6050-2-X 3332F

USB PD Dual-Channel + AB Switch Test System

Basic version

Standard version

Value version

Complete version

Feature

- 2 sets of U.U.T can be tested at the same time to improve test efficiency and save test time and cost
- Select the required device configuration version (Basic / Standard / Added Value / Full version) according to product testing requirements
- In addition to supporting USB PD, also supports QC2.0 / QC3.0 / PE+ / PE+2.0
- Highly cost-effective, fully functional modular design test system
- Operating environment of Windows 7 or higher (included)
- Open architecture software platform

1. Support related hardware expansion
2. User editable test item
3. User editable test program
4. User editable report format & statistical report
5. On-line control function
6. User authority control
7. Support Bar Code Reader

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6050-2（3332F）USB PD DUAL-CHANNEL+AB SWITCH TEST SYSTEM

USB PD Test items and equipment configuration table

Test items	Instrument Equipment							
	APS-7000 AC Source	99094 QC Controller	3332F DC Load	4032-PD Timing & Noise	4015A Power Meter	4013A Power Meter	PFR-100L D.C. Power Supply	5303 AVR
USB PD Performances								
USB PD Source / Sink Profile	✓	✓	✓					
USB PD Power Data Object (PDO)	✓	✓	✓					
Positive Voltage Transitions	✓	✓	✓	✓				
Negative Voltage Transitions	✓	✓	✓	✓				
Hard Reset	✓	✓	✓	✓				
USB Type C Cable unplug	✓	✓	✓	✓				
Output Performances								
Output Voltage	✓	✓	✓					
Output Current	✓	✓	✓					
Dynamic Load (Vpeak +/-)	✓	✓	✓	✓				
Average Efficiency	✓	✓	✓					
Ripple Voltage	✓	✓	✓	✓				
Input Characteristics								
Input RMS Current	✓	✓	✓		✓	✓		
Input Frequency	✓	✓	✓		✓	✓		
Input Power	✓	✓	✓		✓	✓		
No Load Power Consumption	✓	✓	✓		✓	✓		
Input Power Factor	✓	✓	✓		✓	✓		
Input Voltage Sag	✓	✓	✓	✓	✓	✓		
Current Harmonics	✓	✓	✓		✓			
Input Inrush Current	✓	✓	✓		✓	✓		✓
Regulation Tests								
Line Regulation	✓	✓	✓					
Load Regulation	✓	✓	✓					
Combine Regulation	✓	✓	✓					
Timing & Transient								
Turn ON (Set-Up) Time	✓	✓	✓	✓				
Turn OFF (Hold-Up) Time	✓	✓	✓	✓				
Rise Time	✓	✓	✓	✓				
Fall Time	✓	✓	✓	✓				
Protection Tests								
Short Circuit	✓	✓	✓					
OV Protection	✓	✓	✓				✓	
OC Protection	✓	✓	✓					
OP Protection	✓	✓	✓					

USB PD Dual-channel + AB switch test system quick selection table

Test items	USB PD Dual-channel + AB switch test system quick selection table			
	6050-2-A1-X Basic version	6050-2-B1-X Standard version	6050-2-C1-X Value Version	6050-2-D1-X Complete version
USB PD Performances				
USB PD Source / Sink Profile	◉	◉	◉	◉
USB PD Power Data Object (PDO)	◉	◉	◉	◉
Positive Voltage Transitions		◉	◉	◉
Negative Voltage Transitions		◉	◉	◉
Hard Reset		◉	◉	◉
USB Type C Cable unplug		◉	◉	◉
Output Performances				
Output Voltage	◉	◉	◉	◉
Output Current	◉	◉	◉	◉
Dynamic Load (Vpeak +/-)		◉	◉	◉
Average Efficiency	◉	◉	◉	◉
Ripple Voltage		◉	◉	◉
Input Characteristics				
Input RMS Current	◉	◉	◉	◉
Input Frequency	◉	◉	◉	◉
Input Power	◉	◉	◉	◉
No Load Power Consumption	◉	◉	◉	◉
Input Power Factor	◉	◉	◉	◉
Input Voltage Sag	△	◉	◉	◉
Current Harmonics			◉	◉
Input Inrush Current				◉
Regulation Tests				
Line Regulation	◉	◉	◉	◉
Load Regulation	◉	◉	◉	◉
Combine Regulation	◉	◉	◉	◉
Timing & Transient				
Turn ON (Set-Up) Time		◉	◉	◉
Turn OFF (Hold-Up) Time		◉	◉	◉
Rise Time		◉	◉	◉
Fall Time		◉	◉	◉
Protection Tests				
Short Circuit	◉	◉	◉	◉
OV Protection				◉
OC Protection	◉	◉	◉	◉
OP Protection	◉	◉	◉	◉

△ Only provide Input Voltage Sag capability

6050-2-A1-X Single Output USB PD basic version dual-channel + AB switch test system configuration is as shown in the table, just needs APS-7000 series , 3302F + 3332F series and 99094-2 Quick Charge Controller and 4013A-2 Power Meter.
The basic version system configuration is shown below.

→ 3302F + 3332F DC Load

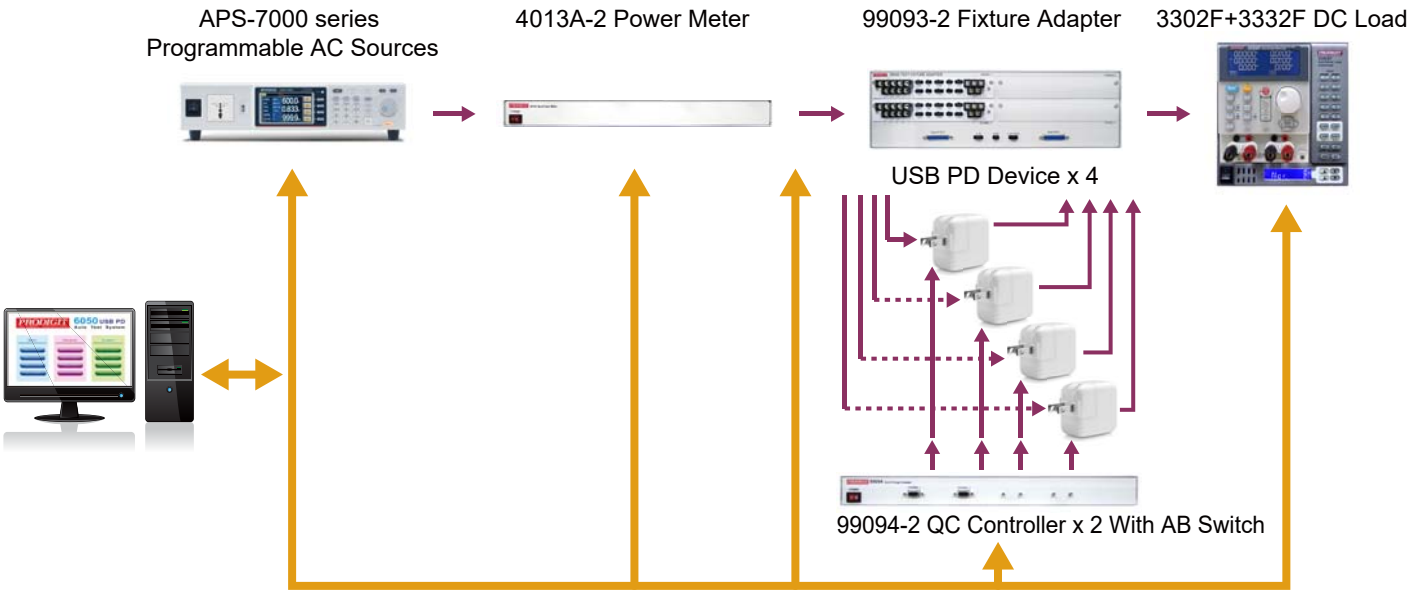
→ 499094-2 Quick Charge Controller

→ 4013A-2 Power Meter

→ 99093-2 Fixture Adapter

→ APS-7000 series AC Sources

6050-2-A1-X Basic version dual-channel + AB switch test system block diagram



6050-2-A1-X Dual Channel Test System Configuration

6050-2-A1-X Basic version dual-channel + AB switch test system test items are as follows

USB PD Performances
USB PD Source / Sink Profile
USB PD Power Data Object (PDO)

Output Perfomances
Output Voltage
Output Current
Average Efficiency

Input Characteristics
Input RMS Current
Input Frequency
Input Power
No Load Power Consumption
Input Power Factor

Regulation Tests
Line Regulation
Load Regulation
Combine Regulation

Protection Tests
Short Circuit
OC Protection
OP Protection

6050-2-A1-X Basic version dual-channel + AB switch test system equipment configuration table

Model	Quantity
APS-7000 Series Programmable Linear AC Power Sources	1
3302F 1CH Mainframe	1
3332F 80V/24A/120Wx 2 DC Load Module	2
99094-2 Quick Charge Controller (dual-channel)	1
4013A-2 Power Meter (dual-channel)	1
99093-2 Fixture Adapter (dual-channel)	1
6050 system software	1
System Controller (PC)	1
CP-104EL-A 1:4 High Speed RS-232 Card	1
Uport 1410 USB to RS-232 4 Port For Note Book	O

System Specifications (PC or Note Book)	
CPU	i5-3470(3.2GHz) or faster
SRAM	256KB
DRAM	4GB or higher
Hard Driver	500GB or higher
CD-ROM	40X or faster
Monitor	22"
KeyBoard	101 Keys
I/O	Mouse/Print Port
System Interface	RS-232
System I/O	1:4 or 1:8 High Speed RS-232 Card
O The system device should use this interface when using Note Book.	

OS : Windows 7.0 or latest version

6050-2-B1-X Standard version dual-channel + AB switch test system is consisted of basic version by adding 4032-PD Dual Timing & Noise Meter can increase USB PD characteristics and timing and transient testing

The standard version system configuration is shown below.

→ 60102 + 4032-PD, 3332F

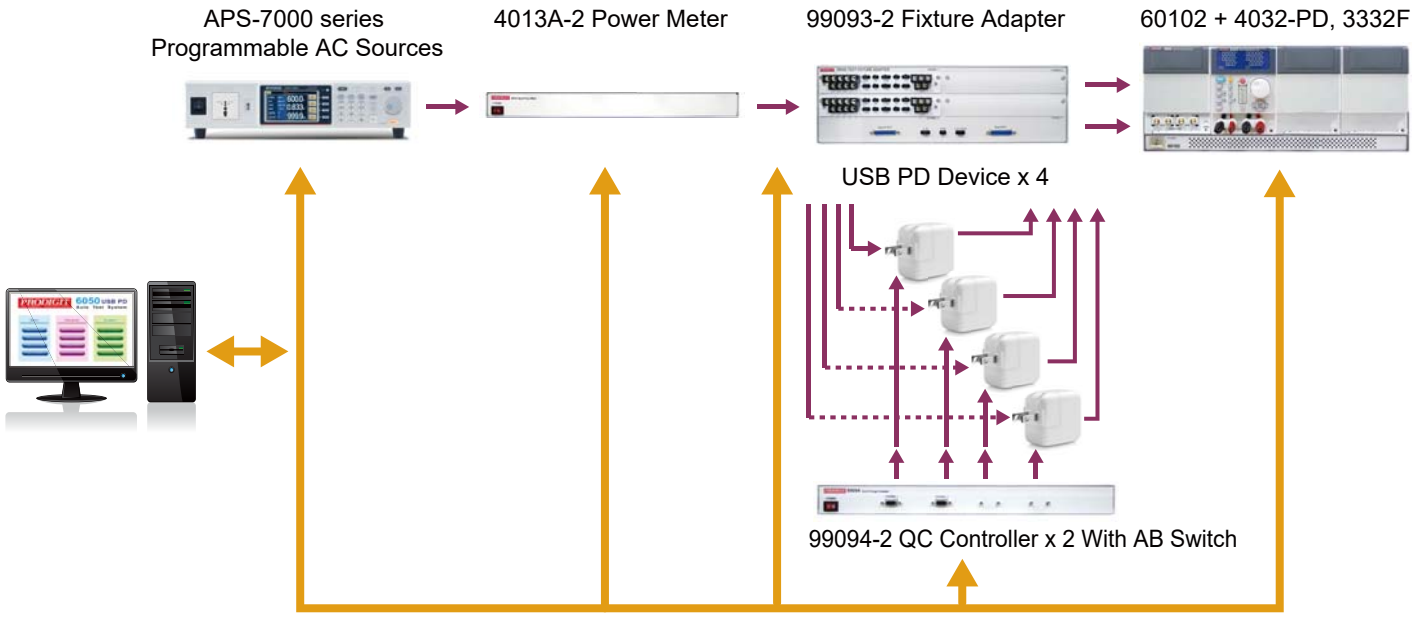
→ 99094-2 QC Controller

→ 4013A-2 Power Meter

→ 99093-2 Fixture Adapter

→ APS-7000 series AC Sources

6050-2-B1-X standard version dual-channel + AB switch test system block diagram



6050-2-B1-X Dual Channel Test System Configuration

6050-2-B1-X Standard version dual-channel + AB switch by adding 4032-PDx2 can increase the test items as shown in the block below.

USB PD Performances
Positive Voltage Transitions
Negative Voltage Transitions
Hard Reset
USB Type C Cable unplug

Timing & Transient
Turn ON (Set-Up) Time
Turn OFF (Hold-Up) Time
Rise Time
Fall Time

Output Perfomances
Dynamic Load (Vpeak +/-)
Ripple Voltage

Input Characteristics
Input Voltage Sag

6050-2-B1-X Standard version dual-channel + AB switch test system equipment configuration table

Model	Quantity
APS-7000 Series Programmable Linear AC Power Sources	1
60102 2CH Mainframe; 4032-PD, 3332F	1
3332F 80V/24A/120Wx 2 DC Load Module	2
4032-PD Dual Timing & Noise Meter for PD	2
99094-2 Quick Charger Controller (dual-channel)	1
4013A-2 Power Meter (dual-channel)	1
99093-2 Fixture Adapter (dual-channel)	1
6050 system software	1
System Controller (PC)	1
CP-104EL-A 1:4 High Speed RS-232 Card	1
Uport 1410 USB to RS-232 4 Port For Note Book	O

System Specifications (PC or Note Book)	
CPU	i5-3470(3.2GHz) or faster
SRAM	256KB
DRAM	4GB or higher
Hard Driver	500GB or higher
CD-ROM	40X or faster
Monitor	22"
KeyBoard	101 Keys
I/O	Mouse / Print Port
System Interface	RS-232
System I/O	1:4 or 1:8 High Speed RS-232 Card
O The system device should use this interface when using Note Book.	

OS : Windows 7.0 or latest version

6050-2-C1-X Value version (Standard version + Input current harmonic) dual-channel + AB switch test system : changing 4013A-2 to 4015A-2 power meter with Harmonic can increase the current harmonic Harmonics test.

The value version system configuration is shown below.

→ 60102 + 4032-PD, 3332F

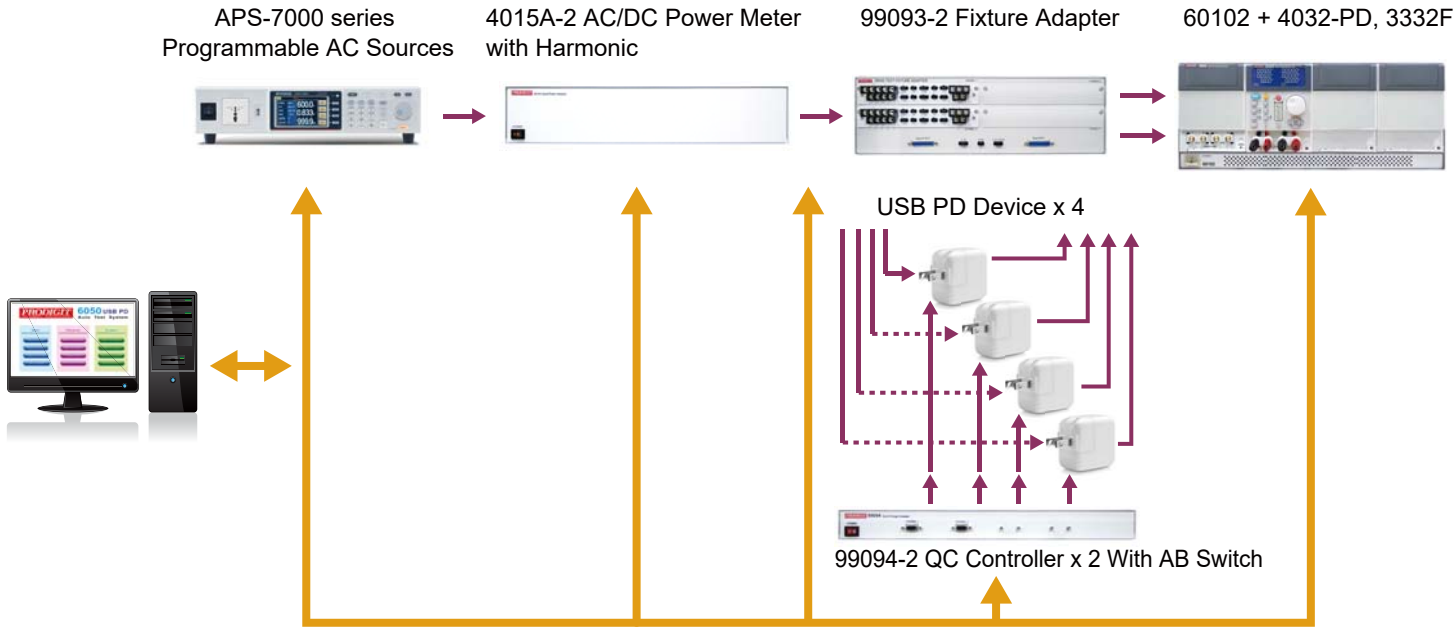
→ 99094-2 QC Controller

→ 4015A-2 Power Meter with Harmonic

→ 99093-2 Fixture Adapter

→ APS-7000 series AC Sources

6050-2-C1-X Value version dual-channel + AB switch test system block diagram



6050-2-C1-X Dual Channel Test System Configuration

6050-2-C1-X Value version dual-channel + AB switch test system : Changing 4013A-2 to 4015A-2 power meter can increase the test items as shown in the following green block

Input Characteristics
Current Harmonics

6050-2-C1-X Value version dual-channel + AB switch test system equipment configuration table

Model	Quantity
APS-7000 Series Programmable Linear AC Power Sources	1
60102 2CH Mainframe; 4032-PD, 3332F	1
3332F 80V/24A/120Wx2 DC Load Module	1
4032-PD Timing & Noise Meter for PD	1
4015A-2 Power Meter with Harmonic (dual-channel)	1
99094-2 Quick Charger Controller (dual-channel)	1
99093-2 Fixture Adapter (dual-channel)	1
6050 system software	1
System Controller (PC)	1
CP-104EL-A 1:4 High Speed RS-232 Card	1
Uport 1410 USB to RS-232 4 Port For Note Book	O
System Specifications (PC or Note Book)	
CPU	i5-3470(3.2GHz) or faster
SRAM	256KB
DRAM	4GB or higher
Hard Driver	500GB or higher
CD-ROM	40X or faster
Monitor	22"
KeyBoard	101 Keys
I/O	Mouse / Print Port
System Interface	RS-232
System I/O	1:4 or 1:8 High Speed RS-232 Card
O The system device should use this interface when using Note Book.	

OS : Windows 7.0 or latest version

6050-2-D1-X Complete version (Standard version + Input Current Harmonics + Input Inrush Current) dual-channel + AB switch test system : adding 5303 AVR and PFR-100L-2 two channels OVP Source to increase Input Inrush Current and over voltage protection tests.

The Complete version system configuration is shown below.

→ 60102 + 4032-PD, 3332F

→ 99094-2 QC Controller

→ PFR-100L Multi-Range D.C. Power Supply

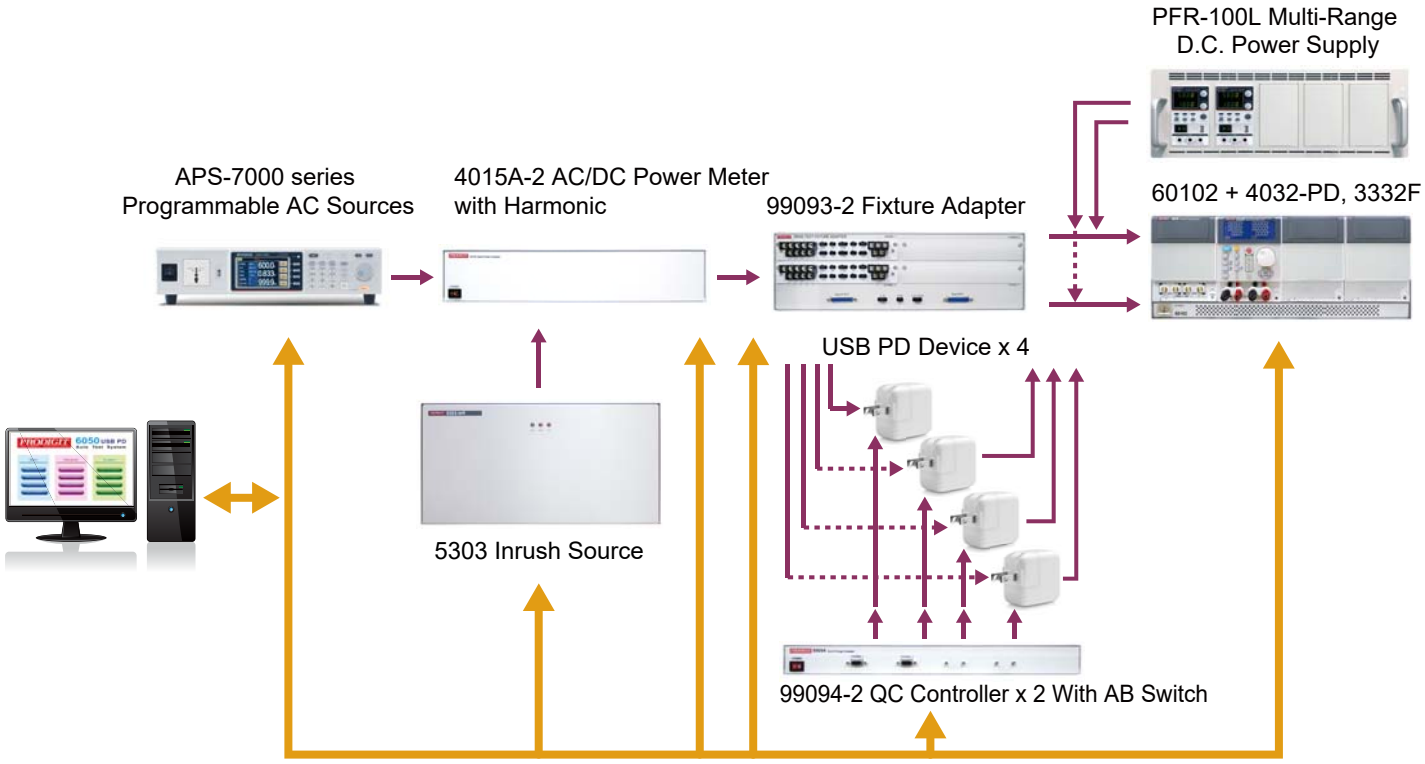
→ 4015A-2 Power Meter with Harmonic

→ 5303 AVR for Inrush Current

→ 99093-2 Fixture Adapter

→ APS-7000 series AC Sources

6050-2-D1-X Complete version dual-channel + AB switch test system block diagram



6050-2-D1-X Dual Channel Test System Configuration

6050-2-D1-X Complete version dual-channel + AB switch test system by adding 5303 AVR and PFR-100L-2two channels OVP Source can increase the test items

Input Characteristics
Input Inrush Current

Protection Tests
OV Protection

6050-2-D1-X Complete version dual-channel + AB switch test system equipment configuration table

Model	Quantity
APS-7000 Series Programmable Linear AC Power Sources	1
60102 2CH Mainframe; 4032-PD, 3332F	1
3332F 80V/24A/120Wx 2 DC Load Module	1
4032-PD Timing & Noise Meter for PD	1
4015A-2 Power Meter with Harmonic (dual-channel)	1
PFR-100L Multi-Range D.C. Power Supply	2
5303 3KVA AVR	1
99094-2 Quick Charger Controller (dual-channel)	1
99093-2 Fixture Adapter (dual-channel)	1
6050 system software	1
System Controller (PC)	1
CP-104EL-A 1:4 High Speed RS-232 Card	1
Uport 1410 USB to RS-232 4 Port For Note Book	O
System Specifications（PC or Note Book）	
CPU	i5-3470(3.2GHz) or faster
SRAM	256KB
DRAM	4GB or higher
Hard Driver	500GB or higher
CD-ROM	40X or faster
Monitor	22"
KeyBoard	101 Keys
I/O	Mouse / Print Port
System Interface	RS-232
System I/O	1:4 or 1:8 High Speed RS-232 Card
O The system device should use this interface when using Note Book.	

OS : Windows 7.0 or latest version

All Equipment Functions and Specifications List

APS-7000 Series Programmable Linear AC Power Sources Suitable test item & Specifications

Model		APS-7000 Series Programmable Linear AC Power Sources			
Suitable Test Item					
1. Input RMS Current 2. Input Frequency 3. Input Power 4. No Load Power Consumption 5. Input Power Factor 6. Input Voltage Sag 7. Line Regulation 8. A voltage ON/OFF angle (0 ~ 360°) Can be programmed					
Specifications		**APS-7050**	**APS-7100**	**APS-7200**	**APS-7300**
Power Rating		500VA	1000VA	2000VA	3000VA
Voltage Rating		0 ~ 155Vrms, 0 ~ 310Vrms			
Current Rating	0~155Vrms	4.2A	8.4A	16.8A	25.2A
	0~310Vrms	2.1A	4.2A	8.4A	12.6A
Frequency		45 ~ 500 Hz			
Angle (ON/OFF)		0 ~ 359°			
PQT<IEC 61000-4-11>		DIP, Interupt, Variation			
MEASUREMENT					
ACV meter (Vrms)		0 ~ 155Vrms, 0 ~ 310Vrms, Auto			
Voltage (RMS)	Range	0.20~38.75Vrms;38.76~77.50Vrms;77.51~155.0Vrms;155.1~310.0Vrms			
	Resolution	0.01V at 0.00 ~ 99.99Vrms; 0.1V at 100.0 ~ 310.0Vrms			
	Accuracy *4	±(0.5% of reading + 2 counts)			
Frequency	Range	45 ~ 500Hz			
	Resolution	0.01Hz at 45Hz~99.99Hz ; 0.1Hz at 100Hz~500.0Hz			
	Accuracy	±0.1Hz			
Current (RMS)	Range	2.00 ~ 70.00mA ; 60.0 ~ 350.0mA ; 0.300 ~ 3.500A ; 3.00 ~ 17.5A		0.200 ~ 3.500A ; 3.00 ~ 35.00A	
	Resolution	0.01mA, 0.1mA, 0.001A, 0.01A		0.001A ; 0.01A	
	Accuracy	± (0.6% of reading+5 counts), 2.00~350.0mA ; ± (0.5% of reading+5 counts), 0.300~3.500A ; ± (0.5% of reading+3 counts),3.000~17.50A		± (0.5% of reading + 5 counts) , 0.200 ~ 3.500A ± (0.5% of reading + 3 counts) , 3.00 ~ 35.00A	
Current (Peak)	Range	0.0 ~ 70.0A		0.0 ~ 140.0A	
	Resolution	0.1A			
	Accuracy	± (1% of reading + 1 count)			
Power (W)	Resolution	0.01W, 0.1W, 1W		0.1W, 1W	
	Accuracy	± (0.6% of reading+5 counts), 0.20~99.99W ; ± (0.6% of reading+5 counts), 100.0~999.9W ; ± (0.6% of reading+2 counts), 1000~9999W		± (0.6% of reading + 5counts) , 0.2 ~ 999.9W ± (0.6% of reading + 2counts) , 1000 ~ 9999W	
Apparent (VA)	Resolution	0.01VA, 0.1VA, 1VA		0.1VA, 1VA	
	Accuracy	±(1% of reading+7 counts), 0.20~99.99VA ; ±(1% of reading+7 counts), 100.0~999.9V A ; ±(1% of reading+5 counts), 1000~9999VA		± (1% of reading + 7 counts) , 0.2 ~ 999.9VA ; ± (1% of reading + 5 counts) , 1000 ~ 9999VA	
Power Factor	Resolution	0.001			
	Accuracy	± (2% of reading + 2 counts)			
Frequency meter		45 ~ 500Hz			
Interface		RS-232			

For IEC-61000-4-11

Table 1 - Preferred test level and durations for voltage dips

Classa[a]	Test level and durations for voltage dips(ts) (50 Hz/60 Hz)				
Class 1	Case-by-case according to the equipment requirements				
Class 2	0 % during 1/2 cycle	0 % during 1 cycle	70 % during 25/30[c] cycles		
Class 3	0 % during 1/2 cycle	0 % during 1 cycle	40 % during 10/12[c] cycles	70 % during 25/30[c] cycles	80 % during 250/300[c] cycles
Class X[b]	X	X	X	X	X

a Classes as per IEC 61000-2-4; see Annex B.

b To be defined by product committee. For equipment connected directly or indirectly to the public network, the levels must not be less severe than Class 2.

c "25/30 cycles" means "25 cycles for 50 Hz test" and "30 cycles for 60 Hz test"

Table 2 - Preferred test level and durations for short interruptions

Classa[a]	Classa Test level and durations for short interruptions (ts) (50 Hz/60 Hz)
Class 1	Case-by-case according to the equipment requirements
Class 2	0 % during 250/300[c] cycles
Class 3	0 % during 250/300[c] cycles
Class X[b]	X

a Classes as per IEC 61000-2-4 ; see Annex B.

b To be defined by product committee. For equipment connected directly or indirectly to the public network, the levels must not be less severe than Class 2.

c "250/300 cycles" means "250 cycles for 50 Hz test" and "300 cycles for 60 Hz test"

Table 3 - Timing of short-term supply voltage variations

Voltage test level	Time for decreasing voltage (td)	Time at reduced voltage (ts)	Time for increasing voltage (ti) (50 Hz/60 Hz)
70%	Abrupt	1 cycle	25/30[b] cycles
X[a]	X[a]	X[a]	X[a]

a To be defined by product committee.

b "25/30 cycles" means "25 cycles for 50 Hz test" and "30 cycles for 60 Hz test".

3332F Dual DC E-Load List of Specification and applicable features

Model	3332F DC E-Load	
Applicable test function		
1. Output Voltage 2. Output Current 3. Dynamic Load 4. Efficiency	5. Average Efficiency 6. Short Circuit 7. OC Protection 8. OP Protection	
Specifications		
Power	120W x 2	
Current	24A	
Voltage	80V	
Constant Current Mode		
Range	0 ~ 2.4A	0 ~ 24A
Constant Resistance Mode		
Range	3.33Ω ~ 199.80KΩ	0.0333Ω ~ 3.33Ω
Constant Voltage Mode		
Range	0 ~ 6V	0 ~ 80V
Constant Power Mode		
Range	0 ~ 12W	0 ~ 120W
Dynamic Mode		
Timing		
Thigh & Tlow	0.050 ~ 9.999 / 99.99 / 999.9 / 9999mS	
Resolution	0.001 / 0.01 / 0.1 / 1mS	
Slew rate	1.6 ~ 100mA/uS	16 ~ 1000mA/uS
Accuracy	± (5% of Setting) ±10uS	
Measurement		
Voltage Read Back		
Range (5 Digital)	6V	81V
Current Read Back		
Range (5 Digital)	2.4A	24A
Resolution	0.0001A	0.001A
Current Monitor	FULL SCALE 10V	
Current Programming Input	FULL SCALE 10V	
Programmable Short	BUILT-IN	
Load ON Voltage	0.1 ~ 25V	
Accuracy	1% of (Setting + Range)	
Load OFF Voltage	0 ~ 25V	
Accuracy	0.025% of (Setting + Range)	
Typical Short Resistance	0.02 Ω	
Maximum Short Current	30 A	
Operating range		
Temperature	0 ~ +40℃	
Humidity	20 ~ 85%rh	

4032-PD List of Specification and applicable features

Model	4032-PD Noise & Timing Analyzer Module

Applicable test function

1. Positive Voltage Transitions
2. Negative Voltage Transitions
3. Hard Reset
4. USB Type C Cable Unplug
5. Ripple Voltage
6. Dynamic Load Vpeak +/- Measure
7. Input Voltage Sag
8. Turn ON(Set-Up) Time
9. Turn OFF(Hold-Up) Time
10. Rise Time
11. Fall Time

Specifications

No. of input channel	2

Timing Measurement		Ripple Measurement	
Set-up / Hold-up / Rise / Fall Time		**Band Width**	0 ~ 100 KHz
Voltage range	0 ~ 10/30 Vdc	**Voltage range**	0 ~ 10 / 30 Vdc
Current range	*(1/4F.S.)/(F.S.) Adc	**Measurement range**	0 ~ 0.4 / 1 Vp-p
Timing range	1 Sec/2 Sec/4 Sec/8 Sec/16 Sec	Resolution	0.001 / 0.01V
Resolution	1 uS/2uS/4uS/8uS/16uS	**Current range**	*(1/4F.S.) / (F.S.) Adc
Vth1 / Vth2		**Measurement range**	*(1/8F.S.) / (1/2F.S.) Ap-p
Voltage range	5% ~ 95% of reading	Resolution	0.001/0.01A
Resolution	0.01V/0.01V, 0.001A/0.01A	Accuracy	±5% of (Reading + Range)
Accuracy	±2% of (Reading + Range)	**Sampling Rate**	100KHz
Noise Measurement		**Update Rate**	50~1000 mS
Low Pass Filter	up to 20 MHz	Resolution	1mS
Voltage range	0.6 / 3Vp-p	**Dimming Measurement**	
Resolution	1mV	**Band Width**	100KHz
Accuracy	±2% OF reading + 5mV	**Current range**	*(1/8F.S.) / (1/2F.S.) Adc
Over Shoot Measurement		Resolution	0.001 / 0.01A
Band Width	0 ~ 100 KHz	Accuracy	±5% of (Reading + Range)
Voltage range	0 ~ 10 / 30 Vdc	**Sampling Rate**	100KHz
Measurement range	0 ~ 10 / 30 Vdc	**Update Rate**	50~1000 mS
Resolution	0.01 Vdc	Resolution	1mS
Current range	*(1/4F.S.) / (F.S.) Adc	**Frequency range**	10Hz~35KHz
Measurement range	*(1/4F.S.) / (F.S.) Adc	Resolution	1Hz
Resolution	0.001 / 0.01A	Accuracy	±1% of (Reading + Range)
Accuracy	±1% of (Reading + Range)	**Duty(Ton) Range**	3uS~90mS
Sampling Rate	100KHz	Resolution	1uS
Update Rate	50~1000 mS	Accuracy	±1% of (Reading + Range)
Resolution	1mS		
Vpeak Measurement		**USB PD Timing Measurement**	
Vpeak+/Vpeak-		**PVT/NVP/Hard Reset/Output Voltage Falling Time**	
Band Width	0 ~ 100 KHz	**Va/Vb/Vc/Vd**	
Voltage range	0 ~ 10 / 30 Vdc	**Voltage range**	0 ~ 10/30 Vdc
Measurement range	0 ~ 10 / 30 Vdc	Resolution	0.01 V
Resolution	0.01 Vdc	Accuracy	1% of (Reading + Range)
Accuracy	±1% of (Reading + Range)	**Timing range**	3 Sec
Sampling Rate	100KHz	Resolution	10 uS
Update Rate	50~1000 mS		
Resolution	1mS		

4015A-2 List of Specification and applicable features

Model		4015A-2 Power Meter With Harmonic		
No. of Input Channel		2		
Applicable test function				
1. Input RMS Current 2. Input Frequency 3. Input Power		4. No Load Power Consumption 5. Input Power Factor 6. Current Harmonic		
Specifications				
ACV meter (Vrms)	Range	15V / 0.001V, 30V / 0.001V, 50V / 0.01V 150V / 0.01V, 300V / 0.01V, 500V / 0.1V		
	Accuracy	±0.1% of (Reading + Range)		
ACA meter (Arms)	Range	20mA / 0.001mA, 500mA / 0.01mA, 10A / 1mA 50mA / 0.001mA, 2A / 0.1mA, 20A / 1mA 200mA / 0.01mA, 5A / 0.1mA, 200A peak / 0.01A		
	Accuracy	±0.1% of (Reading + Range)		
		±2% of (Reading + Range, for Inrush)		
ACW meter	Range	0.3W / 0.01mW 0.75W / 0.1mW 3W / 0.1mW 7.5W / 1mW 30W / 1mW 75W / 1mW 150W / 10mW 300W / 10mW	0.6W / 0.01mW 1.5W / 0.1mW 6W / 0.1mW 15W / 1mW 60W / 1mW 150W / 10mW 300W / 10mW 600W / 10mW	1W / 0.1mW 2.5W / 0.1mW 10W / 1mW 25W / 1mW 100W / 10mW 250W / 10mW 500W / 10mW 1000W / 0.1W
		3W / 0.1mW 7.5W / 1mW 30W / 1mW 75W / 10mW 300W / 10mW 750W / 10mW 1500W / 0.1W 3000W / 0.1W	6W / 0.1mW 15W / 1mW 60W/1mW 150W / 10mW 600W / 10mW 1500W / 0.1W 3000W / 0.1W 6000W / 0.1W	10W / 1mW 25W / 1mW 100W / 10mW 250W / 10mW 1000W / 0.1W 2500W / 0.1W 5000W / 0.1W 10000W / 1W
	Accuracy	±0.1% of (Reading + Range)		
DCV	Range	Same as AC		
	Accuracy	Same as AC		
DCA	Range	Same as AC		
	Accuracy	Same as AC		
DCW	Range	Same as AC		
	Accuracy	Same as AC		
PF meter	Range	±0.001~1.000 / 0.001		
	Accuracy	1% of (Reading + Range, Corresponds to V and A)		
Frequency meter	Range	40~70 / 0.1Hz		
	Accuracy	± 0.1 Hz		
V/A	Number	1~50 th / Same as ACV, ACA meter		
Harmonic	Accuracy	±0.5% of (Reading + Range)		
V/A THD	Range	0%~255% / 0.001%		
	Accuracy	±0.5% of (Reading + Range)		
Inrush Delay / Period		0~100ms		
Low Pass Filter(V & A)		50KHz		
Interface		RS-232		

4013A-2 List of Specification and applicable features

Model	4013A Power Meter
No. of Input Channel	2
Applicable test function	
1. Input RMS Current 2. Input Frequency 3. Input Power	4. No Load Power Consumption 5. Input Power Factor
Specifications	
ACV meter(Vrms)	30V / 300V
Resolution	16-bit
Accuracy	±0.5% of (Reading + Range)
ACA meter(Arms)	20mA / 200mA / 2A / 20A / 200A(for Inrush)
Resolution	16-bit
Accuracy	±0.5% of (Reading + Range) / ±2% of (Reading + Range) (for Inrush)
ACW meter	0.6W / 6W / 60W / 600W / 6000W
Resolution	32-bit
Accuracy	±0.5% of (Reading + Range)
DCV meter	40V / 400V
Resolution	0.001V / 0.01V
Accuracy	±0.5% of (Reading + Range)
DCA meter	20mA / 200mA / 2A / 20A / 200A(for Inrush)
Resolution	0.001mA / 0.01mA / 0.1mA / 1mA / 10mA(for Inrush)
Accuracy	±0.5% of (Reading + Range) / ±2% of (Reading + Range) (for Inrush)
DCW meter	800mW / 8W / 80W / 800W / 8000W
Resolution	32-bit
Accuracy	±0.5% of (Reading + Range)
PF meter	±0.01~1.00
Resolution	0.01
Accuracy	Corresponds to V and A, 1% of (Reading + Range)
Frequency meter	40~70 Hz
Resolution	0.1 Hz
Accuracy	± 0.1 Hz
Inrush Delay/Period	0~99.9mS/0.1~99.9S
Meter Meas. Rate Interval time	100mS / 200mS / 500mS / 1S / 5S / 10S
Low Pass Filter(V & A)	50KHz
Interface	RS-232

5303 AVR Suitable test item & Specifications

Model	5303 AVR
Suitable Test Item	
1. Input Inrush Current	
Specifications	
Power Rating	3KVA
Maximum Capacity	CF > 7
Input Voltage Rating	230Vrms +/- 10%
Output Voltage Rating	230,264,277Vrms Selectable
Accuracy	±2.5Vrms
Interface	RS-232 remote control only

PFR-100L/100M Suitable test item & Specifications

Model		Fanless Multi-Range D.C. Power Supply	
Suitable Test Item			
1. Over Voltage Protection			
Specifications		PFR-100L	PFR-100M
Power Rating		100W	
Voltage range		0 ~ 50V	0 ~ 250V
Resolution		40mV	200mV
Current range		0 ~ 10A	0 ~ 2A
Resolution		1mA	0.1mA
Slew rate	Rise Time	50ms	100ms
	Fall Time	100ms	200ms
Protection		OCP , OTP	

99094-2 List of Specification and applicable features

Model	**99094-2 Quick Charge Controller**
Applicable test function	
1. USB PD Source / Sink Profile 2. USB PD Power Data Object (PDO) 3. USB PD Output Voltage Change 4. USB Type C Cable Unplug	
Specifications	
No. of Test Channel	2
Support Quick Charge	QC2.0, QC3.0, PE+, PE+2.0, USB PD
Terminal of Charger	D-sub 15Pin for ChxA, ChxB

Order Information

Basic version

6050-2-A1-X（3332F）
USB PD Dual-channel Test System

Standard version

6050-2-B1-X（3332F）
USB PD Dual-channel Test System

Value version

6050-2-C1-X（3332F）
USB PD Dual-channel Test System

Complete version

6050-2-D1-X（3332F）
USB PD Dual-channel Test System