

SOLAR CELL STRINGS

Pre-soldered, pre-tabbed, ready to install
solar cells serial assemblies



SmallSat Market
SmallSat Components Marketplace

SUMMARY

The integration of solar cells into pre-configured strings, ranging from 2 to 14 units, is a transformative advancement in photovoltaic module assembly. This modification significantly optimizes production by pre-assembling and soldering the cell strings at the factory. Using automated stringing processes, this approach ensures precise alignment, reduced material stress, and improved connection quality.

It leverages advanced tabbing and stringing technologies, such as infrared soldering and contactless flux application, ensuring high reliability while maintaining flexibility for diverse module designs.

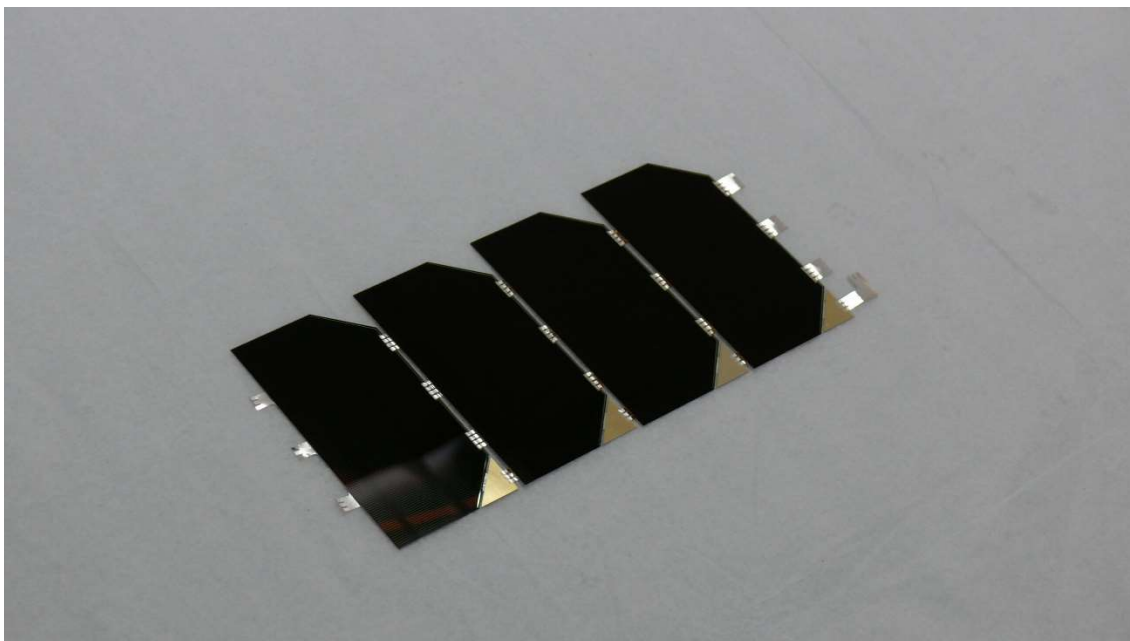
By integrating this modification, the time required for on-site soldering and assembly is reduced by a factor of 10, streamlining installation and minimizing labor costs. Moreover, this method supports the scalability of manufacturing, accommodating large-scale production demands with consistent quality.

The automation of string interconnection improves both the mechanical and electrical performance of the cells while mitigating common issues like misalignment and weak connections, which are more prevalent in manual assembly processes. These enhancements ensure robust operation and durability, even in demanding environmental conditions, aligning well with the high standards of both terrestrial and space applications.



BENEFITS OF SOLAR CELL STRINGING

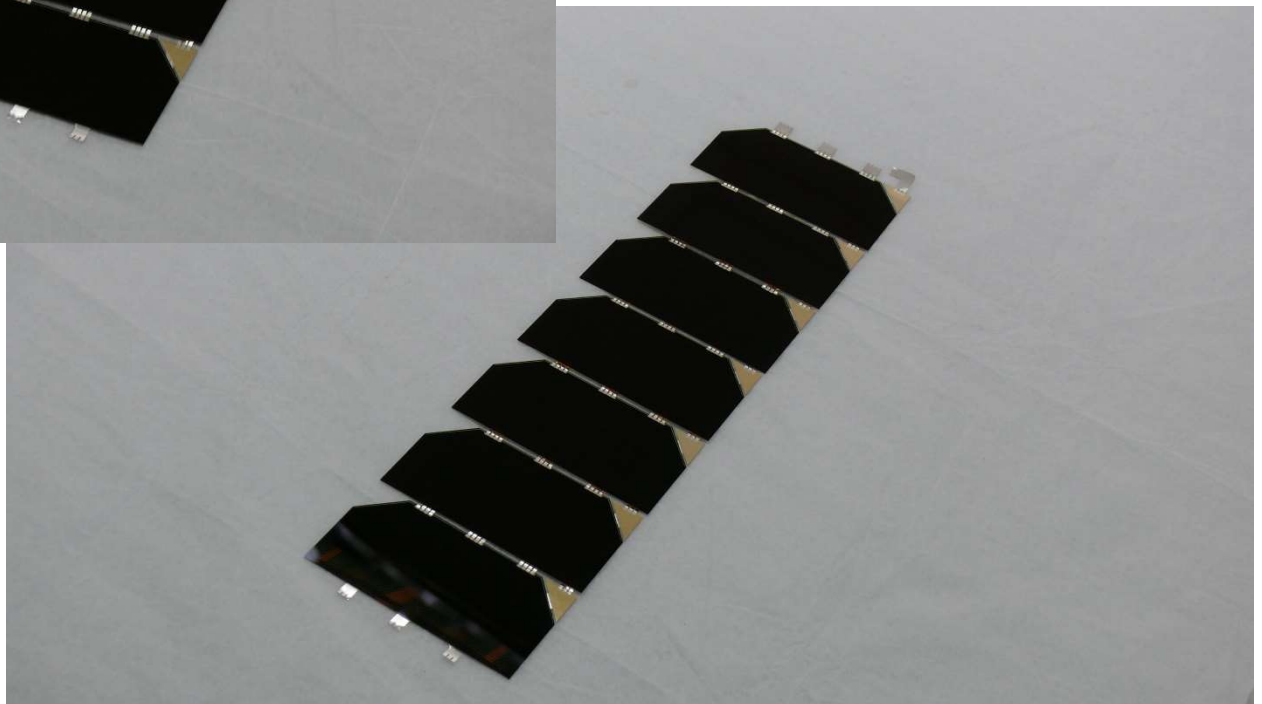
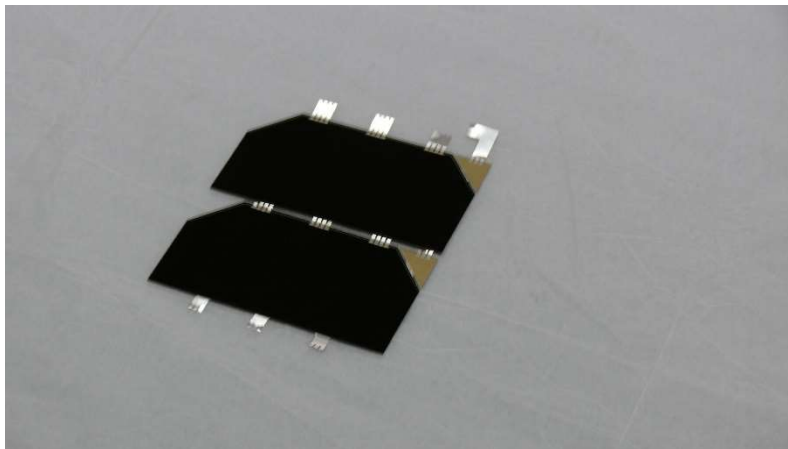
- **Manufacturing Time Reduction:**
Factory pre-assembly reduces on-site installation and soldering time by 90%.
Accelerated module production improves overall project timelines.
- **Enhanced Quality Control:**
Automated stringing ensures precise alignment and soldering, leading to improved electrical conductivity and reduced cell stress.
Consistent and reliable interconnections minimize defects and rework.
- **Cost Reduction:**
Lower labor costs due to automation and reduced need for skilled soldering technicians.
Decreased material waste through precise application processes.
- **Scalability:**
Supports high-volume production with uniform quality, leveraging advanced tabbing and stringing equipment.
- **Durability and Reliability:**
Stronger interconnections improve resistance to mechanical stress and environmental factors.
Pre-assembled strings reduce risks associated with manual assembly errors.
- **Customizability:**
Configurable string lengths (2-14 cells) meet various application requirements, from compact setups to large-scale modules.



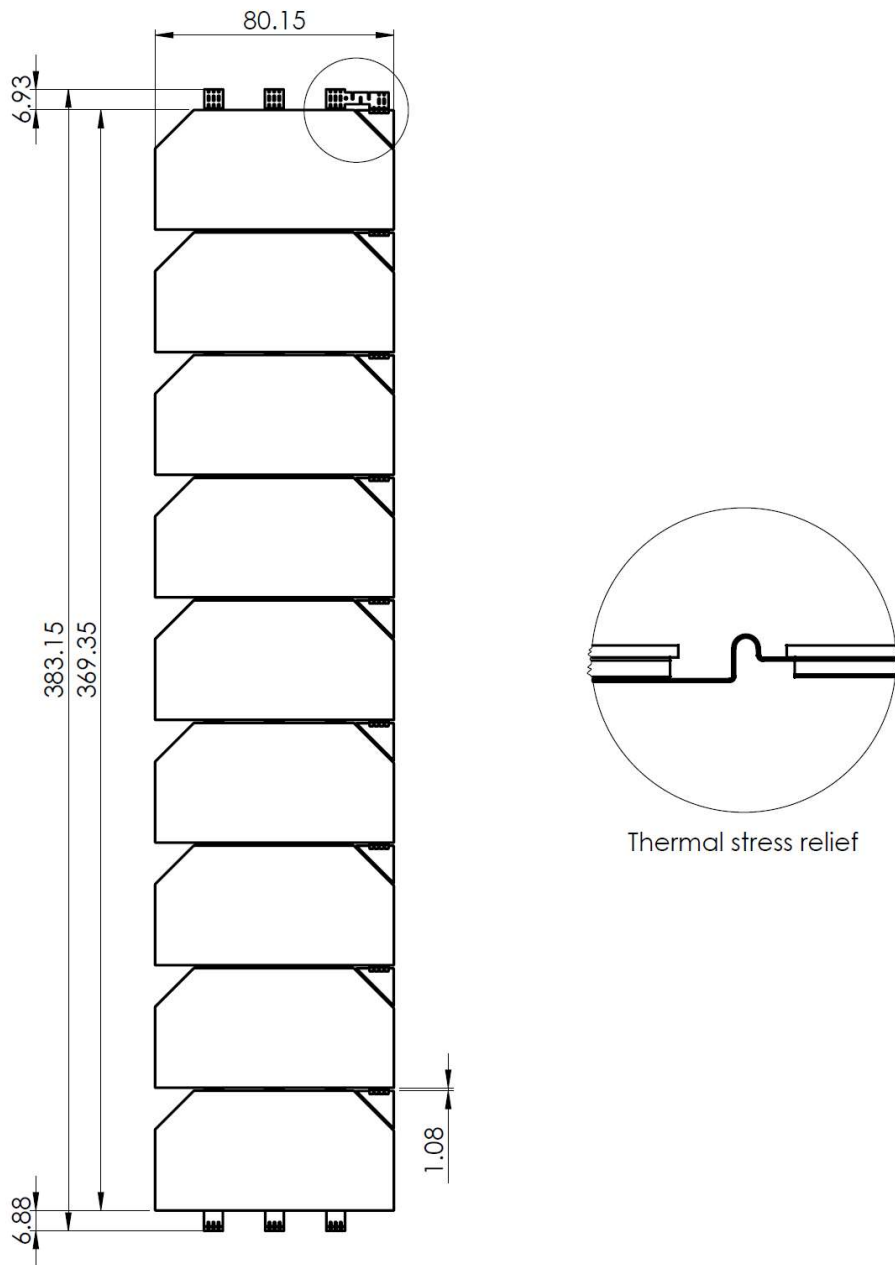
PERFORMANCE

NUMBER OF CELLS IN THE STRING

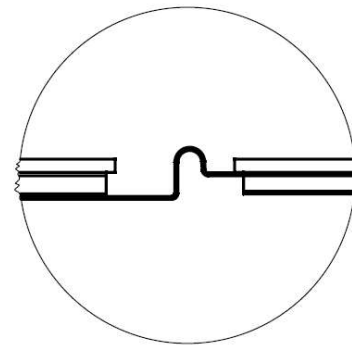
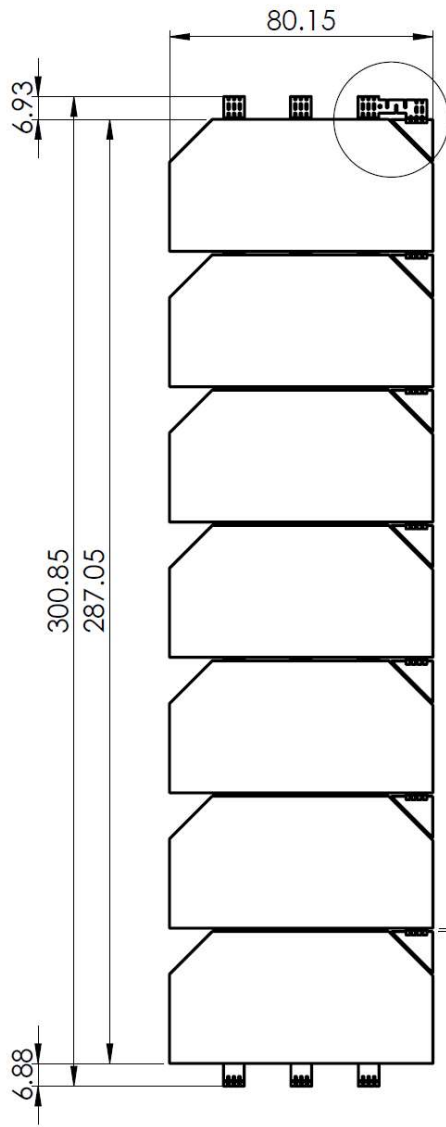
EXA SOLAR CELL STRINGS	2C	3C	4C	5C	6C	7C	8C	9C	10C	11C	12C	13C	14C
Voltage @ Max. Power V_m (V)	4.86	7.29	9.72	12.15	14.58	17.01	19.44	21.87	24.3	26.73	29.16	31.59	34.02
2.43 V													
Power @ Max. Power I_m (W)	2.44	3.67	4.89	6.11	7.33	8.56	9.78	11.00	12.22	13.45	14.67	15.89	17.11
0.503 A													



DRAWINGS

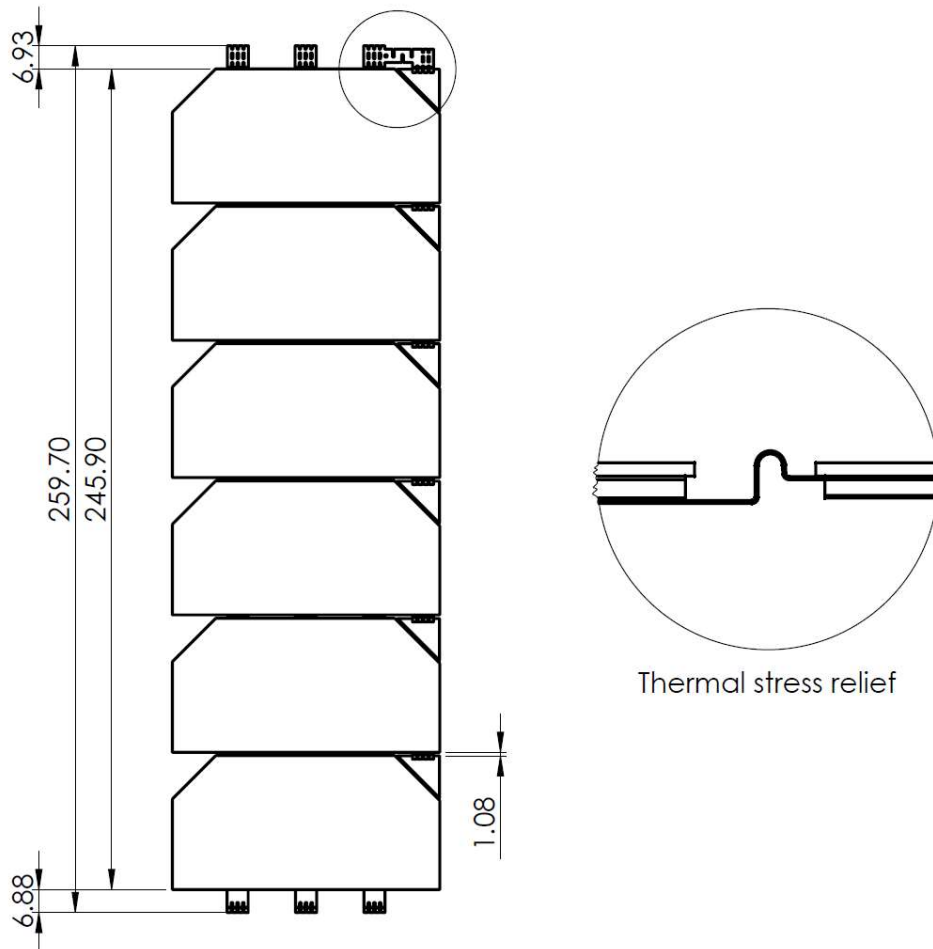


	NAME	SIGNATURE	DATE		TITLE: GENERAL DIMENSIONS	
DRAWN	JND			MATERIAL:	EXA SOLAR CELL STRING	A4
CHKD	RNB					
APPVD	RNB					
MFG	GND/RNB					
Q.A	RNB			WEIGHT:	SCALE 55:100	SHEET 1 OF 3



Thermal stress relief

	NAME	SIGNATURE	DATE		TITLE: GENERAL DIMENSIONS	
DRAWN	JND			MATERIAL:	EXA SOLAR CELL STRING	A4
CHK'D	RNB					
APP'VD	RNB					
MFG	GND/RNB					
QLA	RNB				WEIGHT:	SCALE 55:100



NAME	SIGNATURE	DATE			TITLE: GENERAL DIMENSIONS	
DRAWN	JND			MATERIAL:	EXA SOLAR CELL STRING	A4
CHK'D	RNB					
APPV'D	RNB					
MFG	GND/RNB					
Q.A	RNB			WEIGHT:	SCALE 55:100	SHEET 3 OF 3