

	Normal mode	→	Turbo mode
3310G	60V / 30A / 150W	→	60V / 60A / 300W
3311G	60V / 60A / 300W	→	60V / 120A / 600W
3312G	250V / 12A / 300W	→	250V / 24A / 600W
3314G	500V / 12A / 300W	→	500V / 24A / 600W
3315G	60V / 15A / 75W	→	60V / 30A / 150W
3316G	80V / 80A / 400W	→	80V / 160A / 800W
3318G	500V / 20A / 400W	→	500V / 40A / 800W



## 特 性

- 5位之數位電壓、電流以及功率錶
- 可同時顯示電壓值、電流值、瓦特值
- 大型 LCD Display、可用飛梭旋鈕或按鍵調整設定值
- 不只CC、CR、CP mode具備並聯操作功能，CV mode亦具備並聯操作功能
- 須安裝於機框3302G〔單組框〕3302G機框提供NTC模擬測試功能（選購）、3305G〔雙組框〕或3300G〔四組框〕上，且機框上具有150組 儲存 / 呼叫 記憶
- 可設定開機狀態值
- 於短路測試時可設定短路時間
- 電壓極性顯示可設成正值（“+”）或負值（“-”）
- 具有同步並聯執行之功能（SYNC. Load on）
- 高速Slew rate：3310G up to 5A/uS，3311G up to 10A/uS，3315G up to 2.5A/uS
- 可選用介面：GPIB、RS232、USB、LAN
- 支援太陽能板MPPT CC、CR、CV測試
- 提供電池BMS保護板之保護功能測試
- 9923負載電流波形產生器提供電池實際放電電流波形之模擬（選購）
- 內建測試模式包括 Battery Discharge time, BMS, Fuse / Breaker Trip/Non-Trip, 短路模擬, OCP, OPP 等測試模式
- Turbo mode（倍增模式），能夠在短時間內承受多達2倍電流與功率的電子負載，最適合 Fuse / Breaker 及 BMS、短路、OCP、OPP測試。
- 定電流、定電阻、定電壓、定功率、定電流+定電壓、定功率+定電壓、動態及短路模式
- 過電流、功率、溫度保護及過電壓示警

## 說 明

- 每個3310G系列模組均有獨立的控制及顯示面板、定電流/定電阻/定電壓/定功率/動態模式，配合3300G機框上的150組 儲存/呼叫 記憶，能有效地控制所有負載的設定，更可透過RS232、Ethernet、USB和GPIB等介面進行遠端控制。
- 具備短路測試功能及設定短路時間，並可量測短路電壓及電流。
- 在定電流及定功率模式下，可做動態負載之模擬，其電流上升、下降斜率均為獨立可調，另具有一外部輸入任意波形之動態負載功能。
- 於模組上新增的OCP、OPP單鍵測試功能，使得OCP、OPP之測試更有效率及準確。
- 可設定的吃載/停止吃載（LOAD ON/OFF）電壓點及良/不良（GO/NG）的比較判斷功能、電壓極性顯示可正可負及150組 儲存/呼叫 記憶，使得負載更適用於各種不同的應用。
- 多達150組測試參數及狀態的儲存功能，讓其可根據自動測試（auto sequence）需求，隨時將儲存記憶調出來任意使用。
- 針對電池BMS保護板提供Short、OCCP及OCDP之保護功能測試（選購）

## 應 用

- 電壓 / 電流源測試
- 交換式電源供應器暫態響應
- 定電壓模式供限流測試及模擬電池
- 電池放電容量
- 鋰電池BMS充放電保護
- Fuse, Breaker, PTC規格測試
- 太陽能板MPPT
- 研發、品管
- ATE系統
- 生產測試

# 規 格

MODEL	3310G		3311G		3312G		3314G		3315G	
Power	150W, 300W max. <sup>*1</sup>		300W, 600W max. <sup>*1</sup>		300W, 600W max. <sup>*1</sup>		300W, 600W max. <sup>*1</sup>		75W, 150W max. <sup>*1</sup>	
Current	30A, 60A max. <sup>*1</sup>		60A, 120A max. <sup>*1</sup>		12A, 24A max. <sup>*1</sup>		12A / 24A max. <sup>*1</sup>		15A / 30A max. <sup>*1</sup>	
Voltage	60V		60V		250V		500V		60V	
Min. Operating Voltage	0.3V @ 30A		0.3V @ 60A		1V @ 12A		6V @ 12A		0.25V @ 15A	
<b>PROTECTIONS</b>										
Over Power Protection(OPP)	105%									
Over Current Protection(OCP)	105%									
Over Voltage Protection(OVP)	105%									
Over Temp Protection(OTP)	YES									
<b>Constant Current Mode</b>										
Range <sup>*2</sup>	0 ~ 3A	0 ~ 30A	0 ~ 6A	0 ~ 60A	0 ~ 1.2A	0 ~ 12A	0 ~ 1.2A	0 ~ 12A	0 ~ 1.5A	0 ~ 15A
Resolution	0.05mA	0.5mA	0.1mA	1mA	0.02mA	0.2mA	0.02mA	0.2mA	0.0254mA	0.25mA
Accuracy	± 0.05% of ( setting + Range)									
<b>Constant Resistance Mode</b>										
Range	2~120KΩ	0.02Ω~2Ω	1Ω~60 KΩ	0.0083Ω~1Ω	25Ω~1500KΩ	0.08Ω~25Ω	50 ~ 3000KΩ	0.5Ω ~ 50Ω	4Ω ~ 240 KΩ	0.02Ω ~ 4Ω
Resolution	0.00833mS	0.033mΩ	0.0166mS	0.0166mΩ	0.00066mS	0.4166mΩ	0.000333mS	0.8333mΩ	0.04166mS	0.0666mΩ
Accuracy	± 0.2% of (Setting + Range)									
<b>Constant Voltage Mode</b>										
Range	0 ~ 6V	0 ~ 60V	0 ~ 6V	0 ~ 60V	0 ~ 30V	0 ~ 250V	0 ~ 60V	0 ~ 500V	0 ~ 6V	0 ~ 60V
Resolution	0.0001V	0.001V	0.0001V	0.001V	0.001V	0.01V	0.001V	0.01V	0.0001V	0.001V
Accuracy	± 0.025% of (Setting + Range)									
<b>Constant Power Mode</b>										
Range	0 ~ 15W	0 ~ 150W	0 ~ 30W	0 ~ 300W	0 ~ 30W	0 ~ 300W	0 ~ 30W	0 ~ 300W	0 ~ 7.5W	0 ~ 75W
Resolution	0.00025W	0.0025W	0.0005W	0.005W	0.0005W	0.005W	0.001W	0.01W	0.000125W	0.00125W
Accuracy	± 0.1% of (Setting + Range)									
<b>Constant Current + Constant Voltage Mode</b>										
Range	60V	30A	60V	60A	250V	12A	500V	12A	60V	15A
Resolution	0.001V	0.5mA	0.001V	1mA	0.01V	0.2mA	0.01V	0.2mA	0.001V	0.25mA
Accuracy	± 1.0% of (Setting + Range)									
<b>Constant Power + Constant Voltage Mode</b>										
Range	60V	150W	60V	300W	250V	300W	500V	300W	60V	75W
Resolution	0.001V	0.0025W	0.001V	0.005W	0.01V	0.005W	0.01V	0.01W	0.001V	0.00125W
Accuracy	± 1.0% of (Setting + Range)									
Maximum Current	Turbo OFF Turbo ON <sup>*1</sup>	30A 60A	60A 120A	12A 24A	12A 24A	12A 24A	15A 30A	15A 30A	15A 30A	15A 30A
Meas. Accuracy	± 1.0% of (Reading + Range)									
<b>Short/OCP/OPP Test Function</b>										
Short Time	Turbo OFF Turbo ON <sup>*1</sup>	100ms~10 Sec. or Continue 100~2000ms								
Meas. Accuracy	NA									
OCP Time (Tstep)	Turbo OFF Turbo ON <sup>*1</sup>	100mS 20mS								
Meas. Accuracy	NA									
OPP Time (Tstep)	Turbo OFF Turbo ON <sup>*1</sup>	100mS 20mS								
Meas. Accuracy	NA									
<b>BMS Test Mode <sup>*3</sup></b>										
Short Time	Turbo OFF Turbo ON <sup>*1</sup>	0.05mS~10ms 0.05mS~10ms								
Meas. Accuracy	±0.005mS									
OCP Time (Tstep)	Turbo OFF Turbo ON <sup>*1</sup>	0.05mS~10ms / 11~1000ms 0.05mS~10ms / 11~1000ms								
Meas. Accuracy	±0.005mS / ±0.2mS									
<b>Fuse Test Mode <sup>*4</sup></b>										
Trip & Non-Trip Time	Turbo OFF Turbo ON <sup>*1</sup>	r1 : 1~5999ms, r2 : 6~16383sec 1~2000mS								
Meas. Accuracy	r1 : ±0.2mS(<200mS), ±20mS(>200mS), r2: ±0.5S									
Repeat Cycle	0~255									
<b>Surge Test Mode</b>										
Surge current	0~60A	0~120A	0~24A	0~24A	0~24A	0~24A	0~30A	0~30A	0~30A	0~30A
Normal current	0~30A	0~60A	0~12A	0~12A	0~12A	0~12A	0~15A	0~15A	0~15A	0~15A
Surge Time	10~2000ms									
Surge Step	1~5									
<b>MPPT Mode</b>										
Algorithm	P & O									
Load mode	CV									
P&O interval	1000ms ~ 60000ms									
<b>Dynamic Mode (50KHz)</b>										
Timing	0.010~9.999 / 99.99 / 999.9 / 9999mS									
Thigh & Tlow	0.001 / 0.01 / 0.1 / 1mS									
Resolution	0.008~0.5A/uS   0.08~5A/uS   0.016~1A/uS   0.16~10A/uS   0.0008~0.05A/uS   0.008~0.5A/uS   0.0008~0.05A/uS   0.008~0.5A/uS   0.004~0.25A/uS   0.04~2.5A/uS									
Slew rate	± (5% of Setting) ±10uS									
Accuracy	± (5% of Setting) ±10uS									
<b>Measurement</b>										
<b>Voltage Read Back</b>										
Range (5 Digital)	6V	60V	6V	60V	30V	250V	60V	600V	6V	60V
Resolution	0.0001V	0.001V	0.0001V	0.001V	0.001V	0.01V	0.001V	0.01V	0.0001V	0.001V
Accuracy	± 0.025% of (Reading + Range)									
<b>Current Read Back</b>										
Range (5 Digital)	3A	30A	6A	60A	1.2A	12A	1.2A	30A	1.5A	15A
Resolution	0.0001A	0.001A	0.0001A	0.001A	0.00002A	0.0002A	0.0001A	0.01A	0.00001A	0.001A
Accuracy	± 0.05% of (Reading + Range)									
<b>Power Read Back</b>										
Range (5 Digital)	15W	150W	30W	300W	30W	300W	30W	300W	7.5W	75W
Resolution	0.001W	0.01W	0.001W	0.01W	0.001W	0.01W	0.001W	0.01W	0.0001W	0.001W
Accuracy	± 0.1% of (Reading + Range)									
Current Monitor	FULL SCALE 10V									
Accuracy	0.5% of (Setting + Range)									
Current Programming Input	FULL SCALE 10V									
Programmable Short	BUILT-IN									
Load ON Voltage	0.1 ~ 25V	0.1 ~ 25V	0.2 ~ 50V	0.4 ~ 100V	0.1 ~ 25V	0.1 ~ 25V	0.1 ~ 25V	0.1 ~ 25V	0.1 ~ 25V	0.1 ~ 25V
Accuracy	1% of (Setting + Range)									
Load OFF Voltage	0 ~ 25V	0 ~ 25V	0 ~ 50V	0 ~ 100V	0 ~ 25V	0 ~ 25V	0 ~ 25V	0 ~ 25V	0 ~ 25V	0 ~ 25V
Accuracy	0.025% of (Setting + Range)									
Typical Short Resistance	0.0086 Ω	0.0043 Ω	0.08 Ω	0.5 Ω	0.0129Ω	0.0129Ω	0.0129Ω	0.0129Ω	0.0129Ω	0.0129Ω
Maximum Short Current	30 A	60A	12A	12A	12A	12A	15A	15A	15A	15A
Dimension(HxWxD)	143 x 108 x 412 mm									
Operating Temperature <sup>*5</sup>	0 ~ 40°C									

註\*1：最高達2倍額定電流和功率規格的Turbo mode操作模式，可應用於保險絲(Fuse)、BMS、Short / OCP / OPP的測試

註\*2：CC Mode可強制於Rangell

註\*3：BMS測試功能主要應用於電池BMS保護板的Short / OCCP及OCDP的測試

註\*4：Fuse測試功能主要應用於保險絲(Fuse)及斷路器(Breaker)的測試

註\*5：操作溫度範圍為0~40°C，此規格表內精確度僅適用於25°C±5°C

## 訂 購 方 式

### 直流電子負載模組

- ▶ 3310G 60V · 30A · 150W
- ▶ 3311G 60V · 60A · 300W
- ▶ 3312G 250V · 12A · 300W
- ▶ 3314G 500V · 12A · 300W
- ▶ 3315G 60V · 15A · 75W



### 電子負載機框 選購介面： ① GPIB Card ② RS232 Card ③ USB Card ④ LAN Card

**3302G (單組框)**  
5.5kg  
W160mm / H177mm  
D452mm



**3305G (雙組框)**  
7.5kg  
W269mm /  
H177mm / D452mm



**3300G (四組框)**  
9.3kg  
W440mm /  
H177mm / D445mm



高速Slew rate：  
3310G ▶ 5A/uS 3315G ▶ 2.5A/uS  
3311G ▶ 10A/uS  
選購功能：NTC模擬電阻  
① 10KΩ NTC (100~500KΩ)  
② 100KΩ NTC (1000~5MΩ)

# 規 格

MODEL	3316G		3318G	
Power	400W, 800W max. <sup>*1</sup>		400W, 800W max. <sup>*1</sup>	
Current	80A / 160A max. <sup>*1</sup>		20A / 40A max. <sup>*1</sup>	
Voltage	80V		500V	
Min. Operating Voltage	0.8V @ 80A		4V @ 20A	
<b>PROTECTIONS</b>				
Over Power Protection(OPP)			105%	
Over Current Protection(OCP)			105%	
Over Voltage Protection(OVP)			105%	
Over Temp Protection(OTP)			YES	
<b>Constant Current Mode</b>				
Range <sup>*2</sup>	0 ~ 8.04A	0 ~ 80.4A	0 ~ 2.04A	0 ~ 20.4A
Resolution	0.134mA	1.34mA	0.034mA	0.34mA
Accuracy	± 0.05% of ( setting + Range)			
<b>Constant Resistance Mode</b>				
Range	1Ω~ 60KΩ	0.0083Ω ~ 1Ω	30Ω~ 1800KΩ	0.3Ω ~ 30Ω
Resolution	0.0166mS	0.0166mΩ	0.000555mS	0.5mΩ
Accuracy	± 0.2% of (Setting + Range)			
<b>Constant Voltage Mode</b>				
Range	0 ~ 8.04V	0 ~ 80.4V	60V	500V
Resolution	0.000134V	0.00134V	0.001V	0.01V
Accuracy	± 0.025% of (Setting + Range)			
<b>Constant Power Mode</b>				
Range	0 ~ 40.02W	0 ~ 400.2W	0 ~ 40.02W	0 ~ 400.2W
Resolution	0.667mW	6.67mW	0.667mW	6.67mW
Accuracy	± 0.1% of (Setting + Range)			
<b>Constant Current + Constant Voltage Mode</b>				
Range	80V	80A	500V	20A
Resolution	0.00134V	1.34mA	0.01V	0.34mA
Accuracy	± 1.0% of (Setting + Range)			
<b>Constant Power + Constant Voltage Mode</b>				
Range	80V	400W	500V	400W
Resolution	0.00134V	6.67mW	0.01V	6.67mW
Accuracy	± 1.0% of (Setting + Range)			
Maximum Current	Turbo OFF Turbo ON <sup>*1</sup>	80A 160A	20A 40A	
Meas. Accuracy	± 3.0% of (Reading + Range)			
<b>Short/OCP/OPP Test Function</b>				
Short Time	Turbo OFF Turbo ON <sup>*1</sup>	100ms~10 Sec. or Continue 100~2000ms		
Meas. Accuracy	NA			
OCP Time (Tstep)	Turbo OFF Turbo ON <sup>*1</sup>	100mS 20mS		
Meas. Accuracy	NA			
OPP Time (Tstep)	Turbo OFF Turbo ON <sup>*1</sup>	100mS 20mS		
Meas. Accuracy	NA			
<b>BMS Test Mode<sup>*3</sup></b>				
Short Time	Turbo OFF Turbo ON <sup>*1</sup>	0.05mS~10ms 0.05mS~10ms		
Meas. Accuracy	±0.005mS			
OCP Time (Tstep)	Turbo OFF Turbo ON <sup>*1</sup>	0.05mS~10ms / 11~1000ms 0.05mS~10ms / 11~1000ms		
Meas. Accuracy	±0.005mS / ±0.2mS			
<b>Fuse Test Mode<sup>*4</sup></b>				
Trip & Non-Trip Time	Turbo OFF Turbo ON <sup>*1</sup>	r1 : 1~5999ms, r2 : 6~16383sec 1~2000mS		
Meas. Accuracy	r1 : ±0.2mS(<200mS), ±20mS(>200mS), r2: ±0.5S			
Repeat Cycle	0~255			
<b>Surge Test Mode</b>				
Surge current	0~160A		0~40A	
Normal current	0~80A		0~20A	
Surge Time	10~2000ms			
Surge Step	1~5			
<b>MPPT Mode</b>				
Algorithm	P&O			
Load mode	CV			
<b>Dynamic Mode (50KHz)</b>				
<b>Timing</b>				
Thigh & Tlow	0.010~9.999 / 99.99 / 999.9 / 9999mS			
Resolution	0.001 / 0.01 / 0.1 / 1mS			
Slew rate	5.4 ~ 337.5mA/us	54~ 3375mA/us	1.28 ~ 80mA/us	12.8 ~ 800mA/us
Accuracy	± (5% of Setting) ±10uS			
<b>Measurement</b>				
<b>Voltage Read Back</b>				
Range (5 Digital)	8.04V	80.4V	60V	500V
Resolution	0.000134V	0.00134V	0.001V	0.01V
Accuracy	± 0.025% of (Reading + Range)			
<b>Current Read Back</b>				
Range (5 Digital)	8.04A	80.4A	2.04A	20.4A
Resolution	0.000134A	0.00134A	0.000034A	0.00034A
Accuracy	± 0.05% of (Reading + Range)			
<b>Power Read Back</b>				
Range (5 Digital)	100W	400W	100W	400W
Resolution	0.001W	0.01W	0.001W	0.01W
Accuracy	± 0.1% of (Reading + Range)			
Current Monitor	FULL SCALE 10V			
Accuracy	0.5% of (Setting + Range)			
Current Programming Input	FULL SCALE 10V			
Programmable Short	BUILT-IN			
Load ON Voltage	0.1 ~ 25V		0.4~100V	
Accuracy	1% of (Setting + Range)			
Load OFF Voltage	0 ~ 25V		0~100V	
Accuracy	0.025% of (Setting + Range)			
Typical Short Resistance	0.009Ω		0.15Ω	
Maximum Short Current	80A		20A	
Dimension(HxWxD)	143 x 108 x 412 mm			
Operating Temperature <sup>*5</sup>	0 ~ 40°C			

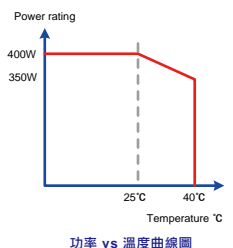
註\*1：最高達2倍額定電流和功率規格的Turbo mode操作模式，可應用於保險絲(Fuse)、BMS、Short / OCP / OPP的測試

註\*2：CC Mode可強制於Rangell

註\*3：BMS測試功能主要應用於電池BMS保護板的Short / OCCP及OCDP的測試

註\*4：Fuse測試功能主要應用於保險絲(Fuse)及斷路器(Breaker)的測試

註\*5：操作溫度範圍為0~40°C，此規格表內精確度僅適用於25°C±5°C



## 訂 購 方 式

### 直流電子負載模組

- ▶ 3316G  
80V · 80A · 400W
- ▶ 3318G  
500V · 20A · 400W



### 電子負載機框

選購介面：① GPIB Card ② RS232 Card ③ USB Card ④ LAN Card

- 3302G (單組框)  
5.5kg  
W160mm / H177mm  
D452mm



- 3305G (雙組框)  
7.5kg  
W269mm / H177mm  
D452mm



- 3300G (四組框)  
9.3kg  
W440mm / H177mm  
D445mm

