

# HISTORIC AND DESIGN REVIEW COMMISSION

January 20, 2021

**HDRC CASE NO:** 2020-548  
**ADDRESS:** 2323 W GRAMERCY PLACE  
**LEGAL DESCRIPTION:** NCB 9074 BLK LOT 21  
**ZONING:** R-6, H  
**CITY COUNCIL DIST.:** 7  
**DISTRICT:** Monticello Park Historic District  
**APPLICANT:** Michael Pensabene/Freedom Solar Power  
**OWNER:** Rebecca Vidal/VIDAL MARTIN ROBERT & REBECCA MARIA  
**TYPE OF WORK:** Solar panels  
**APPLICATION RECEIVED:** December 04, 2020  
**60-DAY REVIEW:** Not applicable due to City Council Emergency Orders  
**CASE MANAGER:** Rachel Rettaliata

## REQUEST:

The applicant is requesting a Certificate of Appropriateness for approval to install 21 solar panels on the existing roof.

## APPLICABLE CITATIONS:

*Historic Design Guidelines, Chapter 3, Guidelines for Additions*

### 6. Designing for Energy Efficiency

#### A. BUILDING DESIGN

- i. *Energy efficiency*—Design additions and new construction to maximize energy efficiency.
- ii. *Materials*—Utilize green building materials, such as recycled, locally-sourced, and low maintenance materials whenever possible.
- iii. *Building elements*—Incorporate building features that allow for natural environmental control – such as operable windows for cross ventilation.
- iv. *Roof slopes*—Orient roof slopes to maximize solar access for the installation of future solar collectors where compatible with typical roof slopes and orientations found in the surrounding historic district.

#### B. SITE DESIGN

- i. *Building orientation*—Orient new buildings and additions with consideration for solar and wind exposure in all seasons to the extent possible within the context of the surrounding district.
- ii. *Solar access*—Avoid or minimize the impact of new construction on solar access for adjoining properties.

#### C. SOLAR COLLECTORS

- i. *Location*—Locate solar collectors on side or rear roof pitch of the primary historic structure to the maximum extent feasible to minimize visibility from the public right-of-way while maximizing solar access. Alternatively, locate solar collectors on a garage or outbuilding or consider a ground-mount system where solar access to the primary structure is limited.
- ii. *Mounting (sloped roof surfaces)*—Mount solar collectors flush with the surface of a sloped roof. Select collectors that are similar in color to the roof surface to reduce visibility.
- iii. *Mounting (flat roof surfaces)*—Mount solar collectors flush with the surface of a flat roof to the maximum extent feasible. Where solar access limitations preclude a flush mount, locate panels towards the rear of the roof where visibility from the public right-of-way will be minimized.

## FINDINGS:

- a. The primary structure at 2323 W Gramercy is a 1-story, single-family residence constructed circa 1940. The house features a hip composition shingle roof with a front gable on the west side of the front façade, a prominent centrally located chimney, stone cladding, and steel windows. The property is contributing to the Monticello Park Historic District.
- b. LOCATION – The applicant is requesting approval to install 21 solar panels on the existing roof. The 8 panels located on the roofline of the west elevation and the 6 panels located on the east side of the roofline will be partially visible from the public right-of-way. The remaining 7 panels will be located toward the rear

of the structure and will not be visible from the public right-of-way. According to the Historic Design Guidelines for Additions 6.C.i., solar collectors should be located on a side or rear roof pitch to the maximum extent possible to minimize the visibility from the public right-of-way. Staff finds that the applicant should explore the panels that will be visible from the public right-of-way to the central portion of the rear roof slope. This location appears to have adequate sun exposure. Staff finds the proposed location of the panels visible from the public right-of-way inconsistent with the Guidelines.

- c. PITCH – The panels will be installed flush with the roof pitch. Staff finds the proposal consistent with the Guidelines.
- d. REVERSABILITY – The panels are fully removable from the existing roof, returning the roof to its pre-solar panel condition. Staff finds this consistent with the Guidelines.

**RECOMMENDATION:**

Staff recommends approval based on findings a through d with the following stipulations:

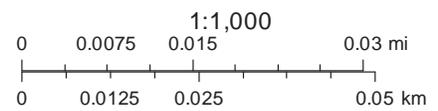
- i. That the solar panels are sited so that they are not visible from the public right-of-way. The applicant is required to submit an updated roof plan showing a solar array that is not visible from the public right-of-way for staff review and approval.
- ii. That the solar panels maintain at least 18” of separation from the roof eaves.

# City of San Antonio One Stop

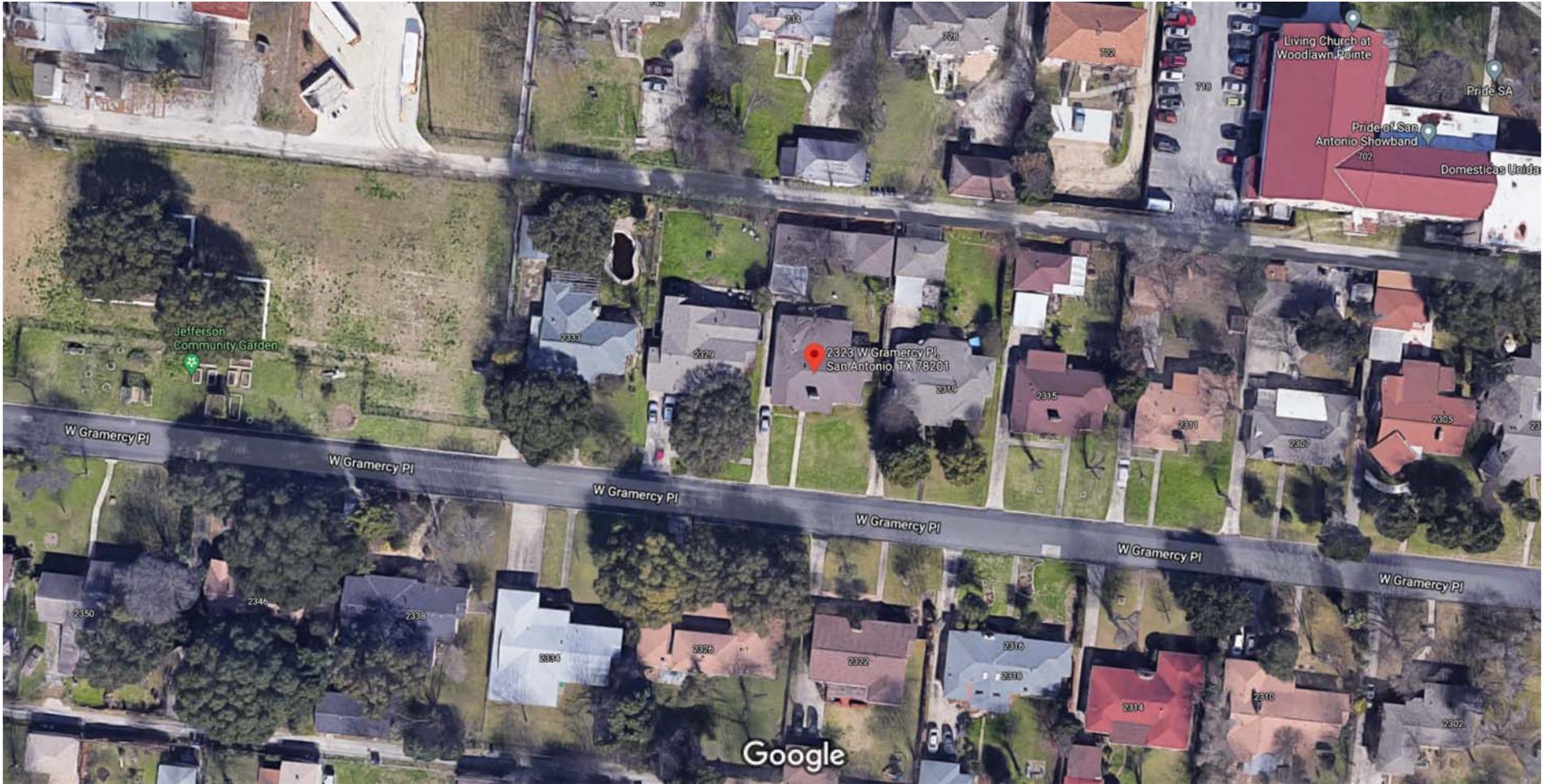


January 12, 2021

 User drawn lines

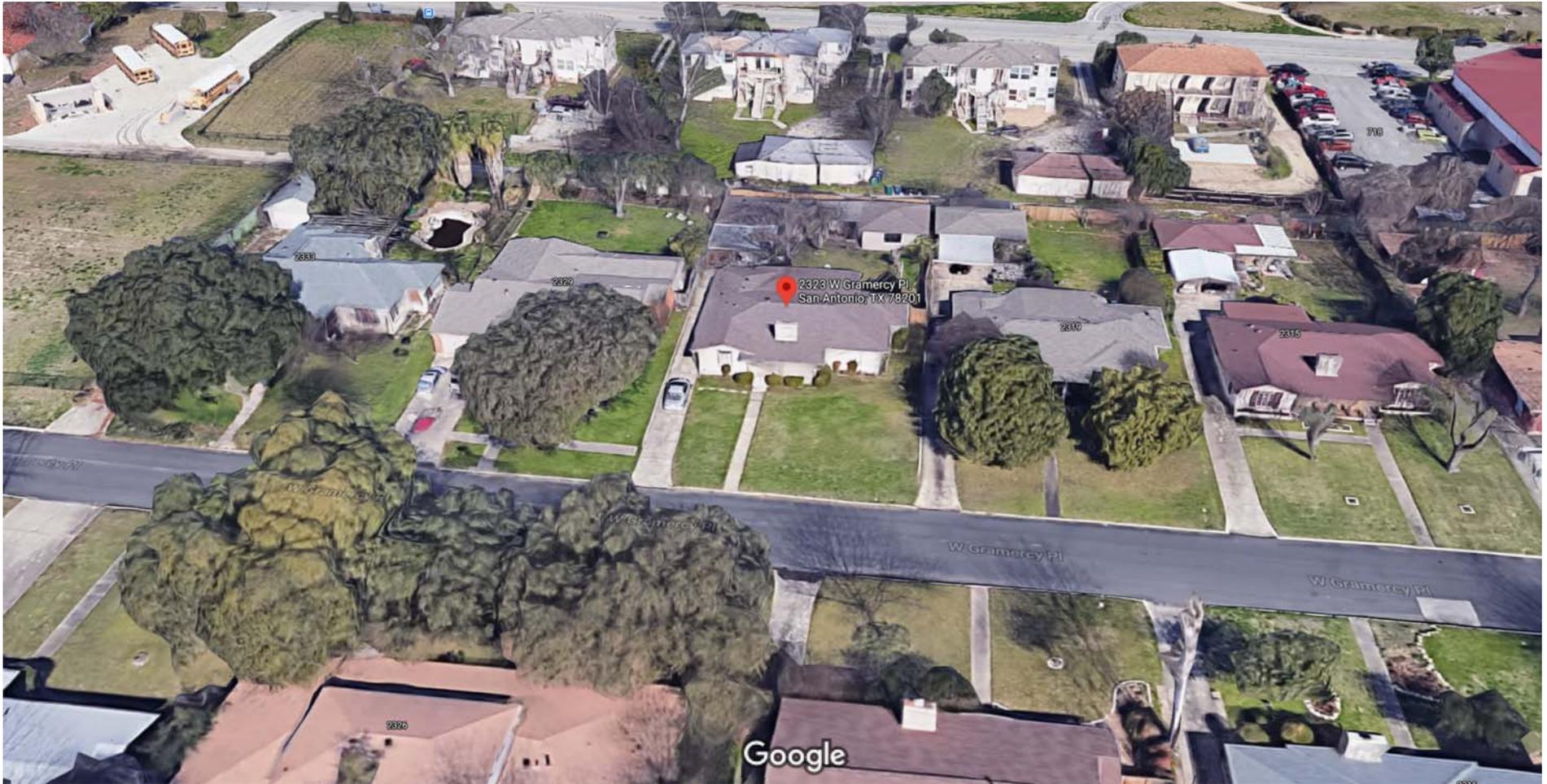


Google Maps 2323 W Gramercy Pl



Imagery ©2021 Google, Imagery ©2021 CAPCOG, Maxar Technologies, Map data ©2021 Google 50 ft

Google Maps 2323 W Gramercy Pl



Imagery ©2021 Google, Map data ©2021, Map data ©2021 Google 20 ft

Google Maps 2323 W Gramercy Pl



Imagery ©2021 Google, Map data ©2021, Map data ©2021 20 ft

Google Maps 2323 W Gramercy Pl



Imagery ©2021 Google, Map data ©2021, Map data ©2021 20 ft











## SCOPE OF WORK

TO INSTALL A SOLAR PHOTOVOLTAIC (PV) SYSTEM AT THE VIDAL RESIDENCE, LOCATED AT 2323 WEST GRAMERCY PLACE, SAN ANTONIO, TEXAS. THE POWER GENERATED BY THE PV SYSTEM WILL BE INTERCONNECTED WITH THE UTILITY GRID THROUGH THE EXISTING ELECTRICAL SERVICE EQUIPMENT. THE PV SYSTEM DOES NOT INCLUDE STORAGE BATTERIES.

## SYSTEM RATING

8.61 kW DC STC  
7.33 kW AC

## EQUIPMENT SUMMARY

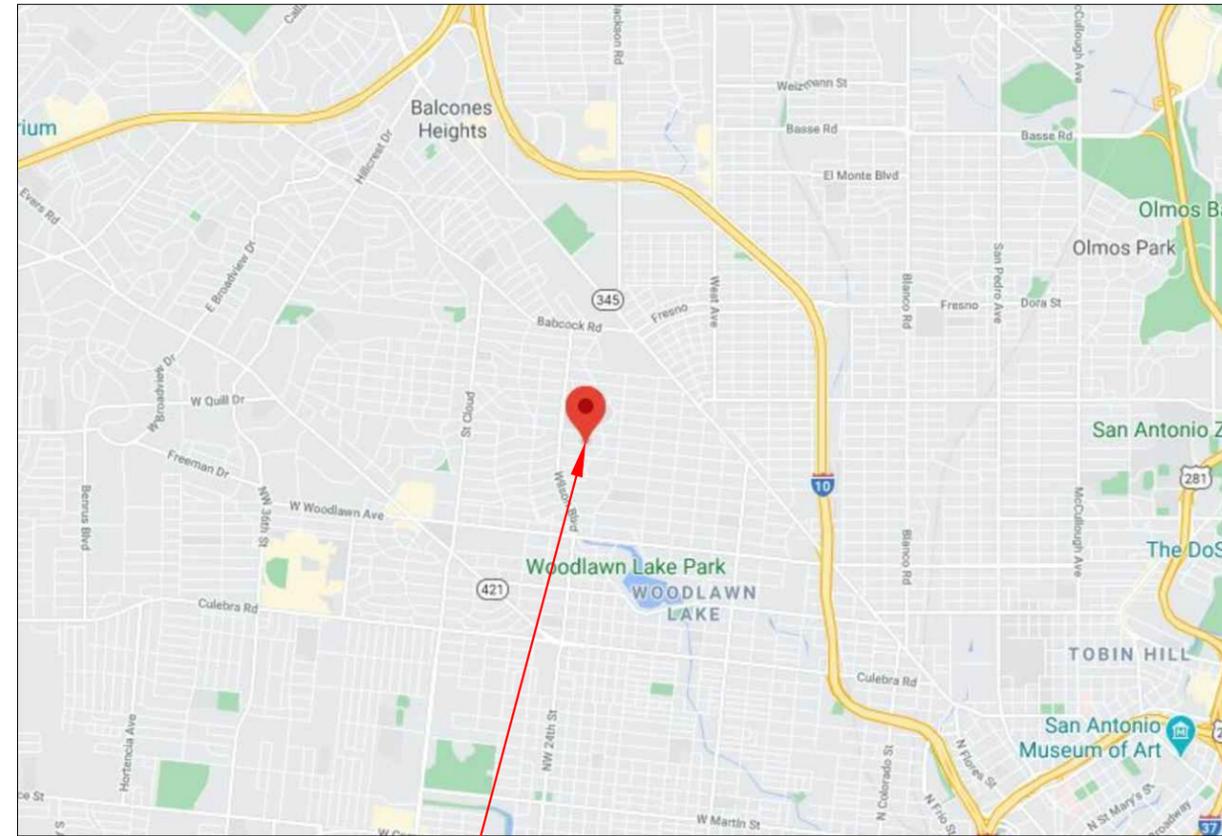
(21) SUNPOWER SPR-A410-G-AC PV MODULES  
(21) SUNPOWER SPR-A410-G-AC [240V] PV INVERTERS  
(172) (16 X 10.75') LINEAR FEET SUNPOWER INVISIMOUNT

## SHEET INDEX

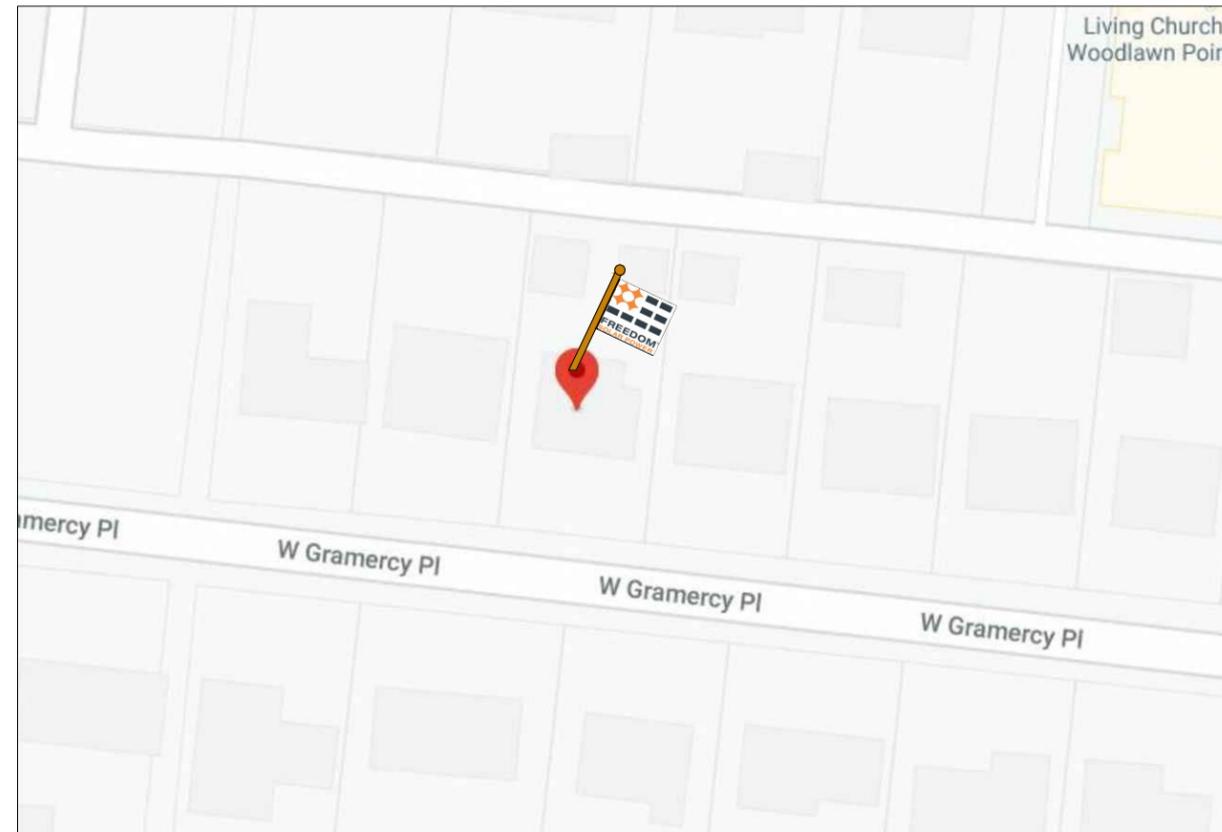
PV-0 COVER  
PV-1 SITE MAP AND PV LAYOUT  
PV-2 STRING MAP AND MONITORING LAYOUT  
PV-3 ELECTRICAL DIAGRAM  
PV-4 EQ WALL & MOUNTING DETAIL  
PV-5 SYSTEM LABELING DETAIL  
PV-6 SAFETY PLAN

## GOVERNING CODES

2017 NATIONAL ELECTRICAL CODE  
2018 INTERNATIONAL RESIDENTIAL CODE  
2018 INTERNATIONAL FIRE CODE  
UNDERWRITERS LABORATORIES (UL) STANDARDS  
OSHA 29 CFR 1910.269



PROJECT LOCATION



VICINITY MAP

DESIGN BY:  
FREEDOM SOLAR, LLC

REVISIONS		
DESCRIPTION	DATE	REV
DESIGN PACKET	11/17/2020	A

CONTRACTOR



**FREEDOM<sup>™</sup>**  
**SOLAR POWER**

FREEDOM SOLAR LLC  
4801 FREIDRICH LN, STE 100  
AUSTIN, TX 78744  
TECL # 28621  
TBPE FIRM # F-17690

PROJECT NAME

VIDAL, REBECCA  
2323 WEST GRAMERCY PLACE  
SAN ANTONIO, TEXAS, 78201  
(720) 378-2137

SHEET NAME

COVER

SHEET SIZE

ANSI B  
11" x 17"

SHEET NUMBER

PV-0

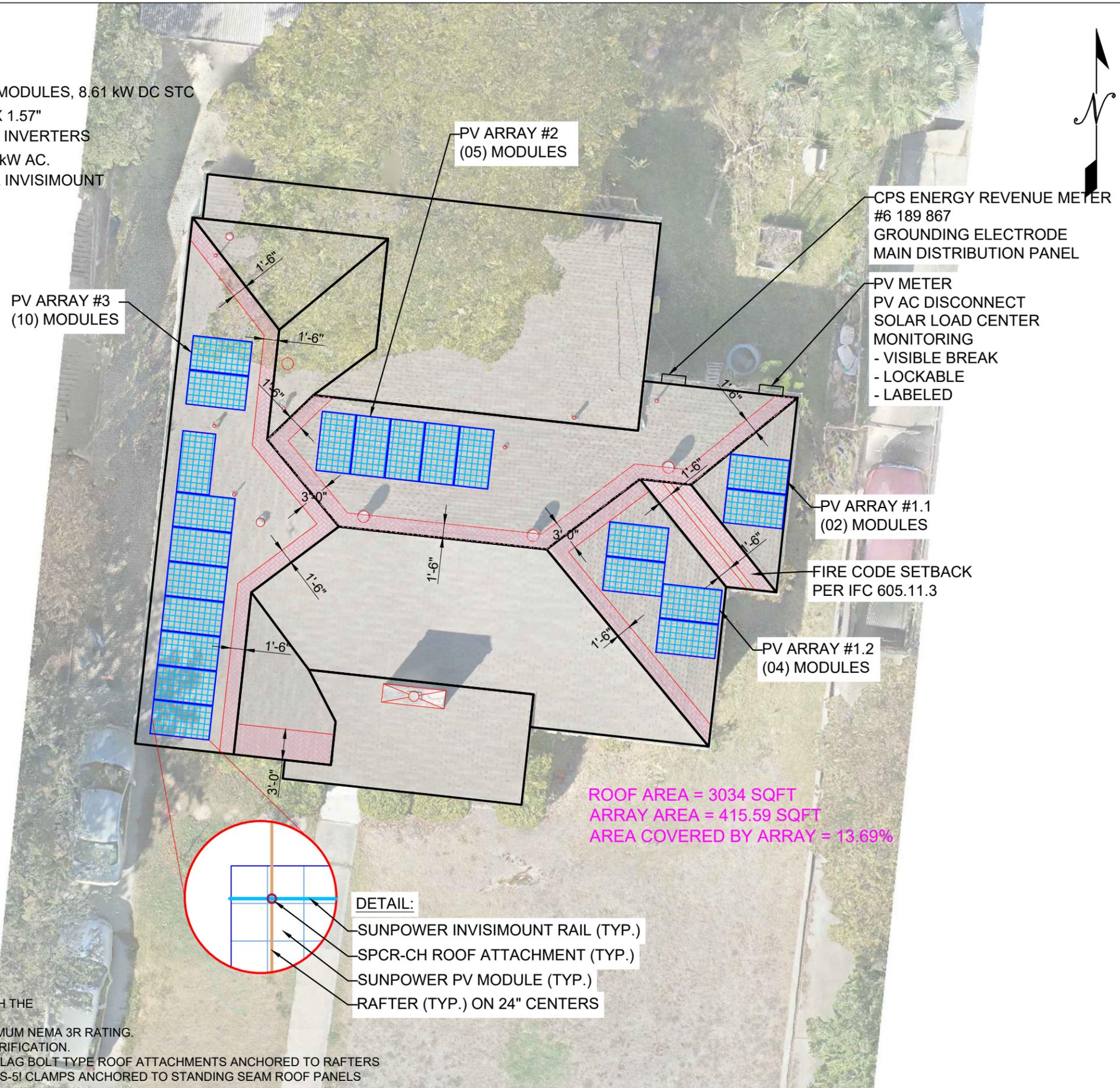
LEAD ID: 29104

CONSTRUCTION SUMMARY

- (21) (SUNPOWER SPR-A410-G-AC) SOLAR MODULES, 8.61 kW DC STC  
MODULE DIMENSIONS = 40.0" X 72.2" X 1.57"
- (21) SUNPOWER SPR-A410-G-AC [240V] PV INVERTERS  
COMBINED INVERTER OUTPUT = 7.33 kW AC.
- (172) (16 X 10.75') LINEAR FEET SUNPOWER INVISIMOUNT
- (60) SPCR-CH ROOF ATTACHMENTS
- (1) SUNPOWER MONITORING

SITE DETAILS

ROOF TYPE: ASPHALT SHINGLE  
 ARRAY #1.1 & 1.2 - TILT = 14°, AZIMUTH = 96°  
 ARRAY #2 - TILT = 14°, AZIMUTH = 6°  
 ARRAY #3 - TILT = 14°, AZIMUTH = 276°  
 INSTALLATION DIFFICULTY = 8 => NORMAL



ROOF AREA = 3034 SQFT  
 ARRAY AREA = 415.59 SQFT  
 AREA COVERED BY ARRAY = 13.69%

CONSTRUCTION NOTES

- 1.) ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- 2.) ALL OUTDOOR EQUIPMENT SHALL BE RAIN-TIGHT WITH MINIMUM NEMA 3R RATING.
- 3.) ALL LOCATIONS ARE APPROXIMATE AND REQUIRE FIELD VERIFICATION.
- 4.) TYP. ROOF ATTACHMENT SPACING SHALL BE 6'-0" MAX FOR LAG BOLT TYPE ROOF ATTACHMENTS ANCHORED TO RAFTERS
- 5.) TYP. ROOF ATTACHMENT SPACING SHALL BE 4'-6" MAX FOR S-51 CLAMPS ANCHORED TO STANDING SEAM ROOF PANELS

DESIGN BY:  
FREEDOM SOLAR, LLC

REVISIONS		
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 FREEDOM SOLAR LLC  
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 AUSTIN, TX 78744  
 TECL # 28621  
 TBPE FIRM # F-17690

PROJECT NAME  
**VIDAL, REBECCA**  
 2323 WEST GRAMERCY PLACE  
 SAN ANTONIO, TEXAS, 78201  
 (720) 378-2137

SHEET NAME  
**SITE MAP & PV LAYOUT**

SHEET SIZE  
**ANSI B  
 11" x 17"**

SHEET NUMBER  
**PV-1**

DESIGN BY:  
FREEDOM SOLAR, LLC

REVISIONS

DESCRIPTION	DATE	REV
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CONTRACTOR



**FREEDOM<sup>™</sup>  
SOLAR POWER**  
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4801 FREIDRICH LN, STE 100  
AUSTIN, TX 78744  
TECL # 28621  
TBPE FIRM # F-17690

PROJECT NAME

VIDAL, REBECCA  
2323 WEST GRAMERCY PLACE  
SAN ANTONIO, TEXAS, 78201  
(720) 378-2137

SHEET NAME

STRING MAP  
&  
MONITORING  
LAYOUT

SHEET SIZE

ANSI B  
11" x 17"

SHEET NUMBER

PV-2

SUNPOWER SUPERVISOR S/N \_\_\_\_\_

**SOLAR ARRAY - 8.61kW DC STC  
(21) (SUNPOWER SPR-A410-G-AC) MODULES**

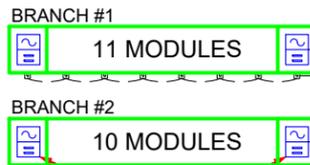
JUNCTION BOXES:  
TRANSITION FROM DG CABLE  
TO AWG #10 THWN-2  
NEMA 3R, UL LISTED

SOLAR LOAD CENTER  
240VAC, 125A  
NEMA 3R, UL LISTED  
(3) 2P-20A BREAKERS

PV AC DISCONNECT  
240VAC, 60A  
NON-FUSIBLE,  
NEMA 3R, UL LISTED

PV METER  
240VAC, 125A  
NEMA 3R, UL LISTED

CPS REVENUE METER  
#6 189 867  
1-PHASE, 240V



(21) (SUNPOWER SPR-A410-G-AC [240V])  
INVERTERS  
240VAC, 1.45A MAX  
CEC WEIGHTED EFFICIENCY 97.0%  
NEMA 4R, UL LISTED, INTERNAL GFDI

(4) AWG #10 THWN-2  
(1) AWG #8 THWN-2 GND  
IN 3/4" CONDUIT

PRODUCTION CT  
ON L1

(3) AWG #6 THWN-2  
(1) AWG #8 THWN-2 GND  
IN 1" CONDUIT

600V FOUR WIRE DIRECT BURIAL CABLE  
IF CT CONDUCTORS ARE EXTENDED

CONSUMPTION CTS ON L1 & L2  
NEW MAIN SERVICE DISCONNECT  
CSR2125N, 240V, 125A  
(UPGRADE)

NEW MAIN DISTRIBUTION  
PANEL CH24B200R 1P3W  
240V, 200A BUS  
(UPGRADE)

POINT OF INTERCONNECTION  
(1) 2P-40A CIRCUIT BREAKER  
INSTALLED AT OPPOSITE END OF  
BUS FROM MAIN DISCONNECT

EXISTING GROUNDING  
ELECTRODE SYSTEM

**ELECTRICAL NOTES**

- 1.) ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- 2.) ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90°C WET ENVIRONMENT UNLESS OTHERWISE NOTED.
- 3.) WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
- 4.) WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
- 5.) DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
- 6.) WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
- 7.) ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
- 8.) MAXIMUM MOUNTING HEIGHT FROM GRADE TO CENTER OF METER SOCKET SHALL BE 72" FOR RESIDENTIAL SINGLE PHASE METER SOCKETS 0-320 AMPS. MINIMUM MOUNTING HEIGHT IS 30" FROM FOR AUSTIN ENERGY, AND 48" FOR ALL OTHER JURISDICTIONS
- 9.) MINIMUM HORIZONTAL CLEARANCE FROM GAS REGULATOR TO ANY ELECTRICAL ENCLOSURE IS 36", EXCEPT AUSTIN ENERGY WHICH REQUIRES 48" CLEARANCE FROM GAS TO METER SOCKET
- 10.) PV DISCONNECT SHALL BE VISIBLE, LOCKABLE AND LABELED AND THE DOOR CANNOT BE OPENED WHEN HANDLE IS IN ON POSITION
- 11.) BY DEFAULT THE MONITORING DEVICE IS SHOWN CONNECTED TO A 20-AMP BREAKER IN THE SOLAR LOAD CENTER. ALTERNATIVELY, THE MONITORING DEVICE MAY BE CONNECTED TO A 20-AMP BREAKER AT THE MAIN DISTRIBUTION PANEL.

CALCULATIONS FOR CURRENT CARRYING CONDUCTORS	CALCULATIONS FOR OVERCURRENT DEVICES
<p>INVERTER OUTPUT WIRE AMPACITY CALCULATION [NEC 690.8(A)(3)]: 1.45A PER INVERTER (SUNPOWER SPR-A410-G-AC [240V]) MAXIMUM INVERTER BRANCH CURRENT = (11)(1.45A) = 16.0A CONTINUOUS USE: #10 WIRE 75°C DERATED AMPACITY = (0.80)(35.0A) = 28.0A <b>28.0A &gt; 16.0A</b> CONDITIONS OF USE: #10 WIRE 90°C DERATED AMPACITY = (0.91)(0.80)(40.0A) = 29.1A <b>29.1A &gt; 16.0A</b></p> <p>SOLAR LOAD CENTER OUTPUT WIRE AMPACITY CALCULATION [NEC 690.8(A)(3)]: 1.45A PER INVERTER (SUNPOWER SPR-A410-G-AC [240V]) COMBINED CURRENT = (21)(1.45A) = 30.5A CONTINUOUS USE: #6 WIRE 75°C DERATED AMPACITY = (0.80)(65A) = 52.0A <b>52.0 &gt; 30.5A</b> CONDITIONS OF USE: #6 WIRE 90°C DERATED AMPACITY = (0.91)(75A) = 68.3A <b>68.3A &gt; 30.5A</b></p>	<p>INVERTER BRANCH AC CURRENT CALCULATION [NEC 690.8(A)(3)]: 1.45A PER INVERTER (SUNPOWER SPR-A410-G-AC [240V]) MAXIMUM BRANCH INVERTER CURRENT = (11)(1.45A) = 16.0A MINIMUM OCPD = (16.0A)(1.25) = 20.0A USE 2P-20A BREAKERS IN SOLAR LOAD CENTER FOR INVERTER BRANCH OCPD</p> <p>SYSTEM AC CURRENT CALCULATION [NEC 690.8(A)(3)]: 1.45A PER INVERTER (SUNPOWER SPR-A410-G-AC [240V]) COMBINED CURRENT = (21)(1.45A) = 30.5A MINIMUM OCPD = (30.5A)(1.25) = 38.1A USE 2P-40A BREAKER IN MDP FOR SYSTEM OCPD</p>

DESIGN BY:  
FREEDOM SOLAR, LLC

REVISIONS		
DESCRIPTION	DATE	REV
DESIGN PACKET	11/17/2020	A

CONTRACTOR

**FREEDOM™  
SOLAR POWER**

FREEDOM SOLAR LLC  
4801 FREDRICH LN, STE 100  
AUSTIN, TX 78744  
TECL # 28621  
TBPE FIRM # F-17690

PROJECT NAME

**VIDAL, REBECCA**

**2323 WEST GRAMERCY PLACE**

**SAN ANTONIO, TEXAS, 78201**

**(720) 378-2137**

SHEET NAME

**ELECTRICAL  
DIAGRAM**

SHEET SIZE

**ANSI B  
11" x 17"**

SHEET NUMBER

**PV-3**

DESIGN BY:  
FREEDOM SOLAR, LLC

REVISIONS		
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CONTRACTOR



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**2323 WEST GRAMERCY PLACE**  
**SAN ANTONIO, TEXAS, 78201**  
**(720) 378-2137**

SHEET NAME

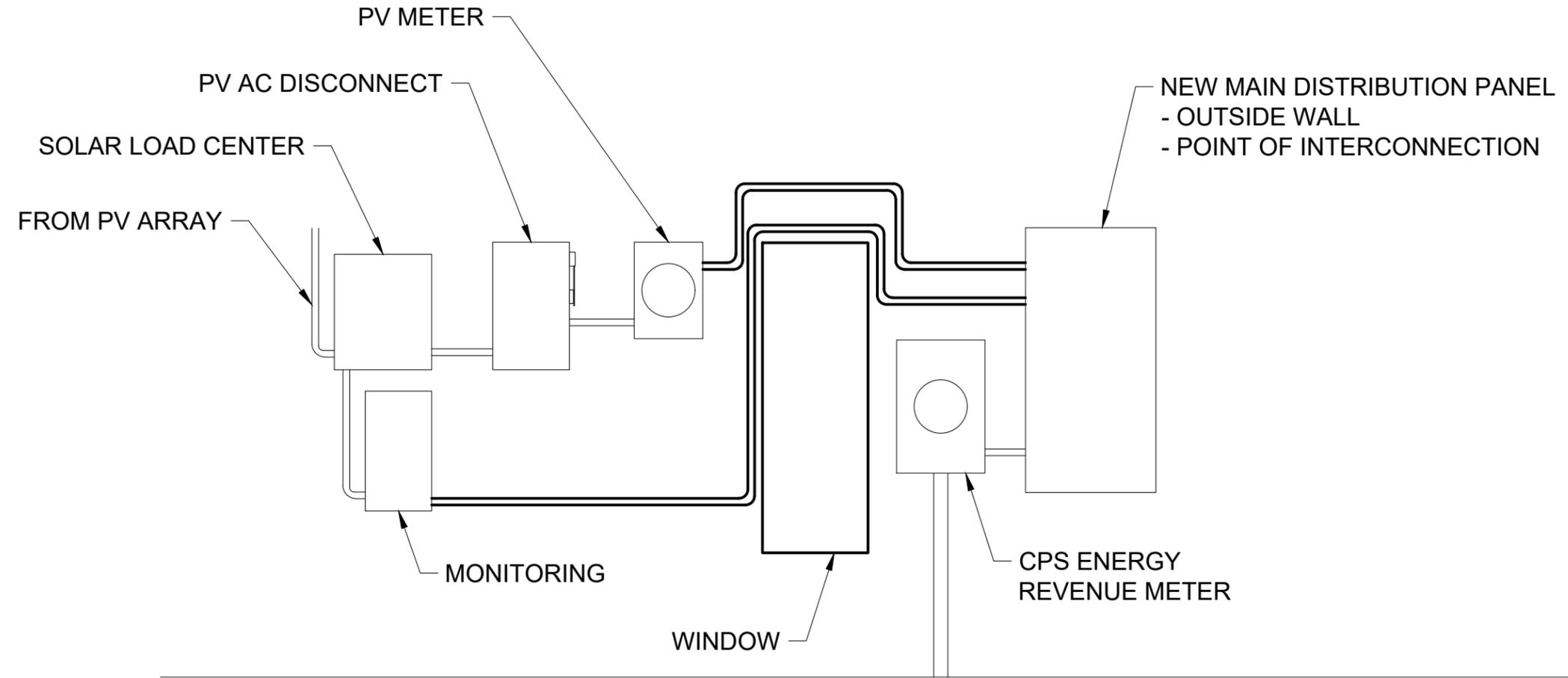
**EQ.WALL & MOUNTING DETAIL**

SHEET SIZE

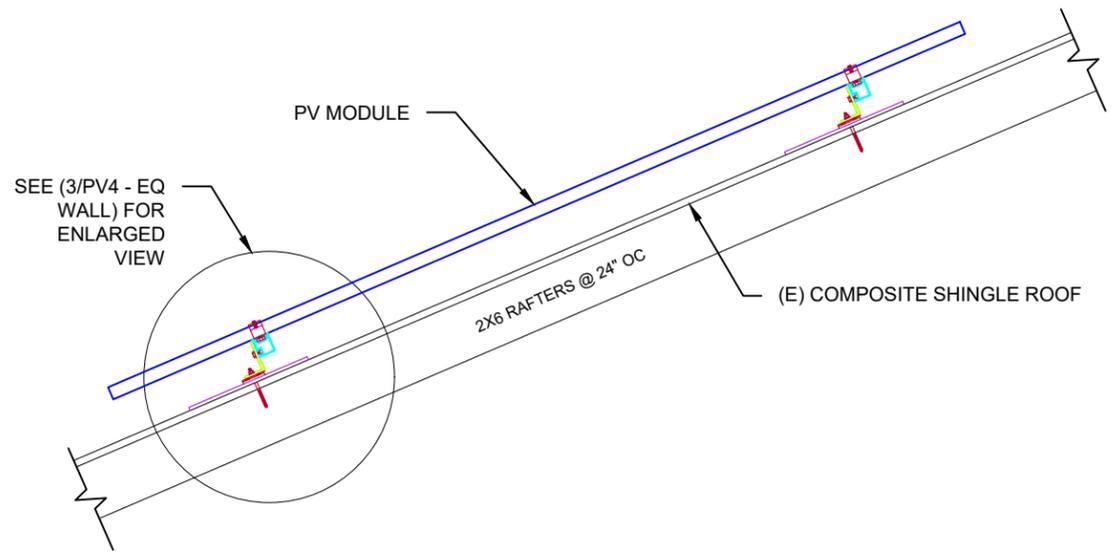
**ANSI B  
11" x 17"**

SHEET NUMBER

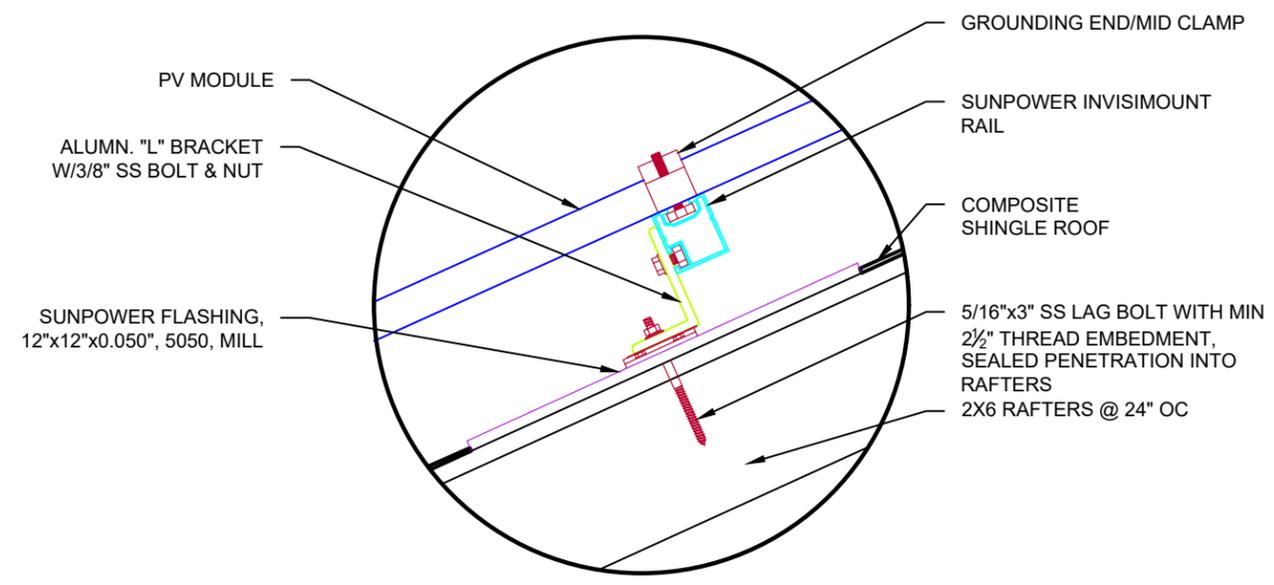
**PV-4**



EQUIPMENT ELEVATION  
NTS 1



MOUNTING METHOD  
NTS 2



MOUNTING DETAIL  
NTS 3

NOTE: NOT ALL LABELS MAY BE APPLICABLE

**SIGNAGE REQUIREMENTS**

- > RED BACKGROUND
- > WHITE LETTERING
- > MIN. 3/8" LETTER HEIGHT
- > ALL CAPITAL LETTERS
- > ARIAL OR SIMILAR FONT
- > REFLECTIVE, WEATHER RESISTANT MATERIAL, UL 969

**PV SYSTEM DISCONNECT**

REQ'D BY: NEC 690.13(B) A  
 APPLY TO:  
 PV DISCONNECT

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

REQ'D BY: NEC 690.13(B) B  
 APPLY TO:  
 PV DISCONNECT

**WARNING: PHOTOVOLTAIC  
 POWER SOURCE**

REQ'D BY: NEC 690.31(G)(3) C  
 APPLY TO:  
 RACEWAYS, CABLE TRAYS,  
 OTHER WIRING METHODS, AND  
 ENCLOSURES THAN CONTAIN  
 PV SYSTEM DC CONDUCTORS

**WARNING**  
 POWER SOURCE OUTPUT  
 CONNECTION. DO NOT  
 RELOCATE THIS  
 OVERCURRENT DEVICE

REQ'D BY: NEC 705.12(B)(2)(3)(b) D  
 APPLY TO:  
 DISTRIBUTION EQUIPMENT  
 ADJACENT TO BACK-FED BREAKER

**2" ADDRESS NUMBERS**

REQ' BY: AHJ E  
 APPLY TO:  
 REVENUE METER SOCKET  
 (IF APPLICABLE)

**PV METER**

REQ'D BY: AHJ F  
 APPLY TO:  
 PV METER SOCKET  
 (IF APPLICABLE)

**REVENUE METER**

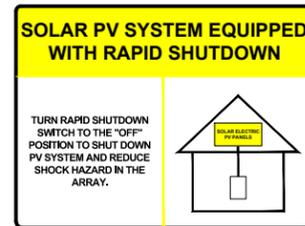
REQ'D BY: AHJ G  
 APPLY TO:  
 REVENUE METER SOCKET  
 (IF APPLICABLE)

**MONITORING**

REQ'D BY: FREEDOM SOLAR H  
 APPLY TO:  
 MONITORING DEVICE ENCLOSURE

**PHOTOVOLTAIC SYSTEM  
 AC DISCONNECT  
 OPERATING CURRENT: 30.5A  
 OPERATING VOLTAGE: 240 VAC**

REQ'D BY: 690.56(1)(a) I  
 APPLY TO:  
 PV DISCONNECT



REQ'D BY: FREEDOM SOLAR J  
 APPLY TO:  
 MAIN DISTRIBUTION PANEL

DESIGN BY:  
 FREEDOM SOLAR, LLC

REVISIONS		
DESCRIPTION	DATE	REV
DESIGN PACKET	11/17/2020	A

CONTRACTOR

**FREEDOM<sup>SM</sup>  
 SOLAR POWER**  
 FREEDOM SOLAR LLC  
 4801 FREIDRICH LN, STE 100  
 AUSTIN, TX 78744  
 TECL # 28621  
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PROJECT NAME

**VIDAL, REBECCA**  
 2323 WEST GRAMERCY PLACE  
 SAN ANTONIO, TEXAS, 78201  
 (720) 378-2137

SHEET NAME

**SYSTEM LABELING DETAIL**

SHEET SIZE

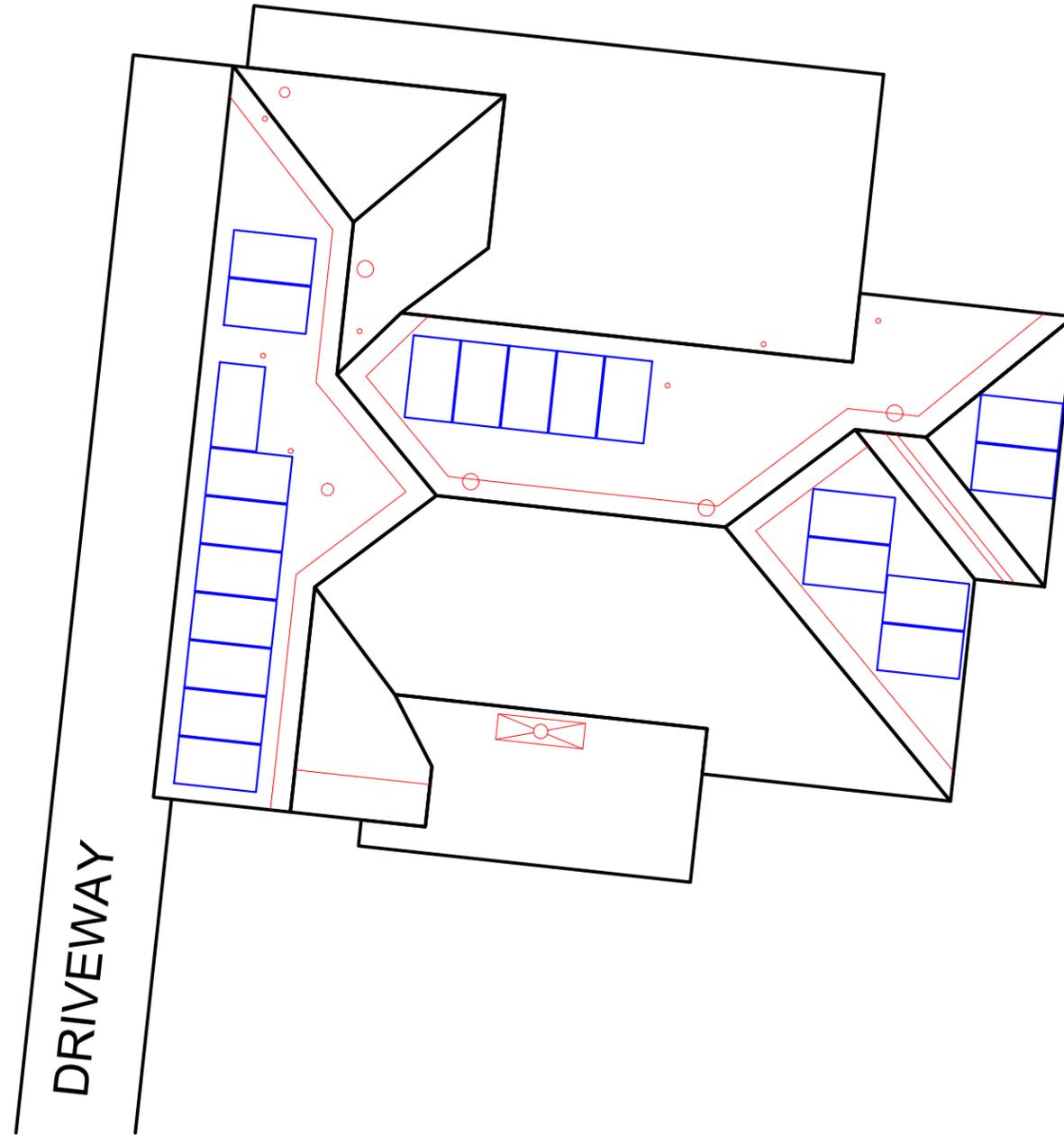
**ANSI B  
 11" x 17"**

SHEET NUMBER

**PV-5**

**DRAW IN CONTROLLED ACCESS ZONE (CAZ) BOUNDARY AND LADDER PLACEMENT ON SITE PLAN BELOW.**

**HARD HAT IS REQUIRED AT ALL TIMES IN CAZ**



**COMPETENT PERSON:** \_\_\_\_\_ **JOB START DATE:** \_\_\_\_\_

**CONDUCT SAFETY MEETING WITH ALL CREW MEMBERS ON SITE AT THE BEGINNING OF EACH JOB. USE SIGN IN SHEET BELOW.**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

**GUEST SIGN IN**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_



DESIGN BY:  
FREEDOM SOLAR, LLC

REVISIONS		
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**VIDAL, REBECCA**  
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**(720) 378-2137**

SHEET NAME

**SAFETY  
PLAN**

SHEET SIZE

**ANSI B  
11" x 17"**

SHEET NUMBER

**PV-6**



# SUNPOWER®



## 420–390 W Residential AC Module

SunPower® Maxeon® Technology

Built specifically for use with the SunPower Equinox™ system, the only fully integrated solution designed, engineered, and warranted by one manufacturer.



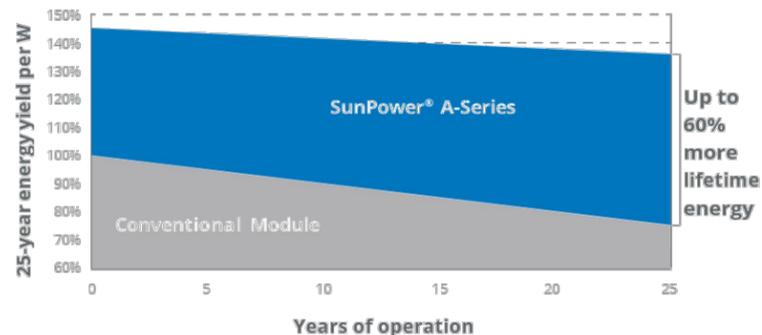
### Highest Power Density Available.

SunPower's new Maxeon® Gen 5 cell is 65% larger than prior generations, delivering the most powerful cell and highest-efficiency module in residential solar. The result is more power per square meter than any commercially available solar.



### Highest Lifetime Energy and Savings.

Designed to deliver 60% more energy over 25 years in real-world conditions like partial shade and high temperatures.<sup>1</sup>



### Best Reliability. Best Warranty.

With more than 25 million modules deployed around the world, SunPower technology is proven to last. That's why we stand behind our module and microinverter with the industry's best 25-year Combined Power and Product Warranty, including the highest Power Warranty in solar.



### Fundamentally Different. And Better.



#### SunPower® Maxeon® Technology

- Most powerful cell in home solar<sup>2</sup>
- Delivers unmatched reliability<sup>3</sup>
- Patented solid metal foundation prevents breakage and corrosion



#### Factory-integrated Microinverter (MI)

- Highest-power integrated AC module in solar
- 60% lighter than prior SunPower MIs
- Engineered and calibrated by SunPower for SunPower AC modules

## A-Series: A420 | A415 | A410 | A400 | A390 SunPower® Residential AC Module

### AC Electrical Data

Inverter Model: SPWR-A4	@240 VAC
Peak Output Power	366 VA
Max. Continuous Output Power	349 VA
Nom. (L-L) Voltage/Range <sup>2</sup> (V)	240 / 211–264
Max. Continuous Output Current (A)	1.45
Max. Units per 20 A (L-L) Branch Circuit <sup>3</sup>	11
CEC Weighted Efficiency	97.0%
Nom. Frequency	60 Hz
Extended Frequency Range	47–68 Hz
AC Short Circuit Fault Current Over 3 Cycles	5.8 A rms
Overvoltage Class AC Port	III
AC Port Backfeed Current	18 mA
Power Factor Setting	1.0
Power Factor (adjustable)	0.7 lead. / 0.7 lag.

### DC Power Data

	A420-G-AC	A415-G-AC	A410-G-AC	A400-G-AC	A390-G-AC
Nom. Power <sup>5</sup> (P <sub>nom</sub> ) W	420	415	410	400	390
Power Tol.	+5/-0%				
Module Efficiency	22.5	22.3	22.0	21.5	20.9
Temp. Coef. (Power)	-0.29%/°C				
Shade Tol.	Integrated module-level max. power point tracking				

### Tested Operating Conditions

Operating Temp.	-40°F to +185°F (-40°C to +85°C)
Max. Ambient Temp.	122°F (50°C)
Max. Load	Wind: 62 psf, 3000 Pa, 305 kg/m <sup>2</sup> front & back Snow: 125 psf, 6000 Pa, 611 kg/m <sup>2</sup> front
Impact Resistance	1 inch (25 mm) diameter hail at 52 mph (23 m/s)

### Mechanical Data

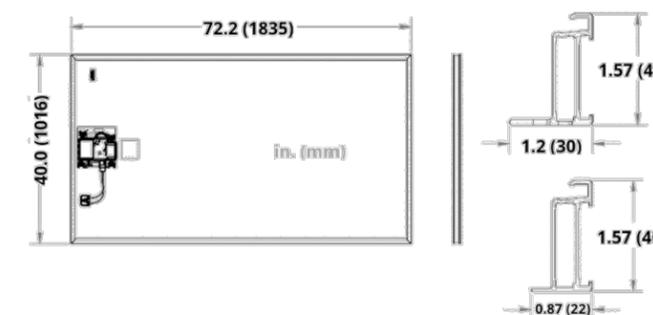
Solar Cells	66 Monocrystalline Maxeon Gen 5
Front Glass	High-transmission tempered glass with anti-reflective coating
Environmental Rating	Outdoor rated
Frame	Class 1 black anodized (highest AAMA rating)
Weight	46.5 lbs (21.1 kg)
Recommended Max. Module Spacing	1.3 in. (33 mm)

- 1 SunPower 415 W, 22.3% efficient, compared to a Conventional Panel on same-sized arrays (260 W, 16% efficient, approx. 1.6 m<sup>2</sup>), 7.9% more energy per watt (based on PVsyst pan files for avg. US climate), 0.5%/yr slower degradation rate (Jordan, et. al. "Robust PV Degradation Methodology and Application," PVSC 2018).
- 2 Based on search of datasheet values from websites of top 10 manufacturers per IHS, as of January 2019.
- 3 #1 rank in "Fraunhofer PV Durability Initiative for Solar Modules: Part 3," PVTech Power Magazine, 2015. Campeau, Z. et al. "SunPower Module Degradation Rate," SunPower white paper, 2013.
- 4 Factory set to 1547a-2014 default settings. CA Rule 21 default settings profile set during commissioning.
- 5 Standard Test Conditions (1000 W/m<sup>2</sup> irradiance, AM 1.5, 25°C). NREL calibration standard: SOMS current, LACCS FF and voltage. All DC voltage is fully contained within the module.
- 6 This product is UL Listed as PVRSE and conforms with NEC 2014 and NEC 2017 690.12; and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors; when installed according to manufacturer's instructions.

See [www.sunpower.com/facts](http://www.sunpower.com/facts) for more reference information. For more details, see extended datasheet [www.sunpower.com/datasheets](http://www.sunpower.com/datasheets) Specifications included in this datasheet are subject to change without notice. ©2019 SunPower Corporation. All Rights Reserved. SUNPOWER, the SUNPOWER logo, Equinox, and MAXEON are registered trademarks of SunPower Corporation in the U.S. and other countries as well. 1-800-SUNPOWER.

### Warranties, Certifications, and Compliance

Warranties	<ul style="list-style-type: none"> <li>• 25-year limited power warranty</li> <li>• 25-year limited product warranty</li> </ul>
Certifications and Compliance	<ul style="list-style-type: none"> <li>• UL 1703</li> <li>• UL 1741 / IEEE-1547</li> <li>• UL 1741 AC Module (Type 2 fire rated)</li> <li>• UL 62109-1 / IEC 62109-2</li> <li>• FCC Part 15 Class B</li> <li>• ICES-0003 Class B</li> <li>• CAN/CSA-C22.2 NO. 107.1-01</li> <li>• CA Rule 21 (UL 1741 SA)<sup>4</sup> (includes Volt/Var and Reactive Power Priority)</li> <li>• UL Listed PV Rapid Shutdown Equipment<sup>6</sup></li> </ul> <p>Enables installation in accordance with:</p> <ul style="list-style-type: none"> <li>• NEC 690.6 (AC module)</li> <li>• NEC 690.12 Rapid Shutdown (inside and outside the array)</li> <li>• NEC 690.15 AC Connectors, 690.33(A)-(E)(1)</li> </ul> <p>When used with InvisiMount racking and InvisiMount accessories (UL 2703):</p> <ul style="list-style-type: none"> <li>• Module grounding and bonding through InvisiMount</li> <li>• Class A fire rated</li> </ul> <p>When used with AC module Q Cables and accessories (UL 6703 and UL 2238)<sup>6</sup>:</p> <ul style="list-style-type: none"> <li>• Rated for load break disconnect</li> </ul>
PID Test	Potential-induced degradation free



# SUNPOWER®

Module Fire Performance: Type 2  
Please read the Safety and Installation Instructions 532628 for additional details.

534092 RevA



# SunPower® EnergyLink™ | Residential and Commercial PVS6

## Improve Support, Reduce Maintenance Costs

An intuitive monitoring website enables you to:

- See a visual map of customer sites
- Remotely manage hundreds of sites
- Receive elective system reports
- Locate system issues and remotely diagnose
- Diagnose issues online
- Drill down for the status of individual devices



## Add Value for Customers

With the SunPower Monitoring System customers can:

- See what their solar system produces each day, month, or year
- Optimize their solar investment and save on energy expenses
- See their energy use and estimated bill savings
- See their solar system's performance using the SunPower monitoring website or mobile app



## SunPower EnergyLink—Plug-and-Play Installation

This complete solution for residential and commercial monitoring and control includes the SunPower® PV Supervisor 6 (PVS6) which improves the installation process, overall system reliability, and customer experience.

- Compact footprint for improved aesthetics
- Robust cloud connectivity and comprehensive local connectivity
- Flexible configuration of devices during installation
- Consumption metering
- Revenue-grade production metering (pending)
- Web-based commissioning
- Remote diagnostics of PVS6 and inverters
- Durable UL Type 3R enclosure reduces maintenance costs
- Easy integration with SunPower eBOS



## Robust Cloud Connectivity

Multiple options to maintain optimal connectivity:

- Hardwired Ethernet
- Wi-Fi
- Cellular backup



# SunPower® EnergyLink™ | Residential and Commercial PVS6

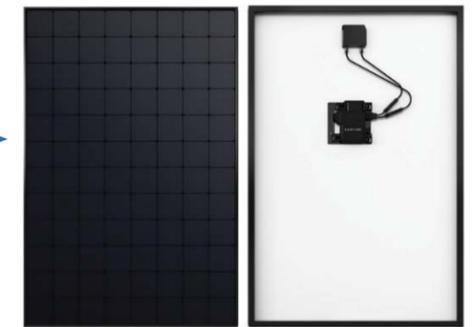
## SunPower Monitoring Websites



## PVS6



## SunPower AC Modules



Multiple communication options include Ethernet, Wi-Fi, and cellular.

Site Requirements	
Number of SunPower AC modules supported per PVS6	85
Internet access	High-speed internet access via accessible router or switch
Power	<ul style="list-style-type: none"> <li>• 100–240 VAC (L–N), 50 or 60 Hz</li> <li>• 208 VAC (L–L in 3-phase), 60 Hz</li> </ul>

Operating Conditions	
Temperature	–22°F to +140°F (–30°C to +60°C)
Humidity (maximum)	95%, non-condensing

Mechanical	
Weight	5.5 lbs (2.5 kg)
Dimensions	11.8 × 8.0 × 4.2 in. (30.5 × 20.5 × 10.8 cm)
Enclosure rating	UL50E Type 3R

Communication	
RS-485	Inverters and meters
Integrated Metering	<ul style="list-style-type: none"> <li>• One channel of revenue-grade production metering</li> <li>• Two channels of consumption metering</li> </ul>
Ethernet	1 LAN (or optional WAN) port
PLC	PLC for SunPower AC modules
Wi-Fi	802.11b/g/n 2.4 GHz and 5 GHz
Cellular	LTE Cat-M1/3G UMTS
ZigBee	IEEE 802.15.4 MAC, 2.4GHz ISM band
Data Storage	60 days
Upgrades	Automatic firmware upgrades

Web and Mobile Device Support	
Customer site	<a href="http://monitor.us.sunpower.com">monitor.us.sunpower.com</a>
Partner site	<a href="http://pvsmgmt.us.sunpower.com">pvsmgmt.us.sunpower.com</a>
Browsers	Firefox, Safari, and Chrome
Mobile devices	iPhone®, iPad®, and Android™
Customer app	<ol style="list-style-type: none"> <li>1. Create account online at: <a href="http://monitor.us.sunpower.com">monitor.us.sunpower.com</a>.</li> <li>2. On a mobile device, download the SunPower Monitoring app from Apple App Store™ or Google Play™ store.</li> <li>3. Sign in using account email and password.</li> </ol>

Warranty and Certifications	
Warranty	10-year Limited Warranty
Certifications	UL, cUL, CE, UL 61010-1 and -2, FCC Part 15 (Class B)



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530536 RevC





## SunPower® InvisiMount™ | Residential Mounting System

### Simple and Fast Installation

- Integrated module-to-rail grounding
- Pre-assembled mid and end clamps
- Levitating mid clamp for easy placement
- Mid clamp width facilitates consistent, even module spacing
- UL 2703 Listed integrated grounding

### Flexible Design

- Addresses nearly all sloped residential roofs
- Design in landscape and portrait with up to 8' rail span
- Pre-drilled rails and rail splice
- Rails enable easy obstacle management

### Customer-Preferred Aesthetics

- #1 module and #1 mounting aesthetics
- Best-in-class system aesthetics
- Premium, low-profile design
- Black anodized components
- Hidden mid clamps and capped, flush end clamps

### Part of Superior System

- Built for use with SunPower DC and AC modules
- Best-in-class system reliability and aesthetics
- Optional rooftop transition flashing, rail-mounted J-box, and wire management rail clips
- Combine with SunPower modules and SunPower EnergyLink® monitoring app



### Elegant Simplicity

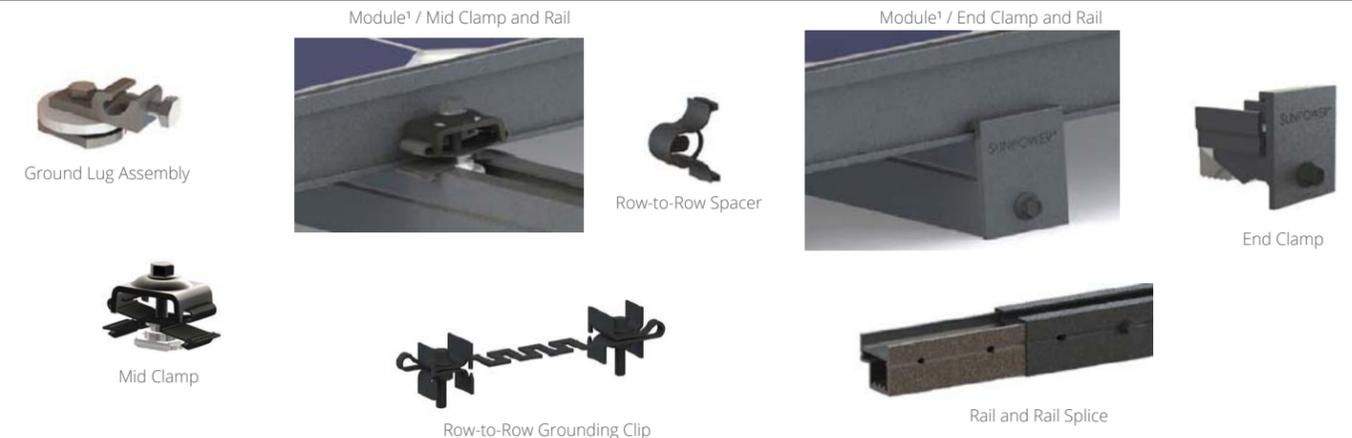
SunPower® InvisiMount™ is a SunPower-designed rail-based mounting system. The InvisiMount system addresses residential sloped roofs and combines faster installation time, design flexibility, and superior aesthetics. The InvisiMount product was specifically envisioned and engineered to pair with SunPower modules. The resulting system-level approach amplifies the aesthetic and installation benefits—for homeowners and for installers.

sunpower.com



## SunPower® InvisiMount™ | Residential Mounting System

### InvisiMount Components



InvisiMount Component Details		
Mid clamp	Black oxide stainless steel 300 series	63 g (2.2 oz)
End clamp	Black anodized aluminum 6000 series	110 g (3.88 oz)
Rail	Black anodized aluminum 6000 series	830 g/m (9 oz/ft)
Rail splice	Aluminum alloy 6000 series	830 g/m (9 oz/ft)
Rail bolt	M10-1.5 x 25 mm; custom T-head SS304	18 g (0.63 oz)
Rail nut	M10-1.5; DIN 6923 SS304	nominal
Ground lug assembly	SS304; A2-70 bolt; tin-plated copper lug	106.5 g (3.75 oz)
Row-to-row grounding clip	SS 301 with SS 304 M6 bolts	75 g (2.6 oz)
Row-to-row spacer	Black POM-grade plastic	5 g (0.18 oz)

InvisiMount Operating Conditions	
Temperature	-40° C to 90° C (-40° F to 194° F)
Max. Load (LRFD)	<ul style="list-style-type: none"> <li>• 3000 Pa uplift</li> <li>• 6000 Pa downforce</li> </ul>

Roof Attachment Hardware Supported by Design Tool	
Application	<ul style="list-style-type: none"> <li>• Composition Shingle Rafter Attachment</li> <li>• Composition Shingle Roof Decking Attachment</li> <li>• Curved and Flat Tile Roof Attachment</li> <li>• Universal interface for other roof attachments</li> </ul>

InvisiMount Component LRFD Capacities <sup>2</sup>		
Mid clamp	Uplift	664 lbf
	Shear	540 lbf
End clamp	Uplift	899 lbf
	Shear	220 lbf
Rail	Moment: upward	548 lbf-ft
	Moment: downward	580 lbf-ft
Rail splice	Moment: upward	548 lbf-ft
	Moment: downward	580 lbf-ft
L-foot	Uplift	1000 lbf
	Shear	390 lbf

InvisiMount Warranties And Certifications	
Warranties	<ul style="list-style-type: none"> <li>• 25-year product warranty</li> <li>• 5-year finish warranty</li> </ul>
Certifications	<ul style="list-style-type: none"> <li>• UL 2703 Listed</li> <li>• Class A Fire Rated</li> </ul>

Roof Attachment Hardware Warranties	
Refer to roof attachment hardware manufacturer's documentation.	

<sup>1</sup> Module frame that is compatible with the InvisiMount system required for hardware interoperability.  
<sup>2</sup> SunPower recommends that all Equinox™, InvisiMount™, and AC module systems always be designed using the InvisiMount Span Tables #524734. If a designer decides to instead use the component capacities listed in this document to design a system, note that the capacities shown are Load and Resistance Factor Design (LRFD) design loads, and are NOT to be used for Allowable Stress Design (ASD) calculations; and that a licensed Professional Engineer (PE) must then stamp all calculations. If you have any questions please contact SunPower Technical Support at 1-855-977-7867.

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# COMP MOUNT – BLACK



## WATERTIGHT FOR LIFE

Pegasus Solar's Comp Mount is a cost effective, high-quality option for rail installations on composition shingle roofs. Designed to last decades, the one-piece flashing with elevated cone means there is simply nothing to fail.



### 25-year Warranty

Manufactured with advanced materials and coating to outlast the roof itself



### Superior Waterproofing

Tested to AC286 without sealant 0.9" elevated water seal



### Code Compliant

Fully IBC/CBC Code Compliant  
Exceeds ASCE 7-10 Standards



### All-In-One Kit Packaging

Flashings, L-Feet and SS lags with bonded EPDM washers are included in each 24-pack

# COMP MOUNT – BLACK

1. Drill pilot hole in center of rafter.



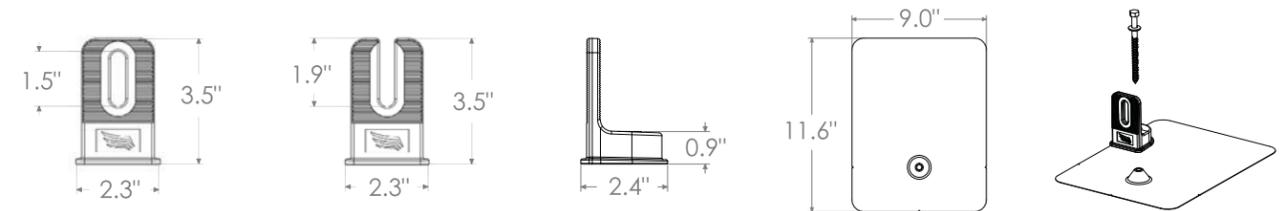
2. Optional: Apply a "U-shape" of sealant to underside of flashing and position under 2nd shingle course, cone over pilot hole.



3. Place L-Foot over cone and install lag with washer through L-Foot.



4. Drive lag to required depth. Attach rail per rail manufacturer's instructions.



Specifications	Black Comp Mount Install Kits		
SKU	PSCR-C0	PSCR-UBB0	SPCR-CH
L-Foot Type	Closed Slot	Open Slot	Closed Slot
Kit Contents	L-Foot, Flashing, 5/16" x 4-1/2" SS Lag w/ EPDM washer	L-Foot, Flashing, 5/16" x 4-1/2" SS Lag w/ EPDM washer	L-Foot, Flashing, 5/16" x 4-1/2" SS Lag w/ EPDM washer, M10 Hex Bolt
Finish	Black L-Foot and Black Flashing		
Roof Type	Composition Shingle		
Certifications	IBC, ASCE/SEI 7-10, AC286		
Install Application	Railed Systems		
Compatible Rail	Most		
Flashing Material	Painted Galvalume Plus		
L-Foot Material	Aluminum		
Kit Quantity	24		
Boxes per Pallet	72		

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## Eaton general duty cartridge fuse safety switch

DG222NRB

UPC:782113144221

### Dimensions:

- **Height:** 14.37 IN
- **Length:** 7.35 IN
- **Width:** 8.4 IN

**Weight:**10 LB

**Notes:**Maximum hp ratings apply only when dual element fuses are used. 3-Phase hp rating shown is a grounded B phase rating, UL listed.

### Warranties:

- Eaton Selling Policy 25-000, one (1) year from the date of installation of the Product or eighteen (18) months from the date of shipment of the Product, whichever occurs first.

### Specifications:

- **Type:** General duty, cartridge fused
- **Amperage Rating:** 60A
- **Enclosure:** NEMA 3R
- **Enclosure Material:** Painted galvanized steel
- **Fuse Class Provision:** Class H fuses
- **Fuse Configuration:** Fusible with neutral
- **Number Of Poles:** Two-pole
- **Number Of Wires:** Three-wire
- **Product Category:** General duty safety switch
- **Voltage Rating:** 240V

### Supporting documents:

- [Eatons Volume 2-Commercial Distribution](#)
- [Eaton Specification Sheet - DG222NRB](#)

### Certifications:

- UL Listed

**Product compliance:** No Data



## Eaton general duty non-fusible safety switch

DG222URB

UPC:782113144238

### Dimensions:

- **Height:** 14.38 IN
- **Length:** 7.38 IN
- **Width:** 8.69 IN

**Weight:**9 LB

**Notes:**WARNING! Switch is not approved for service entrance unless a neutral kit is installed.

### Warranties:

- Eaton Selling Policy 25-000, one (1) year from the date of installation of the Product or eighteen (18) months from the date of shipment of the Product, whichever occurs first.

### Specifications:

- **Type:** Non-fusible, single-throw
- **Amperage Rating:** 60A
- **Enclosure:** NEMA 3R, Rainproof
- **Enclosure Material:** Painted galvanized steel
- **Fuse Configuration:** Non-fusible
- **Number Of Poles:** Two-pole
- **Number Of Wires:** Two-wire
- **Product Category:** General duty safety switch
- **Voltage Rating:** 240V

### Supporting documents:

- [Eatons Volume 2-Commercial Distribution](#)
- [Eaton Specification Sheet - DG222URB](#)

### Certifications:

- UL Listed

**Product compliance:** No Data



## Eaton CH main lug loadcenter

CH8L125RP

UPC:782114190548

### Dimensions:

- **Height:** 3.69 IN
- **Length:** 13 IN
- **Width:** 11 IN

**Weight:** 12 LB

**Notes:** Ground bar kits priced separately. Suitable for use as service equipment when not more than two service disconnecting mains are provided or when not used as a lighting and appliance panelboard.

### Warranties:

- Limited lifetime

### Specifications:

- **Special Features:** Cover included
- **Type:** Main lug only
- **Amperage Rating:** 125A
- **Box Size:** 7r
- **Bus Material:** Copper
- **Enclosure:** NEMA 3R
- **Enclosure Material:** Metallic
- **Feed Type:** Overhead
- **Main Circuit Breaker:** CH
- **Number Of Circuits:** 8
- **Number Of Wires:** Three-wire
- **Phase:** Single-phase
- **Voltage Rating:** 120/240V, 208Y/120, 240V
- **Wire Size:** #6-1/0 AWG

### Supporting documents:

- [Type CH Circuit Breakers and Loadcenters](#)
- [Loadcenters and Circuit Breakers](#)
- [Eatons Volume 1-Residential and Light Commercial](#)



## Eaton CH main lug loadcenter

CH12L125R

UPC:782113097381

### Dimensions:

- **Height:** 5.19 IN
- **Length:** 16.75 IN
- **Width:** 14.31 IN

**Weight:** 15.8 LB

**Notes:** Suitable for use as service equipment when not more than six service disconnecting mains are provided or when not used as a lighting and appliance panelboard. Rainproof panels are furnished with hub closure plates. For rainproof hubs.

### Warranties:

- Limited lifetime

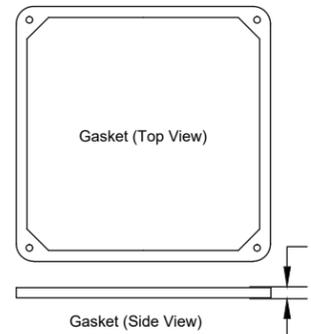
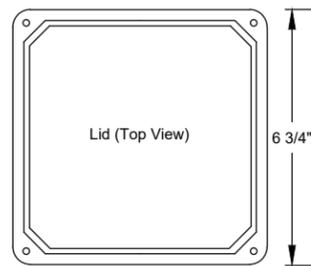
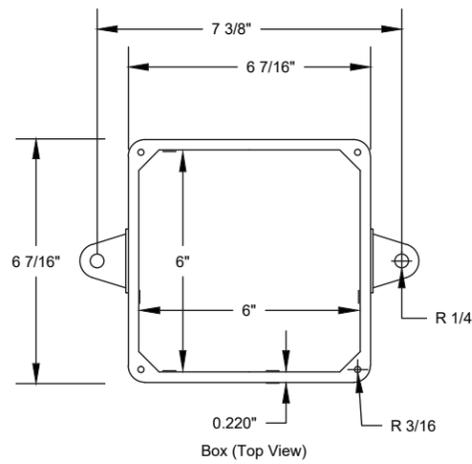
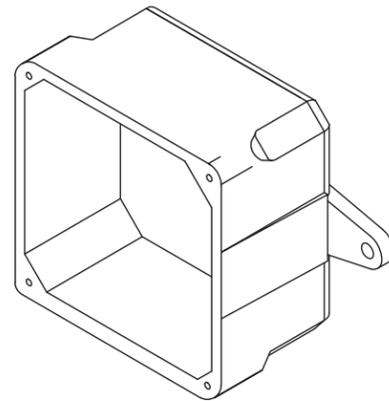
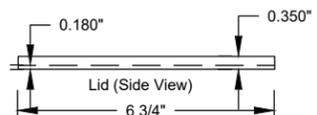
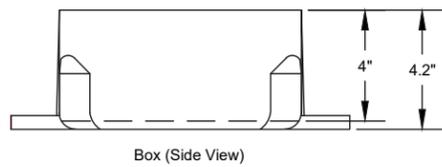
### Specifications:

- **Special Features:** Cover included
- **Type:** Main lug only
- **Amperage Rating:** 125A
- **Box Size:** B
- **Bus Material:** Copper
- **Enclosure:** NEMA 3R
- **Enclosure Material:** Metallic
- **Feed Type:** Overhead
- **Main Circuit Breaker:** CH
- **Number Of Circuits:** 12
- **Number Of Wires:** Three-wire
- **Phase:** Single-phase
- **Voltage Rating:** 120/240V
- **Wire Size:** #6-2/0 AWG

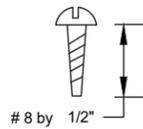
### Supporting documents:

- [Dimensional Drawing - CH 3/4 LOADCENTER, MAIN LUG ONLY, OUTDOOR NEMA 3R, 120/240 VAC, 1 PH](#)





UL Listed  
 Marine Listed  
 UL File # E205935 (QCUP)  
 UL Control # 92CM  
 Material is Rigid PVC  
 132 cu in Volume (2163 cu cm)  
 Screws are Zinc Plated Steel  
 Gasket is neoprene



<b>CANTEX</b> INC. Fort Worth, TEXAS		
<b>Junction Box 6 x 6 x 4</b>		
Drawn By: O.M.	Date: 6/19/17	5133710



# SUNPOWER®

## 420-390 W Residential AC Module

SunPower® Maxeon® Technology

Built specifically for use with the SunPower Equinox™ system, the only fully integrated solution designed, engineered, and warranted by one manufacturer.

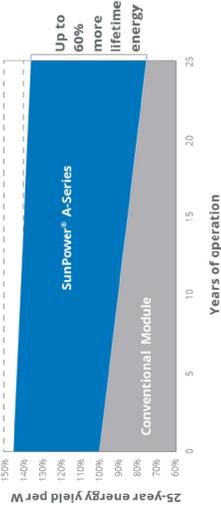


### Highest Power Density Available.

SunPower's new Maxeon® Gen 5 cell is 65% larger than prior generations, delivering the most powerful cell and highest-efficiency module in residential solar. The result is more power per square meter than any commercially available solar.



**Highest Lifetime Energy and Savings.**  
Designed to deliver 60% more energy over 25 years in real-world conditions like partial shade and high temperatures.<sup>1</sup>



### Best Reliability. Best Warranty.

With more than 25 million modules deployed around the world, SunPower technology is proven to last. That's why we stand behind our module and microinverter with the industry's best 25-year Combined Power and Product Warranty, including the highest Power Warranty in solar.



### Fundamentally Different. And Better.



#### SunPower® Maxeon® Technology

- Most powerful cell in home solar.<sup>1</sup>
- Delivers unmatched reliability.<sup>3</sup>
- Patented solid metal foundation prevents breakage and corrosion



#### Factory-integrated Microinverter (MI)

- Highest-power integrated AC module in solar
- 60% lighter than prior SunPower MIs
- Engineered and calibrated by SunPower for SunPower AC modules

## A-Series: A420 | A415 | A410 | A400 | A390 SunPower® Residential AC Module

### AC Electrical Data

Inverter Model: SPVR6-A4	@210 VAC
Peak Output Power	366 VA
Max. Continuous Output Power	349 VA
Nom. (L-L) Voltage/Range <sup>1</sup> (V)	240 / 211-264
Max. Continuous Output Current (A)	1.45
Max. Unis per 20 A (L-L) Branch Circuit <sup>2</sup>	11
CEC Weighted Efficiency	97.0%
Nom. Frequency	60 Hz
Extended Frequency Range	47-68 Hz
AC Short Circuit Fault Current: Over 3 Cycles	5.8 A rms
Overvoltage Class AC Port	III
AC Port Backfeed Current	18 mA
Power Factor Setting	1.0
Power Factor (adjustable)	C7 load / 0.7 lag.

### Warranties, Certifications, and Compliance

Warranties	• 25-year limited power warranty • 25-year limited product warranty
Certifications and Compliance	• UL 1703 • UL 1741 / IEEE-1547 • UL 1741 AC Module (Type 2 fire rated) • UL 62109-1 / IEC 62109-2 • FCC Part 15 Class B • IEC-0003 Class B • CAN/CSA-C22.2 NO. 1071-01 • CA Rule 21 (UL 1741 5A) <sup>3</sup> (Includes Volt/Var and Reactive Power Priority) • UL Listed PV Rapid Shutdown Equipment <sup>4</sup>

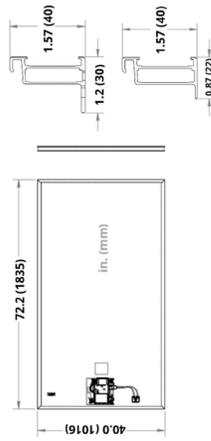
Enables installation in accordance with:

- NEC 690.6 (AC module)
- NEC 690.12 Rapid Shutdown (inside and outside the array)
- NEC 690.15 AC Connectors, 690.33(A)-(E)(1)

When used with InvisiMount racking and InvisiMount accessories (UL 2703):

- Module grounding and bonding through InvisiMount
- UL 6703 fire rated
- When used with AC module Q Cables and accessories (UL 6703 and UL 2738<sup>5</sup>)
- Rated for load break disconnect

PID Test: Potential-induced degradation free



Please read the Safety and Installation Instructions S32628 for additional details.

534092; Rev A



## SunPower® EnergyLink™ | Residential and Commercial PV56

### Improve Support,

### Reduce Maintenance Costs

An intuitive monitoring website enables you to:

- See a visual map of customer sites
- Remotely manage hundreds of sites
- Receive elective system reports
- Locate system issues and remotely diagnose
- Diagnose issues online
- Drill down for the status of individual devices



### Add Value for Customers

With the SunPower Monitoring System

- customers can:
- See what their solar system produces each day, month, or year
  - Optimize their solar investment and save on energy expenses
  - See their energy use and estimated bill savings
  - See their solar system's performance using the SunPower monitoring website or mobile app



### SunPower EnergyLink—Plug-and-Play Installation

This complete solution for residential and commercial monitoring and control includes the SunPower® PV Supervisor 6 (PV56) which improves the installation process, overall system reliability, and customer experience.

- Compact footprint for improved aesthetics
- Robust cloud connectivity and comprehensive local connectivity
- Flexible configuration of devices during installation
- Consumption metering
- Revenue-grade production metering (bending)
- Web-based commissioning
- Remote diagnostics of PV56 and inverters
- Durable UL Type 3R enclosure reduces maintenance costs
- Easy integration with SunPower eBOS



### Robust Cloud Connectivity

Multiple options to maintain optimal connectivity:

- Hardwired Ethernet
- Wi-Fi
- Cellular backup



## SunPower® EnergyLink™ | Residential and Commercial PV56

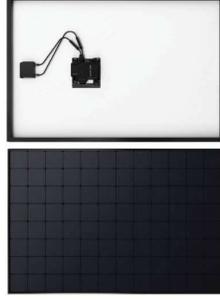
SunPower Monitoring Websites



PV56



SunPower AC Modules



Multiple communication options include Ethernet, Wi-Fi, and cellular.

Site Requirements	
Number of SunPower AC modules supported per PV56	85
Internet access	High-speed internet access via accessible router or switch
Power	<ul style="list-style-type: none"> <li>• 100-240 VAC (L-N), 50 or 60 Hz</li> <li>• 208 VAC (L-L, in 3-phase), 60 Hz</li> </ul>

Operating Conditions	
Temperature	-22°F to +140°F (-30°C to +60°C)
Humidity (maximum)	95%, non-condensing

Mechanical	
Weight	5.5 lbs (2.5 kg)
Dimensions	11.8 x 8.0 x 4.2 in. (30.5 x 20.5 x 10.8 cm)
Enclosure rating	UL50E Type 3R

Communication	
RS-485	Inverters and meters
Integrated Metering	<ul style="list-style-type: none"> <li>• One channel of revenue-grade production metering</li> <li>• Two channels of consumption metering</li> </ul>
Ethernet	1 LAN (or optional WAN) port
PLC	PLC for SunPower AC modules
WiFi	802.11b/g/n 2.4 GHz and 5 GHz
Cellular	LTE Cat-M1/3G UMTS
ZigBee	IEEE 802.15.4 MAC, 2.4GHz ISM band
Data Storage	60 days
Upgrades	Automatic firmware upgrades

Web and Mobile Device Support	
Customer site	monitor.us.sunpower.com
Partner site	psunpower.us.sunpower.com
Browsers	Firefox, Safari, and Chrome
Mobile devices	iPhone®, iPad®, and Android™
Customer app	<ol style="list-style-type: none"> <li>1. Create account online at: <a href="http://monitor.us.sunpower.com">monitor.us.sunpower.com</a>.</li> <li>2. On a mobile device, download the SunPower Monitoring app from Apple App Store® or Google Play® store.</li> <li>3. Sign in using account email and password.</li> </ol>

Warranty and Certifications	
Warranty	10-year Limited Warranty
Certifications	UL, cUL, CE, UL 61010-1 and -2, FCC Part 15 (Class B)



FCC ID: YAW529027



E503346

530536 Rev.C

# SUNPOWER®

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# SUNPOWER®

Datasheet



## SunPower® InvisiMount™ | Residential Mounting System

### Simple and Fast Installation

- Integrated module-to-rail grounding
- Pre-assembled mid and end clamps
- Levitating mid clamp for easy placement
- Mid clamp with facilitates consistent, even module spacing
- UL 2703 Listed integrated grounding

### Flexible Design

- Addresses nearly all sloped residential roofs
- Design in landscape and portrait with up to 8' rail span

- Pre-drilled rails and rail splice
- Rails enable easy obstacle management

### Customer-Preferred Aesthetics

- #1 module and #1 mounting aesthetics
- Best-in-class system aesthetics
- Premium, low-profile design
- Black anodized components
- Hidden mid clamps and capped, flush end clamps

### Part of Superior System

- Built for use with SunPower DC and AC modules
- Best-in-class system reliability and aesthetics
- Optional rooftop transition flashing, rail-mounted J-box, and wire management rail clips
- Combine with SunPower modules and SunPower EnergyLink® monitoring app



sunpower.com



Datasheet

SUNPOWER®



## SunPower® InvisiMount™ | Residential Mounting System

### InvisiMount™ Components

Module 7, Mid Clamp and Rail



Ground Lug Assembly



Row-to-Row Spacer



Module / End Clamp and Rail



End Clamp



Rail and Rail Splice



Row-to-Row Grounding Clip



Mid Clamp

InvisiMount Component Details	InvisiMount Component Details
Mid clamp	Black oxide stainless steel 300 series
End clamp	63 g (2.2 oz)
Rail	Black anodized aluminum 6000 series
Rail splice	110 g (3.88 oz)
Rail bolt	Black anodized aluminum 6000 series
Rail nut	830 g/m (9 oz/ft)
Ground lug assembly	Aluminum alloy 6000 series
Row-to-row grounding clip	M10-1.5 x 25 mm; custom T-head 55304
Row-to-row spacer	M10-1.5; DIN 6923-55304
	nominal
	55304; A2-70 bolt; 1in-plated copper lug
	106.5 g (3.75 oz)
	SS 301 with SS 304 M6 bolts
	75 g (2.6 oz)
	Black POM grade plastic
	5 g (0.18 oz)

InvisiMount Operating Conditions
Temperature
• -40° C to 90° C (-40° F to 194° F)
Max. Load (LFD)
• 3000 Pa uplift
• 6000 Pa downforce

### Roof Attachment Hardware Supported by Design Tool

- Composition Shingle, Rafter Attachment
- Composition Shingle, Roof Decking Attachment
- Curved and Flat Tile Roof Attachment
- Universal Interface for other roof attachments

InvisiMount Component LRFD Capacities*	
Uplift	664 lbf
Shear	540 lbf
Uplift	892 lbf
Shear	220 lbf
Moment: upward	548 lbf-ft
Moment: downward	580 lbf-ft
Moment: upward	548 lbf-ft
Moment: downward	580 lbf-ft
Uplift	1000 lbf
Shear	390 lbf

### InvisiMount Warranties And Certifications

- 25-year product warranty
- 5-year finish warranty
- UL 2703 Listed
- Class A Fire Rated

### Roof Attachment Hardware Warranties

Refer to roof attachment hardware manufacturer's documentation.

\* Module frame that is compatible with the InvisiMount system required for hardware interoperability. SunPower recommends that all Equinox™, InvisiMount™, and AC module systems always be designed using the InvisiMount Span Tables # 524734. If a designer decides to instead use the component capacities listed in this document to design a system, note that the capacities shown are Load and Resistance Factor Design (LRFD) design loads, and are NOT to be used for Allowable Stress Design (ASD) calculations, and that a licensed Professional Engineer (PE) must then stamp all calculations. If you have any questions please contact SunPower Technical Support at 1-855-977-7867.  
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Datasheet

SUNPOWER®



A BETTER DAY ON THE JOB

## COMP MOUNT – BLACK



### WATERTIGHT FOR LIFE

Pegasus Solar's Comp Mount is a cost effective, high-quality option for rail installations on composition shingle roofs. Designed to last decades, the one-piece flashing with elevated cone means there is simply nothing to fail.



**25-year Warranty**  
Manufactured with advanced materials and coating to outlast the roof itself



**Superior Waterproofing**  
Tested to AC208 without sealant  
0.9" elevated water seal

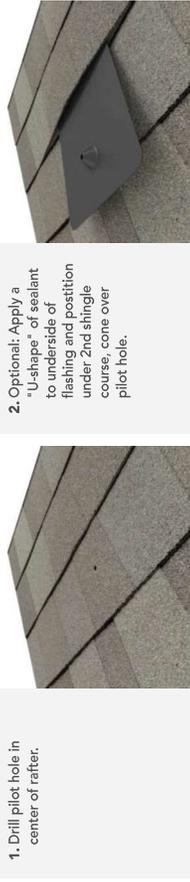


**Code Compliant**  
Fully IBC/CBC Code Compliant  
Exceeds ASCE 7-10 Standards



**All-in-One Kit Packaging**  
Flashings, L-Feet and SS lags with bonded EPDM washers are included in each 24-pack

## COMP MOUNT – BLACK



1. Drill pilot hole in center of rafter.



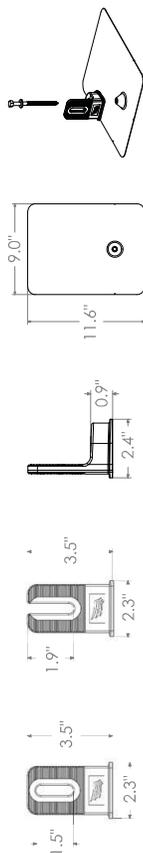
3. Place L-Foot over cone and install lag with washer through L-Foot.



2. Optional: Apply a "U-shape" of sealant to underside of flashing and position under 2nd shingle course, cone over pilot hole.



4. Drive lag to required depth. Attach rail per rail manufacturer's instructions.



### Specifications

SKU	PSCR-CO	PSCR-UBB0	SPCR-CH
L-Foot Type	Closed Slot	Open Slot	Closed Slot
Kit Contents	L-Foot, Flashing, 5/16" x 4-1/2" SS Lag w/ EPDM washer	L-Foot, Flashing, 5/16" x 4-1/2" SS Lag w/ EPDM washer	L-Foot, Flashing, 5/16" x 4-1/2" SS Lag w/ EPDM washer, M10 Hex Bolt
Finish	Black L-Foot and Black Flashing		
Roof Type	Composition Shingle		
Certifications	IBC, ASCE/SEI 7-10, AC208		
Install Application	Railed Systems		
Compatible Rail	Most		
Flashing Material	Painted Galvalume Plus		
L-Foot Material	Aluminum		
Kit Quantity	24		
Boxes per Pallet	72		

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## Eaton general duty cartridge fuse safety switch

DG22NRB

UPC:782113144221

**Dimensions:**

- **Height:** 14.37 IN
- **Length:** 7.35 IN
- **Width:** 8.4 IN

**Weight:**10 LB

**Notes:**Maximum hp ratings apply only when dual element fuses are used. 3-Phase hp rating shown is a grounded B phase rating, UL listed.

**Warranties:**

- Eaton Selling Policy 25-000, one (1) year from the date of installation of the Product or eighteen (18) months from the date of shipment of the Product, whichever occurs first.

**Specifications:**

- **Type:** General duty, cartridge fused
- **Amperage Rating:** 60A
- **Enclosure:** NEMA 3R
- **Enclosure Material:** Painted galvanized steel
- **Fuse Class Provision:** Class H fuses
- **Fuse Configuration:** Fusible with neutral
- **Number Of Poles:** Two-pole
- **Number Of Wires:** Three-wire
- **Product Category:** General duty safety switch
- **Voltage Rating:** 240V

**Supporting documents:**

- [Eaton's Volume 2-Commercial Distribution](#)
- [Eaton Specification Sheet - DG22NRB](#)

**Certifications:**

- UL Listed

**Product compliance:** No Data



## Eaton general duty non-fusible safety switch

DG22URB

UPC:782113144238

**Dimensions:**

- **Height:** 14.38 IN
- **Length:** 7.38 IN
- **Width:** 8.69 IN

**Weight:**9 LB

**Notes:**WARNING! Switch is not approved for service entrance unless a neutral kit is installed.

**Warranties:**

- Eaton Selling Policy 25-000, one (1) year from the date of installation of the Product or eighteen (18) months from the date of shipment of the Product, whichever occurs first.

**Specifications:**

- **Type:** Non-fusible, single-throw
- **Amperage Rating:** 60A
- **Enclosure:** NEMA 3R, Rainproof
- **Enclosure Material:** Painted galvanized steel
- **Fuse Configuration:** Non-fusible
- **Number Of Poles:** Two-pole
- **Number Of Wires:** Two-wire
- **Product Category:** General duty safety switch
- **Voltage Rating:** 240V

**Supporting documents:**

- [Eaton's Volume 2-Commercial Distribution](#)
- [Eaton Specification Sheet - DG22URB](#)

**Certifications:**

- UL Listed

**Product compliance:** No Data



## Eaton CH main lug loadcenter

CH8L125RP

UPC:782114190548

**Dimensions:**

- Height: 3.69 IN
- Length: 13 IN
- Width: 11 IN

**Weight:**12 LB

**Notes:**Ground bar kits priced separately. Suitable for use as service equipment when not more than two service disconnecting mains are provided or when not used as a lighting and appliance panelboard.

**Warranties:**

- Limited lifetime

**Specifications:**

- **Special Features:** Cover included
- **Type:** Main lug only
- **Amperage Rating:** 125A
- **Box Size:** 7r
- **Bus Material:** Copper
- **Enclosure:** NEMA 3R
- **Enclosure Material:** Metallic
- **Feed Type:** Overhead
- **Main Circuit Breaker:** CH
- **Number Of Circuits:** 8
- **Number Of Wires:** Three-wire
- **Phase:** Single-phase
- **Voltage Rating:** 120/240V, 208Y/120, 240V
- **Wire Size:** #6-1/0 AWG

**Supporting documents:**

- Type CH Circuit Breakers and Loadcenters
- Loadcenters and Circuit Breakers
- Eatons Volume 1-Residential and Light Commercial



## Eaton CH main lug loadcenter

CH12L125R

UPC:782113097381

**Dimensions:**

- Height: 5.19 IN
- Length: 16.75 IN
- Width: 14.31 IN

**Weight:**15.8 LB

**Notes:**Suitable for use as service equipment when not more than six service disconnecting mains are provided or when not used as a lighting and appliance panelboard. Rainproof panels are furnished with hub closure plates. For rainproof hubs.

**Warranties:**

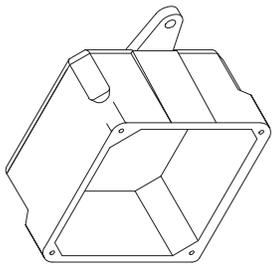
- Limited lifetime

**Specifications:**

- **Special Features:** Cover included
- **Type:** Main lug only
- **Amperage Rating:** 125A
- **Box Size:** B
- **Bus Material:** Copper
- **Enclosure:** NEMA 3R
- **Enclosure Material:** Metallic
- **Feed Type:** Overhead
- **Main Circuit Breaker:** CH
- **Number Of Circuits:** 12
- **Number Of Wires:** Three-wire
- **Phase:** Single-phase
- **Voltage Rating:** 120/240V
- **Wire Size:** #6-2/0 AWG

**Supporting documents:**

- Dimensional Drawing - CH 3/4 LOADCENTER, MAIN LUG ONLY, OUTDOOR NEMA 3R, 120/240 VAC, 1 PH



UL Listed  
 Marine Listed  
 UL File # E205935 (QCUP)  
 UL Control # 92CM  
 Material is Rigid PVC  
 132 cu in Volume (2163 cu cm)  
 Screws are Zinc Plated Steel  
 Gasket is neoprene



Junction Box 6 x 6 x 4

Drawn By: O.M. | Date: 6/19/17 | 5133710

