



IEC2016対応

|       |                    |
|-------|--------------------|
| 日付    |                    |
| 仕様書番号 | TJP240408NEG20C.20 |
| 管理番号  |                    |

## 納入仕様書

御中

品名： 太陽電池モジュール

型式： TSM-NEG20C.20

トリナ・ソーラー・ジャパン株式会社

注記： 製品使用前に、ユーザーマニュアル及び限定保証書をお読みください。  
本仕様書記載事項は予告なく変更されることがあります。

**改定履歷**

| 改定番号 | 日付         | 改定内容                              |
|------|------------|-----------------------------------|
| 1    | 2022/2/25  | 新規作成                              |
| 2    | 2022/11/11 | 追尾式架台（790mmピッチ）穴追記                |
| 3    | 2022/12/5  | 縦置きケーブル極性修正、防水キャップ廃止注記追加          |
| 4    | 2023/1/18  | フレーム高さ（33mm）更新                    |
| 5    | 2023/4/20  | 認証書追加、TSM_JP_2022_A               |
| 6    | 2023/6/28  | 出力追加, 認証書Rev45更新 TSM_JP_2023_A_S1 |
| 7    | 2023/7/12  | 5.3.2 項に絶縁抵抗値追記                   |
| 8    | 2023/11/1  | 出力追加, 認証書Rev47更新 TSM_JP_2023_B    |
| 9    | 2023/12/8  | 公称温度係数Pmax更新（-0.30➡-0.29）         |
| 10   | 2024/4/8   | 出力追加, 認証書Rev51更新 TSM_JP_2024_PA1  |
|      |            |                                   |

# トリナソーラー結晶系太陽電池モジュール

## 1. 適用範囲

本仕様書は、トリナソーラー社製太陽電池モジュール（以下「本モジュール」）に適用する

## 2. 適用規格

本モジュールは 以下の国際規格に関し、第三者機関による認証を取得済みである。

|                    |                                |
|--------------------|--------------------------------|
| IEC 61215-1:2016   | 性能認証規格（試験要求）                   |
| IEC 61215-1-1:2016 | 性能認証規格（結晶系シリコン太陽光モジュール試験の特別要求） |
| IEC 61215-2:2016   | 性能認証規格（試験手順）                   |
| IEC 61730-1:2016   | 安全認証規格（構造に対する要求事項）             |
| IEC 61730-2:2016   | 安全認証規格（試験に対する要求事項）             |

## 3. 感電保護クラス及び火災等級

感電保護クラス      本モジュールはIEC61730-1 4.3項に規定される等級Ⅱに適合する

火災等級              本モジュールはUL790に規定される火災等級Cに適合する

## 4. モジュール最大定格

| 項目        | 単位  | 最大定格値   | 備考       |
|-----------|-----|---------|----------|
| 動作温度      | ℃   | −40～+85 |          |
| 保管温度      | ℃   | −40～+50 | ※1       |
| 動作湿度      | %RH | 85      | ※2       |
| 正圧試験荷重    | Pa  | 5400    | ※3、※4、※5 |
| 負圧試験荷重    | Pa  | 2400    | ※3、※4、※5 |
| 最大システム電圧  | VDC | 1500    |          |
| 最大過電流保護定格 | A   | 35      |          |

※1：ユーザーマニュアルにて定めた保管方法の場合に限る。

※2：雨天時等の一時的な逸脱は、許容する。

※3：ユーザーマニュアルにて定めた取付方法の場合に限る。

※4：IEC61215:2016の機械的荷重試験に準じた方法で、該当する荷重条件にて外観及び電気的性能に異常が無いこととする。

※5：設計荷重の安全係数は、1.5とする。設計荷重は試験荷重の1/1.5。

## 5. 納入仕様

### 5.1 使用材料

本モジュールに使用する材料は、下記内容と規定し、特に規定がないものについてはこの仕様書の性能を十分に満たす材料を選定し使用するものとする

#### 部材仕様

|         |                                    |
|---------|------------------------------------|
| セル      | 単結晶 マンセル近似値 7.5PB/2/0.5            |
| セル枚数    | 120セル                              |
| 外形寸法    | 2172±2 × 1303±2 × 33±1 mm          |
| 質量      | 34.9 kg                            |
| フロントガラス | 高透過・反射防止膜付熱強化ガラス 2.0 mm            |
| 封止材料    | POE/EVA                            |
| バックガラス  | 熱強化ガラス 2.0 mm (ホワイトグリッドガラス)        |
| フレーム    | シルバー・アルマイト処理アルミ合金 33 mm マンセル近似値 N9 |
| 端子ボックス  | IP68定格                             |
| ケーブル    | PVケーブル4.0mm <sup>2</sup>           |
|         | 縦置き： N 280±10 mm, P 350±10 mm      |
|         | 横置き： N 1400±10 mm, P 1400±10 mm    |
| コネクタ    | MC4 EVO2 / TS4 Plus / TS4*         |

\*: トリナコネクタ (ケーブル外径6.0-7.2mm用、  
1パレットに専用スパナと2組の予備コネクタ付属)

### 5.2 出力特性

モジュールの出力特性は、標準試験条件 (STC) で測定したものとする  
(モジュール温度25℃、AM1.5、放射照度：1000w/m<sup>2</sup>)

#### TSM-625NEG20C.20

|                |                  |
|----------------|------------------|
| 型 式            | TSM-625NEG20C.20 |
| 公称最大出力(Pmax)   | 625W             |
| 公称最大動作電圧(Vmax) | 36.4V            |
| 公称最大動作電流(Impp) | 17.19A           |
| 公称開放電圧(Voc)    | 43.5V            |
| 公称短絡電流(Isc)    | 18.21A           |
| モジュール変換効率      | 22.1%            |

#### TSM-630NEG20C.20

|                |                  |
|----------------|------------------|
| 型 式            | TSM-630NEG20C.20 |
| 公称最大出力(Pmax)   | 630W             |
| 公称最大動作電圧(Vmax) | 36.6V            |
| 公称最大動作電流(Impp) | 17.22A           |
| 公称開放電圧(Voc)    | 43.9V            |
| 公称短絡電流(Isc)    | 18.24A           |
| モジュール変換効率      | 22.3%            |

**TSM-635NEG20C.20**

| 型 式            | TSM-635NEG20C.20 |
|----------------|------------------|
| 公称最大出力(Pmax)   | 635W             |
| 公称最大動作電圧(Vmax) | 36.8V            |
| 公称最大動作電流(Impp) | 17.26A           |
| 公称開放電圧(Voc)    | 44.2V            |
| 公称短絡電流(Isc)    | 18.27A           |
| モジュール変換効率      | 22.4%            |

**TSM-640NEG20C.20**

| 型 式            | TSM-640NEG20C.20 |
|----------------|------------------|
| 公称最大出力(Pmax)   | 640W             |
| 公称最大動作電圧(Vmax) | 37.0V            |
| 公称最大動作電流(Impp) | 17.30A           |
| 公称開放電圧(Voc)    | 44.5V            |
| 公称短絡電流(Isc)    | 18.30A           |
| モジュール変換効率      | 22.6%            |

**TSM-645NEG20C.20**

| 型 式            | TSM-645NEG20C.20 |
|----------------|------------------|
| 公称最大出力(Pmax)   | 645W             |
| 公称最大動作電圧(Vmax) | 37.2V            |
| 公称最大動作電流(Impp) | 17.34A           |
| 公称開放電圧(Voc)    | 44.8V            |
| 公称短絡電流(Isc)    | 18.33A           |
| モジュール変換効率      | 22.8%            |

**TSM-650NEG20C.20**

| 型 式             | TSM-650NEG20C.20 |       |
|-----------------|------------------|-------|
| 公称最大出力(Pmax)    | 650W             |       |
| 公称最大動作電圧(Vmax)  | 37.4V            |       |
| 公称最大動作電流(Impp)  | 17.38A           |       |
| 公称開放電圧(Voc)     | 45.1V            |       |
| 公称短絡電流(Isc)     | 18.36A           |       |
| モジュール変換効率       | 23.0%            |       |
| 公称温度係数<br>(%/℃) | 最大出力(Pmax)       | -0.29 |
|                 | 開放電圧(Voc)        | -0.24 |
|                 | 短絡電流(Isc)        | 0.04  |

| 公称出力許容公差 | 上限値 | 下限値 | 単位 |
|----------|-----|-----|----|
|          | 3   | 公称値 | %  |

### 5.3 出荷検査

出荷検査は、電気特性検査、絶縁耐圧試験、及び外観検査を全数行い、良品のみを出荷します。

#### 5.3.1 電気特性検査

ソーラーシミュレーターで、STC条件で、電気特性測定を行います。

STC条件は、AM1.5、放射照度 $1000 \text{ W/m}^2$ 、 $25^\circ\text{C} \pm 2^\circ\text{C}$ です。

#### 5.3.2 絶縁性能

耐電圧：（システム電圧 $\times 2 + 1000\text{V}$ ）の直流電圧を1 分間印加後、

絶縁破壊などの異常がないこと\*1

\*1 JIS C 61215-2 にて出荷検査における耐電圧試験条件の印加電圧を

（システム電圧 $\times 2 + 1000\text{V}$ ） $\times 1.2$  にすることにより、保持時間を1 秒以上に短縮することが認められています。

絶縁抵抗：DC1500Vを印可し絶縁抵抗値 $40\text{M}\Omega \cdot \text{m}^2$ 以上

#### 5.3.3 外観検査

社内規定に準じて、全数検査を行います。

#### 5.3.4 フラッシュレポート

シリアルナンバーと電気特性結果の対比ができるレポートを提出します。

### 5.4 梱包構成

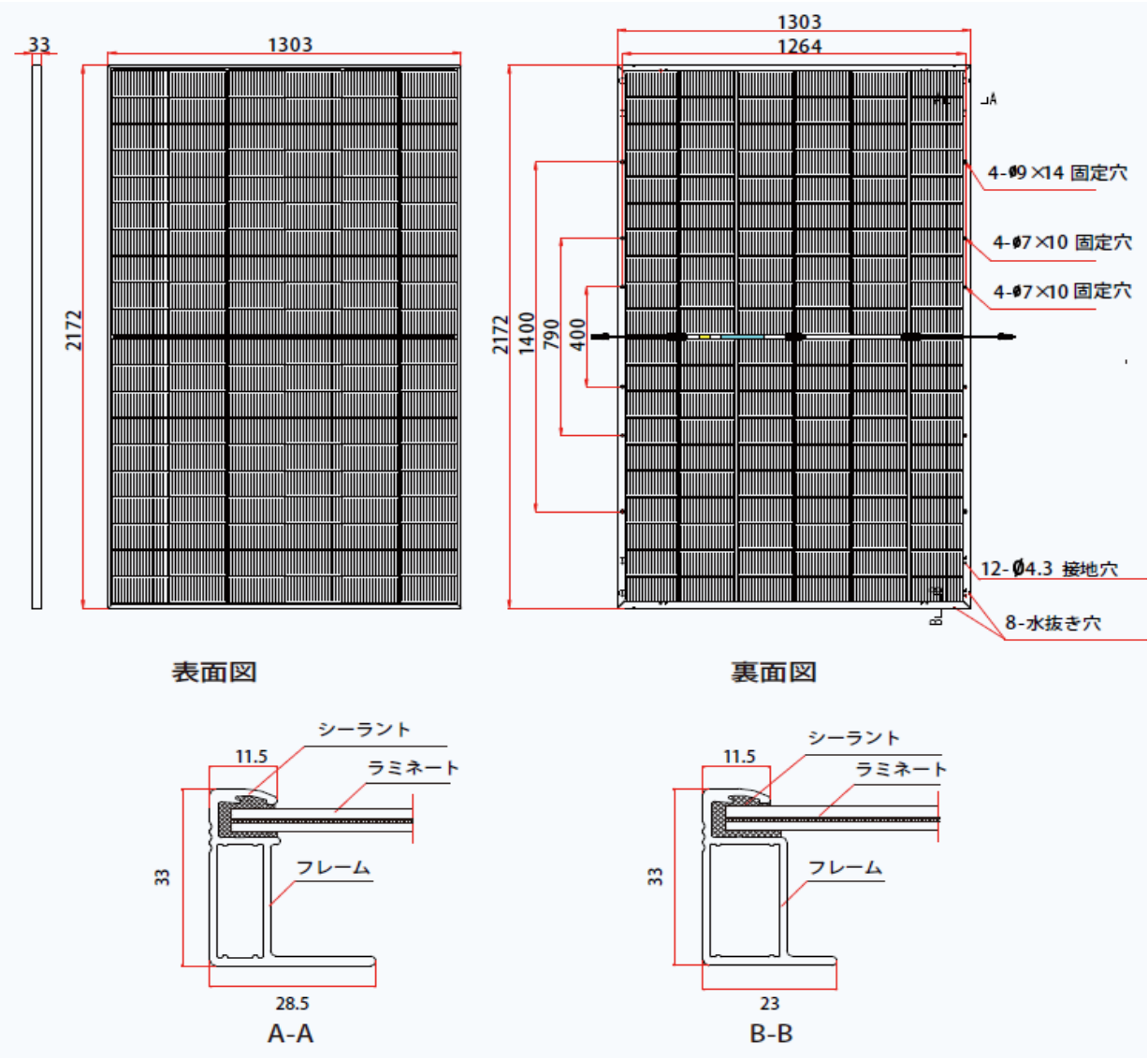
集合梱包 26枚/パレット、39枚/パレット

585枚/40 f t コンテナ(26枚 $\times$  8パレット+ 39枚 $\times$  8パレット)

## 6. 設置上の注意

別途、ユーザーマニュアル参照

7. 各部寸法（モジュール寸法：2172±2 × 1303±2 × 33±1 mm）



注）形状は、写真と異なる場合があります。

## 8. 製品ラベル

### TSM-625NEG20C.20

|                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                  |                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                   |
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| <br><b>TSM-625NEG20C.20</b><br> <b>XX</b> | Maximum Power(P <sub>max</sub> )<br>Maximum Power Voltage(V <sub>mp</sub> )<br>Maximum Power Current(I <sub>mp</sub> )<br>Open Circuit Voltage(V <sub>oc</sub> )<br>Short Circuit Current(I <sub>sc</sub> )<br>Maximum Series Fuse<br>Power Selection<br>Maximum System Voltage<br>Electrical Rating At STC: AM 1.5 1000W/m <sup>2</sup> Tc=25°C | 625W *<br>36.4V<br>17.19A<br>43.5V *<br>18.21A *<br>35A<br>0 → 5W<br>1500V | *(Considering LID, the power range of the certification authority, tolerance (P <sub>max</sub> ) ±3%, (V <sub>oc</sub> ) ±3%, (I <sub>sc</sub> ) ±5%)<br>For field connections, use minimum 4mm <sup>2</sup> (No. 12AWG) copper wires insulated for a minimum 90°C<br> <b>WARNING-ELECTRICAL HAZARD</b><br>This module produces electricity when exposed to light.<br>Follow all applicable electrical safety precautions.<br>Trina Solar Co., Ltd.<br>No.2 TianHe Road, Trina PV Industrial Park, New District, Changzhou City,<br>Jiangsu Province 213031, P. R. China<br>www.trinasolar.com | <br><br><br>EU-28 WEEE COMPLIANT<br><b>Made in China</b> |
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### TSM-630NEG20C.20

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| <br><b>TSM-630NEG20C.20</b><br> <b>XX</b> | Maximum Power(P <sub>max</sub> )<br>Maximum Power Voltage(V <sub>mp</sub> )<br>Maximum Power Current(I <sub>mp</sub> )<br>Open Circuit Voltage(V <sub>oc</sub> )<br>Short Circuit Current(I <sub>sc</sub> )<br>Maximum Series Fuse<br>Power Selection<br>Maximum System Voltage<br>Electrical Rating At STC: AM 1.5 1000W/m <sup>2</sup> Tc=25°C | 630W *<br>36.6V<br>17.22A<br>43.9V *<br>18.24A *<br>35A<br>0 → 5W<br>1500V | *(Considering LID, the power range of the certification authority, tolerance (P <sub>max</sub> ) ±3%, (V <sub>oc</sub> ) ±3%, (I <sub>sc</sub> ) ±5%)<br>For field connections, use minimum 4mm <sup>2</sup> (No. 12AWG) copper wires insulated for a minimum 90°C<br> <b>WARNING-ELECTRICAL HAZARD</b><br>This module produces electricity when exposed to light.<br>Follow all applicable electrical safety precautions.<br>Trina Solar Co., Ltd.<br>No.2 TianHe Road, Trina PV Industrial Park, New District, Changzhou City,<br>Jiangsu Province 213031, P. R. China<br>www.trinasolar.com | <br><br><br>EU-28 WEEE COMPLIANT<br><b>Made in China</b> |
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### TSM-635NEG20C.20

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| <br><b>TSM-635NEG20C.20</b><br> <b>XX</b> | Maximum Power(P <sub>max</sub> )<br>Maximum Power Voltage(V <sub>mp</sub> )<br>Maximum Power Current(I <sub>mp</sub> )<br>Open Circuit Voltage(V <sub>oc</sub> )<br>Short Circuit Current(I <sub>sc</sub> )<br>Maximum Series Fuse<br>Power Selection<br>Maximum System Voltage<br>Electrical Rating At STC: AM 1.5 1000W/m <sup>2</sup> Tc=25°C | 635W *<br>36.8V<br>17.26A<br>44.2V *<br>18.27A *<br>35A<br>0 → 5W<br>1500V | *(Considering LID, the power range of the certification authority, tolerance (P <sub>max</sub> ) ±3%, (V <sub>oc</sub> ) ±3%, (I <sub>sc</sub> ) ±5%)<br>For field connections, use minimum 4mm <sup>2</sup> (No. 12AWG) copper wires insulated for a minimum 90°C<br> <b>WARNING-ELECTRICAL HAZARD</b><br>This module produces electricity when exposed to light.<br>Follow all applicable electrical safety precautions.<br>Trina Solar Co., Ltd.<br>No.2 TianHe Road, Trina PV Industrial Park, New District, Changzhou City,<br>Jiangsu Province 213031, P. R. China<br>www.trinasolar.com | <br><br><br>EU-28 WEEE COMPLIANT<br><b>Made in China</b> |
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### TSM-640NEG20C.20

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### TSM-645NEG20C.20

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| <br><b>TSM-645NEG20C.20</b><br> <b>XX</b> | Maximum Power(P <sub>max</sub> )<br>Maximum Power Voltage(V <sub>mp</sub> )<br>Maximum Power Current(I <sub>mp</sub> )<br>Open Circuit Voltage(V <sub>oc</sub> )<br>Short Circuit Current(I <sub>sc</sub> )<br>Maximum Series Fuse<br>Power Selection<br>Maximum System Voltage<br>Electrical Rating At STC: AM 1.5 1000W/m <sup>2</sup> Tc=25°C | 645W *<br>37.2V<br>17.34A<br>44.8V *<br>18.33A *<br>35A<br>0 → 5W<br>1500V | *(Considering LID, the power range of the certification authority, tolerance (P <sub>max</sub> ) ±3%, (V <sub>oc</sub> ) ±3%, (I <sub>sc</sub> ) ±5%)<br>For field connections, use minimum 4mm <sup>2</sup> (No. 12AWG) copper wires insulated for a minimum 90°C<br> <b>WARNING-ELECTRICAL HAZARD</b><br>This module produces electricity when exposed to light.<br>Follow all applicable electrical safety precautions.<br>Trina Solar Co., Ltd.<br>No.2 TianHe Road, Trina PV Industrial Park, New District, Changzhou City,<br>Jiangsu Province 213031, P. R. China<br>www.trinasolar.com | <br><br><br>EU-28 WEEE COMPLIANT<br><b>Made in China</b> |
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### TSM-650NEG20C.20

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9. 変換効率

【単セル面積】

辺1 a 210 mm  
辺2 b 105 mm  
210 mm × 105 mm = 22050 mm<sup>2</sup>  
( 0.02205m<sup>2</sup> )

【全セル面積/モジュール】

120セル × 0.02205m<sup>2</sup> = 2.646m<sup>2</sup>

【モジュール面積】

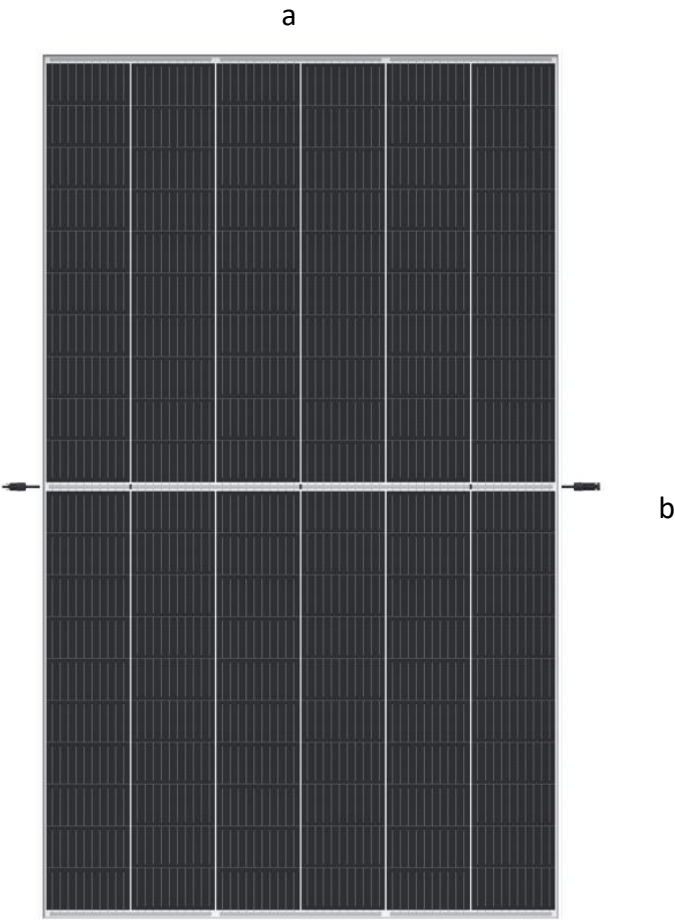
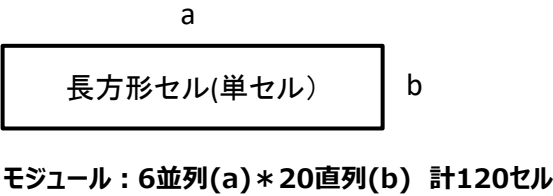
2172mm × 1303mm =2.8301m<sup>2</sup>

1. セル実効変換効率

セル全面積 2.646m<sup>2</sup>  
計算式 (変換効率) 625/2646 (23.62%)  
630/2646 (23.80%)  
635/2646 (23.99%)  
640/2646 (24.18%)  
645/2646 (24.37%)  
650/2646 (24.56%)

2. モジュール変換効率

モジュール面積 2.8301m<sup>2</sup>  
計算式 (変換効率) 625/2830.1 (22.08%)  
630/2830.1 (22.26%)  
635/2830.1 (22.43%)  
640/2830.1 (22.61%)  
645/2830.1 (22.79%)  
650/2830.1 (22.96%)



| 製品型式             | 変換効率種類 | 出力   | 少数第二位切捨て |
|------------------|--------|------|----------|
| TSM-625NEG20C.20 | セル変換効率 | 625W | 23.6%    |
| TSM-630NEG20C.20 |        | 630W | 23.8%    |
| TSM-635NEG20C.20 |        | 635W | 23.9%    |
| TSM-640NEG20C.20 |        | 640W | 24.1%    |
| TSM-645NEG20C.20 |        | 645W | 24.3%    |
| TSM-650NEG20C.20 |        | 650W | 24.5%    |

## 10. 製品認証書

ZERTIFIKAT ◆ CERTIFICATE ◆ 認證證書 ◆ CERTIFICADO ◆ CERTIFICAT



Product Service

# CERTIFICATE

No. Z2 070321 0097 Rev. 51

**Holder of Certificate:** **Trina Solar Co., Ltd.**  
No. 2 TianHe Road, Trina PV Industrial Park  
New District  
213031 Changzhou City, Jiangsu Province  
PEOPLE'S REPUBLIC OF CHINA

**Certification Mark:**



**Product:** Crystalline Silicon Terrestrial Photovoltaic (PV) Modules  
Mono & Poly Crystalline Silicon Photovoltaic (PV) Module(s)

The product was tested on a voluntary basis and complies with the essential requirements. The certification mark shown above can be affixed on the product. It is not permitted to alter the certification mark in any way. In addition, the certification holder must not transfer the certificate to third parties. This certificate is valid until the listed date, unless it is cancelled earlier. All applicable requirements of the Testing, Certification, Validation and Verification Regulations of TÜV SÜD Group have to be complied. For details see: [www.tuvsud.com/ps-cert](http://www.tuvsud.com/ps-cert)

**Test report no.:** 64290170581766

**Valid until:** 2029-02-19

**Date,** 2024-02-22

( Zhulin Zhang )



Product Service

# CERTIFICATE

No. Z2 070321 0097 Rev. 51

(xxx=390-435, in steps of 5).

120 cells:

TSM-xxxNEG7M(II), TSM-xxxNEG7M.05(II),  
TSM-xxxNEG7M.25(II), TSM-xxxNEG7M.07(II),  
TSM-xxxNEG7M.20(II), TSM-xxxNEG7M.27(II),  
TSM-xxxNEG7M.28(II), TSM-xxxNEG7M.29(II)  
(xxx=325-360, in steps of 5).

mono series with 161.7 x 80.85 (mm) half cutting N type MBB bifacial cell:

144 cells:

TSM-xxxNEG16MC(II), TSM-xxxNEG16MC.05(II),  
TSM-xxxNEG16MC.25(II), TSM-xxxNEG16MC.07(II),  
TSM-xxxNEG16MC.20(II), TSM-xxxNEG16MC.27(II),  
TSM-xxxNEG16MC.28(II), TSM-xxxNEG16MC.29(II)

(xxx=390-415, in steps of 5).

120 cells:

TSM-xxxNEG7MC(II), TSM-xxxNEG7MC.05(II),  
TSM-xxxNEG7MC.25(II), TSM-xxxNEG7MC.07(II),  
TSM-xxxNEG7MC.20(II), TSM-xxxNEG7MC.27(II),  
TSM-xxxNEG7MC.28(II), TSM-xxxNEG7MC.29(II)

(xxx=325-345, in steps of 5).

mono series with 210.0 x 70.0 (mm) N type 1/3 cutting MBB bifacial cell:

150 cells:

TSM-xxxNEG18MC.20(II), TSM-xxxNEG18MC.25(II),  
TSM-xxxNEG18MC.27(II), TSM-xxxNEG18MC.28(II),  
TSM-xxxNEG18MC.29(II), TSM-xxxNEG18MC.30(II)

(xxx=500-520, in steps of 5).

120 cells:

TSM-xxxNEG9C.20, TSM-xxxNEG9C.25,  
TSM-xxxNEG9C.27, TSM-xxxNEG9C.28,  
TSM-xxxNEG9C.29

(xxx=390-430, in steps of 5).

mono series with 210.0 x 70.0 (mm) N type 1/3 cutting MBB bifacial cell:

(Module Type for rear side with white EVA or Glass white)

120 cells:

TSM-xxxNEG9.20, TSM-xxxNEG9.25,  
TSM-xxxNEG9.27, TSM-xxxNEG9.28,  
TSM-xxxNEG9.29

(xxx=390-430, in steps of 5).

mono series with 210.0 x 105.0 (mm) half cutting N type MBB bifacial cell:

120 cells:

TSM-xxxNEG20C.20, TSM-xxxNEG20C.25,  
TSM-xxxNEG20C.27, TSM-xxxNEG20C.28,  
TSM-xxxNEG20C.29, TSM-xxxNEG20C.70,  
TSM-xxxNEG20C.C0 (xxx=580-650, in steps of 5).

110 cells:

TSM-xxxNEG19C.20, TSM-xxxNEG19C.25,  
TSM-xxxNEG19C.27, TSM-xxxNEG19C.28,  
TSM-xxxNEG19C.29 (xxx=530-570, in steps of 5).

132 cells:

TSM-xxxNEG21C.20, TSM-xxxNEG21C.25,  
TSM-xxxNEG21C.27, TSM-xxxNEG21C.28,  
TSM-xxxNEG21C.29, TSM-xxxNEG21C.70

(xxx=635-720, in steps of 5).



Product Service

# CERTIFICATE

No. Z2 070321 0097 Rev. 51

cell:

132 cells:

TSM-xxxNEG19RC.20S (xxx=565-595, in steps of 5)

mono series with 182.0 x 70.0 (mm) N type 1/3 cutting MBB bifacial cell:

(Module Type for rear side with white EVA or Glass white)

144 cells:

TSM-xxxNEG9R.20S, TSM-xxxNEG9R.28S (xxx=395-445, in steps of 5)

xxx stands for rated output power at STC

## Parameters:

|                         |                                                                                                                           |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Construction:           | Framed and Frameless with Junction box, Cable and Connectors.                                                             |
| Safety Class:           | Class II                                                                                                                  |
| Maximum System Voltage: | 1500 V DC                                                                                                                 |
| Fire Safety Class:      | Class C according to UL 790                                                                                               |
| Test Laboratory:        | Yangzhou Opto-Electrical Products Testing Institute,<br>No. 10 West Kaifa Road, Yangzhou,<br>225009 Jiangsu, P. R. China. |

## Tested according to:

IEC 61215-1:2016  
IEC 61215-1-1:2016  
IEC 61215-2:2016  
IEC 61730-1:2016  
IEC 61730-2:2016  
EN IEC 61730-1:2018  
EN IEC 61730-2:2018  
EN IEC 61730-1:2018/AC:2018-06  
EN IEC 61730-2:2018/AC:2018-06