



NATIONAL OPTICAL
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OBSERVATORY

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MONSOON
Bill of Materials
CCD 8 CH ACQUISITION BOARD
SN010 - SN032

Dwg No.: MNSN-EL-04-4002 Rev: B2
Next Assembly: MNSN-EL-10-0500

REVISIONS

Bill of Materials
 CCD 8 CH ACQUISITION BOARD
 SN010- SN029

Dwg #: MNSN-EL-04-4002-010
 3/21/2006

LTR	DESCRIPTION	ECR	DATE	BY	APPRVD
B	initial release for rev B card	MNSN-0109	14-Sep-05	DMS	mhunten/pmoore
B1	change to item 15, and 14 of the select resistors that were originally not installed		26-Sep-05	dms	mhunten/pmoore
B2	title page serial number SN022 to be SN032		20-Dec-05	dms	

NOTES

Bill of Materials
CCD 8 CH ACQUISITION BOARD
SN010 - SN029

Dwg #: MNSN-EL-04-4002-010
3/21/2006

1. Components shall only be crossed to equivalent or improved performance parts.

ITEM	QTY	TBD des	REFDES	VALUE	P/N	MFR	P/N DIGIKEY	DESCRIPTION
1	8	RLOAD	R1, R51, R101, R150, R409, R461, R516, R569	open	not installed	N/A		Resistor, 0805 OPEN
2	1	SEL0+B0	R628					Resistor, xx 1% 1/8 Watt 1206
3	1	SEL0+B1	R233					Resistor, xx 1% 1/8 Watt 1206
4	1	SEL0+B2	R234					Resistor, xx 1% 1/8 Watt 1206
5	1	SEL0+B3	R629					Resistor, xx 1% 1/8 Watt 1206
6	1	SEL0+VV0	R170	0	9C12063A0R00JLHFT	Yageo	311-0.0ECT-ND	Resistor, 1206 0 5% 1/4 Watt
7	1	SEL0+VV1	R183	0	9C12063A0R00JLHFT	Yageo	311-0.0ECT-ND	Resistor, 1206 0 5% 1/4 Watt
8	1	SEL0+VV2	R185					Resistor, xx 1% 1/8 Watt 1206
9	1	SEL0-B0	R673					Resistor, xx 1% 1/8 Watt 1206
10	1	SEL0-B1	R277					Resistor, xx 1% 1/8 Watt 1206
11	1	SEL0-B2	R276					Resistor, xx 1% 1/8 Watt 1206
12	1	SEL0-B3	R674					Resistor, xx 1% 1/8 Watt 1206
13	1	SEL0-VV0	R165					Resistor, xx 1% 1/8 Watt 1206
14	1	SEL0-VV1	R176					Resistor, xx 1% 1/8 Watt 1206
15	1	SEL0-VV2	R190	0	9C12063A0R00JLHFT	Yageo	311-0.0ECT-ND	Resistor, 1206 0 5% 1/4 Watt
16	1	SEL1+B0	R630					Resistor, xx 1% 1/8 Watt 1206
17	1	SEL1+B1	R235					Resistor, xx 1% 1/8 Watt 1206
18	1	SEL1+B2	R236					Resistor, xx 1% 1/8 Watt 1206
19	1	SEL1+B3	R631					Resistor, xx 1% 1/8 Watt 1206
20	1	SEL1+VV0	R171					Resistor, xx 1% 1/8 Watt 1206
21	1	SEL1+VV1	R184					Resistor, xx 1% 1/8 Watt 1206
22	1	SEL1+VV2	R186	0	9C12063A0R00JLHFT	Yageo	311-0.0ECT-ND	Resistor, 1206 0 5% 1/4 Watt
23	1	SEL1-B0	R675	0	9C12063A0R00JLHFT	Yageo	311-0.0ECT-ND	Resistor, 1206 0 5% 1/4 Watt
24	1	SEL1-B1	R279	0	9C12063A0R00JLHFT	Yageo	311-0.0ECT-ND	Resistor, 1206 0 5% 1/4 Watt
25	1	SEL1-B2	R278	0	9C12063A0R00JLHFT	Yageo	311-0.0ECT-ND	Resistor, 1206 0 5% 1/4 Watt
26	1	SEL1-B3	R676	0	9C12063A0R00JLHFT	Yageo	311-0.0ECT-ND	Resistor, 1206 0 5% 1/4 Watt
27	1	SEL1-VV0	R168	0	9C12063A0R00JLHFT	Yageo	311-0.0ECT-ND	Resistor, 1206 0 5% 1/4 Watt
28	1	SEL1-VV1	R180	0	9C12063A0R00JLHFT	Yageo	311-0.0ECT-ND	Resistor, 1206 0 5% 1/4 Watt
29	1	SEL1-VV2	R189					Resistor, xx 1% 1/8 Watt 1206
30	1	SEL2+B0	R632					Resistor, xx 1% 1/8 Watt 1206
31	1	SEL2+B1	R237					Resistor, xx 1% 1/8 Watt 1206
32	1	SEL2+B2	R238					Resistor, xx 1% 1/8 Watt 1206
33	1	SEL2+B3	R633					Resistor, xx 1% 1/8 Watt 1206
34	1	SEL2-B0	R677					Resistor, xx 1% 1/8 Watt 1206
35	1	SEL2-B1	R281					Resistor, xx 1% 1/8 Watt 1206
36	1	SEL2-B2	R280					Resistor, xx 1% 1/8 Watt 1206
37	1	SEL2-B3	R678					Resistor, xx 1% 1/8 Watt 1206
38	1	SEL3+B0	R634	0	9C12063A0R00JLHFT	Yageo	311-0.0ECT-ND	Resistor, 1206 0 5% 1/4 Watt
39	1	SEL3+B1	R239	0	9C12063A0R00JLHFT	Yageo	311-0.0ECT-ND	Resistor, 1206 0 5% 1/4 Watt
40	1	SEL3+B2	R240	0	9C12063A0R00JLHFT	Yageo	311-0.0ECT-ND	Resistor, 1206 0 5% 1/4 Watt
41	1	SEL3+B3	R635	0	9C12063A0R00JLHFT	Yageo	311-0.0ECT-ND	Resistor, 1206 0 5% 1/4 Watt
42	1	SEL3-B0	R679					Resistor, xx 1% 1/8 Watt 1206
43	1	SEL3-B1	R283					Resistor, xx 1% 1/8 Watt 1206
44	1	SEL3-B2	R282					Resistor, xx 1% 1/8 Watt 1206

ITEM	QTY	TBD des	REFDES	VALUE	P/N	MFR	P/N DIGIKEY	DESCRIPTION
45	1	SEL3-B3	R680					Resistor, xx 1% 1/8 Watt 1206
46	1	SEL4+B0	R626					Resistor, xx 1% 1/8 Watt 1206
47	1	SEL4+B1	R231					Resistor, xx 1% 1/8 Watt 1206
48	1	SEL4+B2	R232					Resistor, xx 1% 1/8 Watt 1206
49	1	SEL4+B3	R627					Resistor, xx 1% 1/8 Watt 1206
50	1	SEL4-B0	R671					Resistor, xx 1% 1/8 Watt 1206
51	1	SEL4-B1	R275					Resistor, xx 1% 1/8 Watt 1206
52	1	SEL4-B2	R274					Resistor, xx 1% 1/8 Watt 1206
53	1	SEL4-B3	R672					Resistor, xx 1% 1/8 Watt 1206
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ITEM	Count	RefDes	Value	Part Number	MFR	PN Digikey	Description
1	1			MNSN-EL-04-1002 Rev B	NOAO		PCB, Blank 8 CH CCD Acq Board Rev B
2	8	C7, C72, C134, C35, C371, C429, C490, C551	open	NOT INSTALLED	N/A	N/A	Cap, Cerc 0603 OPEN
3	137	C4, C5, C8, C9, C17, C18, C22, C26, C29, C33, C37, C41, C42, C44, C45, C46, C67, C68, C69, C73, C74, C82, C87, C91, C97, C100, C106, C108, C110, C111, C113, C131, C132, C136, C137, C144, C149, C153, C154, C158, C161, C162, C167, C169, C171, C172, C173, C174, C192, C194, C195, C202, C207, C212, C215, C216, C219, C267, C303, C368, C369, C372, C373, C380, C384, C388, C391, C395, C398, C402, C404, C405, C406, C407, C425, C426, C427, C430, C431, C432, C439, C444, C448, C451, C456, C461, C463, C466, C467, C468, C488, C489, C492, C493, C500, C504, C508, C511, C515, C522, C524, C526, C527, C528, C529, C548, C552, C560, C564, C571, C574, C579, C584, C586, C587, C609, C612, C615, C618, C621, C624, C627, C630, C633, C639, C652, C655, C658, C661, C664, C667, C670, C673, C676, C679, C705, C706	0.01uF	ECJ-1VB1H103K	Panasonic	PCC1784CT-ND	Cap, Cerc 0603 0.01uF 50V 10% X7R
4	93	C13, C16, C24, C25, C31, C32, C56, C59, C60, C79, C81, C89, C90, C98, C99, C121, C123, C124, C141, C143, C151, C152, C159, C160, C184, C186, C187, C188, C198, C200, C204, C205, C208, C209, C217, C230, C231, C238, C243, C244, C249, C250, C255, C256, C261, C262, C273, C278, C279, C284, C285, C290, C291, C296, C297, C302, C377, C379, C386, C387, C393, C394, C417, C418, C419, C436, C438, C446, C447, C454, C455, C479, C480, C481, C497, C499, C506, C507, C513, C514, C541, C542, C543, C556, C559, C567, C569, C576, C578, C595, C600, C601, C636	0.1uF	ECJ-1VB1C104K	Panasonic	PCC1762CT-ND	Cap, Cerc 0603 0.1uF 16V 10% X7R
5	8	C6, C70, C71, C133, C370, C428, C491, C549	10pF	ECJ-1VC1H100D	Panasonic	PCC100CVCT-ND	Cap, Cerc 0603 10pF 50V +/-5pF NPO
6	8	C35, C103, C164, C210, C397, C458, C517, C518	330pF	ECHU1H331JX5	Panasonic	PCF1322CT-ND	Cap, PPS film 0805 330pF 50V 5%
7	24	C21, C40, C52, C86, C107, C117, C147, C148, C168, C179, C213, C223, C383, C401, C412, C443, C462, C474, C503, C523, C534, C535, C563, C585	OPEN	NOT INSTALLED	N/A	N/A	Cap, Cerc 0805 open
8	141	C1, C63, C127, C128, C193, C199, C225, C234, C235, C236, C237, C271, C272, C309, C310, C315, C318, C321, C322, C323, C325, C326, C328, C329, C331, C333, C335, C337, C339, C341, C342, C343, C344, C345, C346, C347, C348, C350, C352, C354, C355, C356, C357, C359, C361, C362, C363, C364, C365, C422, C484, C546, C550, C558, C597, C598, C604, C605, C606, C607, C644, C647, C648, C649, C650, C683, C684, C689, C690, C691, C692, C709, C710, C712, C715, C716, C717, C718, C719, C720, C721, C722, C723, C724, C725, C726, C727, C728, C729, C730, C731, C732, C733, C734, C735, C736, C737, C738, C739, C740, C741, C742, C743, C744, C745, C746, C747, C748, C749, C750, C751, C752, C753, C754, C755, C756, C757, C758, C759, C760, C761, C762, C763, C764, C765, C766, C767, C768, C769, C771, C772, C773, C774, C775, C776, C777, C778, C779, C780, C781, C782	0.1uF	ECJ-2YB1H104K	Panasonic	PCC1840CT-ND	Cap, Cerc 0805 0.1uF 50V 10% X7R
9							

APPROVED FOR CONSTRUCTION

ITEM	Count	RefDes	Value	Part Number	MFR	PN Digikey	Description
10	44	C228, C239, C240, C241, C242, C245, C246, C247, C248, C251, C252, C253, C254, C257, C258, C259, C260, C263, C264, C265, C266, C274, C275, C276, C277, C280, C281, C282, C283, C286, C287, C288, C289, C292, C293, C294, C295, C298, C299, C300, C301, C312, C643, C770	1.0uF	GRM216R61E105KA12D	Murata Electronics	490-1700-1-ND	Cap, Cerc 0805 1.0uF 25V 10% X5R
11	8	C11, C76, C77, C138, C375, C434, C495, C553	2700pF	ECJ-2VC1H272J	Panasonic	PCC2159CT-ND	Cap, Cerc 0805 2700pF 50V 5% NPO
12	8	C10, C75, C139, C196, C374, C433, C494, C554	3.9nF	ECJ-2VB1H392K	Panasonic	PCC392BNCT-ND	Cap, Cerc 0805 .0039uF 50V 10% X7R
13	32	C3, C28, C48, C49, C50, C66, C94, C95, C114, C115, C130, C156, C176, C177, C191, C221, C367, C390, C408, C410, C424, C450, C469, C471, C486, C487, C510, C530, C532, C573, C588, C590	10pF	ECJ-2VC1H100D	Panasonic	PCC100CNCT-ND	Cap, Cerc 0805 10pF 50V 5% NPO
14	32	C562, C566, C568, C570, C575, C577, C581, C582, C610, C611, C616, C617, C622, C623, C628, C629, C653, C654, C659, C660, C665, C666, C671, C672, C693, C694, C695, C696, C697, C698, C699, C700	4.7uF	ECJ-3YB1E475M	Panasonic	PCC2241CT-ND	Cap, Cerc 1206 4.7uF 25V +20% X5R
15	22	C634, C635, C637, C638, C677, C678, C701, C702, R168, R170, R180, R183, R186, R190, R239, R240, R278, R279, R634, R635, R675, R676	0	9C12063A0R00JLHFT	Yageo	311-0.0ECT-ND	Resistor, 1206 0 ohm, (SHORT)
16	16	C608, C613, C614, C619, C620, C625, C626, C631, C651, C656, C657, C662, C663, C668, C669, C674	1.0uF	12065G105ZAT2A	AVX	478-1580-1-ND	Cap, Cerc 1.0uF 50V +80%/-20% Y5V 1206
17	61	C57, C58, C61, C62, C122, C125, C126, C185, C189, C190, C226, C229, C232, C233, C268, C304, C308, C311, C316, C319, C320, C324, C327, C330, C332, C334, C336, C338, C340, C416, C420, C421, C478, C482, C483, C540, C544, C545, C592, C594, C596, C599, C602, C603, C641, C642, C645, C646, C681, C682, C685, C686, C687, C688, C703, C704, C707, C708, C711, C713, C714	4.7uF	TAJA475K020R	AVX	478-1668-1-ND	Cap, Tant 3216 4.7uF 20V 10%
18	1	C218	4.7uF	T494B475K010AS	Kemet	399-1773-1-ND	Cap, Tant CT3528-21 4.7uF 10V 10% Low ESR
19	6	C269, C270, C305, C313, C314, C317	22uF	595D226X9050R2	Vishay Sprague		Cap, Tant 22uF 50V 10% SMT 595D-R
20	15	C55, C120, C183, C227, C306, C307, C349, C351, C353, C358, C360, C415, C477, C538, C539 (NOAO CAN SUPPLY)	47uF	TCJB476M006R0070	AVX		Cap, Tant 3528-21 47uF 6.3V 20% low ESR
21	108	C2, C12, C14, C15, C20, C23, C27, C30, C34, C36, C38, C39, C43, C47, C51, C64, C65, C78, C80, C84, C85, C88, C92, C93, C96, C101, C102, C104, C105, C109, C112, C116, C129, C140, C142, C146, C150, C155, C157, C163, C165, C166, C170, C175, C178, C197, C203, C206, C211, C214, C220, C222, C366, C376, C378, C382, C385, C389, C392, C396, C399, C400, C403, C409, C411, C423, C435, C437, C442, C445, C449, C452, C453, C457, C459, C460, C464, C465, C470, C472, C473, C485, C496, C498, C502, C505, C509, C512, C516, C519, C520, C521, C525, C531, C533, C547, C555, C557, C561, C565, C572, C580, C583, C589, C632, C640, C675, C680	1.0uF	ECS-T1VY105R	Panasonic	P11332CT-ND	Cap, Tant 1.0uF 35V 20% SMT3216
22							
23	8	C19, C83, C145, C201, C381, C440, C441, C501	5.0pF	ECJ-1VC1H050C	Panasonic	PCC050CVCT-ND	Cap, Cerc 0603 5.0pF 50V +-25pF COG
24	16	C53, C54, C118, C119, C180, C181, C182, C224, C413, C414, C475, C476, C536, C537, C591, C593	2700pF	ECJ-1VB1H272K	Panasonic	PCC1777CT-ND	Cap, Cerc 0603 2700pF 50V 10% X7R
25	1	J3		064784	ERNI		Con, right angle female cPCI 95 pins J3 position
26	2	J1, J4		064176	ERNI	N/A	Con, right angle female cPCI 110 pin J1, J4 position

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ITEM	Count	RefDes	Value	Part Number	MFR	PN Digikey	Description
27	2	J2, J5		064785	ERNI	n/a	Con, right angle female cPCI 110 pin J2, J5 position
28	8	P1, P2, P3, P4, P5, P6, P7, P8		903-373J-51A	Amphenol RF	ARF1243-ND	Con, SMA Precision RF
29	2	D8, D13		SMCJ5.0CA-13	Diodes, Inc.	SMCJ5.0CADICT-ND	Diode, TVS 1500W SMC 5V Bi-directional
30	2	F1, F10	5A	429 005	Littelfuse	F1275CT-ND	Fuse, very fast acting 429 5.0A 1206
31	8	F2, F3, F4, F5, F6, F7, F8, F9	2A	429 002	Littelfuse	F1238CT-ND	Fuse, very fast acting 429 2.0A 1206
32	1	J6		2-103326-0	Amp/ Tyco	A26532-20-ND	Header, 20 x 2 Right angle
33	0.2	J7		4-103325-0	Amp/ Tyco	A26516-ND	Header, right angle 8 position single row (break to size)
34	3	U54, U62, U130		MAX6325CSA	Maxim		IC, 1ppm/deg C Lo noise, Voltage reference
35	6	U63, U64, U65, U132, U135, U137		74LVX3245MTC	Fairchild		IC, 8 bit dual supply translating tranxceiver w/ 3 state out
36	1	U141		AD7814ARM	Analog Devices		IC, 10 bit digital temp sensor
37	2	U139, U140		74LVTH162373MTD	Fairchild		IC, Low Voltage 16 bit transparent latch w/tri-state outputs
38	8	U11, U23, U34, U46, U81, U93, U104, U115		AD7674AST	Analog Devices		IC, 18 Bit +-2.5 LSB INL, CMOS ADC
39	2	U66, U67		XCR3384XL-7-PQ208C	Xilinx		IC, 256 macrocell CPLD
40	8	U2, U13, U25, U36, U72, U83, U95, U106		AD8001ART	Analog Devices		IC, 800Mhz 50mW current feedback amp
41	1	U143		XC18V02VQ44I	Xilinx		IC, Configuration Prom w/ in sys programming 2M capacity
42	10	U49, U50, U51, U52, U53, U57, U58, U59, U60, U61		DAC8420FS	Analog Devices		IC, DAC Quad 12 bit serial voltage out
43	1	U68		XCV300E-6PQ240C	Xilinx		IC, FPGA Virtex 1.8V
44	16	U4, U8, U15, U19, U27, U31, U39, U43, U74, U78, U85, U89, U97, U101, U109, U113		AD8065AR	Analog Devices	AD8065AR-ND	IC, Op Amp high performance FastFET 145MHz SOIC 8
45	24	U6, U9, U10, U17, U20, U21, U22, U29, U32, U33, U41, U45, U76, U79, U80, U87, U90, U91, U92, U99, U102, U103, U111, U114		AD8021AR	Analog Devices		IC, Low Noise high-speed amplifier
46	4	U133, U134, U136, U138		MAX1270BCAI	Maxim		IC, multirange, 8 ch serial 12-bit ADC
47	8	U1, U12, U24, U35, U71, U82, U94, U105		AD829AR	Analog Devices		IC, Op Amp Hi Speed Lo noise
48	8	U37, U47, U48, U55, U107, U116, U117, U124		DG412CY / MAX313LESE	Maxim		IC, quad +3V Analog Switch
49	24	U3, U5, U7, U14, U16, U18, U26, U28, U30, U38, U40, U42, U73, U75, U77, U84, U86, U88, U96, U98, U100, U108, U110, U112		DG611DY	Vishay		IC, quad hi speed, lo glitch, CMOS SPST NC analog switch
50							
51	1	U44		TPS79318DBVR	TI	296-12155-1-ND	IC, LDO regulator u-low noise, fast RF, linear 1.8V SOT23-5
52	1	U69		DS2401	Dallas	DS2401-ND	IC, Silicon serial number
53	1	U70		TPS75218QPWP	TI		IC, Voltage regulator, 2A low dropout, fast transient
54	1	U142		TPS75233QPWP	TI	296-2682-5-ND	IC, Voltage regulator, 2A low dropout, fast transient
55	13	U56, U118, U119, U120, U121, U122, U123, U125, U126, U127, U128, U129, U131		OPA4227UA	TI		IC, Quad Op amp high precision
56	1	D6		SSF-LXH4RAID	Lumex	67-1303-ND	LED, T-1 Red right angle mount
57	2	D5, D7		SML-LXT0805IW-TR	Lumex	67-1552-1-ND	LED, Thin 635nm Red Diff 0805 SMD
58	8	D1, D2, D3, D4, D9, D10, D11, D12		BAS40-04	Philips		Diode, dual schottky sot-23
59	1	Y1	40 MHz	CB3LV-3C-40M0000	CTS	CTX280LVCT-ND	Oscillator, low voltage 40.0 MHz +-50ppm 7x5mm
60	40	R2, R3, R27, R30, R53, R54, R75, R76, R104, R105, R127, R129, R152, R153, R174, R175, R224, R227, R265, R269, R381, R382, R405, R407, R433, R434, R458, R459, R460, R487, R488, R489, R512, R513, R515, R540, R732, R735, R737, R738	0	ERJ-6GEY0R00V	Panasonic	P0.0ATR-ND	Resistor, 0805 0 ohm 5% 1/10 Watt
61	18	R23, R71, R122, R169, R317, R318, R319, R321, R323, R326, R329, R330, R331, R332, R401, R454, R506, R507	1.0K	ERJ-6ENF1001V	Panasonic	P1.00KCCT-ND	Resistor, 0805 1.0K 1/10W 1%
62	16	R11, R13, R61, R63, R112, R114, R159, R161, R390, R393, R441, R443, R444, R496, R498, R546	1.0K	ERJ-3EKF1001V	Panasonic	P1.00KHCT-ND	Resistor, 0603 1.0K 1/16W 1%
63	11	R223, R229, R261, R273, R588, R621, R622, R668, R727, R741, R745	1.00K	ERA-6YEB102V	Panasonic	P1.0KZCT-ND	Resistor, 0805 1.00K 1/10W 0.1%
64	16	R49, R50, R99, R100, R149, R150, R199, R200, R425, R427, R429, R482, R484, R535, R536, R537	5.62K	RR1220P-5621-B-M-T5	Susumu Co Ltd	RR12P5.62KBCT-ND	Resistor, 0805 5.62K 1/10W 0.1% +-25ppm

ITEM	Count	RefDes	Value	Part Number	MFR	PN Digikey	Description
65	32	R284, R285, R286, R287, R288, R289, R290, R291, R292, R293, R294, R295, R296, R297, R298, R299, R300, R301, R302, R303, R304, R305, R306, R307, R308, R309, R310, R311, R322, R325, R328, R334	56.2K	9C08052A5622FKHFT	Yageo	311-56.2KCCT-ND	Resistor, 0805 56.2K 1/8W 1%
66	1	R762	2.74K	ERJ-6ENF2741V	Panasonic	P2.74KCCT-ND	Resistor, 0805 2.74K 1/10W 1%
67	4	R264, R270, R730, R740	3.01K	RR1220P-3011-B-M-T5	Susumu Co Ltd	RR12P3.01KBCT-ND	Resistor, 0805 3.01K 1/10W 0.1% +-25ppm
	4	R263, R271, R731, R742	4.02K	RR1220P-4021-B-M-T5	Susumu Co Ltd	RR12P4.02KBCT-ND	Resistor, 0805 4.02K 1/10W 0.1% +-25ppm
69	2	R769, R770	4.75K	ERJ-6ENF4751V	Panasonic	P4.75KCCT-ND	Resistor, 0805 4.75K 1/10W 1%
70	32	R552, R557, R558, R565, R566, R570, R571, R576, R592, R595, R598, R601, R604, R607, R610, R614, R636, R640, R642, R647, R649, R653, R654, R658, R682, R691, R692, R702, R704, R713, R715, R724	4.99K	ERJ-6ENF4991V	Panasonic	P4.99KCCT-ND	Resistor, 0805 4.99K 1/10W 1%
71	8	R20, R70, R121, R166, R399, R451, R503, R550	330	9C08052A3300FHKFT	Yageo	311-330CCT-ND	Resistor, 0805 330 1/8W 1%
72	1	R624	499	RR1220P-4990-B-M-T5	Susumu Co Ltd	RR12P499BCT-ND	Resistor, 0805 499 1/10W 0.1% 25ppm
73	150	R8, R9, R10, R14, R15, R16, R19, R22, R24, R31, R35, R38, R39, R40, R41, R45, R46, R59, R60, R64, R65, R66, R69, R72, R79, R80, R83, R86, R87, R88, R90, R91, R94, R95, R110, R111, R115, R116, R117, R120, R123, R131, R134, R137, R138, R139, R140, R142, R145, R146, R157, R162, R163, R164, R172, R181, R188, R191, R196, R197, R226, R267, R387, R388, R389, R394, R395, R396, R400, R403, R410, R412, R415, R416, R417, R419, R422, R423, R424, R438, R439, R445, R446, R447, R448, R449, R453, R455, R464, R467, R468, R471, R472, R473, R474, R476, R479, R480, R493, R494, R499, R500, R501, R505, R508, R509, R517, R520, R523, R524, R525, R526, R528, R531, R532, R545, R547, R549, R563, R574, R578, R583, R590, R591, R596, R597, R602, R603, R608, R609, R613, R615, R619, R623, R637, R641, R643, R646, R648, R652, R655, R659, R660, R667, R670, R734, R365, R366, R372, R767	10	ERJ-3EKF10R0V	Panasonic - ECG	P10.0HCT-ND	Resistor, 0603 10 1/16 W 1%
74	8	R579, R585, R617, R620, R661, R662, R665, R666	OPEN	NOT INSTALLED	N/A	N/A	Resistor, 0603 OPEN
75	16	R51, R101, R151, R201, R430, R431, R485, R538, R581, R584, R616, R618, R663, R664, R725, R726	0	9C06031A0R00JLHFT	Yageo	311-0.0GCT-ND	Resistor, 0603 0 ohm 1/16W 5%
76	39	R347, R373, R374, R375, R376, R377, R553, R554, R560, R564, R568, R569, R573, R575, R593, R594, R599, R600, R605, R606, R611, R612, R638, R639, R644, R645, R650, R651, R656, R657, R683, R688, R694, R700, R705, R710, R717, R722, R763	10.0K	ERJ-6ENF1002V	Panasonic	P10.0KCCT-ND	Resistor, 0805 10.0K 1/10W 1%
77	1	R367	3.32K	9C08052A3321FKHFT	Yageo	311-3.32KCCT-ND	Resistor, 0805 3.32K 1/8W 1%
78	3	R348, R369, R759	150	ERJ-6ENF1500V	Panasonic	P150CCT-ND	Resistor, 0805 150 1/10W 1%
79	24	R17, R18, R47, R48, R67, R96, R97, R98, R118, R147, R148, R198, R397, R426, R428, R450, R481, R483, R502, R533, R534, R548, R586, R587	15	ERJ-3EKF15R0V	Panasonic - ECG	P15.0HCT-ND	Resistor, 0603 15 1/16W 1%
80	8	R12, R62, R113, R160, R391, R392, R442, R497	49.9	ERJ-3EKF49R9V	Panasonic - ECG	P49.9HCT-ND	Resistor, 0603 49.9 1/16W 1%
81	1	R768	49.9K	ERJ-6ENF4992V	Panasonic	P49.9KCCT-ND	Resistor, 0805 49.9K 1/10W 1%
82	1	R194	1.82K	9C08052A1821FKHFT	Yageo	311-1.82KCCT-ND	Resistor, 0805 1.82K 1/10W 1%

ITEM	Count	RefDes	Value	Part Number	MFR	PN Digikey	Description
83	48	R25, R26, R34, R42, R43, R44, R73, R74, R82, R89, R92, R93, R124, R125, R126, R133, R141, R143, R144, R173, R179, R192, R193, R195, R402, R404, R411, R418, R420, R421, R456, R457, R465, R466, R475, R477, R478, R510, R511, R519, R527, R529, R530, R555, R556, R577, R580, R582	500	MPM1001AT	Vishay		Resistor, network SOT-23 series divider 500
84	60	R32, R33, R37, R78, R81, R85, R130, R132, R136, R177, R178, R187, R408, R409, R414, R462, R463, R470, R516, R518, R522, R561, R562, R572, R312, R313, R314, R315, R335, R336, R337, R338, R339, R340, R341, R342, R343, R344, R349, R350, R351, R352, R353, R354, R355, R356, R357, R358, R359, R360, R361, R746, R747, R748, R749, R750, R751, R752, R757, R758	100	ERJ-3EKF1000V	Panasonic - ECG	P100HCT-ND	Resistor, 0603 100 1/16W 1%
85	8	R5, R57, R106, R154, R384, R435, R490, R541	100K	ERJ-6ENF1003V	Panasonic	P100KCCT-ND	Resistor, 0805 100K 1/10W 1%
86	1	R364	301	ERJ-6ENF3010V	Panasonic	P301CCT-ND	Resistor, 0805 301 1/10W 1%
87	16	R7, R28, R29, R58, R77, R109, R128, R158, R386, R406, R440, R461, R495, R514, R544, R559	499	9C08052A4990FKHFT	Yageo	311-499CCT-ND	Resistor, 0805 499 1/8W 1%
88	8	R6, R55, R108, R156, R385, R436, R492, R543	121	ERJ-6ENF1210V	Panasonic	P121CCT-ND	Resistor, 0805 121 1/10W 1%
89	40	R202, R203, R204, R205, R206, R207, R208, R209, R210, R211, R212, R213, R214, R215, R216, R217, R218, R219, R220, R221, R241, R242, R243, R244, R245, R246, R247, R248, R249, R250, R251, R252, R253, R254, R255, R256, R257, R258, R259, R260	20.0K	ERJ-6ENF2002V	Panasonic	P20.0KCCT-ND	Resistor, 0805 20.0K 1/10W 1%
90	1	R625	562	RR1220P-5620-B-M-T5	Susumu Co Ltd	RR12P562BCT-ND	Resistor, 0805 562 1/10W 0.1% +-25ppm
91	59	R1, R52, R102, R103, R222, R225, R228, R230, R262, R266, R268, R272, R320, R324, R327, R333, R380, R432, R486, R539, R589, R669, R681, R684, R685, R686, R687, R689, R690, R693, R695, R696, R697, R698, R699, R701, R703, R706, R707, R708, R709, R711, R712, R714, R716, R718, R719, R720, R721, R723, R728, R729, R733, R736, R739, R743, R744, R765, R766	OPEN	NOT INSTALLED	N/A	N/A	Resistor, 0805 OPEN
92	17	R316, R345, R346, R362, R363, R368, R370, R371, R378, R379, R753, R754, R755, R756, R760, R761, R764	10	742C163 100 J	CTS	742C163100JCT-ND	Resistor, Concave chip Array 8 iso 10 ohm 5% 1/16 W
93	8	R4, R56, R107, R155, R383, R437, R491, R542	249	ERJ-6ENF2490V	Panasonic	P249CCT-ND	Resistor, 0805 249 1/10W 1%
94	8	R21, R68, R119, R167, R398, R452, R504, R551	976	ERJ-6ENF9760V	Panasonic	P976CCT-ND	Resistor, 0805 976 1/10W 1%
95	16	R36, R84, R135, R182, R413, R469, R521, R567, R771, R772, R773, R774, R775, R776, R777, R778	2.0K	ERJ-6ENF2001V	Panasonic	P2.00KCCT-ND	Resistor, 0805 2.0K 1/10W 1%
96	1	R628	SEL0+B0	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
97	1	R233	SEL0+B1	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
98	1	R234	SEL0+B2	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
99	1	R629	SEL0+B3	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
100	1	R170	SEL0+VV0	SEE ITEM 15			SEE ITEM 15
101	1	R183	SEL0+VV1	SEE ITEM 15			SEE ITEM 15
102	1	R185	SEL0+VV2	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
103	1	R673	SEL0-B0	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
104	1	R277	SEL0-B1	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
105	1	R276	SEL0-B2	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
106	1	R674	SEL0-B3	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
107	1	R165	SEL0-VV0	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
108	1	R176	SEL0-VV1	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
109	1	R190	SEL0-VV2	SEE ITEM 15			SEE ITEM 15
110	1	R630	SEL1+B0	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
111	1	R235	SEL1+B1	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206

ITEM	Count	RefDes	Value	Part Number	MFR	PN Digikey	Description
112	1	R236	SEL1+B2	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
113	1	R631	SEL1+B3	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
114	1	R171	SEL1+VV0	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
115	1	R184	SEL1+VV1	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
116	1	R186	SEL1+VV2	SEE ITEM 15			SEE ITEM 15
117	1	R675	SEL1-B0	SEE ITEM 15			SEE ITEM 15
118	1	R279	SEL1-B1	SEE ITEM 15			SEE ITEM 15
119	1	R278	SEL1-B2	SEE ITEM 15			SEE ITEM 15
120	1	R676	SEL1-B3	SEE ITEM 15			SEE ITEM 15
121	1	R168	SEL1-VV0	SEE ITEM 15			SEE ITEM 15
122	1	R180	SEL1-VV1	SEE ITEM 15			SEE ITEM 15
123	1	R189	SEL1-VV2	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
124	1	R632	SEL2+B0	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
125	1	R237	SEL2+B1	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
126	1	R238	SEL2+B2	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
127	1	R633	SEL2+B3	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
128	1	R677	SEL2-B0	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
129	1	R281	SEL2-B1	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
130	1	R280	SEL2-B2	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
131	1	R678	SEL2-B3	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
132	1	R634	SEL3+B0	SEE ITEM 15			SEE ITEM 15
133	1	R239	SEL3+B1	SEE ITEM 15			SEE ITEM 15
134	1	R240	SEL3+B2	SEE ITEM 15			SEE ITEM 15
135	1	R635	SEL3+B3	SEE ITEM 15			SEE ITEM 15
136	1	R679	SEL3-B0	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
137	1	R283	SEL3-B1	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
138	1	R282	SEL3-B2	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
139	1	R680	SEL3-B3	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
140	1	R626	SEL4+B0	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
141	1	R231	SEL4+B1	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
142	1	R232	SEL4+B2	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
143	1	R627	SEL4+B3	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
144	1	R671	SEL4-B0	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
145	1	R275	SEL4-B1	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
146	1	R274	SEL4-B2	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
147	1	R672	SEL4-B3	NOT INSTALLED			Resistor, xx 1% 1/8 Watt 1206
148	1	SW1		EP12SD1ABE	ITT Cannon	CKN4008-ND	Switch, SPDT momentary push button right angle
149	56	TP1, TP2, TP3, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP13, TP14, TP15, TP16, TP17, TP18, TP20, TP21, TP22, TP23, TP24, TP25, TP27, TP28, TP29, TP30, TP41, TP42, TP43, TP44, TP45, TP46, TP47, TP48, TP49, TP51, TP52, TP53, TP54, TP55, TP56, TP58, TP59, TP60, TP61, TP62, TP63, TP65, TP66, TP67, TP68, TP69, TP71, TP72, TP73, TP74		02-1080	E-Mark Inc.		Test point , smt Ball & socket 2mm high
150	1	JP11					Wire, bare 18-20 awg form a loop, ~ 0.5 inches in length
151	0.825	JP1, JP2, JP3, JP4, JP5, JP6, JP7, JP8, JP9, JP10, JP12		4-103185-0	Amp/ Tyco	A26513-ND	Jumper, Header strip 3 X 1 straight, single row (break to size)
152	0.1	JP13, JP14		4-103185-0	Amp/ Tyco	A26513-ND	Jumper, header strip 2 x 1 straight single row (break to size)
153	2	TP33, TP38	GNDA	TP-105-xx-00	Components Corp	ED7564-ND	Test point, black .1 center wire form loop
154	8	TP31, TP32, TP34, TP35, TP36, TP37, TP39, TP40		TP-105-xx-04	Components Corp	ED7564-ND	Test point, yellow .1 center wire form loop
155	8	TP4, TP12, TP19, TP26, TP50, TP57, TP64, TP70	GNDA	TP-108	Components Corp		Test point, SMT low profile lo

APPROVED FOR CONSTRUCTION

Part Number	MFR	Description	Package Markings	COMMENTS
AD7814ARM	Analog Devices	IC, 10 bit digital temp sensor	C AA	
CB3LV-3C-40M0000	CTS	Oscillator, low voltage 40.0 MHz +-50ppm 7x5mm	09-CB3 40M00000	
SMCJ5.0CA-13	Diodes, Inc.	Diode, TVS 1500W SMC 5V Bi-directional	BDE	
TPS75218QPWP	TI	IC, Voltage regulator, 1.8V 2A low dropout, fast transient	PT75218 33T DF8J	
TPS75233QPWP	TI	IC, Voltage regulator, 3.3V 2A low dropout, fast transient	PT75233 39T EL2H	
XC18V02VQ44I	Xilinx	IC, Configuration Prom w/ in sys programming 2M capacity	XC1802VQ44AEN0345	
XCV300E-6PQ240C	Xilinx	IC, FPGA Virtex 1.8V	XCV300E PQ240AMS0101 6C	0101 is the date code
BAS40-04	Philips	Diode, dual schottky sot-23	44?	Last character mfg location
429 002	Littelfuse	Fuse, very fast acting 429 2.0A 1206	FN	
429 005	Littelfuse	Fuse, very fast acting 429 5.0A 1206	FT	
TCJB476M006R0070	AVX	Cap, Tant 3528-21 47uF 6.3V 20% low ESR	476 6	value & voltage