Abstract: Formation of a solar cell device from upgraded metallurgical grade silicon which has received at least one defect engineering process and including a low contact resistance electrical path. An anti-reflective coating is formed on an emitter layer and back contacts are formed on a back surface of the bulk silicon substrate. This photovoltaic device may be fired to form back surface field temperatures sufficiently low to avoid reversal of previous defect engineering processes. The process further forms openings in the anti-reflective coating and a low contact resistance metal layer, such as nickel layer, over the openings in the coating. The process may anneal the low contact resistance metal layer to form n-doped portion and complete an electrically conduct path to the n-doped layer. This low temperature metallization (e.g., < 700°C) supports the use of UMG silicon for the solar device formation without risk of reversing earlier defect engineering processes.
Published: with international search report (Art. 21(3))

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A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H01L 31/00 (2009.01)
USPC - 136/256
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols)
IPC(8) - H01L 31/00 (2009.01)
USPC - 136/256
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic database consulted during the international search (name of database and, where practicable, search terms used)
Patbase, Google Patents

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>US 6,066,516 A (MIYASAKA) 23 May 2000 (23.05.2000) entire document</td>
<td>3,12,19</td>
</tr>
</tbody>
</table>

Further documents are listed in the continuation of Box C.

* Special categories of cited documents:
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Date of the actual completion of the international search: 01 June 2009

Date of mailing of the international search report: 11 JUN 2009

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