

Verification of Conformity

On the basis of the evaluations undertaken, the sample(s) of the below product have been found to comply with the requirements of the referenced specifications at the time the tests were carried out.

Applicant Name & Address	:	Chilicon Power, LLC; 1563 Calle Patricia Pacific Palisades, CA 90272
Product(s) Tested	:	Grid Support Interactive Inverter
Ratings and principal characteristics	:	See Page 2
Model(s)	:	CP-250E-60/72-208/240-MC4
Brand name	:	Chilicon Power
Firmware version	:	3353
Firmware checksum	:	
Relevant Standard(s)/Specification(s)	:	UL 1741 Supplement SA – Grid Support Utility Interactive Inverters and Converters, Sept. 7, 2016 with the source requirements document (SRD) – Electric Rule No.21 Generating Facility Interconnections
Verification Issuing Office Name & Address	:	Intertek, 3933 US Route 11, Cortland, NY 13045, USA
Date of Test(s)	:	07/25/2017 to 11/11/2017
Verification/Report Number(s)	:	100846617LAX-001

NOTE: This verification is part of the full test report(s) and should be read in conjunction with it.

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Signature

Name: Howard Liu
Position: Engineering Team Leader
Date: November 15, 2017

Ratings:



Chilicon Power
CP-250E-60-72-208/240-MC4

Designed in California
Manufactured in California

Enclosure NEMA-4
Max. Ambient Oa. Temp: 65C
FCC Part 15 Class B
Conforms to UL1741, IEEE1547
Certified to CSA Std C22.2 No. 107.1
& CSA T.L.L. 1-35
UL1741SA

Grid Support Interactive Inverter
Input Operating Voltage: 22V - 38.5V
Max DC Input Current: 12A
Rated Output Power: 289W
Max. Cont. Output Current: 1.20A (240V)
AC Output Voltage (min/nom/max): 211V 240V 264V
Max. Cont. Output Current: 1.39A (208V)
AC Output Voltage (min/nom/max): 183V 208V 229V
Operating Freq. Hz (min/nom/max): 59.3 60 60.5
Output Power Factor: 0.6 to 0.6 (1.0 Default)
Max Units Per Branch: 13(289W) 15(250W)



CAUTION: Risk of electric shock.
The DC Conductors of this photovoltaic system are ungrounded and may be energized.



Do not remove endplates, no user serviceable parts inside.
When the photovoltaic array is exposed to light it supplies a DC voltage to this equipment.
Input/Output galvanically isolated from chassis.

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ATTENTION: Risque de choc électrique.
Ne pas dévisser le boîtier.
Aucune pièce réparable par l'utilisateur.

U.S. Patent No. 8,870,592

Serial No

Lorsque le panneau solaire est exposé à la lumière, il fournit une tension continue à cet équipement.
Entrée/Sortie galvaniquement isolées du châssis.

Manufacturer's Stated Accuracy

Chilicon states the following accuracies according to the requirements of UL1741 SA.

Manufacturer's Stated Accuracy

Description	Value
Manufacturer's stated AC voltage accuracy (%Vac)	2%
Manufacturer's stated DC voltage accuracy (%Vdc)	2%
Manufacturer's stated AC current accuracy (%Aac)	2%
Manufacturer's stated frequency measurement accuracy (Hz or %Hz)	0.02Hz
Manufacturer's stated output power accuracy (W or %W)	5W
Manufacturer's stated reactive power accuracy (% or Var)	50Var
Manufacturer's stated power factor accuracy	0.02
Manufacturer's stated time accuracy (sec)	0.3sec

Test Summary

Chilicon completed the following tests according to UL1741 SA.

Grid Support Function Tested	Source Requirement Document(s)	Test Standard(s) and Section(s)	Completion Date
LOW/HIGH VOLTAGE RIDE-THROUGH	Electric Rule No. 21 Table Hh.1	UL 1741 SA 9	10/10/2017
LOW/HIGH FREQUENCY RIDE-THROUGH	Electric Rule No. 21 Table Hh.2	UL 1741 SA10	10/10/2017
DYNAMIC VOLT/VAR OPERATIONS	Electric Rule No. 21 Hh.2J	UL 1741 SA 13	11/1/2017
RAMP RATES	Electric Rule No. 21 Hh.2k	UL 1741 SA 11	10/10/2017
RECONNECT BY "SOFT START"	Electric Rule No. 21 Hh.2k	UL 1741 SA 11	10/9/2017
ANTI-ISLANDING PROTECTION - WITH GRID SUPPORT FUNCTIONS ENABLED	Electric Rule No. 21 Hh.1a	UL 1741 SA 8	10/20/2017
SPECIFIED POWER FACTOR	Electric Rule No. 21 Hh.2i	UL 1741 SA 12	9/29/2017

Grid Support Function Parameters

Chilicon used the following parameters during the testing of the grid support functions according to UL1741 SA.

SA9 Low/High Voltage Ride-Through

Operating Region	Voltage at Point of Interconnection (% of Nominal Voltage)	Operating Mode	Ride Through Until (s)	Default Maximum Trip Time (s)	Range of Adjustability Voltage Trip Magnitude (% of Nominal Voltage)	Range of Adjustability Clearing Time (s)
OV2	$V > 120$ [121]	Mandatory Operation	N/A	0.16	N/A	N/A
OV1	$120 \geq V > 110$ [117]	Momentary Cessation	12	13	110-120	1-13
CO	$110 \geq V > 100$ [107]	Continuous Operation	N/A	N/A	N/A	N/A
CO	$100 > V \geq 88$ [91]	Continuous Operation	N/A	N/A	N/A	N/A
UV1	$88 > V \geq 70$ [73]	Mandatory Operation	20	21	70-88	19-21
UV2	$70 > V \geq 50$ [53]	Mandatory Operation	10	11	50-88	10-11
UV3	$V < 50$	Momentary Cessation	1	2	N/A	0.5-2

SA10 Low High Frequency Ride-Through

Operating Region	Frequency at Point of Interconnection	Operating Mode	Ride Through Until (s)	Default Maximum Trip Time (s)	Range of Adjustability Frequency	Range of Adjustability Clearing Time (s)
OF2	$f > 62$ ($F=64$)	Permissive Operation	None	0.16	62-64	0.16
OF1	$f > 62$ ($F=62.2$)	Permissive Operation	None	0.16	62-64	0.16
High Frequency 1 (HF1)	$60.5 < f \leq 62$ [$F=60.8$]	Mandatory Operation	299	300	60.1-62	N/A
NOF	$F < 60.5$	Continuous Operation	Indefinite	N/A	N/A	N/A
NUF	$f \geq 58.5$	Continuous Operation	Indefinite	N/A	N/A	N/A
Low Frequency 1 (LF1)	$57 < f \leq 58.5$ [$F=58$]	Mandatory Operation	299	300	57-59.9	N/A
UF1	$F < 57$ ($F=56$)	Mandatory Operation	None	None	53-57	0.16
UF2	$F < 57$ ($F=53$)	Permissive Operation	None	None	53-57	0.16

SA11 Normal Ramp Parameters

Description	Value
Output current rating (Aac)	1.3
Minimum normal ramp-up rate (%I _{rated} / sec)	1
Maximum normal ramp-up rate (%I _{rated} / sec)	100
Output current range of function (%I _{rated})	0% to 100%
Ramp rate accuracy (%I _{rated} / sec)	2%

SA11 Soft-Start Ramp Parameters

Description	Value
Output current rating (Aac)	1.3
Minimum soft-start ramp-up rate (%I _{rated} / sec)	0.1
Maximum soft-start ramp-up rate (%I _{rated} / sec)	100
Output current range of function (%I _{rated})	0% to 100%
Ramp rate accuracy (%I _{rated} / sec)	2%

SA12 Specified Power Factor Parameters

Description	Value
Apparent power rating (VA)	289
Output power rating (W)	289
DC Input voltage range with SPF enabled (Vdc)	22-38.5
Nominal AC voltage (Vac)	120 L-N & 120V L-L
AC voltage range with SPF enabled (Vac)	102-138
Manufacturer's stated AC voltage accuracy (%Vac)	2%
Manufacturer's stated DC voltage accuracy (%Vdc)	2%
Active power range of function (W)	50-290
Manufacturer's stated Power Factor accuracy	0.2
Power factor settling time (sec)	30
Minimum Inductive (under excited) Power Factor	-0.3
Minimum Capacitive (overexcited) Power Factor	0.3

SA13 Volt/VAR Parameters

Description	Value
Apparent power rating (VA)	289
Output power rating (W)	289
EUT Input voltage range with Q(V) function enabled (Vdc)	22-38.5
Nominal AC EPS voltage (V)	120 L-N & 120V L-L
AC EPS voltage range with function enabled (Vac)	102-138
Reactive Power Accuracy (Var)	47
Max rated reactive Power (capacitive, overexcited) (VAr)	-165
Max rated reactive Power (inductive, underexcited) (VAr)	165
Maximum slope (VAr/V)	34.5
Deadband Range (Vac)	117.6-126
Settling Time (sec)	30 secs