Irradiation test with thermal neutrons at LNL on 18/05/99 and 3-4/06/99
Irradiation flux, SEU cross-section and MTBF estimation

Thermal neutron flux at 6.5MeV deuteron energy = 2,3E+06 n/cm^2/s/μC
Test beam integrated charge (18/05/99)= 0,00469 C
Test beam integrated charge (03-04/06/99)= 0,0194 C

Component	Flux (n/cm^2)	SEU	Φ_{SEU} (cm^2/dev)	MTBF (h/dev)	Total MTBF (h)
LD Regulator type: MICREL 29501-3.3BU year '97	5,5E+10	0	0,00E+00	4,27E+04	28,4423
ASIC TSS type: TOP5 ceramic package	4,5E+10	0	0,00E+00	3,44E+04	34,3574
ASIC MAD#1	4,5E+10	872	1,95E-08	1,97E+01	0,0003
ASIC MAD#2	4,5E+10	251	5,63E-09	6,83E+01	0,0010
μP type: MOTOROLA MC68HC16 year '94	5,5E+10	0	0,00E+00	4,27E+04	170,6536
FLASH type: ATMEL AT29C101A-12PC year '96	5,5E+10	0	0,00E+00	4,27E+04	170,6536
SRAM#1 type:SONY CXK581000AM-70LL year '93	5,5E+10	32	5,78E-10	6,56E+02	2,6254
SRAM#2 type:SONY CXK581000AM-70LL year '93	5,5E+10	0	0,00E+00	4,27E+04	170,6536
EPROM type: ATMEL AT27C512R-15JC	5,5E+10	0	0,00E+00	4,27E+04	170,6536
Optical transceiver type: HONEYWELL	5,5E+10	0	0,00E+00	4,27E+04	170,6536
BTIM type: BTIM1 FR4 substrate and BTIs in plastic package	4,5E+10	0	0,00E+00	3,44E+04	2,7486

MTBF is calculated assuming:
Thermal neutron fluence = 5,0E+02 n/cm^2/s
Confidence level = 50%

Irradiation test with fast neutrons at LNL on 16/06/99
Map of irradiation fluxes

Neutron flux from target at 6.5MeV deuteron energy = 1,60E+10 n/s/μC
Test beam integrated charge = 1,02E-02 C

Component	Surface (cm^2)	Fraction (%)	Fraction/cm^2 (%)	Fluence (n/cm^2/s/μC)	Flux (n/cm^2)
LD Regulator type: MICREL 29501-3.3BU year '97	0,608	0,018	0,0293	4,7E+06	4,8E+10
ASIC TSS type: TOP5 ceramic package	6,760	0,324	0,0480	7,7E+06	7,8E+10
ASIC MAD#1	1,082	0,026	0,0245	3,9E+06	4,0E+10
ASIC MAD#2	1,082	0,042	0,0388	6,2E+06	6,3E+10
μP type: MOTOROLA MC68HC16 year '94	4,326	0,266	0,0614	9,8E+06	1,0E+11
FLASH type: ATMEL AT29C101A-12PC year '96	5,408	0,404	0,0746	1,2E+07	1,2E+11
SRAM#1 type:SONY CXK581000AM-70LL year '93	1,622	0,116	0,0712	1,1E+07	1,2E+11
SRAM#2 type:SONY CXK581000AM-70LL year '93	1,622	0,114	0,0705	1,1E+07	1,2E+11
EPROM type: ATMEL AT27C512R-15JC	1,082	0,081	0,0744	1,2E+07	1,2E+11
Optical transceiver type: HONEYWELL	5,273	0,208	0,0395	6,3E+06	6,4E+10
BTIM type: BTIM1 FR4 substrate and BTIs in plastic package	6,760	0,336	0,0497	7,9E+06	8,1E+10

Component	Flux (n/cm^2)	SEU	SEU Φ (cm^2/dev)	MTBF (h/dev)	Total MTBF (h)
LD Regulator type: MICREL 29501-3.3BU year '97	4,8E+10	0	1,0E-11	3,7E+04	24,561
ASIC TSS type: TOP5 ceramic package	7,8E+10	0	6,4E-12	6,0E+04	60,285
ASIC MAD#1	4,0E+10	72	1,8E-09	2,1E+02	0,003
ASIC MAD#2	6,3E+10	28	4,5E-10	8,6E+02	0,013
μP type: MOTOROLA MC68HC16 year '94	1,0E+11	0	5,0E-12	7,7E+04	308,641
FLASH type: ATMEL AT29C101A-12PC year '96	1,2E+11	0	4,1E-12	9,4E+04	375,180
SRAM#1 type:SONY CXK581000AM-70LL year '93	1,2E+11	9	8,2E-11	4,7E+03	18,846
SRAM#2 type:SONY CXK581000AM-70LL year '93	1,2E+11	0	4,3E-12	8,9E+04	354,514
EPROM type: ATMEL AT27C512R-15JC	1,2E+11	0	4,1E-12	9,4E+04	374,111
Optical transceiver type: HONEYWELL	6,4E+10	0	7,8E-12	5,0E+04	198,429
BTIM type: BTIM1 FR4 substrate and BTIs in plastic package	8,1E+10	0	6,2E-12	6,2E+04	4,994

MTBF is calculated assuming:
Fast neutron fluence = 5,0E+02 n/cm^2/s
Confidence level = 50%