

	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. ^{*1}		300W, 600W max. ^{*1}		300W, 600W max. ^{*1}		300W, 600W max. ^{*1}		75W, 150W max. ^{*1}		
Current	30A, 60A max. ^{*1}		60A, 120A max. ^{*1}		12A, 24A max. ^{*1}		12A / 24A max. ^{*1}		15A / 30A max. ^{*1}		
Voltage	60V		60V		250V		500V		60V		
Min. Operating Voltage	0.3V @ 30A		0.3V @ 60A		1V @ 12A		6V @ 12A		0.25V @ 15A		
PROTECTIONS											
Over Power Protection(OPP)					105%						
Over Current Protection(OCP)					105%						
Over Voltage Protection(OVP)					105%						
Over Temp Protection(OTP)					YES						
Constant Current Mode											
Range ^{*2}	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)										
Constant Resistance Mode											
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)										
Constant Voltage Mode											
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)										
Constant Power Mode											
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)										
Constant Current + Constant Voltage Mode											
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)										
Constant Power + Constant Voltage Mode											
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 ^{*1}	30A 60A	60A 120A		12A 24A		12A 24A		15A 30A		
Meas. Accuracy	± 1.0% of (Reading + Range)										
Short/OCP/OPP Test Function											
Short Time	Turbo OFF Turbo ON ^{*1}	100ms~10 Sec. or Continue 100~2000ms									
Meas. Accuracy	NA										
OCP Time (Tstep)	Turbo OFF Turbo ON ^{*1}	100mS 20mS									
Meas. Accuracy	NA										
OPP Time (Tstep)	Turbo OFF Turbo ON ^{*1}	100mS 20mS									
Meas. Accuracy	NA										
BMS Test Mode^{*3}											
Short Time	Turbo OFF Turbo ON ^{*1}	0.05mS~10ms 0.05mS~10ms									
Meas. Accuracy	±0.005mS										
OCP Time (Tstep)	Turbo OFF Turbo ON ^{*1}	0.05mS~10ms / 11~1000ms 0.05mS~10ms / 11~1000ms									
Meas. Accuracy	±0.005mS / ±0.2mS										
Fuse Test Mode^{*4}											
Trip & Non-Trip Time	Turbo OFF Turbo ON ^{*1}	r1 : 1~5999ms, r2 : 6~16383sec 1~2000mS									
Meas. Accuracy	r1 : ±0.2mS(<200mS), ±20mS(>200mS), r2: ±0.5S										
Repeat Cycle	0~255										
Surge Test Mode											
Surge current	0~60A		0~120A		0~24A		0~24A		0~30A		
Normal current	0~30A		0~60A		0~12A		0~12A		0~15A		
Surge Time	10~1000ms										
Surge Step	1~5										
MPPT Mode											
Algorithm	P & O										
Load mode	CV										
P&O interval	1000ms ~ 60000ms										
Dynamic Mode (50KHz)											
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 0.008~0.5A/uS 0.004~0.25A/uS 0.04~2.5A/uS										
Slew rate	± (5% of Setting) ±10uS										
Accuracy											
Measurement											
Voltage Read Back											
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)										
Current Read Back											
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)										
Power Read Back											
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		
Accuracy	1% of (Setting + Range)										
Load OFF Voltage	0 ~ 25V		0 ~ 25V		0 ~ 50V		0 ~ 100V		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		
Maximum Short Current	30 A		60A		12A		12A		15A		
Dimension(HxWxD)	143 x 108 x 412 mm										
Operating Temperature ^{*5}	0 ~ 40°C										

註*1：最高達2倍額定電流和功率@1/3的電壓規格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. ^{*1}		400W, 800W max. ^{*1}	
Current	80A / 160A max. ^{*1}		20A / 40A max. ^{*1}	
Voltage	80V		500V	
Min. Operating Voltage	0.8V @ 80A		4V @ 20A	
PROTECTIONS				
Over Power Protection(OPP)			105%	
Over Current Protection(OCP)			105%	
Over Voltage Protection(OVP)			105%	
Over Temp Protection(OTP)			YES	
Constant Current Mode				
Range ^{*2}	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)			
Constant Resistance Mode				
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)			
Constant Voltage Mode				
Range	0 ~ 8.04V	0 ~ 80.4V	60V	500V
Resolution	0.000134V	0.00134V	0.001V	0.01V
Accuracy	± 0.025% of (Setting + Range)			
Constant Power Mode				
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)			
Constant Current + Constant Voltage Mode				
Range	80V	80A	500V	20A
Resolution	0.00134V	1.34mA	0.01V	0.34mA
Accuracy	± 1.0% of (Setting + Range)			
Constant Power + Constant Voltage Mode				
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 ^{*1}	80A 160A	20A 40A	
Meas. Accuracy	± 3.0% of (Reading + Range)			
Short/OCP/OPP Test Function				
Short Time	Turbo OFF Turbo ON ^{*1}	100ms~10 Sec. or Continue 100~2000ms		
Meas. Accuracy	NA			
OCP Time (Tstep)	Turbo OFF Turbo ON ^{*1}	100mS 20mS		
Meas. Accuracy	NA			
OPP Time (Tstep)	Turbo OFF Turbo ON ^{*1}	100mS 20mS		
Meas. Accuracy	NA			
BMS Test Mode^{*3}				
Short Time	Turbo OFF Turbo ON ^{*1}	0.05mS~10ms 0.05mS~10ms		
Meas. Accuracy	±0.005mS			
OCP Time (Tstep)	Turbo OFF Turbo ON ^{*1}	0.05mS~10ms / 11~1000ms 0.05mS~10ms / 11~1000ms		
Meas. Accuracy	±0.005mS / ±0.2mS			
Fuse Test Mode^{*4}				
Trip & Non-Trip Time	Turbo OFF Turbo ON ^{*1}	r1 : 1~5999ms, r2 : 6~16383sec 1~2000mS		
Meas. Accuracy	r1 : ±0.2mS(<200mS), ±20mS(>200mS), r2: ±0.5S			
Repeat Cycle	0~255			
Surge Test Mode				
Surge current	0~160A		0~40A	
Normal current	0~80A		0~20A	
Surge Time	10~2000ms			
Surge Step	1~5			
MPPT Mode				
Algorithm	P&O			
Load mode	CV			
Dynamic Mode (50KHz)				
Timing				
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			
Measurement				
Voltage Read Back				
Range (5 Digital)	8.04V	80.4V	60V	500V
Resolution	0.000134V	0.00134V	0.001V	0.01V
Accuracy	± 0.025% of (Reading + Range)			
Current Read Back				
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)			
Power Read Back				
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 ^{*5}	0 ~ 40°C			

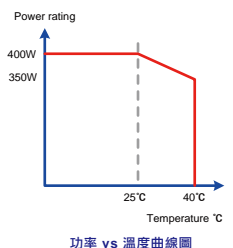
註*1：最高達2倍額定電流和功率@1/3的電壓規格的Turbo mode操作模式，可應用於保險絲(Fuse)、BMS、Short / OCP / OPP的測試

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



電子負載機櫃

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

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



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



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

