

6050-2 3332F

USB PD 雙組自動測試系統



基本版



標準版



加值版



完整版

特 性

- 可同時測試2組待測物，以提高測試效率並節省測試時間及成本
- 可依產品測試需求，選擇所需要的設備配置版本（基本版 / 標準版 / 加值版 / 完整版）
- 除了支援USB PD，亦同時支援QC2.0 / QC3.0 / PE+ / PE+2.0
- 極高性價比，全功能模組化設計之測試系統
- Windows 7 以上（含）的作業環境
- 開放性架構軟體平台
 1. 支援相關硬體擴充
 2. 測試項目編輯功能
 3. 測試程式編輯功能
 4. 統計分析報表編輯功能
 5. 線上儀控功能
 6. 使用者權限設定
 7. 支援 Bar Code Reader

6050-2 (3332F) USB PD 雙組自動測試系統

USB PD測試項目與設備配置表

測試項目	儀器設備							
	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 特性測試 USB PD Performances								
USB PD Source / Sink Profile	✓	✓	✓					
USB PD Power Data Object (PDO)	✓	✓	✓					
正向電壓轉變 Positive Voltage Transitions	✓	✓	✓	✓				
負向電壓轉變 Negative Voltage Transitions	✓	✓	✓	✓				
硬體復歸狀態 Hard Reset	✓	✓	✓	✓				
USB纜線拔除試驗 USB Type C Cable unplug	✓	✓	✓	✓				
輸出特性測試 Output Performances								
輸出電壓 Output Voltage	✓	✓	✓					
輸出電流 Output Current	✓	✓	✓					
動態負載 Dynamic Load (Vpeak +/-)	✓	✓	✓	✓				
平均效率 Average Efficiency	✓	✓	✓					
漣波電壓 Ripple Voltage	✓	✓	✓	✓				
輸入特性測試 Input Characteristics								
輸入有效值電流 Input RMS Current	✓	✓	✓		✓	✓		
輸入頻率 Input Frequency	✓	✓	✓		✓	✓		
輸入功率 Input Power	✓	✓	✓		✓	✓		
無載功率 No Load Power Consumption	✓	✓	✓		✓	✓		
輸入功率因素 Input Power Factor	✓	✓	✓		✓	✓		
輸入電源暫降 Input Voltage Sag	✓	✓	✓	✓	✓	✓		
電流諧波 Current Harmonics	✓	✓	✓		✓			
輸入湧浪電流 Input Inrush Current	✓	✓	✓		✓	✓		✓
調變測試 Regulation Tests								
電源調變 Line Regulation	✓	✓	✓					
負載調變 Load Regulation	✓	✓	✓					
組合調變 Combine Regulation	✓	✓	✓					
時序與暫態特性測試 Timing & Transient								
開機時間 Turn ON (Set-Up) Time	✓	✓	✓	✓				
關機時間 Turn OFF (Hold-Up) Time	✓	✓	✓	✓				
上升時間 Rise Time	✓	✓	✓	✓				
下降時間 Fall Time	✓	✓	✓	✓				
保護特性測試 Protection Tests								
短路保護 Short Circuit	✓	✓	✓					
過電壓保護 OV Protection	✓	✓	✓				✓	
過電流保護 OC Protection	✓	✓	✓					
過功率保護測試 OP Protection	✓	✓	✓					

6050 USB PD 雙組測試系統快選表

測試項目	6050 USB PD 雙組測試系統快選表			
	6050-2-A1 基本版	6050-2-B1 標準版	6050-2-C1 加值版	6050-2-D1 完整版
USB PD 特性測試 USB PD Performances				
USB PD Source / Sink Profile	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
USB PD Power Data Object (PDO)	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
正向電壓轉變 Positive Voltage Transitions		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
負向電壓轉變 Negative Voltage Transitions		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
硬體復歸狀態 Hard Reset		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
USB纜線拔除試驗 USB Type C Cable unplug		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
輸出特性測試 Output Performances				
輸出電壓 Output Voltage	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
輸出電流 Output Current	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
動態負載 Dynamic Load (Vpeak +/-)		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
平均效率 Average Efficiency	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
漣波電壓 Ripple Voltage		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
輸入特性測試 Input Characteristics				
輸入有效值電流 Input RMS Current	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
輸入頻率 Input Frequency	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
輸入功率 Input Power	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
無載功率 No Load Power Consumption	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
輸入功率因素 Input Power Factor	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
輸入電源暫降 Input Voltage Sag	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
電流諧波 Current Harmonics			<input checked="" type="radio"/>	<input checked="" type="radio"/>
輸入湧浪電流 Input Inrush Current				<input checked="" type="radio"/>
調變測試 Regulation Tests				
電源調變 Line Regulation	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
負載調變 Load Regulation	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
組合調變 Combine Regulation	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
時序與暫態特性測試 Timing & Transient				
開機時間 Turn ON (Set-Up) Time		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
關機時間 Turn OFF (Hold-Up) Time		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
上升時間 Rise Time		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
下降時間 Fall Time		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
保護特性測試 Protection Tests				
短路保護 Short Circuit	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
過電壓保護 OV Protection				<input checked="" type="radio"/>
過電流保護 OC Protection	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
過功率保護測試 OP Protection	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>

△ 僅提供輸入 Input Voltage Sag 能力

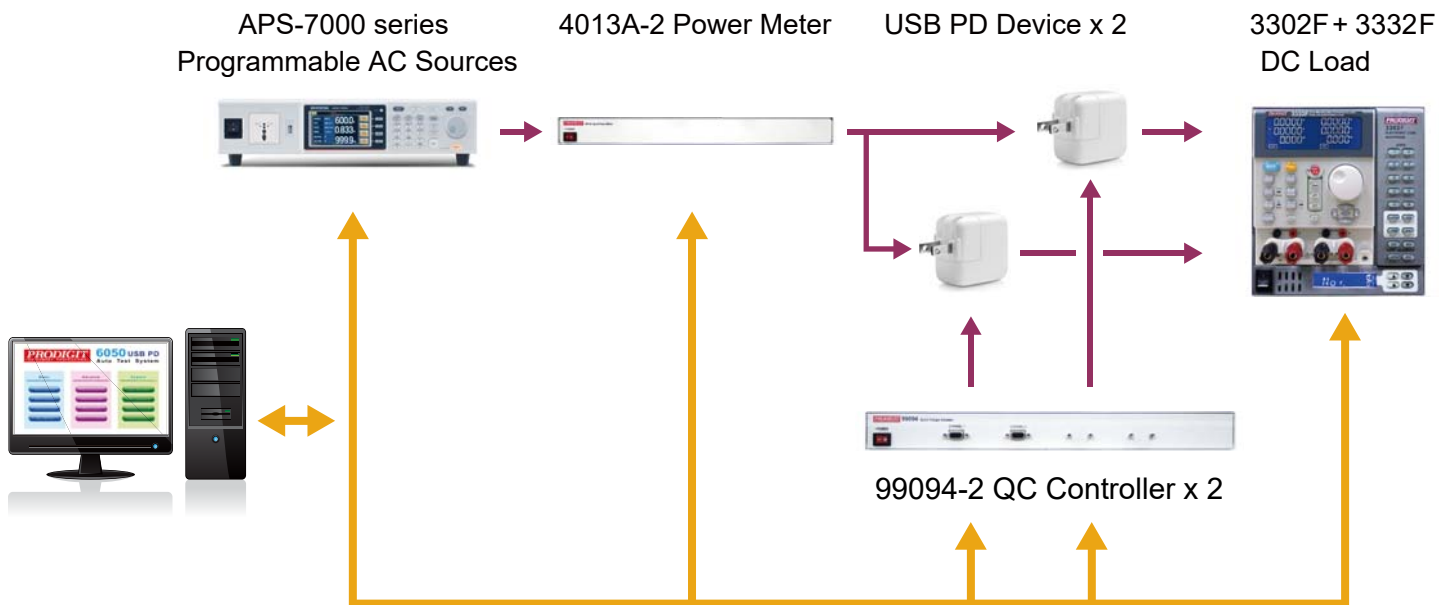
6050-2-A1 單組輸出 USB PD基本版雙組測試系統架構組成如表所示只需 APS-7000 series AC Source, 3302F + 3332F 系列 + 99094-2 Quick Charge Controller 及4013A-2 Power Meter即可。

組成圖示如下



- 3302F + 3332F DC Load
- 99094-2 Quick Charge Controller
- 4013A-2 Power Meter
- APS-7000 series AC Sources

6050-2-A1基本版雙組測試系統方塊圖



6050-2-A1 Dual Channel Test System Configuration

6050-2-A1 基本版雙組測試系統可測試項目如下表

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

輸出特性測試 Output Performances
輸出電壓 Output Voltage
輸出電流 Output Current
平均效率 Average Efficiency

調變測試 Regulation Tests
電源調變 Line Regulation
負載調變 Load Regulation
組合調變 Combine Regulation

輸入特性測試 Input Characteristics
輸入有效值電流 Input RMS Current
輸入頻率 Input Frequency
輸入功率 Input Power
無載功率 No Load Power Consumption
輸入功率因素 Input Power Factor

保護特性測試 Protection Tests
短路保護 Short Circuit
過電流保護 OC Protection
過功率保護測試 OP Protection

6050-2-A1 基本版雙組測試系統設備配備表

6050-2-A1 基本版雙組測試系統設備配備表	
設備名稱型號	數量
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 (雙 Channel)	1
4013A-2 Power Meter (雙 Channel)	1
6050 系統軟件	1
系統控制器 System Controller (PC)	1
CP-104EL-A 1:4 高速 RS-232 界面卡	1
Uport 1410 USB to RS-232 4 Port For Note Book	0
系統規格表 (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
○ 系統裝置使用 Note Book 時應選用此介面	

OS : Windows 7.0 以上版本

6050-2-B1標準版雙組測試系統由基本版增加 4032-PD Dual Timing & Noise Meter 可增加 USB PD 特性及時序與暫態測試。

組成圖示如下



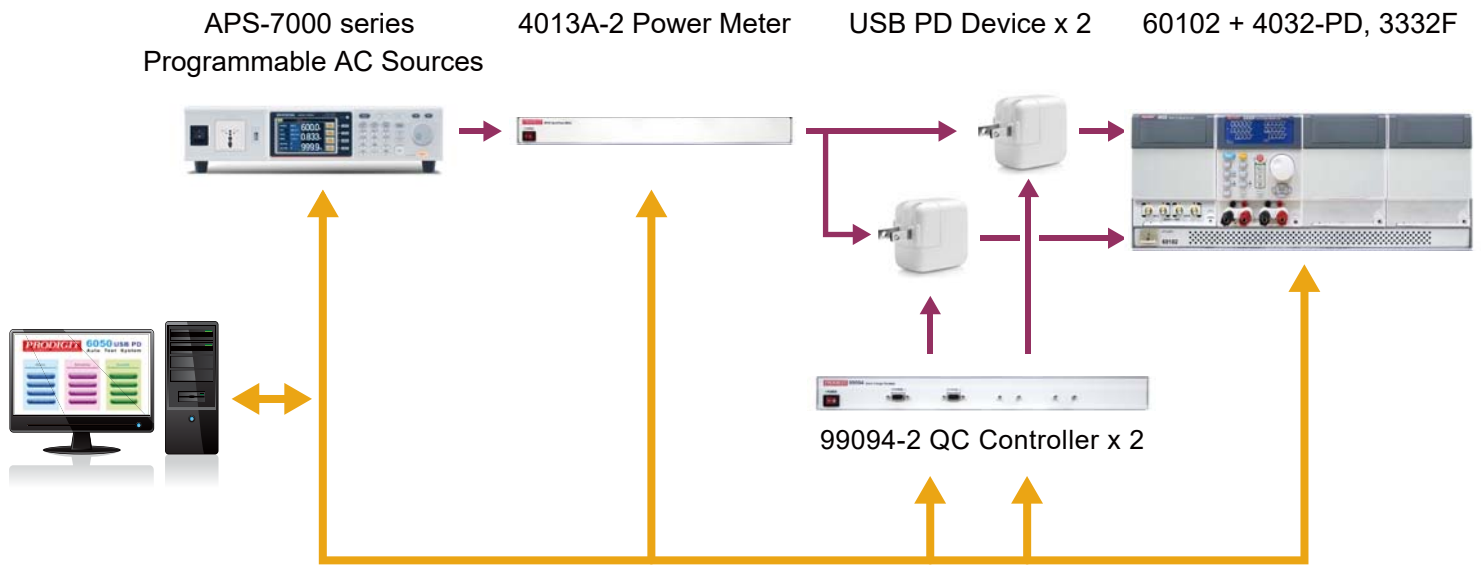
→ 60102+4032-PD+3332F DC Load

→ 99094-2 Quick Charge Controller

→ 4013A-2 Power Meter

→ APS-7000 series AC Sources

6050-2-B1標準版雙組測試系統方塊圖



6050-2-B1 Dual Channel Test System Configuration

6050-2-B1標準版雙組測試系統增加 4032-PD可增加測項目如下表橙色區塊

USB PD 特性測試 USB PD Performances	
正向電壓轉變	Positive Voltage Transitions
負向電壓轉變	Negative Voltage Transitions
硬體復歸狀態	Hard Reset
USB 纜線拔除試驗	USB Type C Cable unplug

時序與暫態特性測試 Timing & Transient	
開機時間	Turn ON (Set-Up) Time
關機時間	Turn OFF (Hold-Up) Time
上升時間	Rise Time
下降時間	Fall Time

輸出特性測試 Output Performances	
動態負載	Dynamic Load (Vpeak +/-)
漣波電壓	Ripple Voltage

輸入特性測試 Input Characteristics	
輸入電源暫降 Input Voltage Sag	

6050-2-B1 標準版雙組測試系統設備配備表

6050-2-B1 標準版雙組測試系統設備配備表	
設備名稱型號	數量
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 (雙 Channel)	1
4013A-2 Power Meter (雙 Channel)	1
6050 系統軟件	1
系統控制器 System Controller (PC)	1
CP-104EL-A 1:4 高速 RS-232 界面卡	1
Uport 1410 USB to RS-232 4 Port For Note Book	0
系統規格表 (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
○ 系統裝置使用 Note Book 時應選用此介面	

OS : Windows 7.0 以上版本

6050-2-C1 加值版(標準版 + 輸入電流諧波) 雙組測試系統更換 4013A-2為 4015A-2可增加電流諧波Harmonics 測試。

組成圖示如下



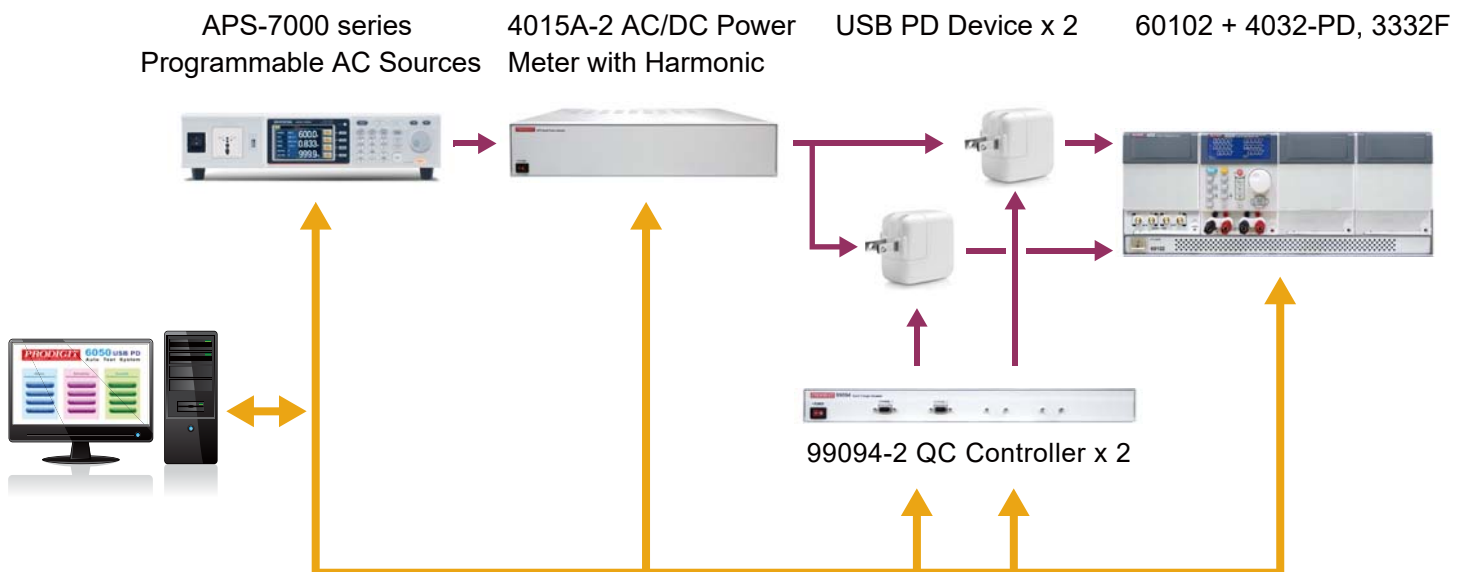
→ 60102+4032-PD+3332F DC Load

→ 99094-2 Quick Charge Controller

→ 4015A-2 Power Meter with Harmonic

→ APS-7000 series AC Sources

6050-2-C1 加值版雙組測試系統方塊圖



6050-2-C1 Dual Channel Test System Configuration

6050-2-C1 加值版雙組測試系統更換 4013A-2為 4015A-2可增加測項目如下表綠色區塊

輸入特性測試 Input Characteristics
電流諧波 Current Harmonics

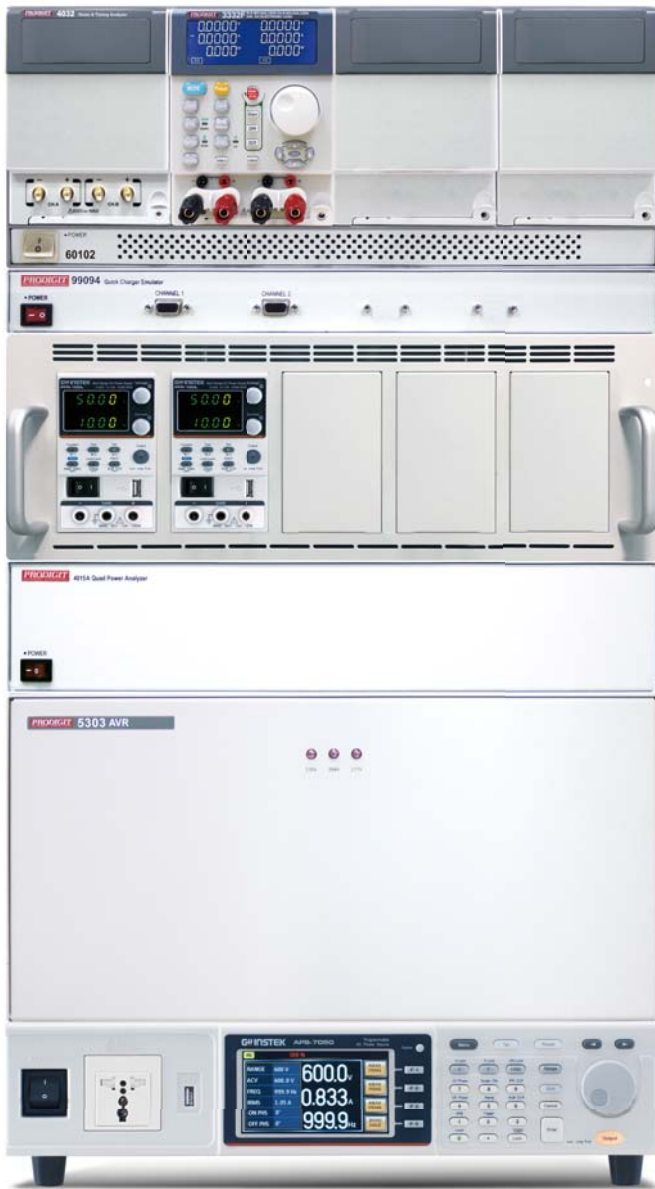
6050-2-C1 加值版雙組測試系統設備配備表

6050-2-C1 加值版雙組測試系統設備配備表	
設備名稱型號	數量
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 (雙 Channel)	1
99094-2 Quick Charger Controller (雙 Channel)	1
6050 系統軟件	1
系統控制器 System Controller (PC)	1
CP-104EL-A 1:4 高速 RS-232 界面卡	1
Uport 1410 USB to RS-232 4 Port For Note Book	0
系統規格表 (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
○ 系統裝置使用 Note Book 時應選用此介面	

OS : Windows 7.0 以上版本

6050-2-D1 完整版（標準版 + 輸入電流諧波 + 輸入湧浪電流）雙組測試系統增加5303及PFR-100L
即可增加輸入湧浪電流 Input Inrush Current 及過電壓保護測試。

組成圖示如下



→ 60102+4032-PD+3332F DC Load

→ 99094-2 Quick Charge Controller

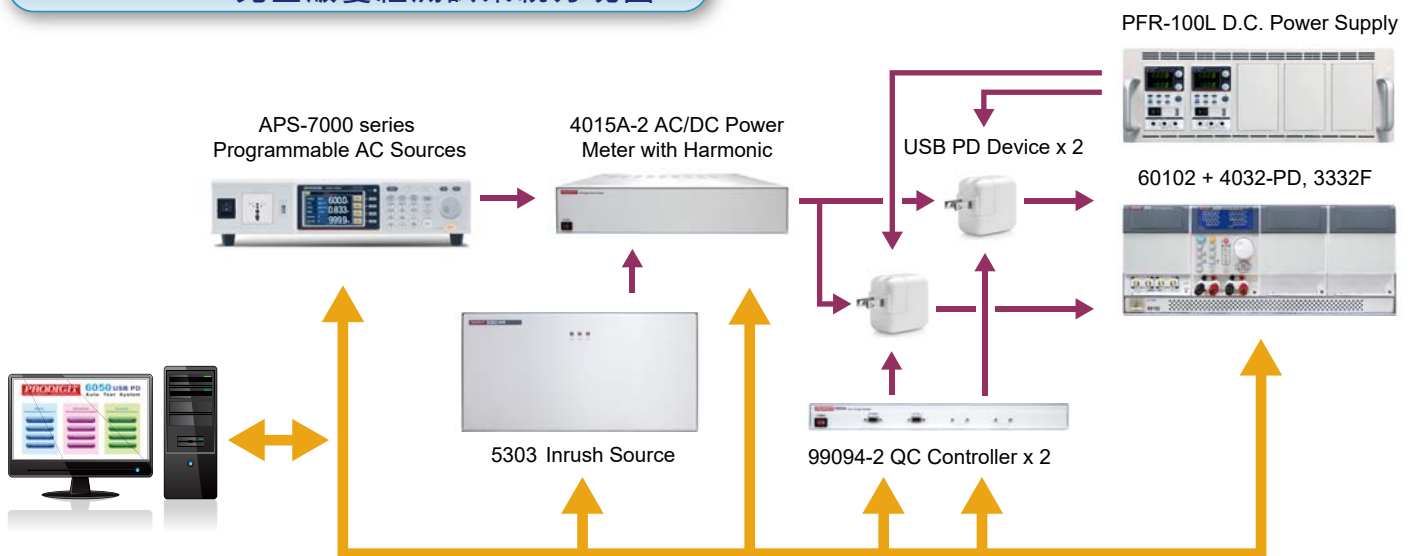
→ PFR-100Lx2 D.C. Power Supply

→ 4015A-2 Power Meter with Harmonic

→ 5303 AVR for Inrush Current

→ APS-7000 series AC Sources

6050-2-D1 完整版雙組測試系統方塊圖



6050-2-D1 Dual Channel Test System Configuration

6050-2-D1 完整版雙組測試系統增加5303及PFR-100L可增加測項目如下表

輸入特性測試 Input Characteristics
輸入湧浪電流 Input Inrush Current
保護特性測試 Protection Tests
過壓保護 OV Protection

6050-2-D1 完整版雙組測試系統設備配備表

6050-2-D1 完整版雙組測試系統設備配備表	
設備名稱型號	數量
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 (雙 Channel)	1
PFR-100L Fanless Multi-Range D.C. Power Supply	2
5303 3KVA AVR	1
99094-2 Quick Charger Controller (雙 Channel)	1
6050 系統軟件	1
系統控制器 System Controller (PC)	1
CP-104EL-A 1:4 高速 RS-232 界面卡	1
Uport 1410 USB to RS-232 4 Port For Note Book	0
系統規格表 (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
○ 系統裝置使用 Note Book 時應選用此介面	

OS : Windows 7.0 以上版本

各儀器設備功能與規格

APS-7000 Series Programmable Linear AC Power Sources規格簡表及可適用之功能列表

Model	APS-7000 Series Programmable Linear AC Power Sources				
適用測試功能					
1. 輸入有效值電流 Input RMS Current 2. 輸入頻率 Input Frequency 3. 輸入功率 Input Power 4. 無載功耗 No Load Power Consumption 5. Input Power Factor 6. 輸入電源暫降 Input Voltage Sag 7. 線性調整率 Line Regulation 8. 可編成電壓開關機 (ON / OFF) 角度 (0~360度)					
規格 (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, Interrupt, 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	Class ^a 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".

3310F DC E-Load 規格簡表及可適用之功能列表

Model	3310F DC E-Load	
適用測試功能		
1. 輸出電壓 Output Voltage 2. 輸出電流 Output Current 3. 動態負載 Dynamic Load 4. 效率 Efficiency	5. 平均效率 Average Efficiency 6. 短路保護 Short Circuit 7. 過電流保護 OC Protection 8. 過功率保護 OP Protection	
規格 (Specifications)		
Power	150W	
Current	30A	
Voltage	60V	
Constant Current Mode		
Range	0 ~ 3A	0 ~ 30A
Constant Resistance Mode		
Range	2 ~120KΩ	0.02Ω ~ 2Ω
Constant Voltage Mode		
Range	0 ~ 6V	0 ~ 60V
Constant Power Mode		
Range	0 ~ 15W	0 ~ 150W
Dynamic Mode		
Timing		
Thigh & Tlow	0.050~9.999 / 99.99 / 999.9 / 9999mS	
Resolution	0.001 / 0.01 / 0.1 / 1mS	
Slew rate	2.0 ~ 125mA/uS	20 ~ 1250mA/uS
Accuracy	± (5% of Setting) ±10uS	
Measurement		
Voltage Read Back		
Range (5 Digital)	6V	60V
Current Read Back		
Range (5 Digital)	3A	30A
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	0.02Ω	
Maximum Short Current	30 A	
Operating range		
Temperature	0~+40℃	
Humidity	20~85%rh	

3332F Dual DC E-Load規格簡表及可適用之功能列表

Model	3332F DC E-Load	
適用測試功能		
1. 輸出電壓 Output Voltage	5. 平均效率 Average Efficiency	
2. 輸出電流 Output Current	6. 短路保護 Short Circuit	
3. 動態負載 Dynamic Load	7. 過電流保護 OC Protection	
4. 效率 Efficiency	8. 過功率保護 OP Protection	
規格 (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°C	
Humidity	20 ~ 85%rh	

4013A-2 規格簡表敘述及可適用之功能列表

Model	4013A Power Meter
No. of Input Channel	2
適用測試功能	
1. 輸入有效值電流 Input RMS Current	4. 無載功率 No Load Power Consumption
2. 輸入頻率 Input Frequency	5. 輸入功率因素 Input Power Factor
3. 輸入功率 Input Power	
規格	
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

4015A-2 規格簡表敘述及可適用之功能列表

Model		4015A-2 Power Meter With Harmonic		
No. of Input Channel		2		
適用測試功能				
1. 輸入有效值電流 Input RMS Current		4. 無載功率 No Load Power Consumption		
2. 輸入頻率 Input Frequency		5. 輸入功率因素 Input Power Factor		
3. 輸入功率 Input Power		6. 電流諧波 Current Harmonic		
規格				
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	0.6W / 0.01mW	1W / 0.1mW
		0.75W / 0.1mW	1.5W / 0.1mW	2.5W / 0.1mW
	3W / 0.1mW	6W / 0.1mW	10W / 1mW	
ACW meter	Range	7.5W / 1mW	15W / 1mW	25W / 1mW
		30W / 1mW	60W / 1mW	100W / 10mW
		75W / 1mW	150W / 10mW	250W / 10mW
		150W / 10mW	300W / 10mW	500W / 10mW
		300W / 10mW	600W / 10mW	1000W / 0.1W
		3W / 0.1mW	6W / 0.1mW	10W / 1mW
		7.5W / 1mW	15W / 1mW	25W / 1mW
		30W / 1mW	60W/1mW	100W / 10mW
		75W / 10mW	150W / 10mW	250W / 10mW
		300W / 10mW	600W / 10mW	1000W / 0.1W
750W / 10mW	1500W / 0.1W	2500W / 0.1W		
1500W / 0.1W	3000W / 0.1W	5000W / 0.1W		
3000W / 0.1W	6000W / 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		

4032-PD 規格簡表敘述及可適用之功能列表

Model	4032-PD Noise & Timing Analyzer Module		
適用測試功能			
1. 正向電壓轉變 Positive Voltage Transitions 2. 負向電壓轉變 Negative Voltage Transitions 3. 硬體負規狀態 Hard Reset 4. USB 纜線拔除試驗 USB Type C Cable Unplug 5. 漣波電壓 Ripple Voltage 6. 動態負載 Dynamic Load Vpeak +/- 量測		7. 輸入電源暫降 Input Voltage Sag 8. 開機時間 Turn ON(Set-Up) Time 9. 關機時間 Turn OFF(Hold-Up) Time 10. 上升時間 Rise Time 11. 下降時間 Fall Time	
規格 (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		

5303 規格簡表敘述及可適用之功能列表

Model	5303 AVR
適用測試功能	
1. Input Inrush Current	
規格	
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 規格表及可適用之功能列表

Model	Fanless Multi-Range D.C. Power Supply	
適用測試功能		
1. 過電壓保護 Over Voltage Protection		
規格	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
	Fall Time	100ms
Protection	OCP , OTP	

99094-2 規格簡表敘述及可適用之功能列表

Model	99094-2 Quick Charge Controller
適用測試功能	
1. USB PD Source / Sink Profile 2. USB PD Power Data Object (PDO) 3. USB PD Output Voltage Change 4. USB 纜線拔除試驗 USB Type C Cable Unplug	
規格	
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

訂 購 方 式



基本版

6050-2-A1 (3332F)
USB PD 雙組自動測試系統



標準版

6050-2-B1 (3332F)
USB PD 雙組自動測試系統



加值版

6050-2-C1 (3332F)
USB PD 雙組自動測試系統



完整版

6050-2-D1 (3332F)
USB PD 雙組自動測試系統