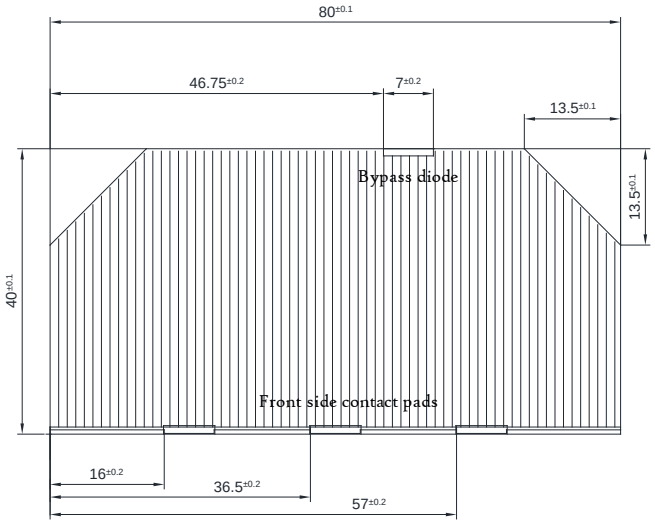
28% Triple Junction GaAs Solar Cell

Type: TJ Solar Cell 3G28C

More than 1 million 3G28C cells delivered

This cell type is a GaInP/GaAs/Ge on Ge substrate triple junction solar cell (efficiency class 28%).
The cell is equipped with an integrated bypass diode, which protects the adjacent cell in the string.



3G28C

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Space

28% Triple Junction GaAs Solar Cell
Type: TJ Solar Cell 3G28C

Design and Mechanical Data

Base Material	GaInP/GaAs/Ge on Ge substrate
AR-coating	TiO_x/Al_2O_3
Dimensions	40 x 80 mm ± 0.1 mm
Cell Area	30.18 cm^2
Average Weight	≤ 86 mg/cm^2
Thickness (without contacts)	150 ± 20 µm
Contact Metallization Thickness (Ag/Au)	4 – 10 µm
Grid Design	Grid system with 3 contact pads

Electrical Data

		BOL	2,5E14	5E14	1E15
Average Open Circuit V_{oc}	[mV]	2667	2560	2534	2480
Average Short Circuit I_{sc}	[mA]	506.0	500.9	500.9	485.8
Voltage at max. Power V_{mp}	[mV]	2371	2276	2229	2205
Current at max. Power I_{mp}	[mA]	487.0	482.1	472.4	457.8
Average Efficiency η_{bare} (1367 W/m^2)	[%]	28.0	26.6	25.5	24.5
Average Efficiency η_{bare} (1353 W/m^2)	[%]	28.3	26.9	25.8	24.7

Standard: CASOLBA 2005 (05-20MV1, etc); Spectrum: AMO WRC = 1367 W/m^2; T = 28 °C

Acceptance Values

Voltage V_{op}	2300 mV
Min. average current $I_{op\ avg}$ @ V_{op}	485 mA (higher I_{op} on demand)
Min. individual current $I_{op\ min}$ @ V_{op}	455 mA

Shadow protection

Integrated protection diode T = 25°C ± 3°C	$V_{forward}$ (605 mA) ≤ 2.5 V $I_{reverse}$ (2.8 V) ≤ 100µA

Temperature Gradients (25°C - 80°C)

			BOL	2,5E14	5E14	1E15
Open Circuit Voltage	$\Delta V_{oc}/\Delta T\uparrow$	[mV/°C]	- 6.0	- 6.4	- 6.2	- 6.3
Short Circuit Current	$\Delta I_{sc}/\Delta T\uparrow$	[mA/°C]	0.32	0.33	0.31	0.39
Voltage at max. Power	$\Delta V_{mp}/\Delta T\uparrow$	[mV/°C]	- 6.1	- 6.8	- 6.3	- 6.4
Current at max. Power	$\Delta I_{mp}/\Delta T\uparrow$	[mA/°C]	0.28	0.36	0.20	0.29

Threshold Values

Absorptivity	≤ 0.91 (with CMX 100 AR)
Pull Test	> 1.6 N at 45° welding test (with 12.5µm Ag stripes)
Status	Qualified

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