Validation test plan

Product information：

Product Name： Portable Data Processing Terminal

Original FCC ID: 2AH25T5F1BN IC: 22621-T5F1BN

Variant FCC ID： 2AH25T5F1B IC: 22621-T5F1B

Evaluation test plan：

According to the product change description, FCC ID will be changed. The Pogpin, front camera, NFC and scanner are removed. LCD dfferent

Description	FCC ID	IC	HVIN	NFC	Scanner	Pogpin
Original (main test prototype)	2AH25T5F1BN	22621-T5F1BN	T5F1BNS	Y	Y	Y
variant	2AH25T5F1B	22621-T5F1B	T5F1B	N	N	N

The evaluation tests are as follows:

1. **SAR for frequency below 6GHz:**

Rule Part	Band	Body SAR 1g	Limbs SAR 10g
FCC 47 CFR § 2.1093	GSM 850	Referencing the original test data (FCC ID: 2AH25T5F1BN) plus spot-check on the worst-case of all bands	Referencing the original test data plus spot-check on the worst-case of all bands
	GSM 1900		
	WCDMA Band II		
	WCDMA Band IV		
	WCDMA Band V		
	LTE FDD 2		
	LTE FDD 4		
	LTE FDD 5		
	LTE FDD 7		
	LTE FDD 12		
	LTE FDD 13		
	LTE FDD14		
	LTE FDD 17		
	LTE FDD 25		
	LTE FDD 26		
	LTE FDD 30		
	LTE TDD 38		
	LTE TDD 41		
	LTE FDD 66		
	LTE FDD 71		

	Wi-Fi (2.4GHz)		
	Wi-Fi (5GHz)		
	Bluetooth		

2. Class Code: JBP

Rule Part	Test item	Data Referencing	Comments
15.107	AC Conducted Emissions	N	Full re-test
15.109	Radiated Emissions	N	Full re-test

3. Class Code: DSS

Rule Part	Test item	Data Referencing	Comments
15.247	Maximum Peak Output Power	Y	Plus spot-check on the worst-case
15.247	20 dB Bandwidth	Y	Plus spot-check on the worst-case
2.1049	99% Occupied Bandwidth	Y	Plus spot-check on the worst-case
15.247, 15.209, 15.205	Band Edges Compliance	Y	Plus spot-check on the worst-case
15.247	Time Of Occupancy (Dwell Time)	Y	Plus spot-check on the worst-case
15.247	Carrier Frequency Separation	Y	Plus spot-check on the worst-case
15.247	Number Of Hopping Channels	Y	Plus spot-check on the worst-case
15.247	Transmitter Spurious Emission-Conducted	Y	Plus spot-check on the worst-case
15.247, 15.209, 15.205	Transmitter Spurious Emission-Radiated	Y	Plus spot-check on the worst-case
15.207	AC Conducted Emissions	Y	Plus spot-check on the worst-case
15.247, 15.203	Antenna requirement	N/A	Same antenna to original

4. Class Code: DTS

Rule Part	Test item	Data Referencing	Comments
15.247	Maximum Output Power	Y	Plus spot-check on the worst-case
15.247	Peak Power Spectral Density	Y	Plus spot-check on the worst-case
15.247	6 dB Bandwidth	Y	Plus spot-check on the worst-case
2.1049	99% Occupied Bandwidth	Y	Plus spot-check on the worst-case
15.247, 15.209, 15.205	Band Edges Compliance	Y	Plus spot-check on the worst-case
15.247	Transmitter Spurious Emission-Conducted	Y	Plus spot-check on the worst-case
15.247, 15.209, 15.205	Transmitter Spurious Emission-Radiated	Y	Plus spot-check on the worst-case
15.207	AC Conducted Emissions	Y	Plus spot-check on the worst-case
15.247, 15.203	Antenna requirement	N/A	Same antenna to original

5. Class Code: NII

Rule Part	Test item	Data Referencing	Comments
15.407	Maximum Output Power	Y	Plus spot-check on the worst-case
KDB 789033 D02	Duty Cycle	Y	Plus spot-check on the worst-case
15.407	Power Spectral Density	Y	Plus spot-check on the worst-case
2.1049	99% Occupied Bandwidth	Y	Plus spot-check on the worst-case
15.407	26 dB Emission Bandwidth	Y	Plus spot-check on the worst-case
15.407	6 dB Bandwidth	Y	Plus spot-check on the worst-case
15.407	Band edge compliance	Y	Plus spot-check on the worst-case
15.407, 15.209, 15.205	Transmitter spurious emissions radiated	Y	Plus spot-check on the worst-case
15.407	Frequency Stability	Y	Plus spot-check on the worst-case
15.407	Transmit Power Control (TPC)	N/A	e.i.r.p. less than 500 mW
15.407	Dynamic Frequency Selection (DFS)	Y	Plus spot-check on the worst-case
15.207	AC Conducted Emissions	Y	Plus spot-check on the worst-case
15.407, 15.203	Antenna requirement	N/A	Same antenna to original

6. Class Code: PCT

Rule Part	Test item	Data Referencing	Comments
22, 24, 27, 90	Conducted RF OUTPUT POWER	Y	Plus spot-check on the worst-case of all bands
22, 24, 27, 90	ERP and EIRP	Y	Plus spot-check on the worst-case of all bands
22, 24, 27, 90	Peak-to-average power ratio	Y	Plus spot-check on the worst-case of all bands
22, 24, 27, 90	99% Occupied Bandwidth	Y	Plus spot-check on the worst-case of all bands
22, 24, 27, 90	26 dB Emission Bandwidth	Y	Plus spot-check on the worst-case of all bands
22, 24, 27, 90	Conducted spurious emissions	Y	Plus spot-check on the worst-case of all bands
22, 24, 27, 90	Band Edge	Y	Plus spot-check on the worst-case of all bands
22, 24, 27, 90	Radiated Spurious Emission	Y	Plus spot-check on the worst-case of all bands
22, 24, 27, 90	Frequency Stability	Y	Plus spot-check on the worst-case of all bands

Please review, TCB whether to accept this test scheme, we will complete the final test according to the guide.
Thanks

KDB data reference

RF Conduction					
Test	**Reference Worst-Case**	**Variant Test**	**dB Difference**	**Spot-Check Parameters**	**Pass Criterion**
24.232(c) RF Power Output and Effective Radiated Power	GSM1900(1850-1910MHz) RdB=32.63	GSM1900(1850-1910MHz) VdB=32.57	DdB=0.06	CdB= 33 dBm MdB=|CdB-RdB|=0.37 ddBmax(MdB)=3.01	ddB<ddBmax(MdB) Pass
22.917(a) Band Edge Compliance	GSM1900(1850-1910MHz) RdB=-28.91	GSM1900(1850-1910MHz) VdB=-31.19	DdB=2.28	CdB= -13 dBm/MHz MdB=|CdB-RdB|=15.91 ddBmax(MdB)=3.79	ddB<ddBmax(MdB) Pass
22.913(d) Peak-to-Average Power Ratio	GSM1900(1850-1910MHz) RdB=2.98	GSM1900(1850-1910MHz) VdB=2.81	DdB=0.17	CdB= 13 dB MdB=|CdB-RdB|=10.02 ddBmax(MdB)=3.50	ddB<ddBmax(MdB) Pass
22.917(a) Spurious Emissions at Antenna Terminals	GSM1900(1850-1910MHz) RdB=-28.7	GSM1900(1850-1910MHz) VdB=-28.85	DdB=0.15	CdB= -13 dBm/MHz MdB=|CdB-RdB|= 15.7 ddBmax(MdB)=3.78	ddB<ddBmax(MdB) Pass

Test	**Reference Worst-Case**	**Variant Test**	**dB Difference**	**Spot-Check Parameters**	**Pass Criterion**
24.232(c) RF Power Output and Effective Radiated Power	WCDMA B2(1850-1910MHz) RdB=25.95	WCDMA B2(1850-1910MHz) VdB=25.46	DdB=0.49	CdB= 33 dBm MdB=|CdB-RdB|=7.05 ddBmax(MdB)=3.35	ddB<ddBmax(MdB) Pass
22.917(a) Band Edge Compliance	WCDMA B2(1850-1910MHz) RdB=-22.837	WCDMA B2(1850-1910MHz) VdB=-22.836	DdB=0.001	CdB= -13 dBm/MHz MdB=|CdB-RdB|=9.837 ddBmax(MdB)=3.492	ddB<ddBmax(MdB) Pass
22.913(d) Peak-to-Average Power Ratio	WCDMA B2(1850-1910MHz) RdB=3.04	WCDMA B2(1850-1910MHz) VdB=3.06	DdB=0.02	CdB= 13 dB MdB=|CdB-RdB|=9.96 ddBmax(MdB)=3.49	ddB<ddBmax(MdB) Pass
22.917(a) Spurious Emissions at Antenna Terminals	WCDMA B2(1850-1910MHz) RdB=-37.86	WCDMA B2(1850-1910MHz) VdB=-37.68	DdB=0.18	CdB= -13 dBm/MHz MdB=|CdB-RdB|=24.86 ddBmax(MdB)=4.24	ddB<ddBmax(MdB) Pass

Test	**Reference Worst-Case**	**Variant Test**	**dB Difference**	**Spot-Check Parameters**	**Pass Criterion**
24.232(c) RF Power Output and Effective Radiated Power	LTE B38(2570-2620MHz) RdB=27.37	LTE B38(2570-2620MHz) VdB=24.78	DdB=2.59	CdB=33 dBm MdB=|CdB-RdB|=5.63 ddBmax(MdB)=3.28	ddB<ddBmax(MdB) Pass
22.917(a) Band Edge Compliance	LTE B38(2570-2620MHz) RdB=-36.52	LTE B38(2570-2620MHz) VdB=-38.44	DdB=1.92	CdB= -10 dBm/MHz MdB=|CdB-RdB|=26.52 ddBmax(MdB)=4.32	ddB<ddBmax(MdB) Pass
22.913(d) Peak-to-Average Power Ratio	LTE B38(2570-2620MHz) RdB=10.84	LTE B38(2570-2620MHz) VdB=7.83	DdB=3.01	CdB= 13 dB MdB=|CdB-RdB|=2.16 ddBmax(MdB)=3.108	ddB<ddBmax(MdB) Pass
22.917(a) Spurious Emissions at Antenna Terminals	LTE B38(2570-2620MHz) RdB=-35.33	LTE B38(2570-2620MHz) VdB=-35.69	DdB=0.36	CdB= -25 dBm/MHz MdB=|CdB-RdB|=10.33 ddBmax(MdB)=3.52	ddB<ddBmax(MdB) Pass

Test	**Reference Worst-Case**	**Variant Test**	**dB Difference**	**Spot-Check Parameters**	**Pass Criterion**
15.247(b) Maximum output power	BLE(2402-2480 MHz) RdB= 6.75	BLE(2402-2480 MHz) VdB= 6.60	DdB=0.15	CdB= 30 dB MdB=|CdB-RdB|=23.25 ddBmax(MdB)=4.16	ddB<ddBmax(MdB) Pass
15.247(e) Power spectral density	BLE(2402-2480 MHz) RdB= -9.95	BLE(2402-2480 MHz) VdB= -10.35	DdB=0.4	CdB= 8 dBm/3KHz MdB=|CdB-RdB|=17.95 ddBmax(MdB)=3.89	ddB<ddBmax(MdB) Pass
15.247(d) Band Edge	BLE(2402-2480 MHz) RdB= -48.97	BLE(2402-2480 MHz) VdB= -48.56	DdB=0.41	CdB= -23.27dBm/100KHz MdB=|CdB-RdB|=25.7 ddBmax(MdB)=4.28	ddB<ddBmax(MdB) Pass
15.247(d) Spurious RF Conducted Emissions	BLE(2402-2480 MHz) RdB= -34.29	BLE(2402-2480 MHz) VdB= -34.29	DdB=0	CdB= -23.42 dB MdB=|CdB-RdB|=10.84 ddBmax(MdB)=3.54	ddB<ddBmax(MdB) Pass

Test	**Reference Worst-Case**	**Variant Test**	**dB Difference**	**Spot-Check Parameters**	**Pass Criterion**
15.407(a) Maximum output power	WIFI（5470-5725 MHz） RdB= 19.25	WIFI（5470-5725 MHz） VdB= 18.58	DdB=0.67	CdB= 24 dB MdB=|CdB-RdB|=4.75 ddBmax(MdB)=3.23	ddB<ddBmax(MdB) Pass
15.407(a) Power spectral density	WIFI（5470-5725 MHz） RdB= 6.47	WIFI（5470-5725 MHz） VdB= 5.36	DdB=1.11	CdB= 11 dBm/MHz MdB=|CdB-RdB|=4.53 ddBmax(MdB)=3.22	ddB<ddBmax(MdB) Pass

SAR For Original FCC ID: 2AH25T5F1BN							
test	reference worset-case	Variant test	relative difference	relative difference	Spot-Check Parameters	Pass Criterion	Conclusion
	（TER_R）	(TER_V)	(d_{TER})	(d_{TERmax}(M))	(M)		
LTE 25	0.99	0.77	0.22	0.25	0.01	TER < 1 and d_{TER} < d_{TERmax}(M)	Pass
Stand-alone for hotspot							
LTE 30	0.49	0.43	0.12	0.26	0.51	TER < 1 and d_{TER} < d_{TERmax}(M)	Pass
Stand-alone for body worn							
U-NII-2A	0.2	0.14	0.28	0.5	0.8	TER < 1 and d_{TER} < d_{TERmax}(M)	Pass
Stand-alone for extremity							
LTE+U-NII-2A	0.99	0.77	0.22	0.25	0.01	TER < 1 and d_{TER} < d_{TERmax}(M)	Pass
Simultaneous							
SAR For Variant FCC ID：2AH25T5F1B							
test	reference worset-case	Variant test	relative difference	relative difference	Spot-Check Parameters	Pass Criterion	Conclusion
	（TER_R）	(TER_V)	(d_{TER})	(d_{TERmax}(M))	(M)		
LTE 25	0.99	0.8	0.19	0.25	0.01	TER < 1 and d_{TER} < d_{TERmax}(M)	Pass
Stand-alone for hotspot							
LTE 30	0.49	0.46	0.05	0.26	0.51	TER < 1 and d_{TER} < d_{TERmax}(M)	Pass
Stand-alone for body worn							
U-NII-2A	0.2	0.13	0.34	0.5	0.8	TER < 1 and d_{TER} < d_{TERmax}(M)	Pass
Stand-alone for extremity							
LTE+U-NII-2A	0.99	0.8	0.19	0.25	0.01	TER < 1 and d_{TER} < d_{TERmax}(M)	Pass
Simultaneous							

	EMC					
	Test	e Worst-	Variant T	Differen ce	Check Paramete	Criterio n
	15.407(b) UNII OOB Limits	5150- 5350 MHz	5150- 5350 MHz	DdB=…		DdB< DdBmax(M
	2.1053, 22.917 (a), 24.238(a), 27.53(h), 27.53(m), 27.53(g),	LTE Band 13 CH-	LTE Band 13 CH-	d_{dB}=4.88 d	CdB= -40 dBm	Pass
2.4GHz	15.247(d), 15.205, 15.209 Unwanted Emissions （Bandedge	802.11n HT40 -	802.11n HT40 -	d_{dB}= 2.49	CdB= 74 dBμV/m	Pass
	15.247(d), 15.205, 15.209 Unwanted Emissions （Bandedge	802.11n HT40-	802.11n HT40-	d_{dB}= 1.51	CdB= 54 dBμV/m	Pass
	15.247(d), 15.205, 15.209 Unwanted Emissions （RE）	802.11n (HT40)	802.11n (HT40)	d_{dB}= 1.34	CdB= 54 dBμV/m	Pass
BLE	15.247(d), 15.205, 15.209 Unwanted Emissions （Bandedge	Bluetoot h LE	Bluetoot h LE	d_{dB}= 1.33	CdB= 74 dBμV/m	Pass
	15.247(d), 15.205, 15.209 Unwanted Emissions （Bandedge	Bluetoot h LE	Bluetoot h LE	d_{dB}= 1.31	CdB= 54 dBμV/m	Pass
	15.247(d), 15.205, 15.209 Unwanted Emissions （RE）	Bluetoot h LE-	Bluetoot h LE-	d_{dB}= 0.44	CdB= 46 dBμV/m	Pass
BT	15.247(d), 15.205, 15.209 Unwanted Emissions （Bandedge	DH5- Channel	DH5- Channel	d_{dB}= 0.71	CdB= 74 dBμV/m	Pass
	15.247(d), 15.205, 15.209 Unwanted Emissions （Bandedge	DH5- Channel	DH5- Channel	d_{dB}= 1.37	CdB= 54 dBμV/m	Pass
	15.247(d), 15.205, 15.209 Unwanted Emissions （RE）	DH5- Channel	DH5- Channel	d_{dB}= 0.21	CdB= 46 dBμV/m	Pass
5GHz	15.407(b), 15.205, 15.209 Unwanted Emissions （Bandedge	802.11ac VHT80-	802.11ac VHT80-	d_{dB}= 2.92	CdB= 68.2 dB	Pass
	15.407(b), 15.205, 15.209 Unwanted Emissions （Bandedge	802.11ac VHT80-	802.11ac VHT80-	d_{dB}= 2.83	CdB= 54 dBμV/m	Pass
	15.407(b), 15.205, 15.209 Unwanted Emissions （RE）	802.11ac (VHT80)	802.11ac (VHT80)	d_{dB}= 4.63	CdB= 54 dBμV/m	Pass

Signature： Minfei Chen

Contact Person: Minfei Chen