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#### PURCHASE SPECIFICATION **GROUP: PHOTOVOLTAICS**

PS- 439 - 118
REV.02

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#### ITEM: 125 mm Pseudo Square Mono Crystalline Silicon Solar Cell

#### PHYSICAL CHARACTERISTICS

1.1 MATERIAL : CZ grown – P type mono-crystalline silicon.

1.2 DIMENSIONS :  $125\pm 1$  mm (Side to Side),  $150\pm 1$  or  $165\pm 1$  mm

(Corner to Corner)

1.3 SHAPE : Pseudo-Square

1.4 THICKNESS : 200 microns

1.5 ORIENTATION  $: <100> \pm 1 \text{ Deg}$ 

1.6 METALISATION : Front - Silver

Back - Silver- Aluminium solderable pads

with Aluminium BSF.

1.7 AR Coating : PECVD Silicon Nitride (Deep blue colour)

#### 2.0 **ELECTRICAL CHARACTERISTICS**

2.1 AVERAGE POWER OUTPUT (Pmax) : 2.30 Watts

2.2 VOLTAGE AT MAX.POWER POINT : 500 mV (Typical)

2.3 OPEN-CIRCUIT VOLTAGE : 600 mV (Typical)

2.4 SHORT-CIRCUIT CURRENT : 5.00 A (Typical)

2.5 FILL FACTOR : 0.72 (Typical)

REVISION: (02) Clause 3.4 added.	APPROVED BY:		
	PREPARED SR	ISSUED Engg.	DATE 21.12.2007
	SAC .	21155.	21.12.2007

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## PURCHASE SPECIFICATION GROUP: PHOTOVOLTAICS

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#### 3.0 **VISUAL CHARACTERISTICS**:

- 3.1 Cells shall not have any edge chips or cracks or deep scratches on the surface.
- 3.2 Cells shall not have any discontinuity or gap or misalignment in the front grid pattern.
- 3.3 Cells shall not have any finger prints or stains or paste smudges on the surface.
- 3.4 Cells shall not have Silicon Nitride coating colour variations or in homogeneity.

- 4.1 Cells shall be packed tightly with heat shrinkable sleeves, then in foam or thermocole boxes, carton box / plywood box suitable for air-freight.
- 4.2 Manufacturer name, Cell type, lot number, wattage / efficiency quantity in each packet, date of manufacture to be identified on each packet.
- 4.3 Test certificate shall be provided along with each consignment.



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#### PURCHASE SPECIFICATION GROUP: PHOTOVOLTAICS

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#### ITEM: 125 mm Pseudo Square Mono Crystalline Silicon Solar Cell

#### 5.0 PHYSICAL CHARACTERISTICS

1.1 MATERIAL : CZ grown – P type mono-crystalline silicon.

1.2 DIMENSIONS :  $125\pm 1$  mm (Side to Side),  $150\pm 1$  or  $165\pm 1$  mm

(Corner to Corner)

1.3 SHAPE : Pseudo-Square

1.4 THICKNESS : 200 microns

1.5 ORIENTATION :  $<100> \pm 1$  Deg

1.6 METALISATION : Front - Silver

Back - Silver- Aluminium solderable pads

with Aluminium BSF.

1.7 AR Coating : PECVD Silicon Nitride (Deep blue colour)

#### 6.0 ELECTRICAL CHARACTERISTICS

2.1 AVERAGE POWER OUTPUT (Pmax) : 2.35 Watts

2.2 VOLTAGE AT MAX.POWER POINT: 500 mV (Typical)

2.3 OPEN-CIRCUIT VOLTAGE : 600 mV (Typical)

2.4 SHORT-CIRCUIT CURRENT : 5.10 A (Typical)

2.5 FILL FACTOR : 0.72 (Typical)

	REVISION (01)	APPROVED BY:		
	Clause 3.4 added.	SS		
		PREPARED	ISSUED	DATE
		SR	Engg.	21.12.2007



### PURCHASE SPECIFICATION GROUP: PHOTOVOLTAICS

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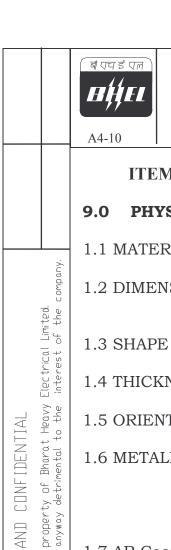
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#### 7.0 **VISUAL CHARACTERISTICS**:

- 3.1 Cells shall not have any edge chips or cracks or deep scratches on the surface.
- 3.2 Cells shall not have any discontinuity or gap or misalignment in the front grid pattern.
- 3.3 Cells shall not have any finger prints or stains or paste smudges on the surface.
- 3.4 Cells shall not have Silicon Nitride coating colour variations or in homogeneity.

- 4.1 Cells shall be packed tightly with heat shrinkable sleeves, then in foam or thermocole boxes, carton box / plywood box suitable for air-freight.
- 4.2 Manufacturer name, Cell type, lot number, wattage / efficiency quantity in each packet, date of manufacture to be identified on each packet.
- 4.3 Test certificate shall be provided along with each consignment.



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ITEM: 125 mm Pseudo Square Mono Crystalline Silicon Solar Cell

#### PHYSICAL CHARACTERISTICS

1.1 MATERIAL : CZ grown – P type mono-crystalline silicon.

1.2 DIMENSIONS :  $125\pm 1$  mm (Side to Side),  $150\pm 1$  or  $165\pm 1$  mm

(Corner to Corner)

: Pseudo-Square

1.4 THICKNESS : 200 microns (Typical)

1.5 ORIENTATION  $: <100> \pm 1 \text{ Deg}$ 

1.6 METALISATION : Front - Silver

Back - Silver- Aluminium solderable pads

with Aluminium BSF.

1.7 AR Coating : PECVD Silicon Nitride (Deep blue colour)

#### 10.0 ELECTRICAL CHARACTERISTICS

2.1 AVERAGE POWER OUTPUT (Pmax) : 2.40 Watts

2.2 VOLTAGE AT MAX.POWER POINT: 500 mV (Typical)

2.3 OPEN-CIRCUIT VOLTAGE : 600 mV (Typical)

2.4 SHORT-CIRCUIT CURRENT : 5.10 A (Typical)

2.5 FILL FACTOR : 0.75 (Typical)

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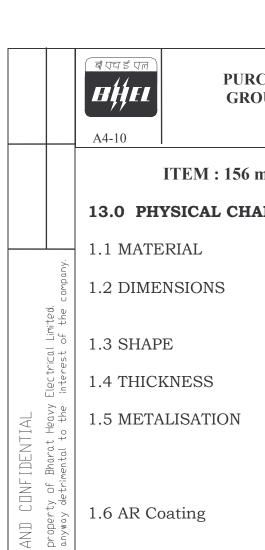
## PURCHASE SPECIFICATION GROUP: PHOTOVOLTAICS

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#### 11.0 VISUAL CHARACTERISTICS:

- 3.1 Cells shall not have any edge chips or cracks or deep scratches on the surface.
- 3.2 Cells shall not have any discontinuity or gap or misalignment in the front grid pattern.
- 3.3 Cells shall not have any finger prints or stains or paste smudges on the surface.
- 3.4 Cells shall not have Silicon Nitride coating colour variations or in homogeneity.

- 4.1 Cells shall be packed tightly with heat shrinkable sleeves, then in foam or thermocole boxes, carton box / plywood box suitable for air-freight.
- 4.2 Manufacturer name, Cell type, lot number, wattage / efficiency quantity in each packet, date of manufacture to be identified on each packet.
- 4.3 Test certificate shall be provided along with each consignment.



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ITEM: 156 mm Square Multi Crystalline Silicon Solar Cell

#### 13.0 PHYSICAL CHARACTERISTICS

: Multi Crystalline Silicon.

1.2 DIMENSIONS : 156± 1 mm (Side to Side)

: Square

1.4 THICKNESS : 200 microns (Typical)

: Front - Silver

Back - Silver- Aluminium solderable pads

with Aluminium BSF.

1.6 AR Coating : PECVD Silicon Nitride (Deep blue colour)

#### 14.0 ELECTRICAL CHARACTERISTICS

2.1 AVERAGE POWER OUTPUT (Pmax) : 3.50 Watts

2.2 VOLTAGE AT MAX.POWER POINT: 500 mV (Typical)

2.3 OPEN-CIRCUIT VOLTAGE : 600 mV (Typical)

2.4 SHORT-CIRCUIT CURRENT : 7.60 A (Typical)

2.5 FILL FACTOR : 0.75 (Typical)

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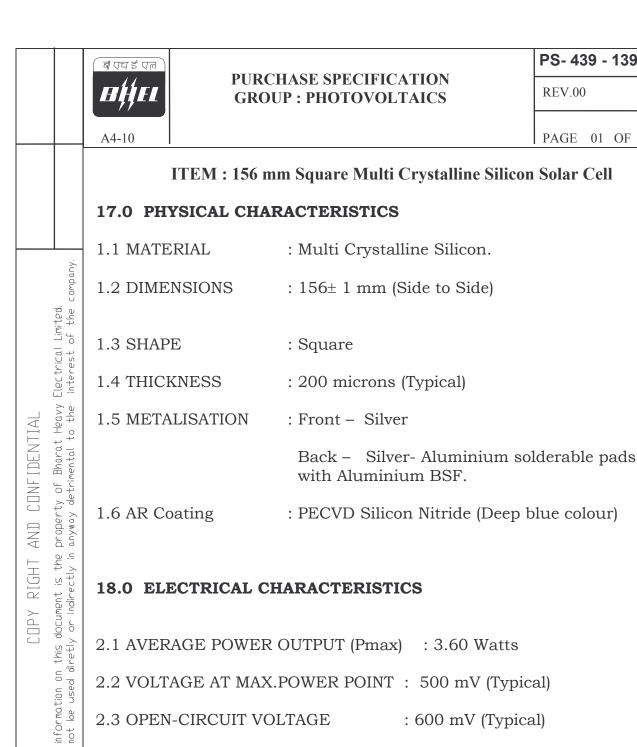
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#### 15.0 VISUAL CHARACTERISTICS:

- 3.1 Cells shall not have any edge chips or cracks or deep scratches on the surface.
- 3.2 Cells shall not have any discontinuity or gap or misalignment in the front grid pattern.
- 3.3 Cells shall not have any finger prints or stains or paste smudges on the surface.
- 3.4 Cells shall not have Silicon Nitride coating colour variations or in homogeneity.

- 4.1 Cells shall be packed tightly with heat shrinkable sleeves, then in foam or thermocole boxes, carton box / plywood box suitable for air-freight.
- 4.2 Manufacturer name, Cell type, lot number, wattage / efficiency quantity in each packet, date of manufacture to be identified on each packet.
- 4.3 Test certificate shall be provided along with each consignment.



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2.2 VOLTAGE AT MAX.POWER POINT: 500 mV (Typical)

2.3 OPEN-CIRCUIT VOLTAGE : 600 mV (Typical)

2.4 SHORT-CIRCUIT CURRENT : 7.70 A (Typical)

2.5 FILL FACTOR : 0.75 (Typical)

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		SR	Engg.	30.4.2008



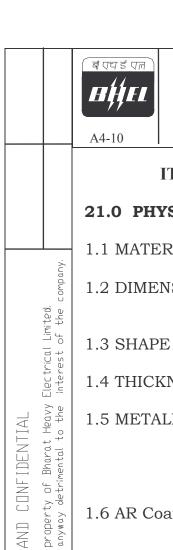
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#### 19.0 VISUAL CHARACTERISTICS:

- 3.1 Cells shall not have any edge chips or cracks or deep scratches on the surface.
- 3.2 Cells shall not have any discontinuity or gap or misalignment in the front grid pattern.
- 3.3 Cells shall not have any finger prints or stains or paste smudges on the surface.
- 3.4 Cells shall not have Silicon Nitride coating colour variations or in homogeneity.

- 4.1 Cells shall be packed tightly with heat shrinkable sleeves, then in foam or thermocole boxes, carton box / plywood box suitable for air-freight.
- 4.2 Manufacturer name, Cell type, lot number, wattage / efficiency quantity in each packet, date of manufacture to be identified on each packet.
- 4.3 Test certificate shall be provided along with each consignment.



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ITEM: 156 mm Square Multi Crystalline Silicon Solar Cell

#### 21.0 PHYSICAL CHARACTERISTICS

1.1 MATERIAL : Multi Crystalline Silicon.

1.2 DIMENSIONS : 156± 1 mm (Side to Side)

: Square

1.4 THICKNESS : 200 microns (Typical)

: Front - Silver 1.5 METALISATION

Back - Silver- Aluminium solderable pads

with Aluminium BSF.

1.6 AR Coating : PECVD Silicon Nitride (Deep blue colour)

#### 22.0 ELECTRICAL CHARACTERISTICS

2.1 AVERAGE POWER OUTPUT (Pmax) : 3.70 Watts

2.2 VOLTAGE AT MAX.POWER POINT: 500 mV (Typical)

2.3 OPEN-CIRCUIT VOLTAGE : 600 mV (Typical)

2.4 SHORT-CIRCUIT CURRENT : 7.80 A (Typical)

2.5 FILL FACTOR : 0.75 (Typical)

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## PURCHASE SPECIFICATION GROUP: PHOTOVOLTAICS

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#### 23.0 VISUAL CHARACTERISTICS:

- 3.1 Cells shall not have any edge chips or cracks or deep scratches on the surface.
- 3.2 Cells shall not have any discontinuity or gap or misalignment in the front grid pattern.
- 3.3 Cells shall not have any finger prints or stains or paste smudges on the surface.
- 3.4 Cells shall not have Silicon Nitride coating colour variations or in homogeneity.

- 4.1 Cells shall be packed tightly with heat shrinkable sleeves, then in foam or thermocole boxes, carton box / plywood box suitable for air-freight.
- 4.2 Manufacturer name, Cell type, lot number, wattage / efficiency quantity in each packet, date of manufacture to be identified on each packet.
- 4.3 Test certificate shall be provided along with each consignment.