Test Org.*	Device	Function	Technology	Mfr.	Effective SEU LET* Threshold	Device Xsection (cm^2)	Bits Tested	Bit Xsection (cm^2)	Test Date	LUth	LU Xsection (cm^2)	Fac.	Remarks 30-Aug-99
		Voltage Comparator											
	Note: Entries in **RED** indicate data added since the 1997 Compendium.												
ARSP	**AD9696**	**Ultrafast, 200ps prop. delay**	**Bipolar**	**ADI**	**6**	**2.0E-06 - 1.0E-05**			**1997**	**>60**		**UCB**	**Koga, et al, 97IEEE TNS, No. 6, pg. 2325. D/C 9605. No LET_{th} dependence on input voltage delta.**
LMM	**CMP01**		**Bipolar**	**ADI**	**11.1**	**3.8E-04**			**97-98**	**>84**		**BNL**	**Bogorad, et al, 99NSREC Poster Paper PD-1 Preprint. X-section for all 2 µS transients > 0.2 V.**
LMM	**CMP01**		**Bipolar**	**ADI**	**26.2**	**2.2E-04**			**97-98**	**>84**		**BNL**	**Bogorad, et al, 99NSREC Poster Paper PD-1 Preprint. X-section for all 2 µS transients > 1.0 V.**
LMM	**CMP01**		**Bipolar**	**ADI**	**30**	**5.3E-05**			**97-98**	**>84**		**BNL**	**Bogorad, et al, 99NSREC Poster Paper PD-1 Preprint. X-section for all 2 µS transients > 4.0 V.**
CNES	LM111	Single	Bipolar	MOT	~2				1994				Ecoffet et al, 94IEEE Wrkshp Rec., pg 72. Transients > 2.4 V
JPL	LM111	Single	Bipolar	NSC	<7	3.0E-04			Nov-95				LET(th) < 7. Transient "+ or - " swing to rail: 4.0E-01 µsec @ LET=44
JPL	LM111	Single	Bipolar	NSC					Dec-96			TAM	Nichols, et al, 96IEEE TNS, No. 6, pg 2960. Transients @ LET<< 7 swing to rail: 3.0E-04 cm2 for 0.4 µsec
JPL	**LM111**	**Single**	**Bipolar**	**NSC**	**<1.45**				**Apr-96**			**BNL**	**Transient test only.**
ARSP	**LM111**	**Single**	**Bipolar**	**NSC**	**3 to 40**	**3.0E-06 - 1.0E-04**			**1997**			**UCB**	**Koga, et al, 97IEEE TNS, No. 6, pg. 2325.. D/C 9619. Very strong LETth dependence on input voltage delta.**
ARSP	LM111H	Single	Bipolar	NSC	15				Nov-93				Koga et al, 93IEEE TNS, No. 6, pg 1838. D/C 9151.
GSFC	LM119	Dual	Bipolar	NSC					Jul-94				LaBel. D/C 8830.
ARSP	**LM119**	**Dual**	**Bipolar**	**NSC**	**~3**	**~1.5E-04**			**1997**			**UCB**	**Koga, et al, 97IEEE TNS, No. 6, pg. 2325. D/C 9535. No LET_{th} dependence on input voltage delta.**
GSFC	LM139	Quad	Bipolar	NSC	50	2.0E-05			Feb-94				LaBel. Permenent current decrease at LET = 82.
JPL	LM139	Quad	Bipolar	NSC					Aug-95				For LET_{th} = 2, 2.5 µsec rail-to-rail transients; 6.0E-04 cm^2
JPL	LM139	Quad	Bipolar	NSC					Dec-96			BNL TAM	Nichols, et al, 96IEEE TNS, No. 6, pg 2960. Transients @ LET = 2, rail-to-rail; 6.0E-04 cm2 for 2 to 3 µsec.
JPL	LM139	Quad	Bipolar	NSC	2	4.0E-04				>60		BNL	For transients only. FWHM is 8 to 25 V for 0.5 to1.5 µsec.
JPL	**LM139**	**Quad**	**Bipolar**	**NSC**	**1.7**				**Apr-96**			**BNL**	**Transient test only.**
GSFC	**LM139**	**Quad**	**Bipolar**	**NSC**	**<10**				**1997**	**>37**		**BNL**	**O'Bryan, et al, 98IEEE Wrkshp Rec., pg 39.**
ARSP	**LM139**	**Quad**	**Bipolar**	**NSC**	**3 to 40**	**1.0E-04 - 3.0E-04**			**1997**			**UCB**	**Koga, et al, 97IEEE TNS, No. 6, pg. 2325.. D/C 9318. Very strong LETth dependence on input voltage delta.**
LMM	**LM139**	**Quad**	**Bipolar**	**NSC**	**8**	**4.3E-04**			**97-98**	**>84**		**BNL**	**Bogorad, et al, 99NSREC Poster Paper PD-1 Preprint. X-section for all 5µs >0.2V delta V = 300mV**
LMM	**LM139**	**Quad**	**Bipolar**	**NSC**	**8**	**2.7E-04**			**97-98**	**>84**		**BNL**	**Bogorad, et al, 99NSREC Poster Paper PD-1 Preprint. X-section for all 5µs >1V, delta V = 300mV**
LMM	**LM139**	**Quad**	**Bipolar**	**NSC**	**8**	**2.5E-04**			**97-98**	**>84**		**BNL**	**Bogorad, et al, 99NSREC Poster Paper PD-1 Preprint. X-section for all 5µs >4V, delta V = 300mV**
LMM	**LM139**	**Quad**	**Bipolar**	**NSC**	**8**	**1.9E-04**			**97-98**	**>84**		**BNL**	**Bogorad, et al, 99NSREC Poster Paper PD-1 Preprint. X-section for all 5µs >0.2V, delta V = 2V**
LMM	**LM139**	**Quad**	**Bipolar**	**NSC**	**36**	**2.3E-05**			**97-98**	**>84**		**BNL**	**Bogorad, et al, 99NSREC Poster Paper PD-1 Preprint. X-section for all 5µs 1V, delta V = 2V**
JPL	LM139	Quad	Bipolar	PMI					Aug-95				For LET_{th} << 7, 0.3 - 4 µsec rail-to-rail transients; 7.0E-04 cm^2.
JPL	LM139	Quad	Bipolar	PMI					Dec-96			TAM	Nichols, et al, 96IEEE TNS, No. 6, pg 2960. Transients @ LET = 1.4, rail-to-rail; 7.0E-04 cm2 for <4 µsec.

Heavy Ion SEE

Test Org.*	Device	Function	Technology	Mfr.	Effective SEU LET* Threshold	Device Xsection (cm^2)	Bits Tested	Bit Xsection (cm^2)	Test Date	LUth	LU Xsection (cm^2)	Fac.	Remarks 30-Aug-99
JPL	**LM139**	**Quad**	**Bipolar**	**PMI**	**<1.45**				**Apr-96**			**BNL**	**Transient test only.**
GSFC	LM139A	Quad	Bipolar	NSC					Jun-94			BNL	LaBel. D/C 9412.
GSFC	LM193H	Dual	Bipolar	NSC					Jul-94			BNL	LaBel. D/C 29344A.
LMM	**LM193H**	**Dual**	**Bipolar**	**NSC**		**8.40E-03**			**97-98**	**>84**		**BNL**	**Bogorad, et al, 99NSREC Poster Paper PD-1 Preprint. X-section for all 2 µS transients > 0.2 V.**
LMM	**LM193H**	**Dual**	**Bipolar**	**NSC**	**8**	**2.7E-04**			**97-98**	**>84**		**BNL**	**Bogorad, et al, 99NSREC Poster Paper PD-1 Preprint. X-section for all 2 µS transients > 1.0 V.**
LMM	**LM193H**	**Dual**	**Bipolar**	**NSC**	**8**	**2.5E-04**			**97-98**	**>84**		**BNL**	**Bogorad, et al, 99NSREC Poster Paper PD-1 Preprint. X-section for all 2 µS transients > 4.0 V.**
LMM	**LT1018**	**Dual**	**Bipolar**	**LTN**	**3**	**2.4E-04**			**97-98**	**>84**		**BNL**	**Bogorad, et al, 99NSREC Poster Paper PD-1 Preprint. X-section for all 15 µS transients > 0.2 V.**
LMM	**LT1018**	**Dual**	**Bipolar**	**LTN**	**8.8**	**1.5E-04**			**97-98**	**>84**		**BNL**	**Bogorad, et al, 99NSREC Poster Paper PD-1 Preprint. X-section for all 15 µS transients > 1.0 V.**
LMM	**LT1018**	**Dual**	**Bipolar**	**LTN**	**26.2**	**1.1E-04**			**97-98**	**>84**		**BNL**	**Bogorad, et al, 99NSREC Poster Paper PD-1 Preprint. X-section for all 15 µS transients > 4.0 V.**

Legend

Manufacturers: ADI - Analog Devices, Inc; MOT - Motorola Semiconductor; NSC - National Semiconductor; PMI - Precision Monolithics, Inc

Test Organizations

ARSP - Aerospace Corp., El Segundo, CA
CNES - Centre National d'etudes Spatiales, Toulouse, France
GSFC - Goddard Space Flight Center, Greenbelt, MD
JPL - Jet Propulsion Laboratory, Pasadena, CA
LMM - Lockheed Martin Missiles and Space, Newtown, PA

Radiation Test Facilities

BNL - Tandem Van de Graaff, Brookhaven National Laboratories, Long Island, NY
IUCF - Indiana University Cyclotron Facility, Bloomington, IN
TAM - Texas A&M University Cyclotron Institute, College Station, TX
UCB - 88-inch Cyclotron, University of California, Berkeley, CA