



NATIONAL OPTICAL  
ASTRONOMY  
OBSERVATORY

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**MONSOON**  
**Bill of Materials**  
**IR Acquisition Daughter Board**  
**SN010 - SN014**

**Dwg No.: MNSN-EL-04-4005-010 Rev: B**  
**Next Assembly: MNSN-EL-10-0200-001**

APPROVED FOR  
CONSTRUCTION

| LTR | DESCRIPTION                 | ECR      | DATE      | BY  | APPRVD  |
|-----|-----------------------------|----------|-----------|-----|---------|
| B   | initial with REV B of board | ECO-0107 | 29-Mar-05 | dms | jgarcia |
|     |                             |          |           |     |         |
|     |                             |          |           |     |         |
|     |                             |          |           |     |         |
|     |                             |          |           |     |         |
|     |                             |          |           |     |         |

NOTES

Bill of Materials  
IR Acquisition Daughter Board  
SN010 - SN014

DWG #: MNSN-EL-04-4005-010  
3/23/2006

1. Components shall only be crossed to equivalent or improved performance parts.
2. All components are listed in the Materials tab, TBDValue tab is for configuration purposes only.
3. Item 13 is made from 2 part numbers.

| ITEM | QTY | TBD DES               | refdes  | VALUE | P/N               | MFR    | P/N DIGIKEY     | DESCRIPTION                               |
|------|-----|-----------------------|---|-------|-------------------|--------|-----------------|---|
| 1    | 1   | <a href="#">OPEN</a>  | R226  | OPEN  | NOT INSTALLED     |        |                 | Resistor, RC0805 OPEN                     |
| 2    | 1   | <a href="#">OPEN</a>  | R227  | OPEN  | NOT INSTALLED     |        |                 | Resistor, RC0805 OPEN                     |
| 3    | 1   | <a href="#">OPEN</a>  | R228  | OPEN  | NOT INSTALLED     |        |                 | Resistor, RC0805 OPEN                     |
| 4    | 1   | <a href="#">OPEN</a>  | R229  | OPEN  | NOT INSTALLED     |        |                 | Resistor, RC0805 OPEN                     |
| 5    | 18  | <a href="#">TBD1</a>  | R1, R21, R22, R39, R59, R82, R103,<br>R121, R124, R231, R251, R271, R295,<br>R297, R318, R334, R356, R377     | 200   | P0603E2000BB_     | Vishay |                 | Resistor, 200 ohms 0.1% 1/8W +-25ppm 0603 |
| 6    | 18  | <a href="#">TBD2</a>  | R3, R19, R40, R42, R61, R83, R104,<br>R122, R125, R230, R250, R272, R294,<br>R296, R317, R335, R355, R378     | 10M   | 9C06031A1005FKHFT | Yageo  | 311-10.0MHTR-ND | Resistor, 10M 1% 1/16W +-100ppm 0603      |
| 7    | 18  | <a href="#">TBD3</a>  | R17, R36, R56, R57, R79, R102, R119,<br>R140, R141, R247, R269, R292, R313,<br>R314, R332, R351, R376, R385   | 20    | P0603E20R0BB_     | Vishay |                 | Resistor, 20 ohms 0.1% 1/8W +-25ppm 0603  |
| 8    | 18  | <a href="#">TBD4</a>  | C19, C47, C48, C81, C110, C141,<br>C172, C203, C205, C345, C376, C412,<br>C446, C486, C488, C524, C555, C585  |       | NOT INSTALLED     | N/A    | N/A             | Cap, Cerc 0603                            |
| 9    | 18  | <a href="#">TBD5</a>  | R16, R35, R55, R77, R78, R100, R118,<br>R138, R154, R245, R267, R268, R289,<br>R312, R331, R350, R373, R374   | 3.01K | P0603Y3011BB_     | Vishay |                 | Resistor, 3.01K 0.1% 1/8W +-25ppm 0603    |
| 10   | 18  | <a href="#">TBD6</a>  | C14, C43, C76, C105, C136, C137,<br>C167, C200, C222, C341, C371, C372,<br>C409, C443, C482, C519, C520, C551 | TBD   | INSTALLED AT TEST |        |                 | Cap, Cerc 0603 NPO                        |
| 11   | 18  | <a href="#">TBD7</a>  | R13, R33, R53, R74, R75, R97, R116,<br>R136, R153, R243, R264, R265, R287,<br>R310, R329, R347, R370, R371    |       | NOT INSTALLED     | N/A    | N/A             | Resistor, 0603                            |
| 12   | 18  | <a href="#">TBD8A</a> | C12, C13, C42, C75, C104, C135,<br>C165, C166, C199, C340, C370, C408,<br>C442, C480, C481, C518, C550, C581  |       | NOT INSTALLED     | N/A    | N/A             | Cap, Cerc 0603                            |
| 13   | 18  | <a href="#">TBD8B</a> | C15, C16, C44, C77, C106, C138,<br>C168, C169, C201, C342, C373, C410,<br>C444, C483, C484, C521, C552, C582  |       | NOT INSTALLED     | N/A    | N/A             | Cap, Cerc 0603                            |

| ITEM | QTY | TBD DES               | refdes  | VALUE | P/N               | MFR    | P/N DIGIKEY   | DESCRIPTION                            |
|------|-----|-----------------------|---|-------|-------------------|--------|---------------|--|
| 14   | 18  | <a href="#">TBD9</a>  | R12, R32, R51, R52, R73, R96, R115, R135, R151, R242, R263, R286, R308, R309, R328, R346, R369, R382    |       | NOT INSTALLED     | N/A    | N/A           | Resistor, 0603                         |
| 15   | 18  | <a href="#">TBD10</a> | R4, R23, R43, R62, R63, R85, R106, R126, R143, R233, R252, R275, R276, R299, R319, R337, R357, R358     | 0     | 9C08052A0R00JLHFT | Yageo  | 311-0.0ACT-ND | Resistor, 0 5% 1/8 Watt 0805           |
| 16   | 18  | <a href="#">TBD11</a> | R6, R25, R44, R65, R87, R89, R107, R128, R144, R234, R253, R254, R277, R300, R320, R338, R359, R360     | 0     | 9C06031A0R00JLHFT | Yageo  | 311-0.0GTR-ND | Resistor, 0 ohm 1/10W 5% 0603          |
| 17   | 18  | <a href="#">TBD12</a> | C2, C30, C61, C62, C93, C124, C152, C185, C216, C328, C359, C397, C427, C428, C468, C506, C540, C574    |       | NOT INSTALLED     | N/A    | N/A           | Cap, Cerc 0603                         |
| 18   | 18  | <a href="#">TBD13</a> | C33, C34, C66, C97, C127, C155, C156, C189, C218, C331, C332, C362, C401, C432, C471, C472, C509, C543  |       | NOT INSTALLED     | N/A    | N/A           | Cap, Cerc 0603                         |
| 19   | 18  | <a href="#">TBD14</a> | R7, R26, R46, R66, R90, R109, R110, R129, R146, R236, R237, R257, R279, R302, R322, R323, R341, R362    | 0     | 9C06031A0R00JLHFT | Yageo  | 311-0.0GTR-ND | Resistor, 0 ohm 1/10W 5% 0603          |
| 20   | 18  | <a href="#">TBD15</a> | R11, R31, R50, R71, R72, R95, R114, R134, R150, R241, R262, R284, R285, R307, R327, R345, R368, R381    | 2.00K | P0603Y2001BB      | Vishay |               | Resistor, 2.00K 0.1% 1/8W +-25ppm 0603 |
| 21   | 18  | <a href="#">TBD16</a> | R10, R30, R49, R69, R70, R94, R113, R133, R149, R240, R260, R282, R283, R305, R325, R344, R365, R367    |       | NOT INSTALLED     | N/A    | N/A           | Resistor, 0603                         |
| 22   | 18  | <a href="#">TBD17</a> | C20, C49, C82, C111, C112, C142, C173, C206, C226, C346, C378, C414, C415, C449, C489, C525, C557, C558 | 0     | 9C06031A0R00JLHFT | Yageo  | 311-0.0GTR-ND | Resistor, 0 ohm 1/10W 5% 0603          |
| 23   | 18  | <a href="#">TBD18</a> | R2, R20, R38, R41, R60, R84, R105, R123, R142, R232, R249, R273, R274, R298, R316, R336, R354, R379     | 0     | 9C06031A0R00JLHFT | Yageo  | 311-0.0GTR-ND | Resistor, 0 ohm 1/10W 5% 0603          |

| ITEM | QTY | TBD DES                | refdes   | VALUE  | P/N            | MFR    | P/N DIGIKEY   | DESCRIPTION                             |
|------|-----|------------------------|--|--------|----------------|--------|---------------|---|
| 24   | 18  | <a href="#">TBD19A</a> | C5, C35, C67, C68, C98, C128, C157, C190, C191, C333, C363, C402, C433, C434, C473, C510, C544, C577       |        | NOT INSTALLED  | N/A    | N/A           | Cap, Cerc 0603                          |
| 25   | 18  | <a href="#">TBD19B</a> | C6, C36, C69, C70, C99, C129, C158, C192, C193, C334, C364, C403, C435, C436, C474, C511, C545, C578       |        | NOT INSTALLED  | N/A    | N/A           | Cap, Cerc 0603                          |
| 26   | 18  | <a href="#">TBD20</a>  | C1, C29, C60, C92, C122, C123, C151, C184, C215, C327, C357, C358, C396, C426, C467, C504, C505, C539      | 0.22uF | 0805YC224KAT2A | AVX    | 478-1400-1-ND | Cap, cerc 0805 0.22uF 16V 10% X7R       |
| 27   |     | <a href="#">TBD21</a>  | INTENTIONALLY LEFT BLANK   |        |                |        |               |   |
| 28   | 12  | <a href="#">TBD22A</a> | R169, R171, R173, R193, R198, R203, R412, R415, R422, R442, R445, R453                                     | 28.0K  | P0805E2802BB   | Vishay |               | Resistor, 28.0K 0.1% 1/8 W +-25ppm 0805 |
| 29   | 12  | <a href="#">TBD22B</a> | R161, R164, R167, R175, R181, R185, R397, R402, R405, R427, R432, R437                                     | 28.0K  | P0805E2802BB   | Vishay |               | Resistor, 28.0K 0.1% 1/8 W +-25ppm 0805 |
| 30   | 12  | <a href="#">TBD23A</a> | R191, R196, R202, R217, R221, R223, R411, R416, R421, R440, R447, R452                                     | 15.4K  | P0805E1542BB_  | Vishay |               | Resistor, 15.4K 0.1% 1/8W +-25ppm 0805  |
| 31   | 12  | <a href="#">TBD23B</a> | R178, R182, R188, R206, R208, R211, R398, R403, R406, R428, R433, R438                                     | 15.4K  | P0805E1542BB_  | Vishay |               | Resistor, 15.4K 0.1% 1/8W +-25ppm 0805  |
| 32   | 18  | <a href="#">TBD24</a>  | R180, R186, R190, R195, R201, R213, R215, R219, R225, R401, R407, R410, R417, R423, R436, R443, R446, R450 | 10.0K  | P0805E1002BB_  | Vishay |               | Resistor, 10.0K 0.1% 1/8W +-25ppm 0805  |
| 33   | 6   | <a href="#">TBD24S</a> | R176, R204, R207, R396, R426, R431   | 10.0K  | P0805E1002BB_  | Vishay |               | Resistor, 10.0K 0.1% 1/8W +-25ppm 0805  |
| 34   | 18  | <a href="#">TBD25</a>  | R183, R187, R192, R197, R200, R212, R216, R220, R224, R400, R408, R413, R418, R420, R435, R441, R448, R451 | 10.0K  | P0805E1002BB_  | Vishay |               | Resistor, 10.0K 0.1% 1/8W +-25ppm 0805  |
| 35   | 6   | <a href="#">TBD25S</a> | R177, R205, R209, R395, R425, R430   | 10.0K  | P0805E1002BB_  | Vishay |               | Resistor, 10.0K 0.1% 1/8W +-25ppm 0805  |

| ITEM | QTY | TBD DES                 | refdes   | VALUE  | P/N               | MFR       | P/N DIGIKEY   | DESCRIPTION                           |
|------|-----|-------------------------|--|--------|-------------------|-----------|---------------|---------------------------------------|
| 36   | 18  | <a href="#">TBDO26</a>  | C235, C242, C248, C253, C254, C271, C276, C283, C289, C628, C634, C638, C643, C648, C664, C669, C674, C679                                     | 1200pF | 12065A122JAT2A    | AVX       |               | Cap, Cerc 1206 1200pF 5% 50V NPO      |
| 37   | 6   | <a href="#">TBDO26S</a> | C233, C259, C264, C623, C654, C659   | 1200pF | 12065A122JAT2A    | AVX       |               | Cap, Cerc 1206 1200pF 5% 50V NPO      |
| 38   | 24  | <a href="#">TBDO27</a>  | R160, R163, R165, R168, R170, R172, R174, R179, R184, R189, R194, R199, R394, R399, R404, R409, R414, R419, R424, R429, R434, R439, R444, R449 | 27.1   | P0603E27R1BB      | Vishay    |               | Resistor, 27.1 0.1% 1/8W +-25ppm 0603 |
| 39   | 2   | <a href="#">TBDO1</a>   | C234, C616   | 4.7uF  | ECJ-3YB1E475M     | Panasonic | PCC2241CT-ND  | Cap, Cerc 1206 4.7uF 25V +20% X5R     |
| 40   | 2   | <a href="#">TBDO2</a>   | R148, R391   | 100    | P0603E1000BB      | Vishay    |               | Resistor, 100 0.1% 1/8W +-25ppm 0603  |
| 41   | 2   | <a href="#">TBDO3</a>   | R152, R390   | OPEN   | NOT INSTALLED     |           |               | Resistor, 0805                        |
| 42   | 2   | <a href="#">TBDO4</a>   | R155, R389   | 100    | P0805E1000BB      | Vishay    |               | Resistor, 100 0.1% 1/8W +-25ppm 0805  |
| 43   | 2   | <a href="#">TBDO5</a>   | C238, C613   |        | NOT INSTALLED     | N/A       | N/A           | Cap, Cerc 0805                        |
| 44   | 2   | <a href="#">TBDO6</a>   | C239, C612   |        | NOT INSTALLED     | N/A       | N/A           | Cap, Cerc 0805                        |
| 45   | 2   | <a href="#">TBDO7</a>   | R162, R393   | 0      | 9C06031A0R00JLHFT | Yageo     | 311-0.0GTR-ND | Resistor, 0 ohm 1/10W 5% 0603         |
| 46   | 2   | <a href="#">TBDR1</a>   | C243, C607   | 4.7uF  | ECJ-3YB1E475M     | Panasonic | PCC2241CT-ND  | Cap, Cerc 1206 4.7uF 25V +20% X5R     |
| 47   | 2   | <a href="#">TBDR2</a>   | R157, R388   | 1.00K  | P0603Y1001BB_     | Vishay    |               | Resistor, 1.0K 0.1% 1/8W +-25ppm 0603 |
| 48   | 2   | <a href="#">TBDR3</a>   | R158, R387   | OPEN   | NOT INSTALLED     | N/A       | N/A           | Resistor, 0805                        |
| 49   | 2   | <a href="#">TBDR4</a>   | R159, R384   | 100    | P0805E1000BB      | Vishay    |               | Resistor, 100 0.1% 1/8W +-25ppm 0805  |
| 50   | 2   | <a href="#">TBDR5</a>   | C246, C602   |        | NOT INSTALLED     | N/A       | N/A           | Cap, Cerc 0805                        |
| 51   | 2   | <a href="#">TBDR6</a>   | C247, C601   |        | NOT INSTALLED     | N/A       | N/A           | Cap, Cerc 0805                        |
| 52   | 2   | <a href="#">TBDR7</a>   | R166, R392   | 0      | 9C06031A0R00JLHFT | Yageo     | 311-0.0GTR-ND | Resistor, 0 ohm 1/10W 5% 0603         |
| 53   | 18  | <a href="#">TBDS1</a>   | R9, R29, R48, R68, R92, R93, R112, R132, R147, R239, R259, R261, R281, R306, R326, R343, R364, R366  |        | NOT INSTALLED     | N/A       | N/A           | Resistor, 0603                        |
| 54   | 18  | <a href="#">TBDS2</a>   | C7, C37, C71, C100, C130, C159, C160, C194, C219, C335, C336, C365, C404, C437, C475, C476, C512, C546   |        | NOT INSTALLED     | N/A       | N/A           | Cap, Tant CT3216                      |
| 55   | 18  | <a href="#">TBDS3</a>   | C8, C38, C72, C101, C131, C132, C161, C195, C220, C337, C366, C367, C405, C438, C477, C513, C514, C547   |        | NOT INSTALLED     | N/A       | N/A           | Cap, Cerc 0603                        |
| 56   | 18  | <a href="#">TBDS4</a>   | R5, R24, R45, R64, R86, R88, R108, R127, R145, R235, R255, R256, R278, R301, R321, R339, R340, R361  |        | NOT INSTALLED     | N/A       | N/A           | Resistor, 0603                        |

| ITEM | QTY | TBD DES                | refdes   | VALUE | P/N           | MFR            | P/N DIGIKEY | DESCRIPTION                                   |
|------|-----|------------------------|--|-------|---------------|----------------|-------------|---|
| 57   | 18  | <a href="#">TBDS5</a>  | C3, C31, C63, C94, C95, C125, C153, C186, C217, C329, C360, C398, C399, C429, C469, C507, C541, C575 |       | NOT INSTALLED | N/A            | N/A         | Cap, Cerc 0603                                |
| 58   | 18  | <a href="#">TBDS6</a>  | C4, C32, C64, C65, C96, C126, C154, C187, C188, C330, C361, C400, C430, C431, C470, C508, C542, C576 |       | NOT INSTALLED | N/A            | N/A         | Cap, Tant CT3216                              |
| 59   | 18  | <a href="#">TBDS7</a>  | R8, R27, R28, R47, R67, R91, R111, R130, R131, R238, R258, R280, R303, R304, R324, R342, R363, R380  |       | NOT INSTALLED | N/A            | N/A         | Resistor, 0603                                |
| 60   | 2   | <a href="#">TBD_OV</a> | U31, U76   |       | AD8021AR      | Analog Devices |             | IC, Low Noise high-speed amplifier            |
| 61   | 2   | <a href="#">TBD_VR</a> | U32, U75   |       | AD797AR       | Analog Devices |             | IC, Ultralow distortion & noise Op Amp        |
| 62   | 18  | <a href="#">TBD_P</a>  | U2, U5, U9, U10, U15, U19, U22, U25, U26, U49, U53, U56, U60, U61, U64, U67, U71, U73                |       | AD8610AR      | Analog Devices | AD8610AR-ND | IC, precision v lo noise, wide BW JFET op amp |
| 63   | 18  | <a href="#">TBD_S</a>  | U1, U4, U8, U13, U14, U18, U21, U24, U29, U48, U51, U52, U55, U59, U63, U66, U69, U70, U89           |       | NOT INSTALLED | N/A            | N/A         | SO8   |
|      |     |                        |  |       |               |                |             |   |
|      |     |                        |  |       |               |                |             |   |



| ITEM | QTY | REFDES   | Value  | Part Number           | MFR            | PN Digikey   | Description                             |
|------|-----|--|--------|-----------------------|----------------|--------------|---|
| 1    | 1   | NOAO will supply   |        | MNSN-EL-04-1005 Rev B | NOAO           |              | PCB BLANK, IR Acquisition Daughter Card |
| 2    | 36  | C9, C18, C39, C40, C46, C73, C79, C80, C102, C109, C133, C140, C162, C171, C196, C197, C204, C225, C338, C344, C368, C377, C406, C413, C439, C440, C447, C448, C478, C487, C515, C523, C548, C556, C579, C584  | 0.01uF | ECJ-1VB1H103K         | Panasonic      | PCC1784CT-ND | Cap, Cerc 0603 0.01uF 50V 10% X7R       |
| 3    | 54  | C23, C24, C25, C53, C54, C55, C56, C85, C86, C87, C88, C115, C116, C117, C118, C146, C147, C148, C177, C178, C179, C180, C209, C210, C211, C230, C231, C349, C350, C351, C382, C383, C384, C418, C419, C420, C421, C452, C453, C454, C455, C493, C494, C495, C496, C529, C530, C531, C561, C562, C563, C588, C589, C590                                  | 0.1uF  | ECJ-1VB1C104K         | Panasonic      | PCC1762CT-ND | Cap, Cerc 0603 0.1uF 16V 10% X7R        |
| 4    | 48  | C256, C257, C262, C263, C267, C270, C273, C277, C280, C281, C285, C287, C292, C294, C296, C299, C301, C303, C306, C309, C312, C314, C317, C319, C596, C597, C603, C609, C617, C619, C621, C626, C631, C636, C641, C647, C651, C653, C656, C658, C661, C663, C666, C668, C671, C673, C676, C678   | 0.01uF | ECJ-2VB1H103K         | Panasonic      | PCC103BCT-ND | Cap, Cerc 0805 0.01uF 50V 10% X7R       |
| 5    | 58  | C28, C91, C183, C221, C228, C237, C240, C245, C249, C252, C321, C326, C354, C355, C356, C388, C389, C390, C391, C392, C393, C394, C395, C424, C425, C459, C460, C461, C462, C463, C464, C465, C466, C499, C500, C501, C502, C503, C534, C535, C536, C537, C538, C567, C568, C569, C570, C571, C572, C573, C586, C593, C594, C600, C605, C611, C615, C681 | 0.1uF  | ECJ-2YB1H104K         | Panasonic      | PCC1840CT-ND | Cap, Cerc 0805 0.1uF 50V 10% X7R        |
| 6    | 1   | U89  |        | REF196GS              | Analog Devices | REF196GS-ND  | IC, Precision micro power V Ref 3.3 V   |
| 7    | 24  | C260, C266, C272, C278, C284, C290, C295, C300, C305, C310, C315, C320, C625, C630, C635, C640, C645, C650, C655, C660, C665, C670, C675, C680   | 4.7uF  | ECJ-2FF1C475Z         | Panasonic      | PCC2232CT-ND | Cap, Cerc 0805 4.7uF 16V +80%/-20% F    |
| 8    | 18  | C22, C52, C84, C114, C144, C145, C176, C208, C227, C348, C380, C381, C417, C451, C492, C527, C528, C560  | 47uF   | TCJB476M006R0070      | AVX            |              | Cap, Tant 3528-21 47uF 6.3V 20          |

| ITEM | QTY    | REFDES  | Value | Part Number                       | MFR            | PN Digikey    | Description  |
|------|--------|---|-------|-----------------------------------|----------------|---------------|--|
| 9    | 84     | C10, C11, C17, C41, C45, C74, C78, C103, C107, C108, C134, C139, C163, C164, C170, C198, C202, C224, C255, C258, C261, C265, C268, C269, C274, C275, C279, C282, C286, C288, C291, C293, C297, C298, C302, C304, C307, C308, C311, C313, C316, C318, C339, C343, C369, C374, C375, C407, C411, C441, C445, C479, C485, C516, C517, C522, C549, C553, C554, C580, C595, C598, C604, C608, C618, C620, C622, C624, C627, C629, C632, C633, C637, C639, C642, C644, C646, C649, C652, C657, C662, C667, C672, C677 | 1.0uF | ECS-T1VY105R                      | Panasonic      | P11332CT-ND   | Cap, Tant 1.0uF 20V 20% SMT3216  |
| 10   | 70     | C21, C26, C27, C50, C51, C57, C58, C59, C83, C89, C90, C113, C119, C120, C121, C143, C149, C150, C174, C175, C181, C182, C207, C212, C213, C214, C223, C229, C232, C251, C322, C324, C347, C352, C353, C379, C385, C386, C387, C416, C422, C423, C450, C456, C457, C458, C490, C491, C497, C498, C526, C532, C533, C559, C564, C565, C566, C583, C587, C591, C592, C682, C236, C241, C244, C250, C599, C606, C610, C614   | 4.7uF | TAJA475K020R                      | AVX            | 478-1668-1-ND | Cap, Tant 3216 4.7uF 20V 10%   |
| 11   | 1      | J6  |       | CES-149-01-S-D                    | Samtec         |               | Con, 98 pin header socket .1 center double row   |
| 12   | 1      | J11   |       | ASP-117024-01<br>NOAO WILL SUPPLY | Samtec         |               | Con, custom right angle header 50 pin .1 ctr elevated  |
| 13   | 1<br>1 | J8  |       | CES-150-01-S-D<br>CES-108-01-S-D  | Samtec         |               | Con, Socket 50 x 2 (100) pins ( combine part numbers)<br>Con, Socket 08 x 2 (16 ) pins (combine to 116 pins con) |
| 14   | 36     | D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, D16, D17, D18, D19, D20, D21, D22, D23, D24, D25, D26, D27, D28, D29, D30, D31, D32, D33, D34, D35, D36   |       | ZHCS350T or<br>UZHCS350T          | Zetex          |               | Diode, SCHOTTKY barrier 40V low Vf SOD523  |
| 15   |        |   |       |                                   |                |               |  |
| 16   |        |   |       |                                   |                |               |  |
| 17   | 2      | U46, U47  |       | AD8802AR                          | Analog Devices |               | IC, 12 channel, 8 bit trimDAC's with pwr shutdown  |
| 18   | 18     | U3, U6, U11, U12, U16, U20, U23, U27, U30, U50, U54, U57, U58, U62, U65, U68, U72, U74  |       | AD7671AST                         | Analog Devices |               | IC, 16 Bit 1 MSPS CMOS ADC   |
| 19   | 3      | U7, U17, U28  |       | XCR3384XL-7-PQ208C                | Xilinx         |               | IC, 256 macrocell CPLD   |

| ITEM | QTY | REFDES  | Value                  | Part Number       | MFR            | PN Digikey    | Description   |
|------|-----|---|------------------------|-------------------|----------------|---------------|---|
| 20   | 24  | U34, U35, U36, U37, U38, U39, U40, U41, U42, U43, U44, U45, U77, U78, U79, U80, U81, U82, U83, U84, U85, U86, U87, U88  |                        | OPA277AU          | TI             |               | IC, Precision low noise & input bias current op amp       |
| 21   | 2   | C323, C325  | 1uF                    | ECJ-2YB1A105K     | Panasonic      | PCC1807CT-ND  | Cap, Cerc 0805 1uF 10V 10% X7R                            |
| 22   | 1   | U33   |                        | ADR421BR          | Analog Devices |               | IC, Ultraprecision, low noise 2.048/2.5V xfet V Reference |
| 23   | 4   | R210, R214, R218, R222  | 0                      | 9C08052A0R00JLHFT | Yageo          | 311-0.0ACT-ND | Resistor, 0805 0 ohm 5% 1/8 Watt                          |
| 24   | 112 | C20, C49, C82, C111, C112, C142, C173, C206, C226, C346, C378, C414, C415, C449, C489, C525, C557, C558, R2, R6, R7, R14, R15, R18, R20, R25, R26, R34, R37, R38, R41, R44, R46, R54, R58, R60, R65, R66, R76, R80, R81, R84, R87, R89, R90, R98, R99, R101, R105, R107, R109, R110, R117, R120, R123, R128, R129, R137, R139, R142, R144, R146, R156, R162, R166, R232, R234, R236, R237, R244, R246, R249, R253, R254, R257, R266, R270, R273, R274, R277, R279, R288, R290, R291, R298, R300, R302, R311, R315, R316, R320, R322, R323, R330, R333, R336, R338, R341, R348, R349, R352, R354, R359, R360, R362, R372, R375, R379, R383, R386, R392, R393 | 0                      | 9C06031A0R00JLHFT | Yageo          | 311-0.0GCT-ND | Resistor, 0603 0 ohm 1/10W 5%                             |
| 25   | 6   | R176, R197, R201, R423, R448, R452  | 10                     | ERJ-6ENF10R0V     | Panasonic      | P10.0CCT-ND   | Resistor, 10 1% 1/10 Watt 0805                            |
| 26   | 3   | R248, R293, R353  | 49.9                   | ERJ-6ENF49R9V     | Panasonic      | P49.9CCT-ND   | Resistor, 49.9 1% 1/10 Watt 0805                          |
| 27   | 61  | TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP12, TP13, TP14, TP15, TP16, TP17, TP18, TP19, TP20, TP21, TP22, TP23, TP24, TP25, TP26, TP27, TP28, TP29, TP30, TP31, TP32, TP33, TP34, TP35, TP36, TP37, TP38, TP39, TP40, TP41, TP42, TP43, TP44, TP45, TP46, TP47, TP48, TP49, TP50, TP51, TP52, TP53, TP54, TP55, TP56, TP57, TP58, TP59, TP60, TP61   |                        | 02-1080           | E-Mark inc.    |               | Test point, ball socket type<br>+H7                       |
| 28   | 8   | R152, R158, R226, R227, R228, R229, R387, R390  | OPEN<br>TBDO3<br>TBDR3 | NOT INSTALLED     | N/A            | N/A           | Resistor, RC0805 OPEN                                     |

| ITEM | QTY | REFDES   | Value  | Part Number       | MFR    | PN Digikey      | Description                               |
|------|-----|--|--|-------------------|--------|-----------------|---|
| 29   | 18  | R1, R21, R22, R39, R59, R82, R103, R121, R124, R231, R251, R271, R295, R297, R318, R334, R356, R377  | 200  | P0603E2000BB_     | Vishay |                 | Resistor, 200 ohms 0.1% 1/8W +-25ppm 0603 |
| 30   | 18  | R3, R19, R40, R42, R61, R83, R104, R122, R125, R230, R250, R272, R294, R296, R317, R335, R355, R378  | 10M  | 9C06031A1005FKHFT | Yageo  | 311-10.0MHTR-ND | Resistor, 10M 1% 1/16W +-100ppm 0603      |
| 31   | 18  | R17, R36, R56, R57, R79, R102, R119, R140, R141, R247, R269, R292, R313, R314, R332, R351, R376, R385  | 20   | P0603E20R0BB_     | Vishay |                 | Resistor, 20 ohms 0.1% 1/8W +-25ppm 0603  |
| 32   | 162 | C2, C3, C5, C6, C8, C12, C13, C15, C16, C19, C30, C31, C33, C34, C35, C36, C38, C42, C44, C47, C48, C61, C62, C63, C66, C67, C68, C69, C70, C72, C75, C77, C81, C93, C94, C95, C97, C98, C99, C101, C104, C106, C110, C124, C125, C127, C128, C129, C131, C132, C135, C138, C141, C152, C153, C155, C156, C157, C158, C161, C165, C166, C168, C169, C172, C185, C186, C189, C190, C191, C192, C193, C195, C199, C201, C203, C205, C216, C217, C218, C220, C328, C329, C331, C332, C333, C334, C337, C340, C342, C345, C359, C360, C362, C363, C364, C366, C367, C370, C373, C376, C397, C398, C399, C401, C402, C403, C405, C408, C410, C412, C427, C428, C429, C432, C433, C434, C435, C436, C438, C442, C444, C446, C468, C469, C471, C472, C473, C474, C477, C480, C481, C483, C484, C486, C488, C506, C507, C509, C510, C511, C513, C514, C518, C521, C524, C540, C541, C543, C544, C545, C547, C550, C552, C555, C574, C575, C577, C578, C581, C582, C585 | TBD4<br>TBD8A<br>TBD8B<br>TBD12<br>TBD13<br>TBD19A<br>TBD19B<br>TBDS3<br>TBDS5 | NOT INSTALLED     | N/A    | N/A             | Cap, Cerc 0603                            |
| 33   | 18  | R16, R35, R55, R77, R78, R100, R118, R138, R154, R245, R267, R268, R289, R312, R331, R350, R373, R374  | 3.01K  | P0603Y3011BB_     | Vishay |                 | Resistor, 3.01K 0.1% 1/8W +-25ppm 0603    |
| 34   | 18  | C14, C43, C76, C105, C136, C137, C167, C200, C222, C341, C371, C372, C409, C443, C482, C519, C520, C551  | TBD6   | INSTALLED AT TEST |        |                 | Cap, Cerc 0603 NPO                        |

| ITEM | QTY | REFDES  | Value  | Part Number    | MFR       | PN Digikey    | Description                            |
|------|-----|---|--|----------------|-----------|---------------|--|
| 35   | 108 | R5, R8, R9, R10, R12, R13, R24, R27, R28, R29, R30, R32, R33, R45, R47, R48, R49, R51, R52, R53, R64, R67, R68, R69, R70, R73, R74, R75, R86, R88, R91, R92, R93, R94, R96, R97, R108, R111, R112, R113, R115, R116, R127, R130, R131, R132, R133, R135, R136, R145, R147, R149, R151, R153, R235, R238, R239, R240, R242, R243, R255, R256, R258, R259, R260, R261, R263, R264, R265, R278, R280, R281, R282, R283, R286, R287, R301, R303, R304, R305, R306, R308, R309, R310, R321, R324, R325, R326, R328, R329, R339, R340, R342, R343, R344, R346, R347, R361, R363, R364, R365, R366, R367, R369, R370, R371, R380, R382 | TBD7<br>TBD9<br>TBD16<br>TBDS1<br>TBDS4<br>TBDS7 | NOT INSTALLED  | N/A       | N/A           | Resistor, 0603                         |
| 36   | 18  | R11, R31, R50, R71, R72, R95, R114, R134, R150, R241, R262, R284, R285, R307, R327, R345, R368, R381  | 2.00K  | P0603Y2001BB   | Vishay    |               | Resistor, 2.00K 0.1% 1/8W +-25ppm 0603 |
| 37   | 18  | C1, C29, C60, C92, C122, C123, C151, C184, C215, C327, C357, C358, C396, C426, C467, C504, C505, C539   | 0.22uF   | 0805YC224KAT2A | AVX       | 478-1400-1-ND | Cap, cerc 0805 0.22uF 16V 10% X7R      |
| 38   | 24  | R178, R182, R188, R191, R196, R202, R206, R208, R211, R217, R221, R223, R398, R403, R406, R411, R416, R421, R428, R433, R438, R440, R447, R452  | 15.4K  | P0805E1542BB_  | Vishay    |               | Resistor, 15.4K 0.1% 1/8W +-25ppm 0805 |
| 39   | 48  | R176, R177, R180, R183, R186, R187, R190, R192, R195, R197, R200, R201, R204, R205, R207, R209, R212, R213, R215, R216, R219, R220, R224, R225, R395, R396, R400, R401, R407, R408, R410, R413, R417, R418, R420, R423, R425, R426, R430, R431, R435, R436, R441, R443, R446, R448, R450, R451  | 10.0K  | P0805E1002BB   | Vishay    |               | Resistor, 10.0K 0.1% 1/8W +-25ppm 0805 |
| 40   | 24  | C233, C235, C242, C248, C253, C254, C259, C264, C271, C276, C283, C289, C623, C628, C634, C638, C643, C648, C654, C659, C664, C669, C674, C679  | 1200pF   | 12065A122JAT2A | AVX       |               | Cap, Cerc 1206 1200pF 5% 50V NPO       |
| 41   | 4   | C234, C243, C607, C616  | 4.7uF  | ECJ-3YB1E475M  | Panasonic | PCC2241CT-ND  | Cap, Cerc 1206 4.7uF 25V +20% X5R      |
| 42   | 2   | R148, R391  | 100  | P0603E1000BB   | Vishay    |               | Resistor, 100 0.1% 1/8W +-25ppm 0603   |

| ITEM | QTY | REFDES   | Value                            | Part Number         | MFR            | PN Digikey    | Description   |
|------|-----|--|----------------------------------|---------------------|----------------|---------------|---|
| 43   | 4   | R155, R159, R384, R389   | 100                              | P0805E1000BB        | Vishay         |               | Resistor, 100 0.1% 1/8W +-25ppm 0805                              |
| 44   | 8   | C238, C239, C246, C247, C601, C602, C612, C613,  | TBDO5<br>TBDO6<br>TBDR5<br>TBDR6 | NOT INSTALLED       | N/A            | N/A           | Cap, Cerc 0805  |
| 45   | 2   | R157, R388   | 1.00K                            | P0603Y1001BB_       | Vishay         |               | Resistor, 1.0K 0.1% 1/8W +-25ppm 0603                             |
| 46   | 36  | C4, C7, C32, C37, C64, C65, C71, C96, C100, C126, C130, C154, C159, C160, C187, C188, C194, C219, C330, C335, C336, C361, C365, C400, C404, C430, C431, C437, C470, C475, C476, C508, C512, C542, C546, C576 | TBDS2<br>TBDS6                   | NOT INSTALLED       | N/A            | N/A           | Cap, Tant CT3216  |
| 47   | 2   | U31, U76   | TBD_OV                           | AD8021AR            | Analog Devices |               | IC, Low Noise high-speed amplifier                                |
| 48   | 2   | U32, U75   | TBD_VR                           | AD797AR             | Analog Devices |               | IC, Ultralow distortion & noise Op Amp                            |
| 49   | 18  | U2, U5, U9, U10, U15, U19, U22, U25, U26, U49, U53, U56, U60, U61, U64, U67, U71, U73  | TBD_P                            | AD8610AR            | Analog Devices | AD8610AR-ND   | IC, precision v lo noise, wide BW JFET op amp                     |
| 50   | 18  | U1, U4, U8, U13, U14, U18, U21, U24, U29, U48, U51, U52, U55, U59, U63, U66, U69, U70, U89   | TBD_S                            | NOT INSTALLED       | N/A            | N/A           | SO8   |
| 51   | 18  | R4, R23, R43, R62, R63, R85, R106, R126, R143, R233, R252, R275, R276, R299, R319, R337, R357, R358  | 0                                | 9C08052A0R00JLHFT   | Yageo          | 311-0.0ACT-ND | Resistor, 0 5% 1/8 Watt 0805                                      |
| 52   | 24  | R161, R164, R167, R169, R171, R173, R175, R181, R185, R193, R198, R203, R397, R402, R405, R412, R415, R422, R427, R432, R437, R442, R445, R453   | 28.0K                            | P0805E2802BB        | Vishay         |               | Resistor, 28.0K 0.1% 1/8 W +-25ppm 0805                           |
| 53   | 24  | R160, R163, R165, R168, R170, R172, R174, R179, R184, R189, R194, R199, R394, R399, R404, R409, R414, R419, R424, R429, R434, R439, R444, R449   | 27.1                             | P0603E27R1BB        | Vishay         |               | Resistor, 27.1 0.1% 1/8W +-25ppm 0603                             |
| 54   | 2   | JP1, JP2   |                                  | MTSW-124-07-G-S-175 | Samtec         |               | Jumper, 3 x1 .175 post length .025 sq pin strt header (break to s |

| Part Number        | MFR            | Description  | Package Markings                | COMMENTS              |
|--------------------|----------------|--|---------------------------------|-----------------------|
| AD7814ARM          | Analog Devices | IC, 10 bit digital temp sensor                             | C<br>AA                         |                       |
| XCR3384XL-7-PQ208C | Xilinx         | IC, 256 macrocell CPLD                                     | XCR3384XL<br>PQ208AMN0301<br>7C | 0301 is the date code |
| TPS75218QPWP       | TI             | IC, Voltage regulator, 1.8V 2A low dropout, fast transient | PT75218<br>33T<br>DF8J          |                       |
| TPS75233QPWP       | TI             | IC, Voltage regulator, 3.3V 2A low dropout, fast transient | PT75233<br>39T<br>EL2H          |                       |
| XCV300E-6PQ240C    | Xilinx         | IC, FPGA Virtex 1.8V                                       | XCV300E<br>PQ240AMS0101<br>6C   | 0101 is the date code |
|                    |                |  |                                 |                       |
|                    |                |  |                                 |                       |
|                    |                |  |                                 |                       |
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|                    |                |  |                                 |                       |
|                    |                |  |                                 |                       |