6050-2 3332F — USB PD Dual-channel 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. Edit test item function
  3. Edit test program function
  4. Edit statistical analysis report function
  5. Online instrument control function
  6. User authorization settings
  7. Support Bar Code Reader

6050-2（3332F）USB PD DUAL-CHANNEL 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 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 test system quick selection table

Test items	6050 USB PD Dual-channel test system quick selection table			
	6050-2-A1 Basic version	6050-2-B1 Standard version	6050-2-C1 Value Version	6050-2-D1 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 Single Output USB PD basic version：

the dual-channel test system configuration is as shown in the table, just needs APS-7000 series AC Source, 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

→ 99094-2 Quick Charge Controller

→ 4013A-2 Power Meter

→ APS-7000 series AC Sources

6050-2-A1 Basic version dual- channel test system block diagram

APS-7000 series Programmable AC Sources	4013A-2 Power Meter	USB PD Device x 2	3302F + 3332F DC Load

99094-2 QC Controller x 2
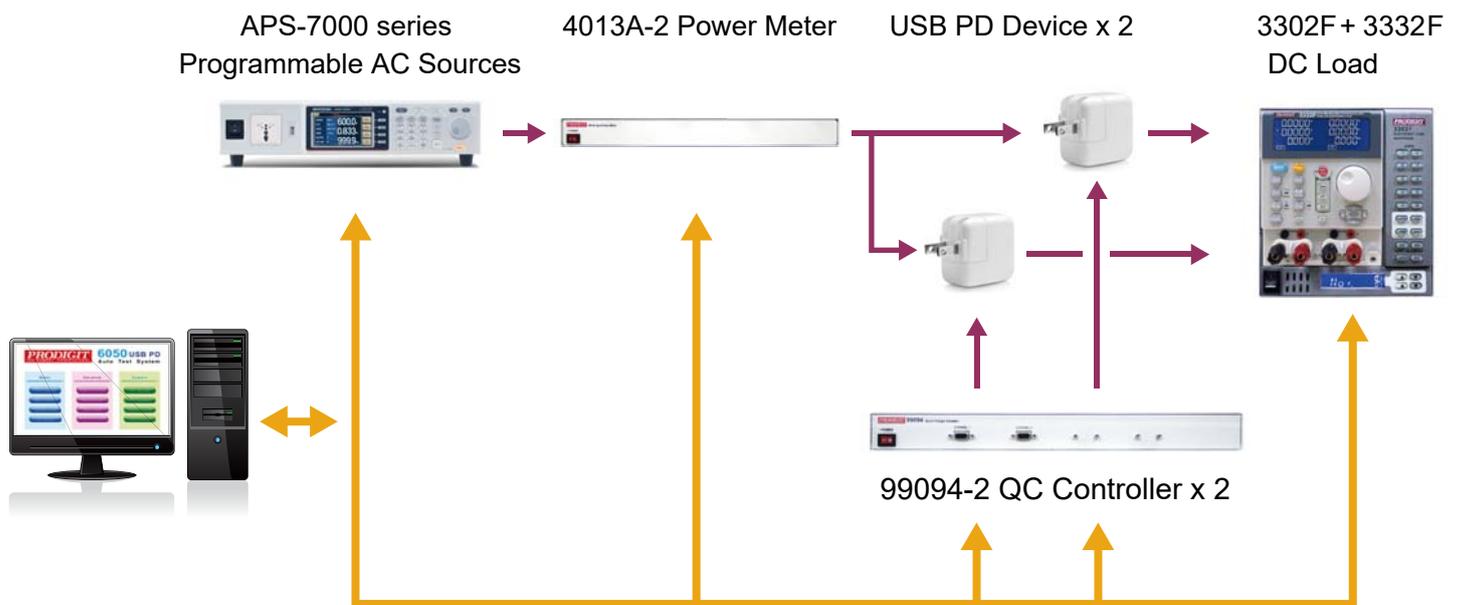
6050-2-A1 Dual Channel Test System Configuration

6050-2-A1 Basic version dual- channel 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 Basic version dual- channel 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	1
99094-2 Quick Charge Controller (dual-channel)	1
4013A-2 Power Meter (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 Standard version dual-channel 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 DC Load

→ 99094-2 Quick Charge Controller

→ 4013A-2 Power Meter

→ APS-7000 series AC Sources

6050-2-B1 Standard version dual-channel test system block diagram
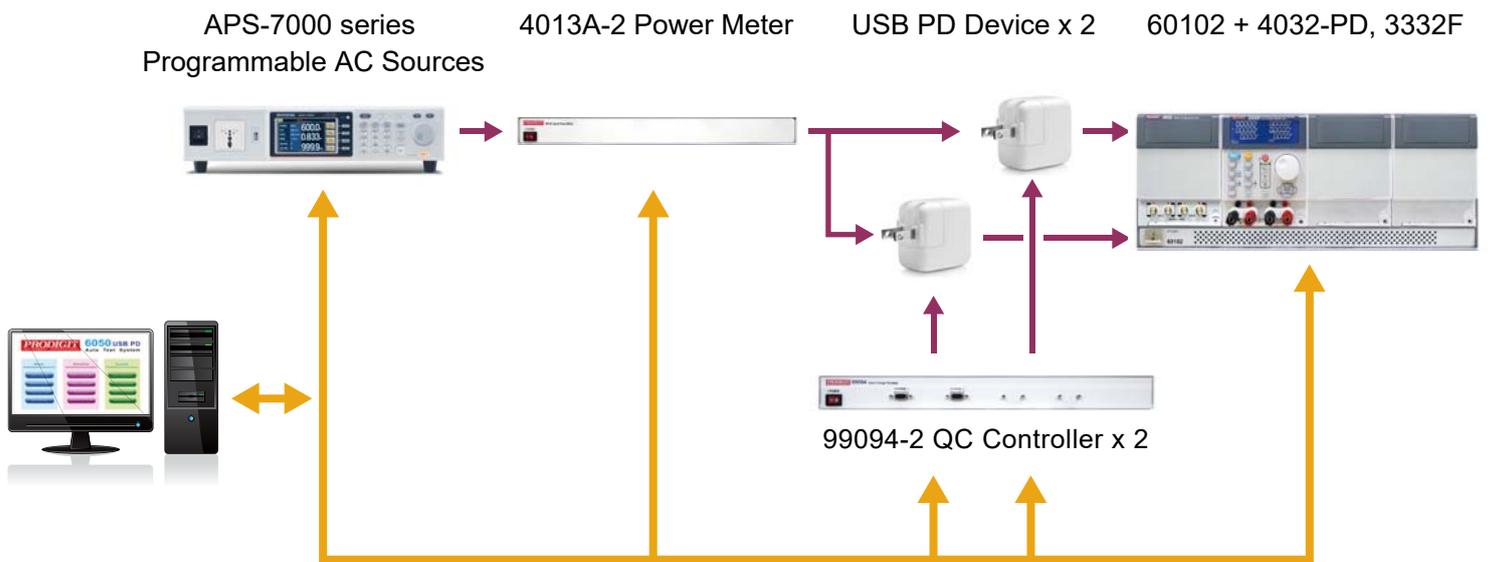
6050-2-B1 Dual Channel Test System Configuration

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 Standard version dual-channel 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/120W x 2 DC Load Module	1
4032-PD Dual Timing & Noise Meter for PD	1
99094-2 Quick Charger Controller (dual-channel)	1
4013A-2 Power Meter (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 Value version (Standard version + Input current harmonic) dual-channel 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 DC Load

→ 99094-2 Quick Charge Controller

→ 4015A-2 Power Meter with Harmonic

→ APS-7000 series AC Sources

6050-2-C1 Value version dual-channel test system block diagram

APS-7000 series
Programmable AC Sources

4015A-2 AC/DC Power
Meter with Harmonic

USB PD Device x 2

60102 + 4032-PD, 3332F

99094-2 QC Controller x 2
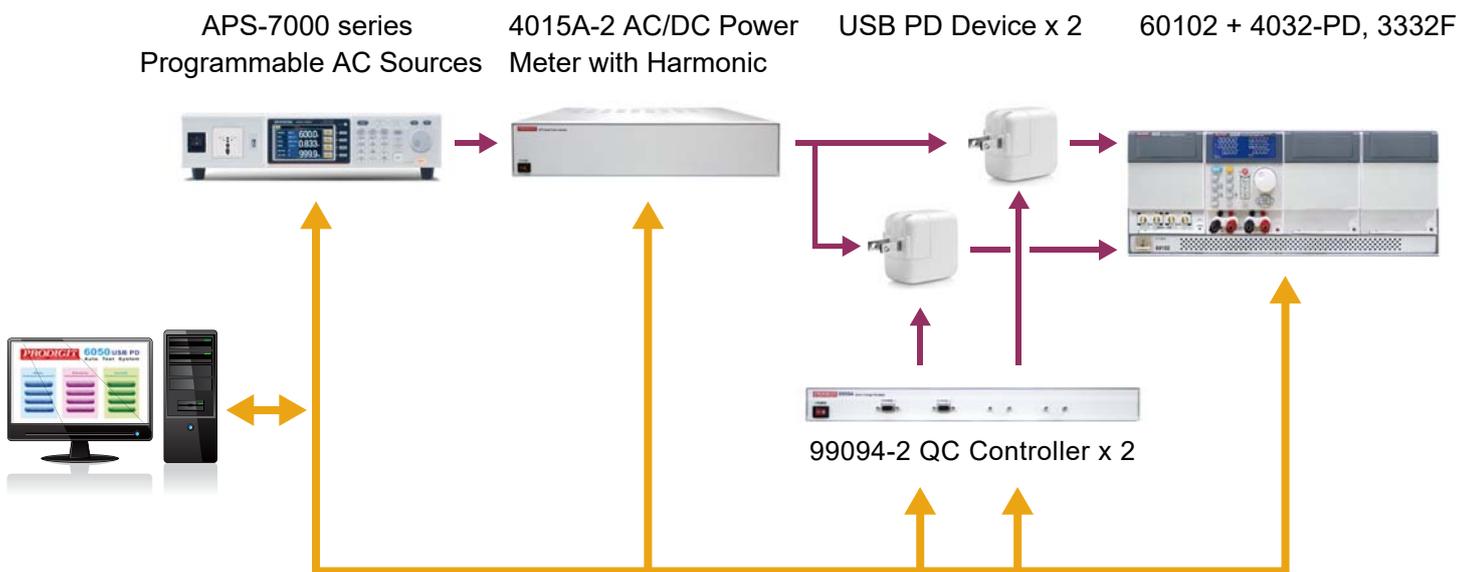
6050-2-C1 Dual Channel Test System Configuration

6050-2-C1 Value version dual-channel 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 Value version dual-channel 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 Dual Timing & Noise Meter for PD	1
4015A-2 Power Meter with Harmonic (dual-channel)	1
99094-2 Quick Charger Controller (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 The Complete version (Standard version + Input Current Harmonics + Input Inrush Current) dual-channel test system : adds 5303 AVR and PFR-100L 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 DC Load

→ 99094-2 Quick Charge Controller

→ PFR-100Lx2 D.C. Power Supply

→ 4015A-2 Power Meter with Harmonic

→ 5303 AVR for Inrush Current

→ APS-7000 series AC Sources

6050-2-D1 Complete version dual-channel test system block diagram

PFR-100L D.C. Power Supply

APS-7000 series Programmable AC Sources

4015A-2 AC/DC Power Meter with Harmonic

USB PD Device x 2

60102 + 4032-PD, 3332F

5303 Inrush Source

99094-2 QC Controller x 2
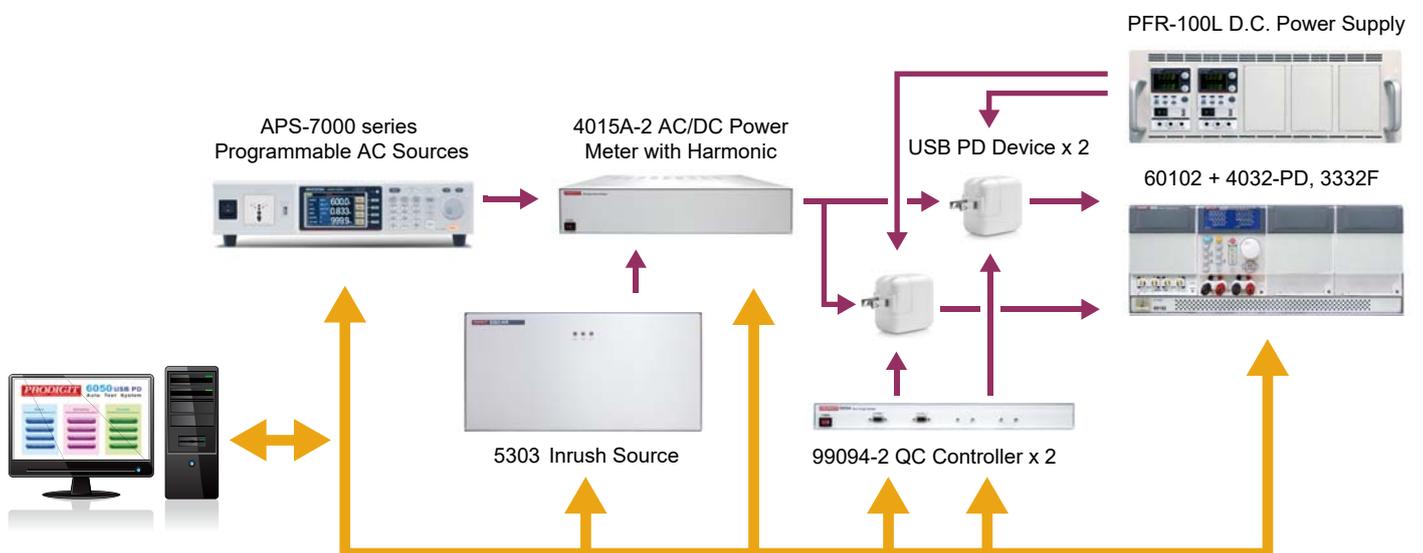
6050-2-D1 Dual Channel Test System Configuration

6050-2-D1 Complete version by adding 5303 and PFR-100L, the following items can be added to the test item

Input Characteristics
Input Inrush Current

Protection Tests
OV Protection

6050-2-D1 Complete version dual-channel 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 Dual Timing & Noise Meter for PD	1
4015A-2 Power Meter with Harmonic (dual-channel)	1
PFR-100L Fanless Multi-Range D.C. Power Supply	2
5303 3KVA AVR	1
99094-2 Quick Charger Controller (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

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			

Table 1 - Preferred test level and durations for voltage dips

Class[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

Class[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   "25/30 cycles" means "25 cycles for 50 Hz test" and "30 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 5. Average Efficiency		
2. Output Current 6. Short Circuit		
3. Dynamic Load 7. OC Protection		
4. Efficiency 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	7. Input Voltage Sag
2. Negative Voltage Transitions	8. Turn ON(Set-Up) Time
3. Hard Reset	9. Turn OFF(Hold-Up) Time
4. USB Type C Cable Unplug	10. Rise Time
5. Ripple Voltage	11. Fall Time
6. Dynamic Load Vpeak +/- Measure	

Specifications

No. of input channel		1	
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		

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		

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		

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

Basic version

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

Standard version

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

Value version

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

Complete version

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