

<i>Peshawer to DG Khan</i>	79.91	92.47	92.82	52.41	No	Yes	Yes	No
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Table 3.3: 3G Signal Strength Technology Auto Detect Mode -100 dBm with 90% Confidence Level

3G Signal Strength -100dBm with 90% Confidence Level – Technology Locked Mode								
<i>Road Name</i>	Confidence Level (%)				Compliant (Yes/No)			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
<i>Quetta to Zhob</i>	98.63	99.6	99.1	93.50	Yes	Yes	Yes	Yes
<i>Lahore to Sargodha</i>	99.02	99.46	97.87	99.75	Yes	Yes	Yes	Yes
<i>Lahore to Rawalpindi</i>	99.08	99.63	99.86	99.37	Yes	Yes	Yes	Yes
<i>Lahore to Multan</i>	99.36	90.83	89.99	100.00	Yes	Yes	No	Yes
<i>Islamabad to Kohat</i>	91.21	98.16	97.17	93.87	Yes	Yes	Yes	Yes
<i>Mianwali to Bakhar</i>	75.06	88.53	84.71	91.23	No	No	No	Yes
<i>Isamabad to D.I Khan</i>	86.37	92.19	91.03	87.68	No	Yes	Yes	No
<i>T.M Panah to Jalalpur Pirwala</i>	99.12	96.08	59.59	99.96	Yes	Yes	No	Yes
<i>Kot Sabzal to Multan</i>	93.65	98.31	94.2	99.78	Yes	Yes	Yes	Yes
<i>Chakdara to Kalam</i>	97.20	99.95	95.48	98.77	Yes	Yes	Yes	Yes
<i>Khuazakhela to Behsam</i>	81.41	97.2	83.69	79.12	No	Yes	No	No
<i>Peshawer to DG Khan</i>	81.84	97.99	98.09	97.01	No	Yes	Yes	Yes

Table 3.4: 3G Signal Strength Technology Locked Mode -100 dBm with 90% Confidence Level

MOBILE BROADBAND SERVICE

4.1. **DATA SESSIONS IN TECHNOLOGY AUTO DETECT MODE & LOCKED MODE.** A series of Mobile Broadband/Data tests including Capacity Tests, Data Transfer Tests, Web Browsing and Ping were carried out wherein Key Performance Indicators (KPIs) of Upload and Download User Data Throughput (i.e. Speed), Webpage Loading Time and Latency have been measured. In Fixed Duration Testing, a File of 10GB was downloaded and Uploaded for 3 minutes duration whereas in Fixed Size Testing, a File of 5MB and 2MB was completely downloaded and uploaded respectively. In order to measure Webpage Loading Time, different national webpages were checked and in case of Latency international and national host were pinged to measure Round Trip Time (RTT)/Latency. The 4G/LTE and 3G signal strength, Number of Tests, Upload and Download User Data Throughput, Webpage Loading Time and Latency detail is mentioned in **Table 4.1: Data Tests Statistics.**

DESCRIPTION				JAZZ	TELENOR	UFONE	ZONG	
AUTO DETECT MODE	CAPACITY TEST	DOWNLOAD	ATTEMPTS	2314	2175	2317	2247	
			SPEED (Mbps)	24.454	6.037	13.107	23.142	
		UPLOAD	ATTEMPTS	2320	2178	2321	2250	
			SPEED (Mbps)	18.531	6.311	15.122	16.37	
	DATA TRANSFER TEST	DOWNLOAD	ATTEMPTS	2270	2089	2048	2228	
			SPEED (Mbps)	10.06	5.236	8.028	10.25	
		UPLOAD	ATTEMPTS	2337	2194	2337	2260	
			SPEED (Mbps)	7.746	6.075	8.222	9.063	
	BROWSING TEST	ATTEMPTS			11643	10923	11634	11277
		LOADING TIME (Seconds)			6.69	7.85	6.91	6.65
	PING TEST	ATTEMPTS			4690	4411	4693	4542
		LATENCY (msec)			259.91	251.97	280	241.8
AVERAGE 4G SIGNAL STRENGTH (RSRP) dBm				-84	-86.3	-85.1	-85	
AVERAGE 3G SIGNAL STRENGTH (RSCP) dBm				-82.58	-80.97	-82.61	-93.04	

DESCRIPTION					JAZZ	TELENOR	UFONE	ZONG
LOCKED MODE	4G	DATA TRANSFER TEST	DOWNLOAD	ATTEMPTS	958	956	958	957
				SPEED (Mbps)	17.125	3.957	10.491	16.64
			UPLOAD	ATTEMPTS	950	950	950	950
				SPEED (Mbps)	15.551	5.12	12.042	9.786
		PING TEST	ATTEMPTS		966	966	966	965
			LATENCY (msec)		94.06	98.66	100.63	114.71
	AVERAGE 4G SIGNAL STRENGTH (RSRP) dBm				-84.8	-87.5	-88.2	-86.1
	3G	DATA TRANSFER TEST	DOWNLOAD	ATTEMPTS	469	840	773	837
				SPEED (Mbps)	2.063	2.532	2.65	2.175
			UPLOAD	ATTEMPTS	405	825	755	826
				SPEED (Mbps)	0.86	1.5	2.006	0.964
		PING TEST	ATTEMPTS		918	918	917	918
			LATENCY (msec)		477.66	661.44	502.52	253.64
		AVERAGE 3G SIGNAL STRENGTH (RSCP) dBm				-74.88	-74.25	-74.91

Table 4.1: Data Tests Statistics

4.2. **DOWNLOAD USER DATA THROUGHPUT.** As per Next Generation Mobile Service (NGMS) licenses, licensees are required to meet the threshold of minimum of 3 Mbps of 4G/LTE & 512 Kbps of 3G Download User Data Throughput. The results of Data Service QoS KPI i.e. Download User Data Throughput is shown in (i). Table 4.2: Download User Data Throughput Technology Auto Detect Mode [Fixed Duration] \geq 3 Mbps, (ii). Table 4.3: Download User Data Throughput Technology Auto Detect Mode [Fixed Size] \geq 3 Mbps, (iii). Table 4.4: Download User Data Throughput 4G/LTE Technology Locked Mode [Fixed Duration] \geq 3 Mbps & (iv). Table 4.5: Download User Data Throughput 3G Technology Locked Mode [Fixed Duration] \geq 512 Kbps.

DOWNLOAD USER DATA THROUGHPUT IN TECHNOLOGY AUTO DETECT MODE (FIXED DURATION)								
Road	Download Data Throughput [Mbps]				Operator Position			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
Quetta to Zhob	20.00	6.55	13.97	27.33	Second	Fourth	Third	First
Zhob to Quetta	18.77	6.75	6.83	11.77	First	Fourth	Third	Second
Lahore to Sargodha	25.84	4.85	18.39	21.23	First	Fourth	Third	Second
Lahore to Rawalpindi	22.23	5.09	9.70	22.20	First	Fourth	Third	Second
Lahore to Multan	18.52	7.77	15.98	16.04	First	Fourth	Third	Second
Islamabad to Kohat	30.69	5.46	12.42	15.65	First	Fourth	Third	Second
Mianwali to Bakhar	26.47	7.04	13.30	27.44	Second	Fourth	Third	First
Isamabad to D.I Khan	24.80	6.12	10.50	14.89	First	Fourth	Third	Second
T.M Panah to Jalalpur Pirwala	13.91	3.99	13.45	25.50	Second	Fourth	Third	First
Kot Sabzal to Multan	26.66	6.10	8.05	24.34	First	Fourth	Third	Second
Chakdara to Kalam	22.67	9.53	15.12	30.24	Second	Fourth	Third	First
Khuazakhela to Behsam	27.97	2.67	15.64	23.38	First	Fourth	Third	Second
Peshawer to DG Khan	15.19	4.75	15.64	37.54	Third	Fourth	Second	First

Table4.2: Download User Data Throughput Technology Auto Detect Mode [Fixed Duration] \geq 3 Mbps

DOWNLOAD USER DATA THROUGHPUT IN TECHNOLOGY AUTO DETECT MODE (FIXED SIZE)								
Road	Download Data Throughput [Mbps]				Operator Position			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
Quetta to Zhob	8.45	6.77	9.25	11.67	Third	Fourth	Second	First
Zhob to Quetta	8.29	6.67	5.70	10.30	Second	Third	Fourth	First
Lahore to Sargodha	11.26	5.22	11.52	11.03	Second	Fourth	First	Third
Lahore to Rawalpindi	11.29	5.52	8.11	11.33	Second	Fourth	Third	First