

SCOPE OF WORK

SYSTEM SIZE: 6720W DC
 MODULES: (24) GIGAWATT GW280MB
 INVERTER(S): (1) SOLAREDDGE SE7600A-US
 RACKING: IRONRIDGE XR10
 ATTACHMENT: QMSE

ESTIMATED SOLAR PRODUCTION: 854kWh/Month - 10249kWh/Year

AVERAGE ELECTRIC CONSUMPTION: 1134kWh/Month - 13608kWh/Year

ESTIMATED kWh OFFSET: 75.32%

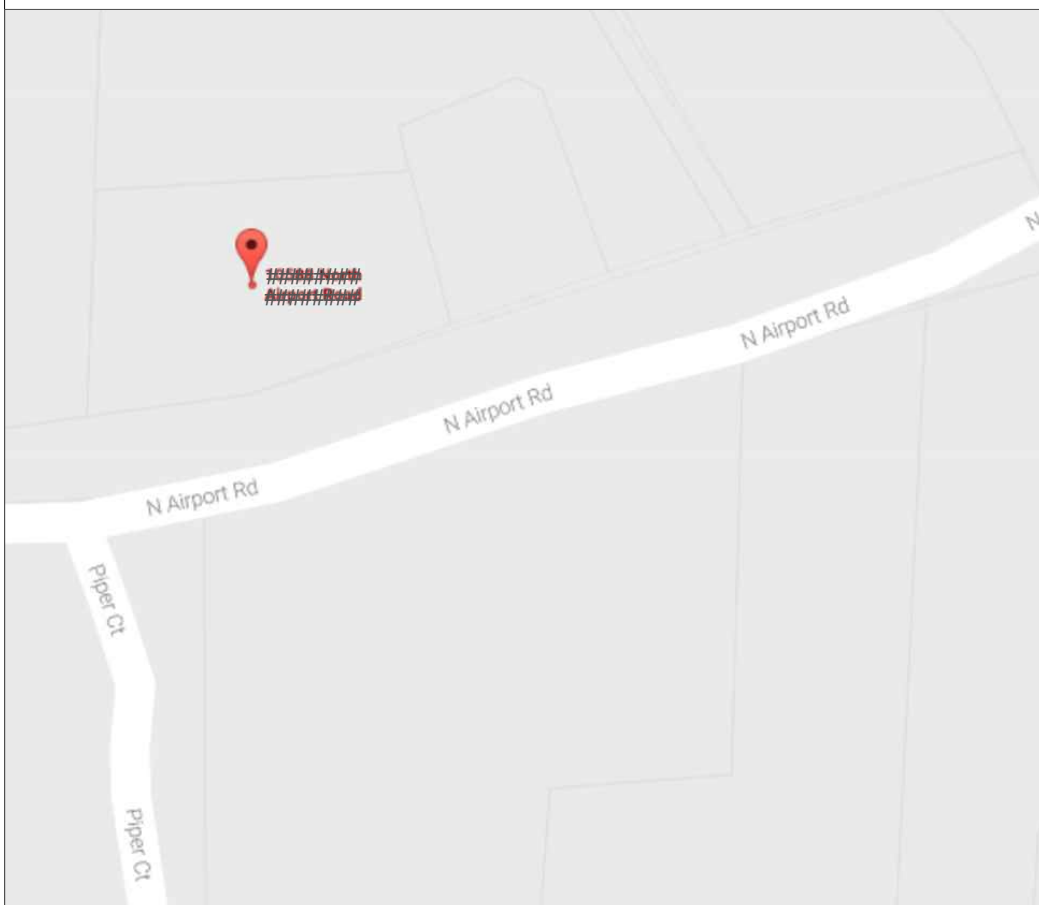
GENERAL NOTES

- LOCAL UTILITY PROVIDER SHALL BE NOTIFIED PRIOR TO USE AND ACTIVATION OF ANY SOLAR PHOTOVOLTAIC INSTALLATION
- THIS PROJECT SHALL COMPLY WITH TITLE 24 AND 2013 CALIFORNIA BUILDING CODE (CBC), CALIFORNIA ELECTRICAL CODE (CEC) CALIFORNIA ENERGY CODE (CEC) AND LOCAL ORDINANCES
- PROPER ACCESS AND WORKING CLEARANCE WILL BE PROVIDED AS PER SECTION 110.26 CEC
- ALL ELECTRICAL WORK SHOWN ON THESE PLANS WILL BE COMPLETED BY THE UNDERSIGNED HOMEOWNER
- ALL APPLICABLE PV EQUIPMENT LISTED AND COMPLIANT WITH UL2703 AND UL1703
- ALL ROOF PENETRATIONS TO BE SEALED WITH A HIGH PERFORMANCE ROOF SEALANT SUCH AS GeoCel 2300 CLEAR SEALANT
- THE SYSTEM WILL NOT BE INTERCONNECTED UNTIL APPROVAL FROM THE LOCAL JURISDICTION AND THE UTILITY IS OBTAINED
- THE SOLAR PHOTOVOLTAIC INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS
- IF THE EXISTING MAIN PANEL DOES NOT HAVE VERIFIABLE GROUNDING ELECTRODE, IT IS THE HOME OWNERS (OWNER INSTALLED SYSTEM) RESPONSIBILITY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE
- EACH MODULE WILL BE GROUNDED USING THE SUPPLIED CONNECTION POINTS IDENTIFIED ON THE MODULE AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS"
- A LADDER SHALL BE IN PLACE FOR THE INSPECTION IN COMPLIANCE WITH CAL-OSHA REGULATIONS
- MAX HEIGHT OF MODULES OFF OF ROOF FACE : <6"
- MAX RAIL SPAN IS 4' OC BETWEEN ROOF ATTACHMENTS"**
- ALL WORK SHALL COMPLY WITH 2011 NEC, 2012 IBC, MUNICIPAL COD, AND ALL MANUFACTURERS' LISTINGS AND INSTALLATION INSTRUCTION.
- PHOTOVOLTAIC SYSTEM WILL COMPLY WITH 2011 NEC.
- ELECTRICAL SYSTEM GROUNDING WILL COMPLY WITH 2011 NEC.
- PHOTOVOLTAIC SYSTEM IN UNGROUNDED. NO CONDUCTORS ARE SOLIDLY GROUNDED IN THE INVERTER. SYSTEM COMPLIES WITH 690.35.
- MODULES CONFORM TO AND ARE LISTED UNDER UL 1703.
- INVERTER CONFORMS TO AND IS LISTED UNDER UL 1741.
- CONSTRUCTION FOREMAN TO PLACE CONDUIT RUN PER 690.31 (E) AND 2012 IFC 605.11.2.
- ELECTRICAL EQUIPMENT AND MATERIAL TO BE LISTED, LABELED, AND INSTALLED PER THE CEC, THE INSTALLATION STANDARDS/MANUFACTURER'S RECOMMENDATIONS AND , IF REQUIRES A RECOGNIZED ELECTRICAL TESTING LABORATORY.

TABLE OF CONTENTS

PAGE #	DESCRIPTION
PV 1.0	COVER SHEET
PV 2.0	SITE PLAN
PV 3.0	DETAIL LAYOUT
PV 4.0	ELECTRICAL DIAGRAM
PV 5.0	WARNING LABELS

VICINITY MAP



LEGEND	
	MAIN SERVICE PANEL
	METER
	AC DISCONNECT
	JUNCTION BOX
	INVERTER
	PV ONLY
	ATT. POINTS 4 FT. O.C.



OWNER INSTALLED

JOHN SOLAR
 310 E. ORANGETHORPE
 PLACENTIA, CA 92870

COVER SHEET

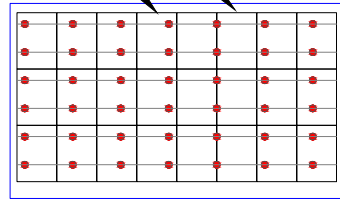
PV 01



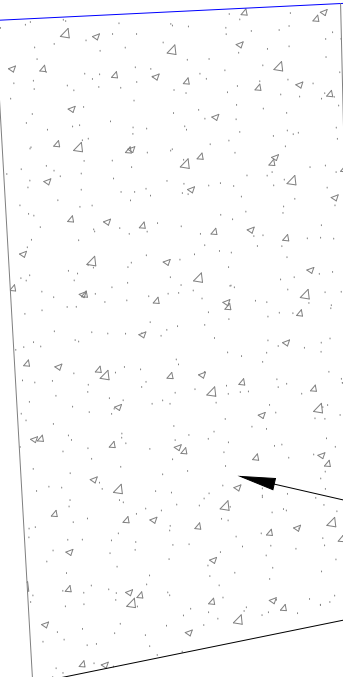
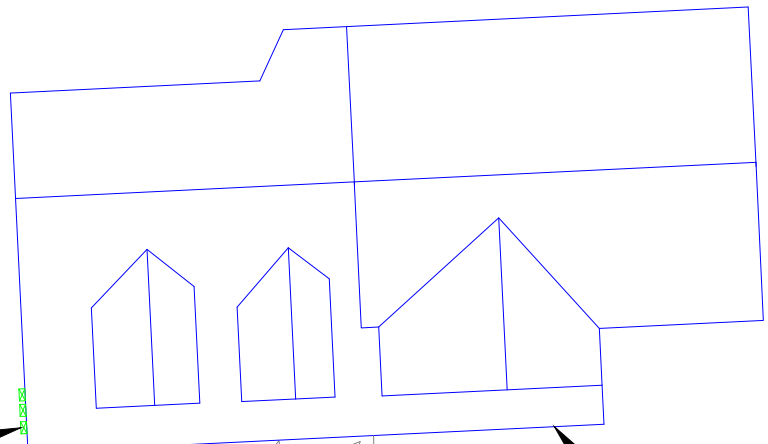
	PITCH	AZIMUTH	PV AREA (SQFT)	PV AREA (LBS)
AR-01	30°	180°	420.29	978.96

(E) GARAGE

(N) ARRAY AR-01



M MP IV



(E) RESIDENCE

(E) DRIVEWAY

PROPERTY LINE

10588 NORTH AIRPORT RD



OWNER INSTALLED

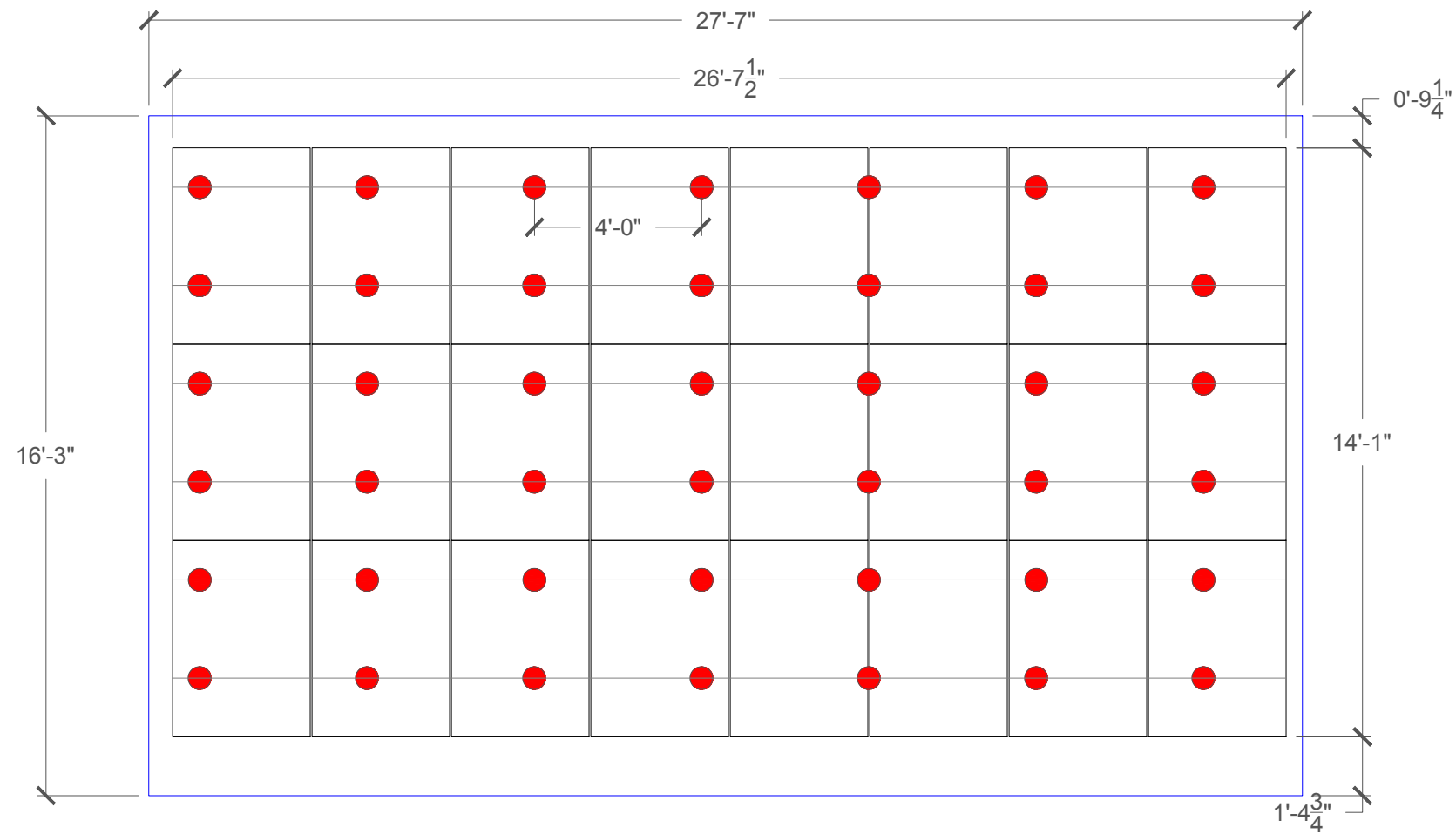
JOHN SOLAR
310 E. ORANGETHORPE
PLACENTIA, CA 92870

SITE PLAN

PV 2.0

	# MODULES PER ARRAY	ROOF TYPE	ATTACHMENT	ROOF HEIGHT	FRAME MATERIAL	FRAME TYPE	FRAME SIZE	OC SPACING
AR-01	24	COMP SHINGLE	QMSE	ONE STORY	WOOD	PREFAB TRUSSES	2 x 4	24" O.C.

AR-01 - SCALE: 1/4" = 1'-0"
 PITCH: 30°
 AZIMUTH: 180°

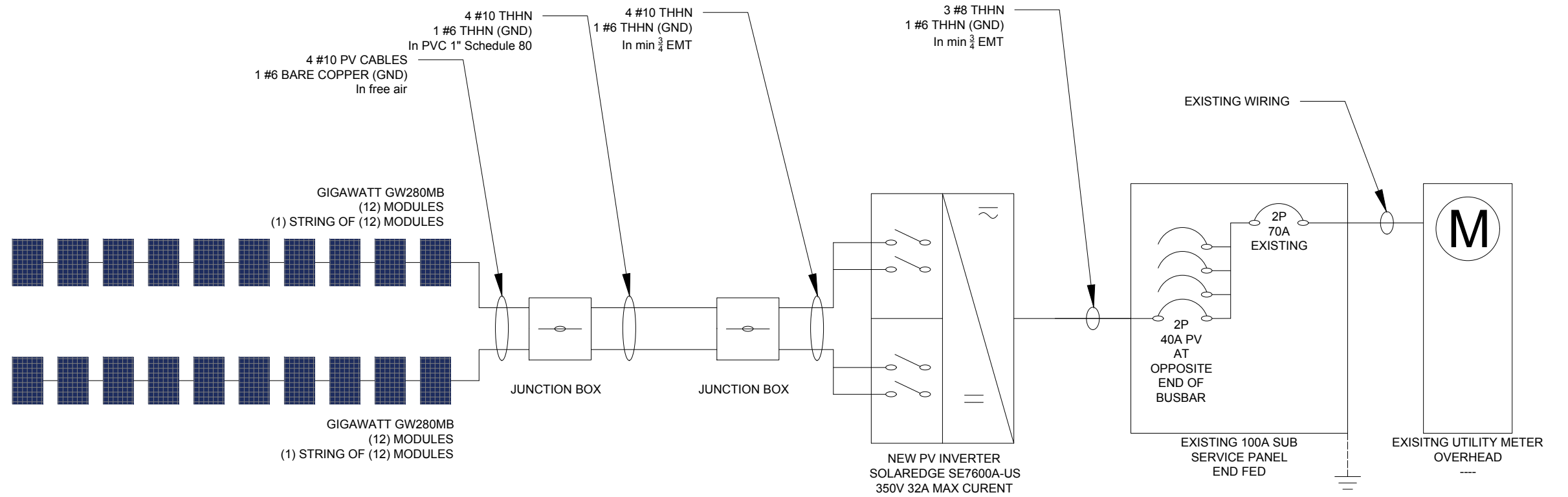


OWNER INSTALLED

JOHN SOLAR
 310 E. ORANGETHORPE
 PLACENTIA, CA 92870

DETAIL LAYOUT

PV 3.0




MICRO INVERTER RATINGS	
MAKE	SOLAREEDGE
MODEL	SE7600A-US
MAX INPUT CURRENT	23A
MAX POWER (AC)	7600W
NOM. AC VOLTAGE	350V
MAX AC CURRENT	32A
CEC EFFICIENCY	97.5%

MODULE AND ARRAY RATINGS: (24) MODULES)				
PV MODULE RATINGS (STC)		STRING 1	STRING 2	
MAKE	GIGAWATT	SERIES	12	12
MODEL	GW280MB	PARALLEL	1	1
I _{mp}	8.80A	I _{mp}	9.6A	9.6A
V _{mp}	31.90V	V _{mp}	350V	350V
I _{sc}	9.46A	I _{sc}	12.83A	12.83A
V _{oc}	39.56V	V _{oc}	350V	350V
P _{max}	280W	P _{max}	3360W	3360W
%V _{oc} /C	0.31%			

CONDUCTOR SIZING CALCULATIONS								
CIRCUIT DESCRIPTION	CURRENT	I _{max} (690.8(A))	I _{cont} (690.8(B)(2)(a) calc)	SPECIFIED CONDUCTOR	AMPACITY @ 90c	AMBIENT TEMP c	CURRENT CARRYING COND.	COND. OF USE APPLIED (690.8(B)(2)(b) calc)
PV SOURCE CIRCUIT STRING 1	12.83A	12.83A x 1.25 = 16.04A	16.04A I _{max} x 1.25=20.05A	#10 THHN	30A	61-65	4-6	30A x 0.65 (am b. temp) x 0.8 (raceway fill) = 15.60A
PV SOURCE CIRCUIT STRING 2	12.83A	12.83A x 1.25 = 16.04A	16.04A I _{max} x 1.25=20.05A	#10 THHN	30A	61-65	4-6	30A x 0.65 (am b. temp) x 0.8 (raceway fill) = 15.60A
SUB PANEL	40A	40A	40A I _{max} x 1.25 = 50A	#8 THHN	55A	56-60	1-3	55A x 0.60 (am b. temp.) x1 (raceway fill) = 35A

TERMINAL TEMPERATURE RATING CONSIDERATIONS					
CIRCUIT DESCRIPTION	CURRENT	I _{cont}	TERMINAL TEMP RATING	SPECIFIED CONDUCTOR	AMPACITY @ TERMINAL TEMP. RATING
PV SOURCE CIRCUIT STRING 1	12.83A	12.83A I _{max} x 1.25 = 16.04A	60C	#10	30A
PV SOURCE CIRCUIT STRING 2	12.83A	12.83A I _{max} x 1.25 = 16.04A	60C	#10	30A
SUB PANEL	40A	40A I _{max} x 1.25 = 50A	60C	#8	55A

VOLTAGE DROP CALCULATIONS					
LENGTH	I	Ohms/kFt	V	CALC	V _{drop}
50Ft	12.83A	0.9989	350V	50' x 12.831A x 2 x 0.9989/1000'/350V=	0.53%
50Ft	12.83A	0.9989	350V	50' x 12.831A x 2 x 0.9989/1000'/350V=	0.53%
30Ft	40A	0.3951	350V	30' x 40A x 2 x 0.3951/1000'/350V=	0.42%


GoGreenSolar.com
OWNER INSTALLED

 JOHN SOLAR
 310 E. ORANGETHORPE
 PLACENTIA, CA 92870
ELECTRICAL
PV 4.0

TO BE INSTALLED ADJACENT TO THE MAIN SERVICE PANEL

CAUTION: SOLAR ELECTRIC SYSTEM CONNECTED

PHOTOVOLTAIC SYSTEM AC DISCONNECT

OPERATING VOLTAGE ____ VOLTS
OPERATING CURRENT ____ AMPS

WARNING

THIS SERVICE METER IS ALSO SERVED BY A PHOTOVOLTAIC SYSTEM

WARNING

TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANEL

TO BE INSTALLED AT THE AC DISCONNECT:

PHOTOVOLTAIC SYSTEM AC DISCONNECT

OPERATING VOLTAGE ____ VOLTS
OPERATING CURRENT ____ AMPS

WARNING

ELECTRIC SHOCK HAZARD

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

PHOTOVOLTAIC DISCONNECT FOR UTILITY OPERATIONS

TO BE INSTALLED ON THE INVERTER NEAR THE GROUND FAULT INDICATOR (GROUNDED SYSTEMS - WHERE APPLICABLE)

WARNING

ELECTRIC SHOCK HAZARD

IF GROUND FAULT IS INDICATED ALL NORMALLY GROUNDED CONDUCTORS MAY BE UNGROUNDED AND ENERGIZED

TO BE INSTALLED AT SOLAR SUB PANEL (WHEN PRESENT)

PHOTOVOLTAIC SYSTEM AC DISCONNECT

OPERATING VOLTAGE ____ VOLTS
OPERATING CURRENT ____ AMPS

CAUTION: DO NOT INSTALL ADDITIONAL LOADS IN THIS PANEL

TO BE INSTALLED EVERY 10 FEET ON ALL EXTERIOR CONDUIT, RACEWAYS AND BOXES

WARNING: PHOTOVOLTAIC POWER SOURCE

PV SOLAR BREAKER
DO NOT RELOCATE THIS OVERCURRENT DEVICE

TO BE INSTALLED ADJACENT TO THE DC DISCONNECT (WHERE APPLICABLE):]

PHOTOVOLTAIC SYSTEM DC DISCONNECT

OPERATING VOLTAGE ____ VDC
OPERATING CURRENT ____ AMPS
MAX SYSTEM VOLTAGE ____ VDC
SHORT CIRCUIT CURRENT ____ AMPS
CHARGE CONTROLLER MAX ____ AMPS

WARNING

ELECTRIC SHOCK HAZARD

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

WARNING : PHOTOVOLTAIC POWER SOURCE

SIGNAGE FORMAT:

ALL LETTERS SHALL BE CAPITALIZED, 3/8" WHITE

LETTERING ON RED BACKGROUND, ARIAL OR SIMILAR FONT, NON-BOLD, REFLECTIVE, ON WEATHER - RESISTANT MATERIAL SUITABLE FOR THE ENVIRONMENT (USE UL-969 AS STANDARD FOR WEATHER RATING) WILL BE USED; DURABLE ADHESIVE MATERIALS MEET THIS REQUIREMENT.



OWNER INSTALLED

JOHN SOLAR
310 E. ORANGETHORPE
PLACENTIA, CA 92870

WARNING LABELS

PV 5.0

The Best Value PV for American Homes



Positive power tolerance

-0 / +5 Wp : guaranteed to produce up to an additional 5W of power.



PID-Free

PID stands for Potential Induced Degradation
Module power loss is less than 5% under IEC 62804



Hot-spot protection

Designed to withstand localized heating caused by cracked, mismatched cells, interconnection failures, or partial shadowing.



Maximum load

Designed to withstand heavy snow and wind pressure under IEC 61215 & IEC 61730.



In-House EL tests

Electroluminescence (EL) measurements rule out invisible defects such as microcracks, finger defects, and low-current output areas in modules.



We're an all American company creating local jobs to support the adoption of renewable solar power. As the leader in home installation solar kits, we understand that pricing, reliability, and performance are important to homeowners. Join us in creating a cleaner, greener world and power your life with sunshine!

Warranty & Certificates



25-year limited warranty on power output
10-year limited warranty on workmanship



60 CELL 270W-280W MONO SOLAR PANEL

Performance at standard test condition (STC)*

		GW270MB	GW275MB	GW280MB	
Maximum Power	P _{max}	270	275	280	W
Open Circuit Voltage	V _{oc}	38.79	39.28	39.56	V
Maximum Power Voltage	V _{mp}	31.19	31.57	31.90	V
Short Circuit Current	I _{sc}	9.37	9.39	9.46	A
Maximum Power Current	I _{mp}	8.69	8.73	8.80	A
Tolerance of Maximum Power		+5 / -0		W	
Module Efficiency		16.60	16.90	17.21	%
PTC Rating		245.5	250.2	254.8	W

*STC: Standard Test Condition, 1000 W/m², AM 1.5, 25°C

*PTC: PVUSA Test Condition

Thermal Characteristics

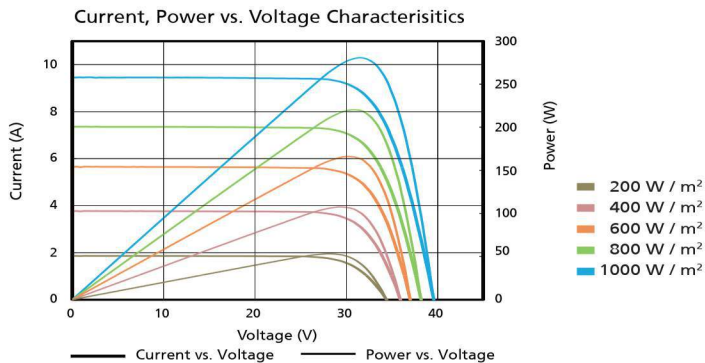
NOCT*	113.9 °F / 45.5°C
TC I _{sc}	+ 0.069 % / °C
TC V _{oc}	- 0.312 % / °C
TC P _{max}	- 0.432 % / °C

*NOCT: Nominal Operating Cell Temperature
800 W/m², AM 1.5, Ambient Temperature 20°C, Wind Speed 1 m/s

System Integration Parameters

Maximum DC system voltage	1000 V (IEC / UL)
Maximum series fuse	15 A
Number of bypass diodes	3
Snow load	112 psf / 5,400 Pascal
Wind load	50 psf / 2,400 Pascal
Operating range	-40 to 185°F / -40 to 85°C
Fire performance	Type 2 (UL 1703)

IV Curve

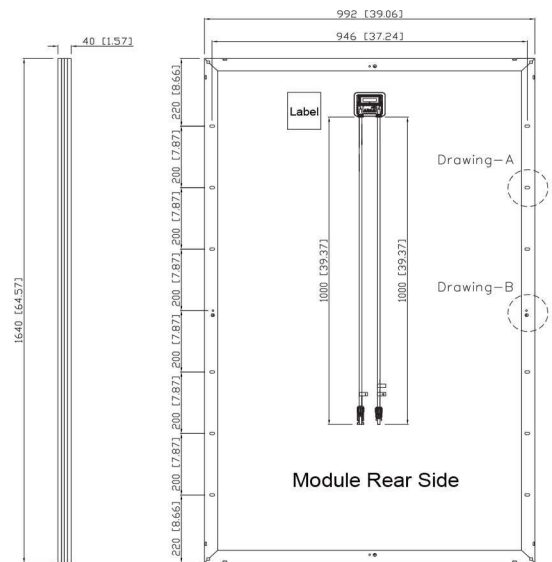


Performance at 800 W/m², NOCT, AM 1.5

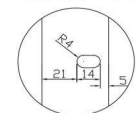
		GW270MB	GW275MB	GW280MB	
Maximum Power	P _{max}	198.59	202.35	206.11	W
Open Circuit Voltage	V _{oc}	35.83	36.29	36.57	V
Maximum Power Voltage	V _{mp}	28.45	28.81	29.12	V
Short Circuit Current	I _{sc}	7.61	7.63	7.69	A
Maximum Power Current	I _{mp}	6.98	7.02	7.08	A

Module Characteristics

Cell Configuration	60 in series
Cell Type	6" Monocrystalline Silicon
Length	64.57 in / 1640 mm
Width	39.06 in / 992 mm
Height	1.57 in / 40 mm
Weight	40.79 lbs / 18.5 Kg
Glass	Low iron tempered with ARC
Frame	Black anodized aluminum
Junction Box	IP 67
Connectors	MC4 Compatible

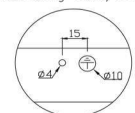


Installation hole



Drawing-A 5:1

Grounding hole/mark



Drawing-B 5:1



Listing Mark Verification

This Listing Mark Verification is not an Authorization to Mark. Verification of products currently authorized to bear the Mark(s) indicated can be found at <http://www.intertek.com/directories>.

Issue Date: August 18, 2015

Applicant:	Gigawatt Inc.
Product Description:	PV Module
Trade Name:	Gigawatt
Models Covered:	GW280PB GW275PB GW270PB GW265PB GW260PB GW255PB GW250PB GW300MB GW295MB GW290MB GW285MB GW280MB GW275MB GW270MB
Standards:	Standard for Safety Flat-Plate Photovoltaic Modules and Panels – UL 1703 and ULC/ORD-C1703
Directory Link(s):	http://www.intertek.com/directories

Pearly Yu
Directory Coordinator

Signature

Relevant Listing Mark(s):



This Listing Mark Verification is valid only on the issue date and is for the exclusive use of the Client and is provided pursuant to the Certification Agreement between Intertek and the Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than the client, in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Listing Mark Verification. Only the Client is authorized to permit copying or distribution of this Listing Mark Verification. The use of Intertek's Certification Mark is restricted to the conditions laid out in the Certification Agreement between Intertek and the Client. Any further use of the Intertek name or Certification Mark for the sale or advertisement of the material, product of service must first be approved by Intertek in writing.



SolarEdge Power Optimizer

Module Add-On For North America

P300 / P320 / P400 / P405



POWER OPTIMIZER

PV power optimization at the module-level

- Up to 25% more energy
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch losses, from manufacturing tolerance to partial shading
- Flexible system design for maximum space utilization
- Fast installation with a single bolt
- Next generation maintenance with module-level monitoring
- Module-level voltage shutdown for installer and firefighter safety



SolarEdge Power Optimizer

Module Add-On for North America

P300 / P320 / P400 / P405

	P300 (for 60-cell modules)	P320 (for high-power 60-cell modules)	P400 (for 72 & 96-cell modules)	P405 (for thin film modules)	
INPUT					
Rated Input DC Power ⁽¹⁾	300	320	400	405	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	48		80	125	Vdc
MPPT Operating Range	8 - 48		8 - 80	12.5 - 105	Vdc
Maximum Short Circuit Current (Isc)	10	11	10.1		Adc
Maximum DC Input Current	12.5	13.75	12.63		Adc
Maximum Efficiency				99.5	%
Weighted Efficiency				98.8	%
Overtoltage Category				II	
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREEDGE INVERTER)					
Maximum Output Current				15	Adc
Maximum Output Voltage	60			85	Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREEDGE INVERTER OR SOLAREEDGE INVERTER OFF)					
Safety Output Voltage per Power Optimizer				1	Vdc
STANDARD COMPLIANCE					
EMC				FCC Part15 Class B, IEC61000-6-2, IEC61000-6-3	
Safety				IEC62109-1 (class II safety), UL1741	
RoHS				Yes	
INSTALLATION SPECIFICATIONS					
Maximum Allowed System Voltage				1000	Vdc
Compatible inverters				All SolarEdge Single Phase and Three Phase inverters	
Dimensions (W x L x H)	128 x 152 x 27.5 / 5 x 5.97 x 1.08		128 x 152 x 35 / 5 x 5.97 x 1.37	128 x 152 x 50 / 5 x 5.97 x 1.96	mm / in
Weight (including cables)	760 / 1.7		830 / 1.8	1064 / 2.3	gr / lb
Input Connector				MC4 Compatible	
Output Wire Type / Connector				Double Insulated; MC4 Compatible	
Output Wire Length	0.95 / 3.0			1.2 / 3.9	m / ft
Operating Temperature Range				-40 - +85 / -40 - +185	°C / °F
Protection Rating				IP68 / NEMA6P	
Relative Humidity				0 - 100	%

⁽¹⁾ Rated STC power of the module. Module of up to +5% power tolerance allowed.

PV SYSTEM DESIGN USING A SOLAREEDGE INVERTER ⁽²⁾	SINGLE PHASE	THREE PHASE 208V	THREE PHASE 480V	
Minimum String Length (Power Optimizers)	8	10	18	
Maximum String Length (Power Optimizers)	25	25	50	
Maximum Power per String	5250	6000	12750	W
Parallel Strings of Different Lengths or Orientations				Yes

⁽²⁾ It is not allowed to mix P405 with P300/P400/P600/P700 in one string.





SolarEdge Single Phase Inverters

For North America

SE3000A-US / SE3800A-US / SE5000A-US / SE6000A-US /
SE7600A-US / SE10000A-US / SE11400A-US



INVERTERS

The best choice for SolarEdge enabled systems

- Integrated arc fault protection for NEC 2011 690.11 compliance
- Rapid shutdown for NEC 2014 690.12
- Superior efficiency (98%)
- Small, lightweight and easy to install on provided bracket
- Built-in module-level monitoring
- Internet connection through Ethernet or Wireless
- Outdoor and indoor installation
- Fixed voltage inverter, DC/AC conversion only
- Pre-assembled Safety Switch for faster installation
- Optional – revenue grade data, ANSI C12.1



Single Phase Inverters for North America

SE3000A-US / SE3800A-US / SE5000A-US / SE6000A-US /
SE7600A-US / SE10000A-US / SE11400A-US

	SE3000A-US	SE3800A-US	SE5000A-US	SE6000A-US	SE7600A-US	SE10000A-US	SE11400A-US	
OUTPUT								
Nominal AC Power Output	3000	3800	5000	6000	7600	9980 @ 208V 10000 @ 240V	11400	VA
Max. AC Power Output	3300	4150	5400 @ 208V 5450 @ 240V	6000	8350	10800 @ 208V 10950 @ 240V	12000	VA
AC Output Voltage Min.-Nom.-Max. ⁽¹⁾ 183 - 208 - 229 Vac	-	-	✓	-	-	✓	-	
AC Output Voltage Min.-Nom.-Max. ⁽¹⁾ 211 - 240 - 264 Vac	✓	✓	✓	✓	✓	✓	✓	
AC Frequency Min.-Nom.-Max. ⁽¹⁾	59.3 - 60 - 60.5							Hz
Max. Continuous Output Current	12.5	16	24 @ 208V 21 @ 240V	25	32	48 @ 208V 42 @ 240V	47.5	A
GFDI Threshold	1							A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes							Yes
INPUT								
Maximum DC Power (STC)	4050	5100	6750	8100	10250	13500	15350	W
Transformer-less, Ungrounded	Yes							
Max. Input Voltage	500							Vdc
Nom. DC Input Voltage	325 @ 208V / 350 @ 240V							Vdc
Max. Input Current ⁽²⁾	9.5	13	16.5 @ 208V 15.5 @ 240V	18	23	33 @ 208V 30.5 @ 240V	34.5	Adc
Max. Input Short Circuit Current	45							Adc
Reverse-Polarity Protection	Yes							
Ground-Fault Isolation Detection	600k Ω Sensitivity							
Maximum Inverter Efficiency	97.7	98.2	98.3	98.3	98	98	98	%
CEC Weighted Efficiency	97.5	98	97 @ 208V 98 @ 240V	97.5	97.5	97 @ 208V 97.5 @ 240V	97.5	%
Nighttime Power Consumption	< 2.5						< 4	W
ADDITIONAL FEATURES								
Supported Communication Interfaces	RS485, RS232, Ethernet, ZigBee (optional)							
Revenue Grade Data, ANSI C12.1	Optional ⁽³⁾							
Rapid Shutdown – NEC 2014 690.12	Yes							
STANDARD COMPLIANCE								
Safety	UL1741, UL1699B, UL1998, CSA 22.2							
Grid Connection Standards	IEEE1547							
Emissions	FCC part15 class B							
INSTALLATION SPECIFICATIONS								
AC output conduit size / AWG range	3/4" minimum / 16-6 AWG					3/4" minimum / 8-3 AWG		
DC input conduit size / # of strings / AWG range	3/4" minimum / 1-2 strings / 16-6 AWG					3/4" minimum / 1-3 strings / 14-6 AWG		
Dimensions with Safety Switch (HxWxD)	30.5 x 12.5 x 7.2 / 775 x 315 x 184					30.5 x 12.5 x 10.5 / 775 x 315 x 260		
Weight with Safety Switch	51.2 / 23.2		54.7 / 24.7		88.4 / 40.1		in / mm lb / kg	
Cooling	Natural Convection				Natural convection and internal fan (user replaceable)		Fans (user replaceable)	
Noise	< 25					< 50		
Min.-Max. Operating Temperature Range	-13 to +140 / -25 to +60 (-40 to +60 version available ⁽⁴⁾)						°F / °C	
Protection Rating	NEMA 3R							

⁽¹⁾ For other regional settings please contact SolarEdge support.

⁽²⁾ A higher current source may be used; the inverter will limit its input current to the values stated.

⁽³⁾ Revenue grade inverter P/N: SExxxxA-US000NNR2 (for 7600W inverter:SE7600A-US002NNR2).

⁽⁴⁾ -40 version P/N: SExxxxA-US000NNU4 (for 7600W inverter:SE7600A-US002NNU4).



RoHS



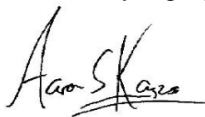
AUTHORIZATION TO MARK

This authorizes the application of the Certification Mark(s) shown below to the models described in the Product(s) Covered section when made in accordance with the conditions set forth in the Certification Agreement and Listing Report. This authorization also applies to multiple listee model(s) identified on the correlation page of the Listing Report.

This document is the property of Intertek Testing Services and is not transferable. The certification mark(s) may be applied only at the location of the Party Authorized To Apply Mark.

Applicant:	SolarEdge Technologies Ltd	Manufacturer:	Jabil Circuit (Guangzhou) LTD
Address:	6 Ha'Harash Street 45240 Hod Hasharon	Address:	DEV EAST DISTRICT 128 JUN CHENG RD GUANGZHOU GUANGDONG 510530 CHINA
Country:	Israel	Country:	China
Contact:	Mr. Oren Bachar or Mr. Meir Adest	Contact:	Elaine Ouyang
Phone:	+972 9 957 6620 #293 or +972 9 957 6620 #131	Phone:	020-2805-4025/ 135-7023-5852
FAX:	+972 9 957 6591	FAX:	NA
Email:	OREN.B@SOLAREEDGE.COM	Email:	Elaine.ouyang@jabil.com

Party Authorized To Apply Mark: Same as Manufacturer
Report Issuing Office: Cortland, NY 13045

Control Number: 4004590 **Authorized by:**  _____
for Thomas J. Patterson, Certification Manager



This document supersedes all previous Authorizations to Mark for the noted Report Number.

This Authorization to Mark is for the exclusive use of Intertek's Client and is provided pursuant to the Certification agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Authorization to Mark. Only the Client is authorized to permit copying or distribution of this Authorization to Mark and then only in its entirety. Use of Intertek's Certification mark is restricted to the conditions laid out in the agreement and in this Authorization to Mark. Any further use of the Intertek name for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. Initial Factory Assessments and Follow up Services are for the purpose of assuring appropriate usage of the Certification mark in accordance with the agreement, they are not for the purposes of production quality control and do not relieve the Client of their obligations in this respect.

Intertek Testing Services NA Inc.
545 East Algonquin Road, Arlington Heights, IL 60005
Telephone 800-345-3851 or 847-439-5667 Fax 312-283-1672

Standard(s):	UL 1741 Standard for Safety for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, Second Edition Dated: January 28, 2010
	CSA C22.2 107.1 Issue:2001/09/01 Ed:3 General Use Power Supplies - (R2011)
	UL SUBJECT 1699B, Outline of Investigation for Photovoltaic (PV) DC Arc-Fault Circuit Protection - Issue No.2, 2013/01/14
	CSA TIL M-07, Interim Certification Requirements for Photovoltaic (PV) DC Arc-Fault Protection - Issue No. 1, 2013/03/11



AUTHORIZATION TO MARK

Product:	Utility Interactive Inverter
Brand Name:	SolarEdge
Models:	7 models: SE3000, SE3300, SE3800, SE5000, SE6000, SE7000, SE7600 (Option: followed by A to indicate Interface board, etc.)



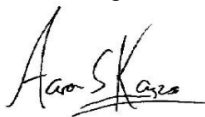
AUTHORIZATION TO MARK

This authorizes the application of the Certification Mark(s) shown below to the models described in the Product(s) Covered section when made in accordance with the conditions set forth in the Certification Agreement and Listing Report. This authorization also applies to multiple listee model(s) identified on the correlation page of the Listing Report.

This document is the property of Intertek Testing Services and is not transferable. The certification mark(s) may be applied only at the location of the Party Authorized To Apply Mark.

Applicant:	SolarEdge Technologies Ltd	Manufacturer:	Bigtech CLI Inc.
Address:	6 Ha'Harash Street 45240 Hod Hasharon	Address:	5990 14th Avenue Markham, Ontario L3S 4M4
Country:	Israel	Country:	Canada
Contact:	Mr. Oren Bachar or Mr. Meir Adest	Contact:	Aldo Cozza
Phone:	+972 9 957 6620 #293 or +972 9 957 6620 #131	Phone:	905-695-0100 or 905-695-0911
FAX:	+972 9 957 6591	FAX:	905-695-0910
Email:	OREN.B@SOLAREEDGE.COM	Email:	aldo@bigtech.ca

Party Authorized To Apply Mark: Same as Manufacturer
Report Issuing Office: Cortland, NY 13045

Control Number: 5000139 **Authorized by:** 
for Thomas J. Patterson, Certification Manager



This document supersedes all previous Authorizations to Mark for the noted Report Number.

This Authorization to Mark is for the exclusive use of Intertek's Client and is provided pursuant to the Certification agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Authorization to Mark. Only the Client is authorized to permit copying or distribution of this Authorization to Mark and then only in its entirety. Use of Intertek's Certification mark is restricted to the conditions laid out in the agreement and in this Authorization to Mark. Any further use of the Intertek name for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. Initial Factory Assessments and Follow up Services are for the purpose of assuring appropriate usage of the Certification mark in accordance with the agreement, they are not for the purposes of production quality control and do not relieve the Client of their obligations in this respect.

Intertek Testing Services NA Inc.
545 East Algonquin Road, Arlington Heights, IL 60005
Telephone 800-345-3851 or 847-439-5667 Fax 312-283-1672

Standard(s):	UL 1741 Standard for Safety for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, Second Edition Dated: January 28, 2010
	CSA C22.2 107.1 Issue:2001/09/01 Ed:3 General Use Power Supplies - (R2011)
	UL SUBJECT 1699B, Outline of Investigation for Photovoltaic (PV) DC Arc-Fault Circuit Protection - Issue No.2, 2013/01/14
	CSA TIL M-07, Interim Certification Requirements for Photovoltaic (PV) DC Arc-Fault Protection - Issue No. 1, 2013/03/11



AUTHORIZATION TO MARK

Product:	Utility Interactive Inverter
Brand Name:	SolarEdge
Models:	7 models: SE3000, SE3300, SE3800, SE5000, SE6000, SE7000, SE7600 (Option: followed by A to indicate Interface board, etc.)



AUTHORIZATION TO MARK

This authorizes the application of the Certification Mark(s) shown below to the models described in the Product(s) Covered section when made in accordance with the conditions set forth in the Certification Agreement and Listing Report. This authorization also applies to multiple listee model(s) identified on the correlation page of the Listing Report.

This document is the property of Intertek Testing Services and is not transferable. The certification mark(s) may be applied only at the location of the Party Authorized To Apply Mark.

Applicant: SolarEdge Technologies Ltd

Manufacturer: Flextronics ZALA

Address: 6 Ha'Harash Street 45240
Hod Hasharon

Address: Zrínyi Miklós u. 38
Zalaegerszeg
8900

Country: Israel
Contact: Mr. Oren Bachar or
Mr. Meir Adest

Country: Hungary
Contact: Balázs Banics

Phone: +972 9 957 6620 #293 or
+972 9 957 6620 #131

Phone: +36 92 507134

FAX: +972 9 957 6591

FAX: +36 92 552033

Email: OREN.B@SOLAREEDGE.COM

Email: balazs.banics@flextronics.com

Party Authorized To Apply Mark: Same as Manufacturer
Report Issuing Office: Cortland, NY 13045

Control Number: 4008271

Authorized by: _____
for Thomas J. Patterson, Certification Manager



This document supersedes all previous Authorizations to Mark for the noted Report Number.

This Authorization to Mark is for the exclusive use of Intertek's Client and is provided pursuant to the Certification agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Authorization to Mark. Only the Client is authorized to permit copying or distribution of this Authorization to Mark and then only in its entirety. Use of Intertek's Certification mark is restricted to the conditions laid out in the agreement and in this Authorization to Mark. Any further use of the Intertek name for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. Initial Factory Assessments and Follow up Services are for the purpose of assuring appropriate usage of the Certification mark in accordance with the agreement, they are not for the purposes of production quality control and do not relieve the Client of their obligations in this respect.

Intertek Testing Services NA Inc.
545 East Algonquin Road, Arlington Heights, IL 60005
Telephone 800-345-3851 or 847-439-5667 Fax 312-283-1672

UL 1741 Standard for Safety for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, Second Edition Dated: January 28, 2010

CSA C22.2 107.1 Issue:2001/09/01 Ed:3 General Use Power Supplies - (R2011)

Standard(s): UL SUBJECT 1699B, Outline of Investigation for Photovoltaic (PV) DC Arc-Fault Circuit Protection - Issue No.2, 2013/01/14

CSA TIL M-07, Interim Certification Requirements for Photovoltaic (PV) DC Arc-Fault Protection - Issue No. 1, 2013/03/11



AUTHORIZATION TO MARK

Product:	Utility Interactive Inverter
Brand Name:	SolarEdge
Models:	7 models: SE3000, SE3300, SE3800, SE5000, SE6000, SE7000, SE7600 (Option: followed by A to indicate Interface board, etc.)



AUTHORIZATION TO MARK


This authorizes the application of the Certification Mark(s) shown below to the models described in the Product(s) Covered section when made in accordance with the conditions set forth in the Certification Agreement and Listing Report. This authorization also applies to multiple listee model(s) identified on the correlation page of the Listing Report.

This document is the property of Intertek Testing Services and is not transferable. The certification mark(s) may be applied only at the location of the Party Authorized To Apply Mark.

Applicant:	SolarEdge Technologies Ltd	Manufacturer:	Flextronics ZALA
Address:	6 Ha'Harash Street 45240 Hod Hasharon	Address:	Posta u. 63 Zalaegerszeg 8900
Country:	Israel	Country:	Hungary
Contact:	Mr. Oren Bachar or Mr. Meir Adest	Contact:	Balázs Banics
Phone:	+972 9 957 6620 #293 or +972 9 957 6620 #131	Phone:	+36 92 507134
FAX:	+972 9 957 6591	FAX:	+36 92 552033
Email:	OREN.B@SOLAREEDGE.COM	Email:	balazs.banics@flextronics.com

Party Authorized To Apply Mark: Same as Manufacturer
Report Issuing Office: Cortland, NY 13045

Control Number: 4008271

Authorized by: 
for Thomas J. Patterson, Certification Manager



This document supersedes all previous Authorizations to Mark for the noted Report Number.

This Authorization to Mark is for the exclusive use of Intertek's Client and is provided pursuant to the Certification agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Authorization to Mark. Only the Client is authorized to permit copying or distribution of this Authorization to Mark and then only in its entirety. Use of Intertek's Certification mark is restricted to the conditions laid out in the agreement and in this Authorization to Mark. Any further use of the Intertek name for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. Initial Factory Assessments and Follow up Services are for the purpose of assuring appropriate usage of the Certification mark in accordance with the agreement, they are not for the purposes of production quality control and do not relieve the Client of their obligations in this respect.

Intertek Testing Services NA Inc.
545 East Algonquin Road, Arlington Heights, IL 60005
Telephone 800-345-3851 or 847-439-5667 Fax 312-283-1672

Standard(s):	UL 1741 Standard for Safety for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, Second Edition Dated: January 28, 2010
	CSA C22.2 107.1 Issue:2001/09/01 Ed:3 General Use Power Supplies - (R2011)
	UL SUBJECT 1699B, Outline of Investigation for Photovoltaic (PV) DC Arc-Fault Circuit Protection - Issue No.2, 2013/01/14
	CSA TIL M-07, Interim Certification Requirements for Photovoltaic (PV) DC Arc-Fault Protection - Issue No. 1, 2013/03/11



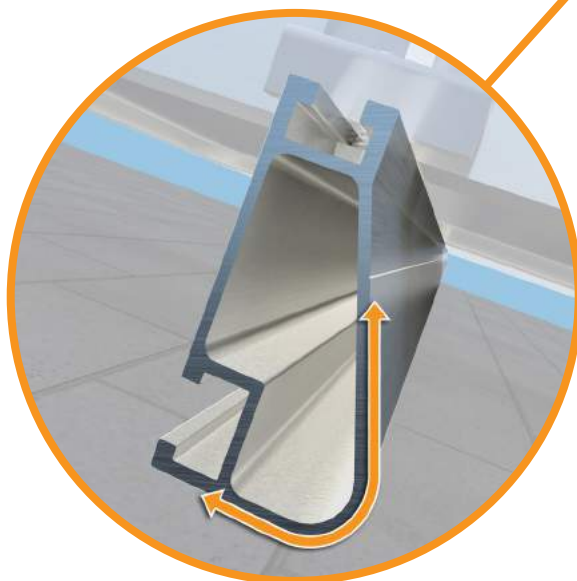
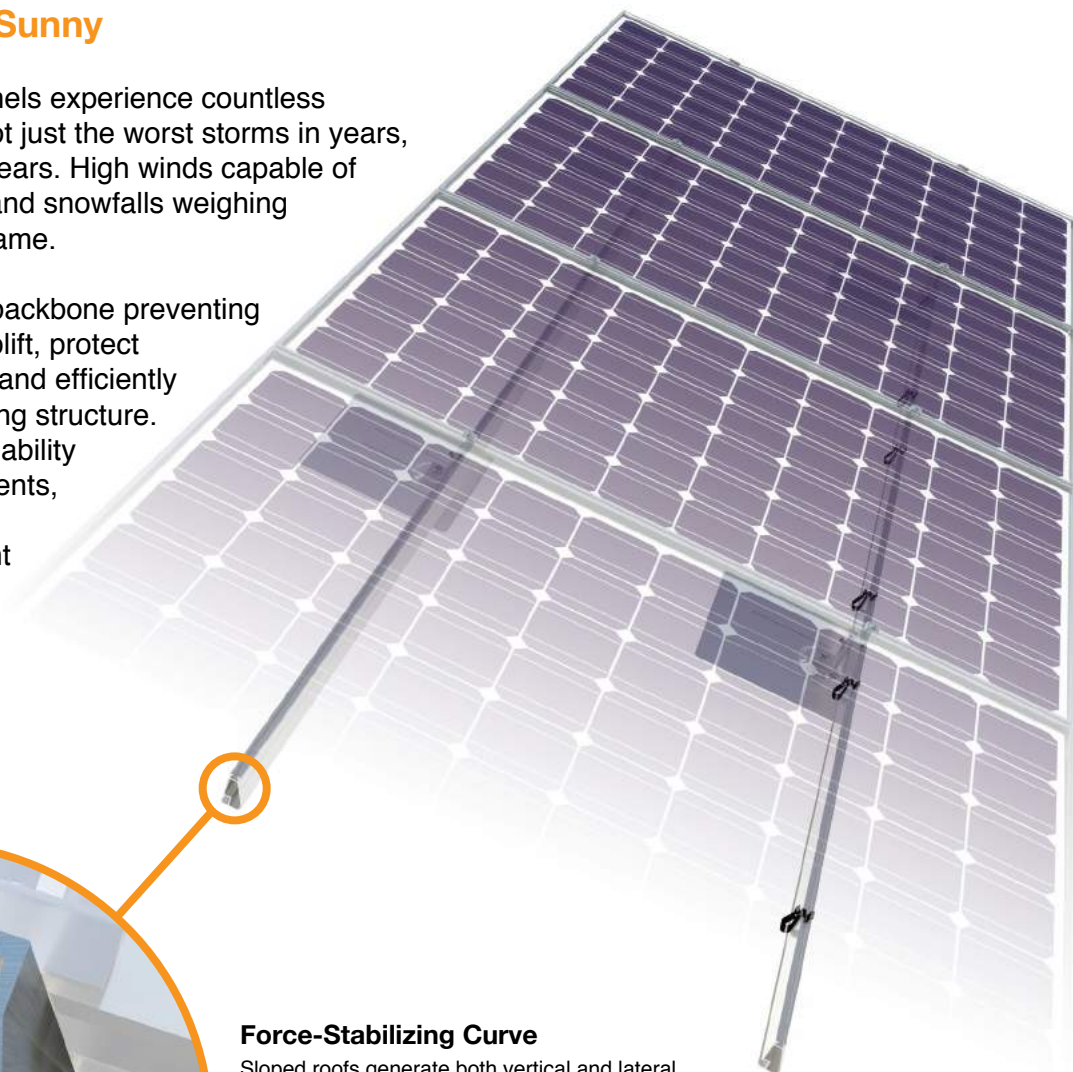
AUTHORIZATION TO MARK

Product:	Utility Interactive Inverter
Brand Name:	SolarEdge
Models:	7 models: SE3000, SE3300, SE3800, SE5000, SE6000, SE7000, SE7600 (Option: followed by A to indicate Interface board, etc.)

Solar Is Not Always Sunny

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

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



Force-Stabilizing Curve

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

Compatible with Flat & Pitched Roofs



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



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

Corrosion-Resistant Materials

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



XR Rail Family

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



XR10

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

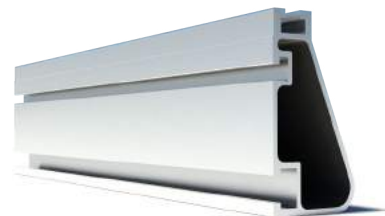
- 6' spanning capability
- Moderate load capability
- Clear & black anodized finish
- Internal splices available



XR100

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 8 feet.

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



XR1000

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

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

Rail Selection

The following table was prepared in compliance with applicable engineering codes and standards. Values are based on the following criteria: ASCE 7-10, Roof Zone 1, Exposure B, Roof Slope of 7 to 27 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed span tables and certifications.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	100	XR10		XR100		XR1000	
	120						
	140						
	160						
10-20	100						
	120						
	140						
	160						
30	100						
	160						
40	100						
	160						
50-70	160						
80-90	160						

Background

All roofing products are tested and classified for their ability to resist fire.

Recently, these fire resistance standards were expanded to include solar equipment as part of the roof system. Specifically, this requires the modules, mounting hardware and roof covering to be tested together as a system to ensure they achieve the same fire rating as the original roof covering.

Adoption of these new requirements will begin in California in 2015 and extend to the rest of the country in 2016.

IronRidge Certification

In August 2014, IronRidge was the first company to receive a Class A Fire Rating—the highest possible rating—from Intertek Group plc., a Nationally Recognized Testing Laboratory.

IronRidge Roof Mount products were tested on flat and sloped roofs in accordance with the new UL 1703 & UL 2703 test standards. The testing evaluated the system's ability to resist flame spread, burning material and structural damage to the roof.

Refer to the table below to determine the requirements for achieving a Class A Fire Rating on your next project.

Fire Testing Process

Test Setup

Solar Modules

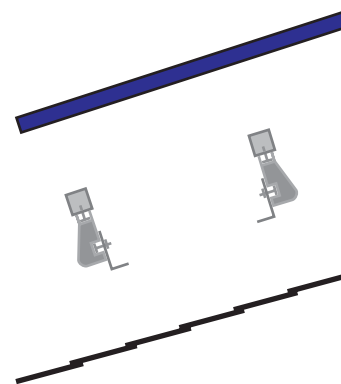
Solar modules are given a Type classification based on their materials and construction.

Mounting System

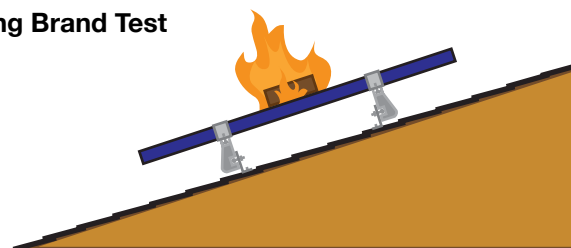
Mounting is tested as part of a system that includes type-tested modules and fire-rated roof covering.

Roof Covering

Roof covering products are given a Fire Class Rating of A, B or C based on their tested fire resistance.

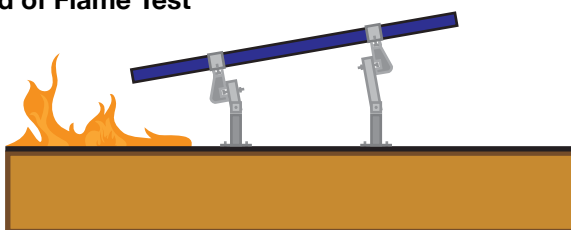


Burning Brand Test






A burning wooden block is placed on module as a fan blows at 12 mph. Flame cannot be seen on underside of roof within 90 minutes.

Spread of Flame Test



Flame at southern edge of roof is aimed up the roof as a fan blows at 12 mph. The flame cannot spread 6 feet or more in 10 minutes.

Roof Slope	Mount	Module	Fire Rating*
Steep Slope (> 9.5 deg.)	Flush 	Type 1 & 2	Class A
Low Slope (< 9.5 deg.)	Flush 	Type 1	Class A
	Tilt 	Type 1	Class A

*Can be installed on Class A, B, & C roofs.

Frequently Asked Questions

What is a “module type”?

The new UL1703 standard introduces the concept of a PV module type, based on 4 construction parameters and 2 fire performance parameters. The purpose of this classification is to certify mounting systems without needing to test it with every module.

What roofing materials are covered?

All fire rated roofing materials are covered within this certification including composition shingle, clay and cement tile, metal, and membrane roofs.

What if I have a Class C roof, but the jurisdiction now requires Class A or B?

Generally, older roofs will be “grandfathered in”, and will not require re-roofing. However, if 50% or more of the roofing material is replaced for the solar installation the code requirement will be enforced.

Where is the new fire rating requirement code listed?

2012 IBC: 1509.7.2 Fire classification. Rooftop mounted photovoltaic systems shall have the same fire classification as the roof assembly required by Section 1505.

Where is a Class A Fire Rating required?

The general requirement for roofing systems in the IBC refers to a Class C fire rating. Class A or B is required for areas such as Wildland Urban Interface areas (WUI) and for very high fire severity areas. Many of these areas are found throughout the western United States. California has the most Class A and B roof fire rating requirements, due to wild fire concerns.

Are standard mid clamps covered?

Mid clamps and end clamps are considered part of the PV “system”, and are covered in the certification.

What attachments and flashings are deemed compatible with Class A?

Attachments and their respective flashings are not constituents of the rating at this time. All code-compliant flashing methods are acceptable from a fire rating standpoint.

What mounting height is acceptable?

The UL testing was performed at a height of 5”. The code does not specify minimum or maximum height. The IronRidge Class A rating covers all heights as long as they fit within the “flush mounted” category.

Am I required to install skirting to meet the fire code?

No, IronRidge achieved a Class A fire rating without any additional racking components.

What determines Fire Classification?

Fire Classification refers to a fire-resistance rating system for roof covering materials based on their ability to withstand fire exposure.

*Class A - effective against severe fire exposure
Class B - effective against moderate fire exposure
Class C - effective against light fire exposure*

What if the roof covering is not Class A rated?

The IronRidge Class A rating will not diminish the fire rating of the roof, whether Class A, B, or C.

What tilts is the tilt mount system fire rated for?

The tilt mount system is rated for 1 degrees and up and any roof to module gap, or mounting height.

More Resources



Fire Rating Certificate

Visit our website to download the official UL 2703 certification document.

[Go to IronRidge.com](http://www.ironridge.com)



Engineering Certification Letters

We offer complete engineering resources and pre-stamped certification letters.

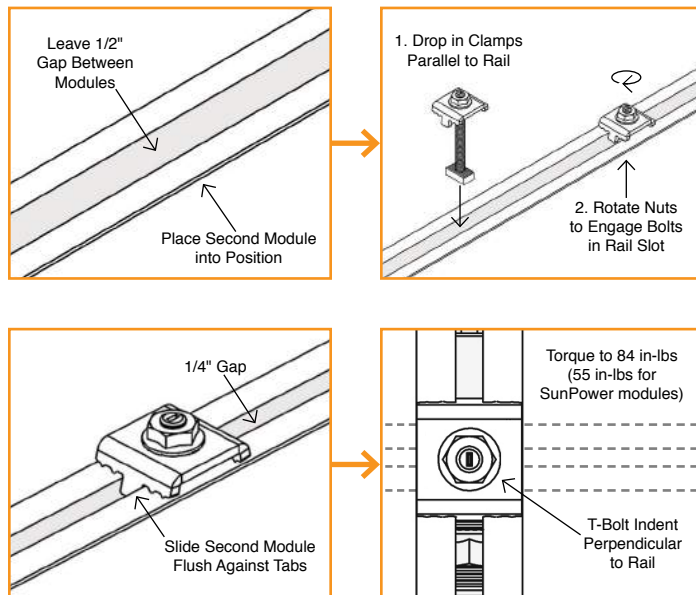
[Go to IronRidge.com](http://www.ironridge.com)

Installation

Once the end module is set into position, place second module into position, leaving a 1/2" gap between it and the previous module. While holding module in place, drop Grounding Mid Clamps into rail slots and rotate nuts to engage T-bolts.

Slide second module flush against clamp tabs. Once clamp teeth are in contact with both module frames and the bolts are properly aligned in slots, torque to 84 in-lbs (55 in-lbs for SunPower modules). Repeat procedure for each following module.

- ▶ **Make sure indent at top of T-bolt is perpendicular to rail slot to ensure T-bolts are properly seated.**
- ▶ **If grounding mid clamps need to be reinstalled, slightly move the modules so that clamp teeth are in contact with a new section of the module frame.**



Markings

Markings are located on the top surface of the Grounding Mid Clamp and being with the manufacturing and model number followed by the revision and manufacturing date.

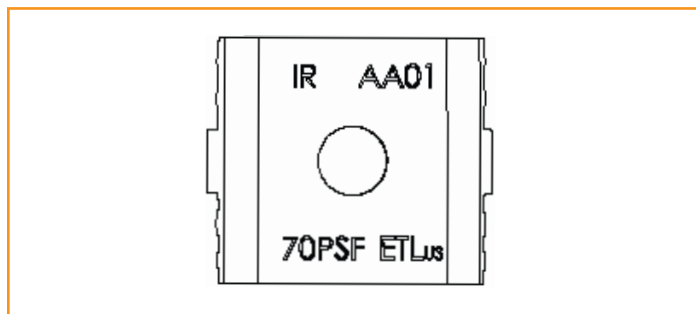
Manufacturer and model number: IR

Revision and manufacturing date:

First digit (revision code): A = Rev A, B = Rev B, etc.

Second digit (month produced): A = Jan, B = Feb, etc.

Third & fourth digits (year produced): 15 = 2015, etc.

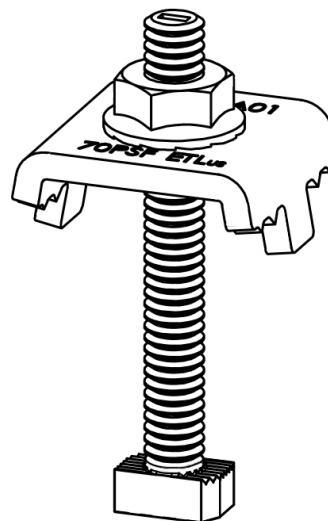


Ratings

Max Overcurrent Protective Device (OCPD) Rating: 25A

Installer is responsible for and shall provide an appropriate method of direct-to-earth grounding according to the latest edition of the National Electrical Code, including NEC 250: Grounding and Bonding, and NEC 690: Solar Photovoltaic Systems.

If loose components, loose fasteners or corrosion are found during periodic inspection, replace affected components immediately.



RECOGNIZED
COMPONENT



Intertek
4008083

Module Compatibility

The Grounding Mid Clamp may be used to ground and/or mount a PV module complying with UL 1703 only when the specific module has been evaluated for grounding and/or mounting in compliance with the included instructions. Unless otherwise noted, “xxx” refers to the module power rating and both black and silver frames are included in the certification.

MANUFACTURER	MODELS
AstroEnergy Solar	Modules with 35, 40, and 45mm frames and model identifier aaSM66yyPzz-xxx; where “aa” can be CH or A; “yy” can be either 10 or 12; “zz” can be blank or (BL).
Canadian Solar	Modules with 40mm frames and model identifier CS6Y-xxxZ; where “Y” can be K, P, V, or X; and “Z” can be M, P, PX, or P-SD.
ET Solar	Modules with 35, 40, and 50mm frames and model identifier ET-Y6ZZxxxAA; where “Y” can be P, L, or M; “ZZ” can be 60 or 72; and “AA” can be WB, WW, BB, WBG, WWG, WBAC, WBCO, WWCO, WWBCO or BBAC.
GigaWatt Solar	Modules with 40mm frames and model identifier GWxxxYY; where “YY” can be either PB or MB.
Hanwha Solar	Modules with 40, 45, and 50mm frames and model identifier HSLaaP6-YY-1-xxxZ; where “aa” can be either 60 or 72; “YY” can be PA or PB; and “Z” can be blank or B.
Hanwha Q CELLS	Modules with 32, 35, 40, and 42mm frames and model identifier Q.YY-ZZ-xxx; where “YY” can be PLUS, PRO, or PEAK; and “ZZ” can be G3, G4, L-G2, L-G3y, L-G4y, BFR-G3, BLK-G3, BFR-G4, BFR-G4.1, or G4.1/SC.
Hyundai	Modules with 35 and 50mm frames and model identifier HiS-YxxxZZ; where “Y” can be M or S; and “ZZ” can be MI, MF, MG, SG, RI, RG, TI, or TG.
JA Solar	Modules with 40 and 45mm frames and model identifier JAYyzz-bb-xxx/aa; where “yy” can be 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, 60, or 72; and “aa” can be MP, SI, PR, 3BB, 4BB, 4BB/RE.
Jinko	Modules with 35 and 40mm frames and model identifier JKMYxxxZZ; where “Y” can either be blank or S; and “ZZ” can be M, P, PP, P-B, or P-V.
Kyocera	Modules with 46mm frames and model identifier KYxxxZZ-AA; 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, or 8BC.
LG	Modules with 35, 40, and 46mm frames and model identifier LGxxy1z-bb; where “y” can be A, N, or S; “z” can be C or K; and “bb” can be A3, B3, G3, C4 or K4.
Mistubishi	Modules with 46mm frames and model identifier PV-MYYxxxZZ; where “YY” can be LE or JE; and “ZZ” can be either HD, HD2, or FB.
Motech	IM and XS series modules with 40, 45, and 50mm frames.
Panasonic	Modules with 35mm frames and model identifier VBHNxxxSAyy; where “yy” can be either 06, 06B, 11, 11B, 15, 15B, 16 or 16B.
Phono Solar	Modules with 35, 40, and 45mm frames and model identifier PSxxxY-ZZ/A; where “Y” can be M or P; “ZZ” can be 20 or 24; and “A” can be F, T or U.
REC Solar	Modules with 38 and 45mm frames and model identifier RECxxxYYZZ; where “YY” can be M, PE or TP; and “ZZ” can be blank, BLK, SLV, or 72.
Renesola	Modules with 35, 40 and 50mm frames and model identifier JCxxxY-ZZ; where “Y” can be F, M or S; and “ZZ” can be Ab, Ab-b, Abh, Abh-b, Abv, Abv-b, Bb, Bb-b, Bbh, Bbh-b, Bbv, Bbv-b, Db, or Db-b.
SolarWorld	Sunmodule Plus, Protect or XL mono or poly modules with 31, 33 or 46mm frames and model identifier SW-xxx.
Stion	Thin film modules with 35mm frames and model identifier STO-xxx.
SunEdison	Modules with 35, 40, and 50mm frames and model identifier SE-YxxxZABCDE; 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.
Suniva	Modules with 35, 38, 40, 46, and 50mm frames and model identifiers OPTxxx-AA-B-YYY-Z or MVXxxx-AA-B-YYY-Z; 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.
Sunpower	SPR-A-xx series with standard (G3) or InvisiMount (G5) 46mm frames; where “A” is either E or X; and “xx” is the series number.
Suntech	Vd, Vem, Wdb, Wde, and Wd series modules with 35, 40, and 50mm frames.
Trina	Modules with 35, 40 and 46mm frames and model identifier TSM-xxxYYZZ; where “YY” can be PA05, PC05, PD05, PA14, PC14, or PD14; and “ZZ” can be blank or A or A.05 or A.08.
Winaico	Modules with 35 and 40mm frames and model identifier Wsy-xxxx6; where “y” can be either P or T; and “z” can be either M or P.
Yingli	Panda, YGE, and YGE-U series modules with 35, 40, and 50 mm frames.



Built for solar's toughest roofs.

IronRidge builds the strongest roof mounting system in solar. Every component has been tested to the limit and proven in extreme environments.

Our rigorous approach has led to unique structural features, such as curved rails and reinforced flashings, and is also why our products are fully certified, code compliant and backed by a 20-year warranty.



Strength Tested

All components evaluated for superior structural performance.



PE Certified

Pre-stamped engineering letters available in most states.



Complete Assembly

End-to-end solution provides attachment, mounting, and grounding.



Design Software

Online tool generates a complete bill of materials in minutes.



Integrated Grounding

UL 2703 system eliminates separate module grounding components.



20 Year Warranty

Twice the protection offered by competitors.

XR Rails

XR10 Rail



A low-profile mounting rail for regions without snow.

- 6' spanning capability
- Moderate load capability
- Clear anodized finish

XR100 Rail



The ultimate residential solar mounting rail.

- 8' spanning capability
- Heavy load capability
- Clear & black anod. finish

XR1000 Rail



A heavyweight mounting rail for commercial projects.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish

Internal Splices

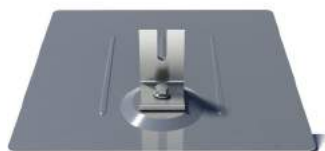


All rails use internal splices for seamless connections.

- Self-tapping screws
- Varying versions for rails
- Grounding Straps offered

Attachments

FlashFoot



Anchor, flash, and mount with all-in-one attachments.

- Ships with all hardware
- IBC & IRC compliant
- Certified with XR Rails

Slotted L-Feet



Drop-in design for rapid rail attachment.

- High-friction serrated face
- Heavy-duty profile shape
- Clear & black anod. finish

Standoffs



Raise flush or tilted systems to various heights.

- Works with vent flashing
- Ships pre-assembled
- Lengths from 3" to 9"

Tilt Legs



Tilt assembly to desired angle, up to 45 degrees.

- Attaches directly to rail
- Ships with all hardware
- Fixed and adjustable

Clamps & Grounding

End Clamps



Slide in clamps and secure modules at ends of rails.

- Mill finish & black anod.
- Sizes from 1.22" to 2.3"
- Optional Under Clamps

Grounding Mid Clamps



Attach and ground modules in the middle of the rail.

- Parallel bonding T-bolt
- Reusable up to 10 times
- Mill & black stainless

T-Bolt Grounding Lugs



Ground system using the rail's top slot.

- No clips or washers
- Eliminates pre-drilling
- Easy top-slot mounting

Accessories



Provide a finished and organized look for rails.

- Snap-in Wire Clips
- Perfected End Caps
- UV-protected polymer

Free Resources



Design Assistant

Go from rough layout to fully engineered system. For free.

[Go to IronRidge.com/rm](http://IronRidge.com/rm)



NABCEP Certified Training

Earn free continuing education credits, while learning more about our systems.

[Go to IronRidge.com/training](http://IronRidge.com/training)

E-Mount Lag | QMSE - LAG

THIS EDGE TOWARDS ROOF RIDGE

1.50

3.00

9.00

4.50

2.50

.040

1.29

AVAILABLE IN MILL, AND BRONZE ANODIZED FINISHES

ITEM NO.	DESCRIPTION	QTY./BOX
1	FLASHING, 9" X 12" X .040", 5052, MILL	1
2	QBLOCK, CLASSIC, A360 CAST AL, MILL	1
3	PLUG, SEALING, 5/16" X 7/8", EPDM / 18-8 SS	1
4	LAG SCREW, HEX HEAD, 5/16" x 5-1/2", 18-8 SS	1
5	WASHER, FENDER, 5/16" ID X 1-1/4" OD, 18-8 SS	1

RACKING COMPONENTS NOT INCLUDED

5

4

3

2

1

Quick Mount PV®

TITLE: QMSE-LAG: QMPV E-MOUNT WITH LAG BOLT

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± 1/8 TWO PLACE DECIMAL ±.18 THREE PLACE DECIMAL ±.125	SIZE	DRAWN BY: RAD	REV
	A	DATE: 12/11/2015	4
	SCALE: 1:3	WEIGHT: 0.92	SHEET 1 OF 1

PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF QUICK MOUNT PV. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF QUICK MOUNT PV IS PROHIBITED.

DO NOT SCALE DRAWING

Lag pull-out (withdrawal) capacities (lbs) in typical lumber:			
	Lag Bolt Specifications		
	Specific Gravity	5/16" shaft per 3" thread depth	5/16" shaft per 1" thread depth
Douglas Fir, Larch	.50	798	266
Douglas Fir, South	.46	705	235
Engelmann Spruce, Lodgepole Pine (MSR 1650 f & higher)	.46	705	235
Hem, Fir	.43	636	212
Hem, Fir (North)	.46	705	235
Southern Pine	.55	921	307
Spruce, Pine, Fir	.42	615	205
Spruce, Pine, Fir (E of 2 million psi and higher grades of MSR and MEL)	.50	798	266

Sources: American Wood Council, NDS 2005, Table 11.2 A, 11.3.2 A

Notes:

- 1) Thread must be embedded in a rafter or other structural roof member.
- 2) See NDS Table 11.5.1C for required edge distances.



E-Mount Lag Installation Instructions

Installation Tools Required: tape measure, roofing bar, chalk line, stud finder, caulking gun, sealant compatible with roofing materials, drill with 7/32" long-style bit, drill or impact gun with 1/2" socket.

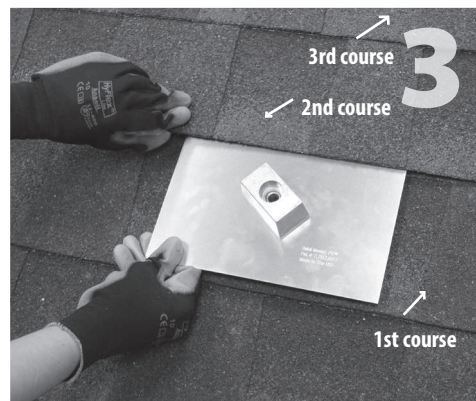
WARNING: Quick Mount PV products are NOT designed for and should NOT be used to anchor fall protection equipment.



1 Locate, choose, and mark centers of rafters to be mounted. Select the courses of shingles where mounts will be placed.



2 Carefully lift composition roof shingle with roofing bar, just above placement of mount. Remove nails as required. See "Proper Flashing Placement" on next page.



3 Insert flashing between 1st and 2nd course. Slide up so top edge of flashing is at least 3/4" higher than the drip edge of the 3rd course and lower flashing edge is above the drip edge of 1st course. Mark center for drilling.



4 Using drill with 7/32" bit, drill pilot hole into roof and rafter, taking care to drill square to the roof. Do not use mount as a drill guide. Drill should be 'long style bit', aka 'aircraft extension bit' to drill a 1 3/4" deep hole into rafter.



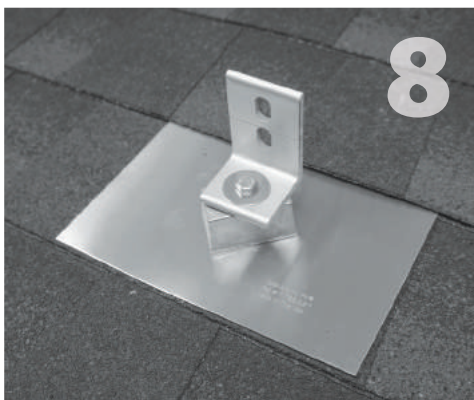
5 Clean off any sawdust, and fill hole with sealant compatible with roofing materials.



6 Slide the flashing into position. Insert the rubber plug into the QBlock cavity.



7 Slide the washer and the L-foot (not included) onto the lag screw.

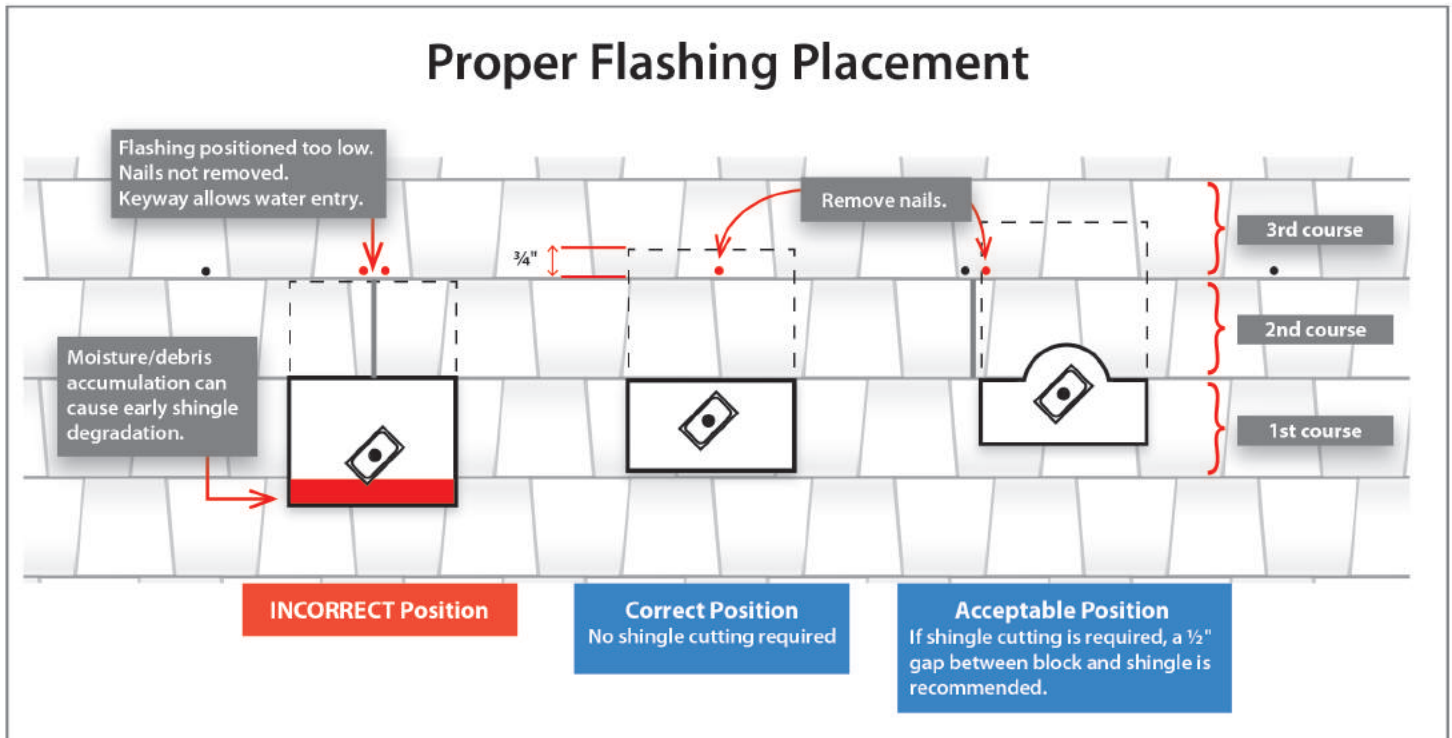


8 Using a 1/2 inch socket on an impact gun drive the lag screw until the QBlock stops rotating easily. **DO NOT over-torque.**

You are now ready for the rack of your choice. Follow all the directions of the rack manufacturer as well as the module manufacturer.

All roofing manufacturers' written instructions must also be followed by anyone modifying a roof system. Consult the roof manufacturer's specs and instructions prior to touching the roof.

Reference and Tips



Additional tips and information for installing mounts:

- See Quick Tips videos on nail removal, and more at: <http://www.quickmountpv.com/support/videos.html>
- It is not necessary or advisable to use nails or other fasteners to secure the perimeter of the flashing.
- The E-Mount is made to work with standard and high-definition composition/asphalt and wood shingle roofs with 5" to 5-5/8" courses. If the exposed surface of the course exceeds this measurement you may need to use our Classic Shake Mount instead.
- Depending on the season and climate, size and location of seal tabs, and quality of the shingles, the seal tabs that adhere the shingle courses together may not effectively seal the shingles to the flashings. If this is the case, simply add several quarter-sized dabs of manufacturer accepted sealant or asphalt roofing cement, meeting ASTM D 4586 Type II, between the flashing and the shingle above.
- Mounts should not be installed in areas of the roof susceptible to ice damming. Water ponding under the shingles can reach the bolt penetration.
- Take care not to damage the roofing material while working on the roof. Removing stone granules and deforming the shingles in any way can shorten the lifespan of the roofing. The value of the solar array is directly affected by the condition of the roof it is attached to.



925-478-8269 | www.quickmountpv.com | info@quickmountpv.com
2700 Mitchell Dr. | Walnut Creek, CA 94598

© 2016 by Quick Mount PV. All rights reserved.



Most Widely Accepted and Trusted

ICC-ES Report

ESR-3744

ICC-ES | (800) 423-6587 | (562) 699-0543 | www.icc-es.org

Reissued 11/2015
This report is subject to renewal 11/2016.

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
SECTION: 06 05 23—WOOD, PLASTIC, AND COMPOSITE FASTENINGS

REPORT HOLDER:

QUICK MOUNT PV

**2700 MITCHELL DRIVE, BUILDING 2
WALNUT CREEK, CALIFORNIA 94598**

EVALUATION SUBJECT:

QUICK MOUNT PV ROOF MOUNTS



Look for the trusted marks of Conformity!

“2014 Recipient of Prestigious Western States Seismic Policy Council (WSSPC) Award in Excellence”



ICC-ES Evaluation Reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this report, or as to any product covered by the report.



ICC-ES Evaluation Report**ESR-3744**

Reissued November 2015

This report is subject to renewal November 2016.www.icc-es.org | (800) 423-6587 | (562) 699-0543

A Subsidiary of the International Code Council®

**DIVISION: 06 00 00—WOOD, PLASTICS AND
COMPOSITES****Section: 06 05 23—Wood, Plastic, and Composite
Fastenings****REPORT HOLDER:****QUICK MOUNT PV
2700 MITCHELL DRIVE, BUILDING 2
WALNUT CREEK, CALIFORNIA 94598
(925) 478-8269
www.quickmountpv.com****EVALUATION SUBJECT:****QUICK MOUNT PV ROOF MOUNTS****1.0 EVALUATION SCOPE****Compliance with the following code:**

- 2012, 2009 and 2006 *International Building Code*® (IBC)
- 2012, 2009 and 2006 *International Residential Code*® (IRC)

Properties evaluated:

- Structural
- Water penetration

2.0 USES

The Quick Mount PV Roof Mounts (QMSE, QMSE-LAG, QMSC-LAG and QMLC-LAG) are mounting brackets used to attach solar panel mounting systems to the wood framing of roofs with asphalt shingle or wood shake roof coverings.

3.0 DESCRIPTION

The Quick Mount PV Roof Mounts (QMSE, QMSE-LAG, QMSC-LAG and QMLC-LAG) have three main components: a hanger bolt or lag screw, an aluminum spacer block and a flashing plate. The hanger bolt is a $\frac{5}{16}$ -inch-diameter-by-6-inch-long (7.9 by 152 mm) fastener with lag-screw threads on one end and UNC threads on the opposite end. The lag screw is a $\frac{5}{16}$ -inch-diameter-by-5½-inch-long (7.9 by 140 mm) fastener with lag-screw threads on one end. The hanger bolts and lag screws are fabricated from stainless steel as described in the approved quality documentation. The flashing plate can be 12 inches (305 mm) square or 18 inches (457 mm) square, formed 0.05-inch-thick (1.3 mm) aluminum conforming to ASTM B209, or 9 inches by 12 inches (229 mm by

305 mm), formed from 0.04-inch-thick (1.0 mm) aluminum conforming to ASTM B209. The 12-inch square or 9-inch-by-12-inch flashing plate are used for installation with asphalt shingles roofs and the 18-inch square flashing plate is used for installation with wood shake roofs. The aluminum spacer block measures 2.25 inches (57 mm) deep by 1.25 inches (32 mm) long. See Figure 2 for an illustration of QMSE Quick Mount Roof Mount, and Figure 4 for an illustration of QMSE-LAG, QMSC-LAG and QMLC-LAG Quick Mount Roof Mounts.

4.0 DESIGN AND INSTALLATION**4.1 Design:**

The tabulated allowable strengths shown in this report are based on allowable stress design (ASD) and include the load duration factor, C_D , corresponding with the applicable loads in accordance with the National Design Specification for Wood Construction (NDS).

Where the roof mounts are exposed to in-service temperatures exceeding 100°F (37.8°C), uplift allowable loads shown in Table 1 must be adjusted by the temperature factor, C_t , in accordance with Section 10.3.4 of the NDS. When products are attached to wood framing having an in-service moisture content greater than 19 percent (16 percent for engineered wood products), or where wet service is expected, the allowable loads must be adjusted by the wet service factor, C_M , specified in Section 10.3.3 of the NDS. Connected wood members must be analyzed for load-carrying capacity at the connection in accordance with the NDS.

4.2 Installation:

The flashing plate must be placed underneath the shingle or shake in a weather-lap fashion. Prior to the hanger bolt or lag screw being placed through the spacer block hole, the hole must be filled with a sealant approved for roofing applications. The lag-screw end of the hanger bolt is screwed into the rafter through the spacer block and flashing plate. The sealing washer and nut are fastened through the threaded rod portion of the hanger bolt. The black gasket is then placed over the nut and through the threaded rod to seal the hole of the spacer block. Then a $\frac{5}{16}$ -inch (7.9 mm) stainless steel nut is placed to secure the connection of a mounting bracket, which is supplied by others, onto the UNC threaded end of the hanger bolt. If a lag screw is used, a sealing plug is placed into the spacer block cavity before the lag screw is screwed into the rafter through the spacer block and flashing plate, securing the mounting bracket, which is supplied by others. Installation of the Quick Mount Roof Mounts described in this report is

limited to roofs having minimum slopes of 2:12 (18 percent) and maximum slopes of 24:12 (200 percent). The minimum specific gravity of the wood member is as noted in Tables 1 and 2.

5.0 CONDITIONS OF USE

The Quick Mount Roof Mounts described in this report comply with, or are suitable alternatives to what is specified in, the code indicated in Section 1.0 of this report, subject to the following conditions:

- 5.1 The Quick Mount PV Roof Mounts must be installed in accordance with this report and the manufacturer's published installation instructions. In the event of a conflict between this report and the manufacturer's published installation instructions, this report governs.
- 5.2 Calculations showing compliance with this report must be submitted to the code official. The calculations must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

6.0 EVIDENCE SUBMITTED

- 6.1 Load test data in accordance with the ICC-ES Acceptance Criteria for Joist Hangers and Similar Devices (AC13), dated October 2010 (editorially revised December 2011).
- 6.2 Rain test data in accordance with the ICC-ES Acceptance Criteria for Roof Flashing for Pipe Penetrations (AC286), dated October 2012 (editorially revised August 2013).
- 6.3 Quality documentation and installation instructions.

7.0 IDENTIFICATION

The Quick Mount PV Roof Mounts are identified with a label bearing the report holder's name (Quick Mount PV), the product name or designation, and the evaluation report number (ESR-3744).

TABLE 1—QUICK MOUNT ROOF MOUNT QMSE ALLOWABLE UPLIFT AND LATERAL LOADS^{1,2,3}

LOAD DIRECTION ⁴	SPECIFIC GRAVITY OF LUMBER RAFTER	ALLOWABLE LOAD (lbf)
Uplift	0.50 (Douglas fir-larch)	811
	0.36 (Western cedars)	436
Lateral	0.50 (Douglas fir-larch)	671
	0.36 (Western cedars)	634

For SI: 1 lbf = 4.48 N.

¹The lag screw portion of the 5/16-inch-diameter (7.9 mm) hanger bolt must be installed into the rafter with a minimum penetration of 2.875 inches (73 mm) and must satisfy edge distance specified by NDS.

²Design forces must be determined in accordance with the applicable code and must not exceed the tabulated values. No increases for load duration are permitted.

³Where the temperatures in the vicinity of the roof framing exceed 100°F (37.8°C), the tabulated uplift allowable loads must be multiplied by the temperature factor, C_t, set forth in Section 10.3.4 of the NDS.

⁴Uplift load direction is perpendicular to the plane of the roof. Lateral load direction is parallel to the rafter. Lateral load perpendicular to the framing member is outside the scope of this report. See figure 1 below for a description of the load direction.

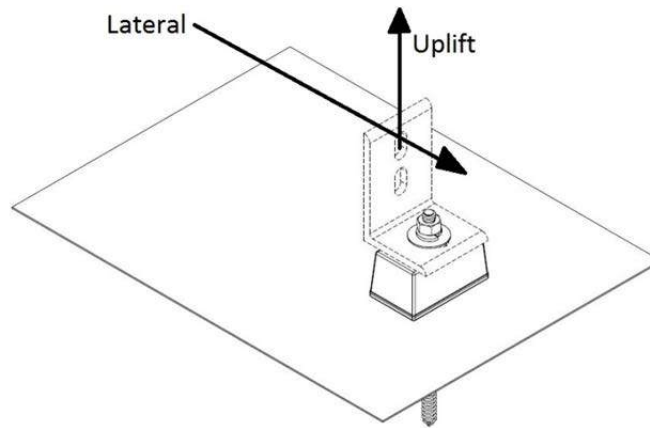
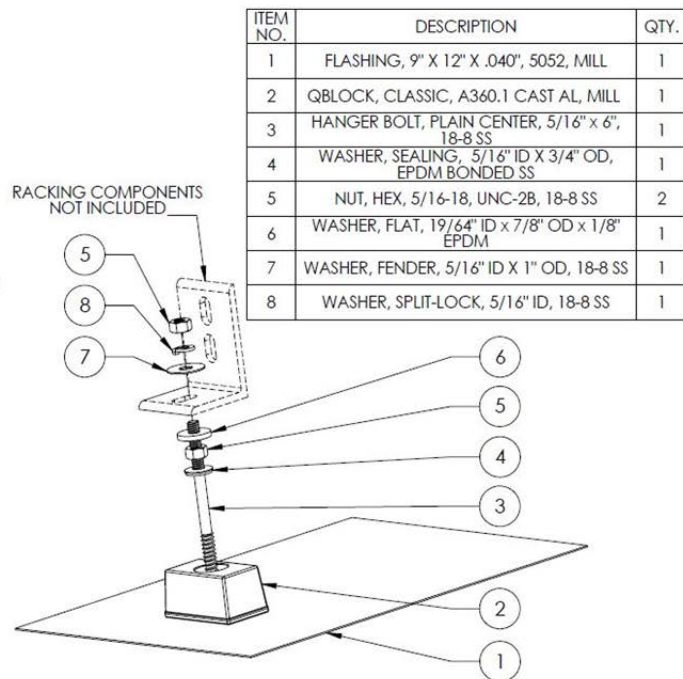
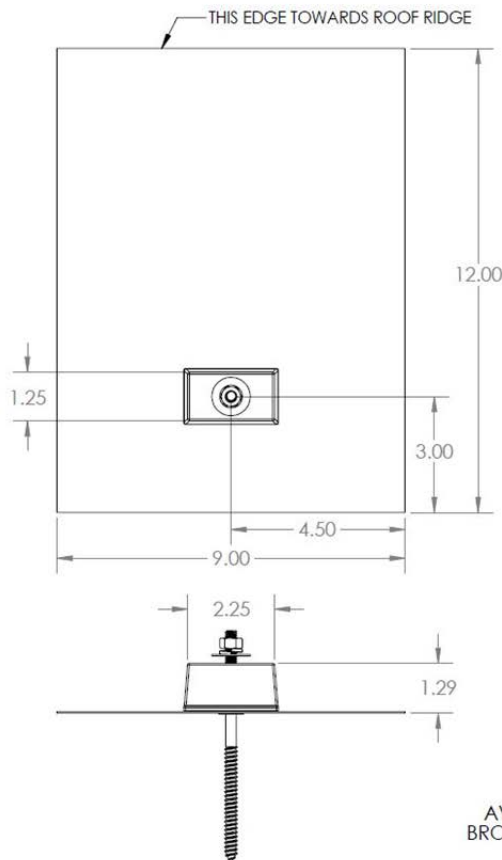


FIGURE 1



AVAILABLE IN MILL, AND BRONZE ANODIZED FINISHES.

FIGURE 2—QMSE Quick Mount Roof Mount

TABLE 2—QUICK MOUNT ROOF MOUNTS QMSE-LAG, QMSC-LAG and QMLC-LAG ALLOWABLE UPLIFT AND LATERAL LOADS^{1,2,3}

LOAD DIRECTION ⁴	SPECIFIC GRAVITY OF LUMBER RAFTER	ALLOWABLE LOAD (lbf)
Uplift	0.50 (Douglas fir–larch)	732
	0.36 (Western cedars)	--
Lateral	0.50 (Douglas fir–larch)	526
	0.36 (Western cedars)	---

For SI: 1 lbf = 4.48 N.

¹The 5/16-inch-diameter (7.9 mm) lag screw must be installed into the rafter with a minimum penetration of 2.875 inches (73 mm) and must satisfy edge distance specified by NDS.

²Design forces must be determined in accordance with the applicable code and must not exceed the tabulated values. No increases for load duration are permitted.

³Where the temperatures in the vicinity of the roof framing exceed 100°F (37.8°C), the tabulated uplift allowable loads must be multiplied by the temperature factor, C_t, set forth in Section 10.3.4 of the NDS.

⁴Uplift load direction is perpendicular to the plane of the roof. Lateral load direction is parallel to the rafter. Lateral load perpendicular to the framing member is outside the scope of this report. See figure 3 below for a description of the load direction.

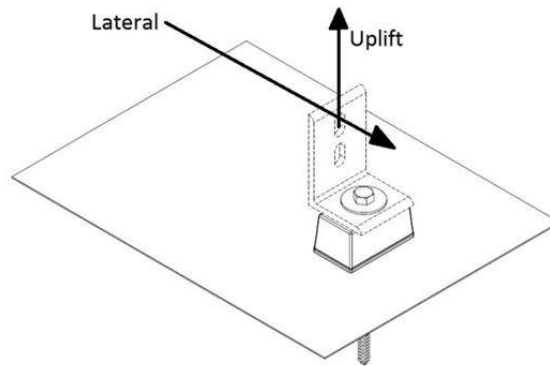
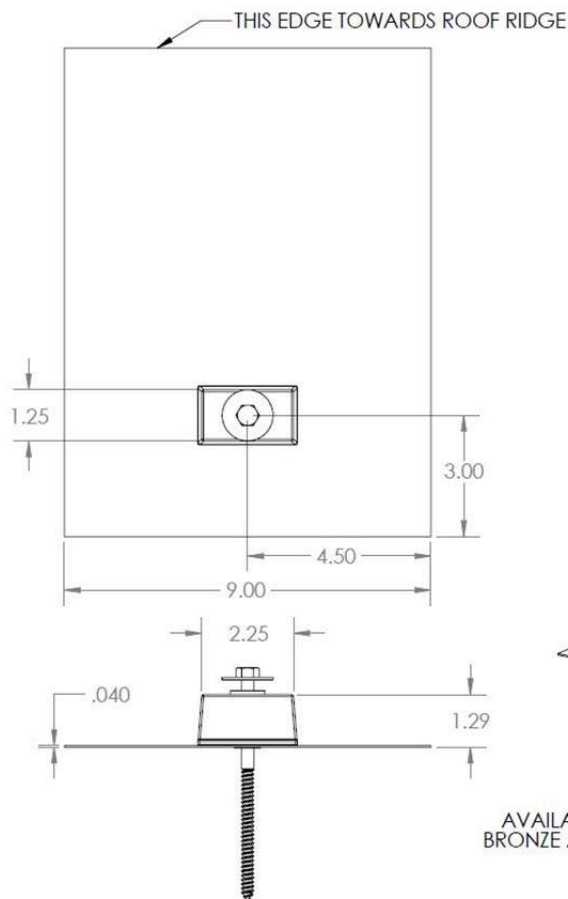
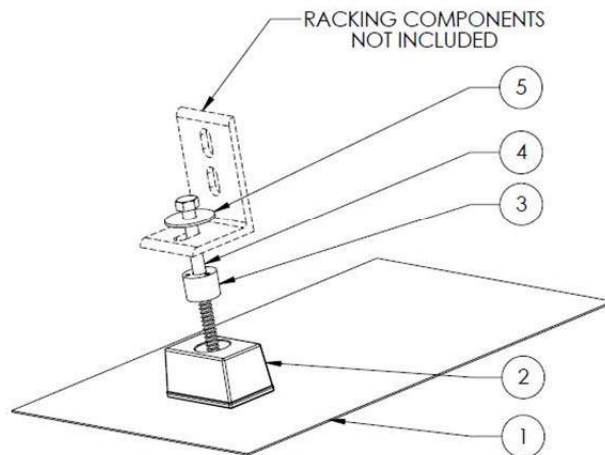


FIGURE 3



ITEM NO.	DESCRIPTION	QTY./BOX
1	FLASHING, 9" X 12" X .040", 5052, MILL	1
2	QBLOCK, CLASSIC, A360.1 CAST AL, MILL	1
3	PLUG, SEALING, 5/16" X 7/8", EPDM / 18-8 SS	1
4	LAG SCREW, HEX HEAD, 5/16" X 5-1/2", 18-8 SS	1
5	WASHER, FENDER, 5/16" ID X 1-1/4" OD, 18-8 SS	1



AVAILABLE IN MILL AND BRONZE ANODIZED FINISHES

FIGURE 4—QMSE-LAG QUICK MOUNT ROOF MOUNT