



Staff Report

PLANNING DIVISION
COMMUNITY & NEIGHBORHOODS

To: Salt Lake City Historic Landmark Commission
From: Caitlyn Tubbs – Principal Planner
(385)-315-8115 or caitlyn.tubbs@slcgov.com
Date: July 15, 2021
Re: Minor Alteration – Solar Shingles at 740 East 3rd Avenue

SOLAR MINOR ALTERATION IN LOCAL HISTORIC DISTRICT

PROPERTY ADDRESS: 740 East 3rd Avenue
PARCEL ID: 09-32-354-009-0000
HISTORIC DISTRICT: Avenues Local Historic District
ZONING DISTRICTS: SR-1A (Special Development Pattern Residential District) &
H – Historic Preservation Overlay District
MASTER PLAN: Avenues
DESIGN GUIDELINES: Residential Handbook and Design Guidelines

REQUEST: Christopher Vargas, on behalf of the property owners, is requesting minor alteration approval to locate Tesla brand solar shingles on the roof of the structure. These solar shingles will be visible from two rights of way; 3rd Avenue and L Street.

RECOMMENDATION: Based on the analysis and findings listed in this staff report, staff recommends that the Historic Landmark Commission approve the requested minor alteration to install Tesla solar shingles.

BACKGROUND AND PROJECT DESCRIPTION:

The subject property is located in the Avenues Local Historic District and is listed by the 2008 RLS as an Eligible/Contributing structure. The home is located on a corner lot at the intersection of 3rd Avenue and L Street. The home was constructed in the Victorian urbanization period detailed in the 2008 survey and has a roof with multiple characteristic pitches. The home on the subject property was constructed in 1904 which is deemed the “most prolific building period and the period during which the Avenues Historic District attained most of its defining characteristics” (2008 RLS, pg. 18).

The homeowners are seeking to install Tesla brand solar shingles on multiple faces of their pitched roof which will



Figure 1: Photograph of Tesla roof from marketing materials.

appears in very good condition from the photographs provided by the Applicant. The roof has a mix of pitches which is characteristic for many Victorian homes in the Avenues Local Historic District. The proposed shingles would not affect the pitch of the roof and could be removed in the future without causing damage to the existing roof.

2. Salt Lake City’s standards for small solar energy collection systems in Historic Preservation Overlay Districts

The following are standards for installation and location of small solar energy systems for properties in historic districts. The first standard has to do with the permanence of the installation: “2. Installation Standards: The small solar energy collection system shall be installed in a location and manner on the building or lot that is least visible and obtrusive and in such a way that causes the least impact to the historic integrity and character of the historic building, structure, site or district while maintaining efficient operation of the solar device. The system must be installed in such a manner that it can be removed and not damage the historic building, structure, or site it is associated with.” The proposed shingles do not require the alteration of the overall pitch or shape of the roof and are removable if the homeowner decides they no longer want to use the shingles in the future. The request complies with this standard.

The second standard addresses the preferred locations for small solar energy systems with regard to their placement on historic properties. These locations are listed in the ordinance in descending priority, meaning the ordinance’s preference is to locate solar systems in rear yard areas outside of view from a public right of way:

- a. Rearyard in a location not readily visible from a public right-of-way.
- b. On accessory buildings or structures in a location not readily visible from a public right-of-way.
- c. In a side yard in a location not readily visible from a public right-of-way.
- d. On the principal building in a location not readily visible from a public right-of-way.
- e. On the principal building in a location that may be visible from a public right-of-way, but not on the structure's front facade.
- f. On the front facade of the principal building in a location most compatible with the character defining features of the structure. (Ord. 60-15, 2015)”

The proposed location of the solar shingles is a highly visible area and is the least preferred of the options listed in the City’s ordinances.

be visible along both 3rd Avenue and L Street. This request is a minor alteration and staff typically review solar requests and issue decisions but this is the first request Salt Lake City has seen for the installation of Tesla solar shingles, therefore this request is being brought to the Historic Landmarks Commission for their review and decision.

Key Considerations

1. The Integrity of the Historic Building

The original home is structurally intact. Staff did not locate any permits or other records of changes or modifications to the historic structure itself. The existing shingled roof

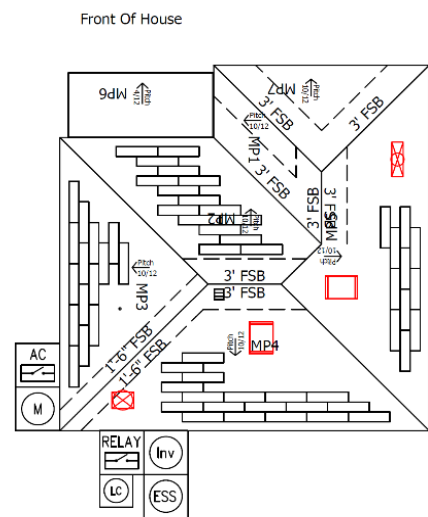


Figure 2: Placement of solar shingles on roof

3. Secretary of the Interior Guidelines for Sustainability

The National Parks Service webpage lists a variety of guidelines for solar installations on historic buildings. These guidelines are listed below:

Recommended	Not Recommended
Considering on-site, solar technology only after implementing all appropriate treatments to improve energy efficiency of the building, which often have greater life-cycle cost benefit than on-site renewable energy.	Installing on-site solar technology without first implementing all appropriate treatments to the building to improve its energy efficiency.
Analyzing whether solar technology can be used successfully and will benefit a historic building without compromising its character or the character of the site or the surrounding historic district.	Installing a solar device without first analyzing its potential benefit or whether it will negatively impact the character of the historic building or site or the surrounding historic district.
Installing a solar device in a compatible location on the site or on a non-historic building or addition where it will have minimal impact on the historic building and its site.	Placing a solar device in a highly-visible location where it will negatively impact the historic building and its site.
Installing a solar device on the historic building only after other locations have been investigated and determined infeasible.	Installing a solar device on the historic building without first considering other locations.
Installing a low-profile solar device on the historic building so that it is not visible or only minimally visible from the public right of way: for example, on a flat roof and set back to take advantage of a parapet or other roof feature to screen solar panels from view; or on a secondary slope of a roof, out of view from the public right of way.	Installing a solar device in a prominent location on the building where it will negatively impact its historic character.
Installing a solar device on the historic building in a manner that does not damage historic roofing material or negatively impact the building's historic character and is reversible.	Installing a solar device on the historic building in a manner that damages historic roofing material or replaces it with an incompatible material and is not reversible.
-	Removing historic roof features to install solar panels.
-	Altering a historic, character-defining roof slope to install solar panels.
-	Installing solar devices that are not reversible.
Installing solar roof panels horizontally- flat or parallel to the roof – to reduce visibility.	Placing solar roof panels vertically where they are highly visible and will negatively impact the historic character of the building.
Investigating off-site renewable energy options when installing on-site solar devices would negatively impact the historic character of the building or site.	-

The proposed solar shingles would be located on the primary and secondary facades and would be easily visible from the public rights of way at 3rd Avenue and L Street which is not recommended in the above guidelines but the proposed shingles would not alter the pitch of the roof and would be installed flat to the existing roofline which is supported by these solar guidelines. They would not cover the entirety of the roof and would still reveal the existing asphalt shingles on the remainder of the roof area. If approved, this would be the first usage of these solar shingles in the Avenues Local Historic District and the City of Salt Lake as a whole.

Staff has examined the general standards for approval for minor alterations to contributing historic structures and finds this request generally complies with adopted standards. The proposed solar shingles would not change the overall usage of the property as a residence and do not include any changes to historic materials or changes which are irreversible.

NEXT STEPS:

If the Historic Landmark Commission finds that the standards of approval are substantially met, the HLC should approve the Applicant's request for Tesla solar shingles at 740 East 3rd Avenue. If the project is denied by the HLC, the Applicant may choose to file an appeal in accordance with adopted ordinances or may continue building with the approved set of plans.

ATTACHMENTS:

- A. Vicinity Map
- B. Historic District Map
- C. Photos from City Records
- D. Applicant's Submittal Materials
- E. Analysis of Historic Preservation Standards



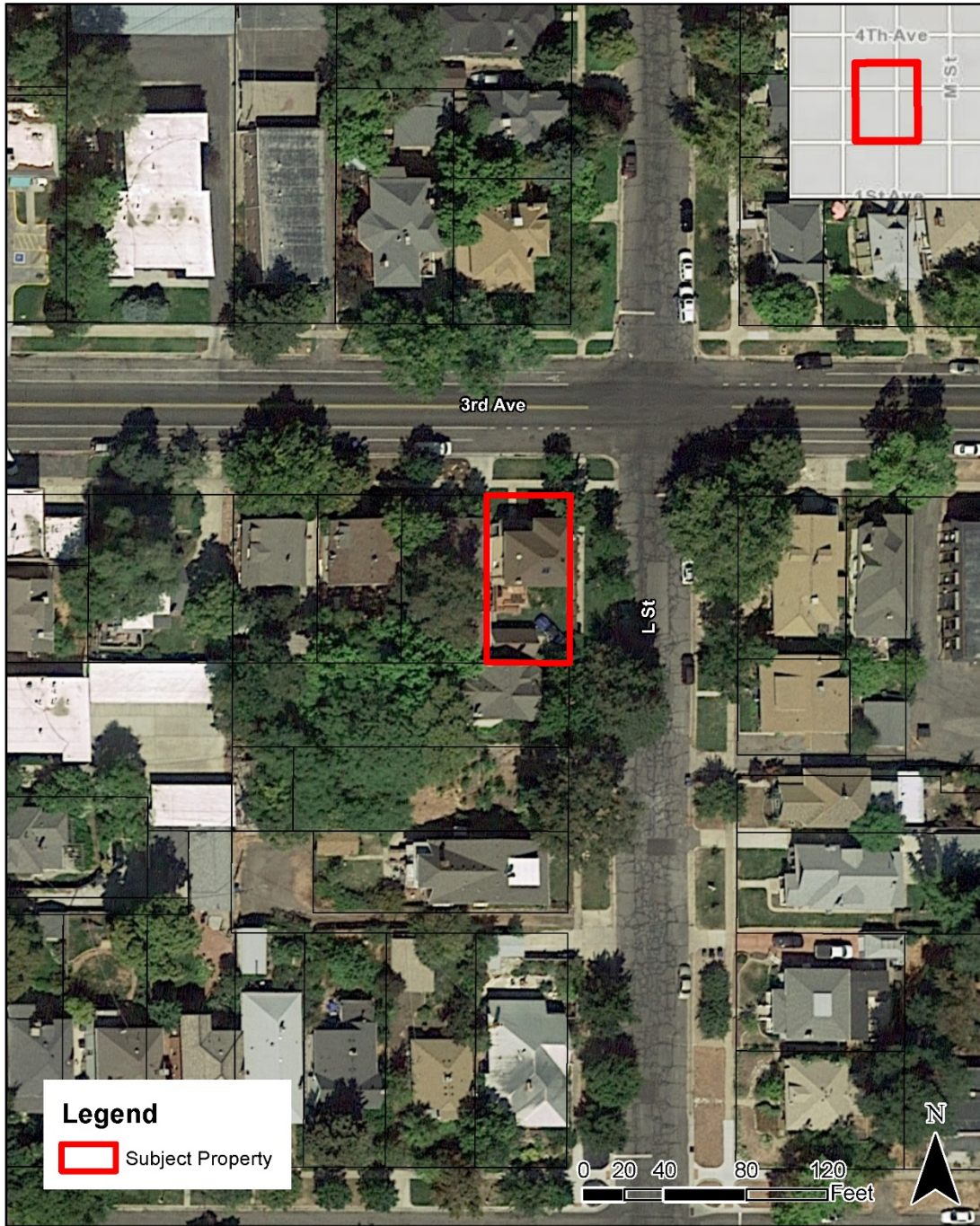
Figure 3: Front facade of home, viewed from 3rd Avenue.



Figure 4: Side facade of home, viewed from L Street.

ATTACHMENT A: VICINITY MAP

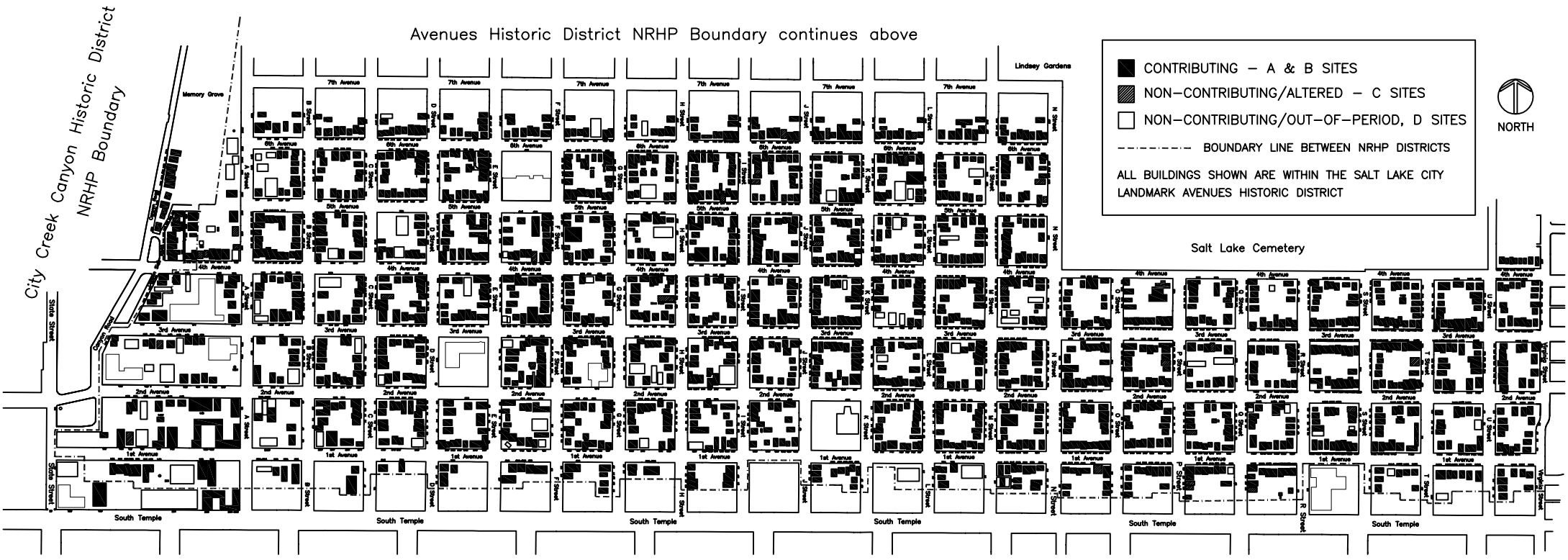
Vicinity Map



Salt Lake City Planning Division 6/21/2021

ATTACHMENT B: HISTORIC DISTRICT MAP





Avenues Historic District NRHP Boundary continues above

■ CONTRIBUTING - A & B SITES
 ▨ NON-CONTRIBUTING/ALTERED - C SITES
 □ NON-CONTRIBUTING/OUT-OF-PERIOD, D SITES
 - - - - - BOUNDARY LINE BETWEEN NRHP DISTRICTS
 ALL BUILDINGS SHOWN ARE WITHIN THE SALT LAKE CITY LANDMARK AVENUES HISTORIC DISTRICT



South Temple Historic District NRHP & City Landmark Boundary

Avenues Historic District


Salt Lake City, Salt Lake County, Utah

Reconnaissance Level Survey
2007-2008

ATTACHMENT C: PHOTOS FROM CITY RECORDS



ATTACHMENT D: APPLICANT'S SUBMITTAL MATERIALS

ABBREVIATIONS	ELECTRICAL NOTES	JURISDICTION NOTES																									
<p>A AMPERE AC ALTERNATING CURRENT BLDG BUILDING CONC CONCRETE DC DIRECT CURRENT EGC EQUIPMENT GROUNDING CONDUCTOR (E) EXISTING EMT ELECTRICAL METALLIC TUBING FSB FIRE SET-BACK GALV GALVANIZED GEC GROUNDING ELECTRODE CONDUCTOR GND GROUND HDG HOT DIPPED GALVANIZED I CURRENT Imp CURRENT AT MAX POWER Isc SHORT CIRCUIT CURRENT kVA KILOVOLT AMPERE kW KILOWATT LBW LOAD BEARING WALL MIN MINIMUM (N) NEW NEUT NEUTRAL NTS NOT TO SCALE OC ON CENTER PL PROPERTY LINE POI POINT OF INTERCONNECTION PV PHOTOVOLTAIC SCH SCHEDULE S STAINLESS STEEL STC STANDARD TESTING CONDITIONS TYP TYPICAL UPS UNINTERRUPTIBLE POWER SUPPLY V VOLT Vmp VOLTAGE AT MAX POWER Voc VOLTAGE AT OPEN CIRCUIT W WATT 3R NEMA 3R, RAIN TIGHT</p>	<p>1. THIS SYSTEM IS GRID-INTERTIED VIA A UL-LISTED POWER-CONDITIONING INVERTER. 2. A NATIONALLY-RECOGNIZED TESTING LABORATORY SHALL LIST ALL EQUIPMENT IN COMPLIANCE WITH ART. 110.3. 3. WHERE ALL TERMINALS OF THE DISCONNECTING MEANS MAY BE ENERGIZED IN THE OPEN POSITION, A SIGN WILL BE PROVIDED WARNING OF THE HAZARDS PER ART. 690.17. 4. EACH UNGROUNDED CONDUCTOR OF THE MULTIWIRED BRANCH CIRCUIT WILL BE IDENTIFIED BY PHASE AND SYSTEM PER ART. 210.5. 5. CIRCUITS OVER 250V TO GROUND SHALL COMPLY WITH ART. 250.97, 250.92(B). 6. DC CONDUCTORS EITHER DO NOT ENTER BUILDING OR ARE RUN IN METALLIC RACEWAYS OR ENCLOSURES TO THE FIRST ACCESSIBLE DC DISCONNECTING MEANS PER ART. 690.31(E). 7. ALL WIRES SHALL BE PROVIDED WITH STRAIN RELIEF AT ALL ENTRY INTO BOXES AS REQUIRED BY UL LISTING.</p>	<p style="text-align: center;">VICINITY MAP</p>  <p style="text-align: center;">INDEX</p> <table border="1" data-bbox="2439 1159 3039 1552"> <tr><td>Sheet 1</td><td>COVER SHEET</td></tr> <tr><td>Sheet 2</td><td>SITE PLAN</td></tr> <tr><td>Sheet 3</td><td>THREE LINE DIAGRAM</td></tr> <tr><td>Sheet 4</td><td>THREE LINE DIAGRAM CONT.</td></tr> <tr><td>Sheet 5</td><td>ELECTRICAL PHOTOS</td></tr> <tr><td colspan="2">Cutsheets Attached</td></tr> </table>		Sheet 1	COVER SHEET	Sheet 2	SITE PLAN	Sheet 3	THREE LINE DIAGRAM	Sheet 4	THREE LINE DIAGRAM CONT.	Sheet 5	ELECTRICAL PHOTOS	Cutsheets Attached													
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<p style="text-align: center;">LICENSE</p> <p>AHJ: Salt Lake City</p> <p>UTILITY: Rocky Mountain Power</p>	<p style="text-align: center;">GENERAL NOTES</p> <p>1. ALL WORK SHALL COMPLY WITH THE 2018 IBC AND 2015 IRC. 2. ALL ELECTRICAL WORK SHALL COMPLY WITH THE 2017 NATIONAL ELECTRIC CODE.</p>	<table border="1" data-bbox="2439 1552 3039 1743"> <thead> <tr><th>REV</th><th>BY</th><th>DATE</th><th>COMMENTS</th></tr> </thead> <tbody> <tr><td>REV A</td><td>NAME</td><td>DATE</td><td>COMMENTS</td></tr> <tr><td>*</td><td>*</td><td>*</td><td>*</td></tr> <tr><td>*</td><td>*</td><td>*</td><td>*</td></tr> <tr><td>*</td><td>*</td><td>*</td><td>*</td></tr> <tr><td>*</td><td>*</td><td>*</td><td>*</td></tr> </tbody> </table>		REV	BY	DATE	COMMENTS	REV A	NAME	DATE	COMMENTS	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
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JOB NUMBER: JB-8411217 00

MOUNTING SYSTEM: TESLA SOLAR ROOF

MODULES: (60) Tesla # SR60T1

INVERTER: Powerwall + Inverter Tesla Inc [240V] # 1850000-00-B 7.6 kW / 13.5 kWh

CUSTOMER: Jordi Duran
740 3rd Ave
Salt Lake City, UT 84103
8019357197

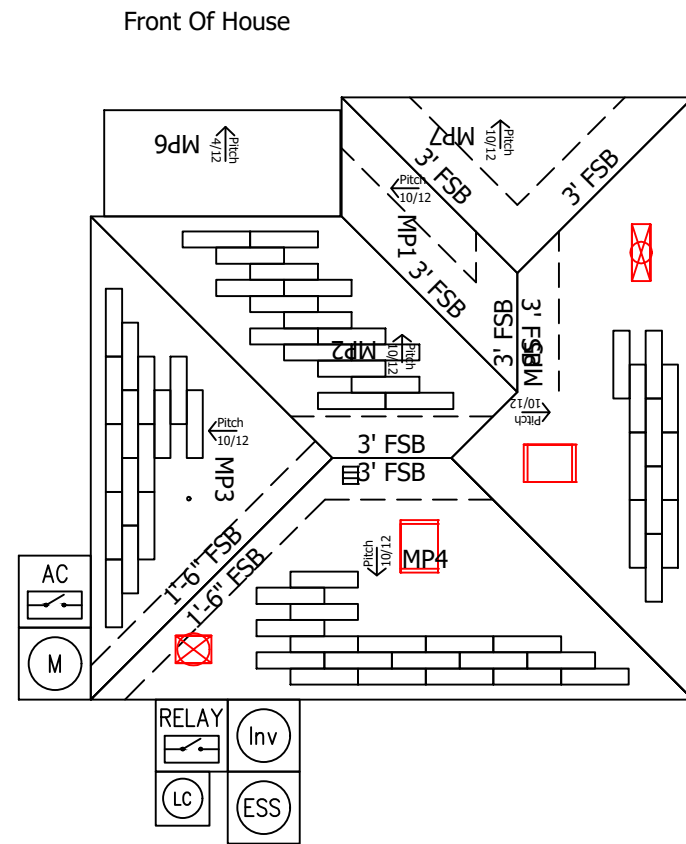
DESCRIPTION: 3.5082 KW PV ARRAY
13.5 KWH ENERGY STORAGE SYSTEM

PAGE NAME: COVER SHEET

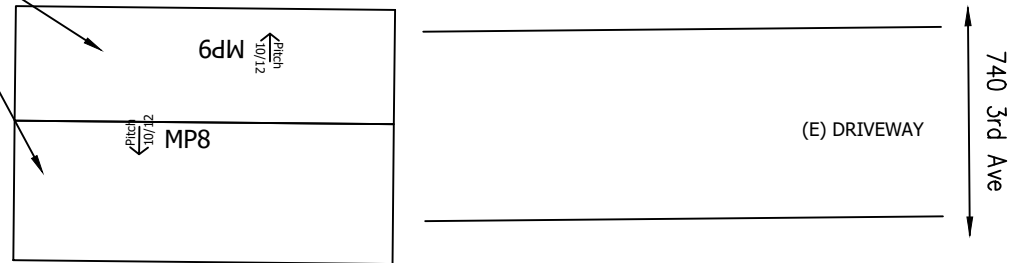
DESIGN: Sierra Wilen

SHEET: 1 REV: a DATE: 4/30/2021





NO SOLAR ROOF ON MP8 OR MP9



MP2	PITCH: 40 AZIMUTH: 360 MATERIAL: Solar Roof	ARRAY PITCH: 40 ARRAY AZIMUTH: 360 STORY: Two
MP3	PITCH: 40 AZIMUTH: 270 MATERIAL: Solar Roof	ARRAY PITCH: 40 ARRAY AZIMUTH: 270 STORY: Two
MP4	PITCH: 40 AZIMUTH: 180 MATERIAL: Solar Roof	ARRAY PITCH: 40 ARRAY AZIMUTH: 180 STORY: Two
MP5	PITCH: 40 AZIMUTH: 90 MATERIAL: Solar Roof	ARRAY PITCH: 40 ARRAY AZIMUTH: 90 STORY: Two

LEGEND

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

SITE PLAN

Scale: 3/32" = 1'



TOTAL ARRAY AREA (SF): 263
 TOTAL ROOF AREA (SF): 1402
 TOTAL ARRAY AREA IS \approx 18.79
 PERCENT OF TOTAL ROOF AREA

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CUSTOMER: Jordi Duran
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 Salt Lake City, UT 84103
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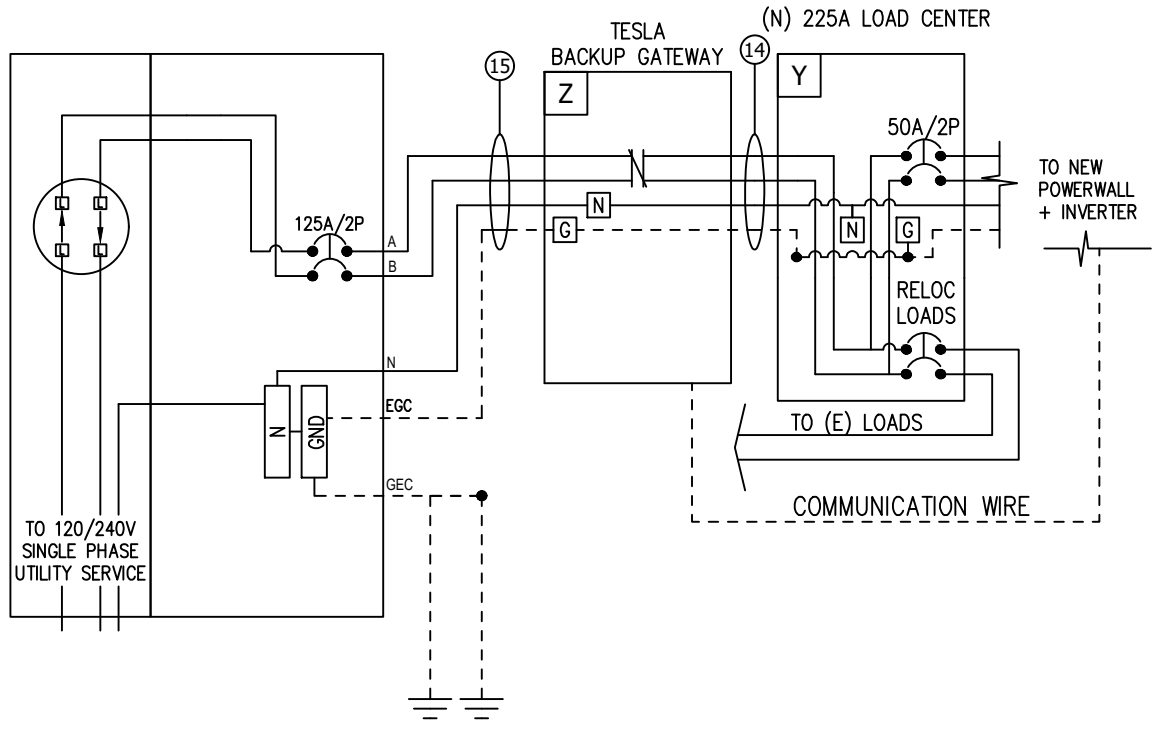
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 13.5 KWH ENERGY STORAGE SYSTEM
 PAGE NAME: SITE PLAN

DESIGN: Sierra Wilen
 SHEET: 2
 REV: a
 DATE: 4/30/2021



GROUND SPECS	MAIN PANEL SPECS	GENERAL NOTES		LICENSE
BOND (N) AWG #6 TO (N) DOUBLE GROUND ROD AT PANEL WITH IRREVERSIBLE CRIMP	Panel Number: SC8L125S Meter Number: 51 157 654 Overhead Service Entrance	*		

(E) 125A MAIN SERVICE PANEL
Multiple Main Breakers (6 or fewer)



- POI** (2) Ground Rod
5/8" x 8", Copper
- (1) SQUARE D # HOM2125
Breaker; 125A/2P, 2 Spaces
- Z** (1) Tesla # 1232100-00-E
Back-up Gateway 2.0 NA for AC PW 2.0
- Y** (1) SQUARE D # HOM2040L225PRB
Load Center; 225A bus, Convertible, NEMA3R, 20sp/40cir, 120v/240v, 10kAIC, Surface
- (1) SQUARE D # HOM250
Breaker; 50A/2P, 2 Spaces

- 14** (1) AWG #1, THWN-2, Black
(1) AWG #1, THWN-2, Red
(1) AWG #1, THWN-2, White
- (1) AWG #6, THWN-2, Green - (1) Conduit
(1) AWG #1, THWN-2, Black - 2" PVC; Schedule 80
- 15** (1) AWG #1, THWN-2, Red
(1) AWG #1, THWN-2, White
- (1) AWG #6, THWN-2, Green - (1) Conduit Kit; 1-1/4" EMT

AC

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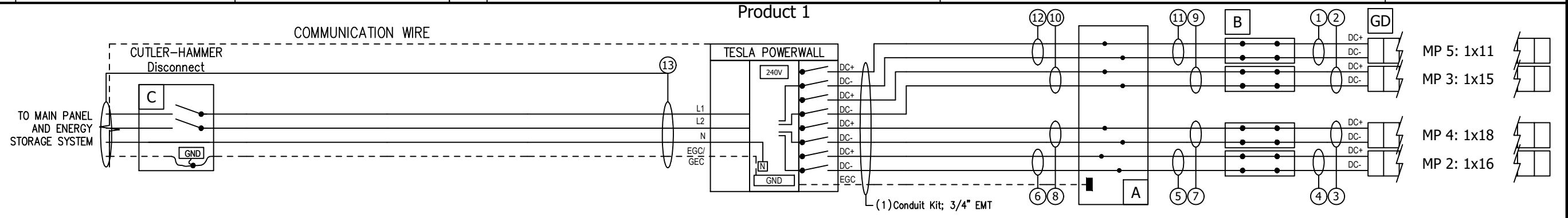
PAGE NAME:
THREE LINE DIAGRAM

DESIGN:
Sierra Wilen

SHEET: 3 REV: a DATE: 4/30/2021



		GENERAL NOTES	PRODUCT SPECS	MODULE SPECS	LICENSE
		Inv 1: DC Ungrounded	1 - (1) Powerwall+ Tesla Inc [240V] # 1850000-00-B 7.6 kW / 13.5 kWh 2 3	- (60) Tesla # SR60T1 Solar Roof PV Module; 58.47W, 52.11W PTC, Textured Voc: 13.34 Vpmax: 10.99 Isc AND Imp ARE SHOWN IN THE DC STRINGS IDENTIFIER	



NO EXPORT TO GRID EXCEPT DURING DE-ISLANDING (LIMITED TO 25 MS).
GATEWAY HAS REVERSE POWER-FLOW DETECTION.
AC DISCONNECT(S) LOCATED WITHIN 10' OF THE METER.

Voc* = MAX VOC AT MIN TEMP

	C	(1) CUTLER-HAMMER # DG222URB Disconnect; 60A, 240Vac, Non-Fusible, NEMA 3R (1) CUTLER-HAMMER # DG100NB Ground/Neutral Kit; 60-100A, General Duty (DG)	AC	A	(4) Junction Box, Metal; 6" x 6" x 4", Box w/ cover; Nema 3R B	(4) 1145820-00-A PASS THROUGH BOX, TWO STRING	GD	— Please see MCI wiring detail page for more information	PV	(9) 1550379-00-D MCI, TESLA, 600V, 13A	DC
				7	(2) AWG #10, PV Wire, 600V, Black (1) Conduit; 3/4" LFMC	Voc* = 275.14 VDC Isc = 5.65 ADC Vmp = 197.82 VDC Imp = 5.32 ADC	1	(2) AWG #10, PV Wire, 600V, Black Voc* = 168.14 VDC Isc = 5.65 ADC Vmp = 120.89 VDC Imp = 5.32 ADC			
				8	(1) AWG #10, THWN-2, Black (1) AWG #10, THWN-2, White (1) AWG #10, THWN-2, Green EGC	Voc* = 275.14 VDC Isc = 5.65 ADC Vmp = 197.82 VDC Imp = 5.32 ADC — (1) Conduit Kit; 3/4" EMT	2	(2) AWG #10, PV Wire, 600V, Black Voc* = 229.29 VDC Isc = 5.65 ADC Vmp = 164.85 VDC Imp = 5.32 ADC			
	13	(1) AWG #8, THWN-2, Black (1) AWG #8, THWN-2, Red (1) AWG #10, THWN-2, Green EGC — (1) Conduit Kit; 3/4" EMT	(1) AWG #8, THWN-2, White Vmp = 240 VAC Imp = 32 AAC	9	(2) AWG #10, PV Wire, 600V, Black (1) Conduit; 3/4" LFMC	Voc* = 229.29 VDC Isc = 5.65 ADC Vmp = 164.85 VDC Imp = 5.32 ADC	3	(2) AWG #10, PV Wire, 600V, Black Voc* = 275.14 VDC Isc = 5.65 ADC Vmp = 197.82 VDC Imp = 5.32 ADC			
				10	(1) AWG #10, THWN-2, Black (1) AWG #10, THWN-2, White (1) AWG #10, THWN-2, Green EGC	Voc* = 229.29 VDC Isc = 5.65 ADC Vmp = 164.85 VDC Imp = 5.32 ADC — (1) Conduit Kit; 3/4" EMT	4	(2) AWG #10, PV Wire, 600V, Black Voc* = 244.57 VDC Isc = 5.65 ADC Vmp = 175.84 VDC Imp = 5.32 ADC			
				11	(2) AWG #10, PV Wire, 600V, Black (1) Conduit; 3/4" LFMC	Voc* = 168.14 VDC Isc = 5.65 ADC Vmp = 120.89 VDC Imp = 5.32 ADC	5	(2) AWG #10, PV Wire, 600V, Black (1) Conduit; 3/4" LFMC Voc* = 244.57 VDC Isc = 5.65 ADC Vmp = 175.84 VDC Imp = 5.32 ADC			
				12	(1) AWG #10, THWN-2, Black (1) AWG #10, THWN-2, White (1) AWG #10, THWN-2, Green EGC — (1) Conduit Kit; 3/4" EMT	Voc* = 168.14 VDC Isc = 5.65 ADC Vmp = 120.89 VDC Imp = 5.32 ADC	6	(1) AWG #10, THWN-2, Black (1) AWG #10, THWN-2, White (1) AWG #10, THWN-2, Green EGC — (1) Conduit Kit; 3/4" EMT Voc* = 244.57 VDC Isc = 5.65 ADC Vmp = 175.84 VDC Imp = 5.32 ADC			

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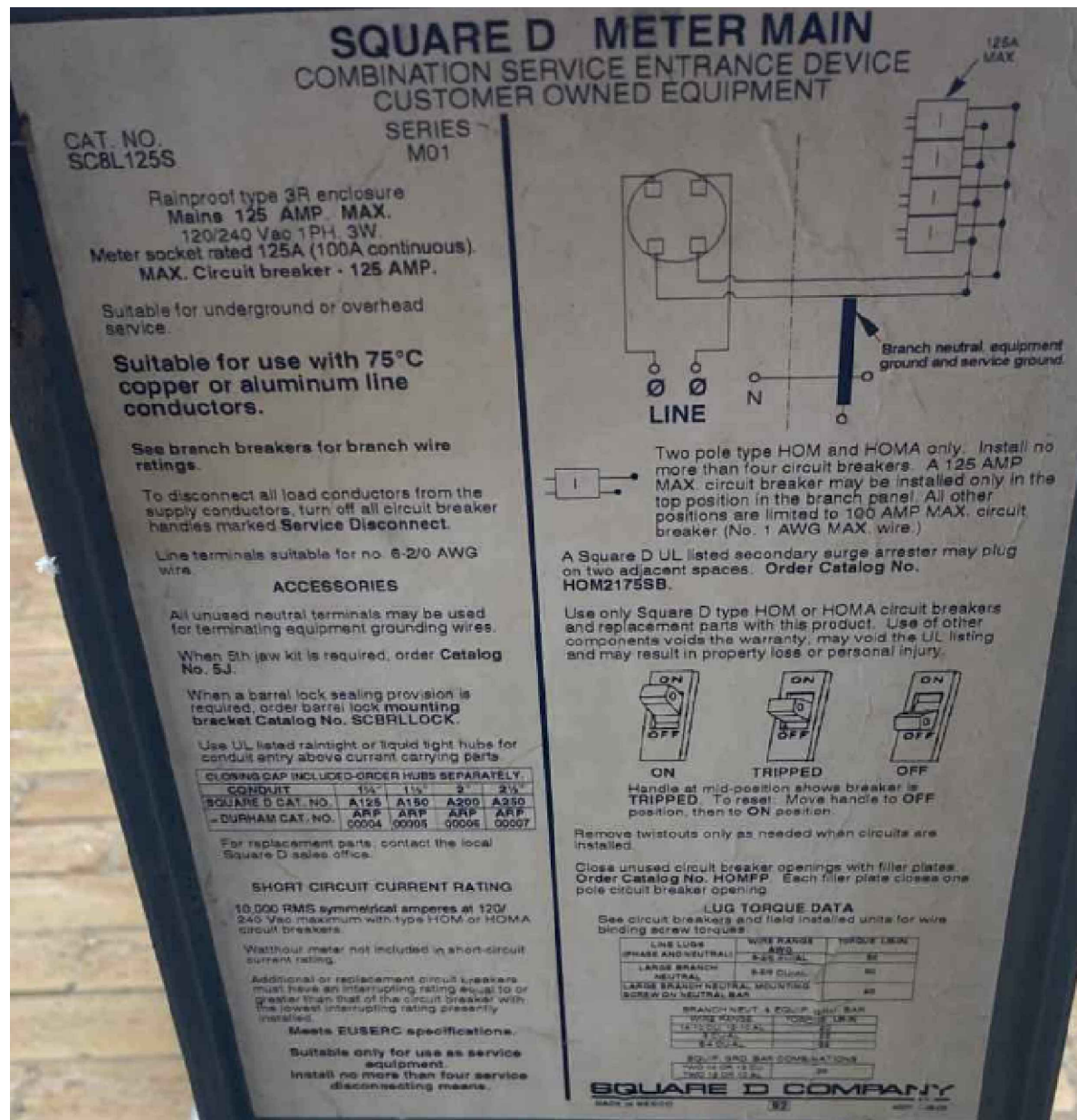
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PAGE NAME: THREE LINE DIAGRAM CONT.

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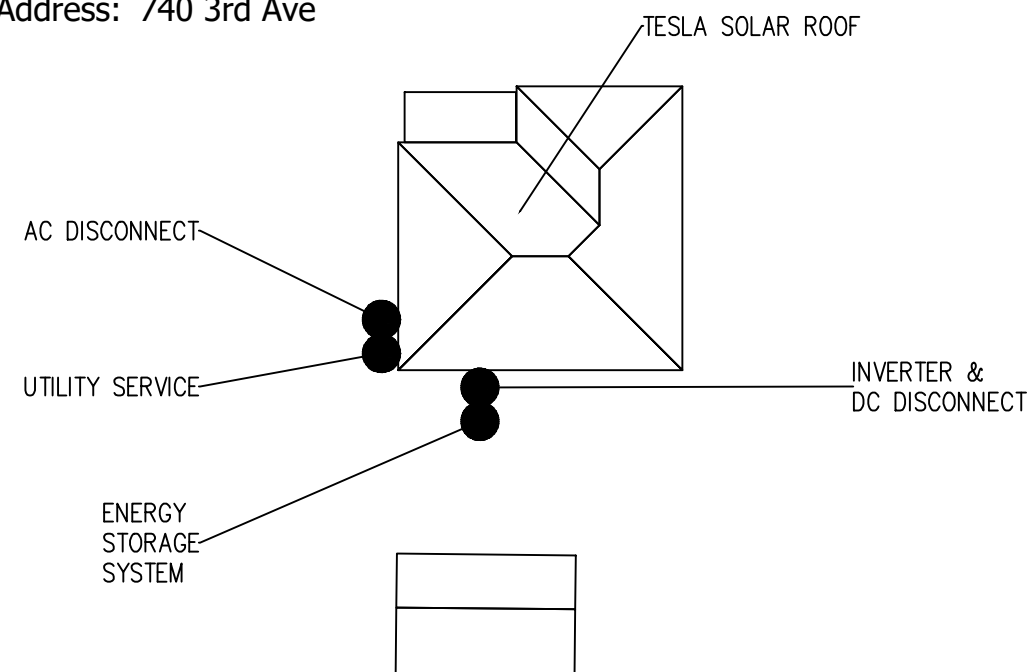
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SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF"
POSITION TO SHUT DOWN PV SYSTEM AND REDUCE
SHOCK HAZARD IN THE ARRAY

Address: 740 3rd Ave



OPERATING VOLTAGE = 240

JB-8411217-00

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SHALL IT BE DISCLOSED IN WHOLE OR IN
PART TO OTHERS OUTSIDE THE RECIPIENT'S
ORGANIZATION, EXCEPT IN CONNECTION WITH
THE SALE AND USE OF THE RESPECTIVE
TESLA EQUIPMENT, WITHOUT THE WRITTEN
PERMISSION OF TESLA INC.

JOB NUMBER: JB-8411217 00

MOUNTING SYSTEM:
TESLA SOLAR ROOF

MODULES:
(60) Tesla # SR60T1

INVERTER:
Powerwall + Inverter Tesla Inc [240V] # 1850000-00-B 7.6 kW

CUSTOMER:
Jordi Duran
740 3rd Ave
Salt Lake City, UT 84103
8019357197

/ 13.5 kWh

DESCRIPTION:
3.5082 KW PV ARRAY
13.5 KWH ENERGY STORAGE SYSTEM

PAGE NAME:
SITE PLAN PLACARD

DESIGN:
Sierra Wilen

SHEET: 6 REV: a DATE: 4/30/2021

TESLA

PHOTOVOLTAIC DC DISCONNECT

Label Location:
(DC) (INV)
Per Code:
NEC 690.13.B

MAXIMUM VOLTAGE
MAXIMUM CIRCUIT CURRENT
MAX RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER OR DC-TO-DC CONVERTER (IF INSTALLED)

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

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

Label Location:
(DC) (INV)
Per Code:
690.41.B

WARNING
ELECTRICAL SHOCK HAZARD DO NOT TOUCH TERMINALS TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION
DC VOLTAGE IS ALWAYS PRESENT WHEN SOLAR MODULES ARE EXPOSED TO SUNLIGHT

Label Location:
(DC) (CB)
Per Code:
CEC 690.13.B

PHOTOVOLTAIC AC DISCONNECT

Label Location:
(AC) (POI)
Per Code:
NEC 690.13.B

MAXIMUM AC OPERATING CURRENT A
MAXIMUM AC OPERATING VOLTAGE V

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

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

Label Location:
(AC)(POI)
Per Code:
NEC 690.13.B

PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN

Label Location:
(INV)
Per Code:
NEC 690.56.C.3

WARNING
INVERTER OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE

Label Location:
(POI)
Per Code:
NEC 705.12.B.2.3.b

PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN

Label Location:
(INV)
Per Code:
NEC 690.56(C)
SIGN IS REFLECTIVE

RAPID SHUTDOWN DISCONNECT

Label Location:
(DC)(INV)

CAUTION
DUAL POWER SOURCE SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

Label Location:
(POI)
Per Code:
NEC 705.12.B.3

CAUTION
PHOTOVOLTAIC SYSTEM CIRCUIT IS BACKFED

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

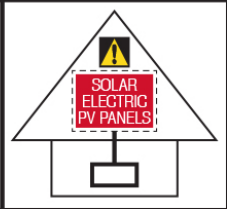
PHOTOVOLTAIC POINT OF INTERCONNECTION
WARNING: ELECTRIC SHOCK HAZARD. DO NOT TOUCH TERMINALS. TERMINALS ON BOTH THE LINE AND LOAD SIDE MAY BE ENERGIZED IN THE OPEN POSITION. FOR SERVICE DE-ENERGIZE BOTH SOURCE AND MAIN BREAKER.
PV POWER SOURCE
MAXIMUM AC OPERATING CURRENT A
MAXIMUM AC OPERATING VOLTAGE V

Label Location:
(POI)
Per Code:
CEC 690.13.B

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

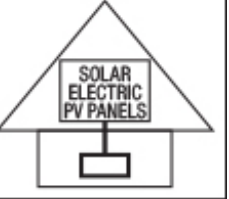
Label Location:
(DC) (INV)

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN
TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN CONDUCTORS OUTSIDE THE ARRAY. CONDUCTORS WITHIN THE ARRAY REMAIN ENERGIZED IN SUNLIGHT



Label Location:
ABB/Delta Solivia Inverter
Per Code:
690.56(C)(1)(b)

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN
TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY.



Label Location:
SolarEdge and,Delta M-Series and,Telsa Inverter
Per Code:
690.56(C)(1)(a)

WARNING: PHOTOVOLTAIC POWER SOURCE

Label Location:
(C)(CB)
Per Code:
NEC 690.31.G.3
TO BE PLACED EVERY 10' ON CONDUIT ENCLOSURES MC CABLE W/ DC WIRING

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

BACKUP LOAD CENTER

Label Location:
(BLC)
Per Code:
NEC 408.4

CAUTION
TRI POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM
THIRD SOURCE IS ENERGY STORAGE SYSTEM

Label Location:
(MP)
Per Code:
NEC 705.12(B)(3)

CAUTION
DO NOT ADD NEW LOADS

Label Location:
(BLC)
Per Code:
NEC 220

WARNING
THIS EQUIPMENT FED BY
MULTIPLE SOURCES. TOTAL
RATING OF ALL OVER CURRENT
DEVICES, EXCLUDING MAIN
SUPPLY OVERCURRENT DEVICE,
SHALL NOT EXCEED AMPACITY
OF BUSBAR.

Label Location:
(MP)
Per Code:
NEC 705.12.B.2.3.c

CAUTION
THIS PANEL HAS SPLICED FEED-
THROUGH CONDUCTORS.
LOCATION OF DISCONNECT AT ENERGY
STORAGE BACKUP LOAD PANEL

Label Location:
(MP)
Per Code:
NEC 312.8.A(3)

NOMINAL ESS VOLTAGE: 120/240V
**MAX AVAILABLE SHORT-
CIRCUIT FROM ESS: 32A**
**ARC FAULT CLEARING
TIME FROM ESS: 67ms**
**DATE OF
CALCULATION:**

Label Location:
(MP)
Per Code:
Per 706.7(D) label to be marked in field

CAUTION
DUAL POWER SOURCE
SECOND SOURCE IS
ENERGY STORAGE SYSTEM

Label Location:
(MP)
Per Code:
NEC 705.12(B)(3)

**ENERGY STORAGE SYSTEM ON SITE
LOCATED WITHIN LINE OF SIGHT**

Label Location:
(MP)
Per Code:

**ENERGY STORAGE SYSTEM ON SITE
LOCATED ON ADJACENT WALL**

Label Location:
(MP)
Per Code:

**ENERGY STORAGE SYSTEM ON SITE
LOCATED ON OPPOSITE WALL**

Label Location:
(MP)
Per Code:

**ENERGY STORAGE SYSTEM ON SITE
LOCATED INSIDE**

Label Location:
(MP)
Per Code:

(AC): AC Disconnect
(BLC): Backup Load Center
(MP): Main Panel

Label Set

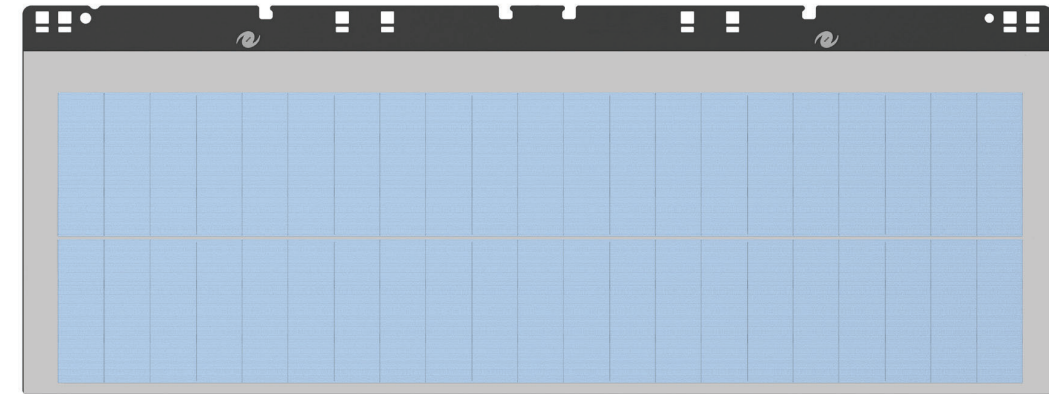
SOLAR ROOF

DATASHEET



14-CELL PV MODULE

MODEL #: SR60T1



ELECTRICAL SPECIFICATIONS

Maximum open circuit voltage rating of connected branch circuits per diode (at STC): 13.34 V

Maximum series fuse rating: 10 A

Maximum system voltage: 600 V

Irradiance (W/m ²)	Temp. (Celsius)	Voc (V)	Vmp (V)	Isc (A)	Imp (A)	Pmax (W)
1000	25	13.34	10.99	5.65	5.32	58.47

These electrical characteristics are within $\pm 5\%$ 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).

MECHANICAL SPECIFICATIONS

Dimensions: 430 mm x 1140 mm

Thickness: Appx. 5 mm module thickness with 35.3 mm maximum height from deck

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).

ROOF PITCH RANGE

2:12 - 24:12

Certain features can be installed up to 62:12

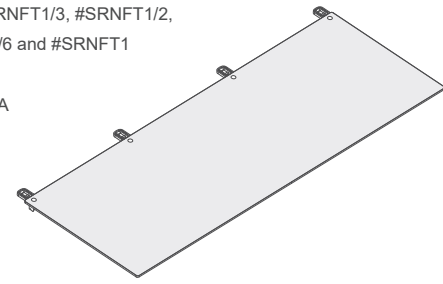
CERTIFICATIONS

UL 61730 (UL Listed); UL 9703 (UL Listed); UL 1741 (UL Listed)

UL 790 Class A (ETL Listed); ASTM D3161 Class F (ETL Listed); TAS100 (ETL Listed)

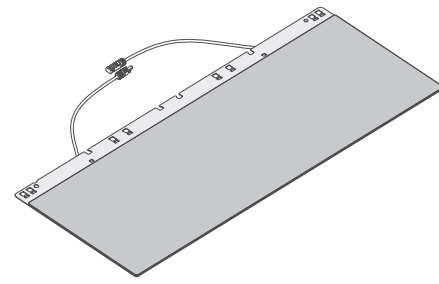
ROOFING MODULES, FULL AND PARTIAL

Model #SRNFT1/6, #SRNFT1/3, #SRNFT1/2,
#SRNFT2/3, #SRNFT5/6 and #SRNFT1
Listed to UL 61730
Listed to UL 790 Class A
ASTM D3161 Class F
TAS100



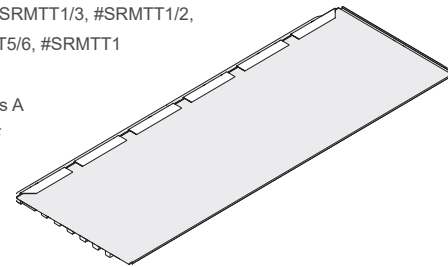
PV MODULE

Model #SR60T1
Listed to UL 61730
UL 790 Class A
ASTM D3161 Class F
TAS100



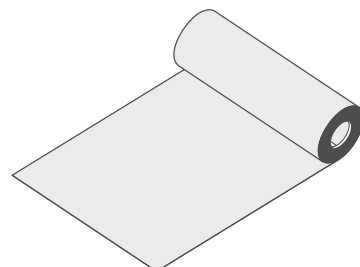
METAL TILES, FULL AND PARTIAL

Model #SRMTT1/6, #SRMTT1/3, #SRMTT1/2,
#SRMTT2/3, #SRMTT5/6, #SRMTT1
Listed to UL 1897
Listed to UL 790 Class A
ASTM D3161 Class F
TAS100



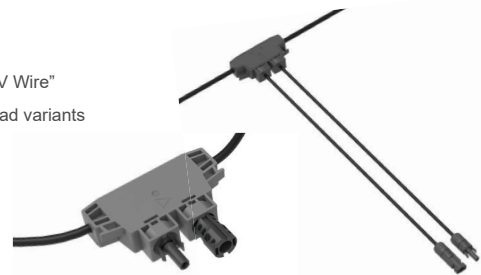
UNDERLAYMENT

FT Cobalt FR
ASTM D1970/ICC AC48
ICC AC188
ASTM E108 Class -A



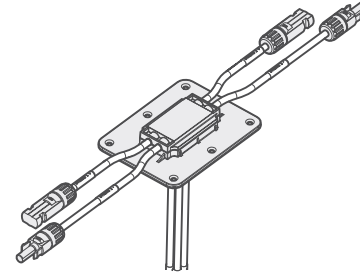
DIODE HARNESS

Model #SRDTH
UL 9703
Listed (ZKLA) "PV Wire"
Short and long lead variants
interchangeable



PASS THROUGH BOX

Model #SRPTB-4
UL 1741, File #E318357



POWERWALL

Backup Gateway 2

The Backup Gateway 2 for Tesla Powerwall provides energy management and monitoring for solar self-consumption, time-based control, and backup.

The Backup Gateway 2 controls connection to the grid, automatically detecting outages and providing a seamless transition to backup power. When equipped with a main circuit breaker, the Backup Gateway 2 can be installed at the service entrance. When the optional internal panelboard is installed, the Backup Gateway 2 can also function as a load center.

The Backup Gateway 2 communicates directly with Powerwall, allowing you to monitor energy use and manage backup energy reserves from any mobile device with the Tesla app.



PERFORMANCE SPECIFICATIONS

AC Voltage (Nominal)	120/240V
Feed-In Type	Split Phase
Grid Frequency	60 Hz
Current Rating	200 A
Maximum Input Short Circuit Current	10 kA ¹
Overcurrent Protection Device	100-200A; Service Entrance Rated ¹
Overvoltage Category	Category IV
AC Meter	Revenue accurate (+/- 0.2 %)
Primary Connectivity	Ethernet, Wi-Fi
Secondary Connectivity	Cellular (3G, LTE/4G) ²
User Interface	Tesla App
Operating Modes	Support for solar self-consumption, time-based control, backup, and off-grid
Backup Transition	Automatic disconnect for seamless backup
Modularity	Supports up to 10 AC-coupled Powerwalls
Optional Internal Panelboard	200A 6-space / 12 circuit Eaton BR Circuit Breakers
Warranty	10 years

¹ When protected by Class J fuses, Backup Gateway 2 is suitable for use in circuits capable of delivering not more than 22kA symmetrical amperes.

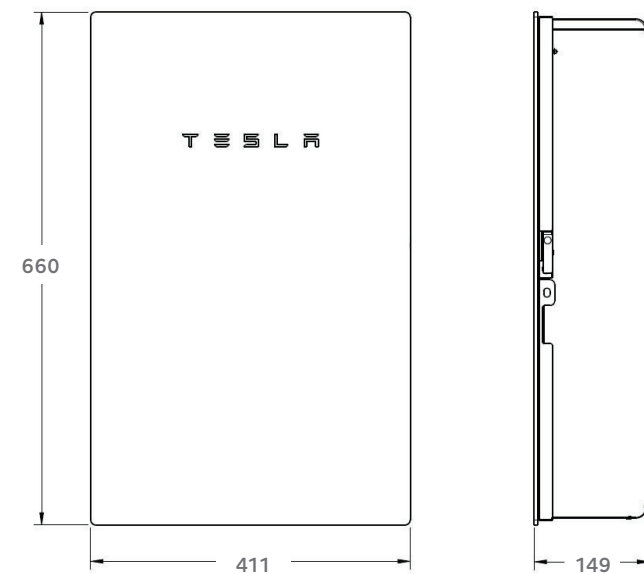
² The customer is expected to provide internet connectivity for Backup Gateway 2; cellular should not be used as the primary mode of connectivity. Cellular connectivity subject to network operator service coverage and signal strength.

COMPLIANCE INFORMATION

Certifications	UL 67, UL 869A, UL 916, UL 1741 PCS CSA 22.2 0.19, CSA 22.2 205
Emissions	FCC Part 15, ICES 003

MECHANICAL SPECIFICATIONS

Dimensions	660 mm x 411 mm x 149 mm (26 in x 16 in x 6 in)
Weight	20.4 kg (45 lb)
Mounting options	Wall mount, Semi-flush mount



ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-20°C to 50°C (-4°F to 122°F)
Operating Humidity (RH)	Up to 100%, condensing
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Type	NEMA 3R

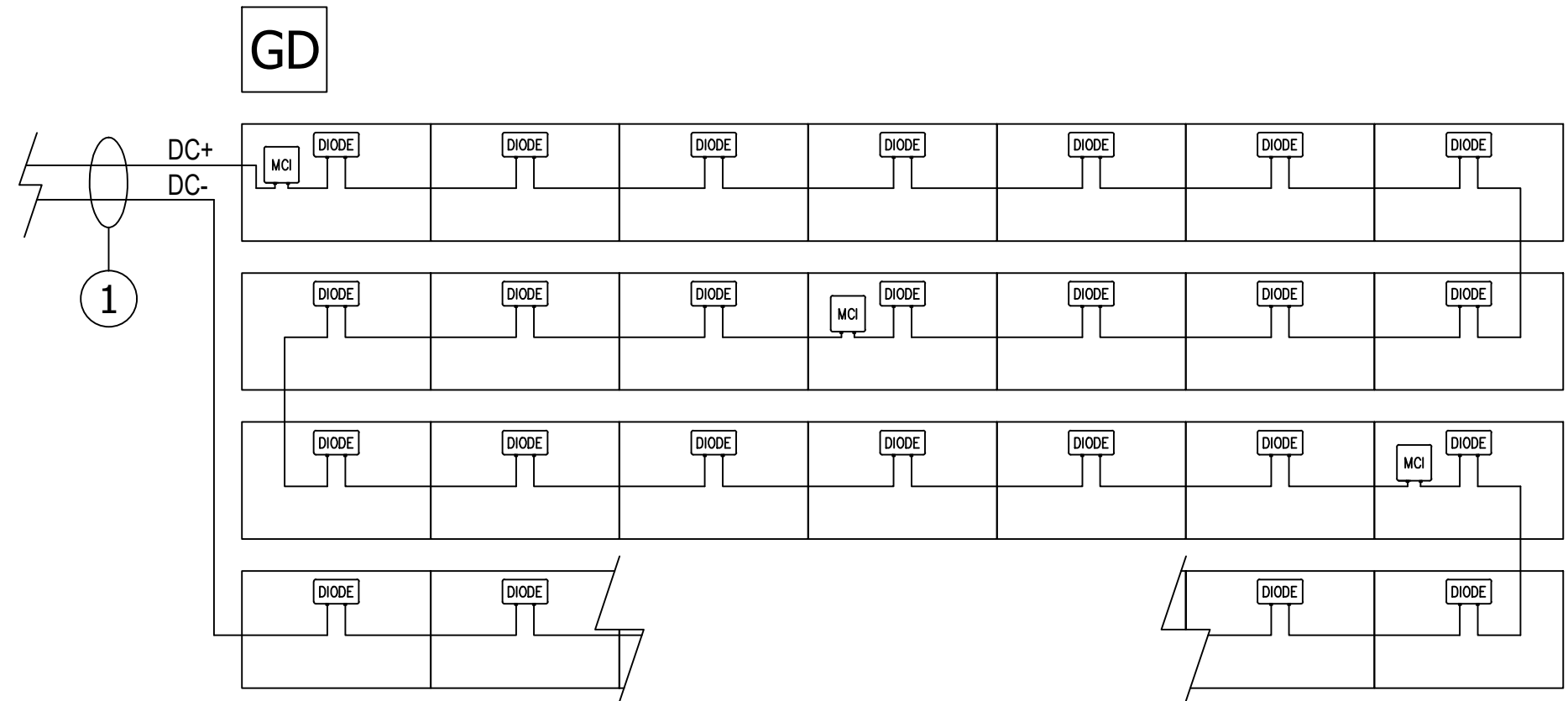
MCI WIRING DETAIL

GENERAL NOTES

- DRAWING OF STANDARD MCI WIRING DETAIL FOR ANY GIVEN STRING LENGTH
- IF INITIATED, RAPID SHUTDOWN OCCURS WITHIN 30 SECONDS OF ACTIVATION AND LIMITS VOLTAGE ON THE ROOF TO NO GREATER THAN 165V (690.12.B.2.1)
- MID CIRCUIT INTERRUPTER (MCI) IS A UL 1741 PVRSE CERTIFIED RAPID SHUTDOWN DEVICE (RSD)

SOLAR ROOF TILES

- MCIS ARE LOCATED AT DECK LEVEL, JUST UNDER THE TILES IN ACCORDANCE WITH 690.12 REQUIREMENTS
- THE QUANTITY OF MCIS PER STRING IS DETERMINED BY STRING LENGTH
 - NUMBER OF TILES BETWEEN MCI UNITS = 0-10
 - MAXIMUM NUMBER OF TILES PER MCI UNIT = 10
 - MINIMUM NUMBER MCI UNITS = TILE COUNT/10



PLEASE REFER TO MCI CUTSHEET AND PVRSA INSERT FOR MORE INFORMATION

① (2)AWG, PV Wire, 600V, Black

DC



POWERWALL+

Powerwall+ is an integrated solar battery system to store energy from solar production. Its integrated design and streamlined installation allow for a simple connection to any home, and improved surge power capability brings whole home backup in a smaller package. System smart controls enable owners to customize system behavior to suit their renewable energy needs.

KEY FEATURES

- Integrated battery, inverter, and system controller for a more compact install
- Integrated soft starter capable of powering motors and air conditioning units¹
- A suite of application modes, including self-powered, time-based control, and backup modes
- Wi-Fi, Ethernet, and LTE connectivity with easy over-the-air updates

¹Supports devices up to 105 LRA

POWERWALL+

Powerwall+ is an AC battery system with solar integration. It supports up to four solar strings for increased design flexibility and production on complex roofs. Its rechargeable lithium-ion battery pack provides energy storage for solar self-consumption, time-based control, and backup applications.

PHOTOVOLTAIC (PV) AND BATTERY ENERGY STORAGE SYSTEM (BESS) SPECIFICATIONS

Nominal Battery Energy	13.5 kWh
Nominal Grid Voltage (Input / Output)	120/240 VAC
Grid Voltage Range	211.2 - 264 VAC
Frequency	60 Hz
Phase	240 VAC: 2W+N+GND
Maximum Continuous Power On-Grid	5 kW input / 7.6 kW output
BESS Continuous Power	5 kW input / 5 kW output
Maximum Continuous Power Off-Grid	5 kW input / 9.6 kW output
Maximum Continuous Current On-Grid	32 A output
BESS Continuous Current	24 A input
Maximum Continuous Current Off-Grid	40 A output
PV Maximum Input Voltage	600 VDC
PV Operating DC Input Voltage Range	60 - 550 VDC
PV DC MPPT Voltage Range	60 - 480 VDC
MPPTs	4 (1-2-1-2 input connectors per MPPT)
Maximum Current per MPPT (I_{mp})	13 A
Maximum Short Circuit Current per MPPT (I_{sc})	15 A
Overcurrent Protection Device	50 A
Output Power Factor Rating	+/- 0.9 to 1
Round Trip Efficiency	90% ¹
Customer Interface	Tesla Mobile App
Internet Connectivity	Wi-Fi, Ethernet, Cellular LTE/4G ²
PV AC Metering	Revenue grade (+/-0.5%)
Protections	Integrated arc fault circuit interrupter (AFCI), Rapid Shutdown (RSD)
Warranty	10 years

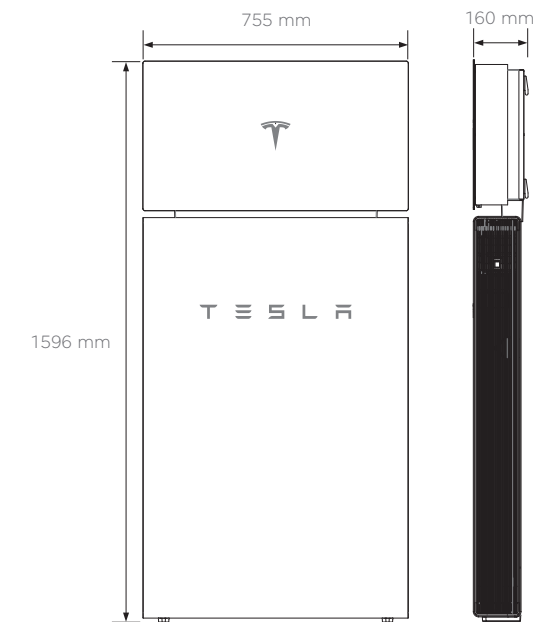
COMPLIANCE INFORMATION

PV Certifications	UL 1699B, UL 1741, UL 1741 SA, UL 1998 (US), IEEE 1547, IEEE 1547.1
Battery Energy Storage System Certifications	UL 1642, UL 1741, UL 1741 PCS, UL 1741 SA, UL 1973, UL 9540, IEEE 1547, IEEE 1547.1, UN 38.3
Grid Connection	US
Emissions	FCC Part 15 Class B
Environmental	RoHS Directive 2011/65/EU
Seismic	AC156, IEEE 693-2005 (high)



MECHANICAL SPECIFICATIONS

Dimensions	1596 mm x 755 mm x 160 mm (62.8 in x 29.7 in x 6.3 in)
Weight	156 kg (343.9 lb) ³
Mounting options	Floor or wall mount



ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-20°C to 50°C (-4°F to 122°F) ³
Recommended Temperature	0°C to 30°C (32°F to 86°F)
Operating Humidity (RH)	Up to 100%, condensing
Storage Conditions	-20°C to 30°C (-4°F to 86°F) Up to 95% RH, non-condensing State of Energy (SoE): 25% initial
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Type	Type 3R
Noise Level @ 1 m	< 40 db(A) optimal, < 50 db(A) maximum

¹AC to battery to AC, at beginning of life.

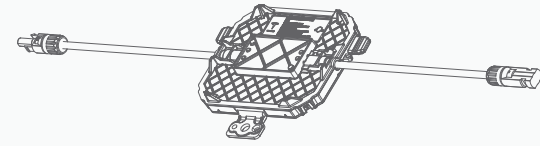
²Cellular connectivity subject to network service coverage and signal strength.

³The battery assembly and solar assembly are mounted separately. The battery assembly weighs 131 kg (288.8 lb) and the solar assembly weighs 23 kg (50.7 lb). The wall bracket weighs 10.5 kg (23 lb).

⁴Performance may be de-rated at operating temperatures below 10°C (50°F) or greater than 43°C (109°F).

SOLAR SHUTDOWN DEVICE

The Tesla Solar Shutdown Device is part of the PV system rapid shutdown (RSD) function in accordance with Article 690 of the applicable NEC. When paired with Powerwall+, solar array shutdown is initiated by any loss of AC power.



ELECTRICAL SPECIFICATIONS

Nominal Input DC Current Rating (I_{MP})	12 A
Maximum Input Short Circuit Current (I_{SC})	15 A
Maximum System Voltage	600 V DC

RSD MODULE PERFORMANCE

Maximum Number of Devices per String	5
Control	Power Line Excitation
Passive State	Normally open
Maximum Power Consumption	7 W
Warranty	25 years

COMPLIANCE INFORMATION

Certifications	UL 1741 PVRSS PVRSA (Photovoltaic Rapid Shutdown Array)
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PVRSA

RSD Initiation Method	Loss of AC power
Compatible Equipment	Powerwall+

ENVIRONMENTAL SPECIFICATIONS

Ambient Temperature	-40°C to 50°C (-40°F to 122°F)
Storage Temperature	-30°C to 70°C (-22°F to 158°F)
Enclosure Rating	NEMA 4 / IP65

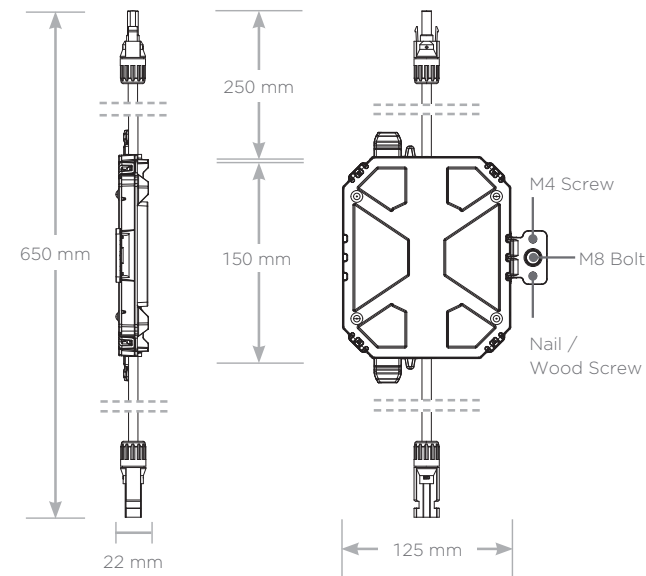
SOLAR SHUTDOWN DEVICE REQUIREMENTS PER MODULE

The following modules have been certified as part of a PV Rapid Shutdown Array (PVRSA) when installed together with Powerwall+ and Tesla Solar Shutdown Devices. See the Powerwall+ Installation Manual for guidance on installing Powerwall+ and Solar Shutdown Devices with other modules.

Brand	Model	Required Solar Shutdown Devices
Tesla	Solar Roof V3	1 Solar Shutdown Device per 10 modules
Hanwha	Q.PEAK DUO BLK-G5	1 Solar Shutdown Device per 3 modules
Hanwha	Q.PEAK DUO BLK-G6+	1 Solar Shutdown Device per 3 modules

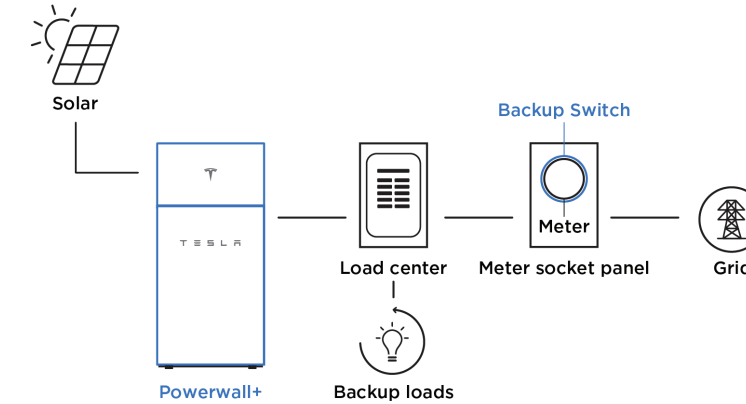
MECHANICAL SPECIFICATIONS

Electrical Connections	MC4 Connector
Housing	Plastic
Dimensions	125 mm x 150 mm x 22 mm (5 in x 6 in x 1 in)
Weight	350 g (0.77 lb)
Mounting Options	ZEP Home Run Clip M4 Screw (#10) M8 Bolt (5/16") Nail / Wood screw

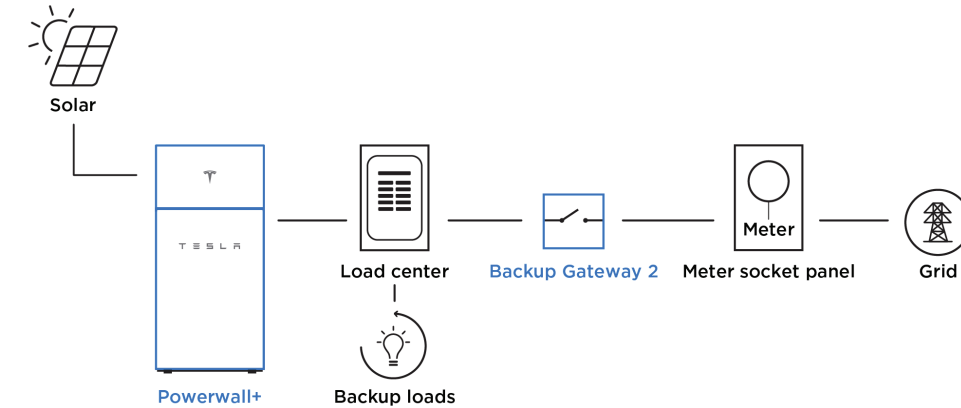


SYSTEM LAYOUTS

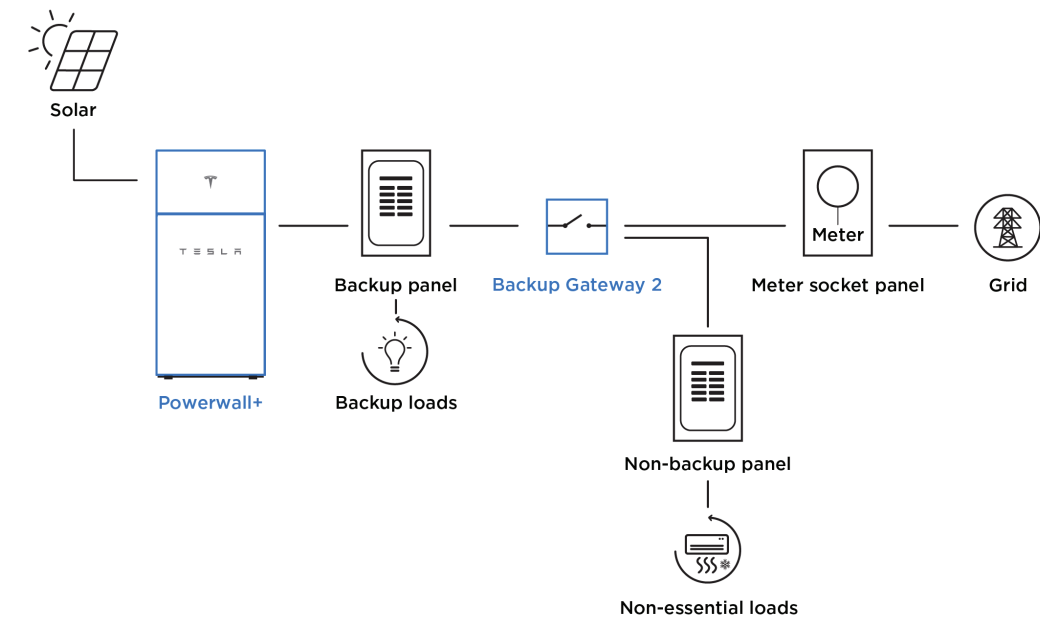
Powerwall+ with Backup Switch for Whole Home Backup



Powerwall+ with Backup Gateway 2 for Whole Home Backup



Powerwall+ with Backup Gateway 2 for Partial Home Backup



PVRSA Model: Solarglass Roof Rapid Shutdown Array
Category QIJR, Report Date: 2021-03-05

Table of Essential Elements

Function	Manufacturer	Model No.	Firmware Versions and Checksums	Certification Standard
PVRSE Mid Circuit Interrupter (MCI)	Tesla	MCI-1 1550379 ²	N/A	UL 1741 PVRSE
Inverter	Tesla	7.6 kW: 1538000 ² 3.8 kW: 1534000 ²	V1, D85CAB80 V1, 8A3CA3F2	UL 1741, 1998 PVRSS/PVRSE
PV Module	Tesla	SR60T1	N/A	UL 61730
Diode Harness	Tesla	SRDTH	N/A	UL 9703
PV Wire Jumper(s)	Tesla	SR-BJ2X SR-BJ3X SR-BJ4X SR-BJMini	N/A	UL 9703
Pass-Through Box	Tesla	SRPTB-4	N/A	UL 1741
PVRSA Initiator ¹ (See installation requirements below)	Non-Specific	N/A	N/A	N/A

¹ Dedicated PV system AC circuit breaker or AC disconnect switch, labeled per NEC 690.12 requirements.

² Applies to variations of this part number with suffix of two numbers and one letter.

Note: PVRSA installation requirements may reduce the effective equipment and component ratings below the individual equipment and component PVRSE ratings in order to achieve PVRSA shock hazard reduction requirements.

PVRSA Installation Requirements

Max System Voltage	600 Vdc
Max Array Internal Voltage After Actuation	165 Vdc (cold weather open circuit)
Max Series-Connected Panels between MCIs:	10

Other Installation Instructions:

1. An MCI must be connected to one end of each series string or mounting plane sub-array string.
2. Verification that MCIs are installed with 10 or fewer modules between MCIs shall be documented for inspection, by voltage measurement logs and/or as-built string layout diagrams.
3. The dedicated PV system AC circuit breaker or PV system AC disconnect switch shall serve as the PVRSA initiator and shall be sized and installed in accordance with NEC requirements. The specific part shall be identified on the as-built system drawings.



Certification Mark of UL on the installation instructions is the only method provided by UL to identify products manufactured under its Certification and Follow-Up Service. The Certification Mark for these products includes the UL symbol, the words "CERTIFIED" and "SAFETY," the geographic identifier(s), and a file number."

PVRSA Model: ZS Rapid Shutdown Array
(Applicable to ZS Comp, ZS Span, ZS Ramp, and ZS Seam)
Category QIJR, Report Date: 2021-03-05

Table of Essential Elements

Function	Manufacturer	Model No.	Firmware Versions and Checksums	Certification Standard
PVRSE Mid Circuit Interrupter (MCI)	Tesla	MCI-1 1550379 ²	N/A	UL 1741 PVRSE
Inverter	Tesla	7.6 kW: 1538000 ² 3.8 kW: 1534000 ²	V1, D85CAB80 V1, 8A3CA3F2	UL 1741, 1998 PVRSS/PVRSE
PV Module	Hanwha Q- CELLS	Q.PEAK DUO BLK-G5/SC315 Q.PEAK DUO BLK-G5/SC320 Q.PEAK DUO BLK G6+/SC330 Q.PEAK DUO BLK-G6+/SC335 Q.PEAK DUO BLK-G6+/SC340 Q.PEAK DUO BLK-G6+/SC345	N/A	UL 1703
Interlock	Tesla	ZEP 850-1613-001 ZEP 850-1388-001 ZEP 850-1281-001	N/A	UL 2703
Ground Zep	Tesla	ZEP 850-1511-001 ZEP 850-1172-002	N/A	UL 467 UL 2703
DC Wire Clip	Tesla	ZEP 850-1509-001 ZEP 850-1448-001	N/A	UL 1565
Homerun Wire Clip	Tesla	ZEP 850-1510-001		UL 1565
PVRSA Initiator ¹ (See installation requirements below)	Non-Specific	N/A	N/A	N/A

¹ Dedicated PV system AC circuit breaker or AC disconnect switch, labeled per NEC 690.12 requirements.

² Applies to variations of this part number with suffix of two numbers and one letter..

Note: PVRSA installation requirements may reduce the effective equipment and component ratings below the individual equipment and component PVRSE ratings in order to achieve PVRSA shock hazard reduction requirements.

PVRSA Installation Requirements

Max System Voltage	600 Vdc
Max Array Internal Voltage After Actuation	165 Vdc (cold weather open circuit)
Max Series-Connected Panels between MCIs:	3

Other Installation Instructions:

1. An MCI must be connected to one end of each series string or sub-array string.
2. Verification that MCIs are installed with 3 or fewer modules between MCIs shall be documented for inspection, by voltage measurement logs and/or as-built string layout diagrams.
3. The dedicated PV system AC circuit breaker or PV system AC disconnect switch shall serve as the PVRSA initiator and shall be sized and installed in accordance with NEC requirements. The specific part shall be identified on the as-built system drawings.



Certification Mark of UL on the installation instructions is the only method provided by UL to identify products manufactured under its Certification and Follow-Up Service. The Certification Mark for these products includes the UL symbol, the words "CERTIFIED" and "SAFETY," the geographic identifier(s), and a file number."



STAND
AGAINST
RACISM

ENOUGH

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WILD
UTAH















TESLA

SOLAR ROOF

DATASHEET



TESLA

SOLARGLASS ROOF

FREQUENTLY ASKED QUESTIONS
FOR BUILDING AND FIRE OFFICIALS



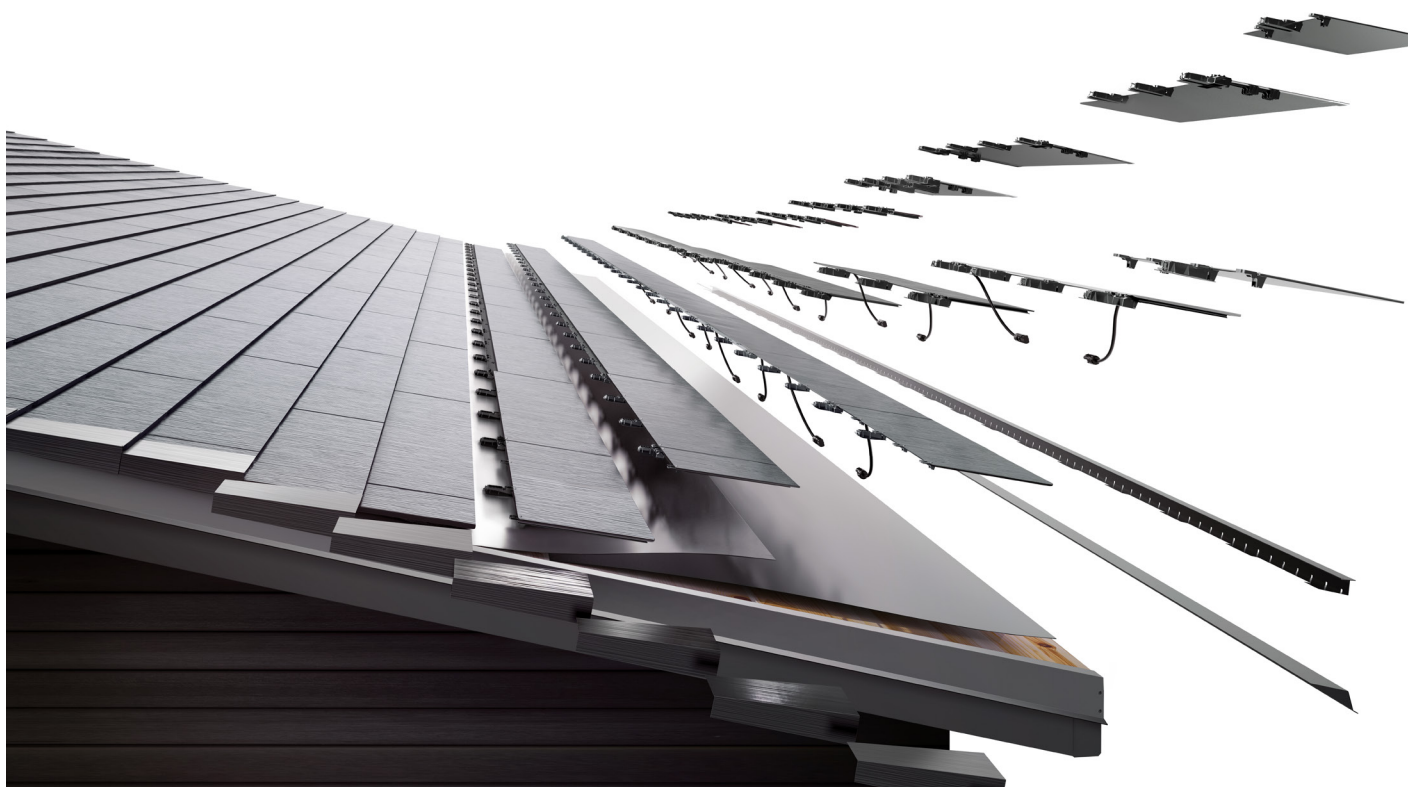
SOLARGLASS OVERVIEW

Tesla Solarglass combines roofing and photovoltaics (PV) into one product. As shown in the cover photo, it is different from other products that integrate photovoltaic roofing with existing roofing. A Solarglass roof replaces all existing roofing with materials that allow the roof to produce electricity.

The roofing components are tested to standards specific to roofing, including fire, wind, rain, and impact resistance. Likewise, the PV and electrical components are tested to applicable standards, including fire, electrical, mechanical, and rapid shutdown.

A complete list of certifications for each part may be found under **System Certifications**. **Certificates of Compliance** may be found at the end of this document.

We would like to answer any questions you have. Please feel free to email codecompliance@tesla.com.



SYSTEM CERTIFICATIONS

Q: TO WHAT STANDARDS HAS SOLARGLASS BEEN EVALUATED?

A: Because Solarglass must perform as both a roof covering and a solar array, it has been tested to standards that apply to each. The table under **System Certifications** shows those standards, and where applicable, the rating each component has achieved.

- UL 61730 for PV Modules
- UL 790 for Roof Fire Classification (Class A rated)
- ASTM D3161 for Wind Resistance of Steep Slope Roofing (Class F rated)
- TAS 100 for Wind-driven Rain

COMPONENT	PART #	PV MODULE SAFETY	FIRE ROOF CLASSIFICATION	WIND RESISTANCE	WIND DRIVEN RAIN
PV MODULE	SR60T1	UL 61730	UL 790 Class A	ASTM D3161 Class F	TAS 100
ROOFING MODULE	SRNFT1/6				
	SRNFT1/3				
	SRNFT1/2				
	SRNFT2/3				
	SRNFT5/6				
	SRNFT1				
FOOTLAP	SR-FOOTLAP		UL 790 Class A	ASTM D3161 Class F	TAS 100
FOOT WITH SUPPORT	SR-FOOTSUP				

- UL 9703 for Distributed Generation Wiring Harnesses
- UL 1741 for Interconnection System Equipment with Distributed Energy Resources

COMPONENT	PART #	WIRING HARNESSSES	SYSTEM EQUIPMENT	OTHER
DIODE HARNESS	SRDTH	UL 703		
JUMPER	SR-BJMINI			
	SR-BJ2X			
	SR-BJ3X			
	SR-BJ4X			
RAPID SHUTDOWN DEVICE	Delta RSS-600 1-1		UL 1741	NEC Article 690.12 NEMA 3R
PASS THROUGH BOX	SRPTB-4			

Q: TO WHAT BUILDING CODES DOES SOLARGLASS COMPLY?

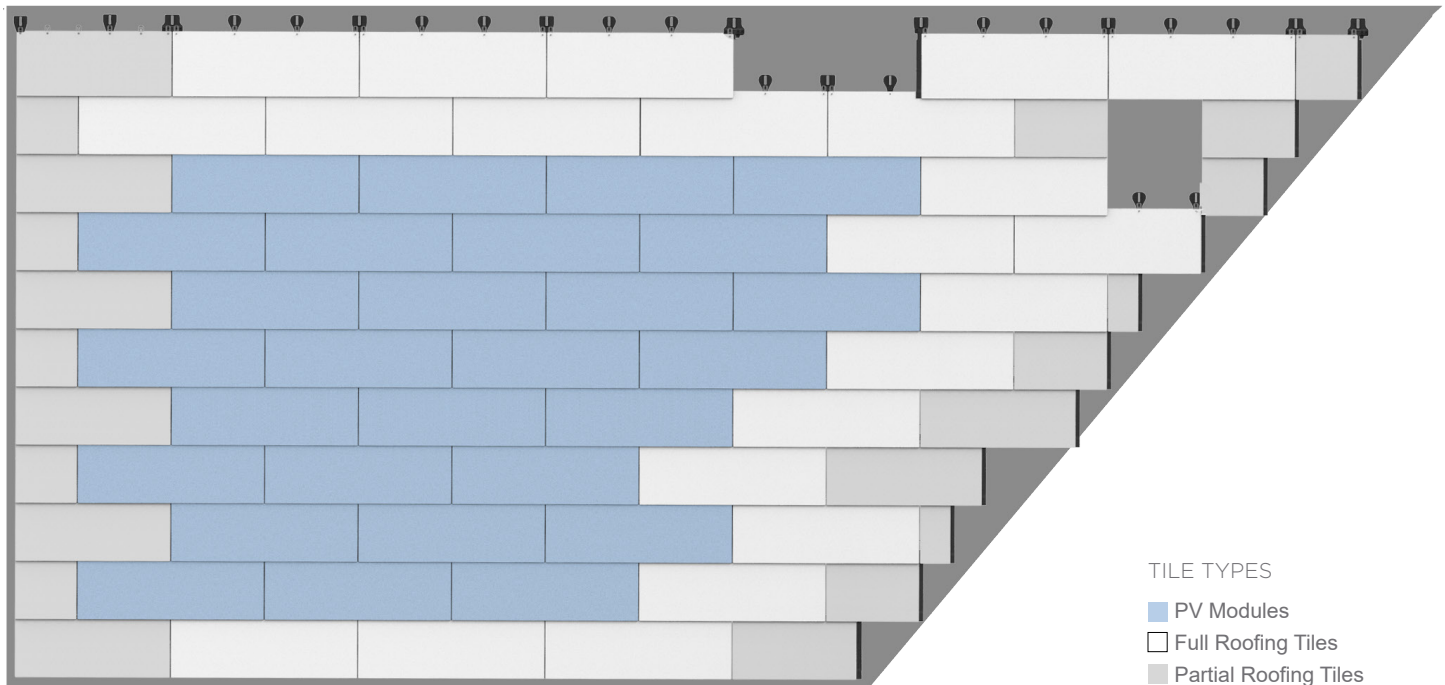
A: Solarglass complies with the applicable sections of IBC, IRC, IFC, NFPA 70 (NEC), and NFPA 1 (FIRE CODE) when installed in accordance with the installation instructions.

FREQUENTLY ASKED QUESTIONS

Q: DOES EVERY PART OF THE ROOF COVERING MAKE ELECTRICITY?

A: No. While much of the roof is made up of PV Modules, parts of the roof are covered with Roofing Modules or other typical roof details that do not produce electricity.

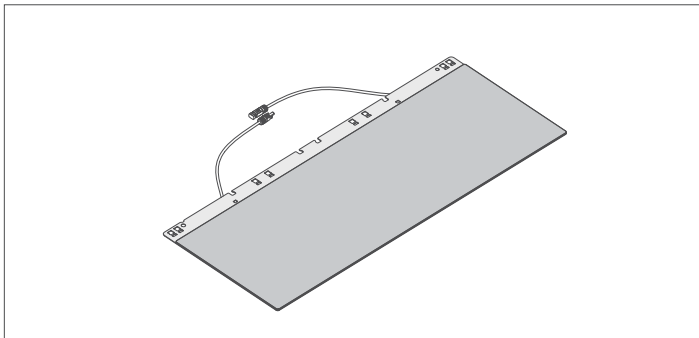
SAMPLE MOUNTING PLANE



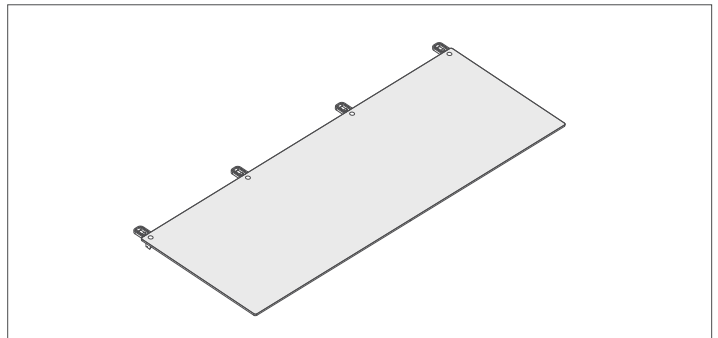
Q: IS SOLARGLASS A TILE OR A SHINGLE?

A: While Solarglass has an appearance similar to both tiles and shingles, it is unique. A typical Solarglass Module consists of a factory-built assembly with integral fasteners. Accordingly, resistance to wind loads has been evaluated through multiple test methods applicable to both roof covering types as well as PV mounting methods, including UL 1897, ASTM D3161 and UL 61730 (Mechanical).

PV MODULE

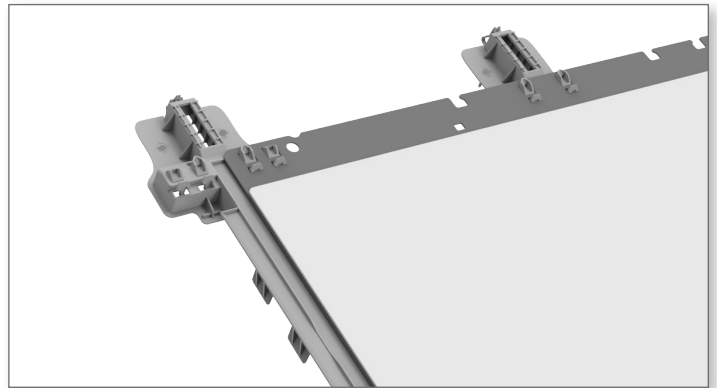
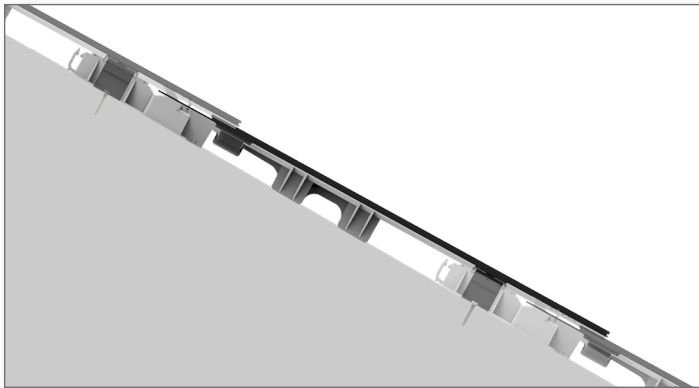


ROOFING MODULES



Q: HOW IS SOLARGLASS ATTACHED?

A: Each PV Module and Roofing Module is secured with traditional fasteners and recloseable fasteners. This attachment method has been evaluated to requirements in UL 1897, ASTM D3161 and UL 61730 (Mechanical).



Q: HOW MUCH DOES SOLARGLASS WEIGH?

A: Solarglass’s complete assembly weighs approximately 3.4 psf for textured tile. These figures include all elements above the roof sheathing, including underlayment and roof covering components.

Q: WHAT IS THE MAXIMUM WIND SPEED THAT SOLARGLASS CAN WITHSTAND?

Solarglass [Roof] is rated “Class F”, the highest attainable wind rating under ASTM D 3161. Refer to IRC 2015 Section R905.16.7, IRC 2018 Section R905.16.6, IBC 2015 Section 1507.17.8, and/or IBC 2018 Section 1507.17.8; for applicability of wind ratings.

Q: IS SOLARGLASS CERTIFIED CLASS “A” UNDER UL 790?

A: Yes. The roof assembly (including the PV Modules, Roofing Modules, and underlayment) have been evaluated to the requirements of UL 790 and has a Class “A” fire rating when installed in accordance with the installation instructions.

Q: CAN SOLARGLASS BE INSTALLED IN A HIGH FIRE HAZARD SEVERITY ZONE (HFHSZ) OR WILDLAND-URBAN INTERFACE (WUI)?

A: Yes. Solarglass has a UL 790 Class A fire rating and complies with the applicable sections of IRC and IWUIC for installation in areas of elevated fire risk when installed according to the manufacturer’s instructions using code-compliant flashings and accessory components.

Q: DOES SOLARGLASS COMPLY WITH THE “COOL ROOF” RATING REQUIREMENTS OF CALIFORNIA TITLE 24?

A: Yes. Solarglass complies with the 2016 CEC Building Energy Efficiency requirements of Section 150.2(b)11 (a) (sometimes called the “cool roof” requirement) through its incorporation of an airspace between the roof deck and roof covering.

Q: CAN YOU WALK ON SOLARGLASS?

A: Yes. Solarglass is engineered to safely withstand applicable live loads required by the building code for steep slope applications. However, to ensure safety and maintain maximum roof life, walking should be avoided except by first responders and trained Solarglass installation professionals. This is a common recommendation for other high-end roof types, including slate, clay, concrete, and composite tile products.

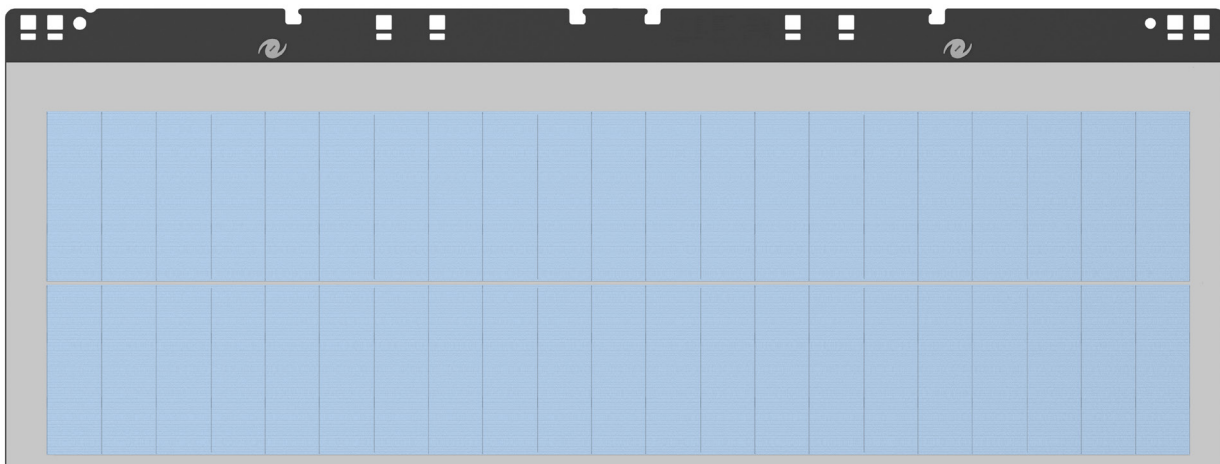
Q: HOW IS SOLARGLASS WIRED? IS IT DIFFERENT FROM TYPICAL PV INSTALLATIONS?

A: Solarglass wiring is similar in most respects to traditional PV systems. It uses the same industry standard, UL-certified wire and PV connectors to combine modules in series strings. UL certified wiring harnesses, called Diode Harnesses, aggregate series-connected PV Modules. The combined circuits exit the roof via a listed assembly, called the Pass Through Box, to listed rapid shutdown devices. The strings then connect to a conventional DC-AC inverter.

The wire routing and installation methods of the system have also been evaluated by UL.

Q: HOW MUCH VOLTAGE AND CURRENT ARE PRODUCED BY A SOLARGLASS PV MODULE?

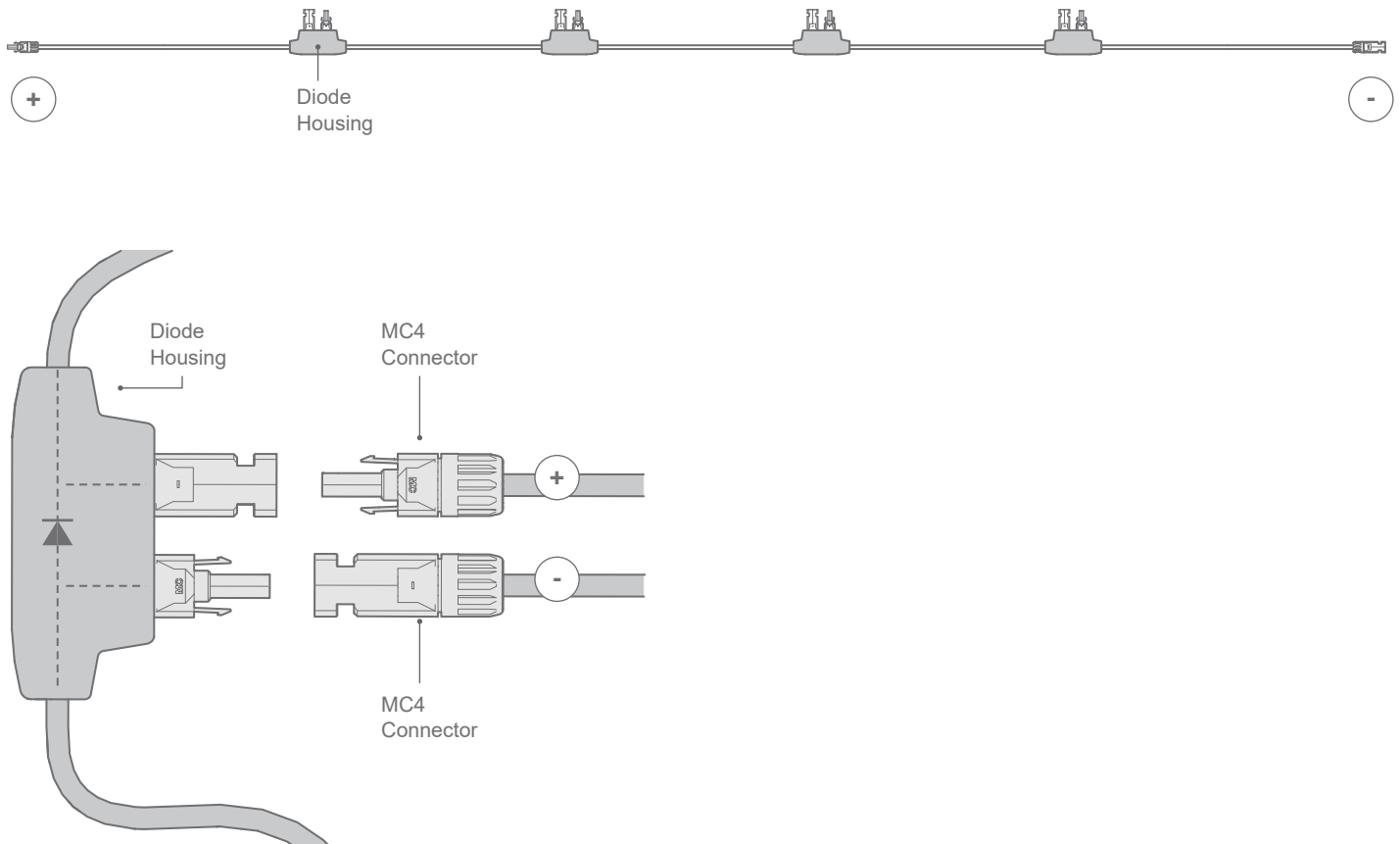
A: One PV Module produces about 10.99 Volts and 5.32 Amps with a nominal power output of approximately 58 Watts.



Q: WHAT IS THE FUNCTION OF THE DIODE HARNESS?

A: The Diode Harness is a UL listed, pre-manufactured cable assembly that connects PV Modules together in series and provides shading protection.

In traditional solar panels, bypass diodes are housed in junction boxes on the back of each module. In Solarglass, the bypass diodes are in the Diode Harness. Under partially shaded conditions, the diode diverts current away from the shaded PV Modules. The diode also diverts current if a connector opens in the series.



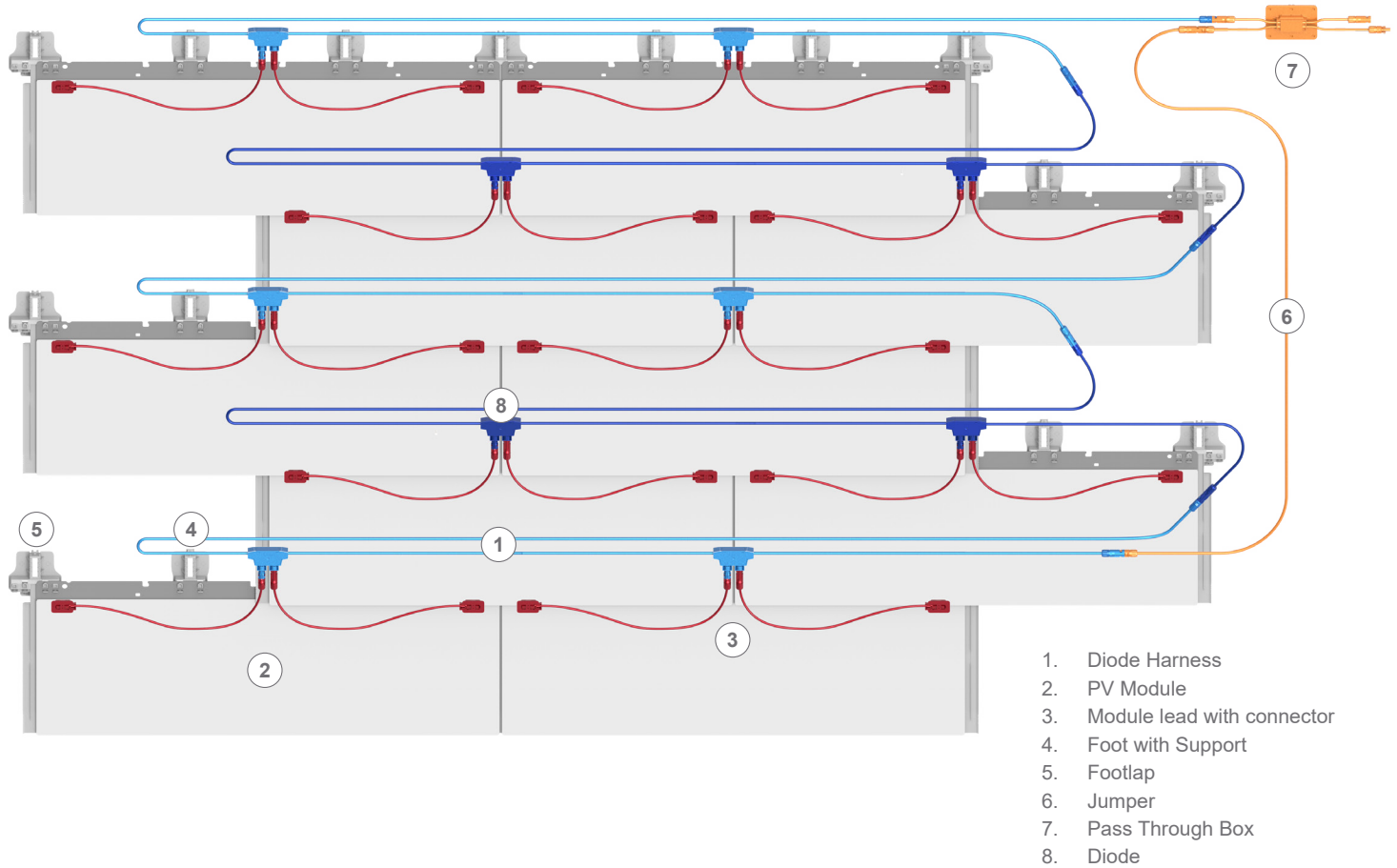
Q: WHAT IS THE MAXIMUM VOLTAGE AND CURRENT PRODUCED BY ANY SOLARGLASS CONDUCTOR?

A: Maximum voltage and current on any conductor beneath Solarglass is less than 600 V and 10 A.

Q: HOW ARE SOLARGLASS PV MODULES CONNECTED?

A: Solarglass PV modules are connected in series using the Solarglass Diode Harness. The diode harness provides module-level shading protection with an individual bypass diode for each PV module. Diode harnesses are prefabricated for sub-strings of 1-4 modules. Multiple Diode Harnesses (with attached modules) are joined in series to create a larger string.

PV STRING DIAGRAM



Q: WHAT IS THE MAXIMUM NUMBER OF PV MODULES THAT CAN BE CONNECTED IN SERIES WITH DIODE HARNESSSES?

A: The maximum number of PV Modules connected in a single string is 39.

TERM	DEFINITION
BYPASS DIODE	Housed in the Diode Harness, a bypass diode protects a shaded branch of PV Modules by diverting current.
DIODE HARNESS	A UL listed, pre-manufactured cable assembly that connects strings of 1 to 4 PV Modules together in series using MC4 connectors. The Harness houses 1 bypass diode per module.
PV MODULE	A UL listed roofing and DC power-producing assembly of six high-efficiency, mono-crystalline cells with a nominal power rating of 24 Watts.
ROOFING MODULE	A UL listed roofing assembly that is aesthetically similar to the PV Module, but produces no power.

Q: HOW IS THE SYSTEM GROUNDED?

A: Unlike traditional PV modules and racking systems, Solarglass PV and Roofing Modules do not incorporate any accessible metal components. By eliminating accessible metal on the roof that might become energized in the event of a fault, Solarglass does not require connection to an Equipment Ground Conductor (EGC) until the array wiring exits the roof.

Q: WHAT OTHER ELECTRICAL SAFETY FEATURES HAVE BEEN INCORPORATED INTO SOLARGLASS?

A: Wire management features built into Solarglass support all wiring to protect it from anything that might cut or abrade its insulation. Because the system is enclosed, the wiring is protected from vermin and contact by people.

Q: HOW DOES SOLARGLASS COMPLY WITH RAPID SHUTDOWN REQUIREMENTS?

A: Solarglass meets 2014 and 2017 NEC Rapid Shutdown requirements by incorporating automatic disconnecting devices in the circuits leaving the arrays. Rapid shutdown is initiated by disconnecting the home from the utility, or by opening the PV system's main AC disconnect. The rapid shutdown components are certified to UL standards, including UL 1741.

Q: DOES SOLARGLASS REQUIRE A SPECIAL INVERTER OR OTHER ELECTRONICS?

A: No. Solarglass uses conventional DC-AC inverters. PV Modules are wired into series strings to achieve a target DC voltage below 600 V. No specialized electronics are required.

Q: HOW DOES SOLARGLASS DEAL WITH ROOF OBSTRUCTIONS SUCH AS VENTS, SKYLIGHTS, DORMERS, VALLEYS, RIDGES, ETC.?

A: Solarglass uses conventional flashing details and practices employed by all roofers to seamlessly integrate with ordinary roof obstructions. Solarglass uses a dedicated metal ridge cap.

Q: IN AREAS SUBJECT TO "ICE DAMMING", WHAT UNDERLAYMENTS ARE USED?

A: To prevent ice damming, Solarglass uses an underlayment that complies with ASTM D1970 and is approved nationwide as a self-adhering ice and water barrier.

Q: WHO IS QUALIFIED TO INSTALL SOLARGLASS?

A: Solarglass can only be installed by Tesla-trained technicians. Solarglass will not be distributed to, or installed by, conventional roofing contractors.

Q: CAN SOLARGLASS BE ACCESSED FOR SERVICE?

A: Yes. The Modules may be removed for servicing. No special tools are required.

CERTIFICATES OF COMPLIANCE

CERTIFICATE OF COMPLIANCE

Certificate Number	20191115-E491360
Report Reference	E491360-201911108
Issue Date	2019-NOVEMBER-15

Issued to: TESLA INC
3500 DEER CREEK RD
PALO ALTO CA 94304

This certificate confirms that representative samples of BUILDING-INTEGRATED PHOTOVOLTAIC MODULES AND PANELS
USL – “Tesla Solarglass Roof” BIPV Roofing Modules, model numbers SR60T1, the associated “non-functional” Roofing Modules, Tesla model numbers SRNFT1/6, SRNFT1/3, SRNFT1/2, SRNFT2/3, SRNFT5/6 and SRNFT1, and their Roof Mounting System elements, which serve as part of the installed system.

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.



Standard(s) for Safety: ANSI/UL 61730-1, Photovoltaic (PV) Module Safety Qualification - Part 1: Requirements for Construction, nd ANSI/UL 61730-2, Photovoltaic (PV) Module Safety Qualification - Part 2: Requirements for Testing.

Additional Information: See the UL Online Certifications Directory at <https://iq.ulprospector.com> for additional information.

This Certificate of Compliance does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

Bruce Mahanobis, Director North American Certification Program
UL LLC
Any information and documentation involving UL Mark services are provided on behalf of UL LLC (LLC) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at <http://ul.com/customer-service>.

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CERTIFICATE OF COMPLIANCE

Certificate Number	20170512-E491361
Report Reference	E491361-20170509
Issue Date	2017-MAY-12

Issued to: Tesla Inc
3500 Deer Creek Rd
Palo Alto CA 94304



This is to certify that representative samples of DISTRIBUTED GENERATION WIRING SYSTEMS AND HARNESSES
Photovoltaic Wiring Harness: Tesla Solar Roof “Diode Trunk Harness” - Tesla Part No. 1122020-00-A.

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL Subject 9703, Distributed Generation Wiring Harnesses.
Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

Look for the UL Certification Mark on the product.

Bruce Mahanobis, Director North American Certification Program
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CERTIFICATE OF COMPLIANCE

Certificate Number	20180627-E318357
Report Reference	E318357-20180625
Issue Date	2018-JUNE-27

Issued to: TESLA INC
3500 Deer Creek Rd
Palo Alto CA 94304

This is to certify that representative samples of DISTRIBUTED GENERATION POWER SYSTEMS ACCESSORY EQUIPMENT
Photovoltaic Pass Through box, Model SRPTB-4



Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 1741, Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

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CERTIFICATE OF COMPLIANCE

Certificate Number	20180608-E491361
Report Reference	E491361-20170718
Issue Date	2018-JUNE-08

Issued to: Tesla Inc
3500 Deer Creek Rd
Palo Alto, CA 94304

This is to certify that representative samples of DISTRIBUTED GENERATION WIRING SYSTEMS AND HARNESSES
Photovoltaic Wiring Harness Products for installation of the Tesla Solar Roof System.



Solar Roof, Branch Jumpers, 1x, 2x, 3x, 4x, mini
Part Nos. 1121897-01-A, -02-A, -03-A, -04-A, -05-A
Part Nos. 1467674-01-A, -02-A, -03-A, -04-A, -05-A

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL Subject 9703, Distributed Generation Wiring Harnesses.
Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

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EVALUATION REPORTS

Report prepared for public access on 12/5/2019 5:49:38 PM

SpecDIRECT™ POWERED BY Intertek

LISTING INFORMATION

Tesla Solarglass Roof V3 is a BIPV roof covering.

This listing applies to the Solarglass Roof BIPV module/tile model No. SR60T-1 and the non-energy producing Solarglass Roof Tile models, SRNFT 1, SRNFT 1/6, SRNFT 1/3, SRNFT 1/2, SRNFT 2/3, and SRNFT 5/6

The Tesla Solarglass BIPV Tiles and non-energy producing Solarglass Roof Tiles are supported and attached by snap engagement to plastic mounting components that are mechanically fastened to prepared roofing. The mounting components are fastened to roof with two 1-1/2 in. ring shank roofing nails with 3/8" heads and 1/8" shanks.

Assemblies are intended for use in steep slope roof applications with roof slope of 2:12 to 12:12, installed over minimum 15/32-in. thick exterior grade plywood roof decks covered with two layers of Firestone Clad-Gard SA-FR underlayment.

WIND RESISTANCE

Test Standard	Rating	Assembly Details
ASTM D3161-12	CLASS F Rating	Deck: 15/32 in. plywood 1. Two layers of Firestone Class "A" CLAD GARD SA-FR underlayment 2. Tesla SolarGlass Roof (V3) System (with SR60T-1 or SRNFT models) Eave and rake flashing conditions and attachment per Tesla Installation instructions.

WIND DRIVEN RAIN

Test Standard	Rating	Assembly Details & Rating
TAS 100-95 Wind and Wind Driven Rain	PASS - No leakage	Deck: 15/32 in. plywood 1. Two layers of Firestone Class "A" CLAD GARD SA-FR underlayment 2. Tesla SolarGlass Roof (V3) System (with SR60T-1 or SRNFT models) Eave, Valley, and rake flashing conditions and attachment per Tesla installation instructions.

FIRE ROOF CLASSIFICATION: CLASS A - UL 790

Assembly No.	Tesla Solarglass Roof V3
Slope:	Qualifies for use with full range of roof slopes 2:12 to 12:12
Deck Type:	Combustible Deck 15/32 in. plywood
Details:	1. Two Layers of Firestone Class "A" CLAD GARD SA-FR underlayment 2. Tesla Solarglass Roof (V3) System (with SR60T-1 or SRNFT models) Attachment and installation per Tesla Installation instructions.

Tesla Inc. | 52115 | Rev: Nov 13 2019 5:18PM | Uncontrolled Copy

Page 2 of 3

Report prepared for public access on 12/5/2019 5:49:38 PM

SpecDIRECT™ POWERED BY Intertek

Note: the component materials of each system must be applied in the order in which they are listed above.

Attribute	Value
Criteria	ASTM D3161/D3161M (2012)
Criteria	UL 790 (2014)
Criteria	TAS 100 (1995)
CSI Code	07 32 00 Roof Tiles
Intertek Services	Certification
Listed or Inspected	LISTED
Listing Section	ROOF COVERING SYSTEMS
Roofing: Deck Type	Combustible
Roofing: Fire Rating	Class A
Spec ID	52115

Tesla Inc. | 52115 | Rev: Nov 13 2019 5:18PM | Uncontrolled Copy

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ROOFING SYSTEM SPECIFICATIONS

CERTIFICATIONS

UL Listed	ETL Listed
UL 61730	UL 790 Class A
UL 9703	TAS100
UL 1741	ASTM D3161 Class F

ELECTRICAL CHARACTERISTICS

Maximum open circuit voltage rating of connected branch circuits per diode (at STC): 13.34 V

Maximum series fuse rating: 10 A

Maximum system voltage: 600 V

ROOF PITCH RANGE

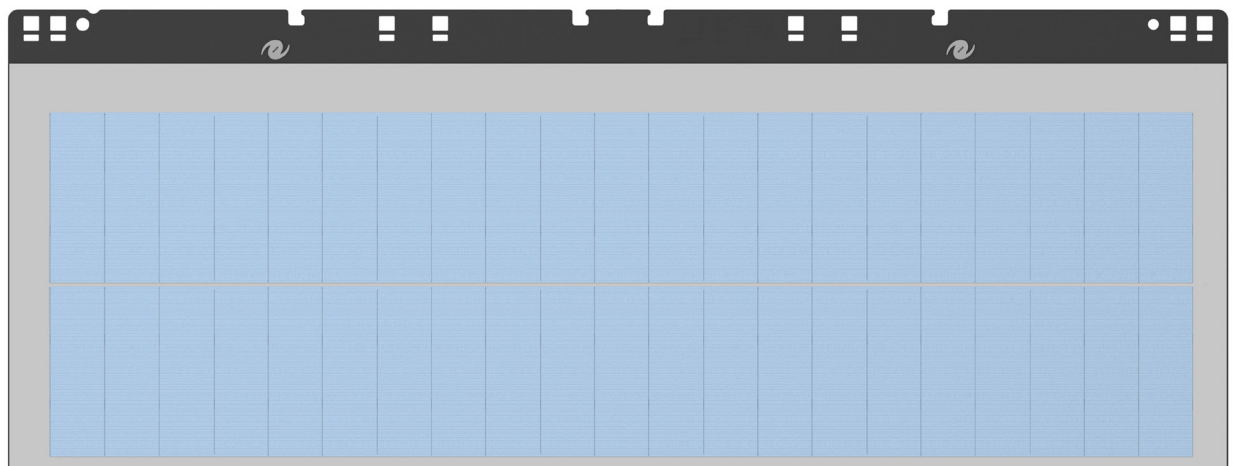
2:12 - 20:12

MODULE SPECIFICATIONS

MODEL #SR60T1 14-CELL MODULE

Irradiance (W/m ²)	Temp. (Celsius)	Voc (V)	Vmp (V)	Isc (A)	Imp (A)	Pmax (W)
1000	25	13.34	10.99	5.65	5.32	58.47

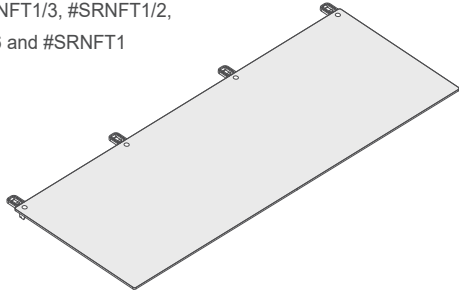
These electrical characteristics are within $\pm 5\%$ of the indicated values of Isc, Voc, and Pmax under standard test conditions (irradiance of 1000 W/m², AM 1.5 spectrum, and a cell temperature of 25 °C or 77 °F).



Dimensions	430 mm x 1140 mm Appx. 5 mm module thickness with 35.3 mm maximum height from deck
Principal Materials	Glass, Polymers, Fiberglass and Silicon
Installed System Weight	Textured Glass: 16.4 kg/m ² or 3.4 psf Installed weights include all components of system above roof sheathing

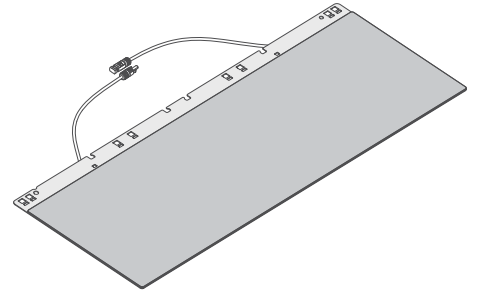
ROOFING MODULES, FULL AND PARTIAL

Model #SRNFT1/6, #SRNFT1/3, #SRNFT1/2,
#SRNFT2/3, #SRNFT5/6 and #SRNFT1
Listed to UL 61730
Listed to UL 790 Class A
ASTM D3161 Class F
TAS100



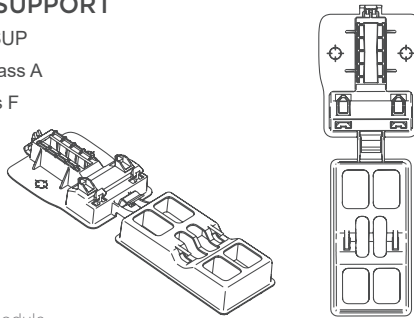
PV MODULE

Model #SR60T1
Listed to UL 61730
UL 790 Class A
ASTM D3161 Class F
TAS100



FOOT WITH SUPPORT

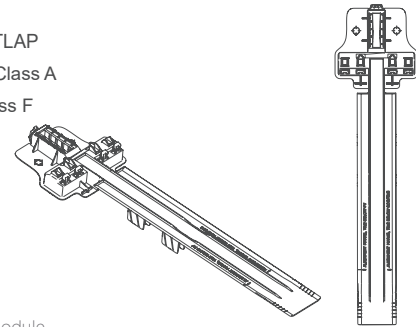
Model #SR-FOOTSUP
Listed to UL 790 Class A
ASTM D3161 Class F
TAS100



Center foot for PV module

FOOTLAP

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

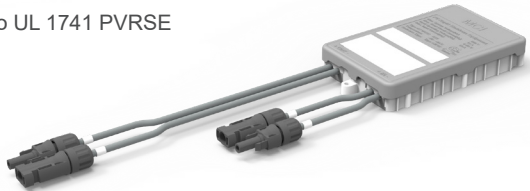


Edge foot for PV module

MCI RAPID SHUTDOWN

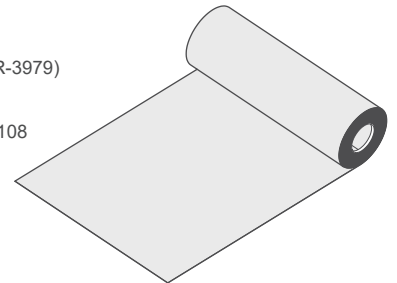
Model #EE-002605-003, Delta #GPI00010110
600V, 12A, NEMA 4X, MC4

Listed to UL 1741 PVRSE



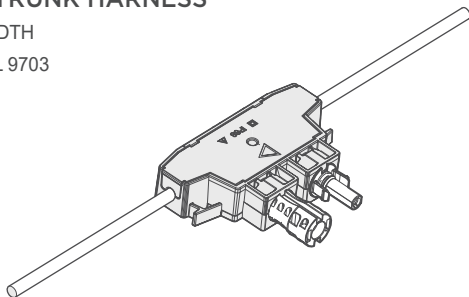
FIRESTONE UNDERLAYMENT

Clad-Gard SA FR
ASTM D226 Type I & II
Certified to ICC-ES AC188 (ESR-3979)
and ASTM D1970
Class A Fire Rated per ASTM E108



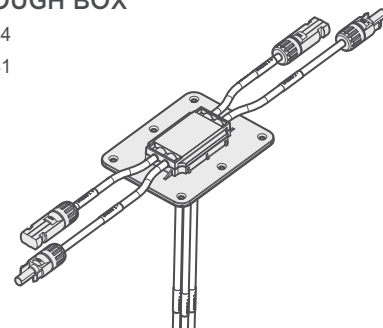
DIODE TRUNK HARNESS

Model #SRDTH
Listed to UL 9703



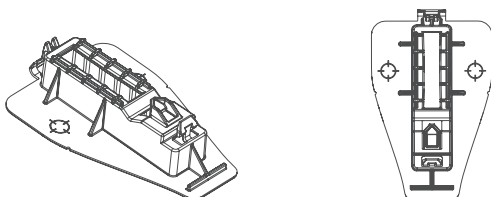
PASS THROUGH BOX

Model #SRPTB-4
Listed to UL 1741



ROOFING FOOT

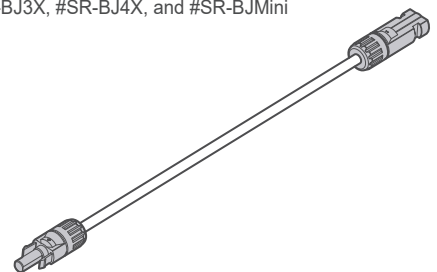
Model #SR-FOOT



Center foot for Roofing module

BRANCH JUMPER

Model #SR-BJ2X, #SR-BJ3X, #SR-BJ4X, and #SR-BJMini
Listed to UL 9703



ATTACHMENT E: HISTORIC PRESERVATION STANDARDS

21A.34.020: H HISTORIC PRESERVATION OVERLAY DISTRICT:

A. Purpose Statement: In order to contribute to the welfare, prosperity and education of the people of Salt Lake City, the purpose of the H - Historic Preservation Overlay District is to:

1. Provide the means to protect and preserve areas of the city and individual structures and sites having historic, architectural or cultural significance;
2. Encourage new development, redevelopment and the subdivision of lots in historic districts that is compatible with the character of existing development of historic districts or individual landmarks;
3. Abate the destruction and demolition of historic structures;
4. Implement adopted plans of the city related to historic preservation;
5. Foster civic pride in the history of Salt Lake City;
6. Protect and enhance the attraction of the city's historic landmarks and districts for tourists and visitors;
7. Foster economic development consistent with historic preservation; and
8. Encourage social, economic and environmental sustainability.

L. Standards for Certificate of Appropriateness for Alteration of a Landmark Site or Contributing Structure Including New Construction of an Accessory Structure: In considering an application for a certificate of appropriateness for alteration of a landmarksite or contributing structure, the Historic Landmark Commission shall find that the project substantially complies with the following general standards and that the decision is in the best interest of the City:

1. Standards for Approval of a Certificate of Appropriateness For Major Alteration to a Contributing Structure:

Design Standards for Alteration of a Contributing Structure	Finding	Rationale
A property shall be used for its historic purpose or be used for a purpose that requires minimal change to the defining characteristics of the building and its site and environment.	Complies	The property is currently used as a residence and will continue to be used as such.
The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.	Complies	While the solar shingles are proposed on the primary and secondary facades of the historic home and are easily visible from two public rights of way, they are also removable and will not alter the overall shape or pitch of the existing roof.
All sites, structures and objects shall be recognized as products of their own time. Alterations that have no historical basis and which seek to create a false sense of history or architecture are not allowed.	Complies	The proposed shingles do not seek to mimic any historic periods.
Alterations or additions that have acquired historic significance in their own right shall be retained and preserved.	Complies	There are no alterations or additions existing currently which are historic in their own right. The primary dwelling itself is the historic structure on the subject property and

Distinctive features, finishes and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.	Complies	The pitched roof is one of the distinctive features of the historic home. The Applicant is not proposing altering the pitch of the roof and the proposed solar shingles will be mounted flush to the existing roofing materials.
Deteriorated architectural features shall be repaired rather than replaced wherever feasible. In the event replacement is necessary, the new material should match the material being replaced in composition, design, texture, and other visual qualities. Repair or replacement of missing architectural features should be based on accurate duplications of features, substantiated by historic, physical or pictorial evidence rather than on conjectural designs or the availability of different architectural elements from other structures or objects.	Complies	The Applicant has not proposed the replacement of any materials on the historic structure; the proposed shingles will be mounted flush to the existing roof and could be removed later.
Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.	Complies	No chemical or physical treatments of historic materials are proposed with this request. The existing roofing materials are not original to the home and are a common asphalt shingle that is found regularly in the Avenues Local Historic District.
Contemporary design for alterations and additions to existing properties shall not be discouraged when such alterations and additions do not destroy significant cultural, historical, architectural or archaeological material, and such design is compatible with the size, scale, color, material and character of the property, neighborhood or environment.	Complies	The proposal does not destroy any significant cultural, historical, architectural or archaeological materials. While the proposed shingles are not compatible with other surrounding building materials they would not destroy the underlying roofing materials.
Certain building materials are prohibited including the following: a) Aluminum, asbestos, or vinyl cladding when applied directly to an original or historic material.	Complies	The Applicant has not proposed any prohibited materials with their request.
Any new sign and any change in the appearance of any existing sign located on a landmark site or within the H Historic Preservation Overlay District, which is visible from any public way or open space shall be consistent with the historic character of the landmark site or H Historic Preservation Overlay District and shall comply with the standards outlined in chapter 21A.46 of this title.	Not Applicable, Complies.	There is no signage on the subject property and the Applicant is not proposing any new signage as part of these petitions. The Applicant is not proposing any signage as part of her request for modified addition size approval.