developer Web site for platform APIs at http://msdn2.microsoft.com/en-us/library/bb158486.aspx

Document history

Change history			
2008-03-05	Version R1	First released version	
2008-05-16	Version R2	Second released version	
2008-05-22	Version R3	Third released version	
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2008-11-17	Version R5	Fifth released version	

Contents

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Product overview

XPERIA™ is premium brand in the Sony Ericsson portfolio to meet the consumer need for a converged entertainment and mobile Web communication experience. XPERIA™ delivers a premium experience of energized communication - anytime, anywhere, anything and with anyone.

X1 is the first product on the XPERIA™ lineup and introduces new experiences for mobile productivity with an extraordinary new blend of multimedia, enterprise and Web functionality. The need for multiple devices – such as a mobile phone, an e-mail client, a mobile companion for a PC and more – are all met in one device with easy-to-use functionality. A sturdy metal design to withstand everyday use and a ground breaking XPERIA™ panel combine to give a seamless and premium user experience.

Features include:
- 3-inch Wide-VGA (800x480) TFT 65K color LCD
- XPERIA™ panel concept
- Unified Media Experience
- 3.2-megapixel camera with Touch auto focus
- Video capture and playback up to 30 fps
- Integrated WiFi and A-GPS
- Mobile broadband
- Handsfree headset with a 3.5 mm audio jack, USB charger, USB cable provided in the kit
- Internet Explorer Mobile browser
- Opera Mobile browser
- HSDPA 7.2Mbps, HSUPA 2Mbps
- Windows Mobile® 6.1 Professional
- YouTube support (3GPP playback)
- FM radio, streaming audio/video
- Video telephony
- Bluetooth™ 2.0
- HW 3D Graphics
- Supports microSD™ High Capacity memory card
- Exchange /IMAP4/POP3 e-mail
- Quad-band EDGE (850/900/1800/1900 MHz)
- Tri-band HSPA :
  X1a: 850/1900/2100 MHz
  X1i: 900/1900/2100 MHz)

The slim arc form factor has a large 3-inch Wide-VGA color screen. Memory capacity is up to 400 MB internally and includes a slot for a microSD™ card. The ergonomically designed QWERTY keypad allows you to quickly write text messages, type phone numbers or search for particular content such as pictures or tracks. The user can quickly toggle between different relevant functions, tailored for all situations in life, and use them as active desktop home screens by using the unique XPERIA™ panel concept.

Key features

3-inch color screen

The large 3-inch (800x480 pixels), full graphic, Wide-VGA touch screen, with16 bit and TFT color enhances viewing to facilitate high-quality multimedia and entertainment.

XPERIA™ panel user experience

A dedicated XPERIA™ panel key on the phone will enable the user to toggle between different user experiences by changing active desktops, or XPERIA™ panels. The user can install additional XPERIA™ panels and configure the XPERIA™ panel behaviour and settings.

Types of preloaded XPERIA™ panels:

- **Sony Ericsson panel** – a panel to read news, weather, finance, world clock and shortcuts to communication and applications.
- **Media Experience panel** – center for viewing and playing multimedia files.
- **Microsoft Today panel** – this panel is the actual Microsoft today screen.
- **3D Fish panel** – a panel that showcases the 3D features of the phone; a fish tank with 3D fishes.
- **FM radio panel** - a panel to access your FM radio straight.
- **Google panel** - provides access to all Google services.
- Customized panels can be offered.

Media Experience

Media can be accessed directly through the Media Experience panel. The user can seamlessly navigate through captured photos and video clips, pictures, photo tags, games, music, videos and more. The Media Experience enables easy navigation to both local and Web content. The music player in the Media Experience panel allows the user to play downloaded music and audio, and the video player to play recorded and downloaded video clips. The navigation system makes it possible for the user to, for example, browse through their favourite tracks and create play lists.

3.2-megapixel camera and video call camera

There are two cameras. The main camera, located on the back, is 3.2 megapixel and includes Touch auto focus. There is also a fixed focus camera located on the front, which is for video calls (QCIF) or still image capture (QVGA).

A picture can be shared with friends or family, as a picture message or e-mail, or using any available transfer method, such as Bluetooth™.

Photo light

When lighting conditions are poor, pictures can be enhanced by turning on the Photo light.

Video capture

The camera also records video and which are stored in the phone or on a memory card. A video clip can be shared with friends or family as a picture message or e-mail, or using any available transfer method, such as Bluetooth™. The phone supports VGA size MPEG-4 video recording at up to 30 frames per second*.

*X1a model supports MPEG-4 encoding of up to 24 fps at QVGA size.

Web browser support

Browse the internet with Internet Explorer Mobile and Opera Mobile.

Bluetooth™ wireless technology

Several devices (simultaneous Bluetooth™ connections) can be connected up to 10 meters (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. Phone and a computer can exchange data such as images, video clips, vCards, music files and calendar data. Bluetooth version 2.0 is supported.

Bluetooth™ audio streaming

Listen to audio in compatible devices. By connecting a Bluetooth A2DP compatible accessory, such as a stereo Bluetooth headset or a Bluetooth music receiver, you can enjoy high quality stereo audio streaming wirelessly from the phone. Many A2DP accessories also support the Bluetooth Audio Video Remote Control Profile (AVRCP) allowing you to control the music player in the phone using the accessory interface.

Location based services

XPERIA™ X1 supports A-GPS for satellite navigation. Several third-party applications can be used for navigation and location based services. Google Maps will be pre-installed for getting the real-time traffic, driving directions, POI and GPS positioning. The phone can support the Turn by Turn driving client with map data.

Web feeds

An RSS Reader is integrated the Sony Ericsson panel. Frequently updated content, such as news headlines or weather can be received as feeds.

Multiple input methods available

The phone supports the following input devices:

- Touch screen - can be operated by hand or stylus
- 4-way Navigation Key - to navigate menus
- Optical joystick - to scroll pages in applications such as browser, messaging and contacts
- Full QWERTY - A full PC-like QWERTY keyboard for easy and fast typing

Push e-mail

The phone supports push e-mail, a method of pushing new e-mails automatically to mobile devices. Push e-mail increases mobile e-mail usability, with e-mail being delivered in the background (similar to SMS or MMS). The Direct Push e-mail infrastructure of Exchange server is built into the phone.

Internet e-mail

User can set-up third-party e-mail accounts (such as GMail, Yahoo! Mail or WIndows Live Hotmail) using the e-mail setup wizard in Windows Mobile. By entering the e-mail address Windows Mobile configures the e-mail accounts automatically.

Quick Search

The Windows Live Search box enables the user to quickly search the internet from the Today screen.

PC software

Microsoft ActiveSync software lets users synchronize their data (e-mail, contacts, calendar, multimedia and files). ActiveSync can synchronize all the pictures, music, videos from the Windows Media Player in the PC. ActiveSync also allows users to install new applications to the phone. In Windows Vista PC, the Windows Mobile Device Center allows users to synchronize data.

Java ME™

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

USB 2.0 mass storage

When connecting the phone to a computer using the provided USB cable, a microSD card in the phone appears on the computer screen as a removable disk along with other disks and drives in the computer. The user can then quickly and easily drag and drop items such as images, documents, music and video clips between folders in the microSD card and the computer.

microSD card slot

microSD is supported. Different kinds of content (pictures, audio, video clips, etc.) can be stored in memory cards, and transferred to other consumer products which support microSD, for example, digital cameras, camcorders, portable music players, TVs, photo printers and computers. SDHC™ (High Capacity) is supported.

Windows Mobile Features

Windows Mobile Application List

- Outlook Mobile: e-mail, Contacts, Calendar, Tasks
- Office Mobile: Word, Excel, PowerPoint and OneNote
- Internet Explorer Mobile

- Windows Media Player 10 Mobile
- Windows Live™ client
- ActiveSync client
- Utility applications: File Explorer, Pictures & Video, Notes and Calculator

Business Mobile productivity

- Familiar Windows interface
- Access to e-mail, calendar, contacts, tasks when and how you want
- Access to your e-mail accounts
- Runs Microsoft Office Mobile
- Runs third party applications

Securely extend corporate Assets

- Scale and save by leveraging existing IT infrastructure
- Consistent development experience and rich support for corporate applications
- Easy application development: tools and APIs speed up applications and services time to market

Advanced Mobile Communications

- Outlook Mobile
- Smart filter, Global Address List (GAL), call history
- Efficient management of mail
- Fetch, flags, OOF, shortcuts, predictive text
- Built in Rights Management
- Integrated Windows Live experience

Increased Mobile Productivity

- Greater control and visibility to your calendar
- Views, attendee & status, conflict resolution, forward meetings
- New Office Mobile suite
- Information search
- Support Smart filter in Contacts, Windows Live and Mobile Outlook
- Greater server collaboration and interoperability
- SharePoint, server search, GAL everywhere
- Improved on-line experience

Integrated Business performance

- Increased Device Security
- Device lock policies
- Storage card security options
- Improved certificate services
- Improved Device Manageability and Tracking
- Greater device control to the administrator
- Flexible administration and support of the mobile user
- Increased server manageability
- Greater support for Mobile Operator requirements

Additional Platform Components

- .NET CF v2, SQL CE
- Windows Mobile Marketplace
- Application framework for access to mobile e-commerce
- Windows Mobile Update
- Phone and Contacts integration

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Images

Technologies in detail

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

Functions and features

The following includes short descriptions of the technologies available in X1.

Feature	X1
3D games	Yes
3G enabled Technology that enables HSDPA 7.2Mbps / HSUPA 2.0Mbps	Yes
Alarm clock Set up to three individual times for single or recurring daily or weekly alarms	Yes
Backlight	Yes
Battery	1500 mAh, Lithium Polymer (Frame pack)
Battery charging time	3.5 hours (using AC adapter in charge only mode)
Bluetooth™ audio streaming Listen to audio in compatible devices	Yes
Bluetooth™ audio video remote control Control music player functions from a Bluetooth accessory, and control the volume in the accessory from the phone	Yes
Bluetooth™ PAN Connect the phone to Internet using Bluetooth	Yes
Bluetooth™ wireless technology Wireless connectivity between devices. Support for specification of the Bluetooth System, version 2.0	Yes
Calculator	Yes
Calendar Calendar with day, week and month views and reminders	Yes
Call list View calls made and received	Yes
Camera	3.2 megapixels

Feature	X1
Camera auto focus The camera automatically focuses on the subject in a focus area in the screen/viewfinder. It also supports Touch auto focus	Yes
Camera key A dedicated camera key. Press and hold to activate the integrated camera	Yes
Camera picture browser Browse camera pictures without leaving the camera application	Yes
Camera flash	Yes, photo light
Camera keys on top When the camera is used in horizontal mode, the side keys with camera functionality are on top, for a digital still camera feel.	Yes
Camera menu Easy-to-use horizontal digital camera touch menu, settings, and Touch auto focus	Yes
Camera red eye reduction	No
Camera scene modes Use predefined settings when taking pictures in different environments	Auto, Portrait, Landscape, Twilight, Sports, Document
Camera settings Settings and shooting options part of camera application	Yes
Clock On-screen clock keeps time even when the phone is off	No
Co-branding area	Yes, (7×21 mm) on the backside (battery cover)
Color	Solid Black & Steel Silver
Contacts Phonebook with fields for name, phone and fax numbers, e-mail address, Web site, title, company address info, personal address info, and birthday - fields are as per Microsoft Exchange synchronization standard	Yes

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Feature	X1
Conference calls Support for multiparty calling	Yes
Content online Downloadable pictures, games, themes, ringtones available online	Yes
Copyright protection - DRM DRM (Digital Rights Management) features the rights and copy protection of downloaded content (audio, pictures, music tones, video clips and entertainment features such as games, Java applications etc.)	Yes, OMA DRM 1.0 and WMDRM 10* * Java applications support OMA DRM 1.0 forward lock and combined delivery only.
Customizable desktop Windows Today screen can be customized with plug-ins	Yes
Design	Arc Slider with QWERTY
Device Management (DM)	Yes
Digital zoom	Yes (still camera mode only, up to 3.2 x): 3MP mode – 1.0 x fixed 2MP mode – 1.0 x to 1.29 x 1MP mode – 1.0 x to 2 x VGA/QVGA mode – 1.0 x to 3.2 x
E-mail Built-in e-mail client with inbox, outbox, compose, send and other functions. (Microsoft Outlook Mobile)	Yes
Exterior description Size mm (length x width x thickness)	110.5 x 52.6 x 17 mm
External antenna connector For use with an advanced car handsfree-accessory	No
File manager Folder structure storage to help store and organize pictures, sounds and other phone content	Yes, uses Media Experience interface

Feature	X1
Flight mode All phone radio transceivers are deactivated included Bluetooth and Wi-Fi. But most of the other non-radio transceiver related features are still available, such as the music player, games, and even Outlook Mobile features except the actual sending and receiving of messages. The phone may then be used in some areas, such as aeroplanes or hospitals, where full mobile phone functionality is not allowed.	Yes, via Comm Manager and Sony Ericsson panel
FM radio FM radio with preset, auto and manual search. The handsfree is used as an antenna	Yes
Form factor	Arc slider
Games download Can install new games	Yes
Games embedded	Yes
GPRS General Packet Radio Services – a communications standard enabling packet data transfer of 21.4 Kbps per time slot	Yes
High Speed Data	• HSDPA – High Speed Downlink Packet Access 7.2 Mbps • HSUPA – High Speed Uplink Packet Access 2.0Mbps
Image formats Note: MP = megapixels (values are without fractions)	• 3 MP (2048x1536) • 3 MP Wide (2048x1280) • 2 MP (1600x1200) • 2 MP Wide (1600x992) • 1 MP (1024x768) • 1 MP Wide (1024x640) • VGA (640x480) • VGA Wide (640x400) • QVGA (320x240) • QVGA Wide (320x192)
Infrared port	No
Instant messaging Chat – several people can take part in a mobile messaging session. Instant messaging and Live community	Yes

Feature	X1
Internet browser	**Internet Explorer Mobile** • HTML - 4.01 • XHTML - Basic, 1.01 (with some exceptions) • WAP - 1.2.1, 2.0 • CSS - Level 1, Level 2 (partial), Mobile Profile 1.0, Wireless (WAP) CSS 1.1 • Scripting/DOM - JScript 5.6, DOM Level 0, DOM Level 1 (partial), DOM Level 2 (partial) • cHTML - A mobile device adapted version of the standard Internet communications protocol HTML • Full HTML support, JScript, Progressive download of video files • Direct access to Search Internet and Enter address **Opera Mobile™ 9.5** • HTML - 4.01 (with some exceptions) • XHTML - Basic, 1.0, 1.1 (both with some exceptions) • XHTML Mobile Profile 1.0, 1.1, 1.2 (with some exceptions) • WML 1.3, 2.0 (both with some exceptions) • CSS - Level 1, Level 2 (partial), Mobile Profile 1.0, Wireless (WAP) CSS 1.0, 1.1 • XSLT 1.0, XPath 1.0, XML Namespaces, XML ID, XML Events • Scripting/DOM - JScript 5.6, DOM Level 0, DOM Level 1 (partial), DOM Level 2 (partial) • Full HTML support, JScript, Progressive download of video files • Direct access to Search Internet and Enter address
Internet security Encrypts confidential information such as credit card and bank account numbers. Necessary for mobile banking and shopping	Yes SSL/TLS
Java ME^{TM} Support for Java ME™ technology	Yes

Feature	X1
Keys - navigation and more	• 4-way navigation keys • 1 centre key with optical joystick • 2 soft keys (left + right), OK key, Send key, End key (long press for keypad lock) • XPERIA™ panel key
Keys - numeric keypad	Part of QWERTY keypad. Press Fn key to access numeric keypad(0-9, * and #).
QWERTY keypad Keypad layout depends on language variant models.	PC-like full QWERTY keypad along with numeric keys
Keys - side and other	• Volume/camera zoom • Camera key • Power key
Lunar calendar A calendar system used in China and other parts of Asia.	No
Internal memory(built-in storage) Phone memory that is free to use (depending on software configuration and file content). Many applications share phone memory. The maximum amount of storage available for any one application, such as calendar entries, is affected by the amount of memory used by other applications, such as messaging, music, pictures and so on	Up to 400 MB
Memory card slot A slot for inserting a microSD card	Yes
miniUSB A miniUSB connector enables fast data transfer between the phone and a computer	Yes (side)
MMS (Multimedia messaging) Picture messaging with text and sound	Yes
MMS video Support for sending video clips via MMS	Yes
Modem Circuit Switched and Packet Switched Internet dial-up support	Yes

Feature	X1
Music player A digital music player with sideways navigation. Play music you have transferred or downloaded. The list structure system enables the user to, for example, organize favourite songs into groups and create simple playlists. A practical play/stop function makes it easy to listen to music any time, anywhere. You can also manage settings and more.	Yes, via Media Experience panel and Windows Media Player
OMA Data Synchronization (SyncML) A device communications standard that enables remote synchronization between devices	No
OTA settings Internet, e-mail and other settings can be sent over the air to the phone	Yes
Predictive text input	Yes
Push e-mail	Yes
RSS reader	Yes, part of Sony Ericsson panel
Screen Size: Resolution: Technology: Color resolution:	 3.0 inches Wide-VGA (800x480 pixels) TFT 65,536 (16 bit)
Settings download	Yes
Sleep mode A power-saving feature that minimizes battery power consumed when the phone is in standby	Yes
Speakerphone	Yes
Standby time GSM UMTS	 500 hours (best case) 640 hours (best case)
Synchronization PC Synchronize and share phone content with a computer	Yes, through ActiveSync
Talktime GSM UMTS	 10 hours (best case) 6 hours (best case)

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Feature	X1
Themes Phone menu texts and background graphics	Yes
UMTS A 3G technology standard capable of data transfer 384 Kbps	Yes
USB connectivity support	Yes, USB 2.0
Vibrating alert The phone vibrates when a call comes in	Yes
Video call camera	Yes
Video calling When you make a video call, the recipient can be seen in the screen. The service requires UMTS.	Yes
Video call talk time	3 hours (best case)
Video player Play video clips you have transferred or downloaded	Yes
Viewfinder When using the camera, a picture can be previewed before it is captured	Yes
WAP A mobile Internet standard to access specially designed Internet sites	Yes, 1.2.1. and 2.0
Web feeds Frequently updated content delivered as feeds via a Web site, for example, news headlines in the browser	Yes, via RSS reader in Sony Ericsson panel
Weight	158 g
WLAN	IEEE 802.11b/g compliant

Facts and figures

This chapter gives 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 EDGE • 850/900/1800/1900 MHz Tri-band HSPA • X1a: 850/1900/2100 MHz • X1i: 900/1900/2100 MHz
Speech coding	AMR-NB, EFR, FR, HR
GSM SIM/ UMTS USIM card	• UART2 • USIM
Memory	NAND Flash 512 MB SDRAM 256 MB
Data transfer speeds	• HSDPA 7.2 Mbps • HSUPA 2 Mbps • Concurrency HSDPA 3.6Mbps+HSUPA 2 Mbps

Performance and technical characteristics

Dimension	WCDMA 850	WCDMA 900	WCDMA 1900	WCDMA 2100
Frequency range (MHz)	Tx: 824–849 Rx: 869–894	Tx: 880–915 Rx: 925–960	Tx: 1850–1910 Rx: 1930–1990	Tx: 1920–1980 Rx: 2110–2170
Channel spacing	5 MHz with 200 kHz channel rasters	5 MHz with 200 kHz channel rasters	5 MHz with 200 kHz channel rasters	5 MHz with 200 kHz channel rasters
Number of channels	108	152	289	277
Modulation	QPSK (WCDMA) QPSK/16 QAM (HSDPA)	QPSK (WCDMA) QPSK/16 QAM (HSDPA)	QPSK (WCDMA) QPSK/16 QAM (HSDPA)	QPSK (WCDMA) QPSK/16 QAM (HSDPA)
TTI	10 ms (WCDMA) 2 ms (HSDPA)	10 ms (WCDMA) 2 ms (HSDPA)	10 ms (WCDMA) 2 ms (HSDPA)	10 ms (WCDMA) 2 ms (HSDPA)
TX phase accuracy	EVM <17.5%	EVM <17.5%	EVM <17.5%	EVM <17.5%
Duplex spacing	45 MHz	45 MHz	80 MHz	190 MHz
Frequency stability	+/- 0.1 ppm	+/- 0.1 ppm	+/- 0.1 ppm	+/- 0.1 ppm
Voltage operation (nominal)	3.8 V	3.8 V	3.8 V	3.8 V
Transmitter RF power output	23 dBm (class 3)	23 dBm (class 3)	24 dBm (class 3)	24 dBm (class 3)
Transmitter Output impedance	50 ohm	50 ohm	50 ohm	50 ohm

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Dimension	WCDMA 850	WCDMA 900	WCDMA 1900	WCDMA 2100
Transmitter spurious emission	<-36 dBm up to 1 GHz <-30 dBm over 1 GHz	<-36 dBm up to 1 GHz <-30 dBm over 1 GHz	<-36 dBm up to 1 GHz <-30 dBm over 1 GHz	<-36 dBm up to 1 GHz <-30 dBm over 1 GHz
RF sensitivity	Better than -104.7 dBm at 12.2k RMC	Better than -103.7 dBm at 12.2k RMC	Better than -104.7 dBm at 12.2k RMC	Better than -106.7 dBm at 12.2k RMC
RX BER	<0.1%	<0.1%	<0.1%	<0.1%

USSD technical data

System	Support
USSD support	GSM Phase 1/2 (cross-phase compatibility)
Mode support	SAT initiated USSD

GPRS technical data

Dimension	Support
Compatible GPRS and SMG specifications	Release 99 according to ETSI specification
Data rates	Multislot class 10 supported (max 5 simultaneously) Coding Scheme: CS-1, CS-2, CS-3, CS-4 supported Data Rates: 9,050 bps, 13,400 bps, 15,600 bps, 21,400 bps supported (network dependent)
Medium Access Modes	Dynamic allocation
Support of Packet Control Channels (PBCCH/PCCCH)	Yes
Network Operation Mode	NOM I, II, III
Support of GPRS/CS combined procedures	Yes
Network control mode	NC0, NC1 and NC2
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

Dimension	Support
Support of power control uplink and downlink	Uplink = yes, downlink is a network feature
Support of ciphering algorithms	GEA1
Support of compression algorithm	Yes, V42bis and IP header compression
Mode of operation	Class B and Class C modes of operation supported
R Reference point	PPP is supported as L2 layer in the R reference point Authentication algorithms PAP, CHAP support
IP connectivity	Supports both static and dynamic IP
PDP context	Multiple PDP is supported (up to 3 simultaneous PDP)
SIM	GPRS aware, as well as non-GPRS aware; SIM cards are supported
AT commands	+CGDCONT - Define PDP Context +CGQREQ - Quality of Service Profile (Requested) +CGQMIN - Quality of Service Profile (Minimum acceptable) +CGATT - GPRS attach or detach +CGACT - PDP context activate or deactivate

SIM AT services supported

Service	Mode	Support
CALL control by SIM		Yes
MO SMS CONTROL		Yes
DISPLAY TEXT	Text of up to 240 characters (120 UCS2 coded) **bit 1**: • 0 = normal priority • 1 = high priority **bit 8**: • 0 = clear message after a delay • 1 = wait for user to clear message	Yes Yes Yes Yes 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
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 phone	Yes
	• '02' = Network Measurement result	Yes
	• '03' = Date, time and time zone (DTTinPLI)	Yes
	• '04' = Language setting	No
	• '05' = Timing advance	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
Select item		Yes
Send DTMF		Yes

Service	Mode	Support
Send short message	**bit 1:** • 0 = packing not required • 1 = SMS packing by the phone required	Yes Yes
Send SS		Yes
Send USSD		Yes
Setup call	General: Capability configuration Set-up speech call CallParty Subaddress DTMF support • '00' = set up call, but only if not currently busy on another call • '01' = set up call, but only if not currently busy on another call, with re-dial • '02' = set up call, putting all other calls (if any) on hold • '03' = set up call, putting all other calls (if any) on hold, with re-dial • '04' = set up call, disconnecting all other calls (if any) • '05' = set up call, disconnecting all other calls (if any), with re-dial	Yes Yes No Yes No Yes No
Setup event list	• '00' = MT call • '01' = Call connected • '02' = Call disconnected • '03' = Location status • '04' = User activity • '05' = Idle screen available • '06' = Card reader status • '07' = Language selection • '08' = Browser termination • '09' = Data available • '0A' = Channel status	Yes Yes Yes Yes No No Not applicable No No No No
Setup idle mode text		Yes, 1 row of text is supported
Set up menu		Yes
Timer management		Yes
Open channel		No
Close channel		No
Receive data		No
Send data		No

Service	Mode	Support
Get channel status		No
Get INPUT	**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 shall not 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

Entertainment

Audio and video

Service	Formats	Extensions
Audio	MP3, AAC, AAC+, EAAC+, WMA v9, AMR, MIDI	.m4a, .aac, .3gp, .3g2, .mp4, .mp3, .mid, .wma (wma playback only through Windows Media player)
Video	MPEG-4, H263, H264, WMV	.3gp, .3g2, .mp4, .m4v, .wmv (wmv playback only through Windows Media player)
Streaming transport	RTSP	
Video encoding	MP4, AMR-NBSimple Profile, H.263 Profile 0	.3gp
Audio encoding	AMR-NB	.mp4, .amr
Audio decoding	MPEG-4 AAC Low Complexity Profile, MPEG-1 Audio Layer 3, AMR-NB	.mp4, .mp3, .3g2

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Java ME™

Feature	Functionality
Java^{TM} Platform, Micro Edition	CLDC 1.1, MIDP 2.0
Java 3D	N/A

Imaging

3.2-megapixel camera

Facts and figures	
Digital still camera (DSC)	
True color	Yes
Digital zoom	Yes, up to 3.2 x depending on the camera resolution: 3MP mode – 1.0 x fixed 2MP mode – 1.0 x to 1.29 x 1MP mode – 1.0 x to 2.0 x VGA/QVGA mode – 1.0 x to 3.2 x
Auto focus	Yes
Shoot modes	Auto, Portrait, Landscape, Twilight, Sports, Document
Picture sizes (resolution)	Max: 2048 x 1536 • 3 MP (2048x1536), 3 MP Wide (2048x1280) • 2 MP (1600x1200), 2 MP Wide (1600x992) • 1 MP (1024x768), 1 MP Wide (1024x640) • VGA (640x480), Wide-VGA (640x400) • QVGA (320x240), Wide-QVGA (320x192) • Video is limited to VGA, Wide-VGA, QVGA and Wide-QVGA
Night mode	Off, On
Self timer	Off, On (2 or 10 seconds)
Effects	Off, Black & white, Negative, Sepia, Solarization
White balance	Auto, Sunny, Cloudy, Fluorescent, Incandescent
Picture quality	Normal, Fine, Economy
Preview	Off, On
Shutter sounds	Yes
Auto rotate	No

Facts and figures	
Reset file number	Yes
Save to memory	Memory Card, Phone Memory
Video recorder	
Video size (resolution)	VGA*
Frame rate	up to 30 fps*
Digital zoom	No
Video clip length	Up to 30 minutes
Night mode	Off, On
Photo light	Off, On
Self-timer	Same as camera
Effects	Same as camera
White balance	Same as camera
Microphone	Off, On
Reset file number	Same as camera
Save to memory	Same as camera

*for X1a model, up to 24 fps at QVGA

Video telephony

Facts and figures	
Picture sizes (resolution)	QCIF (176x144)
Digital zoom	No
Night mode	No
White balance	No
Brightness	Support 5 levels adjustment
Video coding	H.263 profile 0, MPEG-4 simple profile
Audio coding	AMR NB IF2

Images

Images can be shared via Bluetooth™ connection, MMS, e-mail message, computer file transfer or memory card. The image size is limited by the amount of free RAM.

Formats	Support
JPEG	Yes
GIF	Yes
BMP	Yes
PNG	Yes
SVG	No

Supported character sets

Decoding text (Incoming MMS)	• US-ASCII • UTF-8 • ISO-8859-1,2 • ISO-10646-UCS-2
Coding text (Outgoing MMS)	UTF-8

Messaging

Short Messaging Service

Feature	Support
Short Message Service (SMS) MT over CS	R99, Yes
Short Message Service (SMS) MO over CS	R99, Yes
Short Message Service (SMS) MT over PS	R99, Yes
Short Message Service (SMS) MO over PS	R99, Yes
Cell Broadcast Service (CBS)	R99, Yes
Storing of received Class 1 short messages	R99, Yes
Storing of received Class 2 short messages in the SIM	R99, Yes
Replacing of short messages	R99, Yes
Reply procedures	R99, Yes

Feature	Support
Delivery Report	R99, Yes
SMS PP-Download	R99, Yes
Sending and receiving concatenated multiple short messages	R99, Yes
Comply with the "SMS Data Coding Scheme" defined in [3GPPTS23.038]	R99, Yes
For the character code, comply with "3GPPTS23.038". Comply with GSM 7 bit default alphabet and UCS2 Character code	R99, Yes
Support memory full function by setting TP-FCS=D3 (Memory Capacity Exceeded) and RP-Cause=0x16(Memory Capacity Exceeded)	R99, Yes

Multimedia Messaging Services

Feature	Support
SMIL	v2.0 (partial)
Multiple MMS slides	Yes
vCalender	v1.0
vCard	v2.1
OMA DRM	v1.0
Integration with applications	Camera, Contact, Calendar, Pictures & Videos, and File Explorer
Add a favourite URL when editing	Yes
Full screen preview	Yes
Blacklist	Yes

E-mail client

Feature	Support
Emoticon	Yes
Image format	Decoding for JPEG, GIF87a, GIF89a, BMP, PNG
Video format	Decoding for MPEG-4, 3GPP (H.263)
Audio format	Decoding for AMR-NB, AMR-WB, WAV, SP-MIDI and encoding for AMR-NB, QCELP
Send the text only messages via SMS instead	Yes

Feature	Support
Unified inbox	Yes (SMS/MMS/Voicemail)
Contact auto-completion	Yes

Connectivity

Bluetooth™ technical data

Dimension	Support
Bluetooth capability statement	Bluetooth Specification, version 2.0 with enhanced data rate (EDR)
Bluetooth profiles	**GAP:** Generic Access Profile **SDAP:** Service Discovery Application Profile **GOEP:** Generic Object Exchange Profile **A2DP:** Advanced Audio Distribution Profile **AVRCP:** Audio Video Remote Control Profile (v1.0) **HFP:** Hands Free Profile **HSP:** Headset Profile **HID:** Human Interface Device Profile, device not supported **PAN:** Personal Area Network Profile, only server supported ActiveSync-Over-Bluetooth **OPP:** Object Push Profile **SPP:** Serial Port 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	TX Power: 0 dBm (Class 2 typical)
Frequency band	Integrated 2.4 GHz RF transceiver
Data transmission rate	Up to 600 kbps asymmetric and up to 350 kbps symmetric from an application level
Power consumption This is additional to the baseband power consumption	
Shutdown (RESET active)	2 µA, typical
Sleep	10 µA, typical
Page scan, 1.28 seconds, non-interlaced	0.341 mA, typical

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Dimension	Support
ACL connection, sniff mode, 100 ms interval	0.23 mA, typical
ACL data transfer, 723 Kbps data throughput using 8DPSK 3 Mbps data packets	11 mA, typical
SCO connection HV3 with sniff	12 mA, typical

Microsoft® Exchange ActiveSync®

Feature	Support
Protocol version	The device supports Microsoft® ActiveSync® 4.5
Support applications	e-mail, calendar, phone book, Windows Media player contents, tasks, favourites, notes and files
Transport method used	USB, WiFi, Bluetooth, OTA (HTTP, HTTPS)
Option for user to configure login parameters for remote server	Yes
Configuration parameters that can be entered and modified by the user	Server URL, username, domain name, password, applications to sync, e-mail message size, e-mail attachment size, e-mail date range, message alert sound, calendar date range, interval sync, folder for files, Windows Media player settings for sync rules secure connection, roaming option
Ability to use multiple servers	No
Ability to perform conflict resolution	Yes

Internet Explorer Mobile browser technical data

Feature	Support
Bookmarks	Yes
Bookmark export/import	SMS, MMS and e-mail. Synchronized using ActiveSync
Browser compliancy	
HTML and XHTML	• HTML 4.01 • XHTML Basic • XHTML 1.1 Except the Bidirectional text and Full Forms modules. With the addition of the Frames and Legacy modules

Feature	Support
Cascading style sheets (CSS)	• CSS, level 1 (CSS1) • CSS Mobile Profile 1.0 • Wireless CSS 1.1 (part of OMA Browsing v2.3) • Support for media types: all, screen, and handheld • Some CSS, level 2 (CSS2), such as text overflow
XML	• Microsoft XML Parser 3.0 (MSXML3) • Data islands • Extensible Stylesheet Language for Transformations (XSLT) • XMLHTTP • XML stylesheet support
Scripting and Document Object Model (DOM)	• Microsoft Internet Explorer 6 subset • Microsoft JScript 5.6 (compliant with ECMAScript Language Specification Edition 3) For more information about JScript, see this Microsoft Web site http://go.microsoft.com/fwlink/?linkid=62869 • XMLHTTP and XML Doc that is available in script For more information, see the XML feature area • DOM Level 0 For more information about DOM Level 0, see this W3C Web site http://go.microsoft/fwlink/?linkid=62869 **Note:** The term *DOM Level 0* refers to a mix (not formally specified) of HTML document functionalities that Netscape Navigator version 3.0 and Microsoft Internet Explorer version 3.0 offered Collections: all, images, links, frames, forms, anchors innerText/HTML read/write on all elements style object
Wireless Application Protocol (WAP)	• WAP 1.2.1 and 2.0 • Wireless Markup Language (WML) • Wireless Session Protocol (WSP) and Wireless Transport Layer Security (WTLS) • WML over HTTP For more information about what standards are supported, see the HTML and XHTML and CSS feature areas
AJAX support	Although AJAX is not a standard, Internet Explorer Mobile does support the XMLHTTP object used to exchange data with the server synchronously, as well as the DOM/CSS support listed above to update your page dynamically with the new data
Browser version	Internet Explorer Mobile for Windows Mobile 6.1
Cache	Yes (512KB)
Character sets	US-ASCII UTF-8 ISO-8859-1,2 ISO-10646-UCS-2
Clear cache	Yes, persistent. By user interaction, at SIM card change or master reset
Frames	Full frame support (Frames and IFrames)

Feature	Support
Image formats and animations	PNG, JPEG, GIF, Animated GIF files, WBMP, BMP
Schemes	ftp:, http:, https:, file:, news:, mailto:, socks:, javascript:, vbscript
Streaming	Progressive download, RTSP
Web feeds	No

User agent profiles

UA profiles	Wireless session protocol (WSP) session begins, a UAProf client communicates the existence of these details. The UAProf may include, but is not limited to, the following: • Hardware characteristics, such as screen size, manufacturer, and color capabilities. • Software characteristics, such as operating system, version, and audio encoders. • Applications, such as browser manufacturer, version, markup languages, and scripting languages. • WAP details, such as support for Wireless Markup Language (WML) and the WAP version. • Network features, such as latency and reliability.
URL sent pointing to the UA profile at the beginning of browser session	Yes

Download

OMA download functionality	Yes
HTTP GET solution to download content; uses browser for download	Yes

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Client Provisioning (as per Windows Mobile guidelines)

Delivery method	Description
Send over the air (OTA)	A device can be provisioned OTA by either a one-time push, or by using a two-way communication between server and client called continuous provisioning. Windows Mobile uses Open Mobile Alliance (OMA) device management standards for OTA provisioning. The form of the provisioning file is dependent upon the protocol you use to manage devices. The following list shows the protocols used: • OMA Client Provisioning -- A one-way Wireless Application Protocol (WAP) push, typically used for bootstrapping. • OMA Device Management (DM) -- Continuous provisioning that modifies the device configuration settings when necessary and can be repeated on multiple occasions. The provisioning file can be sent over the air from a provisioning server to the device over a Global System for Mobile Communications (GSM) Short Message Service (SMS) wireless network that uses a WAP push gateway. **Note:** Microsoft does not provide an OMA DM or an OMA Client Provisioning server. Sony Ericsson, Operator, or a third party must create their own server. For information about server requirements, see Server Requirements for OMA Device Management (http://msdn2.microsoft.com/en-us/library/bb737589.aspx) or Server Requirements for OMA Client Provisioning (http://msdn2.microsoft.com/en-us/library/bb737529.aspx). Service Indication (SI) and Service Loading (SL) can also be used to send and load provisioning XML files. The provisioning file is downloaded in a CAB Provisioning Format (.cpf) file. For more information, see Over the Air Provisioning with SI and SL Messages (http://msdn2.microsoft.com/en-us/library/bb415577.aspx). A provisioning XML file in a cpf file can also be pulled by the device using the following mechanisms: • Over HTTP or HTTPS (Internet Explorer Mobile) • Using a Secure Digital Multimedia Card (SD/MMC) For more information about these methods for pulling a file, see Packaging the XML File for Delivery (http://msdn2.microsoft.com/en-us/library/bb737273.aspx)
Download in a CAB Provisioning format (.cpf) file	Provisioning XML can be downloaded in a CAB Provisioning Format (.cpf) file. For more information, see the How To Create a .cpf File (http://msdn2.microsoft.com/en-us/library/bb737398.aspx)
Send through Remote API (RAPI)	Provisioning XML can be downloaded from the desktop, using the RAPI in ActiveSync to push the file to a device
Send through DMProcessConfigXML API	Can provision a device by using the DMProcessConfigXML function. For information, see DMProcessConfigXML (http://msdn2.microsoft.com/en-us/library/bb158518.aspx)

Delivery method	Description
Provision during manufacture	Can burn the file in flash memory and configure the device such that the file is loaded during the cold or warm boot procedure. For more information, see Bootstrapping a Device (http://msdn2.microsoft.com/en-us/library/bb737490.aspx)
Push - content types	
Service indication (SI)	Yes
Service loading	Yes
Cache operation (CO) content type	No
Session initiation application (SIA)	Yes

Related information

Links

- *www.sonyericsson.com*
- *developer.sonyericsson.com*
- *www.ericsson.com/mobilityworld*
- *www.midi.org*
- *www.extendedsystems.com*
- *www.gsmworld.com*
- *www.bluetooth.com*
- *www.imc.org*
- *www.3gpp.org*
- *www.irda.org*
- *www.etsi.fr*
- *www.wapforum.org*
- *www.imc.org/pdi*
- *www.syncml.org*
- *www.w3.org/TR/xhtml-basic*
- *www.java.sun.com*
- *www.microsoft.com/windowsmobile*
- *msdn2.microsoft.com*

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