



# FRAME MLPE MOUNT

## INSTALLATION GUIDE

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**VERSION:** v2.6

# FRAME MLPE MOUNT

## INSTALLATION GUIDE

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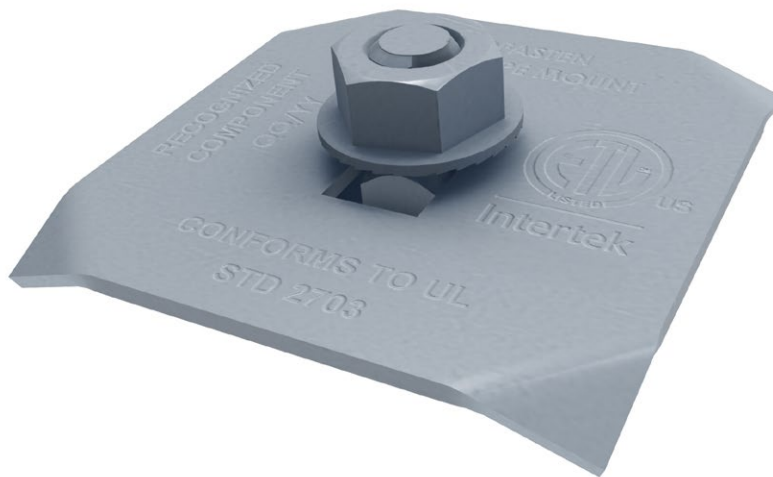
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## FRAME MLPE MOUNT

The Frame MLPE Mount is used to mount module level power electronics (MLPE) to standard PV module frames. The Frame MLPE Mount provides a mounting option for the MLPE device to the module frame with any PV Racking system. The Frame MLPE Mount is used to mount and bond an MLPE to a PV module that complies with UL 1703 or UL 61730 when used with a MLPE and PV module that has been evaluated for bonding and/or mounting in compliance with the instructions provided.

INTRODUCTION

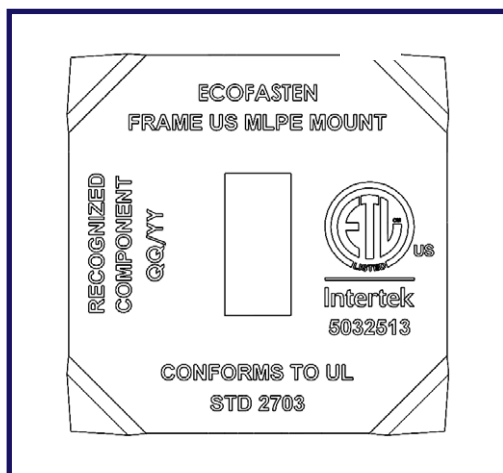
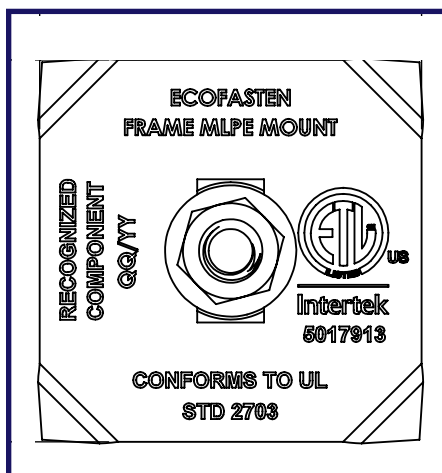
# FRAME MLPE MOUNT

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### UL 2703 MARKING EXAMPLE:


 RECOGNIZED  
COMPONENT

**Intertek**

 5017913  
5032513

|                                                             |                                  |
|-------------------------------------------------------------|----------------------------------|
| <b>Max System Voltage</b>                                   | 1500 V                           |
| <b>Max Fuse Rating</b>                                      | 40A                              |
| <b>Certification</b>                                        | Conforms to UL STD 2703          |
| <b>Warranty</b>                                             | 25 Year Material and Workmanship |
| <b>Module Orientation</b>                                   | Portrait or Landscape            |
| <b>Multiple use Rated Components (Position Independent)</b> | Frame MLPE Mount                 |
| <b>Torque Value</b>                                         | 144 in-lbs                       |

### INSTALLER RESPONSIBILITIES

The Frame MLPE Mount bonds the Module Level Power Electronic device with a 300 series stainless steel bonding plate. The module frame must be grounded by a UL 2703 racking system. The system is to be installed in accordance with the latest National Electrical Code, ANSI/NFPA 70. Any local electrical codes must be adhered in addition to the national electrical codes.

Installer must review module and any third-party manufacturer's documentation for compatibility and compliance with warranty terms and conditions.

Periodic reinspection of components shall be performed to verify that there is no corrosion detrimental to system strength and electrical conductivity, no loose bolts, and/or other variables that could compromise array safety. Any corroded or damaged components shall be immediately replaced.

RATINGS

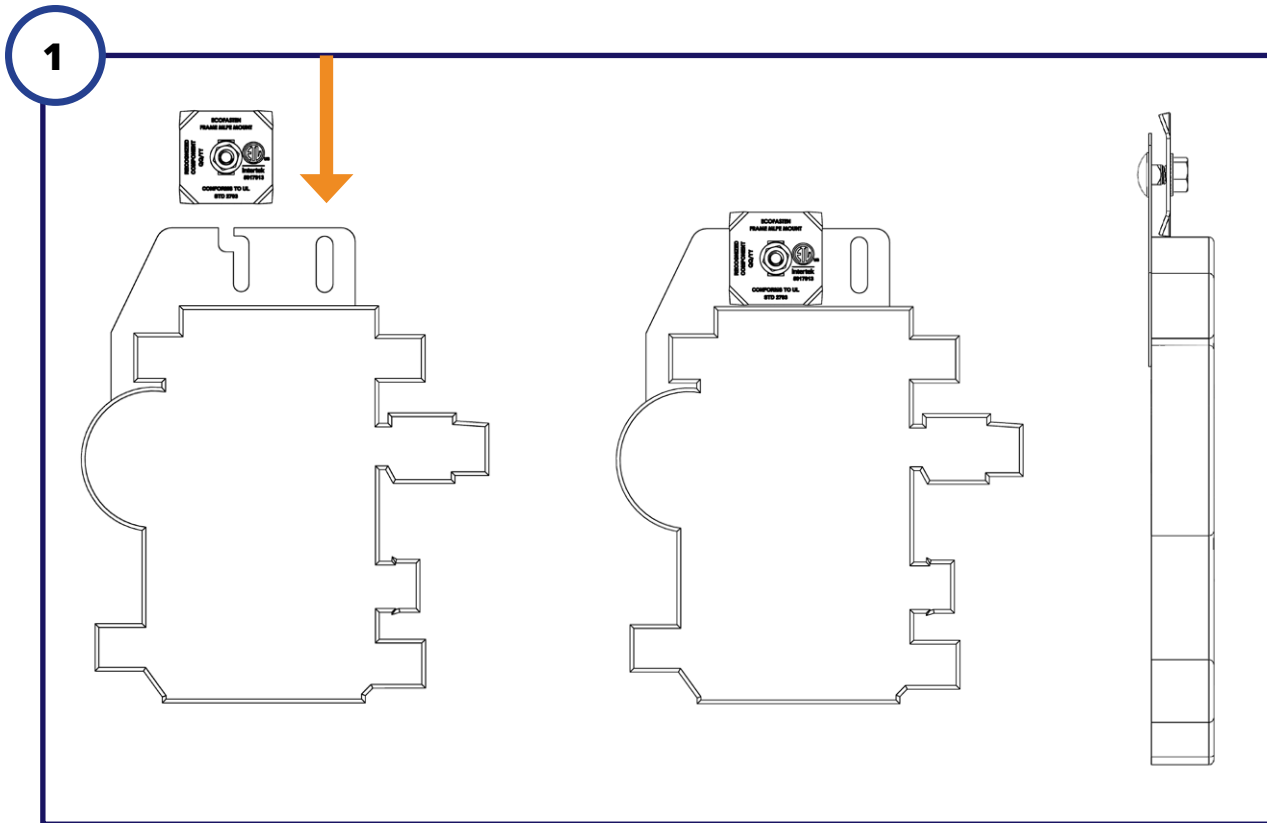
# FRAME MLPE MOUNT

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## INSTALLING THE FRAME MLPE MOUNT



- 1 Insert the Frame MLPE Mount into the flange of the micro inverter/power optimizer with the bolt facing away from the panel.
- 2 Slide the micro inverter/power optimizer and the Frame MLPE Mount towards the panel

**INSTALLATION**

# FRAME MLPE MOUNT

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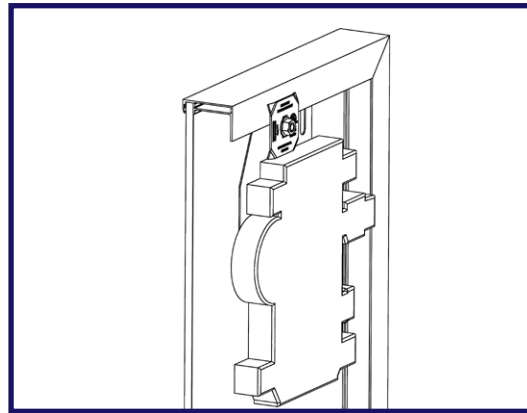
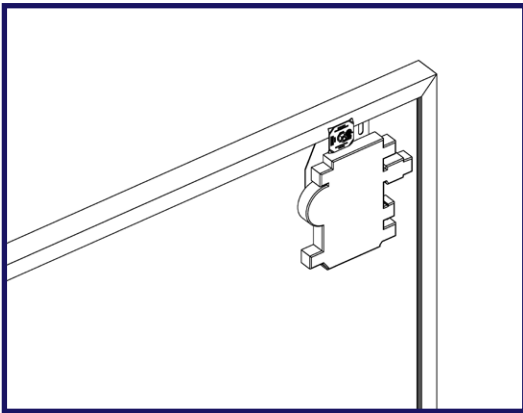
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## INSTALLING THE FRAME MLPE MOUNT

**2A**

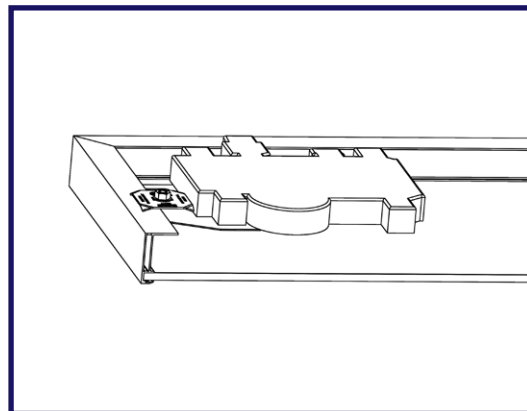
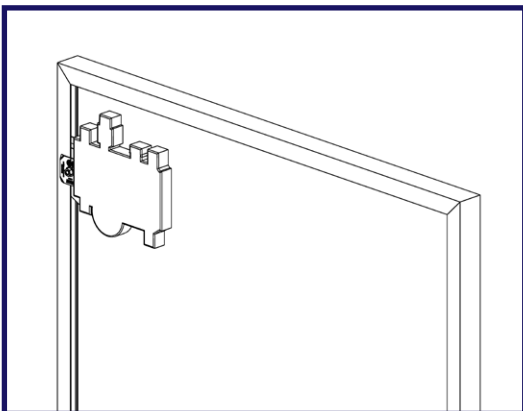
### LANDSCAPE MODULES

Slide the micro-inverter/power optimizer and the Frame MLPE Mount on to the top-right corner on the short side of the module frame. The flange of the micro inverter should be behind the module frame and the Frame MLPE Mount on the outer part of the module frame.

**2B**

### PORTRAIT MODULES

Slide the micro-inverter/power optimizer and the Frame MLPE Mount on to the top-left corner on the long side of the module frame. The flange of the micro inverter should be behind the module frame and the Frame MLPE Mount on the outer part of the module frame.



INSTALLATION

# FRAME MLPE MOUNT

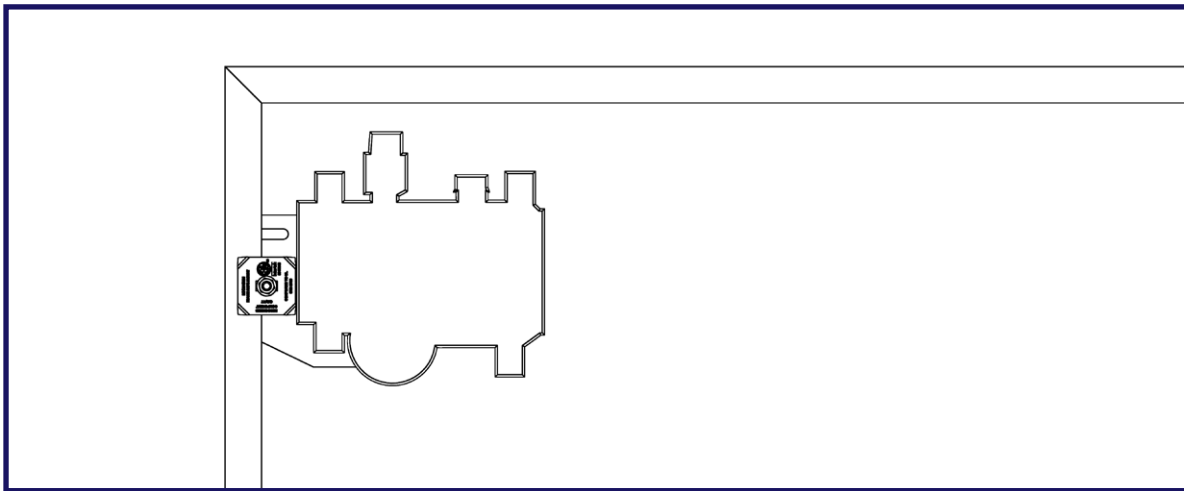
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## INSTALLING THE FRAME MLPE MOUNT

- 3 Tighten the bolt to 144 in-lbs to clamp the Frame MLPE Mount and micro-inverter/ power optimizer to the module frame.



## COMPATIBILITY

### THE FRAME MLPE MOUNT IS COMPATIBLE WITH THE FOLLOWING MLPE DEVICES:

- **DURACELL:** D350-M1, D350-M1A-xxx, D400-M1A-xxx, D600-M2A-xxx, D700-M2, D800-M2A-xxx, D1500-M4  
Where “xxx” can be blank, 208A or 240
- **ENPHASE:** M250-72, 250-60, M215-60, C250-72, S230, S280, IQ 6, IQ 6+, IQ7, IQ 7A, IQ 7+, IQ7 PD, IQ 7X, Q Aggregator; IQ8-60, IQ8PLUS-72, IQ8A-72, IQ8H-208-72, IQ8H-240-72, IQ8M-72, may be followed by -2-US
- **HOYMILES:** HMA-xxxYY-ZZ where “A” can be blank or S, xxx can be 300, 350, 400, 450, 500, 600, 700, 800, 900, 1000, 1200, 1500, 1600, 1800 or 2000; “YY” can be NT, 1T, 2T, 4T; and “ZZ” can be blank, NA or 208-NA
- **LUNAR ENERGY:** Maximizer
- **NEP:** NEP Microinverters: BDM-xxx-yyy Where “xxx” can be 300, 300X2, 350, 400, 500, 550, 650, 800, 1000; and “yyy” can be blank, 208A or 240A  
NEP Rapid Shutdown: PVG-1, PVG-2, PVG-3, PVG-4
- **SOLAREEDGE:** C651U, C652U, M1600, P300, P320, P340, P370, P400, P401, P405, P485, P505, P600, P700, P730, P750, P800p, P800s, P801, P850, P860, P950, P960, P1100, P1101, S440, S500, S500B, S650B, S1200, S1201, U650 and U650B
- **TIGO:** Tigo Access Point (TAP), TS4-R-X (where X can be F, M, O, or S), TS4-R-X-DUO (where X can be M, O, or S), TS4-A-X (where X can be F, 2F, O, O-DUO, or S)  
\*All Tigo MLPEs must be attached

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### UL 2703 CERTIFIED MODULES

The Frame MLPE Mount is a UL 2703 Recognized product used to mount and electrically bond module level power electronics (MLPE) that have been tested and/or evaluated for use in combination with UL 1703 or UL 61730 Listed Modules and a list of approved modules is included below.

Unless otherwise noted, “xxx” refers to the module power rating and both black and silver frames are included in the certification. ” ”

| MANUFACTURER            | LIST OF UL 2703 APPROVED MODULES                                                                                                                                                                                                                                     |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Adani</b>            | Adani modules with 30, 35 and 40 mm frames<br>ASX-Y-ZZ-xxx<br>Where “X” can be B, M or P; “Y” can be 6, 7 or M10 and “ZZ” can be blank, 144, PERC, B-PERC, or AB-PERC                                                                                                |
| <b>AIONRISE</b>         | Aionrise modules with 35 and 40 mm frames<br>AIONyyG1-xxx<br>Where “yy” can be 60 or 72                                                                                                                                                                              |
| <b>Amerisolar</b>       | Amerisolar modules with 35, 40 and 50 mm frames<br>AS-bYxxxZ<br>Where “b” can be 5 or 6; “Y” can be M, P, M27, P27, M30, or P30; and “Z” can be blank, W or WB                                                                                                       |
| <b>Aptos Solar</b>      | Aptos modules with 35 and 40 mm frames<br>DNA-yy-zzaa-xxxbb<br>Where “yy” can be 108, 120 or 144; “zz” can be MF or BF; “aa” can be 10, 23 or 26; and “bb” can be blank or W-DG                                                                                      |
| <b>Astronergy Solar</b> | Astronergy modules with 30, 35 and 40 mm frames<br>aaSMbbyyC/zz-xxx<br>Where “aa” can be CH or A; “bb” can be 60, 66, or 72; “yy” can be blank, 10 or 12; “C” can M, P, M(BL), M-HC, M(BL)-HC, P-HC, M(DG), M(DGT) or N(DG); and “zz” can be blank, HV, F-B, or F-BH |
| <b>ASUN</b>             | ASUN modules with 35 and 40 mm frames<br>ASUN-xxx-YYZZ-aa<br>Where “YY” can be 60 or 72; “ZZ” can be M, or MH5; and “aa” can be blank or BB                                                                                                                          |
| <b>Auxin</b>            | Auxin modules with 35 and 40 mm frames<br>AXNCyzAxxxB<br>Where “C” can be 6, 10 or G1; “y” can be M or P; “z” can be blank, 08, 09, 610, 11, or 612; and “A” can be blank, F, M or T; and “B” can be blank, A, B, C or W                                             |

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| MANUFACTURER            | LIST OF UL 2703 APPROVED MODULES                                                                                                                                                                                                                                                               |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Axitec</b>           | Axitec Modules with 30, 35 and 40 mm frames<br>AC-xxxY/aaZZb<br>Where "Y" can be M, P, MB, MBT or MH; "aa" can be blank, 125- or 156-; "ZZ" can be 54, 60, 72, 108, 120, or 144; "b" can be S, X, V, VB, XV, or MX                                                                             |
| <b>Big Shine Solar</b>  | Big Shine Solar modules with 35mm frames<br>BSExxxN-144BMH-DG                                                                                                                                                                                                                                  |
| <b>Bluesun Solar</b>    | Bluesun modules with 30 and 35 mm frames<br>BSMxxxY-AAA<br>Where "Y" can be M or M10; and "AAA" can be 54HPH, 60HPH or 72HBD                                                                                                                                                                   |
| <b>Boviet</b>           | Boviet modules with 35 and 40 mm frames<br>BVMZZaaYY-xxxBcc<br>Where "ZZ" can be 66 or 76; "aa" can be 9, 10 or 12; "YY" is M or P; and "B" can be blank, L or S; and "cc" can be blank, H, H-BF, H-BF-DG, H-HC, H-HC-BF, H-HC-BF-DG, HC-BF or HC-BF-DG                                        |
| <b>BYD</b>              | BYD modules with 30 and 35 mm frames<br>BYDxxxAY-ZZ<br>Where "A" can be M6, P6, MH, MLB, MLT, NLB or PH; "Y" can be C or K; and "ZZ" can be 30 or 36                                                                                                                                           |
| <b>Canadian Solar</b>   | Canadian Solar modules with 30, 32, 35 and 40 mm frames<br>CSbY-xxxZ<br>Where "b" can be 1, 3, 6, 6.1, 6.2 or 7; "Y" can be H, K, L, N, P, R, U, V, W, X, Y, -48TM, -54TM, -66TB or -72TB; and "Z" can be H, HP, M, P, T, MS, PX, M-SD, P-AG, P-SD, MB-AG, PB-AG, MS-AG, MS-HL, MS-SD or TB-AG |
| <b>CertainTeed</b>      | CertainTeed modules with 30, 35 and 40 mm frames<br>CTBBxxxYZZ-AA<br>Where "BB" can be blank or M10; "Y" can be M, P, or HC; "ZZ" can be 00, 01, 10, or 11; and "AA" can be 01, 02, 03, 04, 06, 08 or 09                                                                                       |
| <b>Crossroads Solar</b> | Crossroads Solar modules with 40 mm frames<br>Crossroads Solar xxx                                                                                                                                                                                                                             |
| <b>CSUN</b>             | Csun modules with 35 and 40 mm frames<br>YYxxx-zzAbb<br>Where "YY" is CSUN or SST; "zz" is blank, 60, or 72; and "A" is blank, P, M or MM; "bb" is blank, BB, 5BB, BW, or ROOF                                                                                                                 |

MODULES

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| MANUFACTURER                      | LIST OF UL 2703 APPROVED MODULES                                                                                                                                                                                                                                                                        |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Dehui</b>                      | Dehui modules with 30, 35 and 40 mm frames<br>DH-MYYYZ-xxx<br>Where "YYY" can be 760, 772, 860, 872; and "Z" can be B, F or W                                                                                                                                                                           |
| <b>Ecosolargy</b>                 | Ecosolargy modules with 35, 40 and 50 mm frames<br>ECOxxxYzzA-bbD<br>Where "Y" can be A, H, S, or T; "zz" can be 125 or 156; "A" can be M or P; "bb" can be 60 or 72; and "D" can be blank or B                                                                                                         |
| <b>Emmvee</b>                     | Emmvee modules with 35 mm frames<br>Exxx-YYZZZ-A<br>Where "YY" can be M, P, HCM, HCMW, HCBG, HCBT; "ZZZ" can be 72, 108, 120, 132 or 144; and "A" can be blank, B, T, or BT                                                                                                                             |
| <b>Energy America</b>             | Energy America modules with 30mm frames<br>EA-ZLK8-THLDD132xxx/M                                                                                                                                                                                                                                        |
| <b>ET Solar<br/>(EliTe Solar)</b> | ET Solar modules with 30, 33, 35 and 40 mm frames<br>ET-YZZZxxxAA<br>Where "Y" can be P, L, M, N or NR; "ZZZ" can be 48TBH, 660, 660BH, 672, 672BH, 754BH, 760BH, 766BH, 772BH, 760TBH, 766TBH, 772TBH or 848TBH; and "AA" can be GB, GL, TB, TW, WB, WW, BB, WBG, WWG, WBAC, WBCO, WWCO, WWBCO or BBAC |
| <b>Flex</b>                       | Flex modules with 35, 40 and 50 mm frames<br>FXS-xxxYY-ZZ;<br>Where "YY" can be BB or BC; and "ZZ" can be MAA1B, MAA1W, MAB1W, SAA1B, SAA1W, SAC1B, SAC1W, SAD1W, SBA1B, SBA1W, SBC1B, or SBC1W                                                                                                         |
| <b>Freedom<br/>Forever</b>        | Freedom Forever modules with 35 mm frames<br>FF-MPa-BBB-xxx<br>Where "a" can be blank or 1                                                                                                                                                                                                              |
| <b>Freevolt</b>                   | Freevolt modules with 35 mm frames<br>ECP-PVGRAF-144HC-xxx                                                                                                                                                                                                                                              |
| <b>GCL</b>                        | GCL modules with 35 mm and 40 mm frames<br>GCL-ab/YY xxx<br>Where "a" can be M or P; "b" can be 3 or 6; and "YY" can be 60, 72, 72H, or 72DH                                                                                                                                                            |
| <b>GigaWatt<br/>Solar</b>         | Gigawatt modules with 40 mm frames<br>GWxxxYY<br>Where "YY" can be either PB or MB                                                                                                                                                                                                                      |

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| MANUFACTURER                    | LIST OF UL 2703 APPROVED MODULES                                                                                                                                                                                                                                                                                    |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Goldi</b>                    | Goldi modules with 35 mm frames<br>GS10-Byyy-zz-xxx<br>Where “yyy” can be 108 or 144; and “zz” can be GF or TF                                                                                                                                                                                                      |
| <b>Grape Solar</b>              | Grape modules with 35 mm frames<br>GS-M120-xxx-FAB1                                                                                                                                                                                                                                                                 |
| <b>GreenWatts Solar</b>         | GreenWatts modules with 30 and 35mm frames<br>HSYY-A-xxx-ZZ<br>Where “YY” can be 54, 60, 66, 72 or 78; “A” can be blank or F; and “ZZ” can be MN or BOB                                                                                                                                                             |
| <b>Hansol</b>                   | Hansol modules with 30, 35 and 40 mm frames<br>HSxxxYY-zz<br>Where “S” can be A or S; “YY” can be AA, AD, PB, PD, PE, TB, TD, UB, UD, UE or XD; and “zz” can be AH2, AN1, AN3, AN4, HH2, HV1, JH2, GNEA0 or NNEA0                                                                                                   |
| <b>Hanwha Solar</b>             | Hanwha Solar modules with 40, 45 and 50 mm frames<br>HSLaaP6-YY-1-xxxZ<br>Where “aa” can be either 60 or 72; “YY” can be PA or PB; and “Z” can be blank or B                                                                                                                                                        |
| <b>Heliene</b>                  | Heliene modules with 35 and 40 mm frames<br>YYZZxxxA<br>Where “YY” can be 36, 60, 72, 96, 108, 120, 132, 144 or 156; “ZZ” can be HC, M, P, or MBLK; and “A” can be blank, HomePV, Bifacial, M10-SL, M10-SL-BLK, M10 TPC SL, M10 Bifacial, M10 SL-Bifacial, M10 TPC SL Bifacial, M10 NTYP SL or M10 NTYP SL Bifacial |
| <b>HT-SAAE</b>                  | HT-SAAE modules with 35 and 40 mm frames<br>HTyy-aaaZ-xxx<br>Where “yy” can be 60, 66, 72 or 78, “aaa” can be 18, 156 or 166, “Z” can be M, P, M-C, P-C, M(S), M(VS), M(V), P(V), M(V)-C, P(V)-C, X or X (ND)-F                                                                                                     |
| <b>Hyperion Solar (Runergy)</b> | Hyperion or Runergy modules with 30 and 35 mm frames<br>HY-DHzzzA8-xxxB<br>Where “zzz” can be 108 or 144; “A” can be N or P; and “B” can be blank or B                                                                                                                                                              |
| <b>Hyundai</b>                  | Hyundai modules with 30, 32, 33, 35 and 40 mm frames<br>HiY-SxxxZZ<br>Where “Y” can be A, D, N or S; “S” can be M, S or T; and “ZZ” can be GI, HG, HI, KI, MI, MF, MG, NF(BK), NJ, OJ, PI, RI, RG, RG(BF), RG(BK), SG, TI, TG, YH(BK) or XG(BK)                                                                     |

MODULES

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| MANUFACTURER          | LIST OF UL 2703 APPROVED MODULES                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Illuminate USA</b> | Illuminate USA Modules with 30 and 35 mm frames<br>IL5-72HBD-xxxM                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Itek</b>           | Itek Modules with 40 and 50 mm frames<br>IT-xxx-YY<br>Where "YY" can be blank, HE, or SE, or SE72                                                                                                                                                                                                                                                                                                                                                                          |
| <b>JA Solar</b>       | JA Solar modules with 30, 35 and 40 mm frames<br>JAyyzz-bbww-xxx/aa<br>Where "yy" can be M, P, M6 or P6; "zz" can be blank, (K), (L), (R), (V), (BK), (FA), (TG), (FA)(R), (L)(BK), (L)(TG), (R)(BK), (R)(TG), (V)(BK), (BK)(TG), or (L)(BK)(TG); "bb" can be 48, 54, 60, 66, 72 or 78; "ww" can be D09, D10, D20, D30, D40, D45, S01, S02, S03, S06, S09, S10, S12, S17, S20, S30 or S31; and "aa" can be BP, LB, MB, MR, SI, SC, PR, 3BB, 4BB, 4BB/RE, 5BB               |
| <b>Jakson Solar</b>   | Jakson Solar modules with 35mm frames<br>JH-xxxYY<br>Where "YY" can be BB or BT                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Jinko</b>          | Jinko modules with 30, 35 and 40 mm frames<br>JKMYxxxZZ-aa<br>Where "Y" can either be blank or S; "ZZ" can be M, N, P, or PP; and "aa" can be blank, 54HL4-B, 60, 60B, 60H, 60L, 60BL, 60HL, 60HB, 60HBL, 6HBL-EP, 60-J4, 60B-J4, 60B-EP, 60(Plus), 60-V, 60-MX, 6RL3, 6RL3-B, 6TL3-B, 66HL4M-BDV, 7RL3-V, 7RL3-TV, 72, 72B, 72-J4, 72B-J4, 72(Plus), 72-V, 72H-V, 72L-V, 72HL-V, 72HBL-V, 72HL4-V, 72HL4-BDV, 72HL4-TV, 72-MX, 72H-BDVP, 72HL-TV, 72HL-V-MX3 or 72HL4-BDX |
| <b>KB Solar</b>       | KB Solar modules with 35 mm frames<br>KBS-xxx-Mono-YY<br>Where "YY" can be blank or BF                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Kyocera</b>        | Kyocera with 46 mm Modules<br>KYxxxZZ-AA<br>Where "Y" can be D or U; "ZZ" can be blank, GX, or SX; and "AA" can be LPU, LFU, UPU, LPS, LPB, LFB, LFBS, LFB2, LPB2, 3AC, 3BC, 3FC, 4AC, 4BC, 4FC, 4UC, 5AC, 5BC, 5FC, 5UC, 6BC, 6FC, 8BC, 6MCA, or 6MPA                                                                                                                                                                                                                     |
| <b>LA Solar</b>       | LA Solar modules with 35 mm frames<br>LSxxxYY<br>Where "YY" can be BF, BL, BLA, HC or ST                                                                                                                                                                                                                                                                                                                                                                                   |

MODULES

# FRAME MLPE MOUNT

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| MANUFACTURER                  | LIST OF UL 2703 APPROVED MODULES                                                                                                                                                                                                                                                                                                                      |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>LG</b>                     | LG modules with 35, 40 and 46 mm frames<br>LGxxxYaZ-bb<br>Where "Y" can be A, E, M, N, Q, S; "a" can be A, 1, 2 or 3 "Z" can be C, K, T, or W;<br>and "bb" can be A3, A5, A6, B3, B6, E6, E6.AW5, G3, G4, J5, K4, L5, N5, V5, V6                                                                                                                      |
| <b>Longi</b>                  | Longi modules with 30, 35 and 40 mm frames<br>LRa-YYZZ-xxxM<br>Where "a" can be 4, 5, 6, 7 or 8; "YY" can be blank, 54, 60, 66, or 72; and "ZZ"<br>can be blank, BK, BP, HV, PB, PE, PH, HBD, HGD, HIB, HIH, HPB, HPH, HIBD,<br>HABB, HABD or HGBB                                                                                                    |
| <b>Magnus Green Solar</b>     | Magnus Green Solar modules with 35 mm frames<br>MGS-xxxW-yyy-M10<br>Where "yyy" can be blank, M54H, M60H or M72H                                                                                                                                                                                                                                      |
| <b>Maxeon</b>                 | Maxeon modules with 35, 40 and 46 mm frames<br>SPR-AAAY-xxx-zzz<br>Where "AAA" can be MAX, P or X; "Y" can be 3, 5, 6, 7, 21 or 22; and "zzz" can<br>be blank, R, BLK, BLK-R, COM or UPP                                                                                                                                                              |
| <b>Meyer Burger</b>           | Meyer Burger Modules with 35 mm frames<br>Meyer Burger Black, White or Glass                                                                                                                                                                                                                                                                          |
| <b>Mission Solar (mSolar)</b> | Mission Solar modules with 30, 33, 35 and 40 mm frames<br>YYYbb-xxxZZaa<br>Where "YYY" can be MSI, MSE, TXI or TXS; "bb" can be blank, 6, 10 or 60A;<br>"ZZ" can be blank, HN, HT, MM, SE, SO, SQ, SR, SX, TS, 108, 120 or 144; and<br>"aa" can be blank, 0B, 2B, BB, BW, 1J, 4G, 4J, 4S, 4T, 5K, 5R, 5T, 60, 6J, 6S, 6W,<br>6Z, 8K, 8T, 9R, 9S or 9Z |
| <b>Mitrex</b>                 | Mitrex modules with 30 and 40 mm frames<br>Mxxx-XYZ<br>Where "X" can be A, B, I or L; "Y" can be 1 or 3; and "Z" can be F or H                                                                                                                                                                                                                        |
| <b>Mitsubishi</b>             | Mitsubishi modules with 46 mm frames<br>PV-MYYxxxZZ<br>Where "YY" can be LE or JE; and "ZZ" can be either HD, HD2, or FB                                                                                                                                                                                                                              |
| <b>Motech</b>                 | IM and XS series modules with 40, 45 and 50 mm frames                                                                                                                                                                                                                                                                                                 |
| <b>Navitas</b>                | Navitas Modules with 35 mm frames<br>NSMxxx-yyy<br>Where "yyy" can be 120, 132 or 144                                                                                                                                                                                                                                                                 |

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| MANUFACTURER                | LIST OF UL 2703 APPROVED MODULES                                                                                                                                                                                                                       |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Next Energy Alliance</b> | Next Energy Alliance modules with 35 and 40 mm frames<br>yyNEA-xxxZZ<br>where "yy" can be blank or US; "ZZ" can be M, MB or M-60                                                                                                                       |
| <b>NE Solar</b>             | NE Solar modules with 30, 35 and 40 mm frames<br>NESExxx-zzAAX-yy<br>Where "zz" can be 54, 60 or 72; "AA" can be MH or TH; "X" can be blank or B; and "yy" can be M6 or M10                                                                            |
| <b>Neo Solar Power</b>      | Neo Solar Power modules with 35 mm frames<br>D6YxxxZZaa<br>Where "Y" can be M or P; "ZZ" can be B3A, B4A, E3A, E4A, H3A, H4A; and "aa" can be blank, (TF), ME or ME (TF)                                                                               |
| <b>Panasonic (HIT)</b>      | Panasonic modules with 35 and 40 mm frames<br>VBHNxxxYYzza<br>Where "YY" can be either KA, RA, SA or ZA; "zz" can be either 01, 02, 03, 04, 06, 06B, 11, 11B, 15, 15B, 16, 16B, 17, or 18; and "A" can be blank E, G or N                              |
| <b>Panasonic (EverVolt)</b> | Panasonic modules with 30 mm frames<br>EVPVxxxA<br>Where "A" can be blank or H, K, HK, HK2 or PK                                                                                                                                                       |
| <b>Peimar</b>               | Peimar modules with 40 mm frames<br>SbxxxYzz<br>Where "b" can be G, M or P; "Y" can be M or P; and "zz" can be blank, (BF), or (FB)                                                                                                                    |
| <b>Philadelphia Solar</b>   | Philadelphia modules with 30, 35 and 40 mm frames<br>PS-YzzAA-xxxW<br>Where "Y" can be M, MNB, MNG or P; "zz" can be 60, 72, 108, 132, 144 or 156; "AA" can be blank, (BF), (HC), (HCBF) or (HCBF)-GG; and "W" can be blank or W                       |
| <b>Phono Solar</b>          | Phono Solar modules with 30, 35 and 40 mm frames<br>PSxxxY-ZZ/A<br>Where "Y" can be M, M1, MH, M1H, M4, M4H, M5GF, M5GFH, M6, M6H, M8, M8H, M8GF, M8GFH or P; "ZZ" can be 18, 20 or 24; and "A" can be F, T, TH, THB, TNH, U, UH, UHB, VH, VHB or VNHB |
| <b>Prism Solar</b>          | Prism Solar modules with 35 mm frames<br>PST-xxxW-M72Y<br>Where "Y" can be H, HB or HBI                                                                                                                                                                |

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|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Q CELLS</b>      | <p>Q CELLS Modules with 30, 32, 35, 40 mm frames<br/>aaYY-ZZ-xxx<br/>where "aa" can be Q. or B.; "YY" can be PLUS, PRO, PEAK, LINE PRO, LINE PLUS, PLUS DUO, PEAK DUO or TRON; and "ZZ" can be G3, G3.1, G4, G4.1, L-G2, L-G2.3, L-G3, L-G3.1, L-G3y, L-G4, L-G4.2, L-G4y, LG4.2/TAA, BFR-G3, BLK-G3, BFR-G3.1, BLK-G3.1, BFR-G4, BFR-G4.1, BFR G4.3, BLK-G4.1, G4/SC, G4.1/SC, G4.1/TAA, G4.1/MAX, BFR G4.1/TAA, BFR G4.1/MAX, BLK G4.1/TAA, BLK G4.1/SC, EC-G4.4, G5, G5/SC, G5/TS, BLK-G5, BLK-G5/SC, BLK-G5/TS, L-G5, L-G5.1, L-G5.2, L-G5.2/H, L-G5.3, G6, G6/SC, G6/TS, G6+/TS, G6+, BLK-G6, L-G6, L-G6.1, L-G6.2, L-G6.3, L-G6.3/BFG, G7, BLK-G6+, BLK-G6+/AC, BLK-G6+/HL, BLK-G6+/SC, BLK-G6/TS, BLK-G6+/TS, BLK-G7, G7.2, G8, BLK-G8, G8+, BLK-G8+ L-G7, L-G7.1, L-G7.2, L-G7.3, L-G8, L-G8.1, L-G8.2, L-G8.3, L-G8.3/BFF, L-G8.3/BFG, L-G8.3/BGT, M-G2+, BLK M-G2+, BLK M-G2.H+, BLK M-G2+/AC, BLK M-G2.H1+/AC, ML-G9, BLK ML-G9, ML-G9+, BLK ML-G9+, BLK-G10, BLK-G10+, BLK G10+/AC, BLK-G10+/HL, ML-G10, BLK ML-G10, ML-G10+, BLK ML-G10+, ML-G10.a, BLK ML-G10.a, ML-G10.a+, BLK ML-G10.a+, BLK ML-G10.B+, BLK ML-G10.C+, BLK ML-G10 +/t, BLK ML-G10+/TS, XL-G2.3/BFG, XL-G9, XL-G9.2, XL-G9.3, XL-G9.3/BFG, XL-G10.2, XL-G10.3, XL-G10.c, XL-G10.d, XL-G10.d/BFG, XL-G10.3/BFG, XL-G11.2, XL-G11.3, XL-G11.3/BFG or XL-G11S.3/BFG</p> |
| <b>Rayzon Solar</b> | <p>Rayzon Solar modules with 35 and 40 mm frames<br/>RSYxxxWC<br/>Where "Y" can be blank or B</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Recom</b>        | <p>Recom modules with 35 and 40 mm frames<br/>RCM-xxx-6yy<br/>Where "yy" can be MA, MB, ME or MF</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>REC Solar</b>    | <p>REC modules with 30 and 38 mm frames<br/>RECxxxYYZZ<br/>Where "YY" can be AA, M, NP, NP2, NP3, PE, PE72, TP, TP2, TP2M, TP2SM, TP2S, TP3M or TP4; and "ZZ" can be blank, Black, BLK, BLK2, SLV, 72, Pro M, Pure, Pure-R, Pure-RX or Pure 2</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Renesola</b>     | <p>ReneSola modules with 35, 40 and 50 mm frames<br/>AAxxxY-ZZ<br/>Where "AA" can be SPM(SLP) or JC; "Y" can be blank, F, M or S; and "ZZ" can be blank, Ab, Ab-b, Abh, Abh-b, Abv, Abv-b, Bb, Bb-b, Bbh, Bbh-b, Bbv, Bbv-b, Db, Db-b, or 24/Bb</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Renogy</b>                | Renogy Modules with 35 and 40 mm frames<br>RZZ-xxxY-AAA<br>Where "ZZ" can be NG or SP; "Y" can be D or P; and "AAA" can be blank, 144, BB-108, BB-120 or BK-120                                                                                                                        |
| <b>Risen</b>                 | Risen Modules with 30, 35 and 40 mm frames<br>RSMyy-a-xxxZZ<br>Where "yy" can be 60, 72, 110, 120, 132 or 144; "a" can be 6, 7 or 8; and "ZZ" can be M, P or BMDG                                                                                                                      |
| <b>Saatvik</b>               | Saatvik Modules with 35 mm frames<br>SGExxx-YYYZZZ<br>Where "YYY" can be 108 or 144; and "ZZZ" can be MHC, MBHC or MHCB                                                                                                                                                                |
| <b>S-Energy</b>              | S-Energy modules with 35 and 40 mm frames<br>SABBB-CCYYY-xxxZ<br>Where "A" can be C, D, L or N; "BB" can be blank, 20, 25, 40 or 45; "CC" can be blank, 60 or 72; "YYY" can be blank, BDE, MAE, MAI, MBE, MBI, MCE or MCI; and "Z" can be V, M-10, P-10 or P-15                        |
| <b>SEG Solar</b>             | SEG Solar with 30, 35 and 40 mm frames<br>SEG-aYY-xxx-ZZ<br>Where "a" can be blank, 6 or B; "YY" can be blank, MA, MB, PA, or PB; and "ZZ" can be blank, BB, BG, BW, HV, WB, WW, BMB, BMA-HV, BMA-BG, BMA-TB, BMB-TB, BMB-HV, BMD-BG, BMD-HV, BMB-BG, BTA-BG, BTB-BG, BTD-BG or BMD-TB |
| <b>Seraphim Energy Group</b> | Seraphim modules with 30, 35, 40 and 50 mm frames<br>SRP-xxx-YYY-ZZ<br>Where "xxx" is the module power rating; and "YYY" can be BMA, BMD, 6MA, 6MB, 6PA, 6PB, 6QA-XX-XX, and 6QB-XX-XX; ZZ is blank, BB, BG or HV                                                                      |
| <b>Seraphim USA</b>          | Seraphim modules with 30, 35, 40 and 50 mm frames<br>SRP-xxx-YYY-ZZ<br>Where "xxx" is the module power rating; and "YYY" can be BMA, BMD, 6MA, 6MB, 6PA, 6PB, 6QA-XX-XX, and 6QB-XX-XX; ZZ is blank, BB, BG or HV                                                                      |
| <b>Sharp</b>                 | Sharp modules with 35 and 40 mm frames<br>NUYYxxx<br>Where "YY" can be SA or SC                                                                                                                                                                                                        |
| <b>Shinsung E&amp;G</b>      | Shinsung Modules with 35 mm frames<br>SSVxxx-144MH                                                                                                                                                                                                                                     |

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|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Silfab</b>            | <p>Silfab Modules with 35 and 38 mm frames<br/>           SYY-Z-xxxAb<br/>           Where “YY” can be IL, SA, LA, SG or LG; “Z” can be blank, M, P, or X; “A” can be blank, B, H, M, N, Q or X; and “b” can be A, C, C+, D, G, K, L, M, M+, N, T, U or X</p> |
| <b>Sinotec</b>           | <p>Sinotec Modules with 30 and 35 mm frames<br/>           STS-xxxP-aabb<br/>           Where “aa” can be 54 or 72; and “bb” can be BB, DB or DD</p>                                                                                                          |
| <b>Sirius PV</b>         | <p>Sirius PV Modules with 35 mm frames<br/>           ELNSMzzM-HC-yy-xxx<br/>           Where “zz” can be 54 or 72; and “yy” can be blank or BF</p>                                                                                                           |
| <b>Solar4America</b>     | <p>Solar4America modules with 30, 35 and 40 mm frames<br/>           S4Axxx-YYzzAA<br/>           Where “YY” can be 60, 72, 108 or 144; “zz” can be MH5, MH10, TH10 or TH16; and “AA” can be blank or BB, BW, SW or STT</p>                                   |
| <b>Solarever</b>         | <p>Solarever modules with 30, 35 mm frames<br/>           SE-zzz*yy-xxxM-aaa<br/>           Where “zzz” can be 166 or 182; “yy” can be 83, 91 or 105; and “aaa” can be 108, 96-BD, 120-BH, 144 or 144N</p>                                                    |
| <b>Solaria</b>           | <p>Solaria modules with 35 and 40 mm frames<br/>           PowerA-xxxY-ZZ<br/>           Where “A” can be X or XT, “Y” can be R or C; and “ZZ” can be blank, AC, BD, BX, BY, PD, PL, PM, PM-AC, PX, PZ, WX, WZ or 4T</p>                                      |
| <b>Solarcity (Tesla)</b> | <p>Solarcity modules with 40 mm frames<br/>           SCxxxYY<br/>           Where “YY” can be blank, B1 or B2</p>                                                                                                                                            |
| <b>SolarSpace</b>        | <p>SolarSpace modules with 30 and 35mm frames<br/>           SS8-yyzzz-xxxA<br/>           Where “yy” can be 54 or 72; “zzz” can be HD, HDB or HSB; and “A” can be M or N</p>                                                                                 |
| <b>SolarTech</b>         | <p>SolarTech modules with 40 and 42 mm frames<br/>           AAA-xxxYY<br/>           Where “AAA” can be PERCB-B, PERCB-W, HJTb-B, HJTb-W or STU; “YY” can be blank, PERC or HJT</p>                                                                          |

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|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SolarWorld AG</b>       | SolarWorld Sunmodule Plus, Protect, Bisun, XL, Bisun XL, may be followed by mono, poly, duo, black, bk, or clear; modules with 31, 33 and 46 mm frames<br>SW-xxx                                                                                           |
| <b>SolarWorld Americas</b> | SolarWorld Sunmodule Plus, Protect, Bisun, XL, Bisun XL, may be followed by mono, poly, duo, black, bk, or clear; modules with 33 mm frames<br>SWA-xxx                                                                                                     |
| <b>Sonali</b>              | Sonali Modules with 35 and 40 mm frames<br>SS-M-xxx-yyy<br>Where "M" can be blank or M; and "yyy" can be blank, 108M-B or W-M60H M10                                                                                                                       |
| <b>Star Solar</b>          | Star Solar modules with 35 mm frames<br>Star-xxxYYY-ZZZ<br>Where "YYY" can be M60H or M60HB; and "ZZZ" can be blank or M10                                                                                                                                 |
| <b>Stion</b>               | Stion Thin film modules with 35 mm frames<br>STO-xxx or STO-xxxA                                                                                                                                                                                           |
| <b>SunEdison</b>           | SunEdison Modules with 35, 40 and 50 mm frames<br>SE-YxxxZABCDE<br>Where "Y" can be B, F, H, P, R, or Z; "Z" can be 0 or 4; "A" can be B,C,D,E,H,I,J,K,L,M, or N; "B" can be B or W; "C" can be A or C; "D" can be 3, 7, 8, or 9; and "E" can be 0, 1 or 2 |
| <b>Sungold</b>             | Sungold Modules with 35 mm frames<br>SG-xxxWM                                                                                                                                                                                                              |
| <b>Suniva</b>              | Suniva modules with 35, 38, 40, 46 and 50 mm frames<br>OPTxxx-AA-B-YYY-Z<br>MVXxxx-AA-B-YYY-Z<br>Where "AA" is either 60 or 72; "B" is either 4 or 5; "YYY" is either 100,101,700,1B0, or 1B1; and "Z" is blank or B                                       |
| <b>Sunket</b>              | Sunket modules with 35 mm frames<br>SKTxxxM10-144S1                                                                                                                                                                                                        |
| <b>Sunmac Solar</b>        | Sunmac modules with 30 and 35 mm frames<br>SMxxxMaaaZZ-YY<br>Where "aaa" can be 660, 754 or 772; "ZZ" can be NH or SH; and "YY" can be BB or TB                                                                                                            |

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|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sunpower</b>                    | <p>Sunpower standard (G3 or G4) or InvisiMount (G5) 35, 40 and 46 mm frames</p> <p>SPR-Zb-xxx-YY</p> <p>Where "Z" can be A, E, M, P or X; "b" can be blank, 17, 18, 19, 20, 21, or 22; and "YY" can be blank, BLK, COM, C-AC, D-AC, E-AC, BLK-E-AC, G-AC, BLK-G-AC, H-AC, BLK-H-AC, BLK-C-AC, or BLK-D-AC</p> |
| <b>Sunspark</b>                    | <p>Sunspark modules with 40 mm frames</p> <p>SYy-xxxZ-A</p> <p>Where "YY" can be MX or ST; and "Z" can be M, MB, M3, M3B, P or W; and "A" can be 60 or 72</p>                                                                                                                                                 |
| <b>Suntech</b>                     | <p>Suntech Modules with 35, 40 and 50 mm frames</p> <p>STPxxxY-zz/aa</p> <p>Where "y" is blank or S; and "zz" can be 20, 24, A60, A72U, B60 or B72; and "aa" can be Vd, Vem, Vfw, Vfh, Vnh, Wdb, Wde, Wd, Wfhh or Wnhb</p>                                                                                    |
| <b>Talesun</b>                     | <p>Talesun modules with 30, 35 and 40 mm frames</p> <p>TAByZZaa-xxx-b</p> <p>Where "A" can be D, M or P; "B" can be 3, 6, 7 or 9; "y" can be blank, F, G, H, I or L; "ZZ" can be 48, 54, 60, 66, 72 or 78; "aa" can be M, M(H), or P; and "b" can be blank, B, T, or (H)</p>                                  |
| <b>Tata Power Renewable Energy</b> | <p>TP Solar Ltd modules with 30mm frames</p> <p>TPxxxHG10B</p>                                                                                                                                                                                                                                                |
| <b>Tesla</b>                       | <p>Tesla modules with 40 mm frames</p> <p>TxxxY</p> <p>Where "Y" can be H or S</p>                                                                                                                                                                                                                            |
| <b>Thornova</b>                    | <p>Thornova Modules with 30 and 35 mm frames</p> <p>TS-YYZZ(XXX)-X</p> <p>Where "YY" can be BB, BBT, BG or BGT; "ZZ" can be 54, 60 or 72; and "X" can be blank, G11 or X</p>                                                                                                                                  |
| <b>Topco Solar</b>                 | <p>Topco Solar modules with 30mm frames</p> <p>TPM7-SH108-xxx/M</p>                                                                                                                                                                                                                                           |

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|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Trina</b>     | <p>Trina Modules with 30, 35 and 40 mm frames</p> <p>TSM-xxxYYZZ</p> <p>Where "YY" can be DD05, DD06, DD14, DE14, DE15, DE15V, DEG15, DE-G15VC, DE18M, DEG18MC, DE09, DE19, DEG19C.20, DE06X, PA05, PC05, PD05, PD06, PA14, PC14, PD14, PE14, PE15, NE19RC, NEG19RC, NE09RC or NE09RH.05 ; and "ZZ" can be blank, .05, .05(II), .08, .08(II), .10, .18, .08D, .18D, 0.82, .002, .005, 05S, 08S, .20, .20(II), A, A.05, A.08, A.10, A.18, (II), A(II), A.05(II), A.08(II), A.082(II), A.10(II), A.18(II), C.05, C.07, C.05(II), C.07(II), H, H(II), H.05(II), H.08(II), HC.20(II), HC.20(II), M, M(II), M.05(II), MC.20(II)</p> |
| <b>Universal</b> | <p>Universal Solar Modules with 35 mm frames</p> <p>UNI-xxx-yyyZZZ-aa</p> <p>Where "yyy" can be 108, 120 or 144; "ZZZ" can be M, MH, BMH; and "aa" can be blank, BB or DG</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>URE</b>       | <p>URE modules with 30 and 35 mm frames</p> <p>DyZxxxxaa</p> <p>Where "D" can be D or F, "y" can be A, B, 6 or 7; "Z" can be F, K, L or M; and "aa" can be B7G, B8G, BFG, BFG-BB, C8G, DFG-BB, H3A, H4A, H8A, L4A, E7G-BB, E8G, E8G-BB, MFG, MFG-BB or M7G-BB</p>                                                                                                                                                                                                                                                                                                                                                              |
| <b>Vikram</b>    | <p>Vikram solar modules with 30, 35 and 40 mm frames</p> <p>XVSyy.ZZ.AAA.bb</p> <p>Where "X" can be blank, Hypersol, Paradea, Prexos or Somera; "yy" can be M, P, MBB, MDH, MDHT, MH, MS, MHBB, or PBB; "ZZ" can be 54, 60, 66, 72 or 78; "AAA" is the module power rating; and "bb" can be 03, 04 or 05</p>                                                                                                                                                                                                                                                                                                                   |
| <b>VSUN</b>      | <p>VSUN modules with 30, 35 and 40 mm frames</p> <p>VSUNxxxA-YYz-aa</p> <p>Where "A" can be blank or N; "YY" can be 60, 72, 108, 120, 132, 144; "z" can be M, P, MH, PH, or BMH; and "aa" can be blank, BB, BW, or DG</p>                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Waaree</b>    | <p>Waaree modules with 35 and 40 mm frames</p> <p>AAyy-xxx</p> <p>Where "AA" can be WS or Bi; and "yy" can be blank, M, MB, MD, MDI, MDIB, 33, 55, 57 or 66</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Winaico</b>   | <p>Winaico modules with 35 and 40 mm frames</p> <p>Wsy-xxxZa</p> <p>Where "y" can be either P or T; "Z" can be either M, P, or MX; and "a" can be blank or 6</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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| <b>Yingli</b>   | Yingli modules with 30, 35 and 40 mm frames<br>YLxxxZ-yy<br>Where "Z" can be D or P; "yy" can be blank, 29b, 30b, 34d, 35b, 36b, 37e 1/2, 37e 1500V 1/2, 40d, 49e 1/2 or 49e 1500V 1/2                                                    |
| <b>Yotta</b>    | Yotta modules with 30 and 35 mm frames<br>YSM-Bxxx-ZZ-72-1<br>Where "ZZ" can be 06 or 10                                                                                                                                                  |
| <b>Zeus</b>     | Zeus Solar Modules with 40mm frames<br>ZxxxM-HB                                                                                                                                                                                           |
| <b>ZN Shine</b> | ZN Shine modules with 30 and 35 mm frames<br>ZXMY-AAA-xxx/M<br>Where "Y" can be 6, 7 or 8; "AAA" can be 72, NH120, NH144, NHDB144, NHLDD144, SH108, SH144, SHDB120, SHDB144, SHLDD144, TP120, TPLDD120 or UHLDD144; and "M" can be M or N |

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