



深圳星源创科技有限公司

Shen Zhen Xing Yuan Chuang Technology Co., Ltd

规格承认书
Approval Sheet

客户名称 Customer	昱科	日期 Data	2024/06/06
产品名称 Product	WiFi副天线	客户机型 Models	E238
料号 P/N	F667E-14RG-245	客户料号 Customer P/N	31TX00E23824500
规格描述 Specifications	黑色FPC；RF0.81四代端子灰色同轴线；L=245mm		

供应商承认签印 Vender Approved By	客户承认签印 Customer Approved By
	
Checked By:	Checked By:
Audit By:	Audit By:
Approval By:	Approval By:

文件修订履历表					
版本 Version	修订内容 Revise The Content	修订人 Revused	核准 Approval	修订日期 Date	备注 Note

地址：深圳市宝安区福永镇福海街道塘尾股份商务大厦1506

Address:1506, Tangwei Business Building, Fuhai Street, Fuyong Town, Baoan District, Shenzhen

Tel: 0755-82103639 QQ: 487580356 Email: Stephdeng_Vis@126.com



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Specification

1.1 Electrical Properties

Characteristics	Specifications
Working Band	2.4GWiFi; 5GWiFi
Antenna From	PIFA
Impedance	50 Ω
Polarization	Linear
Peak Effi	45%@2.4G; 53%@5G
Peak Gain	1.5dBi@2.4G; 4.1dBi@5G

1.2 Physical Properties

Characteristics	Specifications
Operating Temp	-10°C~+60°C
Storage Temp	-10°C~+70°C
Humidity	10~95%RH

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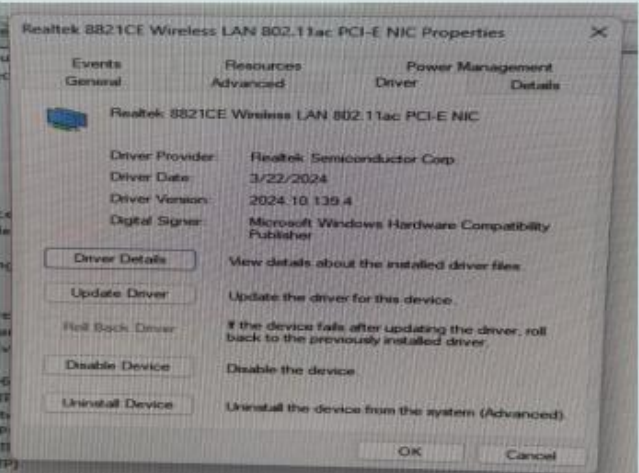
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WiFi Ant Test Information

Frequency	2.4G (2402~2483)Mhz	5G (5150~5850)Mhz
Module information		
Driver version information		

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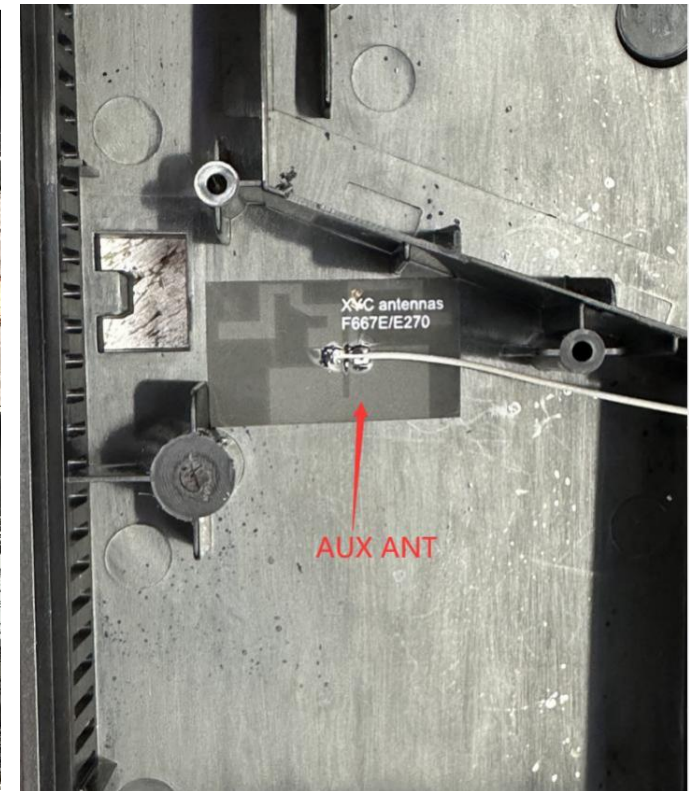
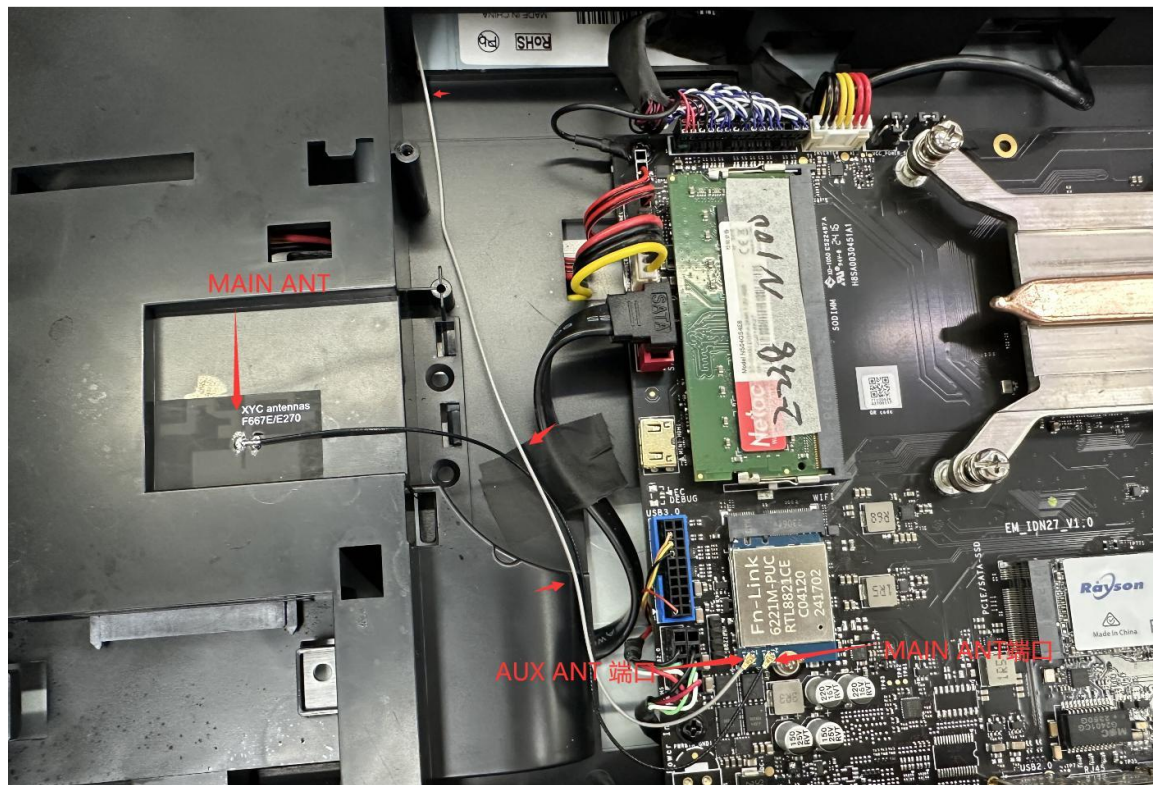
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Antenna Placement



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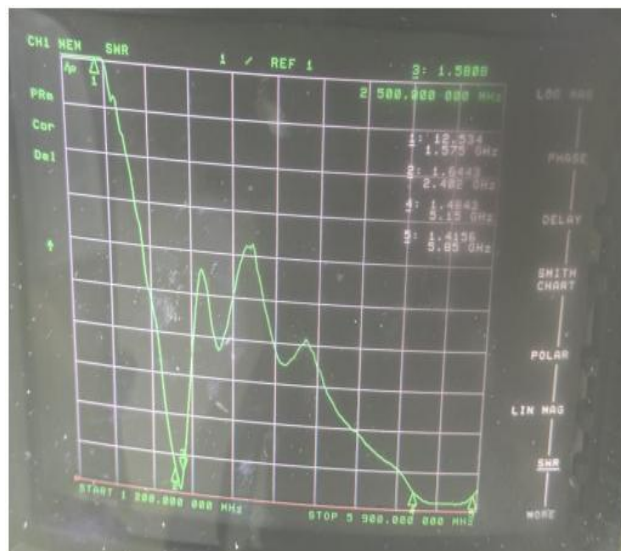
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Test Data

S11 Parameter-VSWR



Frequency (MHZ)	2400	2500	5150	5850
VSWR	1.64	1.58	1.48	1.41
Return Loss (DB)	-12.37	-13.45	-14.2	-15.29

Efficiency Table(2.4G)

Passive Test For WIFI2.4

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHS (%)	Max (dB)	Min (dB)
2400	33.49	-4.75	-0.45	-2.6	16.583	16.903	-0.45	-15.08
2410	33.62	-4.73	-0.31	-2.46	16.383	17.233	-0.31	-16.52
2420	35.84	-4.46	0.11	-2.04	17.291	18.548	0.11	-18.85
2430	36	-4.44	0.25	-1.9	17.293	18.707	0.25	-21.32
2440	36.92	-4.33	0.53	-1.62	17.562	19.355	0.53	-22.09
2450	38.41	-4.16	0.76	-1.39	18.041	20.373	0.76	-20.16
2460	40.58	-3.92	1.16	-0.99	18.824	21.761	1.16	-17.8
2470	42	-3.77	1.38	-0.77	19.282	22.719	1.38	-15.76
2480	43.51	-3.61	1.47	-0.68	19.831	23.683	1.47	-14.45
2490	45.02	-3.47	1.58	-0.57	20.401	24.623	1.58	-13.53
2500	44.82	-3.48	1.58	-0.57	20.262	24.562	1.58	-13.73

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Efficiency Table(5G)

Passive Test For WIFI5G

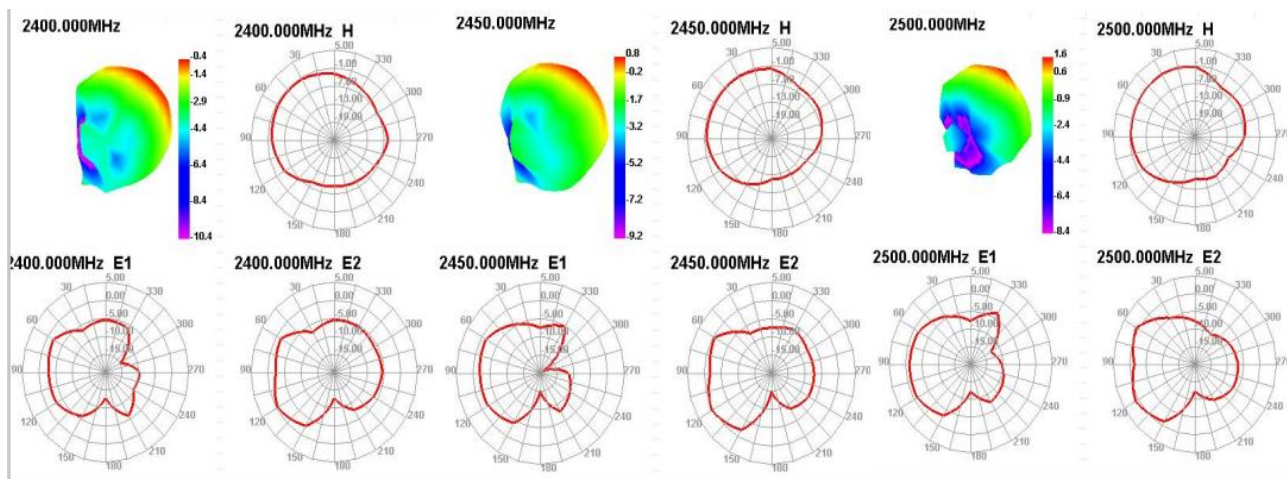
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHIS (%)	Max (dB)	Min (dB)
5150	36.36	-4.39	0.87	-1.28	17.798	18.563	0.87	-23.25
5170	39.08	-4.08	1.29	-0.86	19.219	19.862	1.29	-22.52
5190	39.62	-4.02	1.52	-0.63	19.481	20.138	1.52	-27
5210	44.78	-3.49	2.18	0.03	21.953	22.822	2.18	-24.38
5230	41.68	-3.8	1.89	-0.26	20.575	21.107	1.89	-23.08
5250	48.53	-3.14	2.64	0.49	23.978	24.549	2.64	-23.48
5270	46.89	-3.29	2.72	0.57	23.242	23.647	2.72	-24.03
5290	52.57	-2.79	3.22	1.07	26.128	26.437	3.22	-21.74
5310	46.21	-3.35	2.68	0.53	22.961	23.245	2.68	-22.33
5330	48.73	-3.12	2.97	0.82	24.348	24.378	2.97	-21.55
5350	47.23	-3.26	2.97	0.82	23.561	23.665	2.97	-22.19
5370	47.41	-3.24	3.09	0.94	23.746	23.659	3.09	-19.69
5390	42.52	-3.71	2.49	0.34	21.414	21.11	2.49	-19.91
5410	52.43	-2.8	3.45	1.3	26.694	25.731	3.45	-18.02
5430	44.63	-3.5	2.88	0.73	22.644	21.987	2.88	-21.34
5450	49.03	-3.1	3.39	1.24	24.734	24.3	3.39	-23.71
5470	45.08	-3.46	2.97	0.82	22.587	22.494	2.97	-20.57
5490	46.41	-3.33	3.12	0.97	23.303	23.107	3.12	-21.2
5510	48.38	-3.15	3.54	1.39	24.209	24.173	3.54	-20.4
5530	49.26	-3.07	3.71	1.56	24.097	25.167	3.71	-21.99
5550	53.08	-2.75	4.02	1.87	25.611	27.473	4.02	-25.32
5570	48.98	-3.1	3.68	1.53	23.696	25.286	3.68	-22.13
5590	53.19	-2.74	4.16	2.01	25.712	27.483	4.16	-30.21
5610	47.01	-3.28	3.6	1.45	22.602	24.409	3.6	-21.68
5630	52.3	-2.82	3.98	1.83	25.14	27.158	3.98	-18.91
5650	48.33	-3.16	3.47	1.32	23.423	24.907	3.47	-21.16
5670	52.42	-2.81	3.9	1.75	25.67	26.748	3.9	-22.99
5690	49.75	-3.03	3.61	1.46	24.369	25.384	3.61	-25.12
5710	48.81	-3.11	3.39	1.24	23.951	24.861	3.39	-22.34
5730	53.47	-2.72	3.85	1.7	26.17	27.299	3.85	-20.12
5750	47.97	-3.19	3.49	1.34	23.681	24.286	3.49	-22.86
5770	51.51	-2.88	3.76	1.61	25.484	26.023	3.76	-28.32
5790	46.74	-3.3	3.33	1.18	23.077	23.664	3.33	-25.32
5810	49.47	-3.06	3.56	1.41	24.466	25.008	3.56	-24.18
5830	48.3	-3.16	3.53	1.38	24.17	24.126	3.53	-22.18
5850	50.97	-2.93	3.72	1.57	25.835	25.133	3.72	-21.21

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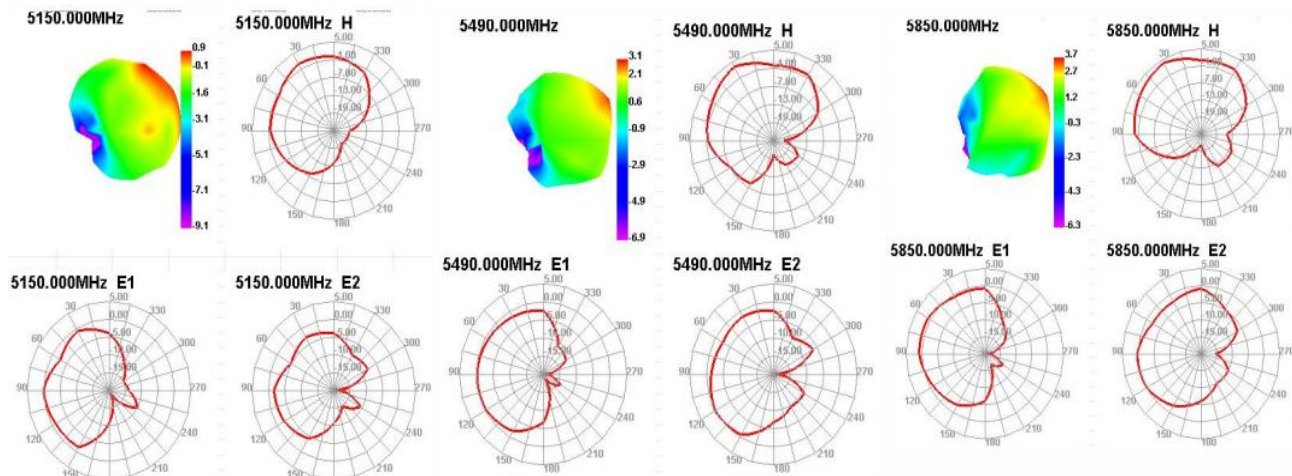
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Radiation Pattern(2.4G)



Radiation Pattern(5G)



BT Test

测试环境：开放空间(通道)
 测试工具：蓝牙音响
 测试距离：10/m
 结果：播放音乐流畅，无杂音。



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Throughput Test(2.4G)

上行	88.9M				下行	122M			
图片	[388]	17.0-18.0 sec	10.9 MBytes	91.8 Mbits/sec	图片	[272]	Interval	Transfer	Bandwidth
	[ID]	Interval	Transfer	Bandwidth		[272]	17.0-18.0 sec	16.5 MBytes	139 Mbits/sec
	[388]	18.0-19.0 sec	10.6 MBytes	89.1 Mbits/sec		[ID]	Interval	Transfer	Bandwidth
	[ID]	Interval	Transfer	Bandwidth		[272]	18.0-19.0 sec	16.4 MBytes	137 Mbits/sec
	[388]	19.0-20.0 sec	10.6 MBytes	89.1 Mbits/sec		[ID]	Interval	Transfer	Bandwidth
	[ID]	Interval	Transfer	Bandwidth		[272]	19.0-20.0 sec	15.5 MBytes	130 Mbits/sec
	[388]	20.0-21.0 sec	10.9 MBytes	91.0 Mbits/sec		[ID]	Interval	Transfer	Bandwidth
	[ID]	Interval	Transfer	Bandwidth		[272]	20.0-21.0 sec	17.6 MBytes	147 Mbits/sec
	[388]	21.0-22.0 sec	11.0 MBytes	92.3 Mbits/sec		[ID]	Interval	Transfer	Bandwidth
	[ID]	Interval	Transfer	Bandwidth		[272]	21.0-22.0 sec	16.4 MBytes	138 Mbits/sec
	[388]	22.0-23.0 sec	10.7 MBytes	90.1 Mbits/sec		[ID]	Interval	Transfer	Bandwidth
	[ID]	Interval	Transfer	Bandwidth		[272]	22.0-23.0 sec	16.4 MBytes	138 Mbits/sec
	[388]	23.0-24.0 sec	10.2 MBytes	85.8 Mbits/sec		[ID]	Interval	Transfer	Bandwidth
	[ID]	Interval	Transfer	Bandwidth		[272]	23.0-24.0 sec	16.0 MBytes	134 Mbits/sec
	[388]	24.0-25.0 sec	10.5 MBytes	88.5 Mbits/sec		[ID]	Interval	Transfer	Bandwidth
	[ID]	Interval	Transfer	Bandwidth		[272]	24.0-25.0 sec	16.1 MBytes	135 Mbits/sec
	[388]	25.0-26.0 sec	10.0 MBytes	84.0 Mbits/sec		[ID]	Interval	Transfer	Bandwidth
	[ID]	Interval	Transfer	Bandwidth		[272]	25.0-26.0 sec	15.8 MBytes	133 Mbits/sec
	[388]	26.0-27.0 sec	10.8 MBytes	90.6 Mbits/sec		[ID]	Interval	Transfer	Bandwidth
	[ID]	Interval	Transfer	Bandwidth		[272]	26.0-27.0 sec	14.3 MBytes	120 Mbits/sec
	[388]	27.0-28.0 sec	11.2 MBytes	93.7 Mbits/sec		[ID]	Interval	Transfer	Bandwidth
	[ID]	Interval	Transfer	Bandwidth		[272]	27.0-28.0 sec	13.3 MBytes	112 Mbits/sec
	[388]	28.0-29.0 sec	10.8 MBytes	90.2 Mbits/sec		[ID]	Interval	Transfer	Bandwidth
	[ID]	Interval	Transfer	Bandwidth		[272]	28.0-29.0 sec	12.6 MBytes	106 Mbits/sec
	[388]	29.0-30.0 sec	11.1 MBytes	93.0 Mbits/sec		[ID]	Interval	Transfer	Bandwidth
	[ID]	Interval	Transfer	Bandwidth		[272]	29.0-30.0 sec	14.2 MBytes	119 Mbits/sec
	[388]	0.0-30.0 sec	310 MBytes	88.9 Mbits/sec		[ID]	Interval	Transfer	Bandwidth
	[ID]	Interval	Transfer	Bandwidth		[272]	0.0-30.0 sec	439 MBytes	122 Mbits/sec

Throughput Test(5G)

上行	242M				下行	286M			
图片	[ID]	Interval	Transfer	Bandwidth	图片	[272]	Interval	Transfer	Bandwidth
	[400]	17.0-18.0 sec	28.9 MBytes	242 Mbits/sec		[272]	17.0-18.0 sec	35.2 MBytes	296 Mbits/sec
	[ID]	Interval	Transfer	Bandwidth		[ID]	Interval	Transfer	Bandwidth
	[400]	18.0-19.0 sec	29.5 MBytes	247 Mbits/sec		[272]	18.0-19.0 sec	28.7 MBytes	241 Mbits/sec
	[ID]	Interval	Transfer	Bandwidth		[ID]	Interval	Transfer	Bandwidth
	[400]	19.0-20.0 sec	28.6 MBytes	240 Mbits/sec		[272]	19.0-20.0 sec	35.1 MBytes	295 Mbits/sec
	[ID]	Interval	Transfer	Bandwidth		[ID]	Interval	Transfer	Bandwidth
	[400]	20.0-21.0 sec	28.3 MBytes	237 Mbits/sec		[272]	20.0-21.0 sec	35.7 MBytes	299 Mbits/sec
	[ID]	Interval	Transfer	Bandwidth		[ID]	Interval	Transfer	Bandwidth
	[400]	21.0-22.0 sec	29.1 MBytes	244 Mbits/sec		[272]	21.0-22.0 sec	34.4 MBytes	289 Mbits/sec
	[ID]	Interval	Transfer	Bandwidth		[ID]	Interval	Transfer	Bandwidth
	[400]	22.0-23.0 sec	29.4 MBytes	246 Mbits/sec		[272]	22.0-23.0 sec	35.2 MBytes	295 Mbits/sec
	[ID]	Interval	Transfer	Bandwidth		[ID]	Interval	Transfer	Bandwidth
	[400]	23.0-24.0 sec	28.9 MBytes	242 Mbits/sec		[272]	23.0-24.0 sec	34.4 MBytes	289 Mbits/sec
	[ID]	Interval	Transfer	Bandwidth		[ID]	Interval	Transfer	Bandwidth
	[400]	24.0-25.0 sec	29.4 MBytes	246 Mbits/sec		[272]	24.0-25.0 sec	33.1 MBytes	278 Mbits/sec
	[ID]	Interval	Transfer	Bandwidth		[ID]	Interval	Transfer	Bandwidth
	[400]	25.0-26.0 sec	28.9 MBytes	243 Mbits/sec		[272]	25.0-26.0 sec	35.7 MBytes	300 Mbits/sec
	[ID]	Interval	Transfer	Bandwidth		[ID]	Interval	Transfer	Bandwidth
	[400]	26.0-27.0 sec	29.6 MBytes	248 Mbits/sec		[272]	26.0-27.0 sec	33.8 MBytes	283 Mbits/sec
	[ID]	Interval	Transfer	Bandwidth		[ID]	Interval	Transfer	Bandwidth
	[400]	27.0-28.0 sec	28.6 MBytes	240 Mbits/sec		[272]	27.0-28.0 sec	36.0 MBytes	302 Mbits/sec
	[ID]	Interval	Transfer	Bandwidth		[ID]	Interval	Transfer	Bandwidth
	[400]	28.0-29.0 sec	29.5 MBytes	247 Mbits/sec		[272]	28.0-29.0 sec	36.0 MBytes	302 Mbits/sec
	[ID]	Interval	Transfer	Bandwidth		[ID]	Interval	Transfer	Bandwidth
	[400]	29.0-30.0 sec	29.4 MBytes	246 Mbits/sec		[272]	29.0-30.0 sec	34.4 MBytes	288 Mbits/sec
	[ID]	Interval	Transfer	Bandwidth		[ID]	Interval	Transfer	Bandwidth
	[400]	0.0-30.0 sec	866 MBytes	242 Mbits/sec		[272]	0.0-30.0 sec	1024 MBytes	286 Mbits/sec

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