66 Treffers Road, Christchurch, 8042, New Zealand
Tel: 0064 3 366 4550 Fax: 0064 3 366 0884 www.enasolar.net

Certificate G83/1-1

TYPE VERIFICATION TEST SHEET

SSEG DETAILS

SSEG Type Reference: **EnaSolar 3.8kWGT-UK**			
SSEG Technology (as per Annex): Photovoltiac (Annex C)			
Manufacturer: EnaSolar Ltd	Address: 66 Treffers Road Christchurch 8042 New Zealand	Telephone: 0064 3 366 4550	Fax: 0064 3 366 0884
Technical File Reference No: R11CA45637-SE01			
Maximum Export Capability (SSEG Rating Less Parasitic Load) 3800W			

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	enquiries@nz.ul.com

TEST DETAILS

Date of Test	10 October 2011 - 17 November 2011
Name of Tester	Richard Takau
Signature of Tester	
Test Location if Different from Above	Same as above

Test Results

POWER QUALITY

Harmonic Current Emissions (A)								
Harmonic	2nd	3rd	5^{th}	7th	9th	11th	13th	15^{th}-39th
Limit*	1.08	2.3	1.14	.77	.4	.33	.21	.15x(15/n)
Test Value	0.02	0.28	0.05	0.07	0.11	0.03	0.09	0.12

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

Voltage Fluctuation and Flicker				
	Starting	Stopping	Running	
Limit*	4%	4%	$P_{st} = 1.0$	$P_{lt} = 0.65$
Test Value	1.144	0.273	0.181	0.107

*Maximum permissible voltage fluctuation (expressed as a percentage of nominal voltage at 100% power) and flicker. As per BS EN 61000-3-3**. These results have been included from a report from an independent laboratory. Refer to Austest test report number 1117ENA38WGTAUNZ_47772P dated 17th of November 2011 for more detail**.

	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 #	11.8	13.1	19.5	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

	Under Frequency		**Over Frequency**	
Parameter	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	48Hz	280ms	50.5Hz	436ms

UNDER/OVER VOLTAGE TESTS

	Under Voltage		**Over Voltage**	
Parameter	Voltage	Time	Voltage	Time
G83/1 Limit	207V	1.5s	264V	1.5s
Actual Setting	208V	1.0s	262V	1.0s
Trip Value	206V	268ms	263V	376ms

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	228ms	188ms	144ms

*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

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.