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## Certificate G83/1-1

### TYPE VERIFICATION TEST SHEET


#### SSEG DETAILS

SSEG Type Reference:		<b>EnaSolar 3kWGT-UK</b>	
SSEG Technology (as per Annex):		Photovoltaic (Annex C)	
Manufacturer:	Address:	Telephone:	Fax:
EnaSolar Ltd	321 Tuam Street Christchurch 8011 New Zealand	0064 3 366 4550	0064 3 366 0884
Technical File Reference No: R11CA11108-SC00			
Maximum Export Capability (SSEG Rating Less Parasitic Load)		3100W	

#### TEST HOUSE DETAILS

Name and Address of Test House	UL International New Zealand Ltd
Telephone Number	+64 3 9404400
Facsimile Number	+64 3 9404411
Email Address	<a href="mailto:enquiries@nz.ul.com">enquiries@nz.ul.com</a>

#### TEST DETAILS

Date of Test	November 2010 – December 2010
Date of Issue	10 March 2011
Name of Tester	Hoong Pang
Signature of Tester	
Test Location if Different from Above	Same as above

# Test Results

## POWER QUALITY

Harmonic Current Emissions (A)								
Harmonic	2nd	3rd	5 <sup>th</sup>	7th	9th	11th	13th	15 <sup>th</sup> -39th
Limit*	1.08	2.3	1.14	.77	.4	.33	.21	.15x(15/n)
Test Value	0.02	0.32	0.12	0.09	0.05	0.02	0.03	0.07

\*Maximum permissible harmonic current As per BS EN 61000-3-2 Class A

Voltage Fluctuation and Flicker				
	Starting	Stopping	Running	
Limit*	4%	4%	P <sub>st</sub> = 1.0	P <sub>It</sub> = 0.65
Test Value	1.15	3.15	0.11	0.15

\*Maximum permissible voltage fluctuation (expressed as a percentage of nominal voltage at 100% power) and flicker. As per BS EN 61000-3-3

	DC injection			Power Factor		
G83/1 Limit	20mA, tested at three power levels*			0.95 lag-0.95 lead at three voltage levels		
Test Level	10%	55%	100%	212V	230V	248V
Test Value #	5.2	7.3	15.2	0.999	0.999	0.999

\* Indicative values are shown for minimum, medium and maximum power levels.

# Insert maximum value of dc injection and worst case pf value recorded during testing

## UNDER/OVER FREQUENCY TESTS

Parameter	Under Frequency		Over Frequency	
	Frequency	Time	Frequency	Time
G83/1 Limit	47Hz	0.5s	50.5Hz	0.5s
Actual Setting	48Hz	0.3s	50.4Hz	0.3s
Trip Value	47.9Hz	440ms	50.5Hz	280ms

## UNDER/OVER VOLTAGE TESTS

Parameter	Under Voltage		Over Voltage	
	Voltage	Time	Voltage	Time
G83/1 Limit	207V	1.5s	264V	1.5s
Actual Setting	208V	1.0s	262V	1.0s
Trip Value	206V	1.1s	262V	280ms

## LOSS OF MAINS TEST

Method Used	Vector Shift		
Output Power Level*	10%	55%	100%
G83/1 Limit	0.5s	0.5s	0.5s
Trip Setting	NA	NA	NA
Trip Value	136ms	160ms	404ms

\*Indicative values are shown for minimum, medium and maximum power levels

## RECONNECTION TIMES

Reconnection Time	Under/Over Voltage	Under/Over Frequency	Loss of Mains
Minimum Value	180 seconds	180 seconds	180 seconds
Actual Setting	180 seconds	180 seconds	180 seconds
Recorded Value	180 seconds	180 seconds	180 seconds

## FAULT LEVEL CONTRIBUTION

C4.6 - As Photovoltaic SSEGs are inverter connected, they are deemed to comply with clause 5.8 and no further tests are required.

## SELF MONITORING – SOLID STATE SWITCHING

Not applicable as electro-mechanical relays are used.

## COMMENTS

The results of the G83/1-1 tests are summarised on this sheet. A full test report is available on request. These tests have been carried out with the specifications and parameters set to meet the requirements of G83/1-1. It is hereby declared by the manufacturer that all units shipped to the UK will have identical parameter settings and that these parameters cannot be changed by a user, installer or any other person without the use of password protected software.