AR0144 IAS Module
Prototype 1/4–inch 1.0 Mp Global Shutter Module

Advance Information
IAS1MOD-AR0144CSSM090110-GEVB

The AR0144 1MP IAS module is part of the ON Semiconductor IAS family of modules offering standardized connectors, layout configuration and OTPM protocol. The modules are compatible with Evaluations systems and reference designs offered by ON Semiconductor. The modules are offered from ON Semiconductor as prototype modules not meant for customer production shipments. Customer can work with ON Semiconductor Distribution partners for equivalent mass production versions of these modules.

Applications
- Machine Vision
- Robotics
- Smart Building
- Industrial
- Consumer

Table 1. KEY PERFORMANCE PARAMETERS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SENSOR</td>
<td></td>
</tr>
<tr>
<td>Sensor Part Number</td>
<td>AR0144CSSM28SUD20</td>
</tr>
<tr>
<td>FUNCTIONAL</td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>Raw</td>
</tr>
<tr>
<td>CFA</td>
<td>Mono</td>
</tr>
<tr>
<td>Max. fps</td>
<td>60 fps @ 1280 x 800</td>
</tr>
<tr>
<td>Interface</td>
<td>2–Lane MIPI</td>
</tr>
<tr>
<td>MECHANICAL</td>
<td></td>
</tr>
<tr>
<td>Module size X<em>Y</em>Z (mm)</td>
<td>9.0 x 30.0 x 6.85</td>
</tr>
<tr>
<td>OPTICAL</td>
<td></td>
</tr>
<tr>
<td>Optical Format</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>Image active resolution</td>
<td>1280 (H) x 800 (V) = 1.0 Mp</td>
</tr>
<tr>
<td>Pixel size</td>
<td>3.0 μm</td>
</tr>
<tr>
<td>Focus Range</td>
<td>14 cm–Inf</td>
</tr>
<tr>
<td>Hyperfocal Distance</td>
<td>230 mm</td>
</tr>
<tr>
<td>Effective Focal Length (EFL)</td>
<td>1.69 mm</td>
</tr>
<tr>
<td>Lens F number</td>
<td>2.0</td>
</tr>
<tr>
<td>Lens Structure</td>
<td>6P</td>
</tr>
<tr>
<td>Diagonal Field of View (DFOV)</td>
<td>150°</td>
</tr>
<tr>
<td>Vertical Field of View (VFOV)</td>
<td>79.5°</td>
</tr>
<tr>
<td>Horizontal Field of View (HFOV)</td>
<td>127°</td>
</tr>
<tr>
<td>TV distortion</td>
<td>≤37.2%</td>
</tr>
</tbody>
</table>

This document contains information on a new product. Specifications and information herein are subject to change without notice.
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<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>ELECTRICAL</td>
<td></td>
</tr>
<tr>
<td>Supply voltages</td>
<td>VDDIO: 1.8 V or 2.8 V VDD: 1.2 V VAA: 2.8 V</td>
</tr>
<tr>
<td>I2C Pull-up Resistor in Module (Note 1)</td>
<td>2.2k</td>
</tr>
<tr>
<td>PROGRAMMABLE STORAGE</td>
<td></td>
</tr>
<tr>
<td>This module has programmable storage.</td>
<td>EEPROM/OTPM is programed per IAS programming specifications. Please refer to the IAS Module EEPROM and OTPM Application note (AND9865/D) for more information.</td>
</tr>
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1. ON Semiconductor recommends that host sites add a 1.5K pull-up resistor.

Table 2. ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Orderable Product Attribute Description</th>
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<tbody>
<tr>
<td>IAS1MOD–AR0144CSSM090110–GEVB</td>
<td>AR0144 1MP 1/4&quot; Mono 28° CRA Die in IAS module with 150° DFOV Lens</td>
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<tr>
<td>IAS1–ADPTR–DM3D1–GEVB</td>
<td>Adapter Board to Demo3, DevWareX Supported</td>
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Table 3. MODULE CONNECTOR PINOUT

<table>
<thead>
<tr>
<th>Pin Number</th>
<th>Pin Name</th>
<th>Pin Number</th>
<th>Pin Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VPP</td>
<td>34</td>
<td>SADDR</td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
<td>33</td>
<td>GND</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>32</td>
<td>EXTCLK</td>
</tr>
<tr>
<td>4</td>
<td>DATA_1P</td>
<td>31</td>
<td>GND</td>
</tr>
<tr>
<td>5</td>
<td>DATA_1N</td>
<td>30</td>
<td>DATA_2P</td>
</tr>
<tr>
<td>6</td>
<td>GND</td>
<td>29</td>
<td>DATA_2N</td>
</tr>
<tr>
<td>7</td>
<td>CLK_P</td>
<td>28</td>
<td>GND</td>
</tr>
<tr>
<td>8</td>
<td>CLK_N</td>
<td>27</td>
<td>NC</td>
</tr>
<tr>
<td>9</td>
<td>GND</td>
<td>26</td>
<td>NC</td>
</tr>
<tr>
<td>10</td>
<td>NC</td>
<td>25</td>
<td>GND</td>
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<tr>
<td>11</td>
<td>NC</td>
<td>24</td>
<td>VDD</td>
</tr>
<tr>
<td>12</td>
<td>GND</td>
<td>23</td>
<td>VDD</td>
</tr>
<tr>
<td>13</td>
<td>VDDIO</td>
<td>22</td>
<td>SDATA</td>
</tr>
<tr>
<td>14</td>
<td>SCLK</td>
<td>21</td>
<td>RESET</td>
</tr>
<tr>
<td>15</td>
<td>FLASH</td>
<td>20</td>
<td>TRIGGER</td>
</tr>
<tr>
<td>16</td>
<td>GND</td>
<td>19</td>
<td>GND</td>
</tr>
<tr>
<td>17</td>
<td>VAA</td>
<td>18</td>
<td>VAA</td>
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Figure 1. Typical Connections
### MODULE CONNECTOR

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Number of Pins</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
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<tbody>
<tr>
<td>BM20B(0.8)−34DP−0.4V(51)</td>
<td>34</td>
<td>9.28</td>
<td>6.4</td>
<td>8.82</td>
</tr>
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</table>

Figure 2.
NOTES:
1. DIMENSIONING AND TOLERANCING PER.
2. CONTROLLING DIMENSION: MILLIMETERS
3. PCB AREA
4. HOLDER
5. BENDING AREA
6. DIMENSIONS D4 AND E4 DENOTE LABEL AREA
7. OPTICAL FIELD OF VIEW START POINT
   Ø2 - OPTICAL FIELD OF VIEW
8. MECHANICAL FIELD OF VIEW START POINT
   Ø2 - MECHANICAL FIELD OF VIEW
9. LENS DIAMETER
10. CONNECTOR: HRS BM20B(0.8)-34DP-0.4V(51)

<table>
<thead>
<tr>
<th>MILLIMETERS</th>
<th>MIN.</th>
<th>NOM.</th>
<th>MAX.</th>
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<tbody>
<tr>
<td>A</td>
<td>5.70</td>
<td>6.85</td>
<td>7.00</td>
</tr>
<tr>
<td>A1</td>
<td>0.25</td>
<td>0.30</td>
<td>0.35</td>
</tr>
<tr>
<td>A2</td>
<td>1.76</td>
<td>1.91</td>
<td>2.06</td>
</tr>
<tr>
<td>A3</td>
<td>3.06</td>
<td>3.21</td>
<td>3.36</td>
</tr>
<tr>
<td>A4</td>
<td>0.90</td>
<td>REF</td>
<td></td>
</tr>
<tr>
<td>A5</td>
<td>1.33</td>
<td>1.36</td>
<td>1.43</td>
</tr>
<tr>
<td>A6</td>
<td>1.51</td>
<td>1.56</td>
<td>1.61</td>
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<tr>
<td>D1</td>
<td>8.85</td>
<td>9.00</td>
<td>9.15</td>
</tr>
<tr>
<td>D2</td>
<td>9.80</td>
<td>9.90</td>
<td>9.95</td>
</tr>
<tr>
<td>D4</td>
<td>5.00</td>
<td>REF</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>29.85</td>
<td>30.00</td>
<td>30.15</td>
</tr>
<tr>
<td>E1</td>
<td>12.0</td>
<td>REF</td>
<td></td>
</tr>
<tr>
<td>E2</td>
<td>8.85</td>
<td>9.00</td>
<td>9.05</td>
</tr>
<tr>
<td>E3</td>
<td>4.2</td>
<td>REF</td>
<td></td>
</tr>
<tr>
<td>E4</td>
<td>7.0</td>
<td>REF</td>
<td></td>
</tr>
<tr>
<td>F1</td>
<td>8.00</td>
<td>8.09</td>
<td>8.10</td>
</tr>
<tr>
<td>F2</td>
<td>1.85</td>
<td>REF</td>
<td></td>
</tr>
<tr>
<td>F3</td>
<td>4.50</td>
<td>REF</td>
<td></td>
</tr>
<tr>
<td>Ø</td>
<td>100°</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ø2</td>
<td>107°</td>
<td></td>
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