

SONY®

White paper

December 2013



Xperia™ Z1 L39t

Note: Screen images are simulated.

Purpose of this document

Sony product White papers are intended to give an overview of a product and provide details in relevant areas of technology.

Document history

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Sony Mobile Developer World

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Product overview

Xperia™ Z1 L39t highlights

- Sony G Lens, 1/2.3" 20.7 MP Exmor RS™ for mobile image sensor and BIONZ™ for mobile image processing engine
- 5" Full HD TRILUMINOS™ Display for mobile with X-Reality™ for mobile picture engine
- Water and dust resistant (IP55 & IP58), durable tempered glass with a plastic frame
- Qualcomm Snapdragon™ 800 quad-core 2.2 Ghz processor, 3000 mAh battery, battery STAMINA Mode

The world's best camera in a water resistant smartphone*

Sharper. Clearer. Brighter. That's what Sony's industry leading compact digital cameras give you. And now with Xperia™ Z1 L39t, we have created a groundbreaking smartphone built with the very same components, giving you the most stellar picture and video quality possible. By combining the large 1/2.3" 20.7MP Exmor RS™ for mobile image sensor, Sony's award-winning G Lens, and intelligent BIONZ™ for mobile image processing engine, the results are nothing less than amazing. The light-sensitive 27mm wide angle lens comes with an aperture of F2.0. Wide apertures mean that *bokeh* – the way the lens renders out-of-focus points of light – will be naturally incorporated in images produced. The large high sensitivity sensor is made exclusively for Xperia™ Z1 L39t and is equivalent to the sensor size used in Sony's Cyber-shot™ digital still cameras, which together with the intelligent noise reduction capabilities of the image processing engine and the sensitive ISO 6400 enables incredibly clear low-light pictures without sacrificing detail. The high pixel resolution, aspherical lens and BIONZ™ for mobile super resolution technology enables zoom without quality loss - just like an optical zoom, while the high shutter speed reduces any risk of blurry footage. Images are delivered with super sharpness, clarity and brightness.

*Xperia™ Z1 L39t features a camera combining the world's largest image sensor (1/2.3 inches) with the highest resolution (20.7MP) in a water resistant smartphone. It also includes the brightest lens (F2.0) available in a slim (8.5mm) water resistant (IPX5/IPX8) smartphone. Specifications verified by Strategy Analytics' SpecTRAX service as of 10th of May 2013. For more information on Strategy Analytics results, go to: www.sonymobile.com/testresults/.

The best colour and sharpness ever

Built with the latest Sony BRAVIA® technologies optimised for mobile, Xperia™ Z1 L39t incorporates a large high-resolution 5" Full HD TRILUMINOS™ Display for mobile, for a wider palette of rich, natural colours – just like having a broader range of colour pencils to draw from. With Sony's exclusive X-Reality™ for mobile picture engine, everything you watch – from HD movies to web videos and photos – is analysed and selectively processed to deliver clean, clear, and lifelike pictures. In addition, the Intelligent Super Resolution technology finds and reproduces lacking pixels, so you'll always be able to enjoy the sharpest videos, preventing your entertainment from being spoiled by low resolution videos. The display comes with a 1920 x 1080 progressive scan, for incredibly crisp pictures free of jagged edges. Paired with a pixel density of 441 pixels per inch, you get pictures that are razor sharp and incredibly bright.

Smart, sleek and water resistant*

Building upon the rich history of Sony's craftsmanship, Xperia™ Z1 L39t has been carefully crafted using only clean lines and premium materials. With OmniBalance™ design, this smartphone offers balance and symmetry in all directions, creating a smartphone that feels wonderful to hold in every angle. Both the front and back are made of durable tempered glass, reflecting the world around you while allowing you to get so immersed in content that the hardware virtually disappears. The plastic frame with sleek metallic

parts creates premium expression. Paired with the Magnetic Charging Dock DK31, charging is made smooth and comfortable, with no need to open a USB cap. And due to its IP55/IP58 rating, this slim and sleek smartphone is both water and dust resistant. In fact, even the headphone jack is water resistant. For a smartphone that is just as breathtaking as it is tough.

*In compliance with IP55 and IP58, Xperia™ Z1 L39t is protected against the ingress of dust and is water resistant. Provided that all the covers for the micro USB port, the micro SIM slot is firmly closed, the phone is (i) protected against low pressure jets of water from all practicable directions in compliance with IP55; and/or (ii) can be kept under 1 metre of freshwater for up to 30 minutes in compliance with IP58. For more information, go to www.sonymobile.com/xperia-z1-waterresistant.

Blazing fast performance

Performance that never lets you down. Isn't that what we're all craving for? With Xperia™ Z1 L39t, that's exactly what you get. This smartphone supports super-fast TDLTE networks, giving you access to entertainment anytime and anywhere. With the latest Qualcomm Snapdragon™ 800 quad-core 2.2 Ghz processor with 2GB RAM, this smartphone comes with ultra-fast performance and breathtaking graphics.

Better battery life

Smartphones use a lot of power, even when you're not actively using them. All those apps that you have on your phone may still be running in the background, draining your battery. Battery STAMINA Mode saves you wasted battery drain. It recognises when you're not using your display and automatically turns off the functions you don't need, while keeping the notifications you want. As soon as you press the power button to wake up your screen, everything is up and running again. So not only do you have an enormous 3000 mAh battery, Battery STAMINA Mode helps you cleverly maximise every bit of that energy.

Facts – dimensions, weight, performance and networks

Operating system	Google™ Android™ 4.2 (Jelly Bean)
Processor	2.2 GHz Qualcomm MSM8974 Quad Core
GPU	Adreno 330
Size	145.7 x 73.9 x 8.55 mm
Weight	163 grams
Available colours	Black Purple
SIM card	micro SIM
Main screen	
Colours	16,777,216 colour TFT
Resolution	1920x1080 pixels
Size (diagonal)	5.0 inches
Input mechanisms	
Text input	On-screen QWERTY keyboard
Touch screen	Capacitive
Touch gesture	Yes – multi-touch, up to 10 fingers supported
Memory	
RAM	2 GB
Flash memory	Up to 32 GB*
Camera	
Camera resolution	20.7 MP
Digital zoom	8x
Photo light	Yes – Pulsed LED
Video recording	Yes – HD 1080p
Front Camera	Yes – HD 1080p for video chat and 2 MP for camera capture
Sensors	
Accelerometer	Yes
Proximity sensor	Yes
Ambient light sensor	Yes
Magnetometer	Yes

Gyroscope	Yes
Networks	
TD-LTE	Bands 38, 39, 40, 41
TD-SCDMA	Bands 34, 39
FDD-LTE (roaming only)	Bands 3, 7
WCDMA (roaming only)	Bands 1, 2, 5
GSM	Bands 2, 3, 5, 8
Data transfer speeds	
GSM GPRS	Up to 86 kbps
GSM EDGE	Up to 237 kbps
TD-HSUPA (upload)	Cat 6, up to 2.2 Mbps
TD-HSDPA (download)	Cat 24, up to 2.8 Mbps
TD-LTE (upload)	Cat 4, up to 50 Mbps
TD-LTE (download)	Cat 4, up to 150 Mbps
Talk time (TD-LTE Standby + GSM Talk)	Up to 16 hours**
Standby time (TD-LTE standby + GSM standby)	Up to 525 hours**
Data Download time (TD-LTE data download + GSM Talk)	Up to 5 hours**
Music listening time	Up to 105 hours**
Video playback time	Up to 7 hours**
Battery (Embedded)	3000 mAh minimum

* Memory comprises approximately 6 GB of firmware, plus 26 GB of “Internal storage” for music, pictures and movies, and downloaded applications and their data. For more details about memory, see “Memory in Android™ devices” on page 18.

** Values are according to GSM Association Battery Life Measurement Technique as performed in controlled laboratory conditions. Actual time may vary.

NOTE: Battery performance may vary depending on network conditions and configurations, and device usage.

NOTE: Performance metrics measured under laboratory conditions.

Categorised feature list

 Camera 20.7 megapixel camera 8x digital zoom - Auto focus - Burst mode - HDR for photos and movies - Face detection - Flash/Pulsed LED - Flash/Photo light - Front-facing camera (2 MP 1080p) - Geotagging - HD video recording (1080p) - Image stabiliser - Object tracking - Picture Effect - Portrait Retouch - Quick Launch - Red-eye reduction - Scene recognition - Self-timer - Send to web - Smile Shutter™ - Sony Exmor RS® for mobile - Image sensor - Superior Auto - Sweep Panorama - Touch capture - Touch focus - White balance	 Music 3D Surround Sound (VPT) - Album art - APT-X - Bluetooth® stereo (A2DP) - ClearAudio+ - Clear bass - Clear Phase™ - Clear stereo - Dynamic normaliser - Low power audio playback*** - Music tones (MP3/AAC) - PlayNow™ service* - SensMe™ - TrackID™ music recognition* “WALKMAN” application - xLoud™ Experience	 Internet - Baidu search - Baidu for Sony - Baidu cloud album - Bookmarks - Pan & zoom - Xperia™ Home* - Web browser (WebKit™)*
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 Communication - Call list - Call recording - Noise suppression - Polyphonic ringtones - Speakerphone - Slow talk - Talk equaliser - Voice enhancement - Xperia™ Socialife*	 Messaging - Conversations - Email - Handwriting recognition - Multimedia messaging (MMS) - Predictive text input - Sound recorder - Text messaging (SMS)	 Design - Auto rotation - Direct touch - Face Unlock - Gesture input - IP58 (water resistant)** - IP5X (Dust-proof) - On-screen QWERTY keyboard - Pen input with stylus - STAMINA mode - Screenshot capturing - Throw - X-Reality™ for mobile - Touch screen - Triluminos™ - Voice input - Wallpaper
 Entertainment 3D games - Media browser - Motion gaming - Radio (FM radio with RDS) - Reader mode - SensMe™ slideshow - TV launcher - Video streaming	 Organiser - Airplane mode - Alarm clock - Calculator - Calendar - Contacts - Document readers - eCompass™ - Lunar calendar - Notes - Setup guide - Stopwatch - Tasks - Timer	 Connectivity 3.5 mm audio jack (CTIA) - ANT+™ sport, fitness, health support - aGPS* - Bluetooth® 4.0 wireless technology - DLNA Certified® - GLONASS* - MHL support - Media Go™ - Media Transfer Protocol support - Micro USB support - Native USB tethering - NFC - PC Companion - Screen mirroring - Smart Connect - Microsoft® Exchange ActiveSync® - Synchronisation via SyncML™ - USB charging - USB High speed 2.0 support - Xperia Link™ - WLAN - WLAN Hotspot functionality

** This service is not available in all markets.*

*** In compliance with IP55 and IP58 standards, Xperia™ Z1 L39t is protected against the ingress of dust and water. Provided that all ports and covers are firmly closed, the phone is (i) protected against low pressure jets of water from all practicable directions in compliance with IP55; and/or (ii) can be kept under 1 metre of freshwater for up to 30 minutes in compliance with IP58. The phone is not designed to float or work submerged underwater outside the IP55 or IP58 classification range that may lead to your warranty being void. To find out more, go to more www.sonymobile.com/testresults.*

**** This feature is only available when you play music using the "WALKMAN" application.*

Technologies in detail

NOTE: The information outlined below is general and levels of compliance to standards and specifications may vary between products and markets. For more information, contact Sony Mobile Developer World or your Sony contact person where applicable.

Device-to-device communications (local)

ANT+™ wireless technology

Connectable devices	ANT+™ devices require download of a supporting application
Frequency band	2.4 GHz
Data transfer rate	Up to 60 Kbps
Encryption	AES-128
Topologies	One to Many, Many to One, Peer to Peer, Star, Practical Mesh

Bluetooth® wireless technology

Bluetooth® profiles supported	Advanced Audio Distribution Profile v1.2 Audio/Video Remote Control Profile v1.3 Device Identification Profile v1.3 Generic Attribute Profile Client/Server over LE Handsfree Profile v1.6 (Wide band speech) Headset Profile v1.2 Health Device Profile v1.1 Human Interface Device Profile, Host role v1.1 Messaging Access Profile v1.0 Object Push Profile v1.1 Personal Area Networking Profile v1.0 Phonebook Access Profile v1.1 Proximity Monitor Profile over LE v1.0 Serial Port Profile v1.1
Core version and supported core features	Version 4.0
Connectable devices	Products support at least one of the Bluetooth® profiles listed above. Bluetooth® 4.0 accessories generally require installation of a supporting application.

More information:

www.sonymobile.com/developer

www.bluetooth.com

WLAN

Supported standards	IEEE 802.11 b/g/n and WLAN WLAN Direct, WLAN Protected Setup
Connectable devices	WLAN access points WLAN Direct compatible devices
Frequency band	2.4 GHz
Data transfer rate	Up to 150 Mbit/s
Security	Open Authentication Shared Authentication EAP-SIM EAP-AKA EAP-TLS EAP-TTLS/MSCHAPv2 PEAPv0/EAP-MSCHAPv2 PEAPv1/EAP-GTC WPA Personal and WPA2 Personal WPA Enterprise and WPA2 Enterprise WAPI
Encryption	WEP 64 bit, WEP 128 bit, TKIP and CCMP (AES)
Power save	WMM-UAPSD
QoS	WMM

DLNA Certified® (Digital Living Network Alliance)

Supported Device Classes	M-DMS – Mobile Digital Media Server Media Types: images, music and video Summary: The digital media server exposes the media files in your device to a WLAN network. The files can then be accessed from other DLNA Certified® clients. +PU+ Media Types: image, video and music Summary: Play media in your device on another device, such as a TV or computer using 2 box push technology. +PU+ is integrated in the Album, Movies and Walkman applications. M-DMP – Mobile Digital Media Player Media Types: image, video and music Summary: Play content stored on another device, for example, a server or a PC, directly on your device. +DN+ Media Types: video and music Summary: Download content stored on another device, for example, a server or a PC, and play the downloaded content directly on your device.
Supported Bearers	WLAN WLAN Direct
DRM Support	The DLNA Certified® implementation does not support DRM-protected content.

Messaging

MMS (Multimedia Messaging Service)

According to OMA Multimedia Messaging Service v1.0 + SMIL

Email

Bearer type (IP)	GPRS, EGPRS, UMTS
Character sets	BIG5 Traditional Chinese GB18030 ISO-2022-JP Japanese ISO-8859-1 ISO-8859-2 Eastern Europe ISO-8859-5 Cyrillic ISO-8859-7 Greek ISO-8859-9 Turkish ISO 8859-11 KOI8-R Cyrillic Shift_JIS Japanese US-ASCII UTF-16 UTF-8 Windows® 874 Windows® 1251 Cyrillic Windows® 1252 Windows® 1254 Turkish Windows® 1258 Vietnamese
Protocols	POP3, IMAP4 and SMTP
Push email	Microsoft® Exchange ActiveSync® (EAS)
Secure email	SSL/TLS, both port methods (POPS/IMAPS) and STARTTLS
HTML mail	Yes (read only)

More information:

www.sonymobile.com/developer

www.openmobilealliance.org

Positioning – location based services

Supported standards:

- OMA Secure User Plane Location (SUPL) v1.0 & v2.0
- 3GPP™ Control Plane location (incl. Emergency location)
- Qualcomm® GPSOneXtra™

Supported satellite systems:

- GPS
- GLONASS*

* NOTE: GPS and GLONASS are used together to calculate the position. Positioning is more robust and accurate in most conditions if both systems are active. The benefits of using GLONASS are automatically available for all applications using the Satellite Positioning API (referred to as "GPS Provider" in Android terminology).

Provisioning (OMA CP)

OMA CP version 1.1

Multimedia (audio, image and video)

Audio Playback	Decoder format	Supported in file format
	MP3	MP3 (.mp3)
	AAC (AAC-LC, AAC+, eAAC+)	3GPP (.3gp, 3gpp, mnv), MP4 (.mp4, .m4a), ADTS (.aac)
	AMR-NB, AMR-WB	3GPP (.3gp, .3gpp), MP4 (.mp4, .m4a), AMR (.amr, .awb)
	MIDI	SMF (.mid), XMF (.xmf), Mobile XMF (.mxmf), OTA (.ota), RTTTL (.rtttl), RTX (.rtx), iMelody (imy)
	PCM	WAV (.wav)
	Vorbis	OGG (.ogg)
	FLAC	FLAC (.flac)
Audio Recording	Encoder format	Supported in file format
	AMR (AMR-NB, AMR-WB)	3GPP (.3gp, .3gpp), MP4 (.mp4, .m4a) AMR (.amr)
	AAC (AAC-LC)	3GPP (.3gp, .3gpp), MP4 (.mp4, .m4a)
Image Playback	Decoder format	Supported in file format
	Windows bitmap	BMP (.bmp)
	GIF	GIF (.gif)
	JPEG	JPEG (.jpg, .jpeg)
	PNG	PNG (.png)
	BMP	BMP (.bmp)
	WebP	WebP (.webp)
Image Capture	Encoder format	Supported in file format
	JPEG	JPEG (.jpg)

Video Playback	Decoder format	Supported in file format
	MPEG-4	3GPP (.3gp, .3gpp), MP4 (.mp4, .m4v) Matroska (.mkv), AVI (.avi), Xvid (.xvid)
	H.264	3GPP (.3gp, .3gpp), MP4 (.mp4, .m4v) Matroska (.mkv)
	H.263	3GPP (.3gp, .3gpp), MP4 (.mp4, .m4v)
	VP8	Webm (.webm, .mkv)
Video Recording	Encoder format	Supported in file format
	H.264	3GPP (.3gp, .3gpp), MP4 (.mp4, .m4v), Video Unlimited (.mnv)
	H.263	3GPP (.3gp, .3gpp), MP4 (.mp4, .m4v)
	MPEG-4	3GPP (.3gp), MP4 (.mp4)
Audio/Video Streaming	Streaming transport	RTSP HTTP progressive download HLS
DRM	DRM (Digital Rights Management) – features the rights and copy protection of downloaded content	OMA DRM v1.0 Marlin DRM Widevine Level 3

Synchronisation (OMA DS, EAS)

OMA Data Synchronisation protocol versions 1.1.2 and 1.2

OMA Data Formats: vCard 2.1, vCalendar 1.0

Microsoft® Exchange ActiveSync® protocol version 2.5

Microsoft® Exchange ActiveSync® protocol version 12

Microsoft® Exchange ActiveSync® protocol version 12.1

Microsoft® Exchange ActiveSync® protocol version 14

Microsoft® Exchange ActiveSync® protocol version 14.1

Related information:

[*www.sonymobile.com/developer*](http://www.sonymobile.com/developer)

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