# PHOTOVOLTAIC ROOF MOUNT SYSTEM

## 15 MODULES-ROOF MOUNTED - 6.075 kW DC, 5.700 kW AC

## 35 TRACE TURNER LN, COATS, NC 27521

## PROJECT DATA

PROJECT ADDRESS: 35 TRACE TURNER LN, COATS, NC 27521

OWNER: JAMES CASSIDY

DESIGNER: ESR

SCOPE: 6.075 kW DC ROOF MOUNT
SOLAR PV SYSTEM WITH
15 JA SOLAR: JAM54S31-405/MR 405W
PV MODULES WITH
15 SOLAREDGE: S440 POWER OPTIMIZERS AND
01 SOLAREDGE: SE5700H-US (240V/5700W)
INVERTER

AUTHORITIES HAVING JURISDICTION:
BUILDING: HARNETT COUNTY
ZONING: HARNETT COUNTY
UTILITY: DUKE ENERGY PROGRESS

## SHEET INDEX



## SIGNATURE

## GENERAL NOTES

1. ALL COMPONENTS ARE UL LISTED AND CEC CERTIFIED, WHERE WARRANTED.
2. THE SOLAR PV SYSTEM WILL BE INSTALLED IN ACCORDANCE WITH ARTICLE 690 OF THE NEC 2017.
3. THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION.
4. ALL CONDUCTORS OF A CIRCUIT, INCLUDING THE EGC, MUST BE INSTALLED IN THE SAME RACEWAY, OR CABLE, OR OTHERWISE RUN WITH THE PV ARRAY CIRCUIT CONDUCTORS WHEN THEY LEAVE THE VICINITY OF THE PV ARRAY.
5. WHERE METALLIC CONDUIT CONTAINING DC CONDUCTORS IS USED INSIDE THE BUILDING, IT SHALL BE IDENTIFIED AS "CAUTION: SOLAR CIRCUIT" EVERY 10FT.
6. HEIGHT OF THE AC DISCONNECT SHALL NOT EXCEED 6'-7" PER NEC CODE 240.24.
7. A GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH CEC 690.47 AND 250.50 THROUGH 60 AND 250-166 SHALL BE PROVIDED. PER NEC GROUNDING ELECTRODE SYSTEM OF EXISTING BUILDING MAY BE USED AND BONDED TO THE SERVICE ENTRANCE. IF EXISTING SYSTEM IS INACCESSIBLE OR INADEQUATE A SUPPLEMENTAL GROUNDING ELECTRODE WILL BE USED AT THE INVERTER LOCATION CONSISTING OF A UL LISTED 8 FT. GROUND ROD WITH ACORN CLAMP. GROUNDING ELECTRODE CONDUCTORS SHALL BE NO LESS THAN #8 AWG AND NO LARGER THAN #6 AWG COPPER AND BONDED TO THE EXISTING GROUNDING ELECTRODE TO PROVIDE FOR A COMPLETE SYSTEM.
8. PHOTOVOLTAIC MODULES ARE TO BE CONSIDERED NON-COMBUSTIBLE.
9. PHOTOVOLTAIC INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING. MECHANICAL, OR BUILDING ROOF VENTS.
10. ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE. WIRING MUST BE PERMANENTLY AND COMPLETELY HELD OFF THE ROOF SURFACE.
11. ALL SINAGE TO BE PLACED IN ACCORDANCE WITH THE LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SINAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.
12. INVERTER(S) USED IN UNGROUNDED SYSTEM SHALL BE UL 1741 LISTED.
13. THE INSTALLATION OF EQUIPMENT AND ALL ASSOCIATED WIRING AND INTERCONNECTION SHALL BE PERFORMED ONLY BY QUALIFIED PERSONS [NEC 690.4(C)]
14. ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED (OR BETTER), INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES.
15. ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC ARTICLE 250.
16. SYSTEM GROUNDING SHALL BE IN ACCORDANCE WITH NEC 690.41.
17. PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION IN ACCORDANCE WITH NEC 690.12
18. DISCONNECTING MEANS SHALL BE LOCATED IN A VISIBLE, READILY ACCESSIBLE LOCATION WITHIN THE PV SYSTEM EQUIPMENT OR A MAXIMUM OF 10 FEET AWAY FROM THE SYSTEM [NEC 690.13(A)]
19. ALL WIRING METHODS SHALL BE IN ACCORDANCE WITH NEC 690.31
20. WORK CLEARANCES AROUND ELECTRICAL EQUIPMENT WILL BE MAINTAINED PER NEC 110.26(A)(1), 110.26(A)(2) AND 110.26(A)(3).
21. ROOFTOP MOUNTED PHOTOVOLTAIC PANELS AND MODULES SHALL BE TESTED, LISTED & IDENTIFIED IN ACCORDANCE WITH UL1703
22. ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT EXPANSION JOINTS AND ANCHOR CONDUIT RUNS AS REQUIRED PER NEC.

## VICINITY MAP


## HOUSE PHOTO

## CODE REFERENCES

2018 NORTH CAROLINA BUILDING CODE
2018 NORTH CAROLINA RESIDENTIAL CODE
2018 NORTH CAROLINA FIRE CODE
2017 NATIONAL ELECTRICAL CODE


**TOP TIER SOLAR SOLUTIONS**

1530 CENTER PARK DR #2911,
CHARLOTTE, NC 28217,
UNITED STATES


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NORTH CAROLINA PROFESSIONAL SEAL 056724 ENGINEER TREVOR JONES

STRUCTURAL ONLY
6-20-2025

PROJECT NAME & ADDRESS

JAMES CASSIDY RESIDENCE

35 TRACE TURNER LN, COATS, NC 27521

DRAWN BY
ESR

SHEET NAME
COVER SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-1

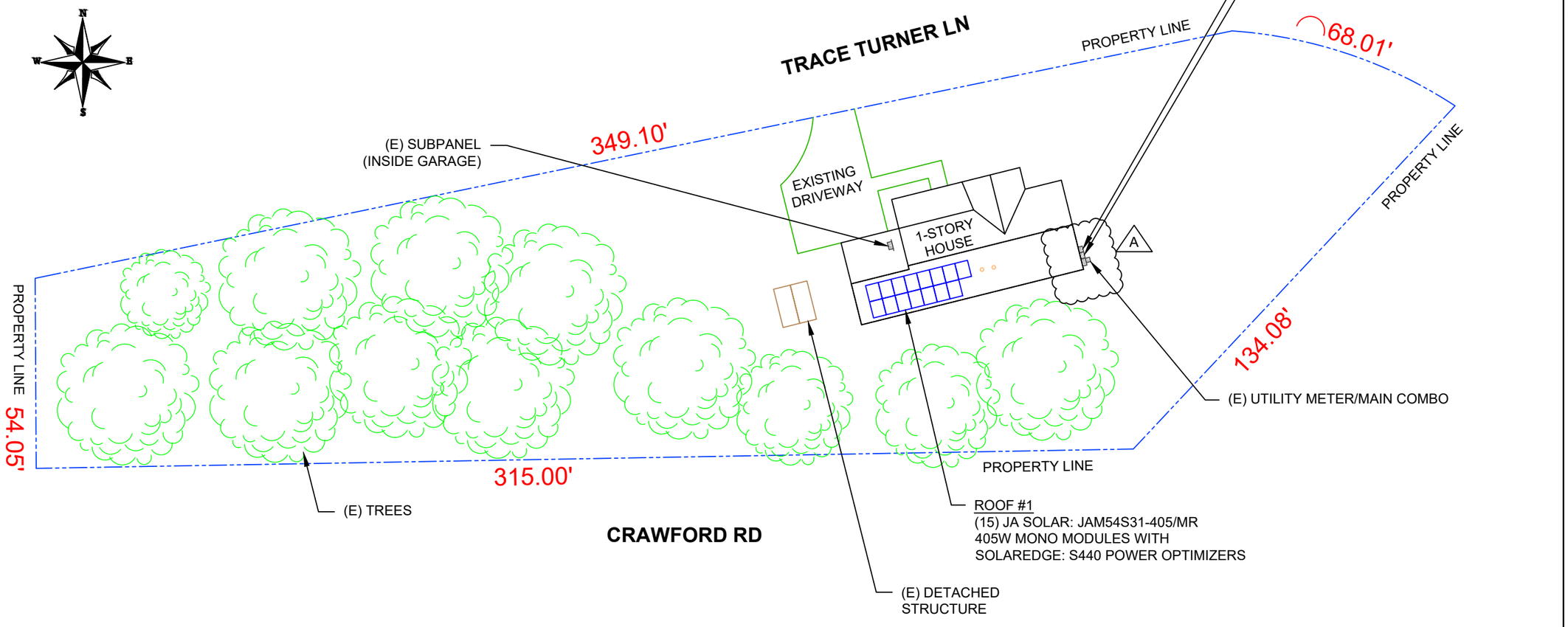
# PROJECT DESCRIPTION:

15 X JA SOLAR: JAM54S31-405/MR 405W MONO MODULES
ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES
DC SYSTEM SIZE: 6.075 kW DC
AC SYSTEM SIZE: 5.700 kW AC

EQUIPMENT SUMMARY
15 JA SOLAR: JAM54S31-405/MR 405W MONO MODULES
15 SOLAREDGE: S440 POWER OPTIMIZERS
01 SOLAREDGE: SE5700H-US (240V/5700W) INVERTER

ROOF ARRAY AREA #1:- 315.15 SQ FT.

NOTE: VISIBLE, LOCKABLE, LABELED AC DISCONNECT
LOCATED WITHIN 10' OF UTILITY METER




1 SITE PLAN
PV-2 SCALE: 1/32" = 1'-0"

DESIGN SPECIFICATION
OCCUPANCY: II
CONSTRUCTION: SINGLE-FAMILY
ZONING: RESIDENTIAL
GROUND SNOW LOAD: REFER STRUCTURAL LETTER
WIND EXPOSURE: REFER STRUCTURAL LETTER
WIND SPEED: REFER STRUCTURAL LETTER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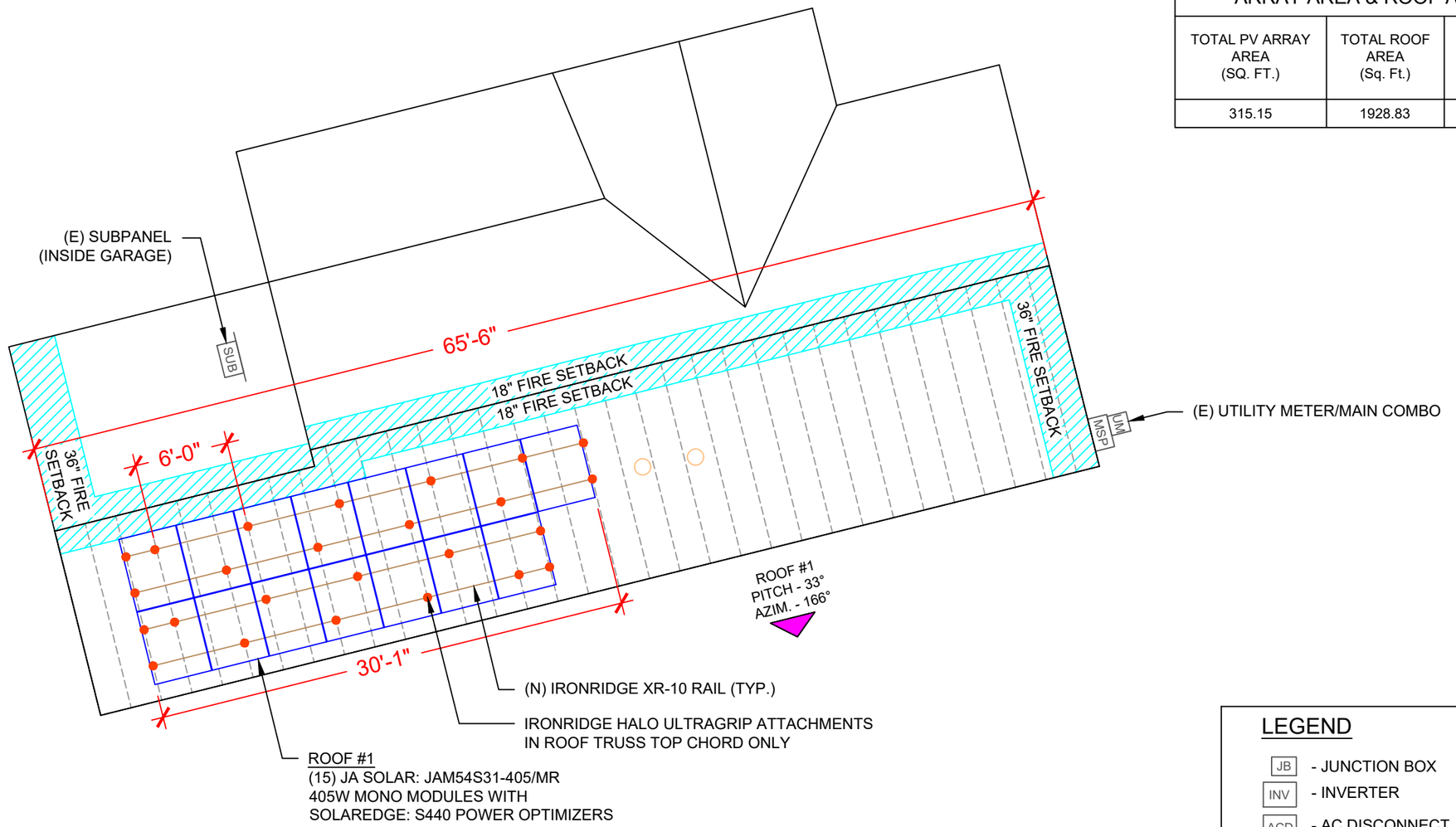
SHEET NAME
SITE PLAN

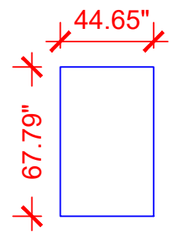
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-2

## MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 15 MODULES
MODULE TYPE = JA SOLAR: JAM54S31-405/MR 405W MONO MODULES
MODULE WEIGHT = 47.39 LBS / 21.5 kg.
MODULE DIMENSIONS = 67.79" x 44.65" = 21.01 SF


JA SOLAR:
JAM54S31-405/MR
405W MODULES

### ROOF DESCRIPTION

| | | | | | |
|---|---|---|---|---|---|
| ROOF TYPE | | | | ASPHALT SHINGLE | |
| ROOF LAYER | | | | 1 LAYER | |
| ROOF | # OF MODULES | ROOF PITCH | AZIMUTH | TRUSS SIZE | TRUSS SPACING |
| #1 | 15 | 33° | 166° | 2"X4" | 24" |

### ARRAY AREA & ROOF AREA CALC'S

| TOTAL PV ARRAY AREA (SQ. FT.) | TOTAL ROOF AREA (Sq. Ft.) | ROOF AREA COVERED BY ARRAY (%) |
|---|---|---|
| 315.15 | 1928.83 | 16 |

### LEGEND

- JB - JUNCTION BOX
- INV - INVERTER
- ACD - AC DISCONNECT
- UM - UTILITY METER
- MSP - MAIN SERVICE PANEL
- SUB - SUB PANEL
- VENT, ATTIC FAN (ROOF OBSTRUCTION)
- ROOF ATTACHMENT
- TRUSS
- CONDUIT

1 ROOF PLAN & MODULES
PV-3 SCALE: 1/8" = 1'-0"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ESR

SHEET NAME
ROOF PLAN & MODULES

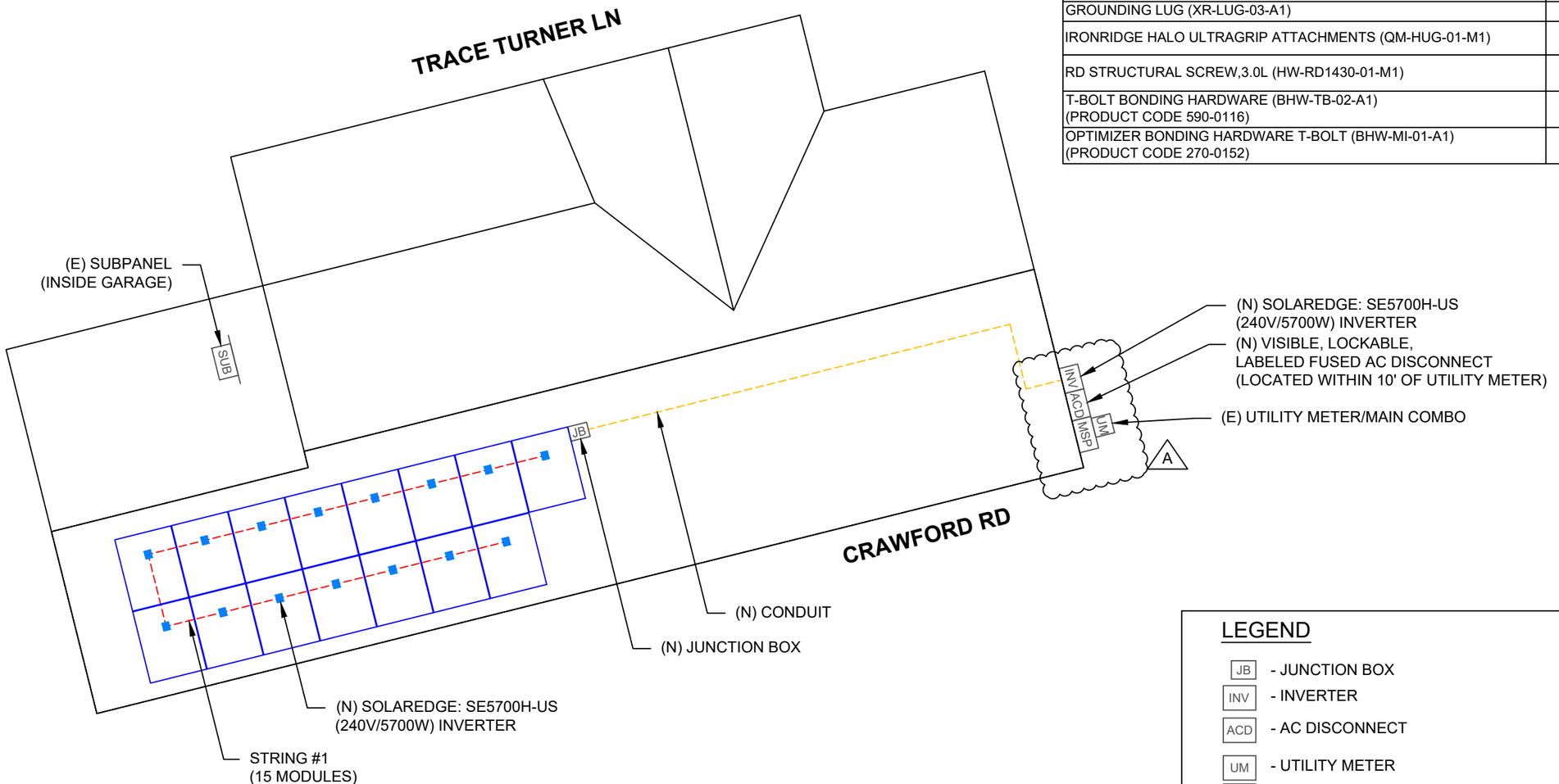
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-3

DC SYSTEM SIZE: 6.075 kW DC
AC SYSTEM SIZE: 5.700 kW AC
(15) JA SOLAR: JAM54S31-405/MR 405W MONO MODULES
WITH (15) SOLAREDGE: S440 POWER OPTIMIZERS
LOCATED UNDER EACH PANEL AND
01 SOLAREDGE: SE5700H-US (240V/5700W) INVERTER

**STRING LEGENDS**

---------- STRING #1


## BILL OF MATERIALS

| EQUIPMENT DESCRIPTION | QTY |
|---|---|
| SOLAR PV MODULES: JA SOLAR: JAM54S31-405/MR 405W MODULE | 15 |
| OPTIMIZERS: SOLAREDGE: S440 POWER OPTIMIZERS | 15 |
| INVERTER: SOLAREDGE: SE5700H-US (240V/5700W) INVERTER | 01 |
| JUNCTION BOX: JUNCTION BOX UL 1741, NEMA 3R CSA C22.2 NO.290 | 1 |
| AC DISCONNECT: FUSED AC DISCONNECT, 60A FUSED, (2) 30A FUSES 240V NEMA 3R, UL LISTED | 1 |
| IRONRIDGE XR10 RAIL (RAIL 168" (14 FEET) CLEAR) (XR-10-168A) | 10 |
| BONDED SPLICE, XR10 (XR10-BOSS-01-M1) | 6 |
| UNIVERSAL MODULE CLAMP, CLEAR (UFO-CL-01-A1) | 26 |
| END FASTENING OBJECT (END CLAMP, 30-40MM), MILL (UFO-END-01-A1) | 8 |
| GROUNDING LUG (XR-LUG-03-A1) | 2 |
| IRONRIDGE HALO ULTRAGRIP ATTACHMENTS (QM-HUG-01-M1) | 24 |
| RD STRUCTURAL SCREW,3.0L (HW-RD1430-01-M1) | 48 |
| T-BOLT BONDING HARDWARE (BHW-TB-02-A1) (PRODUCT CODE 590-0116) | 24 |
| OPTIMIZER BONDING HARDWARE T-BOLT (BHW-MI-01-A1) (PRODUCT CODE 270-0152) | 15 |

## LEGEND

- JB - JUNCTION BOX
- INV - INVERTER
- ACD - AC DISCONNECT
- UM - UTILITY METER
- MSP - MAIN SERVICE PANEL
- SUB - SUB PANEL
- - VENT, ATTIC FAN (ROOF OBSTRUCTION)
- - ROOF ATTACHMENT
- - TRUSS
- ---- - CONDUIT

1 ELECTRICAL PLAN
PV-4 SCALE: 1/8" = 1'-0"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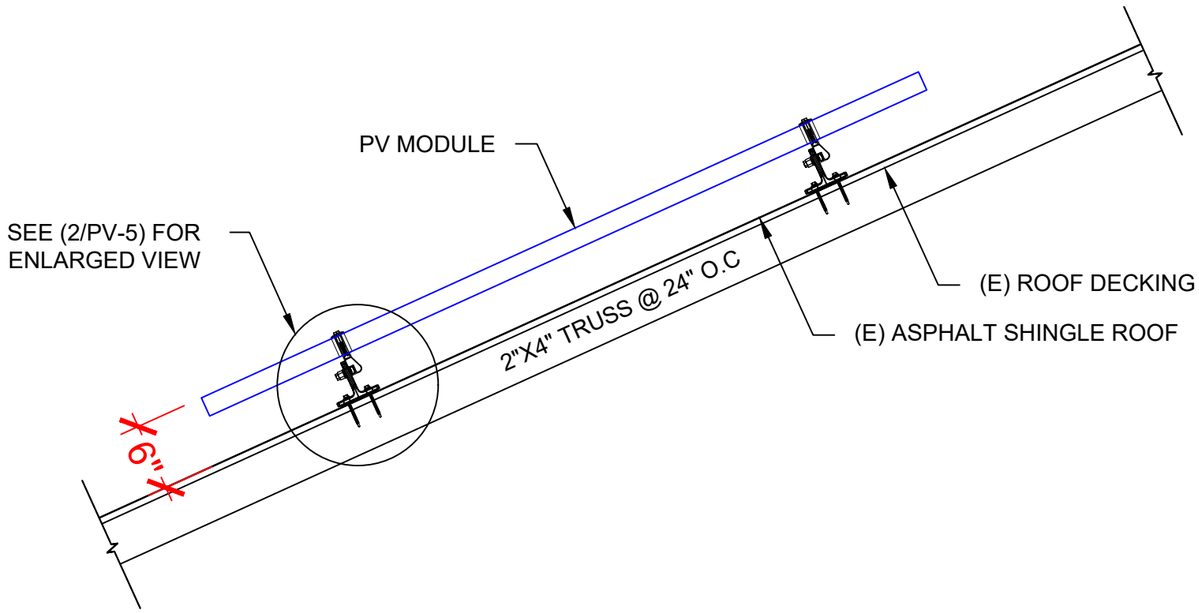
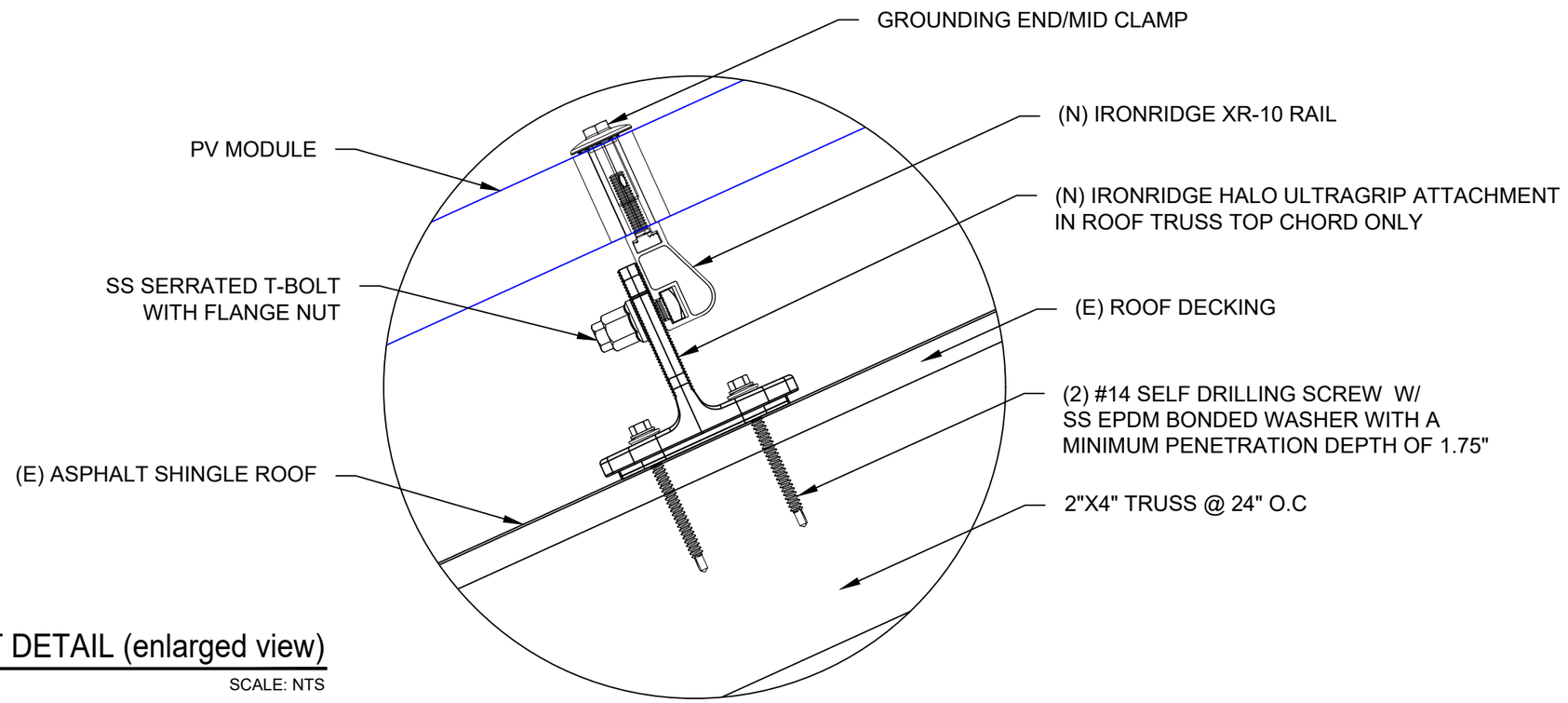
SHEET NAME
ELECTRICAL PLAN

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-4




1 | STRUCTURAL ATTACHMENT (Side view)
PV-5 | SCALE: N.T.S




2 | ATTACHMENT DETAIL (enlarged view)
PV-5 | SCALE: NTS

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ESR

SHEET NAME
STRUCTURAL DETAIL

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-5

DC SYSTEM SIZE: 6.075 kW DC
AC SYSTEM SIZE: 5.700 kW AC

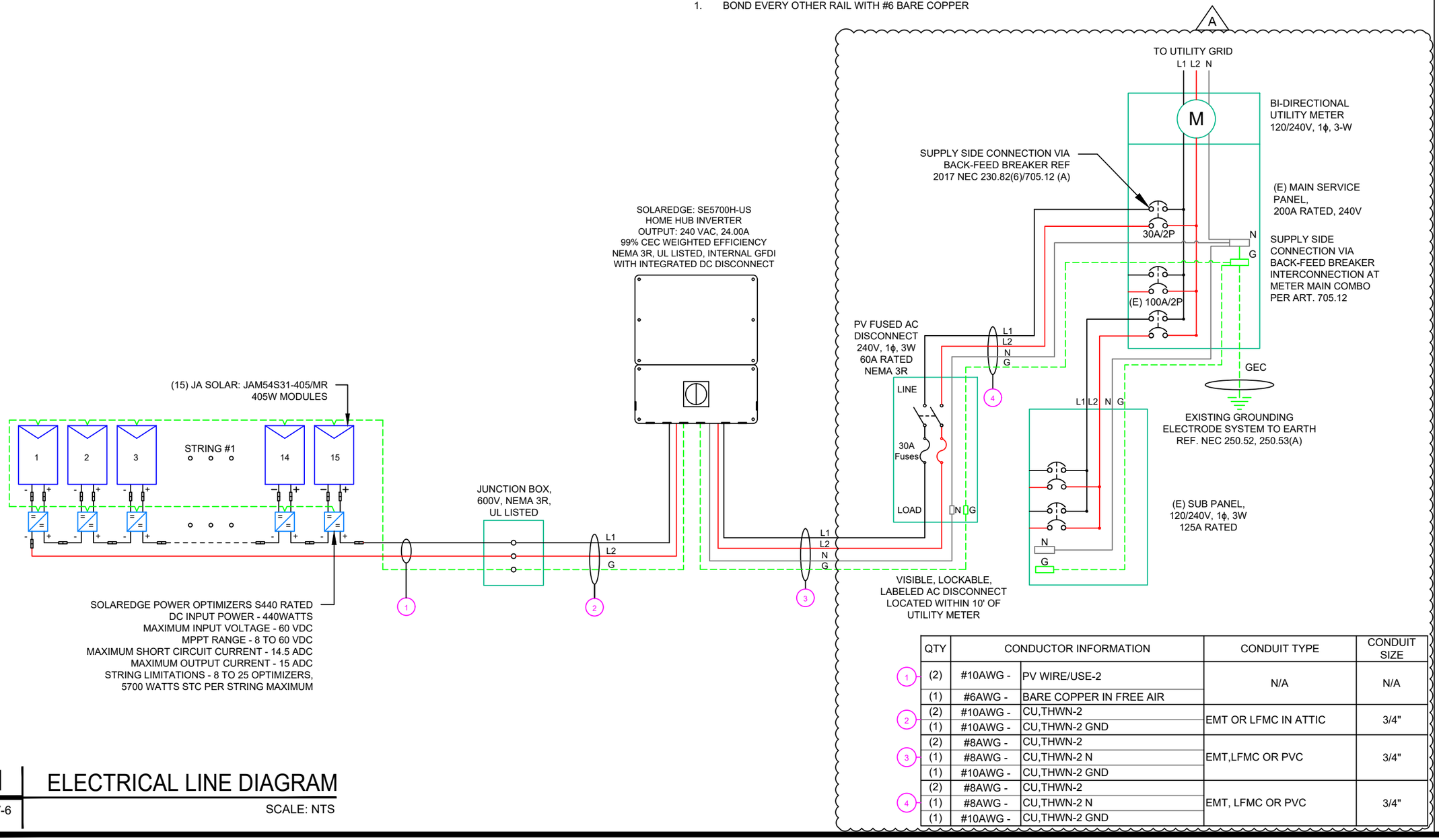
(15) JA SOLAR: JAM54S31-405/MR 405W MONO MODULES
WITH (15) SOLAREDGE: S440 POWER OPTIMIZERS
LOCATED UNDER EACH PANEL (240V) AND
(01) SOLAREDGE: SE5700H-US (240V/5700W) INVERTER
(01) STRING OF 15 MODULES ARE CONNECTED IN SERIES

**INTERCONNECTION NOTES:**
1. INTERCONNECTION SIZING, LIMITATIONS AND COMPLIANCE DETERMINED IN ACCORDANCE WITH [NEC 705.12], AND [NEC 690.59].
2. GROUND FAULT PROTECTION IN ACCORDANCE WITH [NEC 215.9], [NEC 230.95].
3. ALL EQUIPMENT TO BE RATED FOR BACKFEEDING.
4. PV BREAKER TO BE POSITIONED AT THE OPPOSITE END OF THE BUSBAR RELATIVE TO THE MAIN BREAKER.

**DISCONNECT NOTES**:
1. DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING LIVE ARE CONNECTED TO THE TERMINALS MARKED “LINE SIDE” (TYPICALLY THE UPPER TERMINALS)
2. AC DISCONNECT MUST BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
3. DISCONNECT MEANS AND THEIR LOCATION SHALL BE IN ACCORDANCE WITH [NEC 225.31] AND [NEC 225.32].

**GROUNDING & GENERAL NOTES:**
1. PV GROUNDING ELECTRODE SYSTEM NEEDS TO BE INSTALLED IN ACCORDANCE WITH [NEC 690.43]
2. PV INVERTER IS UNGROUNDED, TRANSFORMER-LESS TYPE.
3. DC GEC AND AC EGC TO REMAIN UNSPLICED, OR SPLICED TO EXISTING ELECTRODE
4. ANY EXISTING WIRING INVOLVED WITH PV SYSTEM CONNECTION THAT IS FOUND TO BE INADEQUATE PER CODE SHALL BE CORRECTED PRIOR TO FINAL INSPECTION.
5. JUNCTION BOX QUANTITIES, AND PLACEMENT SUBJECT TO CHANGE IN THE FIELD - JUNCTION BOX DEPICTED ON ELECTRICAL DIAGRAM REPRESENT WIRE TYPE TRANSITIONS.
6. AC DISCONNECT NOTED IN EQUIPMENT SCHEDULE OPTIONAL IF OTHER AC DISCONNECTING MEANS IS LOCATED WITHIN 10' OF SERVICE DISCONNECT.
7. RACEWAYS AND CABLES EXPOSED TO SUNLIGHT ON ROOFTOPS SHOULD BE INSTALLED MORE THAN 7/8" ABOVE THE ROOF USING CONDUIT SUPPORTS.

**RACKING NOTE:**
1. BOND EVERY OTHER RAIL WITH #6 BARE COPPER




| | QTY | CONDUCTOR INFORMATION | | CONDUIT TYPE | CONDUIT SIZE |
|---|---|---|---|---|---|
| 1 | (2) | #10AWG - | PV WIRE/USE-2 | N/A | N/A |
| | (1) | #6AWG - | BARE COPPER IN FREE AIR | | |
| 2 | (2) | #10AWG - | CU,THWN-2 | EMT OR LFMC IN ATTIC | 3/4" |
| | (1) | #10AWG - | CU,THWN-2 GND | | |
| 3 | (2) | #8AWG - | CU,THWN-2 | EMT,LFMC OR PVC | 3/4" |
| | (1) | #8AWG - | CU,THWN-2 N | | |
| | (1) | #10AWG - | CU,THWN-2 GND | | |
| 4 | (2) | #8AWG - | CU,THWN-2 | EMT, LFMC OR PVC | 3/4" |
| | (1) | #8AWG - | CU,THWN-2 N | | |
| | (1) | #10AWG - | CU,THWN-2 GND | | |

1 ELECTRICAL LINE DIAGRAM
PV-6 SCALE: NTS


TOP TIER SOLAR SOLUTIONS

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PROJECT NAME & ADDRESS

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35 TRACE TURNER LN,
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DRAWN BY
ESR

SHEET NAME
ELECTRICAL LINE DIAGRAM

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-6

| SOLAR MODULE SPECIFICATIONS | |
|---|---|
| MANUFACTURER / MODEL # | JA SOLAR: JAM54S31-405/MR 405W MODULE |
| VMP | 31.21V |
| IMP | 12.98A |
| VOC | 37.23V |
| ISC | 13.87A |
| TEMP. COEFF. VOC | -0.275%/°C |
| MODULE DIMENSION | 67.79"L x 44.65"W x 1.18"D (In Inch) |

| INVERTER SPECIFICATIONS | |
|---|---|
| MANUFACTURER / MODEL # | SOLAREDGE: SE5700H-US (240V/5700W) INVERTER |
| NOMINAL AC POWER | 5.700 kW |
| NOMINAL OUTPUT VOLTAGE | 240 VAC |
| NOMINAL OUTPUT CURRENT | 24.00A |

| PERCENT OF VALUES | NUMBER OF CURRENT CARRYING CONDUCTORS IN EMT |
|---|---|
| .80 | 4-6 |
| .70 | 7-9 |
| .50 | 10-20 |

| AMBIENT TEMPERATURE SPECS | |
|---|---|
| AMBIENT TEMP (HIGH TEMP 2%) | 38° |
| RECORD LOW TEMPERATURE | -8° |
| MODULE TEMPERATURE COEFFICIENT OF Voc | -0.275%/°C |

**DC FEEDER CALCULATIONS**

| CIRCUIT ORIGIN | CIRCUIT DESTINATION | VOLTAGE (V) | FULL LOAD AMPS "FLA" (A) | FLA*1.25 (A) | OCPD SIZE (A) | GROUND SIZE | CONDUCTOR SIZE | 75°C AMPACITY (A) | AMPACITY CHECK #1 | AMBIENT TEMP. (°C) | TOTAL CC CONDUCTORS IN RACEWAY | 90°C AMPACITY (A) | DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(2)(a) | DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a) | 90°C AMPACITY DERATED (A) | AMPACITY CHECK #2 | FEEDER LENGTH (FEET) | CONDUCTOR RESISTANCE (OHM/KFT) | VOLTAGE DROP AT FLA (%) | CONDUIT SIZE | CONDUIT FILL (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STRING 1 | JUNCTION BOX | 380 | 15.00 | 18.75 | 20 | BARE COPPER #6 AWG | CU #10 AWG | 35 | PASS | 38 | 2 | 40 | 0.91 | 1 | 36.4 | PASS | 5 | 1.24 | 0.049 | N/A | #N/A |
| JUNCTION BOX | INVERTER | 380 | 15.00 | 18.75 | 20 | CU #10 AWG | CU #10 AWG | 35 | PASS | 38 | 2 | 40 | 0.91 | 1 | 36.4 | PASS | 20 | 1.24 | 0.196 | 3/4" EMT | 11.87617 |

| String 1 Voltage Drop | 0.245 |
|---|---|

A

**AC FEEDER CALCULATIONS**

| CIRCUIT ORIGIN | CIRCUIT DESTINATION | VOLTAGE (V) | FULL LOAD AMPS "FLA" (A) | FLA*1.25 (A) | OCPD SIZE (A) | NEUTRAL SIZE | GROUND SIZE | CONDUCTOR SIZE | 75°C AMPACITY (A) | AMPACITY CHECK #1 | AMBIENT TEMP. (°C) | TOTAL CC CONDUCTORS IN RACEWAY | 90°C AMPACITY (A) | DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(2)(a) | DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a) | 90°C AMPACITY DERATED (A) | AMPACITY CHECK #2 | FEEDER LENGTH (FEET) | CONDUCTOR RESISTANCE (OHM/KFT) | VOLTAGE DROP AT FLA (%) | CONDUIT SIZE | CONDUIT FILL (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| INVERTER | AC DISCONNECT | 240 | 24 | 30 | 30 | CU #10 AWG | CU #10 AWG | CU #10 AWG | 35 | PASS | 38 | 2 | 40 | 0.91 | 1 | 36.4 | PASS | 5 | 1.24 | 0.124 | 3/4" EMT | 15.8349 |
| AC DISCONNECT | POI | 240 | 24 | 30 | 30 | CU #10 AWG | CU #10 AWG | CU #10 AWG | 35 | PASS | 38 | 2 | 40 | 0.91 | 1 | 36.4 | PASS | 5 | 1.24 | 0.124 | 3/4" EMT | 15.8349 |

| CUMULATIVE VOLTAGE DROP | 0.248 |
|---|---|

ELECTRICAL NOTES

1. ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
2. ALL CONDUCTORS SHALL BE RATED UPTO 600V FOR RESIDENTIAL AND 1000V FOR COMMERCIAL AND 90 DEGREE C WET ENVIRONMENT.
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 BOX, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
7. ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
8. MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
9. MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
10. TEMPERATURE RATINGS OF ALL CONDUCTORS, TERMINATIONS, BREAKERS, OR OTHER DEVICES ASSOCIATED WITH THE SOLAR PV SYSTEM SHALL BE RATED FOR AT LEAST 75 DEGREE C.


TOP TIER SOLAR SOLUTIONS

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JAMES CASSIDY RESIDENCE

35 TRACE TURNER LN,
COATS, NC 27521

DRAWN BY

ESR

SHEET NAME

WIRING CALCULATIONS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-7

**PHOTOVOLTAIC POWER SOURCE**

EVERY 10' ON CONDUIT & ENCLOSURES

LABEL- 1:
LABEL LOCATION:
DC/EMT CONDUIT RACEWAY
SOLADECK / JUNCTION BOX
CODE REF: NEC 690.31 (D)(2)

**⚠ WARNING**

**ELECTRIC SHOCK HAZARD**

**TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION**

LABEL- 2:
LABEL LOCATION:
AC DISCONNECT
CODE REF: NEC 690.13(B)

**⚠ WARNING**

**DUAL POWER SUPPLY**

**SOURCE: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM**

LABEL- 3:
LABEL LOCATION:
MAIN SERVICE PANEL
CODE REF: NEC 705.12(C) & NEC 690.59

**SOLAR PV BREAKER:**

BREAKER IS BACKFED
DO NOT RELOCATE

LABEL-4:
LABEL LOCATION:
MAIN SERVICE PANEL
CODE REF: NEC 705.12(C) & NEC 690.59

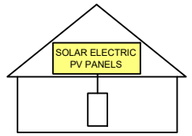
**⚠ WARNING**

POWER SOURCE OUTPUT CONNECTION. DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL- 5:
LABEL LOCATION:
MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)
SUBPANEL (ONLY IF SOLAR IS BACK-FED)
CODE REF: NEC 705.12(B)(3)(2)

**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- 6:
LABEL LOCATION:
AC DISCONNECT
CODE REF: [NEC 690.56(C)(1)(A)]

**RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM**

LABEL- 7:
LABEL LOCATION:
AC DISCONNECT
MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)
CODE REF: NEC 690.56(C)(2)

**DC DISCONNECT**

LABEL- 8:
LABEL LOCATION:
INVERTER
CODE REF: NEC 690.13(B)

**AC DISCONNECT**
PHOTOVOLTAIC SYSTEM POWER SOURCE

| | |
|---|---|
| NOMINAL OPERATING AC VOLATGE | 240 V |
| RATED AC OUTPUT CURRENT | 24.00 A |

LABEL- 9:
LABEL LOCATION:
AC DISCONNECT
CODE REF: NEC 690.54

| | |
|---|---|
| **MAXIMUM VOLTAGE** | 480 V |
| **MAXIMUM CIRCUIT CURRENT** | 30.50 A |
| **MAXIMUM RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER OR DC-TO-DC CONVERTER (IF INSTALLED)** | |

LABEL- 10:
LABEL LOCATION:
ON THE RIGHT SIDE OF THE INVERTER (PRE-EXISTING ON THE INVERTER)
CODE REF: NEC 690.53

TOP TIER SOLAR SOLUTIONS

**TOP TIER SOLAR SOLUTIONS**
1530 CENTER PARK DR #2911,
CHARLOTTE, NC 28217,
UNITED STATES

REVISIONS

| DESCRIPTION | DATE | REV |
|---|---|---|
| INITIAL DESIGN | 02/25/2025 | |
| REVISION | 06/20/2025 | A |
| | | |

PROJECT NAME & ADDRESS

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SHEET NAME
LABELS

SHEET SIZE
ANSI B
11" X 17"

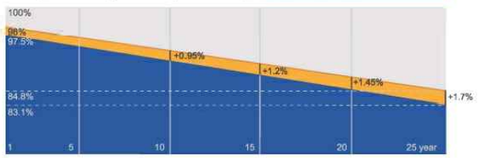
SHEET NUMBER
PV-8


- Higher output power
- Lower LCOE
- Less shading and lower resistive loss
- Better mechanical loading tolerance

## Superior Warranty

- 25-year product warranty
- 25-year linear power output warranty

0.55% Annual Degradation Over 25 years




## Comprehensive Certificates

- IEC 61215, IEC 61730,UL 61215, UL 61730
- ISO 9001: 2015 Quality management systems
- ISO 14001: 2015 Environmental management systems
- ISO 45001: 2018 Occupational health and safety management systems
- IEC TS 62941: 2016 Terrestrial photovoltaic (PV) modules – Guidelines for increased confidence in PV module design qualification and type approval

JA SOLAR

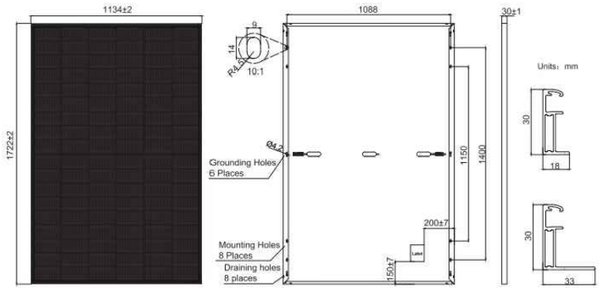
www.jasolar.com

Specifications subject to technical changes and tests.
JA Solar reserves the right of final interpretation.

JA SOLAR

# JAM54S31 380-405/MR Series

## MECHANICAL DIAGRAMS




Remark: customized frame color and cable length available upon request

## SPECIFICATIONS

| | |
|---|---|
| Cell | Mono |
| Weight | 21.5kg±3% |
| Dimensions | 1722±2mm×1134±2mm×30±1mm |
| Cable Cross Section Size | 4mm² (IEC), 12 AWG(UL) |
| No. of cells | 108(6x18) |
| Junction Box | IP68, 3 diodes |
| Connector | MC4-EVO2(1500V) |
| Cable Length (Including Connector) | Portrait: 300mm(+)/400mm(-); Landscape: 1200mm(+)/1200mm(-) |
| Packaging Configuration | 36pcs/Pallet, 864pcs/40ft Container |

## ELECTRICAL PARAMETERS AT STC

| TYPE | JAM54S31 -380/MR | JAM54S31 -385/MR | JAM54S31 -390/MR | JAM54S31 -395/MR | JAM54S31 -400/MR | JAM54S31 -405/MR |
|---|---|---|---|---|---|---|
| Rated Maximum Power(Pmax) [W] | 380 | 385 | 390 | 395 | 400 | 405 |
| Open Circuit Voltage(Voc) [V] | 36.58 | 36.71 | 36.85 | 36.98 | 37.07 | 37.23 |
| Maximum Power Voltage(Vmp) [V] | 30.28 | 30.46 | 30.64 | 30.84 | 31.01 | 31.21 |
| Short Circuit Current(Isc) [A] | 13.44 | 13.52 | 13.61 | 13.70 | 13.79 | 13.87 |
| Maximum Power Current(Imp) [A] | 12.55 | 12.64 | 12.73 | 12.81 | 12.90 | 12.98 |
| Module Efficiency [%] | 19.5 | 19.7 | 20.0 | 20.2 | 20.5 | 20.7 |
| Power Tolerance | ±2% | | | | | |
| Temperature Coefficient of Isc(α_Isc) | +0.045%/℃ | | | | | |
| Temperature Coefficient of Voc(β_Voc) | -0.275%/℃ | | | | | |
| Temperature Coefficient of Pmax(γ_Pmp) | -0.350%/℃ | | | | | |
| STC | Irradiance 1000W/m², cell temperature 25℃, AM1.5G | | | | | |

Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer.They only serve for comparison among different module types.

## ELECTRICAL PARAMETERS AT NOCT

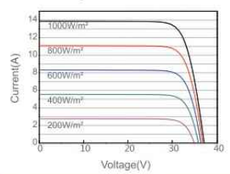
| TYPE | JAM54S31 -380/MR | JAM54S31 -385/MR | JAM54S31 -390/MR | JAM54S31 -395/MR | JAM54S31 -400/MR | JAM54S31 -405/MR |
|---|---|---|---|---|---|---|
| Rated Max Power(Pmax) [W] | 286 | 290 | 294 | 298 | 302 | 306 |
| Open Circuit Voltage(Voc) [V] | 34.36 | 34.49 | 34.62 | 34.75 | 34.88 | 35.12 |
| Max Power Voltage(Vmp) [V] | 28.51 | 28.68 | 28.87 | 29.08 | 29.26 | 29.47 |
| Short Circuit Current(Isc) [A] | 10.75 | 10.82 | 10.89 | 10.96 | 11.03 | 11.10 |
| Max Power Current(Imp) [A] | 10.03 | 10.11 | 10.18 | 10.25 | 10.32 | 10.38 |
| NOCT | Irradiance 800W/m², ambient temperature 20°C,wind speed 1m/s, AM1.5G | | | | | |

## OPERATING CONDITIONS

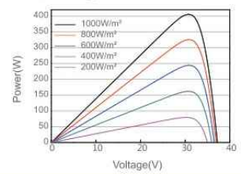
| | |
|---|---|
| Maximum System Voltage | 1000V/1500V DC |
| Operating Temperature | -40℃~+85℃ |
| Maximum Series Fuse Rating | 25A |
| Maximum Static Load,Front* Maximum Static Load,Back* | 5400Pa(112lb/ft²) 2400Pa(50lb/ft²) |
| NOCT | 45±2℃ |
| Safety Class | Class Ⅱ |
| Fire Performance | UL Type 1 |

## CHARACTERISTICS

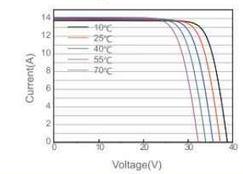
Current-Voltage Curve JAM54S31-405/MR




Power-Voltage Curve JAM54S31-405/MR




Current-Voltage Curve JAM54S31-405/MR




**Premium Cells, Premium Modules**

Version No. : Global_EN_20231130A

TOP TIER SOLAR SOLUTIONS

**TOP TIER SOLAR SOLUTIONS**

1530 CENTER PARK DR #2911,
CHARLOTTE, NC 28217,
UNITED STATES

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PROJECT NAME & ADDRESS

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COATS, NC 27521

DRAWN BY
ESR

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-9

# Residential Power Optimizer

## For North America

S440 / S500B / S650B


POWER OPTIMIZER

## PV power optimization at the module level

- Specifically designed to work with SolarEdge residential inverters
- Detects abnormal PV connector behavior, preventing potential safety issues
- Module-level voltage shutdown for installer and firefighter safety
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch loss, from manufacturing tolerance to partial shading
- Faster installations with simplified wire management and easy assembly using a single bolt
- Flexible system design for maximum space utilization
- Compatible with bifacial PV modules
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)

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# Residential Power Optimizer

## For North America

S440 / S500B / S650B

| | S440 | S500B | S650B | |
|---|---|---|---|---|
| **INPUT** | | | | |
| Rated Input DC Power[1] | 440[2] | 500[3] | 650 | W |
| Absolute Maximum Input Voltage (Voc) | 60 | 125 | 85 | Vdc |
| MPPT Operating Range | 8 – 60 | 12.5 – 105 | 12.5 – 85 | Vdc |
| Maximum Input Current (Maximum Isc of Connected PV Module)[2] | 14.5 | 15 | | Adc |
| Maximum Input Short Circuit Current[4] | 18.75 | | | Adc |
| Maximum Efficiency | 99.5 | | | % |
| Weighted Efficiency | 98.6 | | | % |
| Overvoltage Category | II | | | |
| **OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER)** | | | | |
| Maximum Output Current | 15 | | | Adc |
| Maximum Output Voltage | 60 | 80 | | Vdc |
| **OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE INVERTER OR INVERTER OFF)** | | | | |
| Safety Output Voltage per Power Optimizer | 1 ± 0.1 | | | Vdc |
| **STANDARD COMPLIANCE** | | | | |
| Photovoltaic Rapid Shutdown System | CSA C22.2#330, NEC 2014 – 2023 | | | |
| EMC | FCC Part 15 Class B; IEC 61000-6-2; IEC 61000-6-3 | | | |
| Safety | CSA C22.2#107.1; IEC 62109-1 (Class II Safety); UL 1741 | | | |
| Material | UL 94 V-0, UV Resistant | | | |
| RoHS | Yes | | | |
| Fire Safety | VDE-AR-E 2100-712:2013-05 | | | |
| **INSTALLATION SPECIFICATIONS** | | | | |
| Maximum Allowed System Voltage | 1000 | | | Vdc |
| Dimensions (W x L x H) | 129 x 155 x 30 / 5.07 x 6.10 x 1.18 | 129 x 165 x 45 / 5.07 x 6.49 x 1.77 | | mm / in |
| Weight | 720 / 1.6 | 790 / 1.74 | | gr / lb |
| Input Connector | MC4 | | | |
| Input Wire Length | 0.1 / 0.32 | | | m / ft |
| Output Connector | MC4 | | | |
| Output Wire Length | (+) 2.3; (-) 0.10 / (+) 7.54; (-) 0.32 | | | m / ft |
| Operating Temperature Range[5] | -40 to +85 | | | °C |
| Protection Rating | IP68 / NEMA6P | | | |
| Relative Humidity | 0 – 100 | | | % |

(1) Rated power of the module at STC will not exceed the power optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed.
(2) For S440 with part number S440-1GM4MRMP, the Rated Input DC Power is 650W, and the Maximum Input Current is 15A.
(3) For installations after Aug 1st, 2024, the Rated Input DC Power for S500B is 650W.
(4) The Maximum Input Short Circuit Current is adjusted for worst case conditions of ambient temperature, irradiance, bifacial gain, and so on, in accordance with NEC and CSA.
(5) Power derating is applied for ambient temperatures above +85°C / +185°F for S440, and for ambient temperatures above +75°C / 167°F for S500B and S650B. Refer to the Power Optimizers Temperature Derating technical note for more details.

| PV System Design Using a SolarEdge Inverter[6] | | SolarEdge Home Wave/Hub Single Phase | Three Phase for 208V Grid | Three Phase for 277/480V Grid | |
|---|---|---|---|---|---|
| Minimum String Length (Power Optimizers) | S440 | 8 | 10 | 18 | |
| | S500B, S650B | 6 | 8 | 14 | |
| Maximum String Length (Power Optimizers) | | 25 | | 50[7] | |
| Maximum Usable Power Delivered per String | | 5700 | 6000 | 12,750 | W |
| Maximum Allowed Connected Power per String[8][10] | Inverters with Rated AC Power ≤ 5700W | Per the inverter's maximum input DC power[8] | One string: 7200<br>Two strings or more: 7800 | 15,000 | W |
| | Inverters with Rated AC Power of 6000W | 5700 | | | |
| | Inverters with Rated AC Power ≥ 7600W | 6800; only when connected to at least two strings | | | |
| Parallel Strings of Different Lengths or Orientations | | Yes | | | |

(6) It is not allowed to mix S-series and P-series Power Optimizers in new installations in the same string.
(7) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement.
(8) Refer to the Single String Design Guidelines application note for details.
(9) For the 208V grid, the maximum is permitted only when the difference in connected power between strings is 1,000W or less.
(10) For the 240V or 277/480V grids, the maximum is permitted only when the difference in connected power between strings 2,000W or less.



Intertek RoHS

TOP TIER SOLAR SOLUTIONS

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PROJECT NAME & ADDRESS

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COATS, NC 27521

DRAWN BY
ESR

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-10

# SolarEdge Home Hub Inverter

## Single Phase, for North America

## For Inverters Assembled in the USA

SE3800H-US / SE5700H-US / SE7600H-US / SE10000H-US / SE11400H-US

HOME BACKUP


## Single phase inverter for storage and backup applications

- The ultimate home energy manager in charge of PV production, battery storage, backup operation during a power outage*, EV Charging, and smart energy devices
- Record-breaking 99% weighted efficiency with up to 300% DC oversizing
- Supports LRA – can provide the required energy for HVAC systems starting during backup operation
- Integrates seamlessly with the complete SolarEdge Home Smart Energy Ecosystem, through SolarEdge Home Network
- Module-level monitoring and visibility of battery status, PV production, and self-consumption data
- Fast and easy installation – small and lightweight, with reduced commissioning time
- A scalable solution that supports future homeowner needs through easy connection to a growing ecosystem of products
- Advanced safety features with integrated arc fault protection and rapid shutdown for 690.11 and 690.12
- Advanced reliability with automotive-grade components
- Embedded revenue grade production data, ANSI C12.20 Class 0.5
- IP65-rated, for indoor and outdoor installations

*Requires additional hardware and firmware version upgrade.

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# SolarEdge Home Hub Inverter

## Single Phase, for North America

SE3800H-US / SE5700H-US / SE7600H-US / SE10000H-US / SE11400H-US

| Model Number[1][2] | SE3800H-US | SE5700H-US | SE7600H-US | SE10000H-US | SE11400H-US | Units |
|---|---|---|---|---|---|---|
| **OUTPUT – AC ON GRID** | | | | | | |
| Rated AC Power | 3800 @ 240V<br>3300 @ 208V | 5760 @ 240V<br>5000 @ 208V | 7600 | 10000 | 11,400 @ 240V<br>10,000 @ 208V | W |
| Maximum AC Power Output | 3800 @ 240V<br>3300 @ 208V | 5760 @ 240V<br>5000 @ 208V | 7600 | 10000 | 11,400 @ 240V<br>10,000 @ 208V | W |
| AC Output Voltage (Nominal) | 208 / 240 | | | | | Vac |
| AC Output Voltage (Range) | 183 – 264 | | | | | Vac |
| AC Frequency Range (min - nom - max) | 59.3 – 60 – 60.5[3] | | | | | Hz |
| Maximum Continuous Output Current | 16 | 24 | 32 | 42 | 48 | A |
| GFDI Threshold | 1 | | | | | A |
| Total Harmonic Distortion (THD) | < 3 | | | | | % |
| Power Factor | 1, adjustable -0.85 to 0.85 | | | | | |
| Utility Monitoring, Islanding Protection, Country Configurable Thresholds | Yes | | | | | |
| Charge Battery from AC (if allowed) | Yes | | | | | |
| Typical Nighttime Power Consumption | < 2.5 | | | | | W |
| **OUTPUT – AC STAND-ALONE (BACKUP)[4][5]** | | | | | | |
| Rated AC Power in Stand-alone Operation | 11,400[6] | | | | | W |
| Maximum Stand-alone Capacity | 11,400 | | | | | W |
| AC L-L Output Voltage Range in Stand-alone Operation | 211 – 264 | | | | | Vac |
| AC L-N Output Voltage Range in Stand-alone Operation | 105 – 132 | | | | | Vac |
| AC Frequency Range in Stand-alone (min - nom - max) | 55 – 60 – 65 | | | | | Hz |
| Maximum Continuous Output Current in Stand-alone Operation | 48 | | | | | A |
| GFDI | 1 | | | | | A |
| THD | < 5 | | | | | % |
| **OUTPUT – SOLAREDGE HOME EV CHARGER AC** | | | | | | |
| Rated AC Power | 9600 | | | | | W |
| AC Output Voltage Range | 211 – 264 | | | | | Vac |
| On-Grid AC Frequency Range (min - nom - max) | 59.3 – 60 – 60.5 | | | | | Hz |
| Maximum Continuous Output Current @240V (grid, PV and battery) | 40 | | | | | Aac |
| **INPUT – DC (PV AND BATTERY)** | | | | | | |
| Transformer-less, Ungrounded | Yes | | | | | |
| Max Input Voltage | 480 | | | | | Vdc |
| Nom DC Input Voltage | 380 | | | | | Vdc |
| Reverse-Polarity Protection | Yes | | | | | |
| Ground-Fault Isolation Detection | 600kΩ Sensitivity | | | | | |
| **INPUT – DC (PV)** | | | | | | |
| Maximum DC Power @ 240V | 11,400 | 11,520 | 15,200 | 20,000 | 22,800 | W |
| Maximum DC Power @ 208V | 6600 | 10,000 | - | - | 20,000 | W |
| Maximum Input Current[7] @ 240V | 20 | 30.5 | 40 | 53 | 60 | Adc |
| Maximum Input Current[7] @ 208V | 17.5 | 27 | - | - | 53 | Adc |
| Maximum Input Short Circuit Current | 45 | | | | | Adc |
| Maximum Inverter Efficiency | 99.2 | | | | | % |
| CEC Weighted Efficiency | 98.5 | | 99 | | 99 @ 240V<br>98.5 @ 208V | % |
| 2-pole Disconnection | Yes | | | | | |

(1) These specifications apply to inverters with part numbers SExxxxH-USMNUxxx5 and SExxxxH-USMNFxxx5 and connection unit model number DCD-1PH-US-PxH-F-x.
(2) Inverters with part number SExxxxH-USMNFxxx5 are intended for upgrade installations only, as part of the "Re-Energize" program. Use on non-upgrade installations will revoke the product warranty.
(3) For other regional settings please refer to the SolarEdge Inverters, Power Control Options Application Note.
(4) Not designed for non-grid connected applications and requires AC for commissioning. Stand-alone (backup) functionality is only supported for the 240V grid.
(5) For LRA (Locked Rotor Amperage) values please refer to the LRA for NAM Application Note.
(6) For models SE7600H-US and below, the rated AC stand-alone power is configurable between 7600W or 11,400W from CPU version 4.20.xx.
(7) A higher current source may be used. The inverter will limit its input current to the values stated.



CE ETL Intertek 4004590

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11" X 17"

SHEET NUMBER
PV-11

# SolarEdge Home Hub Inverter

## Single Phase, for North America

SE3800H-US / SE5700H-US / SE7600H-US / SE10000H-US / SE11400H-US

| Model Number[1][2] | SE3800H-US | SE5700H-US | SE7600H-US | SE10000H-US | SE11400H-US | Units |
|---|---|---|---|---|---|---|
| **OUTPUT – DC (BATTERY)** | | | | | | |
| Supported Battery Types | SolarEdge Home Battery, LG RESU Prime | | | | | |
| Number of Batteries per Inverter | Up to 3 SolarEdge Home Battery, up to 2 LG RESU Prime | | | | | |
| Continuous Power[8] | 11,400 @ 240V<br>3800 @ 208V | 11,400 @ 240V<br>5000 @ 208V | 11400 @240V | | 11,400 @ 240V<br>10,000 @ 208V | W |
| Peak Power[8] | 11,400 @ 240V<br>3800 @ 208V | 11,400 @ 240V<br>5000 @ 208V | 11400 @240V | | 11,400 @ 240V<br>10,000 @ 208V | W |
| Maximum Input Current | 30 | | | | | Adc |
| 2-pole Disconnection | Up to the inverter's rated stand-alone power | | | | | |
| **SMART ENERGY CAPABILITIES** | | | | | | |
| Consumption Metering | Built-in[9] | | | | | |
| Stand-alone & Battery Storage | With Backup Interface (purchased separately) for service up to 200A; up to 3 inverters | | | | | |
| EV Charging | Direct connection to the SolarEdge Home EV Charger | | | | | |
| **ADDITIONAL FEATURES** | | | | | | |
| Supported Communication Interfaces | RS485, Ethernet, Cellular[10], Wi-Fi (optional), SolarEdge Home Network (optional) | | | | | |
| Revenue Grade Metering, ANSI C12.20 | Built-in[9] | | | | | |
| Integrated AC, DC and Communication Connection Unit | Yes | | | | | |
| Inverter Commissioning | With the SetApp mobile application using built-in Wi-Fi Access Point for local connection | | | | | |
| DC Voltage Rapid Shutdown (PV and Battery) | Yes, NEC 690.12 | | | | | |
| **STANDARD COMPLIANCE** | | | | | | |
| Safety | UL 1741, UL 1741SA, UL 1741SB, UL 1699B, CSA 22.2#107.1, C22,2#330, C22.3#9, ANSI/CAN/UL 9540 | | | | | |
| Grid Connection Standards | IEEE1547 and IEEE-1547.1, Rule 21, Rule 14H | | | | | |
| Emissions | FCC Part 15 Class B | | | | | |
| **INSTALLATION SPECIFICATIONS** | | | | | | |
| AC Terminals | L1, L2, N terminal blocks, PE busbar for inverter connection<br>L1, L2 terminal blocks, PE busbar for EV Charger AC connection | | | | | |
| DC Terminals | 4 x terminal block pairs for PV input; 1 x terminal block pair for battery input | | | | | |
| AC Output and EV AC Output Conduit Size / AWG Range | 1" maximum / 14-4 AWG | | | | | |
| DC Input (PV and Battery) Conduit Size / AWG Range | 1" maximum / 14-6 AWG | | | | | |
| Dimensions with Connection Unit (H x W x D) | 21.06 x 14.6 x 8.2 / 535 x 370 x 208 | | | | | in / mm |
| Weight with Connection Unit | 44.9 / 20.3 | | | | | lb / kg |
| Noise | < 50 | | | | | dBA |
| Cooling | Natural Convection | | | | | |
| Operating Temperature Range | -40 to +140 / -40 to +60[11] | | | | | °F / °C |
| Protection Rating | NEMA 4X | | | | | |

(8) Discharge power is limited up to the inverter's rated AC power for on-grid and stand-alone applications, as well as up to the installed batteries' rating.
(9) For consumption metering current transformers should be ordered separately: SECT-SPL-225A-T-20 or SEACT1250-400NA-20. Revenue grade metering is only for production metering.
(10) Information concerning the data plan terms & conditions is available in SolarEdge Communication Plan Terms and Conditions.
(11) Full power up to at least 50°C / 122°F; for power derating information refer to the Temperature Derating Technical Note for North America.



CE Intertek 4004590

TOP TIER SOLAR SOLUTIONS

TOP TIER SOLAR SOLUTIONS
1530 CENTER PARK DR #2911,
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REVISIONS

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| REVISION | 06/20/2025 | A |
| | | |

PROJECT NAME & ADDRESS

JAMES CASSIDY RESIDENCE
35 TRACE TURNER LN,
COATS, NC 27521

DRAWN BY
ESR

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-12

Tech Brief

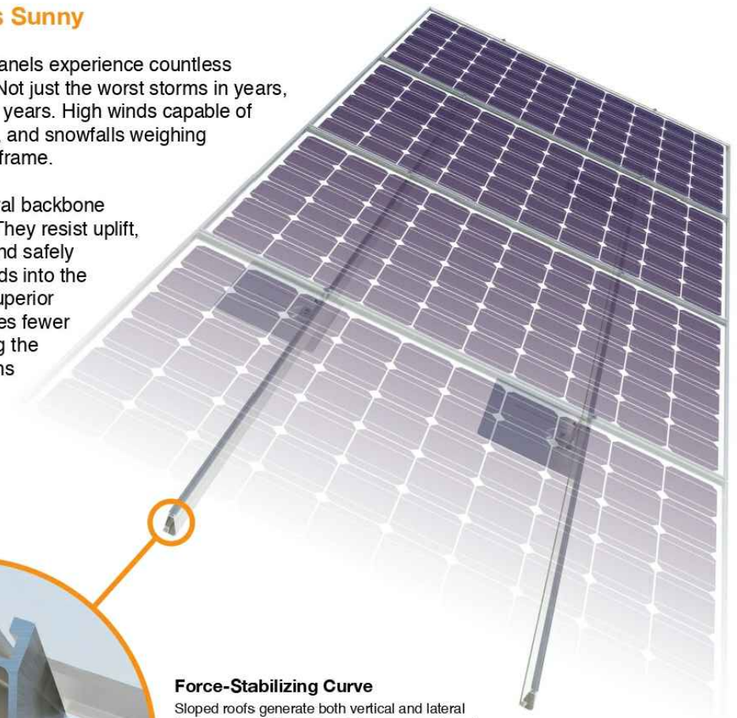
IRONRIDGE

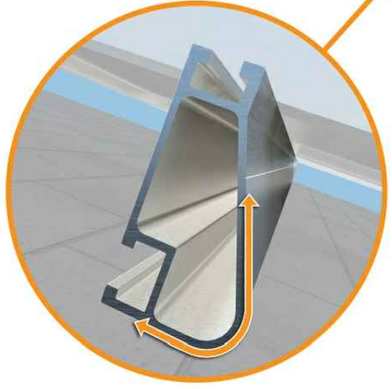
# XR Rail® Family

## Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails® are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.





### Force-Stabilizing Curve

Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails® is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

### Compatible with Flat & Pitched Roofs

XR Rails® are compatible with FlashFoot® and other pitched roof attachments.

IronRidge® offers a range of tilt leg options for flat roof mounting applications.

### Corrosion-Resistant Materials

All XR Rails® are made of 6000-series aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.

Tech Brief

## XR Rail® Family

The XR Rail® Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail® to match.

### XR10

XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves spans up to 6 feet, while remaining light and economical.

- 6' spanning capability
- Moderate load capability
- Clear & black anodized finish
- Internal splices available

### XR100

XR100 is a residential and commercial mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 10 feet.

- 10' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available

### XR1000

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans up to 12 feet for commercial applications.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

## Rail Selection

The table below was prepared in compliance with applicable engineering codes and standards.* Values are based on the following criteria: ASCE 7-16, Gable Roof Flush Mount, Roof Zones 1 & 2e, Exposure B, Roof Slope of 8 to 20 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed certification letters.

| Load | | Rail Span | | | | | |
|---|---|---|---|---|---|---|---|
| Snow (PSF) | Wind (MPH) | 4' | 5' 4" | 6' | 8' | 10' | 12' |
| None | 90 | XR10 | | XR100 | | XR1000 | |
| | 120 | | | | | | |
| | 140 | | | | | | |
| | 160 | | | | | | |
| 20 | 90 | | | | | | |
| | 120 | | | | | | |
| | 140 | | | | | | |
| | 160 | | | | | | |
| 30 | 90 | | | | | | |
| | 160 | | | | | | |
| 40 | 90 | | | | | | |
| | 160 | | | | | | |
| 80 | 160 | | | | | | |
| 120 | 160 | | | | | | |

*Table is meant to be a simplified span chart for conveying general rail capabilities. Use approved certification letters for actual design guidance.



TOP TIER SOLAR SOLUTIONS

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1530 CENTER PARK DR #2911,
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REVISIONS

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| REVISION | 06/20/2025 | A |
| | | |

PROJECT NAME & ADDRESS

JAMES CASSIDY RESIDENCE

35 TRACE TURNER LN,
COATS, NC 27521

DRAWN BY
ESR

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-13

Tech Brief

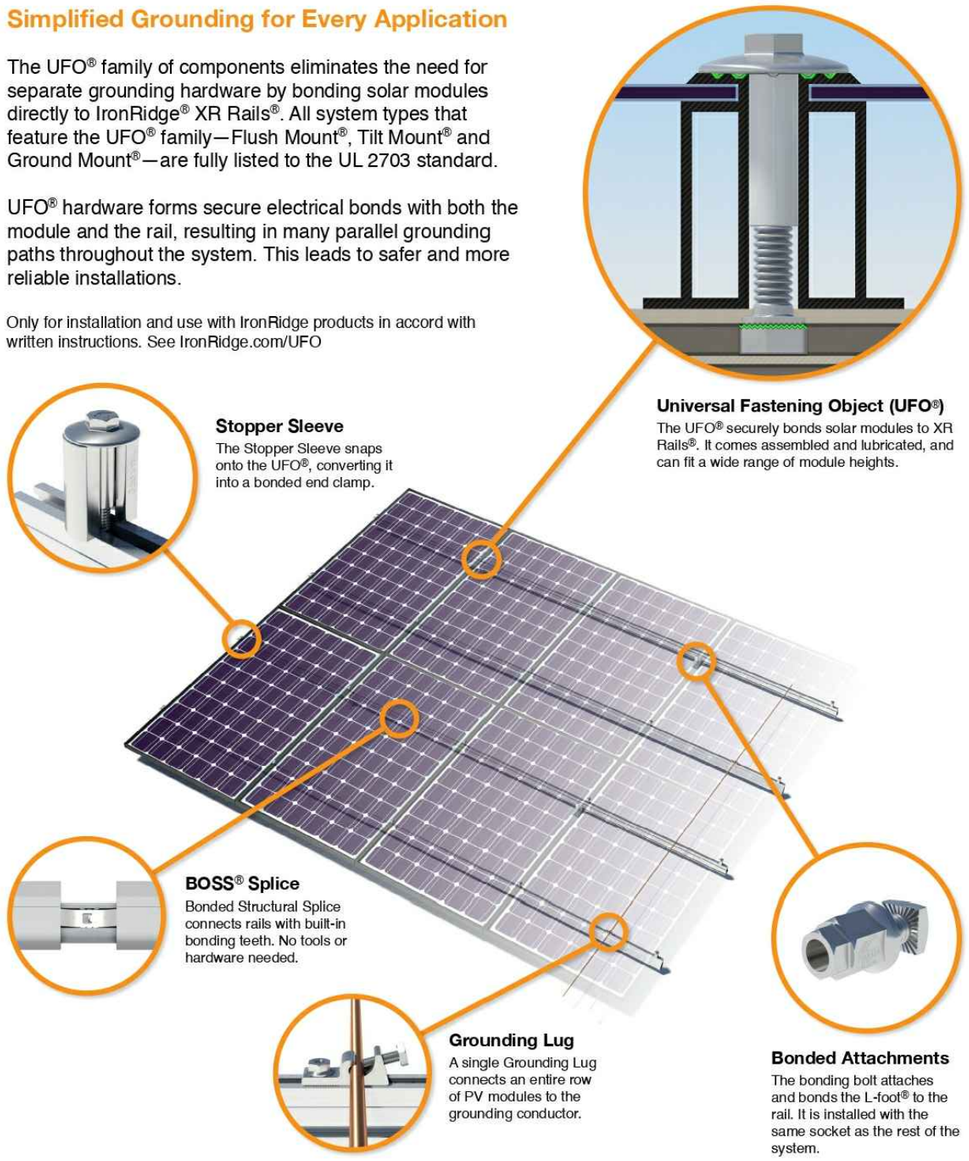
# UFO® Family of Components

## Simplified Grounding for Every Application

The UFO® family of components eliminates the need for separate grounding hardware by bonding solar modules directly to IronRidge® XR Rails®. All system types that feature the UFO® family—Flush Mount®, Tilt Mount® and Ground Mount®—are fully listed to the UL 2703 standard.

UFO® hardware forms secure electrical bonds with both the module and the rail, resulting in many parallel grounding paths throughout the system. This leads to safer and more reliable installations.

Only for installation and use with IronRidge products in accord with written instructions. See IronRidge.com/UFO



**Universal Fastening Object (UFO®)**
The UFO® securely bonds solar modules to XR Rails®. It comes assembled and lubricated, and can fit a wide range of module heights.

**Stopper Sleeve**
The Stopper Sleeve snaps onto the UFO®, converting it into a bonded end clamp.

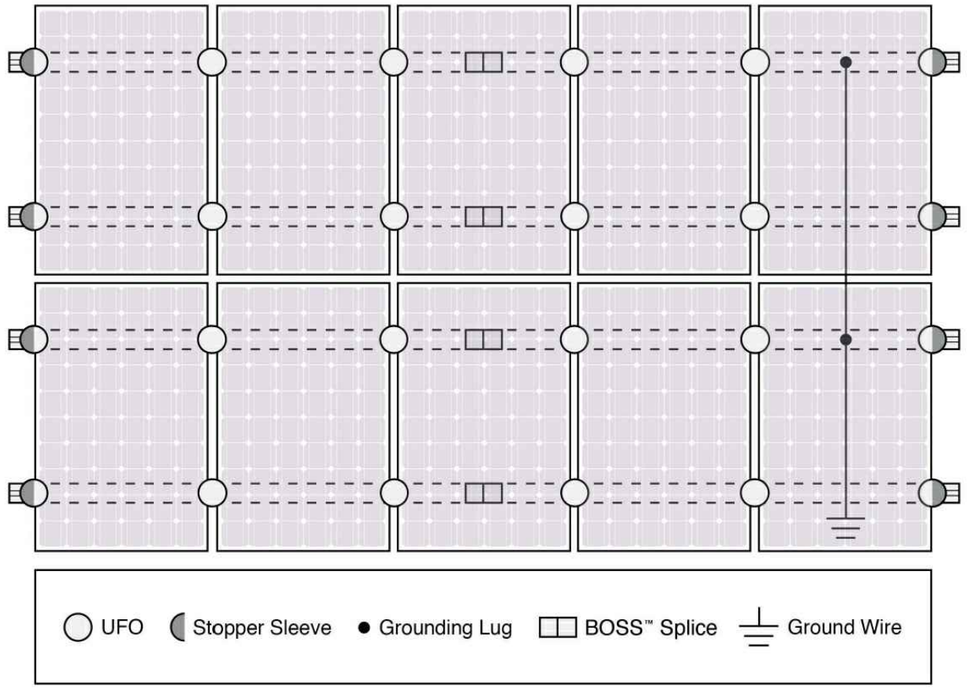
**BOSS® Splice**
Bonded Structural Splice connects rails with built-in bonding teeth. No tools or hardware needed.

**Grounding Lug**
A single Grounding Lug connects an entire row of PV modules to the grounding conductor.

**Bonded Attachments**
The bonding bolt attaches and bonds the L-foot® to the rail. It is installed with the same socket as the rest of the system.

Tech Brief

## System Diagram




Approved Enphase microinverters can provide equipment grounding of IronRidge systems, eliminating the need for grounding lugs and field installed equipment ground conductors (EGC). A minimum of two microinverters mounted to the same rail and connected to the same Engage cable is required. Refer to installation manuals for additional details.

## UL Certification

The IronRidge® Flush Mount®, Tilt Mount®, and Ground Mount Systems have been listed to UL 2703 by Intertek Group plc.

UL 2703 is the standard for evaluating solar mounting systems. It ensures these devices will maintain strong electrical and mechanical connections over an extended period of time in extreme outdoor environments.

Go to IronRidge.com/UFO

| Cross-System Compatibility | | | |
|---|---|---|---|
| **Feature** | **Flush Mount** | **Tilt Mount** | **Ground Mount** |
| **XR Rails®** | ✔ | ✔ | XR100 & XR1000 |
| **UFO®/Stopper** | ✔ | ✔ | ✔ |
| **BOSS® Splice** | ✔ | ✔ | N/A |
| **Grounding Lugs** | 1 per Row | 1 per Row | 1 per Array |
| **Microinverters & Power Optimizers** | Compatible with most MLPE manufacturers. Refer to system installation manual. | | |
| **Fire Rating** | Class A | Class A | N/A |
| **Modules** | Tested or Evaluated with over 400 Framed Modules Refer to installation manuals for a detailed list. | | |



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JAMES CASSIDY RESIDENCE

35 TRACE TURNER LN,
COATS, NC 27521

DRAWN BY
ESR

SHEET NAME
EQUIPMENT SPECIFICATION

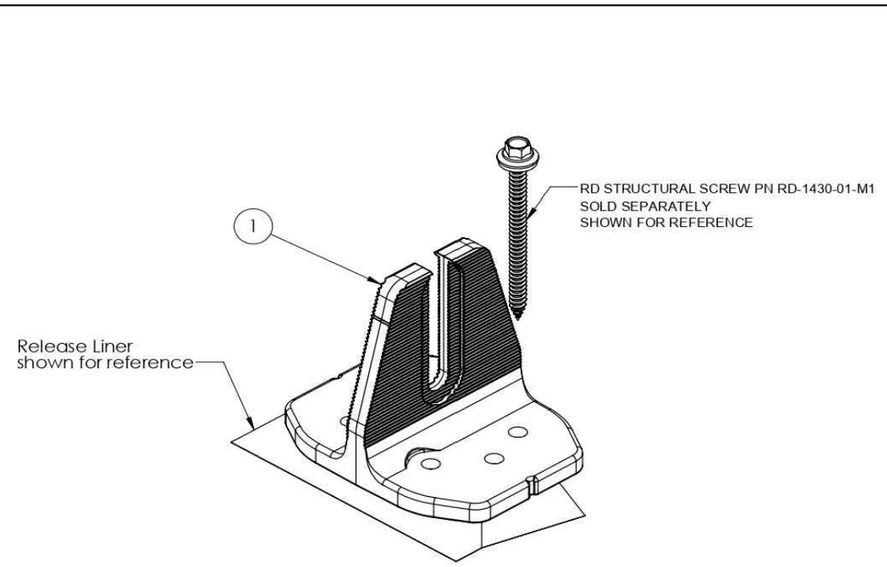
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-14

Cut Sheet

IRONRIDGE

# QuickMount® Halo UltraGrip




| ITEM NO | DESCRIPTION | QTY IN KIT |
|---|---|---|
| 1 | QM Halo UltraGrip(Mill or Black) | 1 |

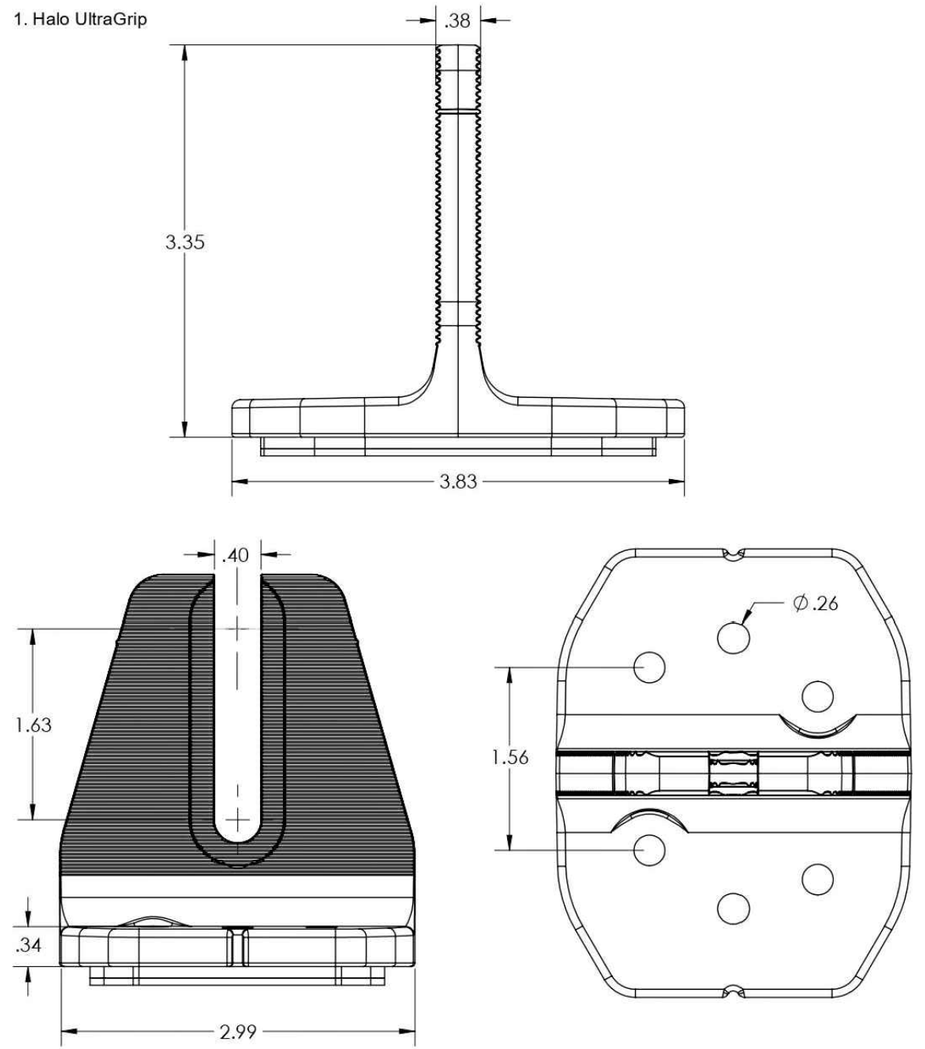
| PART NUMBER | DESCRIPTION |
|---|---|
| QM-HUG-01-M1 | Halo UltraGrip - Mill |
| QM-HUG-01-B1 | Halo UltraGrip - Black |





Cut Sheet

1. Halo UltraGrip




| Property | Value |
|---|---|
| Material | 3000 Series Aluminium |
| Finish | Mill or Black |

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QM-HUG-01-B1 or QM-HUG-01-M1 Cut Sheet Rev 1.0

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PROJECT NAME & ADDRESS

JAMES CASSIDY RESIDENCE

35 TRACE TURNER LN,
COATS, NC 27521

DRAWN BY

ESR

SHEET NAME

EQUIPMENT SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

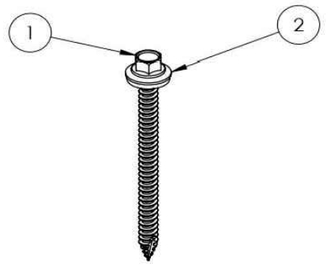
SHEET NUMBER

PV-15

Cut Sheet

IRONRIDGE

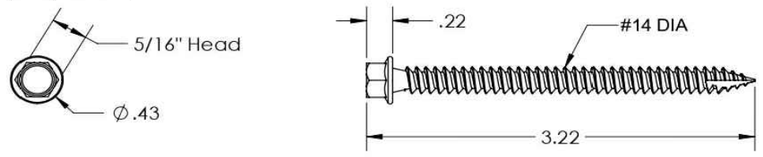
# QuickMount® RD Structural Screw




| ITEM NO | DESCRIPTION | QTY IN KIT |
|---|---|---|
| 1 | Self Drilling Screw, #14, Wood Tip | 1 |
| 2 | Washer, EPDM Backed | 1 |

| PART NUMBER | DESCRIPTION |
|---|---|
| RD-1430-01-M1 | RD Structural Screw |

1. Self Drilling Screw, #14, Wood Tip




| Property | Value |
|---|---|
| Material | 300 Series Stainless Steel |
| Finish | Clear |

2. Washer, EPDM Backed


| Property | Value |
|---|---|
| Material | 300 Series Stainless Steel |
| Finish | Clear |





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RESIDENCE

35 TRACE TURNER LN,
COATS, NC 27521

DRAWN BY

ESR

SHEET NAME

EQUIPMENT
SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-16

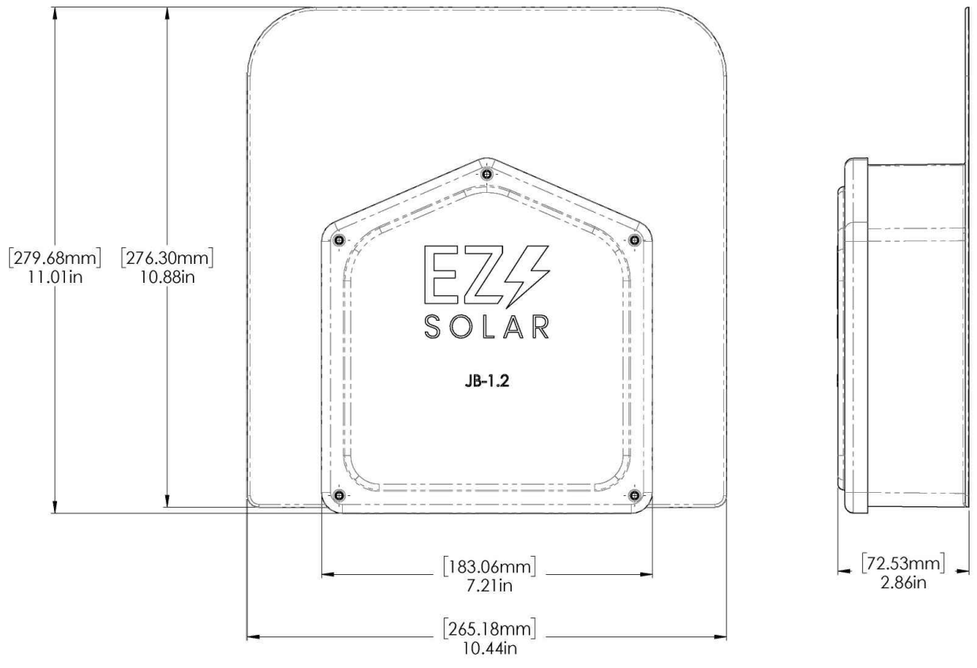
EZ SOLAR
making solar simple.

PHONE: 385-202-4150
WWW.EZSOLARPRODUCTS.COM

| ITEM NO. | PART NUMBER | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | JB-1.2 BODY | POLYCARBONATE WITH UV INHIBITORS | 1 |
| 2 | JB-1.2 LID | POLYCARBONATE WITH UV INHIBITORS | 1 |
| 3 | #10 X 1-1/4" PHILLIPS PAN HEAD SCREW | | 6 |
| 4 | #8 X 3/4" PHILLIPS PAN HEAD SCREW | | 6 |

| SIZE | DWG. NO. | REV |
|---|---|---|
| B | JB-1.2 | |
| SCALE: 1:2 | WEIGHT: 1.45 LBS | SHEET 1 OF 3 |

| | |
|---|---|
| TORQUE SPECIFICATION: | 15-20 LBS |
| CERTIFICATION: | UL 1741, NEMA 3R CSA C22.2 NO. 290 |
| WEIGHT: | 1.45 LBS |



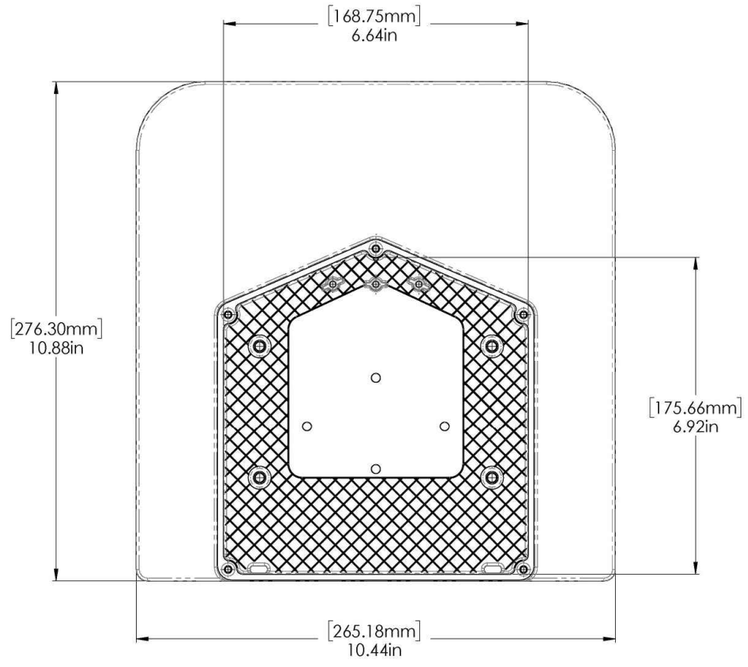



Intertek 5015705

EZ SOLAR
making solar simple.

PHONE: 385-202-4150
WWW.EZSOLARPRODUCTS.COM

| SIZE | DWG. NO. | REV |
|---|---|---|
| B | JB-1.2 | |
| SCALE: 1:2 | WEIGHT: 1.45 LBS | SHEET 2 OF 3 |

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ESR

SHEET NAME
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ANSI B
11" X 17"

SHEET NUMBER
PV-17