

RELIABILITY REPORT

FOR

MAX17526AATP+
MAX17526AATP+T

PLASTIC ENCAPSULATED DEVICES

November 8, 2018

MAXIM INTEGRATED

160 RIO ROBLES
SAN JOSE, CA 95134



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Conclusion

The MAX17526A successfully meets the quality and reliability standards required of all Maxim Integrated products. In addition, Maxim Integrated's continuous reliability monitoring program ensures that all outgoing product will continue to meet Maxim Integrated's quality and reliability standards.

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I. Device Description

A. General

The Olympus series of ICs are the industry's smallest and robust integrated system protection solutions. The MAX17526A adjustable power limiter offers a unique feature to limit power drawn from supplies or delivered to loads, amongst a host of protection features. These protection features include adjustable input overvoltage and undervoltage protection, positive and negative input voltage protection, overcurrent protection, reverse-current protection and overtemperature protection. The device features a built-in low RON (30mΩ typ) NFET, and an integrated gate drive for an optional external NFET. The device highlights a power limit feature that allows programmed reduction in current limit, as an inverse function of an external voltage. Input or output power limit is achieved by limiting the current through the device as a function of input or output voltages. Input undervoltage protection level is adjustable between 5.5V and 24V, and input overvoltage protection level is adjustable between 6V and 40V. The input undervoltage lockout (UVLO) threshold and overvoltage lockout (OVLO) threshold are adjusted using external resistors. The device offers a factory preset internal UVLO and OVLO thresholds at 12.4V (typ) and 36.2V (typ) respectively. The factory preset levels may be invoked by connecting the UVLO and/or the OVLO pins to GND.

II. Manufacturing Information

A. Description/Function:	5.5V-60V, 6A Current-Limiter with OV, UV, Reverse Protection, and Power Limit
B. Process:	S18
C. Device Count	22885
D. Fabrication Location:	Japan
E. Assembly Location:	Taiwan
F. Date of Initial Production:	July 3, 2018

III. Packaging Information

A. Package Type:	TQFN
B. Lead Frame:	Cu194
C. Lead Finish:	Matte Tin
D. Die Attach:	EN4900G
E. Bondwire:	Cu (2.00 mil dia.)
F. Mold Material:	G700LA
G. Assembly Diagram:	05-100848
H. Flammability Rating:	UL-94 (V-0 Rating)
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	Level 1
J. Single Layer Theta Ja:	N/A
K. Single Layer Theta Jc:	N/A
L. Multi Layer Theta Ja:	29 °C/W
M. Multi Layer Theta Jc:	2 °C/W

IV. Die Information

A. Dimensions:	106.2992X139.7637 mils
B. Passivation:	SiO ₂ /Si ₃ N ₄

V. Quality Assurance Information

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|-----------------------------------|--|
| A. Quality Assurance Contacts: | Norbert Gerena (Engineer, Reliability)
Brian Standley (Manager, Reliability)
Bryan Preeshl (SVP of QA) |
| B. Outgoing Inspection Level: | 0.1% for all electrical parameters guaranteed by the Datasheet.
0.1% for all Visual Defects. |
| C. Observed Outgoing Defect Rate: | < 50 ppm |
| D. Sampling Plan: | Mil-Std-105D |

VI. Reliability Evaluation

A. Accelerated Life Test

The results of the 135C biased (static) life test are shown in Table 1. Using these results, the Failure Rate λ is calculated as follows:

$$\lambda = \frac{1}{MTTF} = \frac{1.83}{192 \times 4340 \times 80 \times 2} \text{ (Chi square value for MTTF upper limit)}$$

(where 4340 = Temperature Acceleration factor assuming an activation energy of 0.8eV)

$$\lambda = 13.74 \times 10^{-9}$$

$$\lambda = 13.74 \text{ FITs (60\% confidence level @25°C)}$$

Maxim Integrated performs quarterly life test monitors on its processes. This data is published in the Reliability Report found at <https://www.maximintegrated.com/en/support/qa-reliability/reliability/reliability-monitor-program.html>.

Epson S18 Quarterly Process FIT from Q2FY18

$$\lambda = 0.2 \text{ FITs (60\% confidence level @25°C)}$$

B. E.S.D. and Latch-Up Testing

The MAX17526A has been found to have all pins able to withstand an HBM transient pulse of +/- 2500 V per JEDEC / ESDA JS-001. Latch-Up testing has shown that this device withstands +/- 250 mA current injection and supply overvoltage per JEDEC JESD78.

Table 1
Reliability Evaluation Test Results

MAX17526AATP+

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)	Ta = 135C Biased Time = 192 hrs.	DC Parameters & functionality	80	0	

Note 1: Life Test Data may represent plastic DIP qualification lots.