



LIST OF OUTDOOR THIN FILM OEM SOLAR MODULES

Electrical Output are Rated at Standard Test Condition 100mW/m², 25⁰C, AM1.5

| PART No. | LENGTH (mm) | WIDTH (mm) | OPEN CIRCUIT VOLTAGE(V) | VOLTAGE AT NOMINAL POWER(V) | NOMINAL POWER(Wp) |
|-----------|-------------|------------|-------------------------|-----------------------------|-------------------|
| 81046FPA2 | 44 | 121 | 3.3 | 2.4 | 0.287 |
| 80991FP2 | 52.36 | 65 | 3.3 | 2.4 | 0.181 |
| 80994FP | 52.36 | 65 | 3.3 | 2.4 | 0.181 |
| 81081FP2 | 52.36 | 75 | 3.3 | 2.4 | 0.210 |
| 80908MH | 57 | 50 | 3.3 | 2.4 | 0.148 |
| 80954FA | 57.6 | 54.2 | 3.3 | 2.4 | 0.155 |
| 80761MF | 60 | 90 | 3.3 | 2.4 | 0.290 |
| 90440JH | 37 | 82 | 4.9 | 3.6 | 0.158 |
| 80160JQ | 55 | 23 | 4.9 | 3.6 | 0.066 |
| 80147MF | 55 | 23 | 4.9 | 3.6 | 0.066 |
| 90032MH | 57 | 50 | 4.9 | 3.6 | 0.157 |
| 80936FA | 57.6 | 54.2 | 4.9 | 3.6 | 0.162 |
| 90033JH | 70 | 30 | 4.9 | 3.6 | 0.113 |
| 80907MH | 70 | 30 | 4.9 | 3.6 | 0.113 |
| 80582MFK | Ø71 | | 4.9 | 3.6 | 0.230 |
| 80999MF | 72 | 60 | 4.9 | 3.6 | 0.231 |
| 81049FP2 | 75 | 33.88 | 4.9 | 3.6 | 0.136 |
| 81012MF2 | 75 | 71.7 | 4.9 | 3.6 | 0.302 |
| 80062MQ | 75 | 71.7 | 4.9 | 3.6 | 0.309 |
| 81030MF | 75 | 71.7 | 4.9 | 3.6 | 0.309 |
| 81048FA | 81 | 190 | 4.9 | 3.6 | 0.768 |
| 80881FA | 85 | 85 | 4.9 | 3.6 | 0.388 |
| 81013MF | 95 | 75 | 4.9 | 3.6 | 0.376 |
| 80063MH | 114 | 36 | 4.9 | 3.6 | 0.215 |
| 90010MH | 120 | 112 | 4.9 | 3.6 | 0.658 |
| 80960FA | 122 | 115 | 4.9 | 3.6 | 0.656 |
| 80460QP | 30 | 192 | 6.5 | 4.8 | 0.305 |
| 80600MF | 75 | 71.7 | 6.5 | 4.8 | 0.318 |
| 80623FA | 81 | 190 | 6.5 | 4.8 | 0.841 |
| 90035MH | 97 | 80 | 6.5 | 4.8 | 0.460 |
| 80570MH | 108.4 | 33.8 | 6.5 | 4.8 | 0.210 |
| 80660MH | 108.4 | 33 | 6.5 | 4.8 | 0.198 |
| 90066MH | 119 | 38.4 | 6.5 | 4.8 | 0.260 |
| 80624FA | 122 | 144 | 6.5 | 4.8 | 0.975 |
| 81053FA | 162 | 192 | 6.5 | 4.8 | 1.756 |
| 90036MH | 57 | 50 | 6.5 | 4.8 | 0.157 |

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|-----------|-------------|------------|-------------------------|-----------------------------|-------------------|
| 80900MF2 | 81 | 192 | 8.2 | 6.0 | 0.916 |
| 80900MH | 81 | 192 | 8.2 | 6.0 | 0.924 |
| 80900MHN | 81 | 192 | 8.2 | 6.0 | 0.924 |
| 80900JH | 89.5 | 51.7 | 8.2 | 6.0 | 0.277 |
| 80203HPO | 105 | 105 | 8.2 | 6.0 | 0.662 |
| 80763MH | 110 | 60 | 8.2 | 6.0 | 0.400 |
| 90055HPO | 113.5 | 159 | 8.2 | 6.0 | 1.102 |
| 80764HPO | 114 | 250 | 8.2 | 6.0 | 1.683 |
| 90038HPON | 114 | 250 | 8.2 | 6.0 | 1.683 |
| 80050HPO | 135 | 182 | 8.2 | 6.0 | 1.417 |
| 80902FPAI | 144 | 162 | 8.2 | 6.0 | 1.287 |
| 80957FA | 162 | 162 | 8.2 | 6.0 | 1.633 |
| | | | | | |
| 90004MH | 57 | 50 | 9.8 | 7.2 | 0.155 |
| 90053HP | 72 | 225 | 9.8 | 7.2 | 0.989 |
| 80772HP | 81 | 192 | 9.8 | 7.2 | 0.968 |
| 90511HP | 115 | 122 | 9.8 | 7.2 | 0.887 |
| 90052MH | 122 | 82 | 9.8 | 7.2 | 0.616 |
| 80065HP | 195 | 144 | 9.8 | 7.2 | 1.729 |
| 80271FA | 162 | 192 | 9.8 | 7.2 | 1.830 |
| 80066JH | 488 | 16 | 9.8 | 7.2 | 0.363 |
| | | | | | |
| 90005MH | 120 | 112 | 11.4 | 8.4 | 0.831 |
| 80961FA | 122 | 115 | 11.4 | 8.4 | 0.817 |
| 90006FA | 142 | 194 | 11.4 | 8.4 | 1.612 |
| 80641CA | 144 | 325 | 11.4 | 8.4 | 2.617 |
| 80625FA | 144 | 325 | 11.4 | 8.4 | 2.738 |
| 81051FA | 162 | 192 | 11.4 | 8.4 | 1.809 |
| 80662FA | 192 | 81 | 11.4 | 8.4 | 0.906 |
| 80830FAI | 192 | 192 | 11.4 | 8.4 | 2.073 |
| 80434CPA | 194 | 285 | 11.4 | 8.4 | 3.260 |
| 80067CPO | 194 | 285 | 11.4 | 8.4 | 3.276 |
| 80073FPA | 194 | 285 | 11.4 | 8.4 | 3.276 |
| 90019FA | 242 | 285 | 11.4 | 8.4 | 3.508 |
| | | | | | |
| 80695CA | 194 | 285 | 13.0 | 9.6 | 3.152 |
| 91210FA | 194 | 285 | 13.0 | 9.6 | 3.152 |
| | | | | | |
| 80825JH | 47 | 24 | 14.7 | 10.8 | 0.051 |
| 80068JH | 48 | 20 | 14.7 | 10.8 | 0.044 |
| 80930JH | 69 | 52 | 14.7 | 10.8 | 0.203 |
| 80610MH | 69 | 52.3 | 14.7 | 10.8 | 0.203 |
| | | | | | |
| 90041FA | 170 | 80 | 16.3 | 12 | 0.865 |

| PART No. | LENGTH (mm) | WIDTH (mm) | OPEN CIRCUIT VOLTAGE(V) | VOLTAGE AT NOMINAL POWER(V) | NOMINAL POWER(W _p) |
|-----------|-------------|------------|-------------------------|-----------------------------|--------------------------------|
| 81052FAI | 288 | 325 | 21.2 | 15.6 | 5.605 |
| 80550FAPN | 244 | 96 | 22.8 | 16.8 | 1.485 |
| 80180FA | 244 | 115 | 22.8 | 16.8 | 1.741 |
| 80552FAIB | 281 | 320 | 22.8 | 16.8 | 5.322 |
| 80933FA | 288 | 81 | 22.8 | 16.8 | 1.415 |
| 80580CA | 288 | 139 | 22.8 | 16.8 | 2.530 |
| 80774FA | 288 | 139 | 22.8 | 16.8 | 2.530 |
| 81043CA | 288 | 244 | 22.8 | 16.8 | 4.353 |
| 80270FA | 288 | 244 | 22.8 | 16.8 | 4.353 |
| 80432CA | 288 | 325 | 22.8 | 16.8 | 5.717 |
| 80620FA | 288 | 325 | 22.8 | 16.8 | 5.717 |
| 90047CA | 288 | 488 | 22.8 | 16.8 | 8.140 |
| 80850FA | 288 | 488 | 22.8 | 16.8 | 8.140 |
| 80640CA | 300 | 1000 | 22.8 | 16.8 | 18.328 |
| 80824CA | 300 | 1000 | | rear contact: Ni | |
| 80790FPAN | 310 | 110 | 22.8 | 16.8 | 2.110 |
| 90016MH | 310 | 110 | 22.8 | 16.8 | 2.156 |
| 80540CA | 325 | 576 | 22.8 | 16.8 | 10.095 |
| 80776FA | 325 | 576 | 22.8 | 16.8 | 10.095 |
| 90007MH | 120 | 112 | 24.5 | 18.0 | 0.826 |
| 80962FA | 122 | 115 | 24.5 | 18.0 | 0.809 |
| 80281MH | 192 | 74.7 | 24.5 | 18.0 | 0.918 |
| 80230C | 192 | 81 | 24.5 | 18.0 | 0.992 |
| 80903FA | 192 | 81 | 24.5 | 18.0 | 0.940 |
| 80800CE | 192 | 488 | 24.5 | 18.0 | 0.144 |
| 90011MH | 194 | 142 | 24.5 | 18.0 | 6.114 |
| 80130MHNO | 194 | 142 | 24.5 | 18.0 | 1.783 |
| 90064MHO | 195 | 192 | 24.5 | 18.0 | 2.281 |
| 80892FA | 195 | 192 | 24.5 | 18.0 | 2.338 |
| 80180MH | 244 | 115 | 24.5 | 18.0 | 1.816 |
| 90018MH | 285 | 194 | 24.5 | 18.0 | 3.564 |
| 90020MH | 285 | 242 | 24.5 | 18.0 | 4.425 |
| 90013C | 142 | 323 | 24.5 | 18.0 | 2.924 |
| 80780MH | 325 | 144 | 24.5 | 18.0 | 2.982 |
| 90060CA | 325 | 576 | 24.5 | 18.0 | 10.061 |
| 90490HP | 450 | 90 | 24.5 | 18.0 | 2.398 |
| 80931FAP | 450 | 90 | 24.5 | 18.0 | 2.336 |
| 80851MH | 488 | 72 | 24.5 | 18.0 | 0 |
| 80841MH | 488 | 144 | 24.5 | 18.0 | 4.652 |
| 81056FA | 488 | 144 | 24.5 | 18.0 | 4.465 |

| PART No. | LENGTH (mm) | WIDTH (mm) | OPEN CIRCUIT VOLTAGE(V) | VOLTAGE AT NOMINAL POWER(V) | NOMINAL POWER(Wp) |
|----------|-------------|------------|-------------------------|-----------------------------|-------------------|
| 90062MH | 576 | 54 | 24.5 | 18.0 | 1.985 |
| 81040FA | 576 | 54 | 24.5 | 18.0 | 1.936 |
| 90014MH | 190 | 75 | 27.7 | 20.4 | 0.910 |
| 90480C | 192 | 81 | 29.3 | 21.6 | 0.990 |
| 80770FA | 192 | 81 | 29.3 | 21.6 | 0.938 |
| 90481FA | 288 | 244 | 31.0 | 22.8 | 4.485 |
| 80604CAP | 420 | 40 | 35.9 | 26.4 | 0.845 |
| 90061CA | 325 | 576 | 48.9 | 36.0 | 11.922 |
| 80480C | 809 | 25 | 81.5 | 60.0 | 1.145 |
| 90355C | 976 | 25 | 81.5 | 60.0 | 1.145 |
| 80891C | 576 | 25 | 92.9 | 68.4 | 0.599 |
| 80996C | 894 | 25 | 92.9 | 68.4 | 1.225 |
| 80890C | 976 | 25 | 92.9 | 68.4 | 1.073 |
| 80110C | 325 | 192 | | | 0 |

| TYPES | DESCRIPTION |
|---------------|---|
| Type A | Edge protection laser rim |
| Type B | Solar Module with hole |
| Type C | No protective coating on back. Solar module for processing by encapsulation of unprotected semiconductor layer Figures for electrical data apply to a real contacting |
| Type F | Back protected by special foil against outdoor condition |
| Type J | Back with protective coating and free contact strips. Contacting by soldering at various points along the contact strip. Maximum relative humidity 75% without condensation. Figures for electrical data refer to contacting at a central point |
| Type K | Circular solar module |
| Type M | Back with protective coating and free contact points. Contacting possible by soldering. Wide range of applications outdoors using further encapsulation, edge sealing or housing integration |
| Type N | With cable and sealed soldering points, standard cable length approximately 20cm, cable type 0.25mm ² . |
| Type O | Surrounding laser line for complete electrical isolation of both solar cells and contact areas |
| Type P | Isolated negative pole for optimal area utilization |
| Ends with '2' | Glass thickness 2.3mm otherwise 3.2mm |

| CELL TEMPERATURE COEFFICIENTS | |
|--------------------------------|---|
| Power | Minus 0.2% per degree Celsius |
| Open Circuit Voltage | Minus 0.33% per degree Celsius |
| Short Circuit Current | Plus 0.08% per degree Celsius |
| LIMITS | |
| Permissible module temperature | Minus 40 degree Celsius to plus 80 degree Celsius |
| Relative Humidity | With type J and M maximum 75% relative humidity without condensation; Higher relative humidity permissible depending on version |
| Soldering conditions | 250 to 290 degree Celsius for 1 to 2sec (flux cored solder), Interflux IF141, 0-500, SN60 Pb40 |