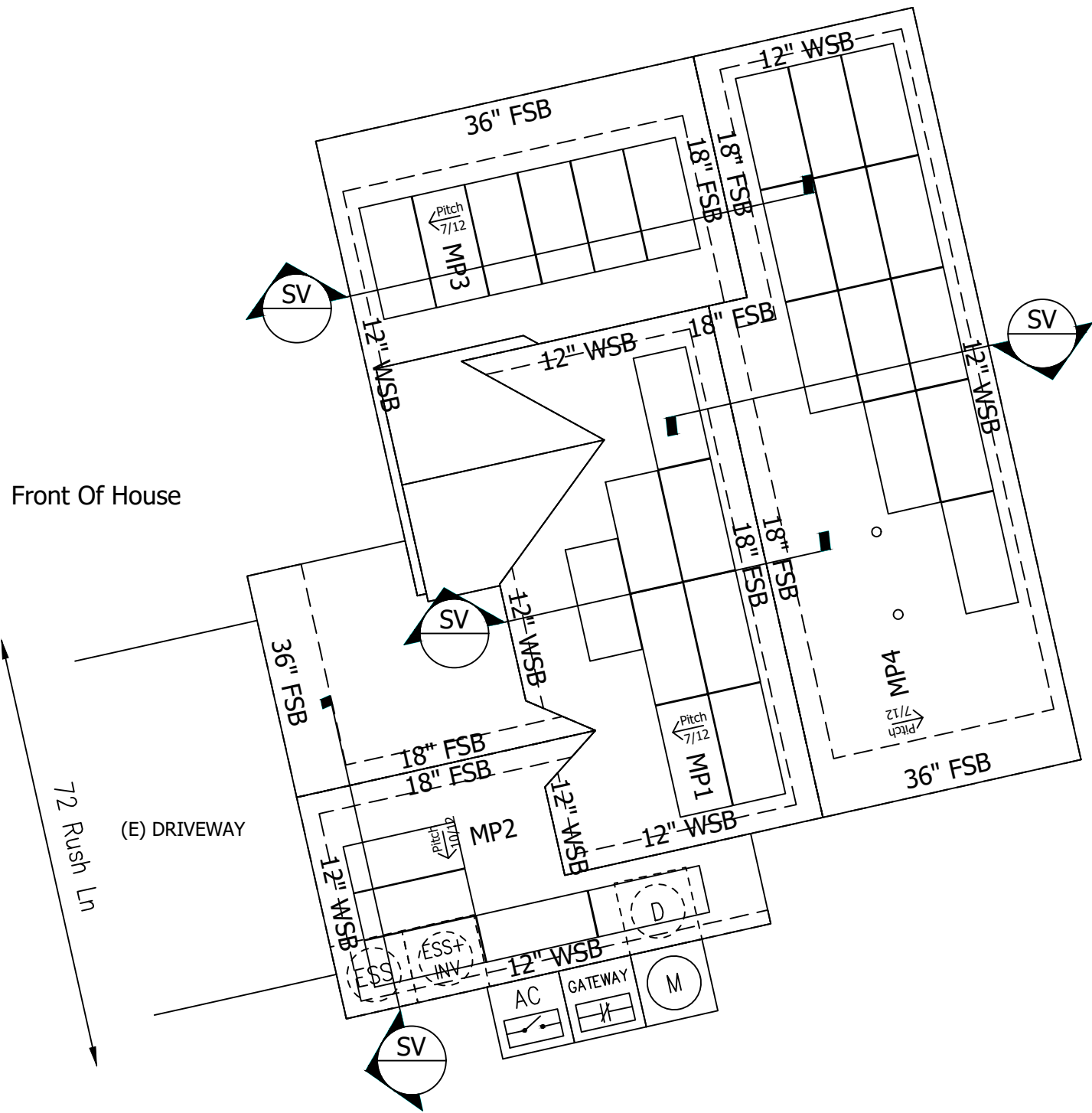




PV ARRAY DEAD LOAD = 3 LBS/SF



*Yong Heng Zhu*  
NORTH CAROLINA  
PROFESSIONAL  
SEAL  
051417  
ENGINEER  
YONG HENG ZHU  
Structural Only  
NC Firm D-0427  
Digitally signed by  
Henry Zhu  
Date: 2025-09-02  
09:04:45 -07:00

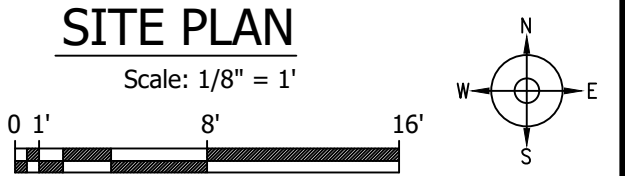
|     |   |
|-----|---|
| MP1 | PITCH: 32° (7:12) ARRAY PITCH: 32° (7:12)<br>AZIMUTH: 257 ARRAY AZIMUTH: 257<br>MATERIAL: COMP SHINGLE STORY: 2 STORIES   |
| MP2 | PITCH: 41° (10:12) ARRAY PITCH: 41° (10:12)<br>AZIMUTH: 167 ARRAY AZIMUTH: 167<br>MATERIAL: COMP SHINGLE STORY: 2 STORIES |
| MP3 | PITCH: 32° (7:12) ARRAY PITCH: 32° (7:12)<br>AZIMUTH: 257 ARRAY AZIMUTH: 257<br>MATERIAL: COMP SHINGLE STORY: 2 STORIES   |
| MP4 | PITCH: 32° (7:12) ARRAY PITCH: 32° (7:12)<br>AZIMUTH: 77 ARRAY AZIMUTH: 77<br>MATERIAL: COMP SHINGLE STORY: 2 STORIES     |

| LEGEND |   |
|--------|---|
|        | (E) UTILITY SERVICE METER               |
|        | DISTRIBUTION PANEL                      |
|        | AC DISCONNECT                           |
|        | GATEWAY                                 |
|        | ENERGY STORAGE SYSTEM                   |
|        | ENERGY STORAGE SYSTEM W/ SOLAR INVERTER |

WARNING LABELS PROVIDED AT APPLICABLE EQUIPMENT

- STANDOFF LOCATIONS
- CONDUIT RUN
- GATE/FENCE
- HEAT PRODUCING VENTS ARE RED
- INTERIOR EQUIPMENT / CONDUIT IS DASHED

TOTAL ARRAY AREA (SF): 672  
TOTAL ROOF AREA (SF): 2051  
TOTAL ARRAY AREA IS ≈ 32.77  
PERCENT OF TOTAL ROOF AREA



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JOB NUMBER: JB-283732 00

MOUNTING SYSTEM:  
ZS Comp V4 w Flashing-Insert

MODULES:  
(31) Hanwha Q Cells Q.PEAK DUO BLK ML-G10+/TS 410

INVERTER:  
Tesla Powerwall 3 [240V] # 1707000-XX-Y 11.5 kW / 13.5 kWh

CUSTOMER:  
JEREMIAH FITTS  
72 Rush Ln  
Cameron, NC 28326

2245008980

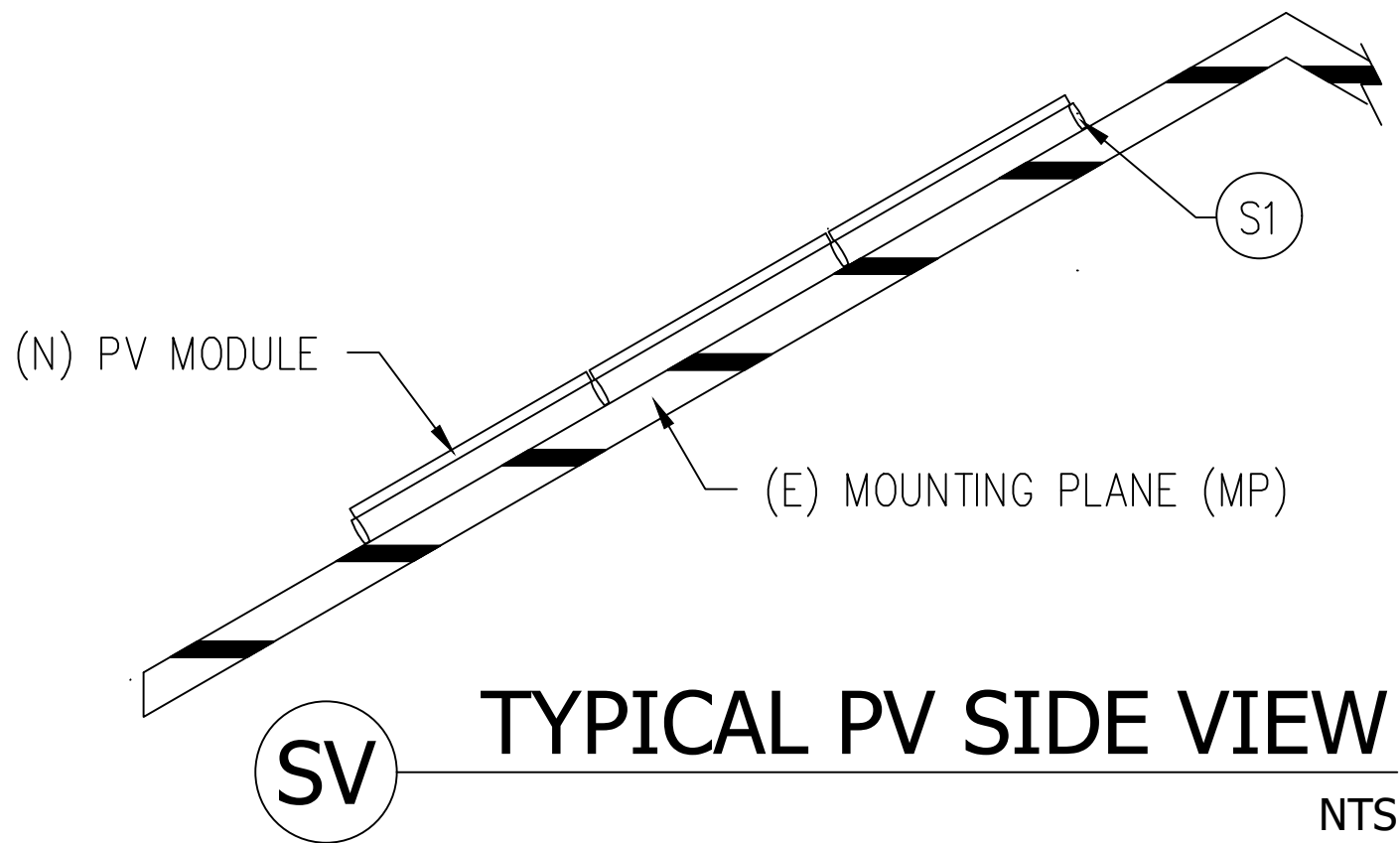
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12.71 KW PV ARRAY  
27 KWH ENERGY STORAGE SYSTEM


PAGE NAME:  
SITE PLAN

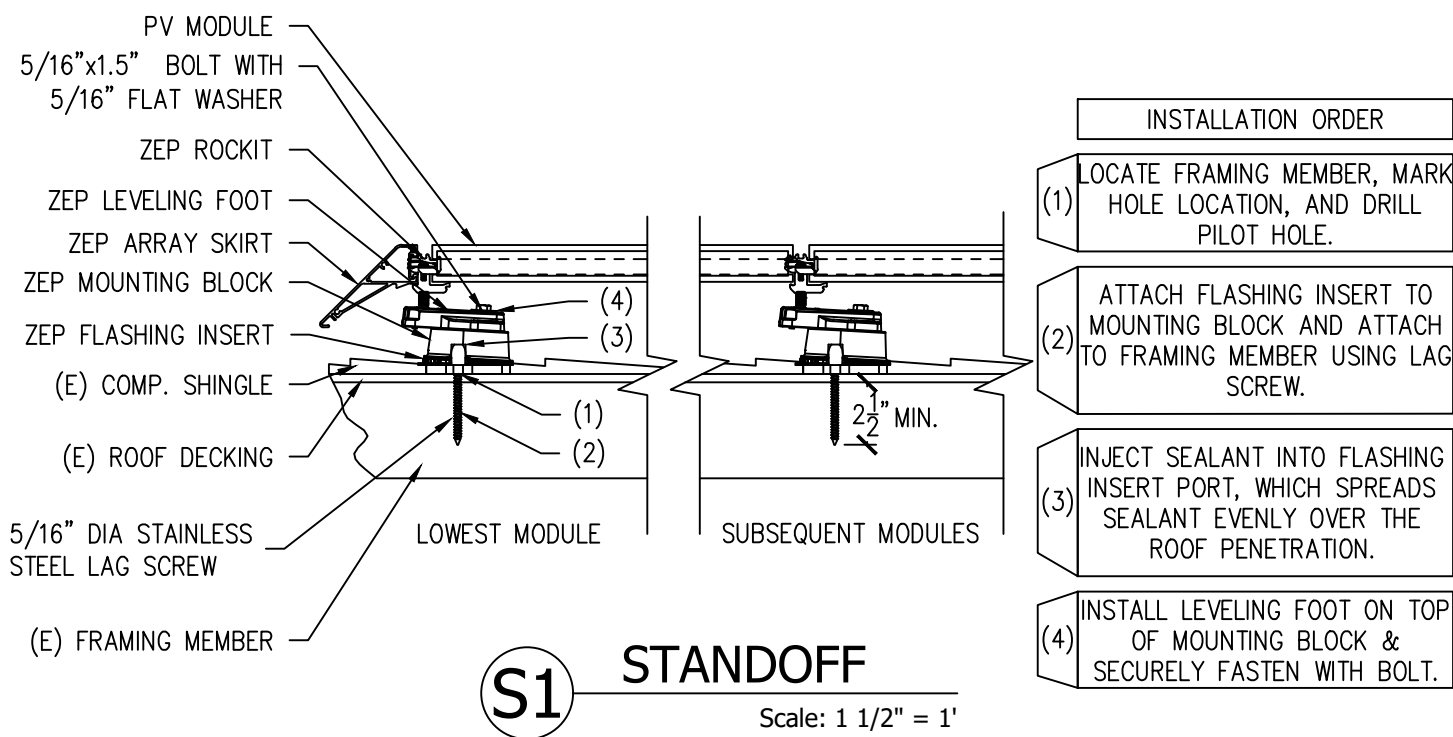
DESIGN:  
Darinka Orduña

SHEET: 2  
REV: A  
DATE: 9/1/2025

TESLA



  
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NC Firm D-0427  
Digitally signed by  
Henry Zhu  
Date: 2025-09-02  
09:04:45 -07:00



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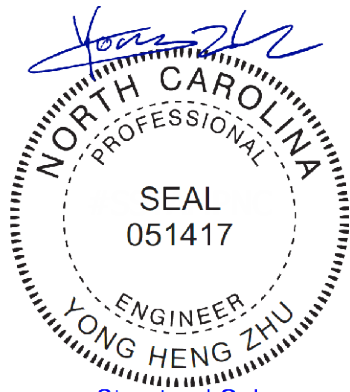
JOB NUMBER: JB-283732 00  
MOUNTING SYSTEM:  
ZS Comp V4 w Flashing-Insert  
MODULES:  
(31) Hanwha Q Cells Q.PEAK DUO BLK ML-G10+/TS 410  
INVERTER:  
Tesla Powerwall 3 [240V] # 1707000-XX-Y 11.5 kW / 13.5 kWh

CUSTOMER:  
JEREMIAH FITTS  
72 Rush Ln  
Cameron, NC 28326  
2245008980

DESCRIPTION:  
12.71 KW PV ARRAY  
27 KWH ENERGY STORAGE SYSTEM  
PAGE NAME:  
STRUCTURAL VIEWS

DESIGN:  
Darinka Orduña  
SHEET: 3 REV: A DATE: 9/1/2025

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Structural Only  
NC Firm D-0427

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Henry Zhu  
Date: 2025-09-02  
09:04:45 -07:00

| Jobsite Specific Design Criteria |       |           |              |
|----------------------------------|-------|-----------|--------------|
| Design Code                      |       | ASCE 7-10 |              |
| Risk Category                    |       | II        | Table 1.5-1  |
| Ultimate Wind Speed              | V-Ult | 115       | Fig. 1609A   |
| Exposure Category                |       | C         | Section 26.7 |
| Ground Snow Load                 | pg    | 10        | Table 7-1    |

| MP Specific Design Information  |                              |                              |                              |                              |
|---|------------------------------|------------------------------|------------------------------|------------------------------|
| MP Name   | MP1                          | MP2                          | MP3                          | MP4                          |
| Roofing   | Comp Shingle                 | Comp Shingle                 | Comp Shingle                 | Comp Shingle                 |
| Standoff  | ZS Comp V4 w Flashing-Insert | ZS Comp V4 w Flashing-Insert | ZS Comp V4 w Flashing-Insert | ZS Comp V4 w Flashing-Insert |
| Pitch   | 32                           | 41                           | 32                           | 32                           |
| SL/RLL: PV  | 4.4                          | 3.3                          | 4.4                          | 4.4                          |
| SL/RLL: Non-PV  | 16.5                         | 13.5                         | 16.5                         | 16.5                         |
| Edge Zone Width   | 4.2 ft                       | 4.2 ft                       | 4.2 ft                       | 4.2 ft                       |
| Azimuth   | 257                          | 167                          | 257                          | 77                           |
| Stories   | 2                            | 2                            | 2                            | 2                            |
| Rafter Size/Spacing   | 2x6 @24" OC                  | 2x6 @24" OC                  | 2x6 @24" OC                  | 2x6 @24" OC                  |
| CJ Size/Spacing   | 2x6 @24" OC                  | 2x6 @24" OC                  | 2x6 @24" OC                  | 2x6 @24" OC                  |
| Standoff Spacing and Layout   |                              |                              |                              |                              |
| MP Name   | MP1                          | MP2                          | MP3                          | MP4                          |
| Applied Wind Zones <sub>2</sub>   | All                          | All                          | All                          | All                          |
| Wind Pressure   | -19.20                       | -19.20                       | -19.20                       | -19.20                       |
| Landscape X-Spacing   | 72                           | 72                           | 72                           | 72                           |
| Landscape X-Cantilever  | 24                           | 24                           | 24                           | 24                           |
| Landscape Y-Spacing   | 41                           | 41                           | 41                           | 41                           |
| Landscape Y-Cantilever  | -                            | -                            | -                            | -                            |
| Portrait X-Spacing  | 48                           | 48                           | 48                           | 48                           |
| Portrait X-Cantilever   | 16                           | 16                           | 16                           | 16                           |
| Portrait Y-Spacing  | 74                           | 74                           | 74                           | 74                           |
| Portrait Y-Cantilever   | -                            | -                            | -                            | -                            |
| Layout  | Staggered                    | Staggered                    | Staggered                    | Staggered                    |
| <b>Notes:</b><br>1. X and Y are maximums that are always relative to the structure framing that supports the PV. X is across rafters and Y is along rafters.<br>2. Hatching in Applied Wind Zone rows corresponds to hatching on Site Plan.<br>3. Table lists consistent conservative standoff specifications and layout requirements across all wind zones to comply with the maximum wind pressure of any zone. |                              |                              |                              |                              |

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JOB NUMBER: JB-283732 00

MOUNTING SYSTEM:  
ZS Comp V4 w Flashing-Insert

MODULES:  
(31) Hanwha Q Cells Q.PEAK DUO BLK ML-G10+/TS 410

INVERTER:  
Tesla Powerwall 3 [240V] # 1707000-XX-Y 11.5 kW / 13.5 kWh

CUSTOMER:  
JEREMIAH FITTS  
72 Rush Ln  
Cameron, NC 28326

2245008980

DESCRIPTION:  
12.71 KW PV ARRAY  
27 KWH ENERGY STORAGE SYSTEM

PAGE NAME:  
UPLIFT CALCULATIONS

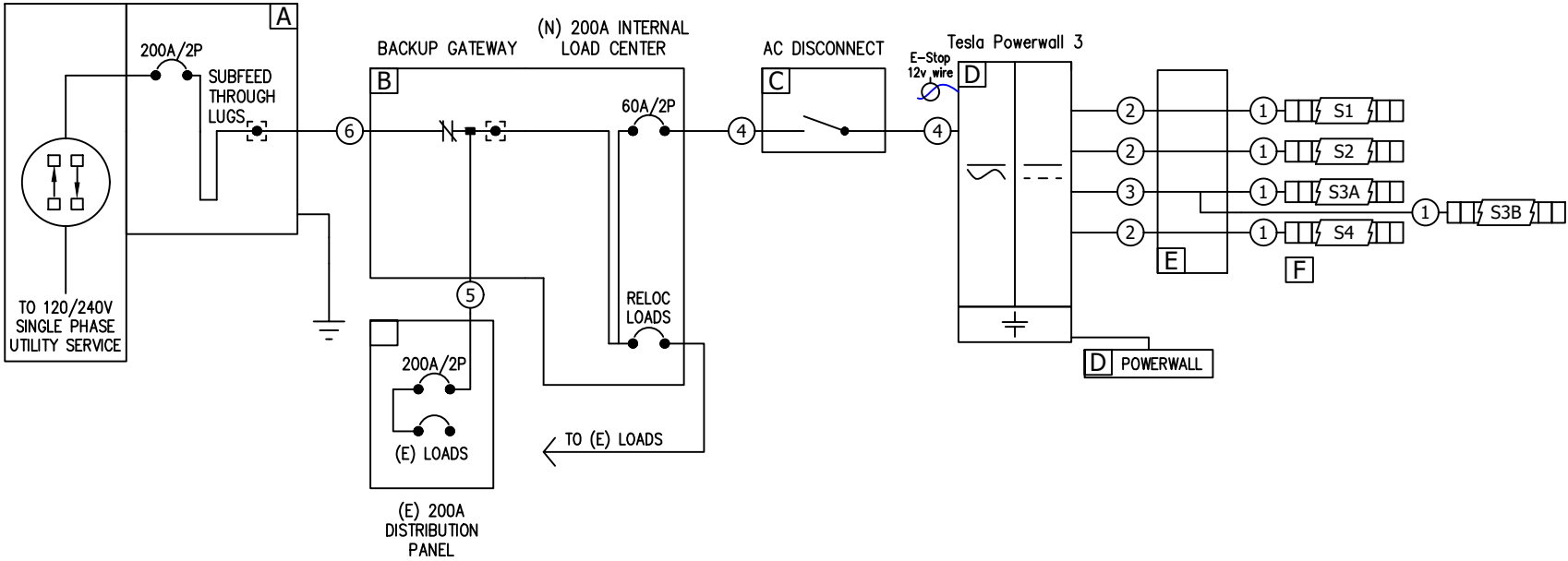
DESIGN:  
Darinka Orduña

SHEET: 4 REV: A DATE: 9/1/2025

TESLA



CONDUIT MATERIAL TYPE AND SIZE TO BE DETERMINED IN THE FIELD TO NEC 2017 STANDARDS.



MAIN SERVICE PANEL IS COMPLIANT WITH  
NEC 705.12(B)(2)(3)(c)

Emergency Stop Button (E-Stop)

- Rapid Shutdown Initiation Device per Article 690.12(C) of the NEC
- Disconnecting Means as defined in Article 100 of the NEC
- Connection to generation sources with 12V, 1A communication wire

1. CONDUIT RUNS MAY BE CONDENSED DUE TO SITE CONDITIONS AND/OR INSTALLATION EASE. ALL CONDUIT FILL DERATES AND PROPER CALCULATIONS HAVE BEEN COMPLETED PER NEC CHAPTER 9, TABLE 4.
2. SOLAR SHUTDOWN DEVICE TO BE INSTALLED FOR SYSTEM RAPID SHUTDOWN (RSD) IN ACCORDANCE WITH ARTICLE 690 OF THE APPLICABLE NEC.
3. CONDUIT TYPE CAN CHANGE DUE TO SITE CONDITIONS AND WILL FOLLOW THE NEC REQUIREMENTS FOR THAT CONDUIT TYPE.

| PARTS |     |   | DC CONDUCTOR TABLE |             |     |                |               |                   |                 |           |             | STRING TABLE |                   |                |            |           |                |             |
|-------|-----|---|--------------------|-------------|-----|----------------|---------------|-------------------|-----------------|-----------|-------------|--------------|-------------------|----------------|------------|-----------|----------------|-------------|
| Ref   | Qty | Description   | Ref                | Type        | Qty | Size (AWG, Cu) | EGC (AWG, Cu) | Conduit           | Isc (ADC)       | Imp (ADC) | Product Ref | String Ref   | Module per String | MCI per String | Voc* (VDC) | Vmp (VDC) | Mounting Plane |             |
| B     | 1   | Breaker; 60A/2P, 2 Spaces                                       | 1                  | PV Wire     | 2   | #10            | SBC #10       | 3/4" EMT          | 11.20           | 10.89     |             |              |                   |                |            |           |                |             |
|       | 1   | Tesla # 1841000-XX-Y: Back-up Gateway 3.0 NA for PW             | 2                  | THWN-2/THWN | 2   | #10            | #10           | 3/4" EMT          | 11.20           | 10.89     |             |              |                   |                |            |           |                |             |
| C     | 1   | Disconnect; 60A, 240Vac, Non-Fusible, NEMA 3R: 2P, 2W, Lockable | 3                  | THWN-2/THWN | 2   | #08            | #10           | 3/4" EMT          | 22.40           | 21.78     |             |              |                   |                |            |           |                |             |
|       | 1   | Ground/Neutral Kit; 60-100A, General Duty (DG)                  | AC CONDUCTOR TABLE |             |     |                |               |                   |                 |           |             |              |                   |                |            |           |                |             |
| D     | 1   | Powerwall 3 Expansion Tesla Inc [240V] # 1807000-XX-Y 13.5 kWh  | Ref                | Type        | Qty | Size (AWG)     |               | Min EGC (AWG, Cu) | Conduit         |           |             |              |                   |                |            |           |                | Length (ft) |
|       | 1   | Tesla Powerwall 3 [240V] # 1707000-XX-Y 11.5 kW / 13.5 kWh      |                    |             |     | (Cu)           | (Al)          |                   | (Cu)            | (Al)      |             |              |                   |                |            |           |                |             |
| E     | 2   | JUNCTION BOX, 4 STRING  | 4                  | THWN-2      | 3   | #06            | #04           | #10               | PVC Jacketed MC | 1" EMT    | 5ft         | 48           | 240               |                |            |           |                |             |
| F     | 11  | ASY, MCI-2, 1000V   | 5                  | THWN-2      | 3   | #2/0           | #4/0          | #06               | 2" PVC          | 2" PVC    | 2ft         | -            | 240               |                |            |           |                |             |
| G     | 1   | UL 508 Emergency Stop Device - NEMA 4X                          | 6                  | THWN-2      | 3   | #2/0           | #4/0          | #06               | 2" PVC          | 2" PVC    | 2ft         | -            | 240               |                |            |           |                |             |

| SITE SPECIFICATIONS |                         | MODULE SPECIFICATIONS                     |       |
|---------------------|-------------------------|---|-------|
| Main Panel Rating   | (E) 200A                | Qty                                       | 31    |
| Main Breaker Rating | (E) 200A                |   |       |
| General Notes       | DC Ungrounded Inverters | Voc                                       | 45.37 |
|                     |                         | Vmp                                       | 37.64 |
| Panel Number        | MB816B200BTS            | Isc and Imp are in the DC Conductor Table |       |
| Meter Number        | 185304276               |   |       |
| Service Entrance    | Underground             |   |       |

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JOB NUMBER: JB-283732 00

MOUNTING SYSTEM:  
ZS Comp V4 w Flashing-Insert

MODULES:  
(31) Hanwha Q Cells Q.PEAK DUO BLK ML-G10+/TS 410

INVERTER:  
Tesla Powerwall 3 [240V] # 1707000-XX-Y 11.5 kW / 13.5 kWh

CUSTOMER:  
JEREMIAH FITTS  
72 Rush Ln  
Cameron, NC 28326

2245008980

DESCRIPTION:  
12.71 KW PV ARRAY  
27 KWH ENERGY STORAGE SYSTEM

PAGE NAME:  
THREE LINE DIAGRAM

DESIGN:  
Darinka Orduña

SHEET: 5    REV: A    DATE: 9/1/2025



WARNING: PHOTOVOLTAIC POWER SOURCE

Label Location:  
(C)(CB)(JB)  
Per Code:  
NEC 690.31.G.3  
  
Label Location:  
(DC)(INV)  
Per Code:  
NEC 690.13.B

DC PHOTOVOLTAIC  
DISCONNECT

⚠ WARNING

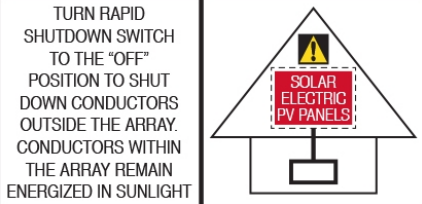
THIS EQUIPMENT FED BY  
MULTIPLE SOURCES. TOTAL  
RATING OF ALL OVER CURRENT  
DEVICES, EXCLUDING MAIN  
SUPPLY OVERCURRENT DEVICE,  
SHALL NOT EXCEED AMPACITY  
OF BUSBAR.

Label Location:  
(MSP)  
Per Code:  
NEC 705.12.B.2.3.C

MAXIMUM POWER-  
POINT CURRENT (Imp)  A  
MAXIMUM POWER-  
POINT VOLTAGE (Vmp)  V  
MAXIMUM SYSTEM  
VOLTAGE (Voc)  V  
SHORT-CIRCUIT  
CURRENT (Isc)  A

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

SOLAR PV SYSTEM  
EQUIPPED WITH RAPID  
SHUTDOWN

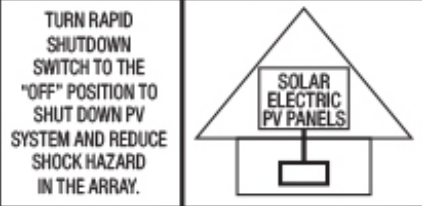


Label Location:  
ABB/Delta Solivia Inverter  
Per Code:  
690.56(C)(1)(b)

AC PHOTOVOLTAIC  
DISCONNECT

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

SOLAR PV SYSTEM  
EQUIPPED WITH RAPID  
SHUTDOWN



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

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 OFF POSITION

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

⚠ WARNING

INVERTER OUTPUT  
CONNECTION  
DO NOT RELOCATE  
THIS OVERCURRENT  
DEVICE

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

(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:  
408.4

CAUTION  
DO NOT ADD NEW LOADS

Label Location:  
(BLC)  
Per Code:  
220

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

Label Location:  
(MSP)  
Per Code:  
312.8.A.3

CAUTION  
DUAL POWER SOURCE  
SECOND SOURCE IS  
ENERGY STORAGE SYSTEM

Label Location:  
(MSP)  
Per Code:  
705.12.B.3

ENERGY STORAGE SYSTEM ON SITE  
LOCATED WITHIN LINE OF SIGHT

Label Location:  
(MSP)  
Per Code:  
706.7.E

ENERGY STORAGE SYSTEM ON SITE  
LOCATED ON ADJACENT WALL

Label Location:  
(MSP)  
Per Code:  
706.7.E

ENERGY STORAGE SYSTEM ON SITE  
LOCATED ON OPPOSITE WALL

Label Location:  
(MSP)  
Per Code:  
706.7.E

ENERGY STORAGE SYSTEM ON SITE  
LOCATED INSIDE

Label Location:  
(MSP)  
Per Code:  
706.7.E

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

Label Location:  
(MSP)  
Per Code:  
705.12.B.3

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:  
(MSP)  
Per Code:  
705.12.B.2.3.c

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

Label Location:  
(MSP)  
Per Code:  
706.7.D (Label to be marked in field per code)

(AC): AC Disconnect  
(BLC): Backup Load Center  
(MSP): Main Service Panel

# Gateway 3

Tesla Gateway 3 controls connection to the grid in a Powerwall system, automatically detecting outages and providing seamless transition to backup power. It provides energy monitoring that is used by Powerwall for solar self-consumption, time-based control, and backup operation.

## Performance Specifications

|                                      |   |                               |  |
|--------------------------------------|---|-------------------------------|--|
| Model Number                         | 1841000-01-y  | AC Meter                      | Revenue accurate (+/- 0.5%)  |
| Nominal Grid Voltage                 | 120/240 V AC  | Communication                 | CAN  |
| Grid Configuration                   | Split phase   | User Interface                | Tesla App  |
| Grid Frequency                       | 60 Hz   | Backup Transition             | Automatic disconnect for seamless backup   |
| Continuous Current Rating            | 200 A   | Overcurrent Protection Device | 100–200 A<br>Service entrance rated Eaton CSR, BWH, or BW, or Square D QOM breakers                  |
| Maximum Supply Short Circuit Current | 22 kA with Square D or Eaton main breaker<br>25 kA with Eaton main breaker <sup>1</sup> | Internal Panelboard           | 200 A<br>8-space/16 circuit breakers Eaton BR, Siemens QP, or Square D HOM breakers rated to 10–125A |
| IEC Protective Class                 | Class I   | Warranty                      | 10 years   |
| Overvoltage Category                 | Category IV   |                               |  |

<sup>1</sup>Only Eaton CSR or BWH main breakers are 25 kA rated

## Environmental Specifications

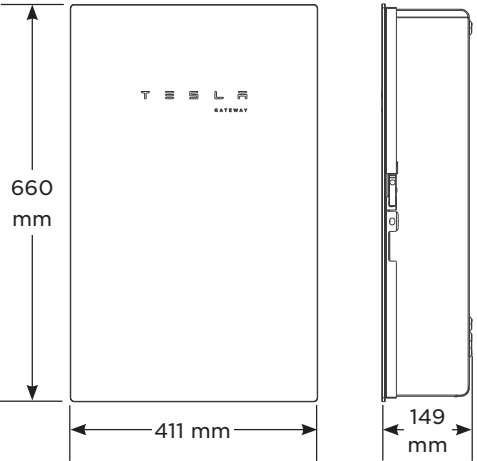
|                         |                               |
|-------------------------|-------------------------------|
| Operating Temperature   | –20°C to 50°C (–4°F to 122°F) |
| Operating Humidity (RH) | Up to 100%, condensing        |
| Maximum Elevation       | 3000 m (9843 ft)              |
|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

## Compliance Information

|                |  |
|----------------|--|
| Certifications | UL 67, UL 869A, UL 916, UL 1741 PCS, CSA 22.2 107.1, CSA 22.2 29 |
| Emmissions     | FCC Part 15, ICES 003  |

## Mechanical Specifications

|                  |  |
|------------------|--|
| Dimensions       | 660 x 411 x 149 mm<br>(26 x 16 x 6 in) |
| Weight           | 16.4 kg (36 lb)                        |
| Mounting options | Wall mount                             |





# Powerwall 3

## Power Everything

Powerwall 3 is a fully integrated solar and battery system, designed to accelerate the transition to sustainable energy. Customers can receive whole home backup, cost savings, and energy independence by producing and consuming their own energy while participating in grid services. Once installed, customers can manage their system using the Tesla App to customize system behavior to meet their energy goals.

Powerwall 3 achieves this by supporting up to 20 kW DC of solar and providing up to 11.5 kW AC of continuous power per unit. It has the ability to start heavy loads rated up to 185 LRA, meaning a single unit can support the power needs of most homes. Powerwall 3 Expansions make it easier and more affordable to scale up customers' systems to meet their current or future needs. Powerwall 3 is designed for fast and efficient installations, modular system expansion, and simple connection to any electrical service.



## Powerwall 3 Technical Specifications

### System Technical Specifications

|  |  |          |           |           |
|--|--|----------|-----------|-----------|
| Model Number   | 1707000-xx-y   |          |           |           |
| Nominal Grid Voltage (Input & Output)  | 120/240 VAC  |          |           |           |
| Grid Type  | Split phase  |          |           |           |
| Frequency  | 60 Hz  |          |           |           |
| Nominal Battery Energy   | 13.5 kWh AC <sub>1</sub>   |          |           |           |
| Nominal Output Power (AC)  | 5.8 kW   | 7.6 kW   | 10 kW     | 11.5 kW   |
| Maximum Apparent Power   | 5,800 VA   | 7,600 VA | 10,000 VA | 11,500 VA |
| Maximum Continuous Current   | 24 A   | 31.7 A   | 41.7 A    | 48 A      |
| Overcurrent Protection Device <sub>2</sub>   | 30 A   | 40 A     | 60 A      | 60 A      |
| Configurable Maximum Continuous Discharge Power Off-Grid (PV Only, -20°C to 25°C)      | 15.4 kW <sub>3</sub>   |          |           |           |
| Maximum Continuous Charge Current / Power (Powerwall 3 only)                           | 20.8 A AC / 5 kW   |          |           |           |
| Maximum Continuous Charge Current / Power (Powerwall 3 with up to (3) Expansion units) | 33.3 A AC / 8 kW   |          |           |           |
| Output Power Factor Rating   | 0 – 1 (Grid Code configurable)   |          |           |           |
| Maximum Output Fault Current (1 s)   | 160 A  |          |           |           |
| Maximum Short-Circuit Current Rating   | 10 kA  |          |           |           |
| Load Start Capability  | 185 LRA  |          |           |           |
| Solar to Battery to Home/Grid Efficiency   | 89% <sup>1,4</sup>   |          |           |           |
| Solar to Home/Grid Efficiency  | 97.5% <sup>5</sup>   |          |           |           |
| Power Scalability  | Up to 4 Powerwall 3 units supported  |          |           |           |
| Energy Scalability   | Up to 3 Expansion units (for a maximum total of 7 units)   |          |           |           |
| Supported Islanding Devices  | Gateway 3, Backup Switch, Backup Gateway 2   |          |           |           |
| Connectivity   | Wi-Fi (2.4 and 5 GHz), Ethernet, Cellular (LTE/4G <sub>e</sub> )   |          |           |           |
| Hardware Interface   | Dry contact relay, Rapid Shutdown (RSD) certified switch and 2-pin connector, RS-485 for meters  |          |           |           |
| AC Metering  | Revenue Grade (+/- 0.5%, ANSI C12.20)  |          |           |           |
| Protections  | Integrated arc fault circuit interrupter (AFCI), Isolation Monitor Interrupter (IMI), PV Rapid Shutdown (RSD) using Tesla Mid-Circuit Interrupters |          |           |           |
| Customer Interface   | Tesla Mobile App   |          |           |           |
| Warranty   | 10 years   |          |           |           |

<sup>1</sup>Values provided for 25°C (77°F), at beginning of life. 3.3 kW charge/discharge power.

<sup>2</sup>See [Powerwall 3 Installation Manual](#) for fuse requirements if using fuse for overcurrent protection.

<sup>3</sup>If enabling the 15.4 kW off-grid maximum continuous discharge power, Powerwall 3 must be installed with an 80 A breaker and appropriately sized conductors.

<sup>4</sup>Typical solar shifting use case.

<sup>5</sup>Tested using CEC weighted efficiency methodology.

<sup>6</sup>The customer is expected to provide internet connectivity for Powerwall 3; cellular should not be used as the primary mode of connectivity. Cellular connectivity subject to network operator service coverage and signal strength.

# Powerwall 3 Technical Specifications

|   |   |                   |
|---|---|-------------------|
| Solar Technical Specifications  | Maximum Solar STC Input                                   | 20 kW             |
|   | Withstand Voltage   | 600 V DC          |
|   | PV DC Input Voltage Range                                 | 60 — 550 V DC     |
|   | PV DC MPPT Voltage Range                                  | 60 — 480 V DC     |
|   | MPPTs   | 6                 |
|   | Maximum Current per MPPT (I <sub>mp</sub> )               | 13 A <sup>7</sup> |
|   | Maximum Short Circuit Current per MPPT (I <sub>sc</sub> ) | 15 A <sup>7</sup> |
| <sup>7</sup> Where the DC input current exceeds the MPPT rating, a jumper can be used to combine two MPPTs into a single input to intake DC current up to 26 A I <sub>MP</sub> / 30 A I <sub>SC</sub> . |   |                   |

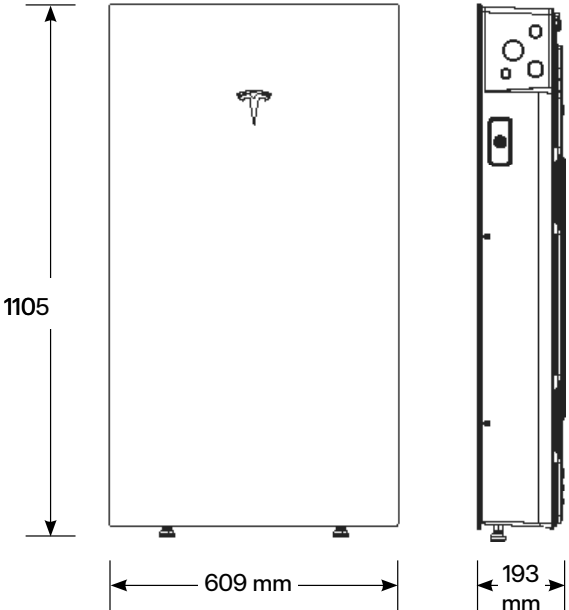
|  |                         |  |
|--|-------------------------|--|
| Environmental Specifications   | Operating Temperature   | −20°C to 50°C (−4°F to 122°F) <sup>8</sup>   |
|  | Operating Humidity (RH) | Up to 100%, condensing   |
|  | Storage Temperature     | −20°C to 30°C (−4°F to 86°F), up to 95% RH, non-condensing, State of Energy (SOE): 25% initial |
|  | Maximum Elevation       | 3000 m (9843 ft)   |
|  | Environment             | Indoor and outdoor rated   |
|  | Enclosure Rating        | NEMA 3R  |
|  | Ingress Rating          | IP67 (Battery & Power Electronics)<br>IP55 (Wiring Compartment)                                |
|  | Pollution Rating        | PD3  |
|  | Operating Noise @ 1 m   | < 50 db(A) typical<br>< 62 db(A) maximum   |
| <sup>8</sup> Performance may be de-rated at operating temperatures above 40°C (104°F). |                         |  |

|                        |                 |  |
|------------------------|-----------------|--|
| Compliance Information | Certifications  | UL 1741, UL 9540, UL 9540A, UL 3741, UL 1741 PCS, UL 1741 SA, UL 1741 SB, UL 1973, UL 1699B, UL 1998, CSA C22.2 No. 0.8, CSA C22.2 No. 107.1, CSA C22.2 No. 330, CSA 22.3 No. 9, IEEE 1547, IEEE 1547A, IEEE 1547.1, CA Rule No.21 |
|                        | Grid Connection | United States and Canada   |
|                        | Emissions       | FCC Part 15 Class B, ICES 003  |
|                        | Environmental   | RoHS Directive 2011/65/EU  |
|                        | Seismic         | AC156, IEEE 693-2005 (high)  |
|                        | Fire Testing    | Meets the unit level performance criteria of UL 9540A  |

# Powerwall 3 Technical Specifications

|                           |                                |   |
|---------------------------|--------------------------------|---|
| Mechanical Specifications | Dimensions                     | 1105 x 609 x 193 mm (43.5 x 24 x 7.6 in) <sup>9</sup> |
|                           | Total Weight of Installed Unit | 132 kg (291.2 lb)                                     |
|                           | Weight of Powerwall 3          | 124 kg (272.5 lb)                                     |
|                           | Weight of Glass Front Cover    | 6.5 kg (14.5 lb)                                      |
|                           | Weight of Wall Bracket         | 1.9 kg (4.2 lb)                                       |
| Mounting Options          |                                | Floor or wall mount                                   |

<sup>9</sup> These dimensions include the glass front cover being installed on Powerwall 3.



# Powerwall 3 Expansion Technical Specifications

## Battery Technical Specifications

|                        |                            |
|------------------------|----------------------------|
| Model Number           | 1807000-xx-y               |
| Nominal Battery Energy | 13.5 kWh                   |
| Voltage Range          | 52 – 92 V DC <sup>11</sup> |

<sup>11</sup>Powerwall 3 Expansion units are connected in parallel and are not field serviceable.

## Environmental Specifications

|                         |  |
|-------------------------|--|
| Operating Temperature   | –20°C to 50°C (–4°F to 122°F) <sup>12</sup>  |
| Operating Humidity (RH) | Up to 100%, condensing   |
| Storage Temperature     | –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 Rating        | NEMA 3R  |
| Ingress Rating          | IP67   |
| Pollution Rating        | PD3  |

<sup>12</sup>Performance may be de-rated at operating temperatures above 40°C (104°F).

## Compliance Information

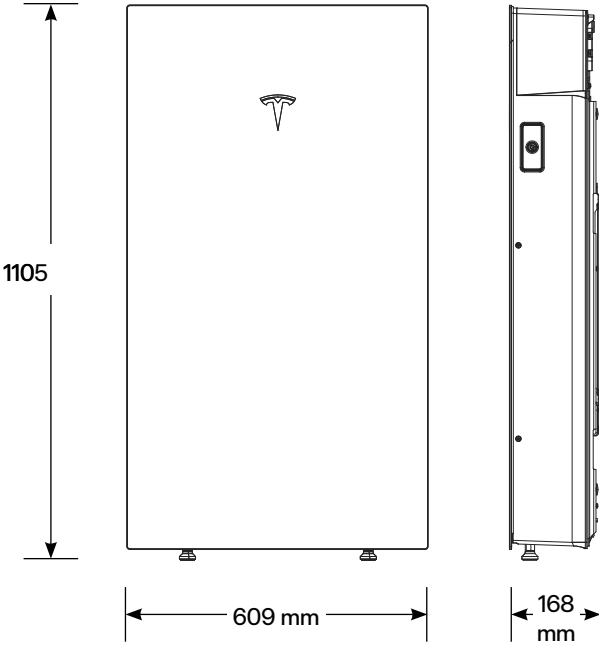
|                |                  |
|----------------|------------------|
| Certifications | UL 1973, UL 9540 |
|----------------|------------------|

## Mechanical Specifications

|   |  |
|---|--|
| Dimensions                                  | 1105 x 609 x 168 mm (43.5 x 24 x 6.6 in) <sup>13</sup> |
| Total Weight of Wall-Mounted Expansion Unit | 118.5 kg (261.2 lb)                                    |
| Weight of Expansion Unit                    | 110 kg (242.5 lb)                                      |
| Weight of Glass Front Cover                 | 6.5 kg (14.5 lb)                                       |
| Weight of Wall Bracket                      | 1.9 kg (4.2 lb)  |
| Weight of Expansion Accessories             | 0.7 kg (1.5 lb)  |
| Mounting Options                            | Floor or wall mount                                    |
| Stacking Capability (Floor Mount Only)      | Up to (3) Expansion units behind a Powerwall 3         |
| Compatibility with Other Systems            | Only compatible with Powerwall 3                       |
| Connection to Powerwall 3 or Expansions     | Powerwall 3 Expansion harness <sup>14</sup>            |

<sup>13</sup>These dimensions include the glass front cover being installed on Powerwall 3 Expansion.

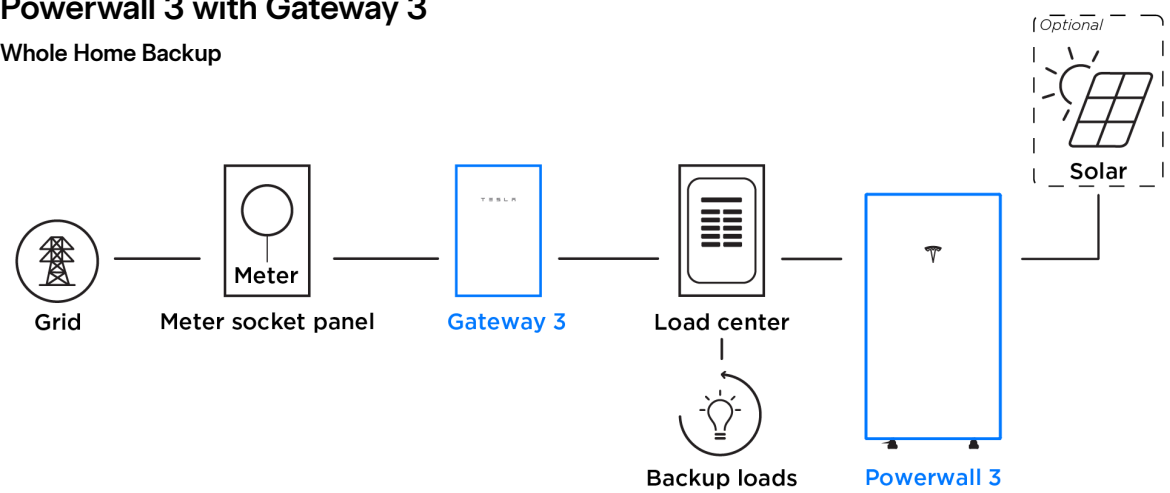
<sup>14</sup>The Powerwall 3 Expansion harness is a listed component of the UL 9540 certification.



# Powerwall 3 Example System Configurations

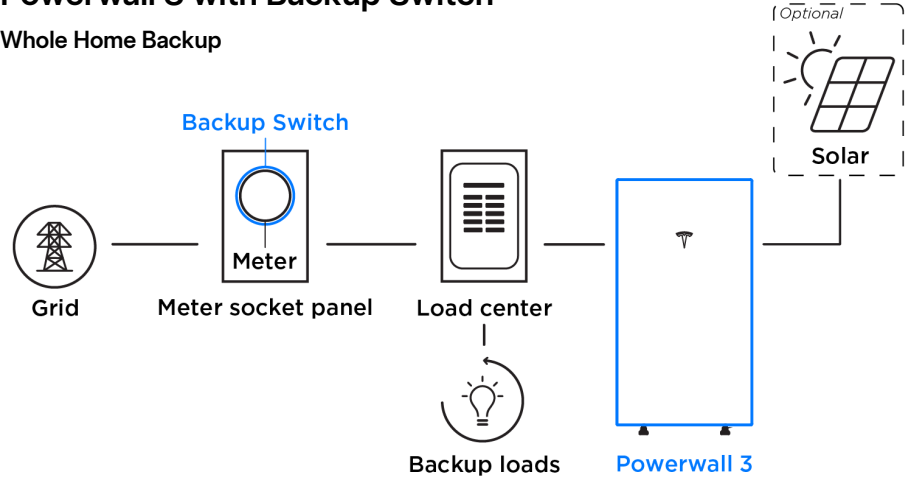
## Powerwall 3 with Gateway 3

Whole Home Backup



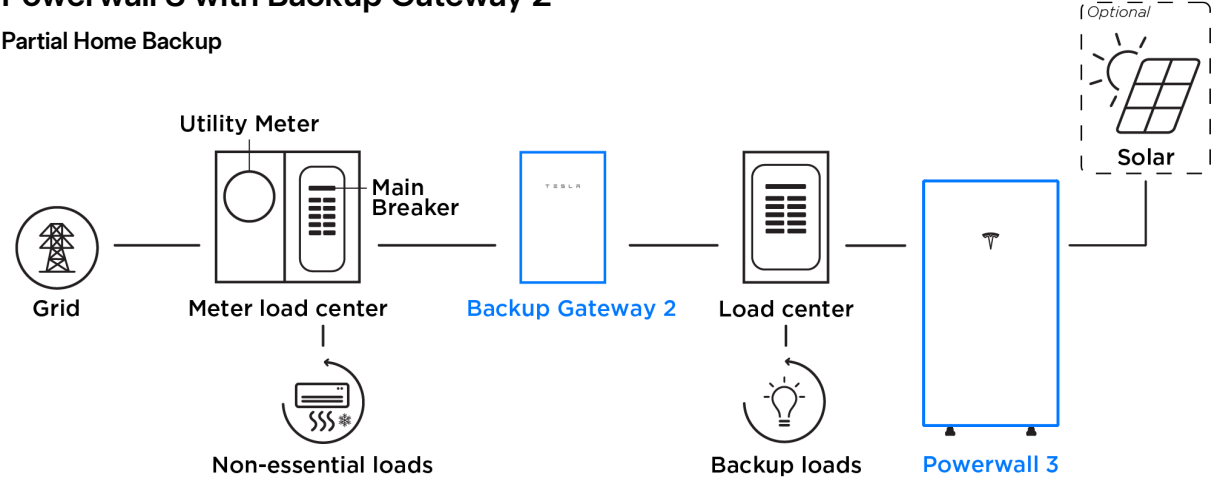
## Powerwall 3 with Backup Switch

Whole Home Backup



## Powerwall 3 with Backup Gateway 2

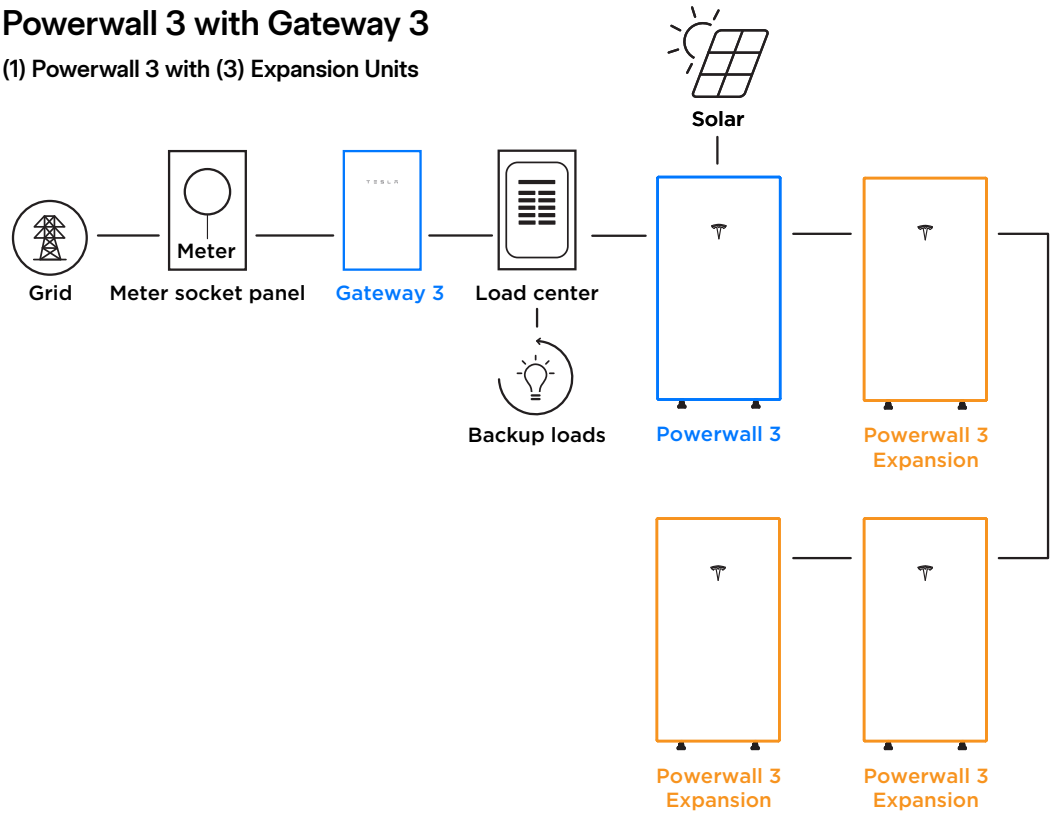
Partial Home Backup



# Powerwall 3 Example System Configurations

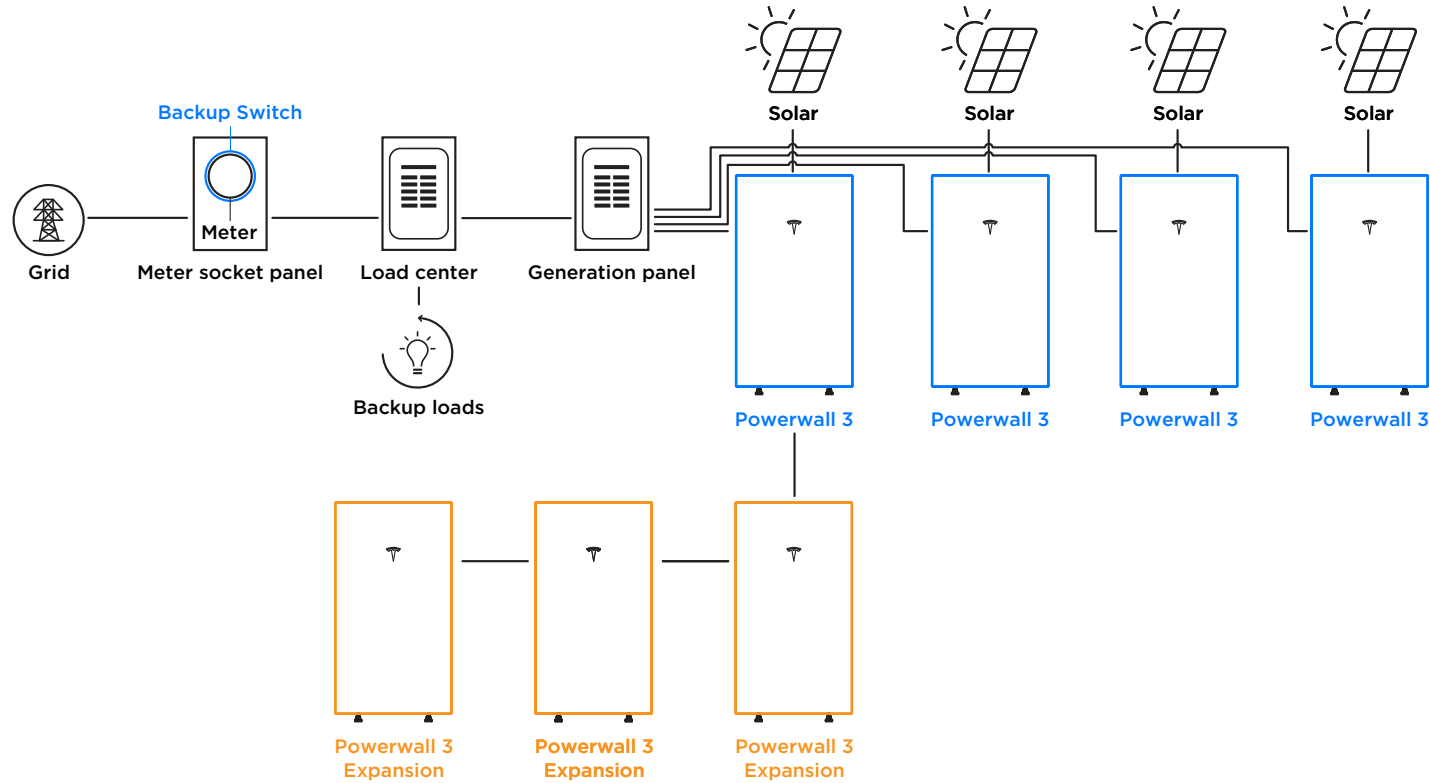
## Powerwall 3 with Gateway 3

(1) Powerwall 3 with (3) Expansion Units



## Powerwall 3 with Backup Switch

(4) Powerwall 3 Units with (3) Expansion Units (Maximum System Size)



# Q.PEAK DUO BLK ML-G10+ SERIES

385-415 Wp | 132 Cells  
21.0% Maximum Module Efficiency



MODEL Q.PEAK DUO BLK ML-G10+/TS



**Breaking the 21 % efficiency barrier**  
Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 21.0 %.



**A reliable investment**  
Inclusive 25-year product warranty and 25-year linear performance warranty<sup>1</sup>.



**Enduring high performance**  
Long-term yield security with Anti LeTID Technology, Anti PID Technology<sup>2</sup> and Hot-Spot Protect.



**Innovative all-weather technology**  
Optimal yields, whatever the weather with excellent low-light and temperature behaviour.



**Zep compatible™ frame design**  
High-tech black Zep Compatible™ frame, for improved aesthetics, easy installation and increased safety.



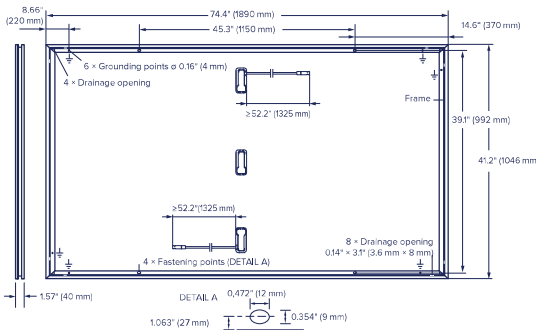
**The most thorough testing programme in the industry**  
Qcells is the first solar module manufacturer to pass the most comprehensive quality programme in the industry: The new “Quality Controlled PV” of the independent certification institute TÜV Rheinland.

<sup>1</sup> See data sheet on rear for further information.  
<sup>2</sup> APT test conditions according to IEC / TS 62804-1:2015, method A (–1500V, 96 h)

## Q.PEAK DUO BLK ML-G10+ SERIES

### Mechanical Specification

|              |   |
|--------------|---|
| Format       | 74.4 in × 41.2 in × 1.57 in (including frame)<br>(1890 mm × 1046 mm × 40 mm)                              |
| Weight       | 51.8 lbs (23.5 kg)  |
| Front Cover  | 0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology                             |
| Back Cover   | Composite film  |
| Frame        | Black anodised aluminium  |
| Cell         | 6 × 22 monocrystalline Q.ANTUM solar half cells   |
| Junction box | 2.09-3.98 in × 1.26-2.36 in × 0.59-0.71 in<br>(53-101 mm × 32-60 mm × 15-18 mm), IP67, with bypass diodes |
| Cable        | 4 mm <sup>2</sup> Solar cable; (+) ≥ 52.2 in (1325 mm), (–) ≥ 52.2 in (1325 mm)                           |
| Connector    | Stäubli MC4; IP68   |

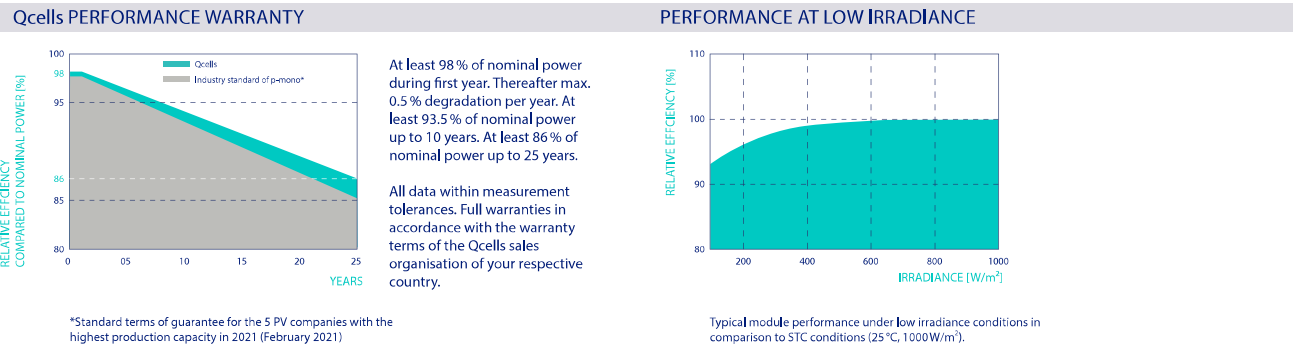


### Electrical Characteristics

| POWER CLASS   |                                    | 385              | 390 | 395    | 400    | 405    | 410    | 415    |
|---|------------------------------------|------------------|-----|--------|--------|--------|--------|--------|
| MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC <sup>1</sup> (POWER TOLERANCE +5 W / –0 W) |                                    |                  |     |        |        |        |        |        |
| Minimum   | Power at MPP <sup>1</sup>          | P <sub>MPP</sub> | [W] | 385    | 390    | 395    | 400    | 415    |
|   | Short Circuit Current <sup>1</sup> | I <sub>SC</sub>  | [A] | 11.04  | 11.07  | 11.10  | 11.14  | 11.23  |
|   | Open Circuit Voltage <sup>1</sup>  | V <sub>OC</sub>  | [V] | 45.19  | 45.23  | 45.27  | 45.3   | 45.41  |
|   | Current at MPP                     | I <sub>MPP</sub> | [A] | 10.59  | 10.65  | 10.71  | 10.77  | 10.95  |
|   | Voltage at MPP                     | V <sub>MPP</sub> | [V] | 36.36  | 36.62  | 36.88  | 37.13  | 37.89  |
| Efficiency <sup>1</sup>   |                                    | η                | [%] | ≥ 19.5 | ≥ 19.7 | ≥ 20.0 | ≥ 20.2 | ≥ 21.0 |

|   |                       |                  |     |       |       |       |       |       |
|---|-----------------------|------------------|-----|-------|-------|-------|-------|-------|
| MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT <sup>2</sup> |                       |                  |     |       |       |       |       |       |
| Minimum   | Power at MPP          | P <sub>MPP</sub> | [W] | 288.8 | 292.6 | 296.3 | 300.1 | 311.3 |
|   | Short Circuit Current | I <sub>SC</sub>  | [A] | 8.90  | 8.92  | 8.95  | 8.97  | 9.05  |
|   | Open Circuit Voltage  | V <sub>OC</sub>  | [V] | 42.62 | 42.65 | 42.69 | 42.72 | 42.83 |
|   | Current at MPP        | I <sub>MPP</sub> | [A] | 8.35  | 8.41  | 8.46  | 8.51  | 8.68  |
|   | Voltage at MPP        | V <sub>MPP</sub> | [V] | 34.59 | 34.81 | 35.03 | 35.25 | 35.89 |

<sup>1</sup>Measurement tolerances P<sub>MPP</sub> ± 3 %; I<sub>SC</sub>·V<sub>OC</sub> ± 5 % at STC: 1000 W/m<sup>2</sup>, 25 ± 2 °C, AM 1.5 according to IEC 60904-3 · <sup>2</sup>800 W/m<sup>2</sup>, NMOT, spectrum AM 1.5



| TEMPERATURE COEFFICIENTS                    |   |         |       |  |      |         |                          |
|---|---|---------|-------|--|------|---------|--------------------------|
| Temperature Coefficient of I <sub>SC</sub>  | α | [% / K] | +0.04 | Temperature Coefficient of V <sub>OC</sub> | β    | [% / K] | −0.27                    |
| Temperature Coefficient of P <sub>MPP</sub> | γ | [% / K] | −0.34 | Nominal Module Operating Temperature       | NMOT | [°F]    | 109 ± 5.4<br>(43 ± 3 °C) |

### Properties for System Design

|  |                  |                          |                               |   |   |
|--|------------------|--------------------------|-------------------------------|---|---|
| Maximum System Voltage                     | V <sub>sys</sub> | [V]                      | 1000 (IEC) / 1000 (UL)        | PV module classification                        | Class II                                      |
| Maximum Series Fuse Rating                 |                  | [A DC]                   | 20                            | Fire Rating based on ANSI / UL 61730            | TYPE 2  |
| Max. Design Load, Push / Pull <sup>3</sup> |                  | [lbs / ft <sup>2</sup> ] | 85 (4080 Pa) / 85 (4080 Pa)   | Permitted Module Temperature on Continuous Duty | –40 °F up to +185 °F<br>(–40 °C up to +85 °C) |
| Max. Test Load, Push / Pull <sup>3</sup>   |                  | [lbs / ft <sup>2</sup> ] | 128 (6120 Pa) / 128 (6120 Pa) |   |   |

<sup>3</sup> See Installation Manual

### Qualifications and Certificates

UL61730-1 & UL61730-2, CE-compliant,  
Quality Controlled PV – TÜV Rheinland,  
IEC 61215:2016, IEC 61730:2016,  
U.S. Patent No. 9,893,215 (solar cells),



\*Contact your Qcells Sales Representative for details regarding the module's eligibility to be Buy American Act (BAA) compliant.

Qcells pursues minimizing paper output in consideration of the global environment.  
Note: Installation instructions must be followed. Contact our technical service for further information on approved installation of this product.  
Hanwha Q CELLS America Inc. 400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | TEL +1 949 748 59 96 | EMAIL hqc-inquiry@qcells.com | WEB www.qcells.com





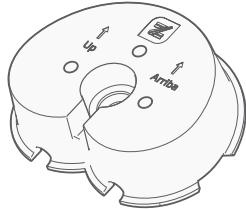
# ROOFING SYSTEM SPECIFICATIONS



|  |  |
|--|--|
| DESCRIPTION  | PV mounting solution for composition shingle roofs.  |
|  | Works with all Zep Compatible Modules.   |
|  | Auto bonding UL-listed hardware creates structural and electrical bond.  |
| SPECIFICATIONS   | Designed for pitched roofs.  |
|  | Installs in portrait and landscape orientations.   |
|  | Engineered for spans up to 72” and cantilevers up to 24”.  |
|  | ZS Comp has a UL 1703 Class “A” Fire Rating when installed using modules from any manufacturer certified as “Type 1” or “Type 2”.            |
|  | Attachment method UL listed to UL 2582 for Wind Driven Rain.   |
|  | ZS Comp supports 50 psf (2400 Pa) front and up to 72 psf (3450 Pa) rear side design load rating for Portrait module orientation per UL 2703. |
|  | ZS Comp supports 50 psf (2400 Pa) front side and up to 72 psf (3450 Pa) rear side design load rating for Landscape module orientation.       |
|  | Engineered for compliance with ASCE 7-05, 7-10, 7-16, and 7-22 wind load requirements.   |
| Zep wire management products listed to UL 1565 for wire positioning devices. |  |
| ZS Comp grounding products are listed to UL 2703 and UL 467.                 |  |
| ZS Comp bonding products are listed to UL 2703.                              |  |

MOUNTING BLOCK

Listed to UL 2703  
Part #850-1633



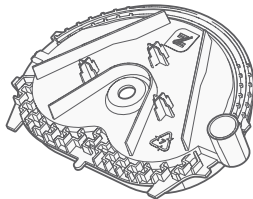
CAPTURED WASHER LAG

Part #850-1631-002 and #850-1631-004



FLASHING INSERT

Listed to UL 2703 and UL 2582 for Wind Driven Rain  
Part #850-1628



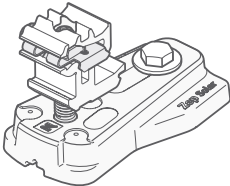
GROUND ZEP

Listed to UL 2703  
Part #850-1511



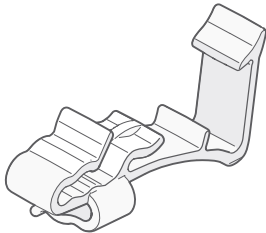
LEVELING FOOT

Listed to UL 2703  
Part #850-1397



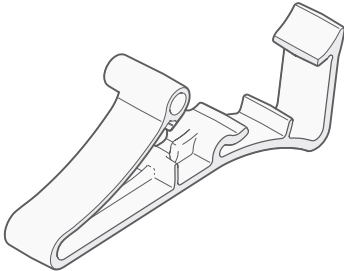
DC WIRE CLIP

Listed to UL 1565  
Part #850-1509



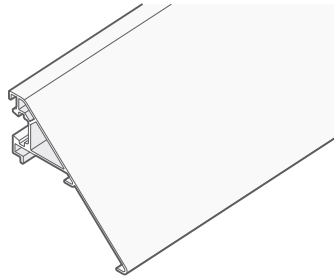
HOME RUN CLIP

Listed to UL 1565  
Part #850-1510



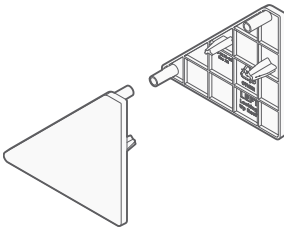
ARRAY SKIRT

Listed to UL 2703  
Part #850-1608



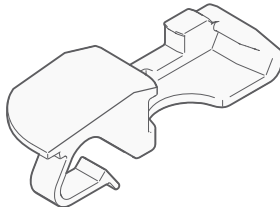
END CAP

Listed to UL 2703  
Part #850-1586 (Left)  
Part #850-1588 (Right)



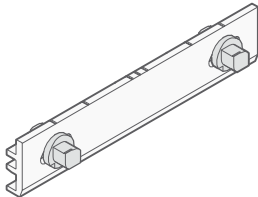
SKIRT GRIP

Listed to UL 2703  
Part #850-1606



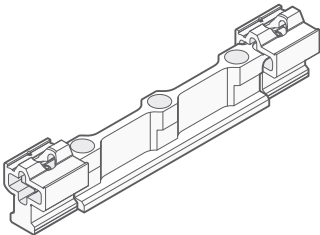
INTERLOCK

Listed to UL 2703  
Part #850-1613



HYBRID INTERLOCK

Listed to UL 2703  
Part #850-1281



# MCI WIRING DETAIL



## GENERAL NOTES

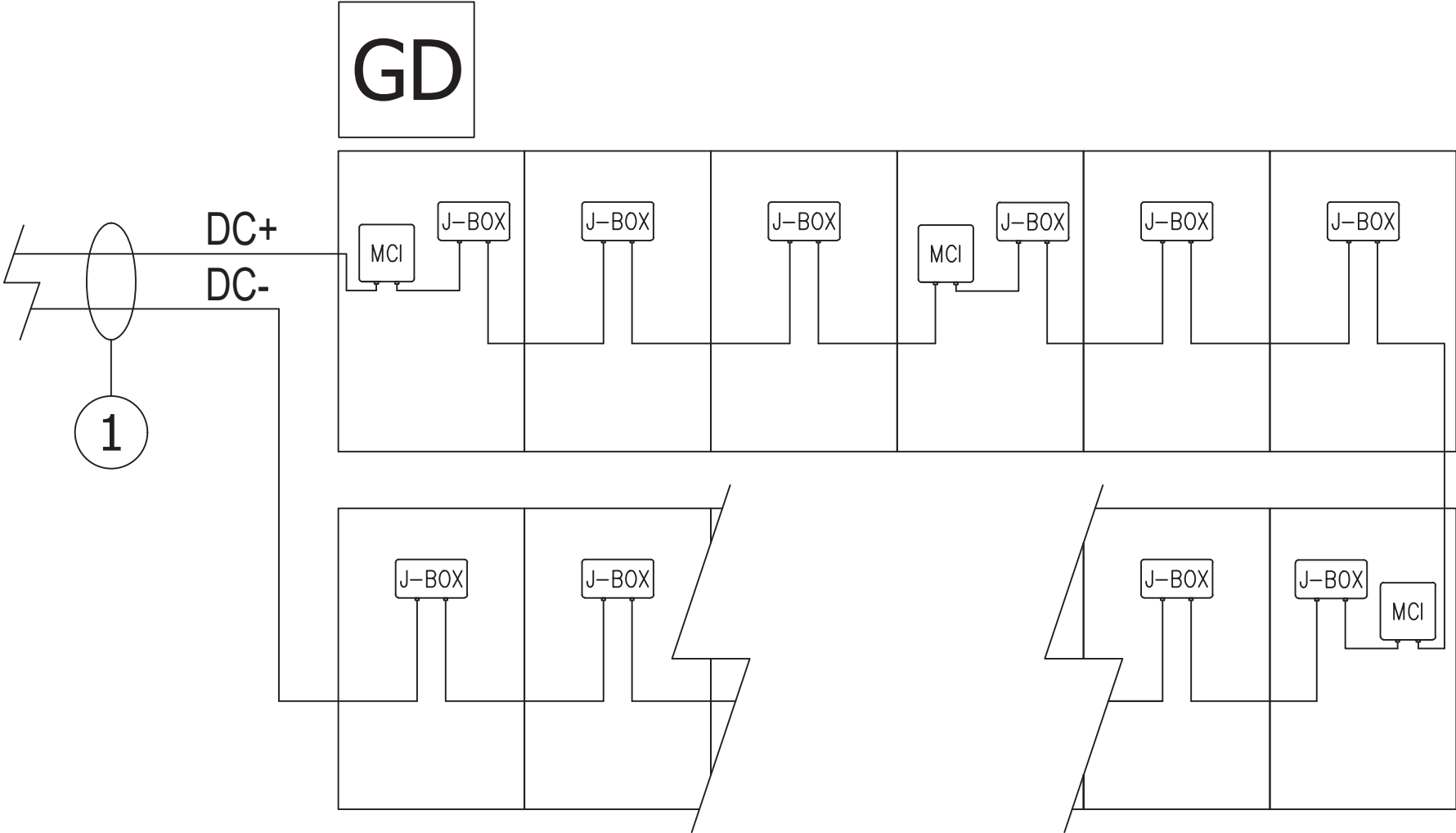
- DRAWING OF STANDARD MCI WIRING DETAIL FOR ANY GIVEN STRING LENGTH
- IF INITIATED, RAPID SHUTDOWN OCCURS WITHIN 30 SECONDS OF ACTIVATION AND LIMITS VOLTAGE ON THE ROOF TO NO GREATER THAN 165V (690.12.B.2.1)
- MID CIRCUIT INTERRUPTER (MCI) IS A UL 1741 PVRSE CERTIFIED RAPID SHUTDOWN DEVICE (RSD)

## RETROFIT PV MODULES

- MCIS ARE LOCATED AT ROOF LEVEL, JUST UNDER THE PV MODULES IN ACCORDANCE WITH 690.12 REQUIREMENTS
- THE QUANTITY OF MCIS PER STRING IS DETERMINED BY STRING LENGTH
  - NUMBER OF MODULES BETWEEN MCI UNITS = 0–3
  - MAXIMUM NUMBER OF MODULES PER MCI UNIT = 3
  - MINIMUM NUMBER MCI UNITS = MODULE COUNT/3

\*Exception: Tesla (Longi) modules installed in locations where the max Voc for 3 modules at low design temperature exceeds 165V shall be limited to 2 modules between MCIs.

PLEASE REFER TO MCI CUTSHEET AND PVRSA INSERT FOR MORE INFORMATION



① (2) AWG, PV Wire, 600V, Black

DC

# Solar Shutdown Device 2 Technical Specifications

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

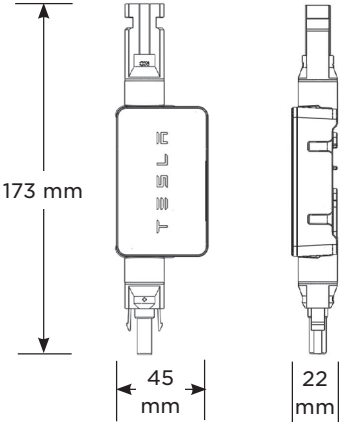
|                           |  |           |
|---------------------------|--|-----------|
| Electrical Specifications | Nominal Input DC Current Rating ( $I_{MP}$ )     | 13 A      |
|                           | Maximum Input Short Circuit Current ( $I_{SC}$ ) | 17 A      |
|                           | Maximum System Voltage (PVHCS)                   | 1000 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              |

|                              |                     |                                |
|------------------------------|---------------------|--------------------------------|
| Environmental Specifications | Ambient Temperature | -45°C to 70°C (-49°F to 158°F) |
|                              | Enclosure Rating    | NEMA 4X / IP65                 |

|                        |                       |   |
|------------------------|-----------------------|---|
| Compliance Information | Certifications        | UL 1741 PVRSE, UL 3741, PVRSA (Photovoltaic Rapid Shutdown Array) |
|                        | RSD Initiation Method | PV System AC Breaker or Switch                                    |
|                        | Compatible Equipment  | See Compatibility Table below                                     |

|                           |                        |  |
|---------------------------|------------------------|--|
| Mechanical Specifications | Model Number           | MCI-2                                    |
|                           | Electrical Connections | MC4 Connector                            |
|                           | Housing                | Plastic                                  |
|                           | Dimensions             | 173 x 45 x 22 mm<br>(6.8 x 1.8 x 0.9 in) |
|                           | Weight                 | 120 g (0.26 lb)                          |



## UL 3741 PV Hazard Control (and PVRSA) Compatibility

Tesla Solar Roof and Tesla/Zep ZS Arrays using the following modules are certified to UL 3741 and UL 1741 PVRSA when installed with Powerwall+ or Tesla Solar Inverter and Solar Shutdown Devices. See [Powerwall+ / Tesla Solar Inverter Rapid Shutdown: Module Selection Based on PV Hazard Control System Listing](#) for guidance on installing other modules.

| Brand  | Model  | Required Solar Shutdown Devices                    |
|--------|--|--|
| Tesla  | Solar Roof V3  | 1 Solar Shutdown Device per 10 modules             |
| Tesla  | Tesla TxxxS (where xxx = 405 to 450 W, increments of 5)<br>Tesla TxxxH (where xxx = 395 to 415 W, increments of 5) | 1 Solar Shutdown Device per 3 modules <sup>1</sup> |
| Hanwha | Q.PEAK DUO BLK-G5 or Q.PEAK DUO BLK-G6+  | 1 Solar Shutdown Device per 3 modules              |

<sup>1</sup>Exception: Tesla solar modules installed in locations where the max Voc for three modules at low design temperatures exceeds 165 V shall be limited to two modules between Solar Shutdown Devices.