



## Certificate G83/1-1

### Engineering Recommendation

Manufacturer:	<b>SMA Solar Technology AG</b>
Address:	Sonnenallee 1
Postal code, place:	34266 Niestetal
Country:	Germany

Test house details:	Masterpower Electronics Ltd, Aberdeen (UK) (a)
	<b>SMA Solar Technology AG</b> , R&D Department, Niestetal (D) (b)

Type reference:	Sunny Boy SB 2500 / SB 2800i / SB 3000
	Windy Boy WB 2500 / WB 2800i / WB 3000
Max. AC power:	2500 W / 2800 W / 3000 W
Nominal AC power:	2300 W / 2600 W / 2750 W

The results of the G83/1-1 tests are summarized in this certificate. SMA declares that all devices (with G83 setting) that are shipped to the UK comply with the requirements defined in engineering recommendation G83/1-1. These setting cannot be changed by an installer, user or by any other person without the use of a tool (password protected). The complete documentation can be viewed at SMA (headquarters) after prior announcement.

#### Test details

- Power quality
- Harmonic current emissions as per BS EN 61000-3-2 A
- Voltage fluctuations and flicker as per BS EN 61000-3-3 A
- DC injection / Power factor
- Under / Over frequency switch off
- Under / Over voltage switch off
- Loss of mains test

**SMA Solar Technology AG**

Niestetal, 11.02.2010

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Vice President T MP

## Test results

### Power quality

Harmonic current emissions as per BS EN 61000-3-2 A, tested by (b)								
Harmonic	2 <sup>nd</sup>	3 <sup>rd</sup>	5 <sup>th</sup>	7 <sup>th</sup>	9 <sup>th</sup>	11 <sup>th</sup>	13 <sup>th</sup>	15 <sup>th</sup> ... 39 <sup>th</sup>
Limit [A]	1.08	2.3	1.14	0.77	0.4	0.33	0.21	0.15 x (15/n)
Test value [A]	0.03	0.07	0.08	0.03	0.09	0.06	0.07	< limit BS EN 61000-3-2 A

Voltage Fluctuations and Flicker, tested by (a)						
Harmonic	starting		stopping		running	
Limit	4 %		4 %		P <sub>st</sub> = 1.0	
Test value	< 0.9 %		< 2.0 %		0.082	
					P <sub>it</sub> = 0.65	
					0.01	

	DC injection, tested by (a)			Power factor, tested by (a)		
G83/1-1 Limit	20 mA, tested at three levels			0.95 lag - 0.95 lead at three voltage levels at P <sub>rated</sub>		
Test level	10 %	55 %	100 %	212 V	230 V	248 V
Test value	2.286 mA	8.241 mA	5.895 mA	0.998	0.997	0.997

### Under / Over frequency switch off

Parameter	Under frequency switch off, tested by (a)		Over frequency switch off, tested by (a)	
	Frequency (Hz)	Time (s)	Frequency (Hz)	Time (s)
G83/1-1 Limit	47 Hz +/- 0.5 %	5 s	50.5 Hz +/- 0.5 %	5 s
Actual setting	47.0 Hz	-	50.5 Hz	-
Trip value	46.98 Hz	< 1 s	50.65 Hz	< 1 s

### Under / Over voltage switch off

Parameter	Under voltage switch off, tested by (b)		Over voltage switch off, tested by (b)	
	Voltage (V)	Time (s)	Voltage (V)	Time (s)
G83/1-1 Limit	207 V	5 s	264 V	5 s
Actual setting	209 V	-	261 V	-
Trip value	208 V	< 1 s	262 V	< 1 s

### Loss of mains test, tested by (a)

Method used	Resonant Circuit as per Annex C		
Output power level	10 % P <sub>rated</sub>	55 % P <sub>rated</sub>	100 % P <sub>rated</sub>
G83/1-1 Limit	0.5 (5) s	0.5 (5) s	0.5 (5) s
Trip setting	-	-	-
Trip value	0.13 s	0.1 s	0.1 s

## Reconnection time measurement, tested by (a)

	Under / Over voltage	Under / Over frequency	Loss of mains
Minimum value	180 s	180 s	180 s
Actual setting	180 s	180 s	180 s
Recorded value	210 s	200 s	200 s

## Fault level contribution

As Photovoltaic SSEGs are inverter connected, they are deemed to automatically comply with regulations and no further tests are required.

## Self monitoring – solid state switching

Not applicable as electro-mechanical relays used.