

10/23/2014



**RELIABILITY MONITOR REPORT  
FOR**

**Epson 0.18 $\mu$ m Silicon Gate (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:

MAX14661ETI+	MAX14662ETI+	MAX14689ETP+	MAX14691ATP+	MAX15096GWE
MAX16935RAU	MAX16935RAU	MAX16935RAU	MAX16935SAU	MAX16935SAU
MAX16970GEE	MAX16970GEE	MAX16970GEE	MAX16971GEE	MAX17491GTA+
MAX17552AUB	MAX20003ATP	MAX20003ATP	MAX20003ATP	MAX98357AETE
MAX98357AEW	MAX98357BETE	MAX98357BEW	MAX98358EWL	

The calculated failure rate for devices using this process is:

**FAILURE RATE: MTTF (YRS): 56719 QUANTITY: 1663 FAILS: 1 FITS: 2.0**

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 10/1/2013 and 9/30/2014 .

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## Process Information:

Process Description: Epson 0.18µm Silicon Gate (S18)

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### OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	LOT NO.
HIGH TEMP OP LIFE	1310	MAX14661ETI+	135°C	192 HRS	80	0	EALN9Q002AQ
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	1335	MAX98358EWL+T	135°C	192 HRS	80	0	EANZ7Q002FQ
HIGH TEMP OP LIFE	1340	MAX17552AUB+	135°C	192 HRS	76	1	EAOK7Q002BQ
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	1345	MAX17552AUB+	135°C	192 HRS	75	0	EAQK7Q003EQ
HIGH TEMP OP LIFE	1347	MAX16935SAUE/V+G2Z	135°C	192 HRS	80	0	EANK5Q001CQ
HIGH TEMP OP LIFE	1347	MAX16935RAUE/V+	135°C	1000 HRS	80	0	EANK5Q001CE
HIGH TEMP OP LIFE	1352	MAX16970GEEB/V+GE	135°C	500 HRS	80	0	EAPU1Q001E#
HIGH TEMP OP LIFE	1402	MAX16935RAUE/V+GE	135°C	1000 HRS	80	0	EANK5Q002BB
HIGH TEMP OP LIFE	1402	MAX16935RAUE/V+GE	135°C	500 HRS	80	0	EANK5Q002CD
HIGH TEMP OP LIFE	1406	MAX14662ETI+	135°C	192 HRS	80	0	EARH7Q003BQ
HIGH TEMP OP LIFE	1408	MAX15096GWE+	135°C	192 HRS	80	0	EAQG2Q001BQ
HIGH TEMP OP LIFE	1409	MAX16935RAUE/V+GE	135°C	500 HRS	80	0	EANK5Q003CA
HIGH TEMP OP LIFE	1413	MAX20003ATPA/V+GE	135°C	1000 HRS	78	0	EAQR7Q001H#

HIGH TEMP OP LIFE	1419	MAX14691ATP+	135°C	192	HRS	79	0	EARL3Q001IQ
HIGH TEMP OP LIFE	1424	MAX20003ATPA/V+	135°C	1000	HRS	80	0	EATO3Q001D#
HIGH TEMP OP LIFE	N/A	MAX98357BEWL+	135°C	1000	HRS	80	0	EANZQ7002C#
<b>Total:</b>							<b>1</b>	

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### STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	LOT NO.	
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	1343	MAX98357AETE+	150°C	1000 HRS	80	0	EAMU0Q003B#	
STORAGE LIFE	1352	MAX16971GEEA/V+GE	150°C	500 HRS	50	0	EAPU2Q002AH	
STORAGE LIFE	1352	MAX16970GEEB/V+GE	150°C	1000 HRS	80	0	EAPU1Q001E#	
STORAGE LIFE	1402	MAX16935RAUE/V+GE	150°C	1000 HRS	80	0	EANK5Q002CD	
STORAGE LIFE	1411	MAX16971GEEA/V+GE	150°C	1000 HRS	80	0	EAPU2Q001Q1/Q2/Q3	
STORAGE LIFE	1412	MAX20003ATPA/V+T	150°C	1000 HRS	79	0	EAQR7Q001BA	
STORAGE LIFE	1413	MAX20003ATPA/V+GE	150°C	1000 HRS	80	0	EAQR7Q001H#	
STORAGE LIFE	1420	MAX16935RAUE/V+	150°C	500 HRS	80	0	EANK5Q002EA	
STORAGE LIFE	1424	MAX20003ATPA/V+	150°C	1000 HRS	80	0	EATO3Q001D#	
STORAGE LIFE	N/A	MAX98357BEWL+	150°C	1000 HRS	80	0	EANZQ7002C#	
<b>Total:</b>							<b>0</b>	

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### TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	LOT NO.
TEMP CYCLE, 15' RAMP, 15' DWELL	1321	MAX98357AETE+	-40C TO +125C (Condition G)	850 CYS	77	0	EAMU0Q001C#
TEMP CYCLE, 15' RAMP, 15' DWELL	1321	MAX98357AEWE+	-40C TO +125C (Condition G)	850 CYS	80	0	EAMU0Q001C
TEMP CYCLE, 5' RAMP, 10' DWELL	1332	MAX16935RAUE/V+G2Z	-65C TO +150C (Condition C)	1000 CYS	64	0	EANK5Q001B\$
TEMP CYCLE, 5' RAMP, 10' DWELL	1350	MAX16970GEEA/V+GE	-65C TO +150C (Condition C)	1000 CYS	80	0	EAPU1Q001CA
TEMP CYCLE, 5' RAMP, 10' DWELL	1351	MAX16935SAUE/V+GE	-65C TO +150C (Condition C)	500 CYS	80	0	EANK5Q001G#
TEMP CYCLE, 5' RAMP, 10' DWELL	1352	MAX16970GEEB/V+GE	-65C TO +150C (Condition C)	500 CYS	90	0	EAPU1Q001E#
TEMP CYCLE, 5' RAMP, 10' DWELL	1402	MAX16935RAUE/V+GE	-65C TO +150C (Condition C)	1000 CYS	80	0	EANK5Q002BB

TEMP CYCLE, 5' RAMP, 10' DWELL	1402	MAX16935RAUE/V+GE	-65C TO +150C (Condition C)	500	CYS	80	0	EANK5Q002CD
TEMP CYCLE, 5' RAMP, 10' DWELL	1407	MAX16935SAUE/V+GE	-65C TO +150C (Condition C)	500	CYS	80	0	EANK5Q003A#
TEMP CYCLE, 5' RAMP, 10' DWELL	1409	MAX16935RAUE/V+GE	-65C TO +150C (Condition C)	500	CYS	80	0	EANK5Q003CA
TEMP CYCLE, 5' RAMP, 10' DWELL	1411	MAX16971GEEA/V+GE	-65C TO +150C (Condition C)	500	CYS	80	0	EAPU2Q001Q1/Q2/Q 3
TEMP CYCLE, 5' RAMP, 10' DWELL	1411	MAX20003ATPA/V+GE	-65C TO +150C (Condition C)	1000	CYS	80	0	EAQR7Q001Q1
TEMP CYCLE, 5' RAMP, 10' DWELL	1411	MAX20003ATPA/V+GE	-65C TO +150C (Condition C)	1000	CYS	80	0	EAQR7Q001Q2
TEMP CYCLE, 5' RAMP, 10' DWELL	1411	MAX20003ATPA/V+GE	-65C TO +150C (Condition C)	1000	CYS	80	0	EAQR7Q001Q3
TEMP CYCLE, 5' RAMP, 10' DWELL	1412	MAX20003ATPA/V+T	-65C TO +150C (Condition C)	1000	CYS	80	0	EAQR7Q001BA
TEMP CYCLE, 5' RAMP, 10' DWELL	1413	MAX20003ATPA/V+GE	-65C TO +150C (Condition C)	500	CYS	80	0	EAQR7Q001H#
TEMP CYCLE, 5' RAMP, 10' DWELL	1420	MAX16935RAUE/V+	-65C TO +150C (Condition C)	500	CYS	80	0	EANK5Q002EA
TEMP CYCLE, 5' RAMP, 10' DWELL	1424	MAX20003ATPA/V+	-65C TO +150C (Condition C)	1000	CYS	80	0	EATO3Q001D#
<b>Total:</b>							<b>0</b>	

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### TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	LOT NO.	
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.	192	HRS	45	0	EAIJ2A012HG
BIASED MOISTURE	1402	MAX16935RAUE/V+GE	130C, 85% R.H.	96	HRS	78	0	EANK5Q002BB
BIASED MOISTURE	1402	MAX16935RAUE/V+GE	130C, 85% R.H.	96	HRS	78	0	EANK5Q002CD
BIASED MOISTURE	1407	MAX16935SAUE/V+GE	130C, 85% R.H.	96	HRS	80	0	EANK5Q003A#
BIASED MOISTURE	1409	MAX16935RAUE/V+GE	130C, 85% R.H.	96	HRS	78	0	EANK5Q003CA

BIASED MOISTURE	1411	MAX16971GEEA/V+GE	130C, 85% R.H.	100	HRS	80	1	EAPU2Q001Q1/Q2/Q3
BIASED MOISTURE	1412	MAX20003ATPA/V+T	130C, 85% R.H.	200	HRS	80	0	EAQR7Q001BA
BIASED MOISTURE	1413	MAX20003ATPA/V+GE	130C, 85% R.H.	96	HRS	80	0	EAQR7Q001H#
BIASED MOISTURE	1424	MAX20003ATPA/V+	130C, 85% R.H.	200	HRS	80	0	EATO3Q001D#
<b>Total:</b>							<b>1</b>	

**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	LOT NO.	
MOISTURE SOAK	1321	MAX98357AETE+	85 C/85% R.H.	1000	HRS	80	0	EAMU0Q001C#
MOISTURE SOAK	1321	MAX98357AETE+	130C, 85% R.H.	1000	HRS	80	0	EAMU0Q001C
MOISTURE SOAK	1332	MAX16935RAUE/V+G2Z	130C, 85% R.H.	100	HRS	80	0	EANK5Q001B\$
MOISTURE SOAK	1351	MAX16935SAUE/V+GE	130C, 85% R.H.	96	HRS	80	0	EANK5Q001G#
MOISTURE SOAK	1352	MAX16970GEEB/V+GE	130C, 85% R.H.	100	HRS	90	0	EAPU1Q001E#
MOISTURE SOAK	1402	MAX16935RAUE/V+GE	130C, 85% R.H.	96	HRS	80	0	EANK5Q002BB
MOISTURE SOAK	1402	MAX16935RAUE/V+GE	130C, 85% R.H.	96	HRS	80	0	EANK5Q002CD
MOISTURE SOAK	1407	MAX16935SAUE/V+GE	130C, 85% R.H.	96	HRS	80	0	EANK5Q003A#
MOISTURE SOAK	1409	MAX16935RAUE/V+GE	130C, 85% R.H.	96	HRS	80	0	EANK5QOO3CA
MOISTURE SOAK	1411	MAX16971GEEA/V+GE	130C, 85% R.H.	100	HRS	80	0	EAPU2Q001Q1/Q2/Q3
MOISTURE SOAK	1411	MAX20003ATPA/V+GE	130C, 85% R.H.	100	HRS	80	0	EAQR7Q001Q1
MOISTURE SOAK	1411	MAX20003ATPA/V+GE	130C, 85% R.H.	100	HRS	80	0	EAQR7Q001Q2
MOISTURE SOAK	1411	MAX20003ATPA/V+GE	130C, 85% R.H.	100	HRS	80	0	EAQR7Q001Q3
MOISTURE SOAK	1412	MAX20003ATPA/V+T	130C, 85% R.H.	500	HRS	80	0	EAQR7Q001BA
MOISTURE SOAK	1413	MAX20003ATPA/V+GE	130C, 85% R.H.	96	HRS	80	0	EAQR7Q001H#
MOISTURE SOAK	1420	MAX16935RAUE/V+	130C, 85% R.H.	96	HRS	80	0	EANK5Q002EA
MOISTURE SOAK	1424	MAX20003ATPA/V+	130C, 85% R.H.	300	HRS	80	0	EATO3Q001D#
<b>Total:</b>							<b>0</b>	

**FAILURE RATE: MTTF (YRS): 56719      QUANTITY: 1663      FAILS: 1      FITS: 2.0**