

4/16/2014



**RELIABILITY MONITOR REPORT
FOR**

Epson 0.18 μ m Silicon Gate CMOS (S18)

MAXIM INTEGRATED

**160 RIO ROBLES
SAN JOSE, CA 95134**

**This Report was prepared by
MAXIM INTEGRATED Reliability Engineering**

Summary:

The data in the tables that follow was generated as the result of an on-going Process Reliability Monitor. The specific products in this process monitor are:

MAX13253ATB+	MAX14660ETG+	MAX14660EZL+	MAX14660EZL+	MAX14661ETI+
MAX14670ETB+	MAX14681EUB+	MAX14689ETP+	MAX14709ENL+	MAX14777GTP+
MAX14778ETP+	MAX14834ETB+	MAX16935RAU	MAX16935RAU	MAX16935SAU
MAX16970GEE	MAX17491GTA+	MAX17552AUB	MAX17806EUI+	MAX20044UGE
MAX77612AEM	MAX77612AEXJ	MAX77663KEXJ	MAX98091EWN	MAX98357AETE
MAX98357AEW	MAX98357BETE	MAX98357BEW	MAX98358EWL	MAX98730EWJ+

The calculated failure rate for devices using this process is:

FAILURE RATE: MTTF (YRS): 27190 QUANTITY: 2527 FAILS: 5 FITS: 4.2

The parameters used to calculate this failure rate are as follows:

Cf: 60% Ea: 0.7 Tu: 25 °C

The reliability data follows and in this section is the detailed reliability data by stress. The reliability data section includes the latest data available. This report covers data between 4/1/2013 and 3/31/2014 .

Process Information:

Process Description: Epson 0.18µm Silicon Gate CMOS (S18)

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	LOT NO.
HIGH TEMP OP LIFE	1303	MAX13253ATB+	135°C	192 HRS	80	0	EALE0Q002BQ
HIGH TEMP OP LIFE	1303	MAX14660ETG+	135°C	1000 HRS	80	0	EAKW2Q002CQ
HIGH TEMP OP LIFE	1307	MAX14777GTP+	135°C	228 HRS	80	0	EAKG7Q001CQ
HIGH TEMP OP LIFE	1307	MAX14777GTP+	135°C	240 HRS	78	0	EAKG7Q001DQ
HIGH TEMP OP LIFE	1310	MAX14661ETI+	135°C	192 HRS	80	0	EALN9Q002AQ
HIGH TEMP OP LIFE	1310	MAX14778ETP+	135°C	1000 HRS	80	0	EALJ3Q001A
HIGH TEMP OP LIFE	1312	MAX14778ETP+	135°C	1000 HRS	80	0	EALJ3Q003B
HIGH TEMP OP LIFE	1313	MAX14670ETB+T	135°C	192 HRS	78	0	EAMA5Q003FQ
HIGH TEMP OP LIFE	1313	MAX14670ETB+T	135°C	192 HRS	80	0	EAMA5Q003EQ
HIGH TEMP OP LIFE	1316	MAX14778ETP+	135°C	1000 HRS	79	0	EALJ3A004A
HIGH TEMP OP LIFE	1317	MAX98091EWN+T	135°C	192 HRS	48	0	EALZ7Q002DQ
HIGH TEMP OP LIFE	1317	MAX98091EWN+T	135°C	192 HRS	32	0	EALZ7Q002CQ
HIGH TEMP OP LIFE	1317	MAX98091EWN+T	135°C	192 HRS	48	1	EALZ7Q002BQ
HIGH TEMP OP LIFE	1321	MAX14681EUB+	135°C	192 HRS	80	0	EAMH7Q001EQ
HIGH TEMP OP LIFE	1321	MAX14681EUB+	135°C	192 HRS	80	1	EAMH7Q001DQ
HIGH TEMP OP LIFE	1321	MAX98357AEWL+T	135°C	1000 HRS	48	0	EAMU0Q001CQ
HIGH TEMP OP LIFE	1322	MAX14689ETP+	135°C	192 HRS	80	0	EANA9Q002AQ
HIGH TEMP OP LIFE	1322	MAX98357BETE+	135°C	1000 HRS	80	0	EAMU0Q001B#
HIGH TEMP OP LIFE	1334	MAX16970GEEA/V+	135°C	192 HRS	80	0	EANT3Q001EQ
HIGH TEMP OP LIFE	1334	MAX17806EUI+	135°C	1000 HRS	80	0	EAME4A034C

HIGH TEMP OP LIFE	1335	MAX98358EWL+T	135°C	192	HRS	80	0	EANZ7Q002FQ
HIGH TEMP OP LIFE	1335	MAX17806EUI+	135°C	1000	HRS	80	0	EAME4A035D
HIGH TEMP OP LIFE	1336	MAX17806EUI+	135°C	1000	HRS	80	0	EAME4A040E
HIGH TEMP OP LIFE	1340	MAX14834ETB+T	135°C	192	HRS	80	1	EAOV2Q002BQ
HIGH TEMP OP LIFE	1340	MAX17552AUB+	135°C	192	HRS	76	1	EAOK7Q002BQ
HIGH TEMP OP LIFE	1340	MAX14834ETB+T	135°C	240	HRS	80	1	EAOV2Q002AQ
HIGH TEMP OP LIFE	1343	MAX98357AETE+	135°C	192	HRS	80	0	EANZ7Q003AA
HIGH TEMP OP LIFE	1343	MAX98357AETE+	135°C	1000	HRS	80	0	EANZ7Q003AA
HIGH TEMP OP LIFE	1345	MAX17552AUB+	135°C	192	HRS	75	0	EAQK7Q003CQ
HIGH TEMP OP LIFE	1347	MAX16935SAUE/V+G2Z	135°C	192	HRS	80	0	EANK5Q001CQ
HIGH TEMP OP LIFE	1404	MAX98730EWJ+TCGT	135°C	192	HRS	80	0	EAOY8A101A#
HIGH TEMP OP LIFE	N/A	MAX77612AEMJ+	135°C	1000	HRS	45	0	EAFU4A293A#
HIGH TEMP OP LIFE	N/A	MAX98357BEWL+	135°C	192	HRS	80	0	EANZ7Q002C#
HIGH TEMP OP LIFE	N/A	MAX98357BEWL+	135°C	1000	HRS	80	0	EANZ7Q002C#
Total:							5	

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	LOT NO.	
STORAGE LIFE	1305	MAX14660EZL+	150°C	500	HRS	80	0	EALW2Q003BC
STORAGE LIFE	1305	MAX14660EZL+	150°C	1000	HRS	80	0	EAKW2Q003BC
STORAGE LIFE	1310	MAX14778ETP+	150°C	1000	HRS	80	0	EALJ3Q001A
STORAGE LIFE	1312	MAX14778ETP+	150°C	1000	HRS	80	0	EALJ3Q003B
STORAGE LIFE	1315	MAX14660EZL+	150°C	1000	HRS	80	0	EAKW2Q003EA
STORAGE LIFE	1316	MAX14778ETP+	150°C	1000	HRS	80	0	EALJ3A004A
STORAGE LIFE	1316	MAX14660EZL+	150°C	1000	HRS	80	0	EAKW2Q003FA
STORAGE LIFE	1322	MAX98357AETE+	150°C	1000	HRS	80	0	EAMU0Q001C
STORAGE LIFE	1332	MAX16935RAUE/V+G2Z	150°C	1000	HRS	50	0	EANK5Q001B\$
STORAGE LIFE	1334	MAX17806EUI+	150°C	1000	HRS	80	0	EAME4A034C
STORAGE LIFE	1335	MAX17806EUI+	150°C	1000	HRS	80	0	EAME4A035D
STORAGE LIFE	1336	MAX17806EUI+	150°C	1000	HRS	80	0	EAME4A040E
STORAGE LIFE	1336	MAX17806EUI+	150°C	1000	HRS	80	0	EAME4A035C
STORAGE LIFE	1343	MAX98357AETE+	150°C	1000	HRS	80	0	EAMU0Q003B#
STORAGE LIFE	1350	MAX98730EWJ+TCGT	150°C	500	HRS	80	0	EAOY8A050B#
STORAGE LIFE	1403	MAX14709ENL+TCGZ	150°C	500	HRS	80	0	EAES5A393C#
STORAGE LIFE	1404	MAX98730EWJ+TCGT	150°C	500	HRS	80	0	EAOY8A101AB
STORAGE LIFE	N/A	MAX77612AEMJ+	150°C	1000	HRS	77	0	EAFU4A293A#
STORAGE LIFE	N/A	MAX98357BEWL+	150°C	500	HRS	80	0	EANZ7Q002C#
STORAGE LIFE	N/A	MAX98357BEWL+	150°C	1000	HRS	80	0	EANZ7Q002C#
Total:							0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	LOT NO.
TEMP CYCLE, 15' RAMP, 15' DWELL	1305	MAX14660EZL+T	-40C TO +125C	1000 CYS	80	0	EAKW2Q003BC
TEMP CYCLE, 5' RAMP, 10' DWELL	1310	MAX14778ETP+	-65C TO 150C	500 CYS	80	0	EALJ3Q001A
TEMP CYCLE, 5' RAMP, 10' DWELL	1312	MAX14778ETP+	-65C TO 150C	500 CYS	80	0	EALJ3Q003B
TEMP CYCLE, 15' RAMP, 15' DWELL	1315	MAX14660EZL+T	-40C TO +125C	1000 CYS	80	0	EAKW2Q003EA
TEMP CYCLE, 5' RAMP, 10' DWELL	1316	MAX14778ETP+	-65C TO 150C	500 CYS	80	0	EALJ3A004A
TEMP CYCLE, 15' RAMP, 15' DWELL	1316	MAX14660EZL+T	-40C TO +125C	1000 CYS	80	0	EAKW2Q003FA
TEMP CYCLE, 15' RAMP, 15' DWELL	1321	MAX98357AETE+	-40C TO +125C	500 CYS	78	0	EAMU0Q001C#
TEMP CYCLE, 5' RAMP, 10' DWELL	1332	MAX16935RAUE/V+G2Z	-65C TO 150C	1000 CYS	64	0	EANK5Q001B\$
TEMP CYCLE, 5' RAMP, 10' DWELL	1334	MAX17806EUI+	-65C TO 150C	500 CYS	80	0	EAME4A034C
TEMP CYCLE, 5' RAMP, 10' DWELL	1335	MAX17806EUI+	-65C TO 150C	500 CYS	80	0	EAME4A035D
TEMP CYCLE, 5' RAMP, 10' DWELL	1336	MAX17806EUI+	-65C TO 150C	500 CYS	80	0	EAME4A040E
TEMP CYCLE, 5' RAMP, 10' DWELL	1344	MAX77663KEXJ+	-65C TO 150C	1000 CYS	80	0	EAFU4A309Q1
TEMP CYCLE, 5' RAMP, 10' DWELL	1351	MAX20044UGEE/V+GE	-65C TO 150C	500 CYS	80	0	EAQC5Q001AB
TEMP CYCLE, 5' RAMP, 10' DWELL	1351	MAX20044UGEE/V+GE	-65C TO 150C	500 CYS	80	0	EAQC5Q001AC
TEMP CYCLE, 15' RAMP, 15' DWELL	1403	MAX14709ENL+TCGZ	-40C TO +125C	500 CYS	80	0	EAES5A393C#
TEMP CYCLE, 15' RAMP, 15' DWELL	N/A	MAX77612AEMJ+	-40C TO +125C	1000 CYS	77	0	EAFU4A293A#
TEMP CYCLE, 5' RAMP, 10' DWELL	N/A	MAX77612AEMJ+	-65C TO 150C	1000 CYS	77	0	EAFU4A293A#
Total:						0	

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	LOT NO.
BIASED MOISTURE	1312	MAX14778ETP+	130C, 85% R.H.	100 HRS	33	0	EALJ3Q003B
BIASED MOISTURE	1332	MAX16935RAUE/V+G2Z	130C, 85% R.H.	100 HRS	78	0	EANK5Q001B\$
BIASED MOISTURE	1334	MAX17491GTA+T	130C, 85% R.H.	192 HRS	45	0	EAIJ2A012HE
BIASED MOISTURE	1334	MAX17491GTA+T	130C, 85% R.H.	192 HRS	45	0	EAIJ2A012HF

BIASED MOISTURE	1334	MAX17491GTA+T	130C, 85% R.H.	96	HRS	45	0	EAIJ2A012HG
BIASED MOISTURE	1334	MAX17491GTA+T	130C, 85% R.H.	192	HRS	45	0	EAIJ2A012HG
BIASED MOISTURE	1336	MAX17806EUI+	130C, 85% R.H.	100	HRS	79	0	EAME4A040E
BIASED MOISTURE	1402	MAX16935RAUE/V+GE	130C, 85% R.H.	96	HRS	78	0	EANK5Q002BB
Total:							0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	LOT NO.	
MOISTURE SOAK	1305	MAX14660EZL+	85 C/85% R.H.	1000	HRS	45	0	EAKW2Q003BC
MOISTURE SOAK	1315	MAX14660EZL+	85 C/85% R.H.	1000	HRS	45	0	EAKW2Q003EA
MOISTURE SOAK	1316	MAX14660EZL+	85 C/85% R.H.	1000	HRS	45	0	EAKW2Q003FA
MOISTURE SOAK	1321	MAX98357AETE+	85 C/85% R.H.	500	HRS	80	0	EAMU0Q001C
MOISTURE SOAK	1332	MAX16935RAUE/V+G2Z	130C, 85% R.H.	100	HRS	80	0	EANK5Q001B\$
MOISTURE SOAK	1344	MAX77663KEXJ+	85 C/85% R.H.	500	HRS	80	1	EAFU4A309Q1
MOISTURE SOAK	1402	MAX16935RAUE/V+GE	130C, 85% R.H.	96	HRS	80	0	EANK5Q002BB
MOISTURE SOAK	N/A	MAX77612AEXJ+	85 C/85% R.H.	1000	HRS	18	0	EAFU4A126AA
MOISTURE SOAK	N/A	MAX77612AEMJ+	130C, 85% R.H.	1000	HRS	77	0	EAFU4A293A#
Total:							1	

FAILURE RATE: MTTF (YRS): 27190 QUANTITY: 2527 FAILS: 5 FITS: 4.2