MONTGOMERY COUNTY HISTORIC PRESERVATION COMMISSION
STAFF REPORT

Address: 54 Walnut Avenue, Takoma Park
Resource: Contributing Resource
Takoma Park Historic District
Applicant: Steve Shira
Review: HAWP
Case Number: 37/03-20W
PROPOSAL: Solar Panel Installation

STAFF RECOMMENDATION:

Staff recommends the HPC approve the HAWP application.

ARCHITECTURAL DESCRIPTION:

SIGNIFICANCE: Contributing Resource to the Takoma Park Historic District
STYLE: Cottage
DATE: c.1920

Figure 1: 54 Walnut Ave. is located at the edge of the Takoma Park Historic District.
PROPOSAL

The applicant proposes to remove the existing three-tab asphalt shingle roof and replace it with a solar shingle roof.

APPLICABLE GUIDELINES:

When reviewing alterations and additions for new construction to Contributing Resources within the Takoma Park Historic District, decisions are guided by the Takoma Park Historic District Design Guidelines (Guidelines) and Montgomery County Code Chapter 24A (Chapter 24A), and the Secretary of the Interior’s Standards for Rehabilitation (Standards). As this project is also in one of the two commercial districts in Takoma Park review of the project shall be guided by the Design Guidelines for Commercial Buildings in the City of Takoma Park, Maryland.

Takoma Park Historic District Design Guidelines
There are two very general, broad planning and design concepts which apply to all categories. These are:

The design review emphasis will be restricted to changes that are at all visible from the public right-of-way, irrespective of landscaping or vegetation (it is expected that the majority of new additions will be reviewed for their impact on the overall district), and,

The importance of assuring that additions and other changes to existing structures act to reinforce and continue existing streetscape, landscape, and building patterns rather than to impair the character of the district.

Contributing Resources should receive a more lenient review than those structures that have been classified as Outstanding. This design review should emphasize the importance of the resource to the overall streetscape and its compatibility with existing patterns rather than focusing on a close scrutiny of architectural detailing. In general, however, changes to Contributing Resources should respect the predominant architectural style of the resource. As stated above, the design review emphasis will be restricted to changes that are at all visible from the public right-of-way, irrespective of landscaping or vegetation.

Some of the factors to be considered in reviewing HAWPs on Contributing Resources include:

All exterior alterations, including those to architectural features and details, should be generally consistent with the predominant architectural style and period of the resource and should preserve the predominant architectural features of the resource; exact replication of existing details and features is, however, not required

Minor alterations to areas that do not directly front on a public right-of-way such as vents, metal stovepipes, air conditioners, fences, skylights, etc. – should be allowed as a matter of course; alterations to areas that do not directly front on a public way-of-way which involve the replacement of or damaged to original ornamental or architectural features are discouraged, but may be considered and approved on a case-by-case basis

Some non-original building materials may be acceptable on a case-by-case basis; artificial siding on areas visible to the public right-of-way is discouraged where such materials would replace or damage original building materials that are in good condition

Alterations to features that are not visible from the public right-of-way should be allowed as a
matter of course

All changes and additions should respect existing environmental settings, landscaping, and patterns of open space.

**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:

1. The proposal will not substantially alter the exterior features of an historic site or historic resource within an historic district; or
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

(d) In the case of an application for work on an historic resource located within an historic district, the commission shall be lenient in its judgment of plans for structures of little historical or design significance or for plans involving new construction, unless such plans would seriously impair the historic or architectural value of surrounding historic resources or would impair the character of the historic district. (Ord. No. 9-4, § 1; Ord. No. 11-59.)

**Secretary of the Interior’s Standards for Rehabilitation**

2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, space and spatial relationships that characterize a property will be avoided.

9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportions, and massing to protect the integrity of the property and its environment.

10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

**Historic Preservation Policy 20-01**

WHEREAS, Section 24-8(b)(6) states, “In balancing the interest of the public in preserving the historic site or historic resource located within an historic district, with the interests of the public from the use and benefit of the alternative proposal, the general public welfare is better served by granting the permit;”

WHEREAS, the widespread use of solar panels and shingles, both for hot water and for electricity production, will reduce greenhouse gases in the county, in accordance with the aims of the Emergency Climate Mobilization resolution (Resolution No.: 18-974), it shall be the policy of the Historic Preservation Commission that:

1. The preferred locations for solar panel installation(s) on a designated historic site or an historic resource located within an historic district is a) on the rear of the property, b) on non-historic building additions, c) on accessory structures, or d) in ground-mounted arrays;
2. If it is not feasible to install solar panels in one of the identified preferred locations due to resource orientation or other site limitations; and,
3. The roof is determined to be neither architecturally significant, nor a character-defining feature of the resource, nor is it a slate or tile roof, that unless it can be demonstrated that the solar array will be installed without damaging the historic character of the resource or historic fabric; then
4. The public welfare is better served by approving a Historic Area Work Permit for solar panels on all visible side or front roof slopes under Section 24A-8(b)(6).
STAFF DISCUSSION

The applicant proposes to remove the existing three-tab asphalt shingle roof and install a Tesla solar shingle (specifications attached) roof in its place. Staff finds that the proposed roof will not significantly alter the character of the historic resource and is in keeping with the recently adopted solar panel policy and recommends approval.

The subject property is a one-story cottage with a side gable roof. According to historic preservation records, a side porch was added to the right side of the house in 1925. The Sanborn maps labeled the historic roofing has “composition.” In the 1920s these shingles were composed of pine tar or coal tar impregnated onto a felt or cotton rag backing, usually with some type of stone, like slate, mica, or even oyster shells added to the exterior for durability. There was no single design or size standard until the 1950s. The existing asphalt shingle roof has no historic significance and its removal will not be detrimental to the character of the building or the surrounding district.

In place of the existing roof, the applicant proposes to install Tesla solar shingles. This is the first instance the HPC has evaluated this material, so this Staff Report will provide more background on the material than typical. To install the shingles, the existing asphalt shingles will be removed and much of the roof sheathing will be replaced. New sheathing and solar shingles will be installed on top of the existing roof structure. This means that the proposed solar shingles will preserve the roofline as it exists today. All of the electronic connections will be made under the roof surface, so there won’t be any exposed conduit, unlike the roof-mounted solar panel arrays that have come before the HPC. In locations
that aren’t conducive to collecting solar energy, ‘dummy’ shingles that look the same but lack the photovoltaics will be installed to maintain a uniform appearance.

The new shingles are larger than the exposed asphalt shingles. The proposed shingles measure $430 \text{ mm} \times 1140 \text{ mm}$ (four hundred thirty millimeters by one thousand forty millimeters), this is approximately $15'' \times 45''$ (fifteen inches by forty-five inches). A typical three-tab shingle is $12'' \times 36''$ (twelve inches by thirty-six inches), though those shingles are divided so that each visible rectangle is $5'' \times 12''$ (five inches by twelve inches), see below. While the proposed shingles are noticeable larger, Staff does not find this difference in dimension to be detrimental to the character of the house or the surrounding district.

![Figure 3: Typical 3-tab asphalt shingle dimensions.](image)

![Figure 4: Tesla Solar Shingle dimensions.](image)
Staff was directed by the project consultant to the house at 1946 Seminary Rd., Silver Spring as an example of a solar shingle roof installed. Staff visited the house and includes two photos in this Staff Report, but notes that the photographs are a poor substitute for seeing this roof in person.

Figure 5: 1946 Seminary Rd., Silver Spring (across from the fire station) is one of the first solar shingle installations in the county.

Staff observed that the solar shingle roof was more reflective than an asphalt shingle roof, which was to be expected. What was surprising was how much the uniform appearance of the solar shingle roof surface blended into the architecture of the house. Because there is only one material on the roof and it has uniform reflectivity, it didn’t seem out of place the way some roof-mounted solar arrays can.

Staff finds that the proposed solar shingle roof is consistent with the Solar Panel Policy, will not substantially alter the historic character of the house (Standard 2), and is an appropriate use of a non-original material (per the Design Guidelines). Staff recommends the HPC approve the HAWP.
Figure 6: Oblique view of 1946 Seminary Rd., Silver Spring.

STAFF RECOMMENDATION

Staff recommends that the Commission approve the HAWP application:

Under the Criteria for Issuance in Chapter 24A-8(b)(1), (2), and (d), having found that the proposal will not substantially alter the exterior features of the historic resource and is compatible in character with the district and the purposes of Chapter 24A;

and in conformance with HPC Policy No. 20-01;

and with the Secretary of the Interior’s Standards for Rehabilitation #2, 9, and 10;

and with the general condition that the applicant shall present the 3 permit sets of drawings, if applicable, to Historic Preservation Commission (HPC) staff for review and stamping prior to submission for the Montgomery County Department of Permitting Services (DPS) building permits;

and with the general condition that final project design details, not specifically delineated by the Commission, shall be approved by HPC staff or brought back to the Commission as a revised HAWP application at staff’s discretion;

and with the general condition that the applicant shall notify the Historic Preservation Staff if they
I propose to make **any alterations** to the approved plans. Once the work is completed the applicant will contact the staff person assigned to this application at 301-563-3400 or dan.bruechert@montgomeryplanning.org to schedule a follow-up site visit.
HISTORIC PRESERVATION COMMISSION
301/563-3400

APPLICATION FOR
HISTORIC AREA WORK PERMIT

Contact Email: lvallandingham@tesla.com
Tax Account No.: 01070736
Name of Property Owner: STEVEN SHIRA
Address: 54 WALNUT AVE, TAKOMA PARK MD, 20912
Contractor: Tesla Energy Operations, Inc.
Contractor Registration No.: 128948 (MHIC)
Agent for Owner: Beth Vallandingham

LOCATION OF BUILDING PREMISE
House Number: 54
Street: WALNUT AVE
Town/City: TAKOMA PARK
Lot: 29
Block: A
Subdivision: 0025
Lib: 58431
Folio: 00450
Parcel: 0000

PART ONE: TYPE OF IMPROVEMENT AND USE
1A. CHECK ALL APPLICABLE:
☐ Construct    ☑ Extend    ☐ Alter/Renovate
☐ Move    ☐ Install    ☐ Wreck/Raze
☐ Revision    ☐ Repair    ☐ Renovate

1B. Construction cost estimate: $25,223

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

PART TWO: COMPLETE FOR NEW CONSTRUCTION AND EXTENDED 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 ON FENCE OR 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 hereby acknowledge and accept this to be a condition for the issuance of this permit.

Signature of owner or authorized agent: 
Date: 4/3/2020

Approved: ________________________ For Chairperson, Historic Preservation Commission
Signature: ________________________ Date: ________________________

Application/Permit No.: ________________________ Data Filed: ________________________ Data Issued: ________________________

SEE REVERSE SIDE FOR INSTRUCTIONS
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:
      876 SF, 1 story residential suburban single family dwelling, built in 1923
      property land area of 10,492 SF
   b. General description of project and its effect on the historic resource(s), the environmental setting, and, where applicable, the historic district:
      Re-roofing existing residential home with Solarglass (solar roof tiles)

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.

PLEASE PRINT IN BLUE OR BLACK INK OR TYPE THIS INFORMATION ON THE FOLLOWING PAGE.
PLEASE STAY WITHIN THE GUIDES OF THE TEMPLATE, AS THIS WILL BE PHOTOCOPIED DIRECTLY ONTO MAILING LABELS.
HAWP APPLICATION: MAILING ADDRESSES FOR NOTIFYING
[Owner, Owner’s Agent, Adjacent and Confronting Property Owners]

<table>
<thead>
<tr>
<th>Owner’s mailing address</th>
<th>Owner’s Agent’s mailing address</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEVEN SHIRA</td>
<td>TESLA ENERGY OPS, INC.</td>
</tr>
<tr>
<td>54 WALNUT AVE,</td>
<td>9000 VIRGINIA MANOR RD, SUITE 250,</td>
</tr>
<tr>
<td>TAKOMA PARK MD, 20912</td>
<td>BETLSVILLE MD, 20705</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Adjacent and confronting Property Owners mailing addresses</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEBORAH GEORGE</td>
</tr>
<tr>
<td>56 WALNUT AVE, TAKOMA PARK MD, 20912</td>
</tr>
<tr>
<td>JEFFREY HOPKINS</td>
</tr>
<tr>
<td>51 WALNUT AVE, TAKOMA PARK MD, 20912</td>
</tr>
<tr>
<td>FANG-CHING CHEN</td>
</tr>
<tr>
<td>1634 EVERS DR, MCLEAN VA, 22101 (MAILING)</td>
</tr>
<tr>
<td>6815 EASTERN AVE, TAKOMA PARK MD, 20912 (PROPERTY)</td>
</tr>
</tbody>
</table>
Existing Property Condition Photographs (duplicate as needed)

Detail: Front of house

Detail: Left side of house with existing electrical equipment

Beth Vallandingham
Applicant:
**Existing Property Condition Photographs** (duplicate as needed)

**Detail:** Right/Back portion of home

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**Map view**

**Detail:**

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Beth Vallandingham

Applicant:
Recently completed Solarglass installation in Silver Spring
**ABBREVIATIONS**

- AC: Alternating Current
- DC: Direct Current
- FSB: Fire Set-Back
- GEC: Ground Electrode Conductor
- HCC: Hot Dip Galvanized
- IVC: Interlocking Volt Circuit
- NEMA: National Electrical Manufacturers Association
- TRN: Trench

**ELECTRICAL NOTES**

1. The system is grid-connected 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. 70.
4. Where all terminations 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 multiconductor circuit shall be identified by phase and system per Art. 700.
6. Circuits over 250V to ground shall comply with Art. 250.97, 250.925.
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. 690.316.
8. All wires shall be provided with strain relief at all entry into boxes as required by UL listing.

**JURISDICTION NOTES**

- District of Columbia
- Takoma Park
- Maryland
- Sanborn, U.S. Geological Survey, USDA Farm Service Agency

**LICENSE**

#1805 Master Electrician
Nicholas Meyers

AHJ: Takoma Park

Utility: Pepco (MD)

**GENERAL NOTES**

1. All work shall comply with the 2015 IBC and 2015 IRC.
2. All electrical work shall comply with the 2014 National Electric Code.

**INDEX**

Sheet 1: COVER SHEET
Sheet 2: SITE PLAN
Sheet 3: THREE LINE DIAGRAM
Cutsheets Attached

**CONSTRUCTION**

- DB: Delta Electronics # MB-TL-US [240V]
- CT: Tesla Solar Roof
- Manufacturer: Tesla

**MATERIALS**

- Manufacturer: Tesla
- Model: TESLA # S9001
- S/N: 5042201245

**PERMITS**

- Jay B-2094576 00
- Steve Shira
- S4 Walnut Ave
- Takoma Park, MD 20912

**PHOTO**

6.8946 KW PV ARRAY

**REVIEW**

- Lilly-Jeanne Gurney
- Date: 2/22/2020
- Comments: 

**VICTORY MAP**

DRIVEWAY

54 Walnut Ave

Front Of House

Legend

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. 20656. Expiration Date: 05/26/2020

Site Plan

Scale: 1/8" = 1'

Takoma Park, MD 20912

Steve Shira

Site Plan

DATE: 2/02/2020

6.8946 KW PV ARRAY

68-4576 00

TESLA SOLAR ROOF

J.B. &apos;S" TESLA # 8601

(1) Delta Electronics # MB-UI-US [240V]

SITE PLAN

CONVENTION - THE INFORMATION CONTAINED SHALL NOT BE USED FOR THE DESIGN OR CONSTRUCTION EXCEPT TESLA ROC. NOT SHALL IT BE DISCLOSED IN WHOLE OR IN PART TO OTHERS EXCEPT THE RECIPIENTS. EXCEPT IN CONNECTION WITH THE SALE AND USE OF THE RESTRICTED EQUIPMENT, WITHOUT THE WRITTEN PERMISSION OF TESLA ROC.
CONDUIT RUNS MAY BE CONDENSED DUE TO SITE CONDITIONS AND/OR INSTALLATION EASE. ALL CONDUIT FILL DERATES AND PROPER CALCULATIONS HAVE BEEN COMPLETED PER NEC CHAPTER 9, TABLE 4.
**SOLARGLASS DATASHEET**

**ROOFING SYSTEM SPECIFICATIONS**

**CERTIFICATIONS**

<table>
<thead>
<tr>
<th>UL Listed</th>
<th>ETL Listed</th>
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</thead>
<tbody>
<tr>
<td>UL/IEC 61730</td>
<td>UL 790 Class A</td>
</tr>
<tr>
<td>UL 9703</td>
<td>TAS100</td>
</tr>
<tr>
<td>UL 1741</td>
<td>ASTM D3161 Class F</td>
</tr>
</tbody>
</table>

**ELECTRICAL CHARACTERISTICS**

- Maximum open circuit voltage rating of connected branch circuits per diode (at STC): 13.34 V
- Maximum series fuse rating: 15 A
- Maximum system voltage: 600 V

**ROOF PITCH RANGE**

2:12 - 12:12

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**MODULE SPECIFICATIONS**

**MODEL #SR60T1 14-CELL MODULE**

<table>
<thead>
<tr>
<th>Irradiance (W/m²)</th>
<th>Temp. (Celsius)</th>
<th>Voc (V)</th>
<th>Vmp (V)</th>
<th>Iac (A)</th>
<th>Imp (A)</th>
<th>Pmax (W)</th>
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<tbody>
<tr>
<td>1000</td>
<td>25</td>
<td>13.34</td>
<td>10.99</td>
<td>5.65</td>
<td>5.32</td>
<td>58.47</td>
</tr>
</tbody>
</table>

These electrical characteristics are within ± 5% of the indicated values of Iac, Voc, and Pmax under standard test conditions (irradiance of 1000 W/m², AM 1.5 spectrum, and a cell temperature of 25 °C or 77 °F).

**Dimensions**

430 mm x 1140 mm x 34.5 mm

**Principal Materials**

Glass, Polymers, Fiberglass and Silicon

**Installed System Weight**

Textured Glass: 16.4 kg/m² or 3.4 psf

Installed weights include all components of system above roof sheathing.
ROOFING MODULES, FULL AND PARTIAL
Model #SRNF1/6, #SRNF1/3, #SRNF1/2, #SRNF2/3, #SRNF3/5, and #SRNF1/1
Listed to UL 790 Class A
ASTM D3161 Class F
TAS100

ROOFING FOOT
Model #SR-FOOT
Center foot for Roofing module

PV MODULE
Model #SR60T1
Listed to UL/IEC 61730
UL 790 Class A
ASTM D3161 Class F
TAS100

FOOT WITH SUPPORT
Model #SR-FOOTSUP
Listed to UL 790 Class A
ASTM D3161 Class F
TAS100

ROOFING MODULES, FULL AND PARTIAL
Model #SRNFT1/6, #SRNFT1/3, #SRNFT1/2, #SRNFT2/3, #SRNFT3/5, and #SRNFT1/1
Listed to UL 790 Class A
ASTM D3161 Class F
TAS100

FOOTLAP
Model #SR-FOOTLAP
Listed to UL 790 Class A
ASTM D3161 Class F
TAS100

RAPID SHUTDOWN DEVICE
Delta RSS-600 1-1
Listed to UL 1741
MEC Article 680.12
NEMA 3R Enclosure

DIODE TRUNK HARNESS
Model #SR-DTH
Listed to UL 9703

PASS THROUGH BOX
Model #SRPTB-4
Listed to UL 1741

FOOTLAP
Model #SR-FOOTLAP
Listed to UL, 790 Class A
ASTM D3161 Class F
TAS100

FIRESTONE UNDERLAYMENT
Clad-Gard SA FR
Listed to UL 790 Class A
ASTM D3161 Class F
TAS100

Rapid Shutdown Device
Delta RSS-600 1-1
Listed to UL 1741
MEC Article 680.12
NEMA 3R Enclosure

DioDe Trunk Harness
Model #SR-DTH
Listed to UL 9703

Pass Through Box
Model #SRPTB-4
Listed to UL 1741

Diode Trunk Harness
Model #SR-DTH
Listed to UL 9703
Rapid Shutdown Device for Delta 3.0~7.6 TL Inverters

Delta’s Rapid Shutdown Devices provide an automatic disconnect of 600VDC residential or small commercial PV array system, fully compliant with the Rapid Shutdown requirements of NEC 2014 article 690.12. It is compatible with Delta’s single-phase residential inverters.

**KEY FEATURES**
- C-ULus Protection
- Compact and Lightweight
- Rack Mount Installation
- Fast Connect with PV Connectors
- Compliant with NEC 2014 article 690.12
- PLC Communication (Model RSS-60B-1.1 only)

**Technical Specifications**

<table>
<thead>
<tr>
<th>Input Ratings</th>
<th>RSS-60F-1</th>
<th>RSS-60F-2</th>
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<tbody>
<tr>
<td>Nominal Voltage</td>
<td>600VDC</td>
<td>600VDC</td>
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<tr>
<td>Max. Number of IEC Cells</td>
<td>1</td>
<td>4</td>
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<tr>
<td>Rated Input Current</td>
<td>20A</td>
<td>10A</td>
</tr>
<tr>
<td>Short Circuit</td>
<td>N/A</td>
<td>15A</td>
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**Output Ratings**

<table>
<thead>
<tr>
<th>Output Rating</th>
<th>RSS-60F-1</th>
<th>RSS-60F-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Number of IEC Cells</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Maximum Current</td>
<td>25A</td>
<td>25A</td>
</tr>
<tr>
<td>Output Voltage</td>
<td>12.6VDC</td>
<td>12.6VDC</td>
</tr>
<tr>
<td>Output Current</td>
<td>N/A</td>
<td>3A</td>
</tr>
<tr>
<td>Output Voltage</td>
<td>N/A</td>
<td>70-80VDC</td>
</tr>
<tr>
<td>PV String Power</td>
<td>N/A</td>
<td>600V</td>
</tr>
<tr>
<td>PV String Voltage</td>
<td>N/A</td>
<td>24-54V</td>
</tr>
</tbody>
</table>

**General Data**

- Enclosure: a Wire & Laminates 7.87" x 5.91" x 2.08" (200 x 150 x 53)
- Weight: 4.58 lbs (2.1kg)
- Input Current: 3A
- Output Current: 3A
- Voltage Range: 0-100%
- Max. Current: 10A

**Delta Products Corporation, Inc.**

46101 Fremont Blvd.
Fremont, CA 94539

Sales Email: Inverter.Sales@delta-corp.com

Support Email: Inverter.Support@delta-corp.com

Sales: +1-877-440-5851 or +1-650-348-8521
Support: +1-877-440-8832

www.delta-america.com/misadjustinverters

*Revision: 2017* - All information and specifications are subject to change without notice.
Single Phase Solar Inverter for North America


Key Features:

- Smart inverter with BLE, optional WiFi, Ethernet, 3G / 4G cellular communication
- Support bi-directional cloud communication
- Support remote diagnosis and OTA
- Type 4 protection
- Built-in AFCI & Rapid shutdown controller
- CEC efficiency 97.5%
- Option: Revenue Grade Meter: ANSI 12.20 (0.5% accuracy)
- UL 1741 SA, HECO & CA Rule 21 compliant

Specifications:

**INPUT (DC)**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Maximum system voltage</td>
<td>600 V</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Nominal voltage</td>
<td>380 V</td>
<td></td>
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<tr>
<td>Maximum operating voltage Voc</td>
<td>540 V</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Operating MPPT range</td>
<td>50 V to 480 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum input current (per MPPT)</td>
<td>12 A</td>
<td>12 A</td>
<td></td>
<td>20 A</td>
<td></td>
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<tr>
<td>Maximum short circuit current @ STC</td>
<td>15 A / 15 A</td>
<td>15 A / 15 A</td>
<td></td>
<td>25 A / 25 A</td>
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<tr>
<td>Maximum DC/AC ratio</td>
<td>1.3</td>
<td></td>
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**OUTPUT (AC)**

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Nominal power @ 240V</td>
<td>3840 W</td>
<td>4800 W</td>
<td>5760 W</td>
<td>7680 W</td>
<td>9600 W</td>
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<tr>
<td>Maximum output power</td>
<td>4000 W</td>
<td>5000 W</td>
<td>6000 W</td>
<td>8000 W</td>
<td>10000 W</td>
</tr>
<tr>
<td>Voltage range</td>
<td>183 Vac to 228 Vac @ 208 Vac</td>
<td>211 Vac to 264 Vac @ 240 Vac</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum continuous current</td>
<td>16 A</td>
<td>20 A</td>
<td>24 A</td>
<td>32 A</td>
<td>40 A</td>
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<tr>
<td>Nominal frequency</td>
<td>60 Hz</td>
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<tr>
<td>Frequency range</td>
<td>50.3 Hz to 60.5 Hz</td>
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<tr>
<td>Adjustable frequency range</td>
<td>50 Hz to 60 Hz</td>
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<tr>
<td>Night consumption</td>
<td>&lt; 1.5 W</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>THD @ nominal power</td>
<td>&lt; 2 %</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Adjustable power factor range</td>
<td>0.85 to 0.98</td>
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**GENERAL SPECIFICATION**

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</thead>
<tbody>
<tr>
<td>Maximum efficiency</td>
<td>98%</td>
<td></td>
<td></td>
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<tr>
<td>CEC efficiency</td>
<td>97.5% @ 208 V</td>
<td>97.5% @ 240 V</td>
<td>97.5% @ 208 V</td>
<td>97.5% @ 240 V</td>
<td>97.5% @ 208 V</td>
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<tr>
<td>Operating temperature range</td>
<td>-22 °F to 149 °F (-30 °C to 65 °C)</td>
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<td></td>
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<tr>
<td>Storage temperature range</td>
<td>-40 °F to 185 °F (-40 °C to 85 °C)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Humidity</td>
<td>95% or less</td>
<td></td>
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<tr>
<td>Maximum operating altitude</td>
<td>9,843 ft (3,000 m)</td>
<td></td>
<td></td>
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<tr>
<td>Acoustic noise</td>
<td>&lt; 45 dB(A) @ 3 ft (1m)</td>
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# SPECIFICATIONS

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<thead>
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<tbody>
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<td><strong>MECHANICAL DESIGN</strong></td>
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</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>16.7 x 23.2 x 5.9 in (425 x 590 x 150 mm)</td>
<td>16.7 x 23.2 x 5.9 in (425 x 590 x 150 mm)</td>
<td>16.7 x 23.2 x 5.9 in (425 x 590 x 150 mm)</td>
<td>16.7 x 23.2 x 5.9 in (425 x 590 x 150 mm)</td>
<td>16.7 x 23.2 x 5.9 in (425 x 590 x 150 mm)</td>
</tr>
<tr>
<td>Weight</td>
<td>41.9 lbs (19.0 kg)</td>
<td>41.9 lbs (19.0 kg)</td>
<td>44.3 lbs (20.1 kg)</td>
<td>45.2 lbs (20.5 kg)</td>
<td>47.6 lbs (21.6 kg)</td>
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<tr>
<td>Cooling</td>
<td>Natural convection</td>
<td>Natural convection</td>
<td>Natural convection with internal fan</td>
<td>Natural convection with internal fan</td>
<td>Natural convection with internal fan</td>
</tr>
<tr>
<td>DC connection</td>
<td>Spring contact type</td>
<td>Spring contact type</td>
<td>Spring contact type</td>
<td>Spring contact type</td>
<td>Spring contact type</td>
</tr>
<tr>
<td>Admissible conductor size DC</td>
<td>AWG 12 to AWG 8</td>
<td>AWG 12 to AWG 8</td>
<td>AWG 12 to AWG 8</td>
<td>AWG 12 to AWG 8</td>
<td>AWG 12 to AWG 8</td>
</tr>
<tr>
<td>AC connection</td>
<td>Spring contact type</td>
<td>Spring contact type</td>
<td>Spring contact type</td>
<td>Spring contact type</td>
<td>Spring contact type</td>
</tr>
<tr>
<td>Admissible conductor size AC</td>
<td>AWG 10 to AWG 8</td>
<td>AWG 8 to AWG 8</td>
<td>AWG 6 to AWG 6</td>
<td>AWG 6 to AWG 6</td>
<td>AWG 6 to AWG 6</td>
</tr>
<tr>
<td>Communication interface</td>
<td>BLE, optional WiFi, Ethernet, 3G / 4G cellular communication</td>
<td>BLE, optional WiFi, Ethernet, 3G / 4G cellular communication</td>
<td>BLE, optional WiFi, Ethernet, 3G / 4G cellular communication</td>
<td>BLE, optional WiFi, Ethernet, 3G / 4G cellular communication</td>
<td>BLE, optional WiFi, Ethernet, 3G / 4G cellular communication</td>
</tr>
<tr>
<td><strong>STANDARDS / DIRECTIVES</strong></td>
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<tr>
<td>Enclosure protection rating</td>
<td>Type 4</td>
<td>Type 4</td>
<td>Type 4</td>
<td>Type 4</td>
<td>Type 4</td>
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<tr>
<td>Ground fault protection</td>
<td>UL 1741 CRD</td>
<td>UL 1741 CRD</td>
<td>UL 1741 CRD</td>
<td>UL 1741 CRD</td>
<td>UL 1741 CRD</td>
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<tr>
<td>Anti-islanding protection</td>
<td>IEEE 1547, IEEE 1547.1</td>
<td>IEEE 1547, IEEE 1547.1</td>
<td>IEEE 1547, IEEE 1547.1</td>
<td>IEEE 1547, IEEE 1547.1</td>
<td>IEEE 1547, IEEE 1547.1</td>
</tr>
<tr>
<td>EMC</td>
<td>FCC part 15 Class B</td>
<td>FCC part 15 Class B</td>
<td>FCC part 15 Class B</td>
<td>FCC part 15 Class B</td>
<td>FCC part 15 Class B</td>
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<tr>
<td>AFCI</td>
<td>UL 1699B (Type 1), NEC 2017 Article 690.11</td>
<td>UL 1699B (Type 1), NEC 2017 Article 690.11</td>
<td>UL 1699B (Type 1), NEC 2017 Article 690.11</td>
<td>UL 1699B (Type 1), NEC 2017 Article 690.11</td>
<td>UL 1699B (Type 1), NEC 2017 Article 690.11</td>
</tr>
<tr>
<td>Integrated meter</td>
<td>ANSI C12.20 (meets 0.5% accuracy)</td>
<td>ANSI C12.20 (meets 0.5% accuracy)</td>
<td>ANSI C12.20 (meets 0.5% accuracy)</td>
<td>ANSI C12.20 (meets 0.5% accuracy)</td>
<td>ANSI C12.20 (meets 0.5% accuracy)</td>
</tr>
<tr>
<td>Grid support regulation</td>
<td>UL 1741 SA, California Rule 21 phase 1, 2 (pending), NEC Compliant</td>
<td>UL 1741 SA, California Rule 21 phase 1, 2 (pending), NEC Compliant</td>
<td>UL 1741 SA, California Rule 21 phase 1, 2 (pending), NEC Compliant</td>
<td>UL 1741 SA, California Rule 21 phase 1, 2 (pending), NEC Compliant</td>
<td>UL 1741 SA, California Rule 21 phase 1, 2 (pending), NEC Compliant</td>
</tr>
<tr>
<td><strong>WARRANTY</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Standard warranty</td>
<td>10 years</td>
<td>10 years</td>
<td>10 years</td>
<td>10 years</td>
<td>10 years</td>
</tr>
</tbody>
</table>

---

1) Without communication meter
Accessory: MCI (Middle Circuit Interrupter)

**Features:**
- Automatic function test upon startup, ensure safety
- Enclosure protection Type 4
- Meet 2017 NEC Article 690.12 Rapid Shutdown
- No installation needed for every PV Module, make better cost performance for PV system
- With PLC, no additional cable needed

### INPUT RATINGS

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delta part number</td>
<td>GPI000010110</td>
</tr>
<tr>
<td>Maximum system voltage</td>
<td>600 Vdc</td>
</tr>
<tr>
<td>Rated input operating voltage</td>
<td>6 Vdc to 80 Vdc</td>
</tr>
<tr>
<td>Number of input circuit</td>
<td>1</td>
</tr>
<tr>
<td>Rated input current</td>
<td>12 A</td>
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</table>

### OUTPUT RATINGS

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated output current</td>
<td>12 A</td>
</tr>
<tr>
<td>Control signal method</td>
<td>PLC signal</td>
</tr>
</tbody>
</table>

### GENERAL DATA

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (W x H x D)</td>
<td>3.8 x 6.5 x 1.1 in (97.3 x 165 x 27.3 mm)</td>
</tr>
<tr>
<td>Weight</td>
<td>1.4 lbs (0.64 kg)</td>
</tr>
<tr>
<td>Cooling</td>
<td>Natural convection</td>
</tr>
<tr>
<td>DC input/ output connectors</td>
<td>MC4 PV connector</td>
</tr>
<tr>
<td>Enclosure material</td>
<td>Plastic</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-40 °F to 185 °F (-40 °C to 85 °C)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 °F to 185 °F (-40 °C to 85 °C)</td>
</tr>
<tr>
<td>Humidity</td>
<td>0% to 95%</td>
</tr>
<tr>
<td>Maximum operating altitude</td>
<td>9,843 ft (3,000m) above sea level</td>
</tr>
<tr>
<td>Self power consumption</td>
<td>&lt;3.0 W</td>
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<tr>
<td>Warranty</td>
<td>10 years</td>
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### STANDARD COMPLIANCE

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Enclosure protection rating</td>
<td>Type 4</td>
</tr>
<tr>
<td>Safety</td>
<td>UL 1741, CSA-C22.2 No. 107.1-01</td>
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<tr>
<td>Rapid shutdown</td>
<td>NEC 2017 Article 690.12</td>
</tr>
<tr>
<td>EMC</td>
<td>FCC Part 15 Class B</td>
</tr>
</tbody>
</table>
MUNICIPALITY LETTER
March 3, 2020

To: Steve Shira
54 Walnut Avenue
Takoma Park, MD, 20912

To: Department of Permitting Services
255 Rockville Pike, 2nd Floor
Rockville, Maryland 20850-4166
Fax 240-777-6398; 240-777-6262; 240-777-6223

From: Planning and Development Services Division

THIS IS NOT A PERMIT – For Informational Purposes Only

VALID FOR ONE YEAR FROM DATE OF ISSUE

The property owner is responsible for obtaining all required permits from Montgomery County and the City of Takoma Park. If this property is in the Takoma Park Historic District, it is subject to Montgomery County Historic Preservation requirements.

Representative/email: Beth Vallandingham / lvallandingham@tesla.com
Location of Project: 54 Walnut Avenue, Takoma Park, MD 20912
Proposed Scope of Work: Re-roof with Solarglass (solar roof tile)- 6.90 kW

The purpose of this municipality letter is to inform you that the City of Takoma Park has regulations and city permit requirements that may apply to your project. This municipality letter serves as notification that, in addition to all Montgomery County requirements, you are required to comply with all City permitting requirements, including:

- Tree Impact Assessment/Tree Protection Plan
- Stormwater management
- City Right of Way

Failure to comply with these requirements could result in the issuance of a Stop Work Order and other administrative actions within the provisions of the law. Details of Takoma Park’s permit requirements are attached on page 2.

The issuance of this letter does not indicate approval of the project nor does it authorize the property owner to proceed with the project. The City retains the right to review and comment on project plans during the Montgomery County review process.
The City of Takoma Park permits for the following issues:

Tree Impact Assessment/Tree Protection Plan/Tree Removal Application:
Construction activities that occur within 50 feet of any urban forest tree (7 5/8” in diameter or greater), located on the property or on an adjacent property, may require a Tree Impact Assessment and Tree Protection Plan. Make sure to submit a Tree Impact Assessment and schedule a site visit with the City's Urban Forest Manager if any urban forest tree will be impacted by the proposed construction. The removal of any urban forest tree will require a tree removal application. The tree ordinance is detailed in the City Code, section 12.12. For permit information check: https://takomaparkmd.gov/services/permits/tree-permits/ The City's Urban Forest Manager can be reached at 301-891-7612 or janvz@takomaparkmd.gov

Stormwater Management:
If you plan to develop or redevelop property, you may be required to provide appropriate stormwater management measures to control or manage runoff, as detailed in City Code section 16.04. All commercial or institutional development in the city must apply for Stormwater Management Permit regardless of the size of the land disturbance. Additions or modifications to existing detached single-family residential properties do not require a Stormwater Management permit if the project does not disturb more than 5,000 square feet of land area. For more information: https://takomaparkmd.gov/government/public-works/stormwater-management-program/. The City Engineer should be contacted to determine if a City permit is required at 301-891-7620.

City Right of Way:
- To place a construction dumpster or storage container temporarily on a City right of way (usually an adjacent road), you will need to obtain a permit. A permit is not required if the dumpster is placed in a privately-owned driveway or parking lot.
- If you plan to install a new driveway apron, or enlarge or replace an existing driveway apron, you need a Driveway Apron Permit.
- If you plan to construct a fence in the City right of way, you need to request a Fence Agreement. If approved, the Agreement will be recorded in the Land Records of Montgomery County.

For more information and applications for City permits, see https://takomaparkmd.gov/services/permits/ or contact the Takoma Park Department of Public Works at 301-891-7633.

Failure to comply with the City’s permitting requirements could result in the issuance of a Stop Work Order and other administrative actions within the provisions of the law.
ROOFING SYSTEM SPECIFICATIONS

CERTIFICATIONS

<table>
<thead>
<tr>
<th>UL Listed</th>
<th>ETL Listed</th>
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<tbody>
<tr>
<td>UL/IEC 61730</td>
<td>UL 790 Class A</td>
</tr>
<tr>
<td>UL 9703</td>
<td>TAS100</td>
</tr>
<tr>
<td>UL 1741</td>
<td>ASTM D3161 Class F</td>
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</tbody>
</table>

ELECTRICAL CHARACTERISTICS

Maximum open circuit voltage rating of connected branch circuits per diode (at STC): 13.34 V
Maximum series fuse rating: 15 A
Maximum system voltage: 600 V

ROOF PITCH RANGE

2:12 - 12:12

MODEL SPECIFICATIONS

MODEL #SR60T1 14-CELL MODULE

<table>
<thead>
<tr>
<th>Irradiance (W/m²)</th>
<th>Temp. (Celsius)</th>
<th>Voc (V)</th>
<th>Vmp (V)</th>
<th>Isc (A)</th>
<th>Imp (A)</th>
<th>Pmax (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>25</td>
<td>13.34</td>
<td>10.99</td>
<td>5.65</td>
<td>5.32</td>
<td>58.47</td>
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</tbody>
</table>

These electrical characteristics are within ± 5% of the indicated values of Isc, Voc, and Pmax under standard test conditions (irradiance of 1000 W/m², AM 1.5 spectrum, and a cell temperature of 25 °C or 77 °F).

Dimensions

430 mm x 1140 mm x 34.5 mm

Principal Materials

Glass, Polymers, Fiberglass and Silicon

Installed System Weight

Textured Glass: 16.4 kg/m² or 3.4 psf

Installed weights include all components of system above roof sheathing
<table>
<thead>
<tr>
<th>Component</th>
<th>Model</th>
<th>UL/IEC Standards</th>
<th>Classifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roofing Foot</td>
<td>SR-FOOT</td>
<td>UL 790 Class A, ASTM D3161 Class F</td>
<td></td>
</tr>
<tr>
<td>PV Module</td>
<td>SR60T1</td>
<td>Listed to UL/IEC 61730, UL 790 Class A</td>
<td>ASTM D3161 Class FTAS100</td>
</tr>
<tr>
<td>Roofing Modules, Full and Partial</td>
<td>SRNFT1/6,</td>
<td>Listed to UL 790 Class A, ASTM D3161</td>
<td>FTAS100</td>
</tr>
<tr>
<td>Foot with Support</td>
<td>#SRFOOTSUP</td>
<td>Class A, ASTM D3161 Class F</td>
<td>FTAS100</td>
</tr>
<tr>
<td>Roofing Module</td>
<td>SRNFT1/3</td>
<td>Listed to UL 790 Class A, ASTM D3161</td>
<td>FTAS100</td>
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<tr>
<td>Rapid Shutdown Device</td>
<td>RSS-600</td>
<td>Listed to UL 1741, MEC Article 600.12</td>
<td>NEMA 3R Enclosure</td>
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<td>Firestone Underlayment</td>
<td>Clad-Gard SA FR</td>
<td>Listed to UL 1741, ASTM D226 Type I &amp; II, ASTM D1970 Class A Fire Rated per ASTM E108</td>
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<tr>
<td>Diode Trunk Harness</td>
<td>SRDTH</td>
<td>Listed to UL 9703</td>
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</tr>
<tr>
<td>Pass Through Box</td>
<td>SRPTB-4</td>
<td>Listed to UL 1741</td>
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</table>