

HISTORIC PRESERVATION COMMISSION STAFF REPORT

Address:	7101 Sycamore Ave., Takoma Park	Meeting Date:	01/11/17
Applicant:	David Band	Report Date:	01/04/17
Resource:	Non-Contributing Resource Takoma Park Historic District	Public Notice:	12/28/16
Review:	HAWP	Tax Credit:	n/a
Case Number:	37/03-17E	Staff:	Dan Bruechert

PROPOSAL: Solar panel installation**RECOMMENDATION:** Approval with conditions**STAFF RECOMMENDATION**Staff recommends HPC **approve** the HAWP application.**PROJECT DESCRIPTION**

SIGNIFICANCE: Non-Contributing to the Takoma Park Historic District
STYLE: Victorian Revival
DATE: 1987

The subject property is a non-contributing, three-bay, vinyl-sided, Victorian Revival house, one-and-a-half stories tall. The asphalt-shingled roof appears to be an L-shaped gable from the front; however, the roof contains an offset gable to the rear. The one-story front porch has a hipped roof and Victorian decorative scrollwork.

PROPOSAL

The proposal calls for the installation of 26 solar panels mounted flush to the roof. The panels will be installed on the northwest (street-facing) roof gable as well as the slopes on the east (rear) side of the house.

Twelve panels will be installed on the street-facing side with the remainder on the rear. The solar panels have an anti-glare coating and black anodized aluminum frames. All the hardware that attaches the solar array to the roof is obscured by the panels.

APPLICABLE GUIDELINES***Montgomery County Code, Chapter 24A Historic Resources Preservation***

(b) The commission shall instruct the director to issue a permit, or issue a permit subject to such conditions as are found to be necessary to insure conformity with the purposes and requirements of this chapter, if it finds that:

(2) The proposal is compatible in character and nature with the historical, archeological, architectural or cultural features of the historic site or the historic district in which an historic resource is located and would not be detrimental thereto or to the achievement of the purposes of this chapter; or

Takoma Park Historic District Design Guidelines

course. The only exceptions would be major additions and alterations to the scale and massing of Non-Contributing/Out-of-Period Resources which affect the surrounding streetscape and/or landscape and could impair character of the district as a whole.

STAFF DISCUSSION

7101 Sycamore Ave., Takoma Park is listed as a Non-Contributing resource to the Takoma Park Historic District. As such, most changes to Non-Contributing or Out-of-Period resources in the district are to be approved as a matter of course. The exception to this case is where the change will negatively impact the streetscape and would impact the district as a whole.

The installation of 26 solar panels – 12 of which are visible from the public right-of-way – will only have a minimal impact on the roofline of the building as they will be installed as close to the roof surface as possible. Additionally, because the house is significantly setback from the street, the solar panels will not have a significant impact the character of the surrounding district. And while the black solar panels will stand in contrast to the brown asphalt-shingled roof, overall they will not have a detrimental impact on the streetscape or landscape of the surrounding Takoma Park District.

STAFF RECOMMENDATIONS

Staff recommends that the Commission **approve** the HAWP application as being consistent with Chapter 24A-8(b)(2),

The proposal is compatible in character and nature with the historical, archeological, architectural or cultural features of the historic site or the historic district in which an historic resource is located and would not be detrimental thereto or to the achievement of the purposes of this chapter.

and with the general condition applicable to all Historic Area Work Permits that **the applicant will present 3 permit sets of drawings to HPC staff for review and stamping prior to submission for permits (if applicable)**. After issuance of the Montgomery County Department of Permitting Services (DPS) permit, the applicant will arrange for a field inspection by calling the DPS Field Services Office at 240-777-6370 prior to commencement of work and not more than two weeks following completion of work.



HISTORIC PRESERVATION COMMISSION
301/563-3400

DPS - #8

APPLICATION FOR HISTORIC AREA WORK PERMIT

Contact Email: jkrupski@solarcity.com Contact Person: JIM KRUPSKI
Daytime Phone No.: (202) 809-8349
Tax Account No.: 13- 01076972
Name of Property Owner: DAVID BAND Daytime Phone No.: (301) 412-8432
Address: 7101 SYCAMORE AVE, TAKOMA PARK MD 20912-4634
Street Number City State Zip Code
Contractor: SOLARCITY Phone No.: (888) 765-2489
Contractor Registration No.: 128948 (MHIC)
Agent for Owner: JAMES KRUPSKI Daytime Phone No.: (202) 809-8349

LOCATION OF BUILDING/PREMISE

House Number: 7101 Street: SYCAMORE AVE.
Town/City: TAKOMA PARK Nearest Cross Street: BEECH AVE.
Lot: 15 Block: 22 Subdivision: 0025
Liber: _____ Folio: _____ Parcel: 0000

PART ONE: TYPE OF PERMIT ACTION AND USE

1A. CHECK ALL APPLICABLE:

☐ Construct ☐ Extend ☐ Alter/Renovate
☐ Move ☒ Install ☐ Wreck/Raze
☐ Revision ☐ Repair ☐ Revocable

CHECK ALL APPLICABLE:

☐ A/C ☐ Slab ☐ Room Addition ☐ Porch ☐ Deck ☐ Shed
☒ Solar ☐ Fireplace ☐ Woodburning Stove ☐ Single Family
☐ Fence/Wall (complete Section 4) ☐ Other: _____

1B. Construction cost estimate: \$ 10,320.00

1C. If this is a revision of a previously approved active permit, see Permit # N/A

PART TWO: COMPLETE FOR NEW CONSTRUCTION AND EXTEND/ADDITIONS

2A. Type of sewage disposal: 01 ☐ WSSC 02 ☐ Septic 03 ☐ Other: _____
2B. Type of water supply: 01 ☐ WSSC 02 ☐ Well 03 ☐ Other: _____

PART THREE: COMPLETE ONLY FOR FENCE/RETAINING WALL

3A. Height _____ feet _____ inches

3B. Indicate whether the fence or retaining wall is to be constructed on one of the following locations:

☐ On party line/property line ☐ Entirely on land of owner ☐ On public right of way/easement

I hereby certify that I have the authority to make the foregoing application, that the application is correct, and that the construction will comply with plans approved by all agencies listed and I hereby acknowledge and accept this to be a condition for the issuance of this permit.

James Krupski
Signature of owner or authorized agent

19 DECEMBER 2016
Date

Approved: _____ For Chairperson, Historic Preservation Commission

Disapproved: _____ Signature: _____ Date: _____

Application/Permit No.: _____ Date Filed: _____ Date Issued: _____

Edit 6/21/99

SEE REVERSE SIDE FOR INSTRUCTIONS

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**THE FOLLOWING ITEMS MUST BE COMPLETED AND THE
REQUIRED DOCUMENTS MUST ACCOMPANY THIS APPLICATION.**

1. WRITTEN DESCRIPTION OF PROJECT

- a. Description of existing structure(s) and environmental setting, including their historical features and significance:

11,149 square foot residential property with
single family dwelling: two stories, 1785 square feet

- b. General description of project and its effect on the historic resource(s), the environmental setting, and, where applicable, the historic district:

Installation of 26 solar panels mounted flush to roof
of single-family dwelling

2. SITE PLAN

Site and environmental setting, drawn to scale. You may use your plat. Your site plan must include:

- a. the scale, north arrow, and date;
- b. dimensions of all existing and proposed structures; and
- c. site features such as walkways, driveways, fences, ponds, streams, trash dumpsters, mechanical equipment, and landscaping.

3. PLANS AND ELEVATIONS

You must submit 2 copies of plans and elevations in a format no larger than 11" x 17". Plans on 8 1/2" x 11" paper are preferred.

- a. Schematic construction plans, with marked dimensions, indicating location, size and general type of walls, window and door openings, and other fixed features of both the existing resource(s) and the proposed work.
- b. Elevations (facades), with marked dimensions, clearly indicating proposed work in relation to existing construction and, when appropriate, context. All materials and fixtures proposed for the exterior must be noted on the elevations drawings. An existing and a proposed elevation drawing of each facade affected by the proposed work is required.

4. MATERIALS SPECIFICATIONS

General description of materials and manufactured items proposed for incorporation in the work of the project. This information may be included on your design drawings.

5. PHOTOGRAPHS

- a. Clearly labeled photographic prints of each facade of existing resource, including details of the affected portions. All labels should be placed on the front of photographs.
- b. Clearly label photographic prints of the resource as viewed from the public right-of-way and of the adjoining properties. All labels should be placed on the front of photographs.

6. TREE SURVEY

If you are proposing construction adjacent to or within the dripline of any tree 6" or larger in diameter (at approximately 4 feet above the ground), you must file an accurate tree survey identifying the size, location, and species of each tree of at least that dimension.

7. ADDRESSES OF ADJACENT AND CONFRONTING PROPERTY OWNERS

For ALL projects, provide an accurate list of adjacent and confronting property owners (not tenants), including names, addresses, and zip codes. This list should include the owners of all lots or parcels which adjoin the parcel in question, as well as the owner(s) of lot(s) or parcel(s) which lie directly across the street/highway from the parcel in question.

HAWP APPLICATION: MAILING ADDRESSES FOR NOTIFYING
[Owner, Owner's Agent, Adjacent and Confronting Property Owners]

Owner's mailing address 7101 SYCAMORE AVE. TAKOMA PARK, MD 20912-4634	Owner's Agent's mailing address 9000 VIRGINIA MANOR RD, STE. 250 BELTSVILLE, MD 20705
Adjacent and confronting Property Owners mailing addresses	
7017 SYCAMORE AVE. TAKOMA PARK, MD 20912	7103 SYCAMORE AVE. TAKOMA PARK, MD 20912
7100 SYCAMORE AVE. TAKOMA PARK, MD 20912	

Existing Property Condition Photographs:



Detail: Front of house, Google street view, 7101 Sycamore Ave., Takoma Park



Detail: front of house, showing Mounting plane 1 (under satellite dish)

MOUNTING PLANE 1



Detail: side of house and driveway



Detail: back of house, showing Mounting plane 2



MOUNTING PLANE 2

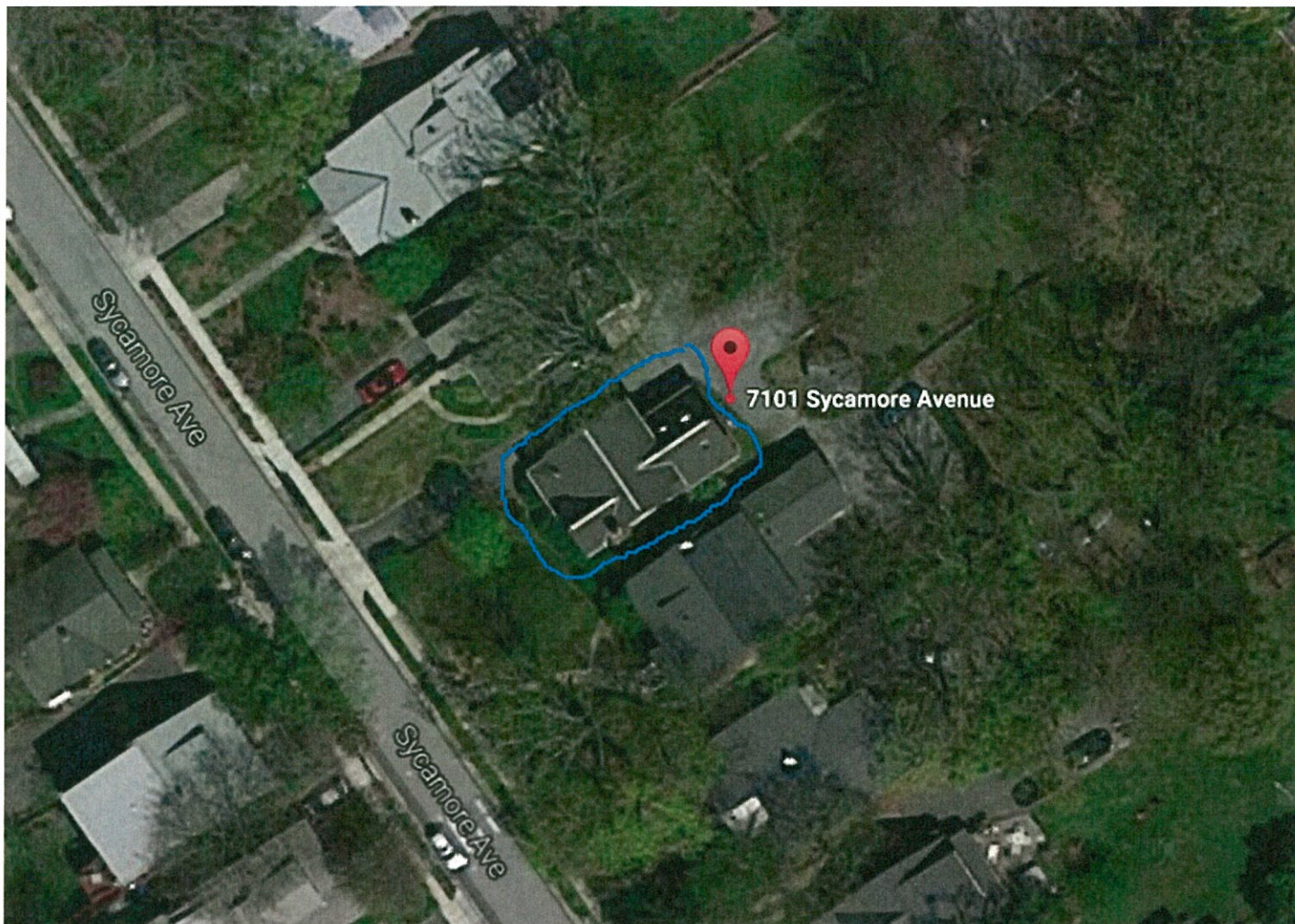


Detail: Mounting plane 1 (front of house)



Detail: Mounting plane 2 (back of house)





Detail: Google satellite view of home (circled)

November 26, 2016

RE: CERTIFICATION LETTER

Project/Job # 2093220
Project Address:

M Residence
7101 Sycamore Ave
Takoma Park, MD 20912

AHJ
SC Office

Montgomery County
Beltsville

Design Criteria:

- Applicable Codes = IRC 2015 / IBC 2015, ASCE 7-10, and 2012 NDS
- Risk Category = II
- Wind Speed = 115 mph, Exposure Category C, Partially/Fully Enclosed Method
- Ground Snow Load = 30 psf
- MP1: 2x8 @ 16" OC, Roof DL = 14.5 psf, Roof LL/SL = 19.41 psf (Non-PV), Roof LL/SL = 10.59 psf (PV)
- MP2: 2x8 @ 16" OC, Roof DL = 14.5 psf, Roof LL/SL = 21 psf (Non-PV), Roof LL/SL = 21 psf (PV)

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the law of the State of Maryland, License No. 49464, Expiration Date: 05/26/2018

Henry
Zhu

Digitally signed by Henry Zhu
DN: cn=Henry Zhu,
email=hzhu@solarcity.com,
ou=ADOBE(r)-AATL, c=US,
o=SolarCity Corporation
Date: 2016.11.26 23:32:06
+08'00'

Note: Per IBC 1613.1; Seismic check is not required because $S_s = 0.15451 < 0.4g$ and Seismic Design Category (SDC) = B < D

To Whom It May Concern,

[v] I reviewed the design of the photovoltaic (PV) system, as designed by the manufacturer, and the design criteria utilized for the mounting equipment and panel mounting assembly (rack system) for the installation of panels supported by the rack system, as shown on the drawings prepared for the above referenced address. I certify that the configurations and design criteria meet the standards and requirements of the International Residential Code (IRC) and International Existing Building Code (IEBC) adopted by Montgomery County in COMCQR 08.00.02.

[v] The attachment of the rack system to the building at the above address, including the location, number, and type of attachment points; the number of fasteners per attachment point; and the specific type of fasteners (size, diameter, length, minimum embedment into structural framing, etc.) meets the standards and requirements of the IRC and IEBC adopted by Montgomery County in COMCOR 08.00.02.

[v] I evaluated the existing roof structure of the building at the above address and analyzed its capacity to support the additional loads imposed by the PV system. I certify that no structural modifications of the existing roof structure are required. The existing roof structure meets the standards and requirements of the IRC and IEBC, adopted by Montgomery County in COMCOR 08.00.02, necessary to support the PV system.

[] I evaluated the existing roof structure of the building at the above address and analyzed its capacity to support the additional loads imposed by the PV system. Structural modifications of the existing roof structure are required. I certify that the roof structure, as modified on the drawings for this project, will support the additional loads imposed by the PV system. I further certify that design of the modified roof structure meets the standards and requirements of the IRC and IEBC, adopted by Montgomery County in COMCOR 08 00 02

☒ I prepared or approved the construction documents for the mounting equipment, rack system, roof structure for this project.

3055 Clearyview Way San Mateo, CA 94402 • (650) 638 - 1028 (888) SOL - CITY • (650) 638 - 1029 solarcity.com

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DATE 08-17-96 BY SP8 BTG/KS

HARDWARE DESIGN AND STRUCTURAL ANALYSIS RESULTS SUMMARY TABLES

Landscape Hardware	Hardware - Landscape Modules' Standoff Specifications					
	X-X Spacing	X-X Cantilever	Y-Y Spacing	Y-Y Cantilever	Configuration	Uplift DCR
MP1	64"	24"	39"	NA	Staggered	38.8%
MP2	64"	24"	39"	NA	Staggered	34.8%

Portrait Hardware	Hardware - Portrait Modules' Standoff Specifications					
	X-X Spacing	X-X Cantilever	Y-Y Spacing	Y-Y Cantilever	Configuration	Uplift DCR
MP1	64"	20"	65"	NA	Staggered	63.7%
MP2	48"	20"	65"	NA	Staggered	42.8%

Structure	Mounting Plane Framing			Qualification Results
	Type	Spacing	Pitch	Member Evaluation Results
MP1	Vaulted Ceiling	16" O.C.	40°	Member Impact Check OK
MP2	Vaulted Ceiling	16" O.C.	26°	Member Analysis OK

Refer to the submitted drawings for details of information collected during a site survey. All member analysis and/or evaluation is based on framing information gathered on site. The existing gravity and lateral load carrying members were evaluated in accordance with the IBC and the IEBC.

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[illegible]

STRUCTURE ANALYSIS - LOADING SUMMARY AND MEMBER CHECK - MP1

Member Properties Summary					
MP1		Horizontal Member Spans		Rafter Properties	
		Overhang	0.32 ft	Actual W	1.50"
Roof System Properties		Span 1	13.85 ft	Actual D	7.25"
Number of Spans (w/o Overhang)	1	Span 2		Nominal	Yes
Roofing Material	Comp Roof	Span 3		A (in ²)	10.88
Re-Roof	No	Span 4		Sx (in. ³)	13.14
Plywood Sheathing	No	Span 5		Ix (in. ⁴)	47.63
Board Sheathing	Solid-Sheathing	Total Rake Span	18.50 ft	TL Defl'n Limit	180
Vaulted Ceiling	Yes	PV 1 Start	1.58 ft	Wood Species	SPF
Ceiling Finish	1/2" Gypsum Board	PV 1 End	13.50 ft	Wood Grade	#2
Rafter Slope	40°	PV 2 Start		Fb (psi)	875
Rafter Spacing	16" O.C.	PV 2 End		Fv (psi)	135
Top Lat Bracing	Full	PV 3 Start		E (psi)	1,400,000
Bot Lat Bracing	Full	PV 3 End		E-min (psi)	510,000

Member Loading Summary					
Roof Pitch	10/12	Initial	Pitch Adjust	Non-PV Areas	PV Areas
Roof Dead Load	DL	14.5 psf	x 1.31	18.9 psf	18.9 psf
PV Dead Load	PV-DL	3.0 psf	x 1.31		3.9 psf
Roof Live Load	RLL	20.0 psf	x 0.70	14.0 psf	
Live/Snow Load	LL/SL ^{1,2}	30.0 psf	x 0.65 x 0.35	19.4 psf	10.6 psf
Total Load (Governing LC)	TL			38.3 psf	33.4 psf

Notes: 1. ps = Cs*pf; Cs -roof, Cs -pv per ASCE 7 [Figure 7-2] 2. pf = 0.7 (C_e) (C_t) (I_s) p_g; C_e=0.9, C_t=1.1, I_s=1.0

Member Design Summary (per NDS)					
Governing Load Comb	CD	CL (+)	CL (-)	CF	Cr
D + S	1.15	1.00	1.00	1.2	1.15

Member Analysis Results Summary					
Governing Analysis	Pre-PV Moment	(lb-in)	Post-PV Moment	Net Impact	Result
Gravity Loading Check	1,118		978	0.87	Pass

CALCULATION OF DESIGN WIND LOADS - MP1

Mounting Plane Information			
Roofing Material		Comp Roof	
Roof Slope		40°	
Rafter Spacing		16" O.C.	
Framing Type / Direction		Y-Y Rafters	
PV System Type		SolarCity SleekMount™	
Zep System Type		ZS Comp	
Standoff (Attachment Hardware)		Comp Mount Type C	
Spanning Vents		No	

Wind Design Criteria			
Wind Design Code	IBC 2015	ASCE 7-10	
Wind Design Method		Partially/Fully Enclosed Method	
Ultimate Wind Speed	V-Ult	115 mph	Fig. 1609A
Exposure Category		C	Section 26.7
Roof Style		Gable Roof	Fig. 30.4-2A/B/C-5A/B
Mean Roof Height	h	25 ft	Section 26.2

Wind Pressure Calculation Coefficients			
Wind Pressure Exposure	K_z	0.95	Table 30.3-1
Topographic Factor	K_{zt}	1.00	Section 26.8
Wind Directionality Factor	K_d	0.85	Section 26.6-1
Importance Factor	I	NA	
Velocity Pressure	q_h	$q_h = 0.00256 (K_z) (K_{zt}) (K_d) (V^2)$ 27.2 psf	Equation 30.3-1

Wind Pressure			
Ext. Pressure Coefficient (Up)	$G C_p$ (Up)	-0.95	Fig. 30.4-2A/B/C-5A/B
Ext. Pressure Coefficient (Down)	$G C_p$ (Down)	0.88	Fig. 30.4-2A/B/C-5A/B
Design Wind Pressure	p	$p = q_h (G C_p)$	Equation 30.4-1
Wind Pressure Up	$P_{(up)}$	-25.9 psf	
Wind Pressure Down	$P_{(down)}$	23.8 psf	

ALLOWABLE STANDOFF SPACINGS

		X-Direction	Y-Direction
Max Allowable Standoff Spacing	Landscape	64"	39"
Max Allowable Cantilever	Landscape	24"	NA
Standoff Configuration	Landscape	Staggered	
Max Standoff Tributary Area	Trib	17 sf	
PV Assembly Dead Load	W-PV	3.0 psf	
Net Wind Uplift at Standoff	T-actual	-247 lbs	
Uplift Capacity of Standoff	T-allow	637 lbs	
Standoff Demand/Capacity	DCR	38.8%	

		X-Direction	Y-Direction
Max Allowable Standoff Spacing	Portrait	64"	65"
Max Allowable Cantilever	Portrait	20"	NA
Standoff Configuration	Portrait	Staggered	
Max Standoff Tributary Area	Trib	29 sf	
PV Assembly Dead Load	W-PV	3.0 psf	
Net Wind Uplift at Standoff	T-actual	-406 lbs	
Uplift Capacity of Standoff	T-allow	637 lbs	
Standoff Demand/Capacity	DCR	63.7%	

STRUCTURE ANALYSIS - LOADING SUMMARY AND MEMBER CHECK - MP2

Member Properties Summary					
MP2		Horizontal Member Spans		Rafter Properties	
		Overhang	0.32 ft	Actual W	1.50"
Roof System Properties		Span 1	14.26 ft	Actual D	7.25"
Number of Spans (w/o Overhang)	1	Span 2		Nominal	Yes
Roofing Material	Comp Roof	Span 3		A (in ^{^2})	10.88
Re-Roof	No	Span 4		Sx (in. ^{^3})	13.14
Plywood Sheathing	No	Span 5		Ix (in ^{^4})	47.63
Board Sheathing	Solid-Sheathing	Total Rake Span	16.22 ft	TL Defl'n Limit	180
Vaulted Ceiling	Yes	PV 1 Start	1.50 ft	Wood Species	SPF
Ceiling Finish	1/2" Gypsum Board	PV 1 End	13.50 ft	Wood Grade	#2
Rafter Slope	26°	PV 2 Start		Fb (psi)	875
Rafter Spacing	16" O.C.	PV 2 End		Fv (psi)	135
Top Lat Bracing	Full	PV 3 Start		E (psi)	1,400,000
Bot Lat Bracing	Full	PV 3 End		E-min (psi)	510,000

Member Loading Summary					
Roof Pitch	6/12	Initial	Pitch Adjust	Non-PV Areas	PV Areas
Roof Dead Load	DL	14.5 psf	x 1.11	16.1 psf	16.1 psf
PV Dead Load	PV-DL	3.0 psf	x 1.11		3.3 psf
Roof Live Load	RLL	20.0 psf	x 0.90	18.0 psf	
Live/Snow Load	LL/SL ^{1,2}	30.0 psf	x 0.7 x 0.7	21.0 psf	21.0 psf
Total Load (Governing LC)	TL			37.1 psf	40.5 psf

Notes: 1. ps = Cs*pf; Cs -roof, Cs -pv per ASCE 7 [Figure 7-2] 2. pf = 0.7 (C_e) (C_s) (I_s) p_g; C_e=0.9, C_s=1.1, I_s=1.0

Member Design Summary (per NDS)					
Governing Load Comb	CD	CL (+)	CL (-)	CF	Cr
D + S	1.15	1.00	1.00	1.2	1.15

Member Analysis Results Summary					
Governing Analysis	Max Moment	@ Location	Capacity	DCR	Result
(+) Bending Stress (psi)	1,248	7.5 ft	1,389	0.90	Pass

CALCULATION OF DESIGN WIND LOADS - MP2

Mounting Plane Information			
Roofing Material		Comp Roof	
Roof Slope		26°	
Rafter Spacing		16" O.C.	
Framing Type / Direction		Y-Y Rafters	
PV System Type		SolarCity SleekMount™	
Zep System Type		ZS Comp	
Standoff (Attachment Hardware)		Comp Mount Type C	
Spanning Vents		No	

Wind Design Criteria			
Wind Design Code	IBC 2015	ASCE 7-10	
Wind Design Method		Partially/Fully Enclosed Method	
Ultimate Wind Speed	V-Ult	115 mph	Fig. 1609A
Exposure Category		C	Section 26.7
Roof Style		Gable Roof	Fig. 30.4-2A/B/C-5A/B
Mean Roof Height	h	25 ft	Section 26.2

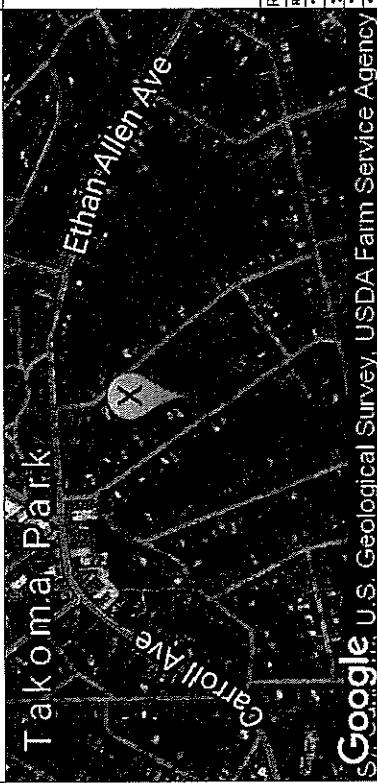
Wind Pressure Calculation Coefficients			
Wind Pressure Exposure	K_z	0.95	Table 30.3-1
Topographic Factor	K_{zt}	1.00	Section 26.8
Wind Directionality Factor	K_d	0.85	Section 26.6-1
Importance Factor	I	NA	
Velocity Pressure	q_h	$q_h = 0.00256 (K_z) (K_{zt}) (K_d) (V^2)$ 27.2 psf	Equation 30.3-1

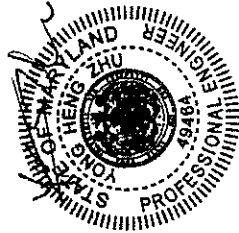
Wind Pressure			
Ext. Pressure Coefficient (Up)	GCp (Up)	-0.88	Fig. 30.4-2A/B/C-5A/B
Ext. Pressure Coefficient (Down)	GCp (Down)	0.45	Fig. 30.4-2A/B/C-5A/B
Design Wind Pressure	p	$p = q_h (GCp)$	Equation 30.4-1
Wind Pressure Up	$P_{(up)}$	-23.8 psf	
Wind Pressure Down	$P_{(down)}$	16.0 psf	

ALLOWABLE STANDOFF SPACINGS

		X-Direction	Y-Direction
Max Allowable Standoff Spacing	Landscape	64"	39"
Max Allowable Cantilever	Landscape	24"	NA
Standoff Configuration	Landscape	Staggered	
Max Standoff Tributary Area	Trib	17 sf	
PV Assembly Dead Load	W-PV	3.0 psf	
Net Wind Uplift at Standoff	T-actual	-222 lbs	
Uplift Capacity of Standoff	T-allow	637 lbs	
Standoff Demand/Capacity	DCR	34.8%	

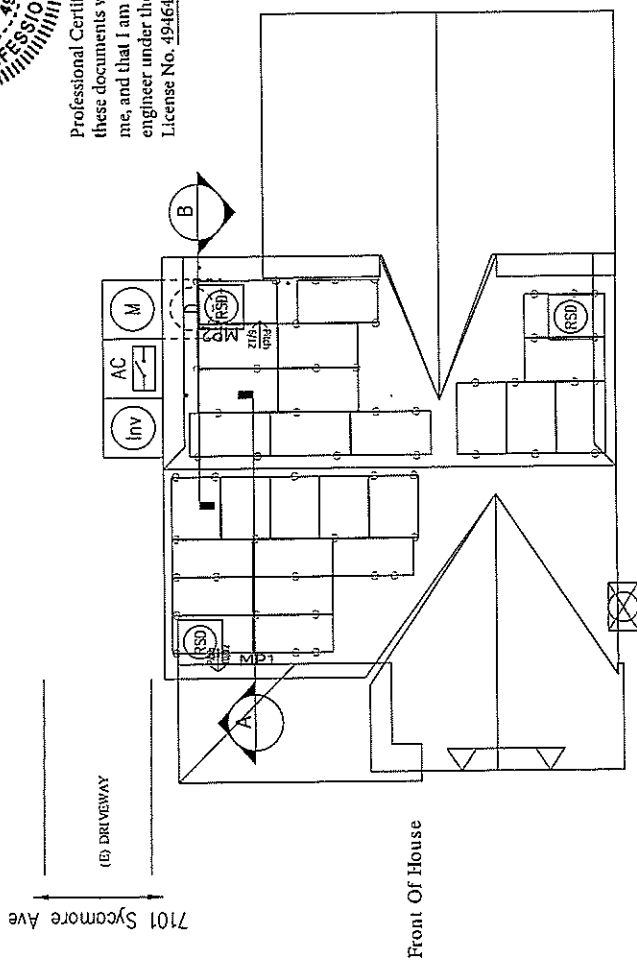
		X-Direction	Y-Direction
Max Allowable Standoff Spacing	Portrait	48"	65"
Max Allowable Cantilever	Portrait	20"	NA
Standoff Configuration	Portrait	Staggered	
Max Standoff Tributary Area	Trib	22 sf	
PV Assembly Dead Load	W-PV	3.0 psf	
Net Wind Uplift at Standoff	T-actual	-273 lbs	
Uplift Capacity of Standoff	T-allow	637 lbs	
Standoff Demand/Capacity	DCR	42.8%	

ABBREVIATIONS		ELECTRICAL NOTES		JURISDICTION NOTES	
A AMPERE AC ALTERNATING CURRENT BLDG BUILDING CONC CONCRETE DC DIRECT CURRENT EGC EQUIPMENT GROUNDING CONDUCTOR (E) EXISTING EMT ELECTRICAL METALLIC TUBING FSB FIRE SET-BACK GALV GALVANIZED GEC GROUNDING ELECTRODE CONDUCTOR GND GROUND HDS HOT DIPPED GALVANIZED I CURRENT Imp CURRENT AT MAX POWER Isc SHORT CIRCUIT CURRENT KVA KILOWATT AMPERE KW KILOWATT LBW LOAD BEARING WALL MIN MINIMUM (N) NEW NEUT NEUTRAL NTS NOT TO SCALE OC ON CENTER PL PROPERTY LINE POI POINT OF INTERCONNECTION PV PHOTOVOLTAIC SCH SCHEDULE S STAINLESS STEEL STC STANDARD TESTING CONDITIONS TYP TYPICAL UPS UNINTERRUPTIBLE POWER SUPPLY V VOLT Vmp VOLTAGE AT MAX POWER Voc VOLTAGE AT OPEN CIRCUIT W WATT 3R NEMA 3R, RAIN/TIGHT		1. THIS SYSTEM IS GRID-INTERFERED VIA A UL-LISTED POWER-CONDITIONING INVERTER. 2. THIS SYSTEM HAS NO BATTERIES, NO UPS. 3. A NATIONALLY-RECOGNIZED TESTING LABORATORY SHALL LIST ALL EQUIPMENT IN COMPLIANCE WITH ART. 110.3. 4. WHERE ALL TERMINALS OF THE DISCONNECTING MEANS MAY BE ENERGIZED IN THE OPEN POSITION, A SIGN WILL BE PROVIDED WARNING OF THE HAZARDS PER ART. 690.17. 5. EACH UNGROUNDED CONDUCTOR OF THE MULTIWIRE BRANCH CIRCUIT WILL BE IDENTIFIED BY PHASE AND SYSTEM PER ART. 210.5. 6. CIRCUITS OVER 250V TO GROUND SHALL COMPLY WITH ART. 250.97, 250.97(B). 7. DC CONDUCTORS EITHER DO NOT ENTER BUILDING OR ARE RUN IN METALLIC RACEWAYS OR ENCLOSURES TO THE FIRST ACCESSIBLE DC DISCONNECTING MEANS PER ART. 690.31(E). 8. ALL WIRES SHALL BE PROVIDED WITH STRAIN RELIEF AT ALL ENTRY INTO BOXES AS REQUIRED BY UL LISTING. 9. MODULE FRAMES SHALL BE GROUNDED AT THE UL-LISTED LOCATION PROVIDED BY THE MANUFACTURER USING UL LISTED GROUNDING HARDWARE. 10. MODULE FRAMES, RAIL AND POSTS SHALL BE BONDED WITH EQUIPMENT GROUND CONDUCTORS.		STRUCTURAL DESIGN FOR THE SUPPORTING STRUCTURE OF THE HOUSE WAS PERFORMED IN ACCORDANCE WITH IRC/IBC 2015 - STRUCTURAL DESIGN FOR THE RACK SYSTEM AND MOUNTING HARDWARE WAS PERFORMED IN ACCORDANCE WITH IRC/IBC 2015.	
LICENSE		GENERAL NOTES		VICINITY MAP	
#1805 MASTER ELECTRICIAN Nicholaus Meyers		1. ALL WORK SHALL COMPLY WITH THE 2015 IBC AND 2015 IRC. 2. ALL ELECTRICAL WORK SHALL COMPLY WITH THE 2014 NATIONAL ELECTRIC CODE.			
MODULE GROUNDING METHOD: ZEP SOLAR Ahl: Montgomery County				PV1 COVER SHEET PV2 SITE PLAN PV3 STRUCTURAL VIEWS PV4 UPLIFT CALCULATIONS PV5 THREE LINE DIAGRAM Cutsheets Attached	
UTILITY: PEPCO (MD)				REV BY DATE COMMENTS	
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Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the law of the State of Maryland, License No. 49464, Expiration Date: 05/26/2018

Henry Zhu
Digitally signed by Henry Zhu
DN: cn=Henry Zhu,
email=henry@solcity.com,
ou=ADOBE, o=HATL, ou=US,
c=US
Date: 2016.11.23 13:24:43 -0800



MP1	PITCH: 40 AZIMUTH: 235 MATERIAL: Camp Shingle	ARRAY PITCH: 40 ARRAY AZIMUTH: 235 STORY: 2 Stories
MP2	PITCH: 26 AZIMUTH: 55 MATERIAL: Camp Shingle	ARRAY PITCH: 26 ARRAY AZIMUTH: 55 STORY: 2 Stories

LEGEND

- (E) UTILITY METER & WARNING LABEL
- INVERTER W/ INTEGRATED DC DISCO & WARNING LABELS
- DC DISCONNECT & WARNING LABELS
- AC DISCONNECT & WARNING LABELS
- DC JUNCTION/COMBINER BOX & LABELS
- DISTRIBUTION PANEL & LABELS
- LOAD CENTER & WARNING LABELS
- DEDICATED PV SYSTEM METER
- RAPID SHUTDOWN
- STANDOFF LOCATIONS
- CONDUIT RUN ON EXTERIOR
- CONDUIT RUN ON INTERIOR
- GATE/FENCE
- HEAT PRODUCING VENTS ARE RED
- INTERIOR EQUIPMENT IS DASHED

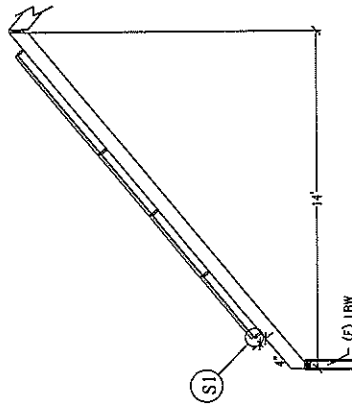
SITE PLAN

Scale: 1/8" = 1'



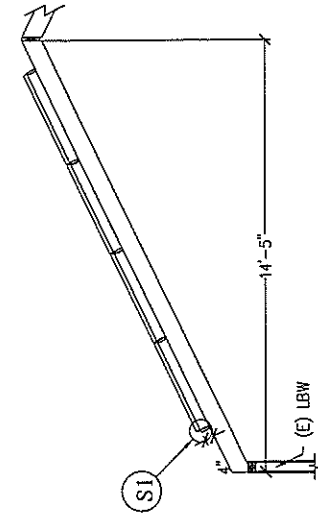
JOB NUMBER: JB-2093220 00		PREPARED BY: David M Band		DESCRIPTION: David M Band RESIDENCE	
DRAWING SYSTEM: Comp Mount Type C		DATE: 11/26/2016		SHEET: PV 2	
WORKS: (26) LG # LG315N1C-Z4		PAGE NAME: SITE PLAN		SHEET: PV 2	
DRAWN BY: Delta # Solivio 7.6 TL		DATE: 11/26/2016		SHEET: PV 2	
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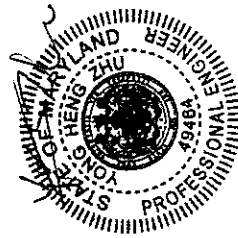
SIDE VIEW OF MP1 NTS

MP1	X-SPACING	X-CANTILEVER	Y-SPACING	Y-CANTILEVER	NOTES
LANDSCAPE	64"	24"	39"	0"	STAGGERED
PORTRAIT	64"	20"	64"	0"	
RAFTER	2x8 @ 16" OC		ROOF AZI 335	PITCH 46	STORIES: 2
			ARRAY AZI 335	PITCH 46	
					Comp Shingle - Solid Sheathing



SIDE VIEW OF MP2 NTS

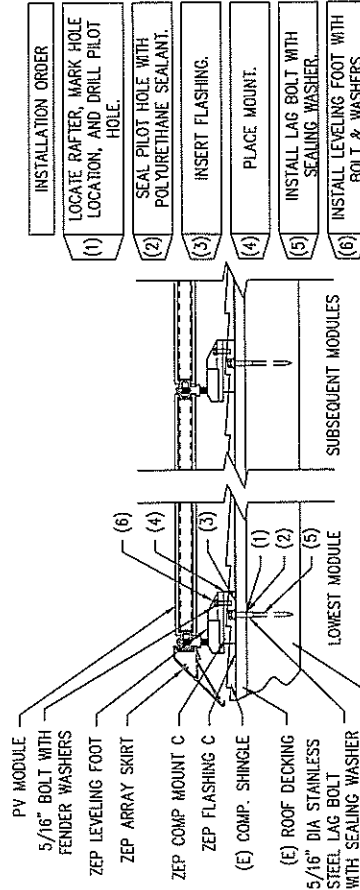
MP2	X-SPACING	X-CANTILEVER	Y-SPACING	Y-CANTILEVER	NOTES
LANDSCAPE	64"	24"	39"	0"	STAGGERED
PORTRAIT	48"	20"	64"	0"	
RAFTER	2x8 @ 16" OC		ROOF AZI 55	PITCH 26	STORIES: 2
			ARRAY AZI 55	PITCH 26	
					Comp Shingle - Solid Sheathing



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the law of the State of Maryland, License No. 49464, Expiration Date: 05/26/2018

Digitally signed by Henry Zhu
 DN: cn=Henry Zhu, email=henryzhu@solcity.com, ou=ADOBE/AATL-CUL, o=SolCity Corporation, c=USA
 Date: 2016.11.26 13:25 -0800

Henry
Zhu



S1 STANDOFF

Scale: 1 1/2" = 1'

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JOB NUMBER: JB-2093220 00
 DRAWING SYSTEM: Comp Mount Type C
 MOSES: (28) LG # LG315NIC-Z4
 REVISION: Delta # Solivio 7.6 TL

PREMISE OWNER:
 DAVID M BAND
 7101 SYCAMORE AVE
 TAKOMA PARK, MD 20912

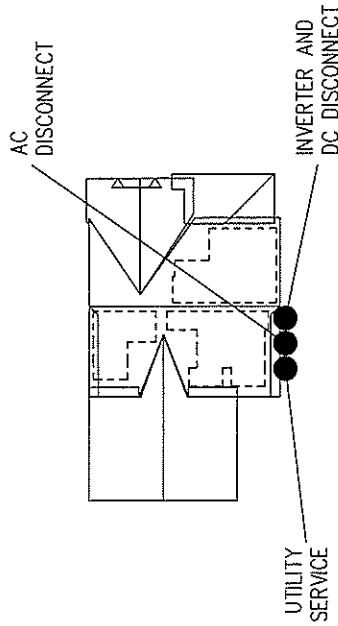
DESCRIPTION:
 David M Band Residence
 8.19 KW PV ARRAY

DESIGNER:
 Lisette Lopez
 PV 3 11/26/2016

SolarCity
 3905 Chukar Way
 San Mateo, CA 94402
 T: (650) 639-1028 F: (650) 639-1029
 (800)-501-0177 (415)-2469 www.solcity.com

CAUTION

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS SHOWN:
- Address: 7101 Sycamore Ave



[SOLAR PHOTOVOLTAIC ARRAY(S)]

PHOTOVOLTAIC BACK-FED CIRCUIT BREAKER IN MAIN ELECTRICAL PANEL IS AN A/C DISCONNECT PER NEC 690.17

OPERATING VOLTAGE = 240V JB-2093220-00

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JOB NUMBER: JB-2093220 00
MOUNTING SYSTEM: Comp Mount Type C
WORKER: (26) LG # LG315NIC-Z4
INVERTER: Delta # Soliva 7.6 TL

PERMITS OWNER: DAVID M BAND
7101 SYCAMORE AVE
TAKOMA PARK, MD 20912

DESCRIPTION: David M Band RESIDENCE
8.19 KW PV ARRAY

DESIGNER: Lisette Lopez
SHEET: PV 6
REV: 11/26/2016

SolarCity
3355 Sycamore Way
San Mateo, CA 94402
T: (650) 638-1025 F: (650) 638-1029
(800)-SOL-CITY (752-2469) www.solarcity.com

WARNING: PHOTOVOLTAIC POWER SOURCE

Label Location:
(C)(CB)
Per Code:
NEC 690.31.G.3
Label Location:
(DC) (INV)
Per Code:
NEC 690.14.C.2

**PHOTOVOLTAIC DC
DISCONNECT**

MAXIMUM POWER-
POINT CURRENT (I_{mp}) A
MAXIMUM POWER-
POINT VOLTAGE (V_{mp}) V
MAXIMUM SYSTEM
VOLTAGE (V_{oc}) V
SHORT-CIRCUIT
CURRENT (I_{sc}) A

Label Location:
(DC) (INV)
Per Code:
NEC 690.53

WARNING

ELECTRIC SHOCK HAZARD
IF A GROUND FAULT IS INDICATED
NORMALLY GROUNDED
CONDUCTORS MAY BE
UNGROUND AND ENERGIZED

Label Location:
(DC) (INV)
Per Code:
NEC 690.5(C)

WARNING

ELECTRIC SHOCK HAZARD
TERMINALS ON BOTH LINE AND
LOAD SIDES MAY BE ENERGIZED
IN THE OPEN POSITION
DC VOLTAGE IS
ALWAYS PRESENT WHEN
SOLAR MODULES ARE
EXPOSED TO SUNLIGHT

Label Location:
(DC) (CB)
Per Code:
NEC 690.17(4)

**PHOTOVOLTAIC AC
DISCONNECT**

Label Location:
(AC) (POI)
Per Code:
NEC 690.14.C.2

MAXIMUM AC
OPERATING CURRENT A
MAXIMUM AC
OPERATING VOLTAGE V

Label Location:
(AC) (POI)
Per Code:
NEC 690.54

WARNING

ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALS
TERMINALS ON BOTH LINE AND
LOAD SIDES MAY BE ENERGIZED
IN THE OPEN POSITION

Label Location:
(AC)(POI)
Per Code:
NEC 690.17.E

WARNING

ELECTRIC SHOCK HAZARD
THE DC CONDUCTORS OF THIS
PHOTOVOLTAIC SYSTEM ARE
UNGROUND AND
MAY BE ENERGIZED

Label Location:
(DC) (INV)
Per Code:
NEC 690.35(F)
TO BE USED WHEN
INVERTER IS
UNGROUND

PHOTOVOLTAIC POINT OF
INTERCONNECTION

WARNING: ELECTRIC SHOCK
HAZARD. DO NOT TOUCH
TERMINALS. TERMINALS ON
BOTH THE LINE AND LOAD SIDE
MAY BE ENERGIZED IN THE OPEN
POSITION. FOR SERVICE
DISCONNECT BOTH SOURCE
AND MAIN BREAKER.
PV POWER SOURCE

OPERATING CURRENT A
MAXIMUM AC
OPERATING VOLTAGE V

Label Location:
(POI)
Per Code:
NEC 690.17.4; NEC 690.54

CAUTION

DUAL POWER SOURCE
SECOND SOURCE IS
PHOTOVOLTAIC SYSTEM

Label Location:
(POI)
Per Code:
NEC 690.64.B.4

CAUTION

PHOTOVOLTAIC SYSTEM
CIRCUIT IS BACKFED

Label Location:
(D) (POI)
Per Code:
NEC 690.64.B.4

WARNING

INVERTER OUTPUT
CONNECTION
DO NOT RELOCATE
THIS OVERCURRENT
DEVICE

Label Location:
(POI)
Per Code:
NEC 690.64.B.7

(AC): AC Disconnect
(C): Conduit
(CB): Combiner Box
(D): Distribution Panel
(DC): DC Disconnect
(G): Interior Run Conduit
(INV): Inverter With Integrated DC Disconnect
(LC): Load Center
(M): Utility Meter
(POI): Point of Interconnection



SolarCity

Label Set

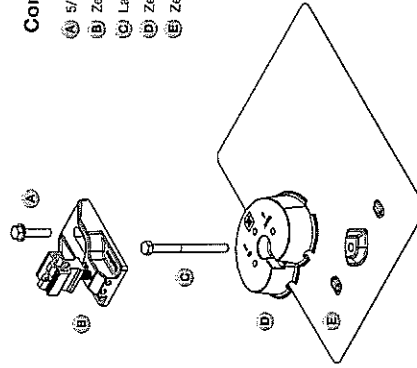
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REPRODUCTION OR TRANSMISSION IN ANY FORM OR BY ANY MEANS, ELECTRONIC
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SolarCity SleekMount™ – Comp

The SolarCity SleekMount hardware solution is optimized to achieve superior strength and aesthetics while minimizing roof disruption and labor. The elimination of visible rail ends and mounting clamps, combined with the addition of array trim and a lower profile all contribute to a more visually appealing system. SleekMount utilizes modules with strengthened frames that attach directly to Zep standoffs, effectively eliminating the need for rail and reducing the number of standoffs required. In addition, composition shingles are not required to be cut for this system, allowing for minimal roof disturbance.

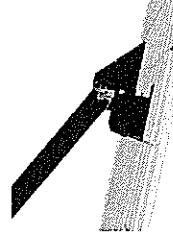
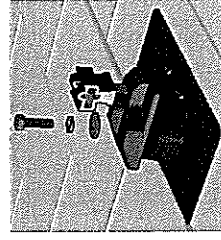
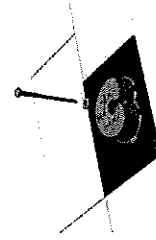
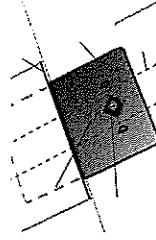
- Utilizes Zep hardware and Zep compatible modules.
- Interlock ETL listed to UL 1703 as ground bond means
- Ground Zep UL and ETL listed to UL 467 as grounding and bonding device
- Full system listed to UL 2703 for grounding
- Galvanized aluminum waterproof flashing
- Anodized components for corrosion resistance
- Applicable for vent spanning functions



Components

- (A) 5/16" Machine Screw
- (B) Zep Leveling Foot
- (C) Lag Screw
- (D) Zep Comp Mount
- (E) Zep Comp Mount Flashing

SolarCity SleekMount™ – Comp

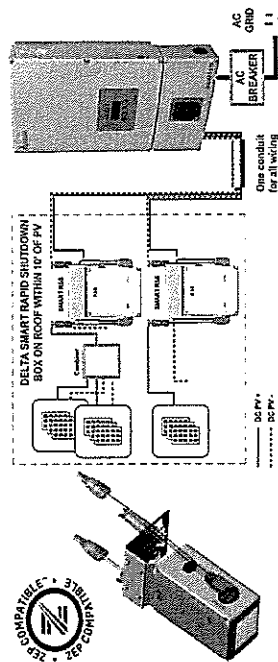


Installation Instructions

- 1 Drill Pilot Hole of Proper Diameter for Fastener Size Per NDS Section 1.1.3.2
- 2 Seal pilot hole with roofing sealant
- 3 Insert Comp Mount flashing under upper layer of shingle
- 4 Place Comp Mount centered upon flashing
- 5 Install lag pursuant to NDS Section 11.1.3 with sealing washer.
- 6 Secure Leveling Foot to the Comp Mount using machine screw
- 7 Place module

Technical Data for Delta Smart Rapid Shutdown System

RATINGS	
Max. system voltage	600V DC
Rated system current	20A DC
Rated input operating voltage	150 ~ 550V DC
Rated input operating current	0 ~ 20A DC
Fuses (rating)	1A
Max. number of controlled circuits	1
Self power consumption	<4W
GENERAL DATA	
L x W x D (inches)	7.87 x 5.91 x 2.09
Weight	0.5 lbs.
Cooling	Natural Convection
DC input/output connectors	Amphenol HeliCoil H or MC4 PV Connector
Enclosure	Groove Adapter Bracket
Enclosure material	Diecast Aluminum
Operating temperature	-40 ~ 153 °F (-40 ~ 70 °C)
Storage temperature	-40 ~ 185 °F (-40 ~ 85 °C)
Humidity	0 ~ 100%
Max. operating altitude	2000m above sea level
STANDARD COMPLIANCE	
Endurance protection rating	NEMA 4X
Safety	UL 1741, UL 1741 CRD-PVRS, CSA-C22.2 No. 107.1-01
Rapid shutdown	NEC 2014 Article 690.12
EMC	FCC Part 15 A
WARRANTY	
Standard Warranty	10 years



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2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 2681, 26

UNIT DOC

100V	200V	300V	400V	500V	600V	700V	800V	900V	1000V	1100V	1200V	1300V	1400V	1500V	1600V	1700V	1800V	1900V	2000V	2100V	2200V	2300V	2400V	2500V	2600V	2700V	2800V	2900V	3000V	3100V	3200V	3300V	3400V	3500V	3600V	3700V	3800V	3900V	4000V	4100V	4200V	4300V	4400V	4500V	4600V	4700V	4800V	4900V	5000V	5100V	5200V	5300V	5400V	5500V	5600V	5700V	5800V	5900V	6000V	6100V	6200V	6300V	6400V	6500V	6600V	6700V	6800V	6900V	7000V	7100V	7200V	7300V	7400V	7500V	7600V	7700V	7800V	7900V	8000V	8100V	8200V	8300V	8400V	8500V	8600V	8700V	8800V	8900V	9000V	9100V	9200V	9300V	9400V	9500V	9600V	9700V	9800V	9900V	10000V	10100V	10200V	10300V	10400V	10500V	10600V	10700V	10800V	10900V	11000V	11100V	11200V	11300V	11400V	11500V	11600V	11700V	11800V	11900V	12000V	12100V	12200V	12300V	12400V	12500V	12600V	12700V	12800V	12900V	13000V	13100V	13200V	13300V	13400V	13500V	13600V	13700V	13800V	13900V	14000V	14100V	14200V	14300V	14400V	14500V	14600V	14700V	14800V	14900V	15000V	15100V	15200V	15300V	15400V	15500V	15600V	15700V	15800V	15900V	16000V	16100V	16200V	16300V	16400V	16500V	16600V	16700V	16800V	16900V	17000V	17100V	17200V	17300V	17400V	17500V	17600V	17700V	17800V	17900V	18000V	18100V	18200V	18300V	18400V	18500V	18600V	18700V	18800V	18900V	19000V	19100V	19200V	19300V	19400V	19500V	19600V	19700V	19800V	19900V	20000V	20100V	20200V	20300V	20400V	20500V	20600V	20700V	20800V	20900V	21000V	21100V	21200V	21300V	21400V	21500V	21600V	21700V	21800V	21900V	22000V	22100V	22200V	22300V	22400V	22500V	22600V	22700V	22800V	22900V	23000V	23100V	23200V	23300V	23400V	23500V	23600V	23700V	23800V	23900V	24000V	24100V	24200V	24300V	24400V	24500V	24600V	24700V	24800V	24900V	25000V	25100V	25200V	25300V	25400V	25500V	25600V	25700V	25800V	25900V	26000V	26100V	26200V	26300V	26400V	26500V	26600V	26700V	26800V	26900V	27000V	27100V	27200V	27300V	27400V	27500V	27600V	27700V	27800V	27900V	
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COUNT (AC)

100V	200V	300V	400V	500V	600V	700V	800V	900V	1000V	1100V	1200V	1300V	1400V	1500V	1600V	1700V	1800V	1900V	2000V	2100V	2200V	2300V	2400V	2500V	2600V	2700V	2800V	2900V	3000V	3100V	3200V	3300V	3400V	3500V	3600V	3700V	3800V	3900V	4000V	4100V	4200V	4300V	4400V	4500V	4600V	4700V	4800V	4900V	5000V	5100V	5200V	5300V	5400V	5500V	5600V	5700V	5800V	5900V	6000V	6100V	6200V	6300V	6400V	6500V	6600V	6700V	6800V	6900V	7000V	7100V	7200V	7300V	7400V	7500V	7600V	7700V	7800V	7900V	8000V	8100V	8200V	8300V	8400V	8500V	8600V	8700V	8800V	8900V	9000V	9100V	9200V	9300V	9400V	9500V	9600V	9700V	9800V	9900V	10000V	10100V	10200V	10300V	10400V	10500V	10600V	10700V	10800V	10900V	11000V	11100V	11200V	11300V	11400V	11500V	11600V	11700V	11800V	11900V	12000V	12100V	12200V	12300V	12400V	12500V	12600V	12700V	12800V	12900V	13000V	13100V	13200V	13300V	13400V	13500V	13600V	13700V	13800V	13900V	14000V	14100V	14200V	14300V	14400V	14500V	14600V	14700V	14800V	14900V	15000V	15100V	15200V	15300V	15400V	15500V	15600V	15700V	15800V	15900V	16000V	16100V	16200V	16300V	16400V	16500V	16600V	16700V	16800V	16900V	17000V	17100V	17200V	17300V	17400V	17500V	17600V	17700V	17800V	17900V	
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MECHANICAL DESIGN

100V	200V	300V	400V	500V	600V	700V	800V	900V	1000V	1100V	1200V	1300V	1400V	1500V	1600V	1700V	1800V	1900V	2000V	2100V	2200V	2300V	2400V	2500V	2600V	2700V	2800V	2900V	3000V	3100V	3200V	3300V	3400V	3500V	3600V	3700V	3800V	3900V	4000V	4100V	4200V	4300V	4400V	4500V	4600V	4700V	4800V	4900V	5000V	5100V	5200V	5300V	5400V	5500V	5600V	5700V	5800V	5900V	6000V	6100V	6200V	6300V	6400V	6500V	6600V	6700V	6800V	6900V	7000V	7100V	7200V	7300V	7400V	7500V	7600V	7700V	7800V	7900V	8000V	8100V	8200V	8300V	8400V	8500V	8600V	8700V	8800V	8900V	9000V	9100V	9200V	9300V	9400V	9500V	9600V	9700V	9800V	9900V	10000V	10100V	10200V	10300V	10400V	10500V	10600V	10700V	10800V	10900V	11000V	11100V	11200V	11300V	11400V	11500V	11600V	11700V	11800V	11900V	12000V	12100V	12200V	12300V	12400V	12500V	12600V	12700V	12800V	12900V	13000V	13100V	13200V	13300V	13400V	13500V	13600V	13700V	13800V	13900V	14000V	14100V	14200V	14300V	14400V	14500V	14600V	14700V	14800V	14900V	15000V	15100V	15200V	15300V	15400V	15500V	15600V	15700V	15800V	15900V	16000V	16100V	16200V	16300V	16400V	16500V	16600V	16700V	16800V	16900V	17000V	17100V	17200V	17300V	17400V	17500V	17600V	17700V	17800V	17900V	
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STANDARDS / DIRECTIVES

100V	200V	300V	400V	500V	600V	700V	800V	900V	1000V	1100V	1200V	1300V	1400V	1500V	1600V	1700V	1800V	1900V	2000V	2100V	2200V	2300V	2400V	2500V	2600V	2700V	2800V	2900V	3000V	3100V	3200V	3300V	3400V	3500V	3600V	3700V	3800V	3900V	4000V	4100V	4200V	4300V	4400V	4500V	4600V	4700V	4800V	4900V	5000V	5100V	5200V	5300V	5400V	5500V	5600V	5700V	5800V	5900V	6000V	6100V	6200V	6300V	6400V	6500V	6600V	6700V	6800V	6900V	7000V	7100V	7200V	7300V	7400V	7500V	7600V	7700V	7800V	7900V	8000V	8100V	8200V	8300V	8400V	8500V	8600V	8700V	8800V	8900V	9000V	9100V	9200V	9300V	9400V	9500V	9600V	9700V	9800V	9900V	10000V	10100V	10200V	10300V	10400V	10500V	10600V	10700V	10800V	10900V	11000V	11100V	11200V	11300V	11400V	11500V	11600V	11700V	11800V	11900V	12000V	12100V	12200V	12300V	12400V	12500V	12600V	12700V	12800V	12900V	13000V	13100V	13200V	13300V	13400V	13500V	13600V	13700V	13800V	13900V	14000V	14100V	14200V	14300V	14400V	14500V	14600V	14700V	14800V	14900V	15000V	15100V	15200V	15300V	15400V	15500V	15600V	15700V	15800V	15900V	16000V	16100V	16200V	16300V	16400V	16500V	16600V	16700V	16800V	16900V	17000V	17100V	17200V	17300V	17400V	17500V	17600V	17700V	17800V	17900V	
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WARRANTY

100V	200V	300V	400V	500V	600V	700V	800V	900V	1000V	1100V	1200V	1300V	1400V	1500V	1600V	1700V	1800V	1900V	2000V	2100V	2200V	2300V	2400V	2500V	2600V	2700V	2800V	2900V	3000V	3100V	3200V	3300V	3400V	3500V	3600V	3700V	3800V	3900V	4000V	4100V	4200V	4300V	4400V	4500V	4600V	4700V	4800V	4900V	5000V	5100V	5200V	5300V	5400V	5500V	5600V	5700V	5800V	5900V	6000V	6100V	6200V	6300V	6400V	6500V	6600V	6700V	6800V	6900V	7000V	7100V	7200V	7300V	7400V	7500V	7600V	7700V	7800V	7900V	8000V	8100V	8200V	8300V	8400V	8500V	8600V	8700V	8800V	8900V	9000V	9100V	9200V	9300V	9400V	9500V	9600V	9700V	9800V	9900V	10000V	10100V	10200V	10300V	10400V	10500V	10600V	10700V	10800V	10900V	11000V	11100V	11200V	11300V	11400V	11500V	11600V	11700V	11800V	11900V	12000V	12100V	12200V	12300V	12400V	12500V	12600V	12700V	12800V	12900V	13000V	13100V	13200V	13300V	13400V	13500V	13600V	13700V	13800V	13900V	14000V	14100V	14200V	14300V	14400V	14500V	14600V	14700V	14800V	14900V	15000V	15100V	15200V	15300V	15400V	15500V	15600V	15700V	15800V	15900V	16000V	16100V	16200V	16300V	16400V	16500V	16600V	16700V	16800V	16900V	17000V	17100V	17200V	17300V	17400V	17500V	17600V	17700V	17800V	17900V	
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Fax: +1 477 417 4333
Monday to Friday 9 am to 5 pm Pacific Time (UTC-8)



Transformed/less (TL) 3.0 kW, 3.8 kW, 5.2 kW, 6.6 kW, 7.6 kW

High GEC: Efficacy 97.5%

NEUMA 4X plus Sulf Mist Corrosion Protection

12001 MP131 5.2kW / 6.6kW / 6kW

00, 1741 / IEEE 1547 / IEEE 1547.1 / CEC

United States District Court, District of Columbia

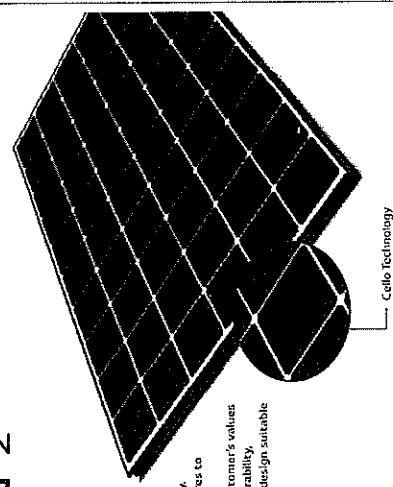




LG NeON[™] 2 LG315N1C-Z4

60 cell

LG's new module, NeON[™] 2, adopts Cello technology. Cello technology replaces 3 busbars with 12 thin wires to enhance power output and reliability. NeON[™] 2 demonstrates LG's efforts to increase customer's values beyond efficiency. It features enhanced warranty, durability, performance under real environment, and aesthetic design suitable for roofs.



Key Features

- Enhanced Performance Warranty**
 LG NeON[™] 2 has an enhanced performance warranty. The annual degradation has fallen from -0.75%/yr to -0.55%/yr. Even after 25 years, it can generate more power output than the previous NeON[™] modules.
- Aesthetic Roof**
 LG NeON[™] 2 has been designed with aesthetics in mind. The product can increase the value of a property with its modern design.
- Better Performance on a Sunny Day**
 LG NeON[™] 2 now performs better on a sunny day due to its 45° improved temperature coefficient.
- High Power Output**
 Compared with previous models, the LG NeON[™] 2 has been designed to significantly enhance its output efficiency making it efficient even in limited space.
- Improved Product Warranty**
 As well as the enhanced performance warranty, LG NeON[™] 2 has an additional 2 years warranty.
- Double-Sided Cell Structure**
 The rear of the cell used in LG NeON[™] 2 will contribute to generation just like the front. The light beam reflected from the rear of the module is reabsorbed to generate a great amount of additional power.

About LG Electronics
 LG Electronics is a South Korean multinational electronics company. It is a subsidiary of LG Group, a South Korean conglomerate. LG Electronics is a global leader in consumer electronics, including smartphones, televisions, and home appliances.

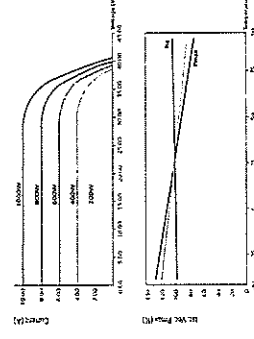


LG315N1C-Z4 LG NeON[™] 2

Mechanical Properties	
Cell Type	Monocrystalline / H-Type
Cell Dimensions	156.75 ± 0.15 mm (6 in.)
Number of Cells	72 (6x12) Mono Cells
Dimensions (L x W x H)	1545 ± 2 mm (61 in.) x 750 ± 2 mm (29.5 in.) x 35 ± 1 mm (1.38 in.)
Weight	18.2 ± 0.1 kg (40.1 lb)
Connector Type	MC4
Warranty	12 years / 15000 hours
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +125°C
Humidity	95% RH, 1000 hours
Shock	1500 m/s ² 2 G
Vibration	10 m/s ² 10 Hz
Front	Anti-Reflection Coating

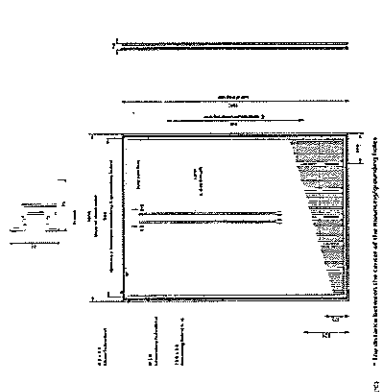
Certifications and Warranty	
Certifications	UL 1703, IEC 61215, IEC 61730, TUV, ISO 9001, ISO 14001, Type 2
Module Fire Performance (UL)	Class B
Fire Resistance Class (IEC)	Class B
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +125°C
Humidity	95% RH, 1000 hours
Shock	1500 m/s ² 2 G
Vibration	10 m/s ² 10 Hz
Front	Anti-Reflection Coating

Temperature Characteristics	
NOCT	45 ± 2 °C
Temp. Coefficient	-0.45 / °C
Temp. Coefficient	-0.03 / °C



Electrical Properties (STC*)	
Model	LG315N1C-Z4
Maximum Power (Pmax)	233 W
Maximum Power (Pmp)	233 W
Maximum Current (Imp)	9.5 A
Open Circuit Voltage (Voc)	40.6 V
Short Circuit Current (Isc)	10.2 A
Power Factor	1.0
Maximum System Voltage	1500 V
Maximum System Current	20 A
Power Tolerance	±3%
Temperature Coefficient (Pmax)	-0.45 / °C
Temperature Coefficient (Voc)	0.03 / °C

Electrical Properties (NOCT*)	
Model	LG315N1C-Z4
Maximum Power (Pmax)	233 W
Maximum Power (Pmp)	233 W
Maximum Current (Imp)	9.5 A
Open Circuit Voltage (Voc)	40.6 V
Short Circuit Current (Isc)	10.2 A
Power Factor	1.0
Maximum System Voltage	1500 V
Maximum System Current	20 A
Power Tolerance	±3%
Temperature Coefficient (Pmax)	-0.45 / °C
Temperature Coefficient (Voc)	0.03 / °C



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