



Smartphones

Which One Is Yours?

Just over a decade ago, it was an exceptional wireless device that could make and receive calls and send a few text messages by connecting through an invisible and unknown spectrum. Today, the standard mobile phone supports a wide variety of other services such as text messaging, MMS, email, Internet access, short-range wireless communications through infrared, Bluetooth and WiFi, business applications, gaming, photography, videography... almost any task that was once done by another digital gadget.

Looking at the number of mobile phone 'applications' that are being made every day, it seems that owning one such smart device will soon become a necessity, if not a synchronized part of the body. Here, in an effort to help you in identifying the better and the best smartphones available in the market within the medium price range, we are sharing the comparative test findings on GSM smartphones tested by International Consumer Research and Testing (ICRT).

The tests conducted on the phones were quite diverse as far as functionality was concerned. Some phone models under test were very basic as compared to the ones with comprehensive functionalities like LTE, HSPA+, GPS and HD camcorder. [LTE: long-term evolution; HSPA: high speed packet access; GPS: global positioning satellite; HD: high definition]

The brands and their models were chosen from the detailed test report covering a large number of brands, keeping in consideration their availability and sales in India. The test parameters cover more

THE VERDICT

All the models from all the brands performed quite satisfactorily in terms of the transmission and reception, which is a basic function of the mobile phone.

In terms of the overall test performance – where comparative ratings were possible – HTC (ONE XL) performed on the top followed by Nokia 603, Sony (Xperia Miro) and Motorola (RAZR Maxx). Nokia's other models – Asha 305 and Asha 306 – got lower grading due to certain key test parameters.

than 60 observations/tests and verifications. While the majority of tests/observations was based on the verification of the facilities/features, the comparative ratings were assigned on a 1–5 grade scale for the selected test parameters where comparable results were possible/obtained.

PHYSICAL ASPECTS

Rain test

An artificial raining appliance was used to give an even rain distribution simulating the actual rain effect on the mobile phone. During the test, phones were laid horizontally on a rotary table and were showered with water for five minutes. The functions of the phone were assessed immediately and subsequently after one, two and three days.

All the models were found to be functioning and scored full marks except for LG and HTC (One XL & Desire X), which were on a slightly lower side.

Volume and weight

Length, width and height of each phone were measured physically and volume was calculated.

HTC (One XL) has the highest volume and a comparatively lower weight, while HTC (Desire X) is the smallest phone among all the brands tested.

Shock resistance

Durability against mechanical shocks – falls, slides, etc. – was tested by throwing the phones in different angles from a height of 80cm.

All brands performed quite satisfactorily and were rated on a scale of 5. HTC (Desire X) was found on the lower side and scored only 1.5/5.

Scratch test

The scratch resistance of the phones' displays and their bodies was examined by a hardness test pencil. This pencil is equipped with a spiral spring and a carbide ball tip of 1mm diameter. Ratings were given after scratching the body and display of phone with five different loads and looking at the permanent scratches.

The Nokia Asha models (305, 306) were not at par so far as scratch on display was concerned.

GENERAL CONVENIENCE

Visual interface – display, keyboard, keypad and touchscreen

A smartphone's visual interface is a very important factor for proper picture quality and in combination with a touchscreen, which is important for proper usability. The display plays the role of a PC monitor and also doubles up as the keypad for accessing all applications – even to make a call. Therefore, the screen size should be optimal in size for better visibility and interactivity, but should not be so big that it compromises on the phone's portability. The display should also be equally effectual in sunlight and outdoors.

These demands are very challenging and need several investigations. The display quality, size and convenience in use of touchscreen were investigated by several measurements and rating was given on a scale of 5.

Motorola (Razr Maxx) and HTC (One XL) were given full scores for their visual interface.


Display size (in cm²)

The bigger the display, the more information is visible with the same character size. Also, for navigation purposes – where maps are displayed – the size of the screen is vital. Hence, a larger display size was rated better.







The screen size of the sample phones varied from 39mm × 65mm (Nokia Asha 305 and Nokia Asha 306) to 58mm × 103mm (HTC One XL).



COMPARATIVE TEST

BRAND →	Motorola RAZR Maxx XT910	HTC One XL	Nokia 603	Sony Xperia Miro ST23i	HTC Desire X
					
QUICK ANALYSIS	<p>Big smartphone with a huge and very good display, and convenient handling</p> <p>Nearly all convenience ratings are on a good level</p> <p>Battery running times are very good</p> <p>Measurements like speech quality are on a very high level</p> <p>Recommended</p>	<p>It was tested with Android 4.0.4 and supports LTE</p> <p>Nearly all convenience ratings are on a good level, especially the display quality</p> <p>Battery running times are on an average level</p> <p>Recommended</p>	<p>The convenience ratings suffer due to small buttons</p> <p>Screen is too small for convenient Internet or email use</p> <p>Like for all Symbian phones, the Google support is weak</p>	<p>At the beginning of the test we had problems in charging the device</p> <p>Both A and B models seemed to have battery contact problems</p> <p>The test shows that the device is an average Android model</p> <p>No headphones are delivered</p>	<p>A sparsely equipped smartphone (for example, it does not provide a compass)</p> <p>Almost all convenience ratings are on a good level</p> <p>Two models were damaged in the tumbling drum in the same way</p>
PROS	<p>Good battery performance</p> <p>Good RF sensitivity</p> <p>Good camera video quality</p> <p>Good for GPS navigation</p> <p>Typical good Android menu</p> <p>Good display quality</p> <p>Good touchscreen convenience</p>	<p>Fast data transmission via LTE possible</p> <p>Good camera video quality</p> <p>Good sound quality of music player (earphones delivered)</p> <p>Good for GPS navigation</p> <p>Very good display and touchscreen convenience</p> <p>Typical good Android menu</p>	<p>Fast upload speed HSUPA</p> <p>Good sound quality of music player (earphones delivered)</p> <p>Good onboard GPS navigation but not suitable for off-road use</p> <p>Good basic phone operation</p>	<p>Good RF sensitivity</p> <p>Good keypad or touchscreen</p> <p>Typically good Android menu</p>	<p>Good sound quality of music player (earphones delivered)</p> <p>Good display quality</p> <p>Good touchscreen convenience</p>
CONS		<p>Weak battery performance</p> <p>Poor manual</p>	<p>Poor camera picture quality</p>	<p>Shutter delay more than 1 second</p>	<p>Poor camera picture quality</p> <p>Seriously damaged in tumbling test</p>

SMARTPHONES

Sony Xperia Tipo Dual ST21i2	Alcatel One Touch 991D SMART	Huawei Ascend G300	LG Optimus L3 Dual SIM E405	Nokia Asha 305 Dual SIM	Nokia Asha 306
					
<p>It is similar to the former tested model of Sony Xperia Tipo except for its dual SIM function</p> <p>Battery times are slightly shorter than for code 984</p>	<p>There are two SIM card slots – one for 2G and another for 3G</p> <p>Reaction of touchscreen is slow</p> <p>Display is not optimal</p> <p>Sound of headphones and camera quality are not up to the mark</p>	<p>The device offers neither any backup app nor any backup software</p> <p>Music player does not play the tested files in the correct order</p> <p>Sound quality of earphone is poor</p> <p>Sound quality during video recording is poor</p> <p>Not Recommended</p>	<p>The convenience ratings suffer due to poor display resolution of 240 x 320 pixels</p> <p>Camera and camcorder quality is poor</p> <p>HSUPA is not supported</p> <p>Phone is delivered without earphones or a headset</p> <p>Not Recommended</p>	<p>It offers Nokia Maps but cannot determine the position via GPS</p> <p>Brand's website makes misleading claim on GPS</p> <p>Resistive touchscreen is bad</p> <p>Picture and video records serve a poor quality</p> <p>Not Recommended</p>	<p>This device offers Nokia Maps and can show the rough location only via WiFi</p> <p>Brand's website makes misleading claim on GPS</p> <p>Resistive touch screen is bad</p> <p>Picture and video records serve a poor quality</p> <p>Not Recommended</p>
<p>Good keypad or touchscreen convenience</p> <p>Typically good Android menu</p>	<p>Fast upload speed HSUPA</p> <p>Typical good Android menu handling and structure</p>	<p>Good Android menu handling and structure</p>	<p>Good keypad or touchscreen convenience</p> <p>Typical good Android menu handling and structure</p>		
<p>Poor camera picture and video quality</p>	<p>Weak battery</p> <p>Poor picture and video quality</p> <p>Long shutter delay</p> <p>Poor sound</p> <p>Zero internal storage capacity</p>	<p>Poor recording and poor earphones sound quality</p>	<p>Poor display quality</p> <p>Poor camera picture and video quality</p> <p>No camera flash</p>	<p>Poor camera picture and video quality</p> <p>Poor music player</p> <p>Poor display quality</p> <p>Shutter delay more than 1 second</p>	<p>Poor camera picture and video quality</p> <p>Poor music player</p> <p>Poor display quality</p> <p>Shutter delay more than 1 second</p>

COMPARATIVE TEST

		FEATURES				
Brand →		Motorola RAZR Maxx XT910	HTC One XL	Nokia 603	Sony Xperia Miro ST23i	HTC Desire X
OS		Android 4.0.4	Android 4.0.4	Nokia Belle	Android 4.0.4	Android 4.0.4
Display resolution (dots per inch)		259	318	212	165	237
Camera resolution (megapixels)		8	8	5	5	5
Camera flash		Yes	Yes	No	Yes	Yes
Accessible internal storage		8GB	24.4GB	1.57GB	2GB	1.09GB
Dual SIM		No	No	No	No	No
Display and keypad		Capacitive touchscreen	Capacitive touchscreen	Capacitive touchscreen	Capacitive touchscreen	Capacitive touchscreen
Camcorder with HD resolution		Yes	Yes	Yes	No	No
PRICE (IN RS)		25,000	24,800	12,000	13,000	15,500

Characteristics of a Smartphone

- display area > 18cm²
- display resolution > 240 x 320 pixels
- data transfer speed: UMTS and Wi-Fi
- Email client and HTML browser
- Full keyboard (physical keyboard or keys or on screen)
- All multimedia phones' criteria



TO LOOK AT					
Sony Xperia Tipo Dual ST21i2	Alcatel One Touch 991D SMART	Huawei G300 ASCEND	LG Optimus L3 Dual SIM E40	Nokia Asha 305 Dual SIM	Nokia Asha 306
Android 4.0.4	Android 2.3.6	Android 2.3.6	Android 2.3.6	Series 40 Asha	Series 40 Asha
181	147	235	125	156	156
3	5	5	3	2	2
No	Yes	Yes	No	No	No
2.2GB	None; external SD card necessary	2.1GB	1GB	None	None
Yes	Yes	No	Yes	Yes	No
Capacitive touchscreen	Capacitive touchscreen	Capacitive touch screen	Capacitive touchscreen	Resistive touchscreen	Resistive touchscreen
Yes	No	No	No	No	No
8,000	9,000	8,000	6,799	4,300	3,850

GENERAL PERFORMANCE

Battery

Power consumption was calculated in consideration of the nominal battery capacity for endless call mode, and the time was noted for each brand.

Motorola (RAZR Maxx) ran for longest time in battery backup (for 16.5 hours), while Sony (Xperia Tipo) shut earliest (in only 7.4 hours).

Charging time

The charging time was measured in real charging mode. The charging indicators (LEDs or battery symbols) were checked every 15 minutes until the device displayed that its battery was completely

charged. Lower charging time was considered to be better.

Nokia (603) and Huawei charged in the lowest time (120 minutes), while Motorola (RAZR Maxx) took the longest time (270 minutes).

CAMERA AND CAMCORDER FUNCTION

The camera functions were judged for the following:

Resolution

All phones having a camera resolution of > 2 megapixels were tested as a camera phone. *Motorola and HTC (One XL) have the highest resolution of 8 megapixels.*

COMPARATIVE TEST

Flash

Almost half of the brands had flash facility for better picture quality in low light and/or in dark. The exceptions were LG, Nokia (all models) and Sony (Xperia Tipo).

Picture quality

All evaluations of the picture quality were performed after transferring the photos to the personal computer (PC). For all tests the cameras were set to wide zoom mode and to full automatic function, and ratings were given out of 5 based on the quality of images.

HTC (One XL) was found to have the excellent image quality hence was given 4.5/5

Video quality

In studio light conditions a video scene with the mobile phone on a tripod was recorded within an area of about 2 x 2 metres; the camcorder was set to wide, recording from a 3 meters' distance. Quality aspects like exposure, contrast, sharpness and colour quality were rated directly via the mobile phone as well as via a high-quality monitor after transmission to a PC.

HTC (One XL) and Motorola were seen to have the best video quality, with scores of 4.5 and 4, respectively.

Transferring images and videos to computer

The transfer possibilities to storage locations like personal computers were evaluated. Various aspects like mandatory installation of software on the computer and the maximum possible upload data were checked. Ratings were given depending on which brands were most convenient and simple to use.

HTC (One XL) was the most convenient and simple to use while transferring data.

MUSIC FUNCTION

Music function was tested on the phones that had an inbuilt music player. Various parameters including media playback formats, music player convenience, music transfer, sound quality of the music player and maximum sound pressure level (SPL) were evaluated.

Motorola (5/5) was given the highest score as it was found to be more reliable in the above-mentioned parameters.

OPERATIONS

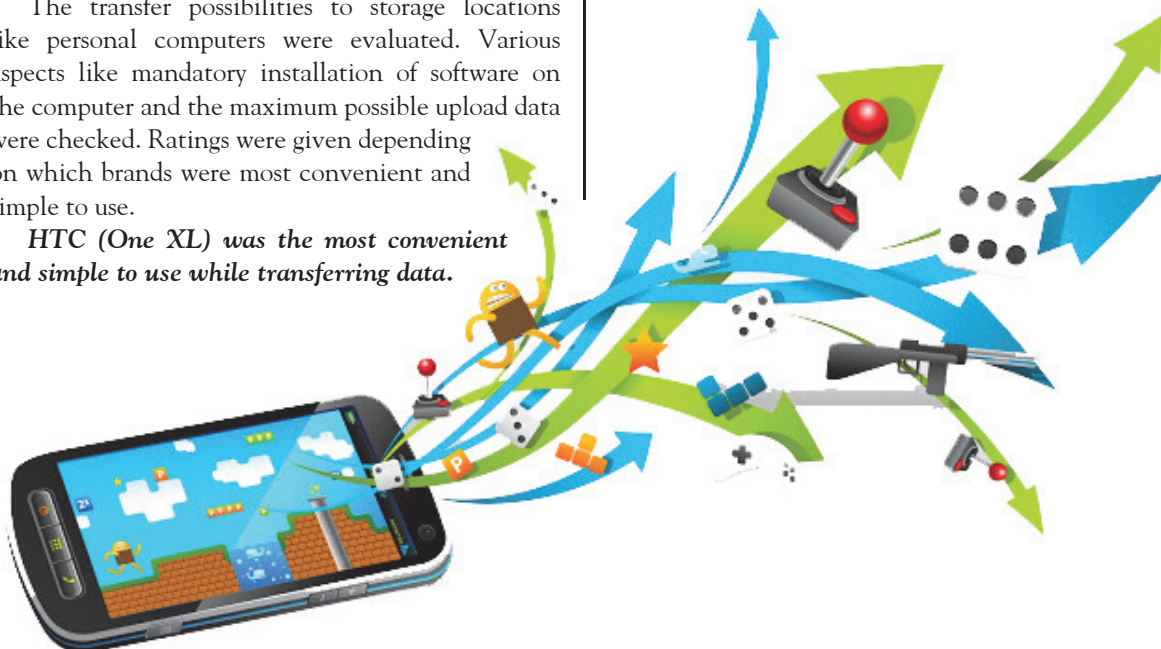
The basic operation is investigated from lab experts according to the following functions:

Telephone calls

The basic operation of a mobile phone (calling) is investigated from lab expertise. Ratings were given based on judgements on the parameters listed below

- receiving a call
- dialling phone numbers
- dialling from the phonebook
- dialling from speed dial or from the caller list
- quality of display of the dialling process
- display indications while calling

All the brands performed satisfactorily in calling functions. Motorola and HTC (One XL) performed on the top and hence were given full scores.



SMS convenience

The following parameters were judged by experts while checking for convenience in using the SMS facility

- Is SMS content visible on display immediately after receiving (privacy) keypad and display not locked?
- Is archiving of SMS possible?
- Is sorting of SMS possible?
- Deleting a group of SMS
- Writing text, names and addresses (with special characters), answering, deleting
- Writing test text and measuring time

Most of the brands performed well except for Nokia (Asha 305 and 306), which were on the lower side because of smaller buttons and absence of button space.

Internet and Web browsing convenience

Most of the mobile phones offer possibilities to surf the Internet. Due to the restricted display size and resolution compared to the regular personal computer, new user interface tools like touchscreen operation with multi-finger touch are necessary. Hence, Internet access for most phones is limited to emails and social media websites like YouTube and Facebook, with little scope for full Internet browsing.

Experts used the phones to access the following websites:

- www.irctc.com for Indian railway timetable and form filling
- www.youtube.com to check playback of a video – partly redirected to m.youtube.de (missing flash player)
- www.googlemail.com for Web mail account (including login, reading and writing emails, viewing PDF and JPEG attachments)
- www.wikipedia.org with search of a name, indication and reading of the resulting page
- YouTube, Facebook and Twitter – by apps if possible (if not via browser)

HTC One XL (5.5) followed by HTC Desire X (4.5) performed on top, while LG E405 stood lowest.

GPS antenna

The navigation possibilities of smartphones differ in software, software version and concept. These components majorly influence the overall quality. Various GPS functions were tested on phones claiming to have GPS facility.

Only the Nokia Asha series (305 and 306) did not provide this facility.



The tests of GSM smartphones were conducted by International Consumer Research and Testing (ICRT), based in Europe. ICRT is an association of 37 consumer organizations from 33 countries, including Consumer VOICE. It aims to promote cooperation in consumer research and testing among its members and other organizations concerned with consumer matters.

COMPARATIVE TEST

COMPARATIVE PERFORMANCE CHART OF GSM SMARTPHONES

Brand→	Motorola	HTC	Nokia	Sony	HTC	Sony	Alcatel	Huawei	LG	Nokia	Nokia
Model→	RAZR Maxx	One XL	603	Xperia Miro	Desire X	Xperia Tipo Dual Sim	OT 991	G300 ASCEND	E405 L3 Dual SIM	Asha 305 Dual SIM	Asha 306
Operating system (version) →	Android (4.0.4)	Android (4.0.4)	Symbian 3	Android (4.0.4)	Android (4.0.4)	Android (4.0.4)	Android (2.3.6)	Android (2.3.6)	Android (2.3.6)	Series 40 Asha	Series 40 Asha
Price (in Rs)#	25,000	24,800	12,000	13,000	15,500	8,000	9,000	8,000	6,799	4,300	3,850
Warranty (months)	24	24	24	12	24	12	12	24	24	24	24
Display size (width × height), mm	53 × 94	58 × 103	43 × 77	49 × 74	51 × 86	44 × 68	55 × 84	52 × 87	48 × 65	39 × 65	39 × 65
Volume (cm ³)/weight (gm)	100.9/144	113.4/133	84.5/111	81.4/109	74.3/116	76.3/102	101/133	86.6/139	76.6/108	77.2/99	77.2/98
Camera resolution	8	8	5	5	5	3	5	5	3	2	2
Charging time (minutes)	270	195	120	135	180	135	135	120	150	150	150
Battery running time (hours) (endless call mode)	16.5	11.3	13.1	9.6	8.4	7.4	8.8	8.4	9.9	8.7	9
TEST PARAMETERS											
1. Transferring data to PC	4.5	5	4	3.5	4.5	3	4	3	3	2.5	2.5
2. Shock resistance	4	4	4.5	5	1.5	4.5	5	3.5	4	4.5	4.5
3. Water resistance (5 minutes)	5	4	5	5	3.5	5	5	5	4	5	5
4. Picture quality	3	3	2.5	3.5	2.5	2.5	2	3	2	2	2
5. Sound quality (integrated speakers)	3.5	3	4	3	3	3.5	1.5	0.5	2.5	1	1
6. Sound quality (headphones)	3.5	2	3	2.5	3	3	1.5	0.5	2	1	1
7. Music player basic use	5	4.5	4.5	4	4.5	4	4.5	4.5	4	3.5	3.5
8. Video quality	4	4.5	3.5	3	3	2.5	2.5	3	2	1	1
9. Convenience in use											
9.1 Phone calls	5	5	4.5	4.5	4	4	4.5	4.5	4.5	3	3
9.2 SMS	5	5	3.5	4	4.5	3.5	4	4.5	3.5	2.5	2.5
9.3 Email	5	5	4	4.5	4.5	3.5	3	3.5	3	nt	nt
9.4 Internet	5	5.5	3.5	4	4.5	3.5	3.5	4	2.5	nt	nt
9.5 Keyboard/Keypad/Touchscreen	5	5	3.5	4	4.5	3.5	3	4	4	2.5	2.5
9.6 Camera functions	4	4.5	3	2.5	4	2.5	2.5	3	2	2	2
Overall Rating	4.39	4.29	3.79	3.79	3.68	3.46	3.32	3.32	3.07	2.54	2.54

Grading: Excellent 4.6–5.5, Very Good 3.6–4.5, Good 2.6–3.5, Average 1.6–2.5, Poor 0.6–1.5

#Prices have been taken from various sources and will vary from retailer to retailer.