

Analog Processing Board Parts Stress Analysis			32-04010.02																												
Rev 01			5/8/06																												
Rev 02			5/22/06																												
Schematic: 32-03004 Rev 01																															
Capacitors																															
Quantity	Reference	Part Description	Procurement Info	Spec	Derated	App.	Margin	Spec	Derated	App.	Margin	Ambient Temperature (C)																			
12	C102,C202,C302,C402,C502,C602,C106,C206,C306,C406,C506,C606	Ceramic Chip Capacitor, 390p, 1%, 100V, 0.01% FR	CDR31BP391BFUR	100	60	10	500%	125	110	50	120%																				
12	C103,C203,C303,C403,C503,C603,C113,C213,C313,C413,C513,C613	Ceramic Chip Capacitor, 100p, 1%, 100V, 0.01% FR	CDR31BP101BFUR	100	60	10	500%	125	110	50	120%																				
12	C3,C4,C5,C7,C8,C9,C107,C207,C307,C407,C507,C607	Ceramic Chip Capacitor, 10p, 10%, 100V, 0.01% FR	CDR32BP100BKUR	100	60	10	500%	125	110	50	120%																				
54	C1,C2,C6,C16,C17,C18,C19,C20,C21,C22,C23,C24,C25,C26,C27,C28,C29,C30,C104,C105,C108,C109,C111,C112,C204,C205,C208,C209,C212,C221,C304,C305,C308,C309,C311,C312,C404,C405,C408,C409,C411,C412,C504,C505,C508,C509,C511,C512,C604,C605,C608,C609,C611,C612	Ceramic Chip Capacitor, 10n, 10%, 100V	CDR32BX103BKUR	100	60	10	500%	125	110	50	120%																				
6	C110,C210,C310,C410,C510,C610	Ceramic Chip Capacitor, 100n, 10%, 100V	CDR33BX104AKWS	100	60	10	500%	125	110	50	120%																				
15	C10,C11,C12,C101,C101B,C201,C201B,C301,C301B,C401,C401B,C501,C501B,C601,C601B	Ceramic Capacitor, 10%, 1u, 50V	M123A028XB105KC	50	30	10	200%	125	110	50	120%																				
3	C13,C14,C15	Tantalum Capacitor, 10%, 10u, 15V	CWR11HH106KD	15	9	5	80%	125	110	50	120%																				
Connectors																															
Quantity	Reference	Part Description	Procurement Info	Spec	Derated	App.	Margin	Spec	Derated	App.	Margin	Working Voltage (volts)				Contact Current (A)				Ambient Temperature (C)											
1	J1	Connector, 78 pins, High Density, 90deg, Dsub	SDD78M4000G	300	225	225	0%	5	5	1	400%																				
1	J2	Connector, combo, Dsub, Straight PCB	SCBM24W7F3000G	300	225	10	2150%	5	5	0.01	49900%																				
1	J2	Contact Shielded, Female, for 24W7 Dsub	FC4102M	300	225	225	0%	5	5	0.01	49900%																				
6	J3,J4,OUT1,OUT2,OUT3,OUT4,OUT5,OUT6	SMA test connector	SMA	50	37.5	5	650%	1	1	0.01	9900%																				
Crystal Oscillator																															
Quantity	Reference	Part Description	Procurement Info	Spec	Derated	App.	Margin	Spec	Derated	App.	Margin	Voltage (volts)				Junction Temperature (C)				Output Current (ma)				Radiation (Krad)							
0																															
Magnetics / Inductors																															
Quantity	Reference	Part Description	Procurement Info	Spec	Derated	App.	Margin	Spec	Derated	App.	Margin	Working Voltage (volts)				Operating Temperature (C)															
6	L1,L2,L3,L4,L5,L6	Inductor, 10%, 0.01% FR	M39010/03B-471KR	50	25	5	400%	105	85	50	70%																				
Microcircuits -- Analog																															
Quantity	Reference	Part Description	Procurement Info	Spec	Derated	App.	Margin	Spec	Derated	App.	Margin	Voltage (volts)				Power (mW)				Junction Temperature (C)				Output Current (ma)				Radiation (Krad)			
1	U8	AD590 Temperature Transducer, SM	AD590LP/883B	30	24	10	140%	n/a	n/a	n/a	n/a																				
6	U101,U201,U301,U401,U501,U601	RH1814MW, 100MHz, radhard opamp	RH1814MW	12.6	10.08	1%	120%	300	90	40	125%																				
3	U5,U6,U7	RH1498M, 4MHz, radhard opamp	RH1498MW	36	28.8	10	188%	300	225	27	733%																				
6	U103,U203,U303,U403,U503,U603	RH1199W, radhard comparator	RH1199W	36	28.8	10	188%	414	310.5	160	94%																				
6	U102,U202,U302,U402,U502,U602	RH1078, radhard precision opamp	RH1078M	5	4	3.5	14%	430	322.5	5	6350%																				
Microcircuits -- Digital																															
Quantity	Reference	Part Description	Procurement Info	Spec	Derated	App.	Margin	Spec	Derated	App.	Margin	Voltage (volts)				Power (mW)				Junction Temperature (C)				Output Current (ma)				Radiation (Krad)			
1	U1	HCS14KMSR schmitt trigger inverter	5962R9568101VXC	5.5	5.25	5	5%	430	344	5	6780%																				
3	U2,U3,U4	ACS74KMSR flip flop	5962P9679901VXC	5.5	5.25	5	5%	430	344	10	3340%																				
1	U10	ACS03, radhard NAND gate, open drain	5962R9670301VCC	5.5	5.25	5	5%	430	344	5	6780%																				
Microcircuits -- Hybrid																															
Quantity	Reference	Part Description	Procurement Info	Spec	Derated	App.	Margin	Spec	Derated	App.	Margin	Voltage (volts)				Power (mW)				Junction Temperature (C)				Output Current (ma)				Radiation (Krad)			
1	U9	Dosimeter	Dos1	40	32	10	220%	n/a	n/a	n/a	n/a																				
Microcircuits -- Plastic																															
Quantity	Reference	Part Description	Procurement Info	Spec	Derated	App.	Margin	Spec	Derated	App.	Margin	Voltage (volts)				Input Voltage (volts)				Junction Temperature (C)				Output Current (ma)				Radiation (Krad)			
0																															
Resistors																															
Quantity	Reference	Part Description (ohms, 1%)	Procurement Info	Spec	Derated	App.	Margin	Spec	Derated	App.	Margin	Power (watts)				Voltage (volts)				Temperature (C)											
18	R1,R67,R77,R87,R97,R137,R116,216,R316,R416,R516,R616,R127,R227,R327,R427,R527,R627	Resistor, 1K, 1%, 50V, 100mW, Class S	M55342K06B1E00S	0.1	0.06	0.025	140%	50	40	5	700%																				
16	R2,R8,R32,R33,R34,R35,R36,R37,R38,R39,R40,R41,R26,R30,R65,R66	Resistor, 49.9, 1%, 50V, 100mW, Class S	M55342K06B49D9S	0.1	0.06	0.020	200%	50	40	1	3900%																				
6	R112,R212,R312,R412,R512(R3=R512),R612	Resistor, 1.1K 1%, 50V, 100mW, Class S	M55342K06B1E10S	0.1	0.06	0.023	164%	50	40	5	700%																				
13	R10,R11,R14,R16,R31,R47,R48,R113,R213,R313,R413,R513(R4=R513),R613	Resistor, 10K, 1%, 50V, 100mW, Class S	M55342K06B10E0S	0.1	0.06	0.003	2300%	50	40	5	700%																				
10	R5,R7,R9,R42,R114,R214,R314,R414,R514,R614	Resistor, 20K, 1%, 50V, 100mW, Class S	M55342K06B20E0S	0.1	0.06	0.001	4700%	50	40	5	700%																				
7	R6,R124,R224,R324,R424,R524,R624	Resistor, 2K, 1%, 50V, 100mW, Class S	M55342K06B2E00S	0.1	0.06	0.013	380%	50	40	5	700%																				
6	R12,R17,R19,R21,R43,R46	Resistor, 7.68K, 1%, 50V, 100mW, Class S	M55342K06B7E68S	0.1	0.06	0.003	1743%	50	40	5	700%																				
9	R13,R18,R20,R22,R44,R45,R49,R50,R51	Resistor, 512, 1%, 50V, 100mW, Class S	M55342K06B512DS	0.1	0.06	0.049	23%	50	40	5	700%																				
22	R15,R52,R105,R108,R110,R205,R208,R210,R305,R308,R310,R405,R408,R410,R505,R508,R510,R605,R608,R610,R23,R24	Resistor, 10, 1%, 50V, 100mW, Class S	M55342K06B10D0S	0.1	0.06	0.001	5900%	50	40	0.1	39900%																				
1	R25	Resistor, 4.99K, 1%, 50V, 100mW, Class S	M55342K06B4E99S	0.1	0.06	0.005	1100%	50	40	5	700%																				

14	R27,R29,R53,R54,R55,R56,R57,R58,R59,R60,R61,R62,R63,R64	Resistor, 100, 1%, 50V, 100mW, Class S	M55342K06B100DS	0.1	0.06	0.013	380%	50	40	5	700%	125	70	50	40%								
1	R28	Resistor, 499, 1%, 50V, 100mW, Class S	M55342K06B499DS	0.1	0.06	0.050	20%	50	40	5	700%	125	70	50	40%								
6	R101,R201,R301,R401,R501,R601	Resistor, 48.7K, 1%, 50V, 100mW, Class S	M55342K06B48E7S	0.1	0.06	0.001	11588%	50	40	5	700%	125	70	50	40%								
6	R102,R202,R302,R402,R502,R602	Resistor, 1.07K, 1%, 50V, 100mW, Class S	M55342K06B1E07S	0.1	0.06	0.023	157%	50	40	5	700%	125	70	50	40%								
6	R102T,R202T,R302T,R402T,R502T,R602T	Resistor, SEL, 1%, 50V, 100mW, Class S	M55342K06BXXXXS	0.1	0.06	0.020	200%	50	40	5	700%	125	70	50	40%								
6	R103,R203,R303,R403,R503,R603	Resistor, 750, 1%, 50V, 100mW, Class S	M55342K06B750DS	0.1	0.06	0.033	80%	50	40	5	700%	125	70	50	40%								
6	R104,R204,R304,R404,R504,R604	Resistor, 4.53K, 1%, 50V, 100mW, Class S	M55342K06B4E53S	0.1	0.06	0.006	987%	50	40	5	700%	125	70	50	40%								
6	R106,R206,R306,R406,R506,R606	Resistor, 5.11K, 1%, 50V, 100mW, Class S	M55342K06B5E11S	0.1	0.06	0.005	1126%	50	40	5	700%	125	70	50	40%								
12	R107,R207,R307,R407,R507,R607,R117,R217,R317,R417,R517,R617	Resistor, 1.24K, 1%, 50V, 100mW, Class S	M55342K06B1E24S	0.1	0.06	0.020	198%	50	40	5	700%	125	70	50	40%								
6	R109,R209,R309,R409,R509,R609	Resistor, 2.21K, 1%, 50V, 100mW, Class S	M55342K06B2E21S	0.1	0.06	0.011	430%	50	40	5	700%	125	70	50	40%								
6	R111,R211,R311,R411,R511,R611	Resistor, 2.74K, 1%, 50V, 100mW, Class S	M55342K06B2E74S	0.1	0.06	0.009	558%	50	40	5	700%	125	70	50	40%								
6	R115,R215,R315,R415,R515,R615	Resistor, 19.1K, 1%, 50V, 100mW, Class S	M55342K06B19E1S	0.1	0.06	0.001	4484%	50	40	5	700%	125	70	50	40%								
6	R118,R218,R318,R418,R518,R618	Resistor, 15, 1%, 50V, 100mW, Class S	M55342K06B15D0S	0.1	0.06	0.000	15900%	50	40	0.1	39900%	125	70	50	40%								
12	R119,R219,R319,R419,R519,R619,R121,R221,R321,R421,R521,R621	Resistor, 200K, 1%, 50V, 100mW, Class S	M55342K06B200ES	0.1	0.06	0.000	47900%	50	40	5	700%	125	70	50	40%								
6	R120,R220,R320,R420,R520,R620	Resistor, 806, 1%, 50V, 100mW, Class S	M55342K06B806DS	0.1	0.06	0.031	93%	50	40	5	700%	125	70	50	40%								
6	R122,R222,R322,R422,R522,R622	Resistor, 1.62K, 1%, 50V, 100mW, Class S	M55342K06B1E62S	0.1	0.06	0.015	289%	50	40	5	700%	125	70	50	40%								
6	R123,R223,R323,R423,R523,R623	Resistor, 20, 1%, 50V, 100mW, Class S	M55342K06B20D0S	0.1	0.06	0.001	11900%	50	40	0.1	39900%	125	70	50	40%								
6	R125,R225,R325,R425,R525,R625	Resistor, 38.3K, 1%, 50V, 100mW, Class S	M55342K06B3E3S	0.1	0.06	0.001	9092%	50	40	5	700%	125	70	50	40%								
6	R126,R226,R326,R426,R526,R626	Resistor, 3.83K, 1%, 50V, 100mW, Class S	M55342K06B3E83S	0.1	0.06	0.007	819%	50	40	5	700%	125	70	50	40%								
6	R128,R228,R328,R428,R528,R628	Resistor, 127K, 1%, 50V, 100mW, Class S	M55342K06B127ES	0.1	0.06	0.001	5900%	50	40	5	700%	125	70	50	40%								
6	R129,R229,R329,R429,R529,R629	Resistor, 499K, 1%, 50V, 100mW, Class S	M55342K06B499ES	0.1	0.06	0.001	5900%	50	40	5	700%	125	70	50	40%								
6	R130,R230,R330,R430,R530,R630	Resistor, 9.09K, 1%, 50V, 100mW, Class S	M55342K06B9E09S	0.1	0.06	0.003	2084%	50	40	5	700%	125	70	50	40%								
Diodes				Peak Inverse Voltage (volts)				Surge Current (Amps)				Forward Current				Junction Temperature							
Quantity	Reference	Part Description	Procurement Info	Spec	Derated	App.	Margin	Spec	Derated	App.	Margin	Spec	Derated	App.	Margin	Spec	Derated	App.	Margin				
6	D1,D2,D3,D4,D5,D6	1N6642 small signal diode	1N6642JTXV	100	70	5	1300%	2.5	1.25	0.001	124900%	0.3	0.15	0.00	14900%	175	125	60	108%				
Transistors				Power (Watts)				Current (Amps)				Vgs, Vbe (V)				Vds, Vce (V)				Junction Temperature			
Quantity	Reference	Part Description	Procurement Info	Spec	Derated	App.	Margin	Spec	Derated	App.	Margin	Spec	Derated	App.	Margin	Spec	Derated	App.	Margin	Spec	Derated	App.	Margin
1	Q7	2N6989 quad npn bipolar transistor	2N6989JTXV	1.5	0.9	0.1	800%	0.3	0.6	0.02	2900%	6	3.6	0.70	414%	50	37.5	5.00	650%	175	100	60	67%
1	Q8	2N6987 quad npn bipolar transistor	2N6987JTXV																				
6	Q1,Q2,Q3,Q4,Q5,Q6	2N2222 npn bipolar transistor	2N2222JTXV																				
Wire				Current (amps)				Ambient Temperature (C)															
Quantity	Reference	Part Description	Procurement Info	Spec	Derated	App.	Margin	Spec	Derated	App.	Margin												
0																							
END OF DOCUMENT																							