



Silicon Sensing Proprietary Information



# Orion™ Combi-Sensor Evaluation Boards

December 2014



Silicon Sensing is a joint venture between UTC Aerospace Systems and Sumitomo Precision Products

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## Orion™ Combi-sensor Evaluation Boards

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SENSING®



**To be the leading provider of affordable, high performance, high integrity MEMS inertial products and foundry services**

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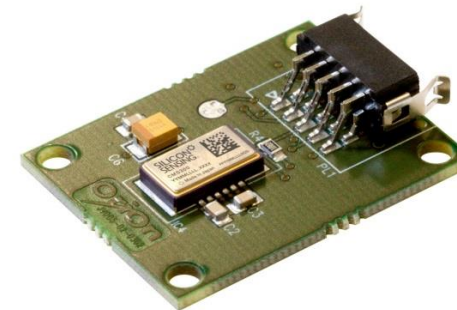
# Orion™ Combi-sensor Evaluation Boards

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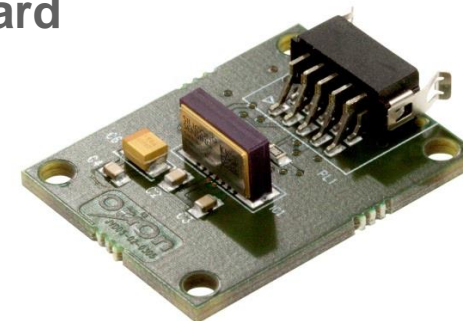


Two Orion™ combi-sensor evaluation boards are available:

**In-plane CMS300 Combi-sensor Evaluation Board  
(Part Number – CMS300-02-0302)**



**Orthogonal CMS390 Combi-sensor Evaluation Board  
(Part Number – CMS390-02-0305)**



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# Statement of Use and Disclaimer



## Statement of Use and Disclaimer For Silicon Sensing Systems Evaluation Boards

The Evaluation Boards described in this document are development tools and as such are provided solely for the evaluation and assessment by the Purchaser of the suitability of the Silicon Sensing Systems Limited (SSSL) range of Inertial Sensors within the Purchaser's application. They are not to be used either as an integral or discrete part or component within any Purchaser application or product. SSSL does not warrant the specification or performance of these boards in anyway whatsoever in such circumstances where use by the Purchaser for any application or product is in contravention of the foregoing advice from SSSL.

The Purchaser uses these Evaluation Boards entirely at its own risk and shall fully indemnify SSSL from any and all Purchaser or third party claims, losses, costs, damages and expenses and related liability whether in contract or tort that may arise from such improper use as provided in this statement.

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# Orion™ Combi-sensor Evaluation Boards

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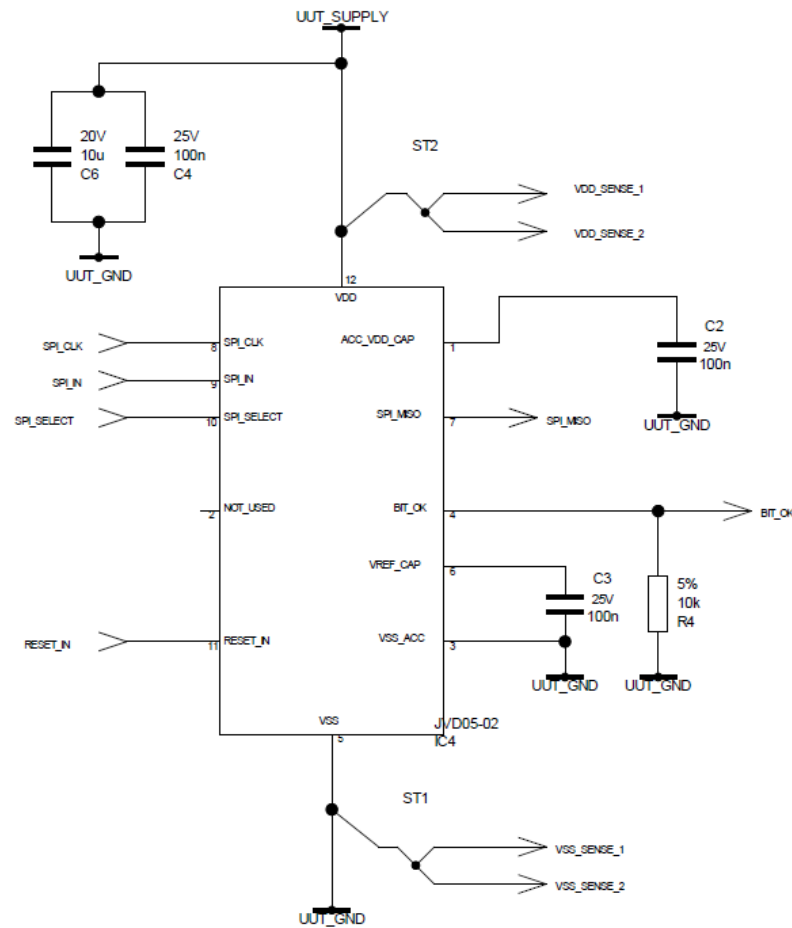
## Orion™ Combi-sensor Evaluation Boards:

**Two Part Numbers Available:** CMS300-02-0302 (CMS300) and  
CMS390-02-0305 (CMS390)

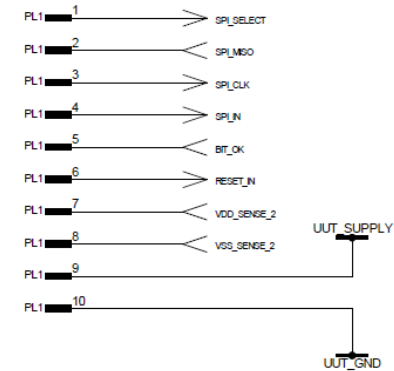
Board Size:	34mm x 26mm
Board Mounting:	Mounting holes provided
PCB material:	1.6mm FR4, solder resist.
Power Supply:	+3V3 and 0V
Analogue outputs:	Not Available
Digital interface:	SPI Bus.
Dynamic Ranges:	150°/sec and 300°/sec angular rate 2.5g and 10g linear acceleration



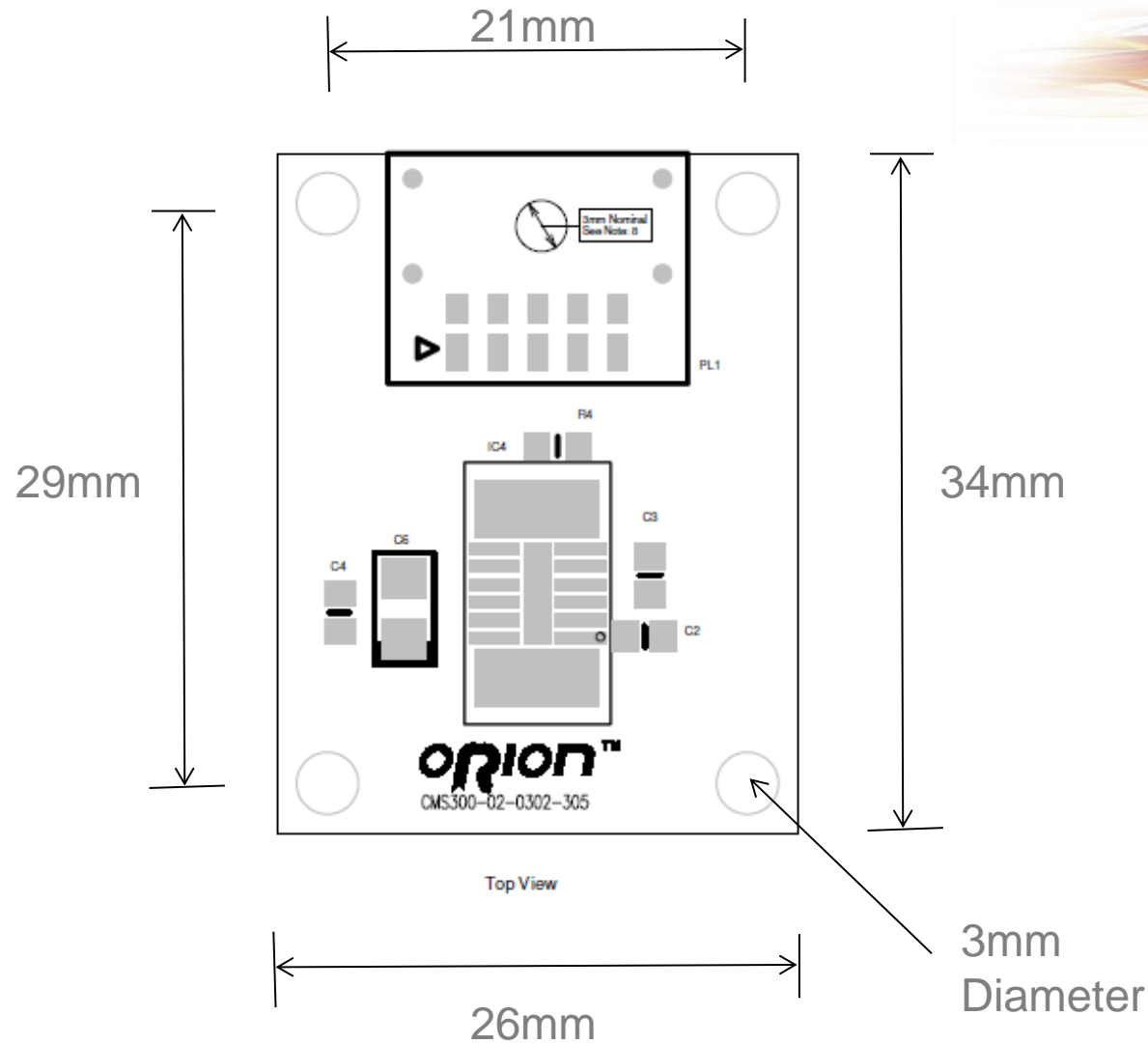
# CMS300 Evaluation Board Schematic



Datamate UUT Connection



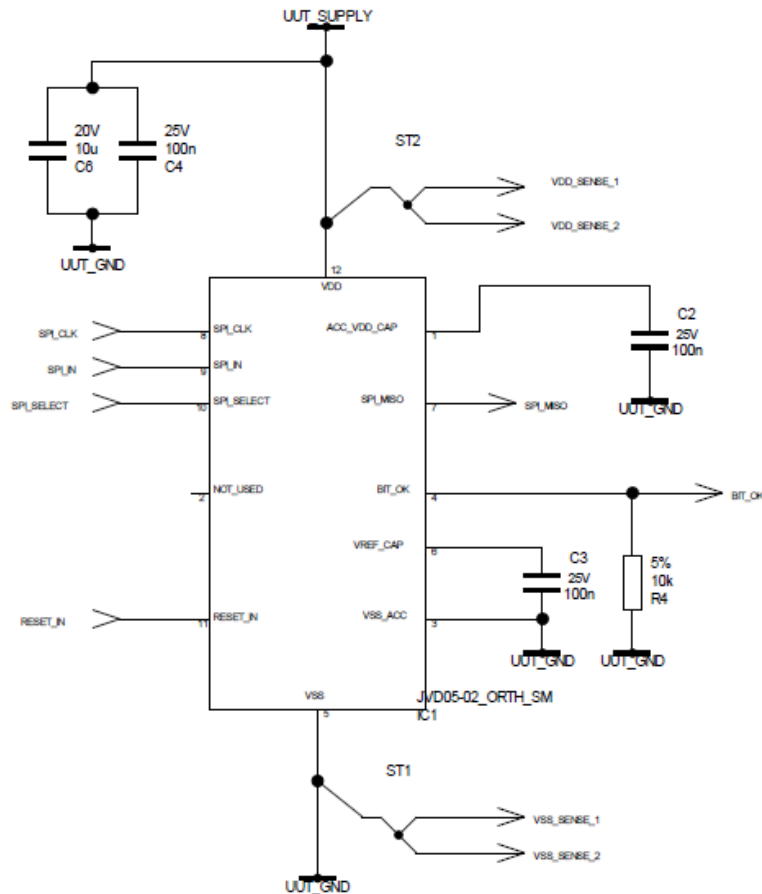
# CMS300 Evaluation Board Pad locations



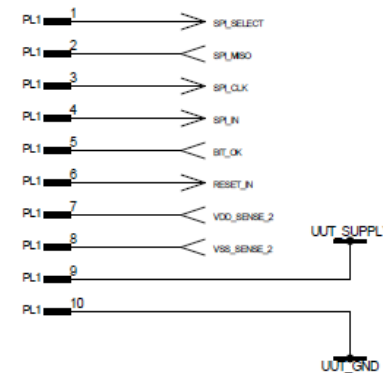
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# CMS390 Evaluation Board Schematic

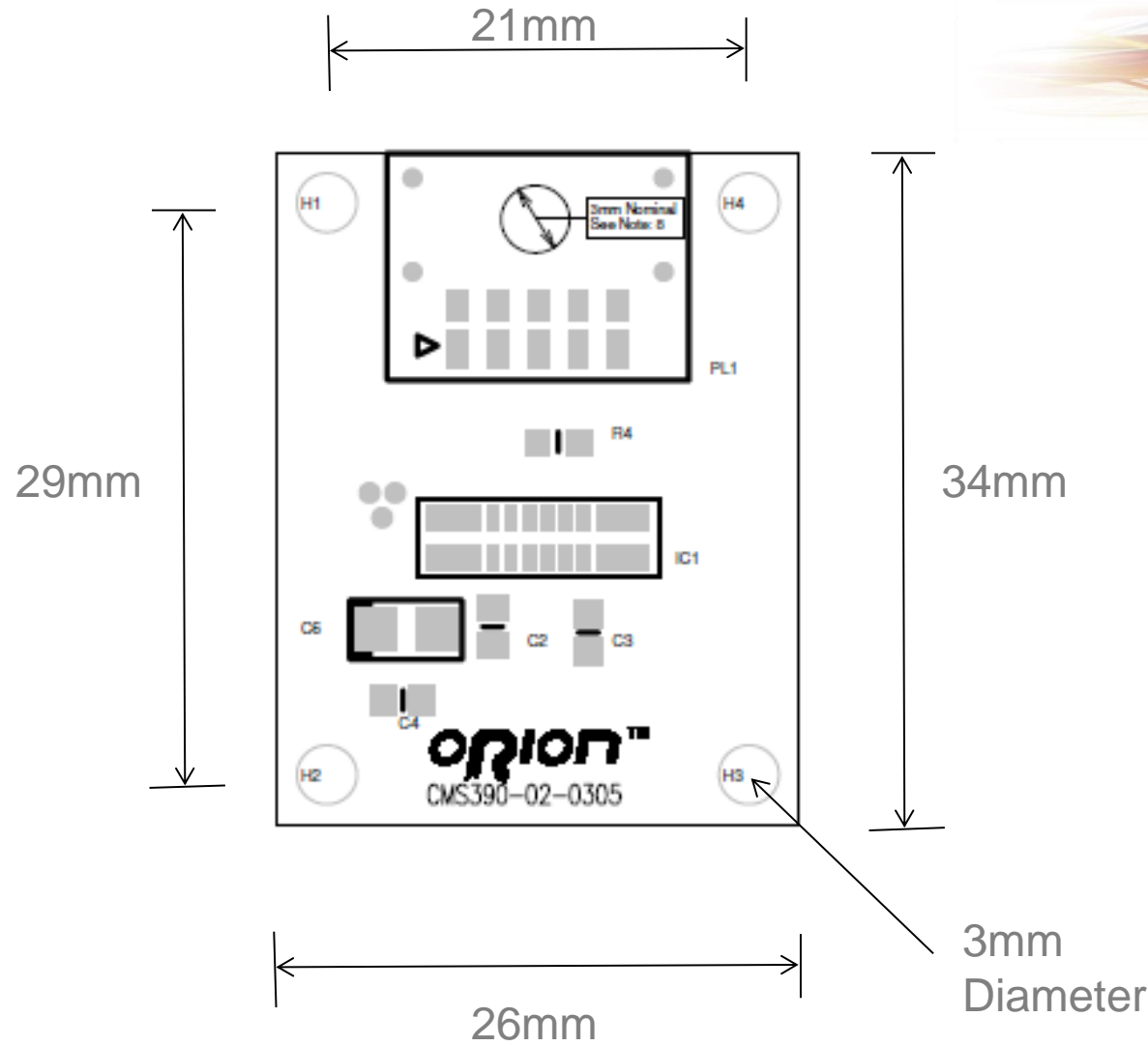


Datamate UUT Connection





# CMS390 Evaluation Board Pad locations



Layer 1 View

# CMS300 CMS390 CRC Calculation



## JVD05-02-0100-131(ICD Document), NOTE 8:

In all message to and from the ASIC a 4-bit CRC (data bits D3:0) shall be added. The CRC polynomial used shall be  $x^4+1$ . A seed value of "1010" shall be used with a calculation order MSB to LSB. The CRC shall be checked for all i/p messages. If the CRC fails then the message shall be ignored and a SPI Error message output in the next message.

The CRC is calculated using the following calculation:

Where data(31) is the MS bit of the message (transmitted first).  $\text{crc\_seed}(3:0) = \text{"1010"}$ .

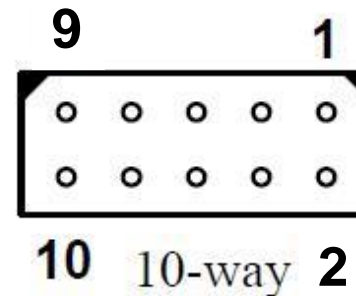
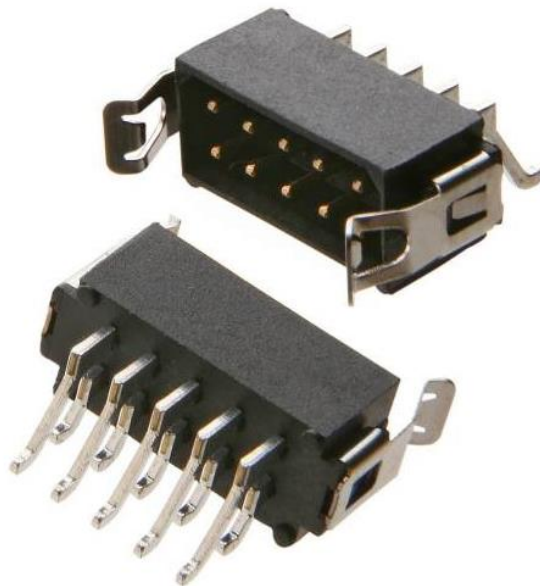
```

crc(0) = data(4) XOR data(8) XOR data(12) XOR data(16) XOR data(20) XOR data(24) XOR data(28) XOR crc_seed(0);
crc(1) = data(5) XOR data(9) XOR data(13) XOR data(17) XOR data(21) XOR data(25) XOR data(29) XOR crc_seed(1);
crc(2) = data(6) XOR data(10) XOR data(14) XOR data(18) XOR data(22) XOR data(26) XOR data(30) XOR crc_seed(2);
crc(3) = data(7) XOR data(11) XOR data(15) XOR data(19) XOR data(23) XOR data(27) XOR data(31) XOR crc_seed(3);
  
```

# CMS3xx Evaluation Boards Connector Details

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Harwin M80-6661042  
2mm pitch, right  
angle, double row,  
10-way connector



View looking into the connector

- 1 = SPI\_SEL
- 2 = SPI\_MISO
- 3 = SPI\_CLK
- 4 = SPI\_IN
- 5 = BIT\_OK
- 6 = RESET
- 7,9 = CDD\*
- 8,10 = VSS\*

\* Note; pins 7 and 8 do not require connecting to VDD and VSS respectively as they are connected on the EVB

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