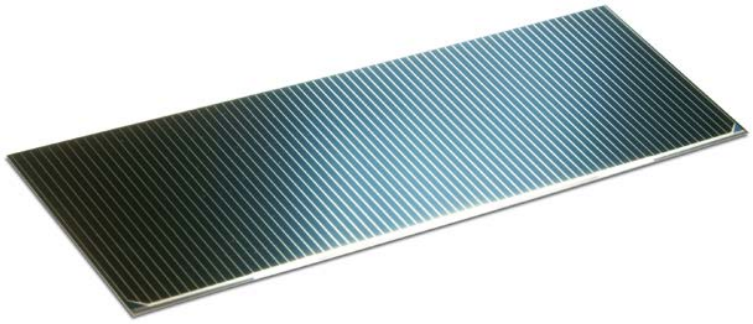
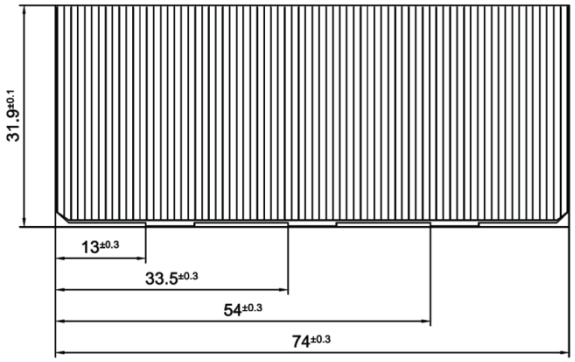
Silicon Solar Space Cell S 32

Type: S 32



This cell type is a state-of-the-art high efficiency, low weight silicon solar cell with an integrated by-pass diode.



S 32

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Space

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Design and Mechanical Data

Base Material	CZ, <1-0-0>
AR-coating	TiO_x/Al_2O_3
Dimensions (bare cell)	74.0 x 31.9 mm ± 0.1 mm
Cell Area	23.61 cm²
Average Weight	≤ 32 mg/cm²
Cell - Thickness	130 ± 30 µm
Ag - Thickness	3 – 11 µm
Grid Design	Improved Grid system with 3 contact pads
Resistivity	p (B) 2 ± 1 Ω cm
Shadow Protection	Integrated Zener by-pass diode I_{rev} = 55 mA/cm² (1.2 Isc) @ V_{rev} = 5 – 6 V

Electrical Data

		BOL	3E14	1E15	3E15
Average Open Circuit V_{oc}	[mV]	628	0.91	0.89	0.85
Average Short Circuit I_{sc}	[mA/cm²]	45.8	0.88	0.85	0.76
Voltage at max. Power V_{mp}	[mV]	528	0.91	0.89	0.84
Current at max. Power I_{mp}	[mA/cm²]	43.4	0.88	0.84	0.75
Average Efficiency η_{bare}	[%]	16.9	0.80	0.74	0.64

Test Conditions: AMO Spectrum; Light Intensity E = 135.3 mW/cm²; Cell Temperature T_c = 28°C
Standard: CNES 01-23MV1
BOL measurement accuracy: ± 1.5% relative

Temperature Gradients

		BOL	3E14	1E15	3E15
Voltage dV_{oc}/dT	[mV/°C]	- 2.02	- 2.14	- 2.17	- 2.20
Short Circuit dI_{sc}/dT	[mA/cm²/°C]	0.030	0.045	0.055	0.059
Voltage dV_{pmax}/dT	[mV/°C]	- 2.07	- 2.22	- 2.19	- 2.25
Power dP_{mpax}/dT	[mW/cm²/°C]	0.004	0.023	0.023	0.035

Threshold Values

Absorptivity	≤ 0.78 (with CMX 100 AR/IRR)
Pull Test	> 5 N at 45° welding test (with 35µm Ag stripes)
Development Status	Qualified

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