UM3204H
Rev.01

Reliability Report

FOR

UM3204H

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UNION SEMICONDUCTOR, INC.

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Conclusion

The UM3204H successfully meets the quality and reliability standards required of all Union products.

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I. Device Description

A. General

The UM3204H is quad channel ESD-protected level translator provide the level shifting necessary to allow data transfer in a multi-voltage system. Externally applied voltages, VCCB and VCCA, set the logic levels on either side of the device. A low-voltage logic signal present on the VCCA side of the device appears as a high-voltage logic signal on the VCCB side of the device, and vice-versa. The UM3204H bidirectional level translator utilizes a transmission-gate based design to allow data translation in either direction (VCCA↔VCCB) on any single data line. The UM3204H accepts VCCA from +1.65V to +3.6V and VCCB from +2.3V to +5.5V, making it ideal for data transfer between low-voltage ASICs / PLDs and higher voltage systems.

The UM3204H enters a three-state output mode to reduce supply current when output enable (OE) is low. The UM3204H is designed so that the OE input circuit is supplied by VCCA. ±5kV ESD protection on the VCCB side for greater protection in applications that route signals externally.

The UM3204H is a quad level translator available in CSP12 1.9×1.4 package.

B. Absolute Maximum Ratings

Item	Rating
All Voltages Referenced to GND	
Supply Voltage (V CCA)	-0.5 to +4.5V
Supply Voltage (V CCB)	-0.5 to +6.5V
A Port Voltage (VA)	-0.5 to +4.5V
B Port Voltage (VB)	-0.5 to +6.5V
Lead soldering temperature (T_L)	300°C (10 sec.)
Operating Temperature (T_{OP})	-40 to +85 °C
Storage Temperature (T_{STG})	-65 to +150 °C

II. Manufacturing Information

A. Process: CMOS

B. Wafer Type: UU029

C. Fabrication Location: Tai Wan

D. Assembly Location: P.R.China

III. Packaging Information

A. Package Type: CSP12

B. Lead Frame: N/A

C. Lead Finish: N/A

D. Die Attach: N/A

E. Bond wire: N/A

F. Mold Material: N/A

G. Flammability Rating: Class UL94-V0

H. ESD Level (HBM): ±5KV(B Port); ±2KV(Other Pin)

J. Classification of Moisture Sensitivity
per JEDEC standard JESD22-A113: Level 1

IV. Die Information

A. Dimensions: 1320 x 1820 um^2

B. Passivation: Si_3N_4/SiO_2 (Silicon nitride/ Silicon dioxide)

C. Interconnect: Al/Si/Cu

D. Backside Metallization: N/A

E. Minimum Metal Width: 0.7 um

F. Minimum Metal Spacing: 0.65 um

G. Bondpad Dimensions: 222 x 222 um^2

H. Isolation Dielectric: SiO_2

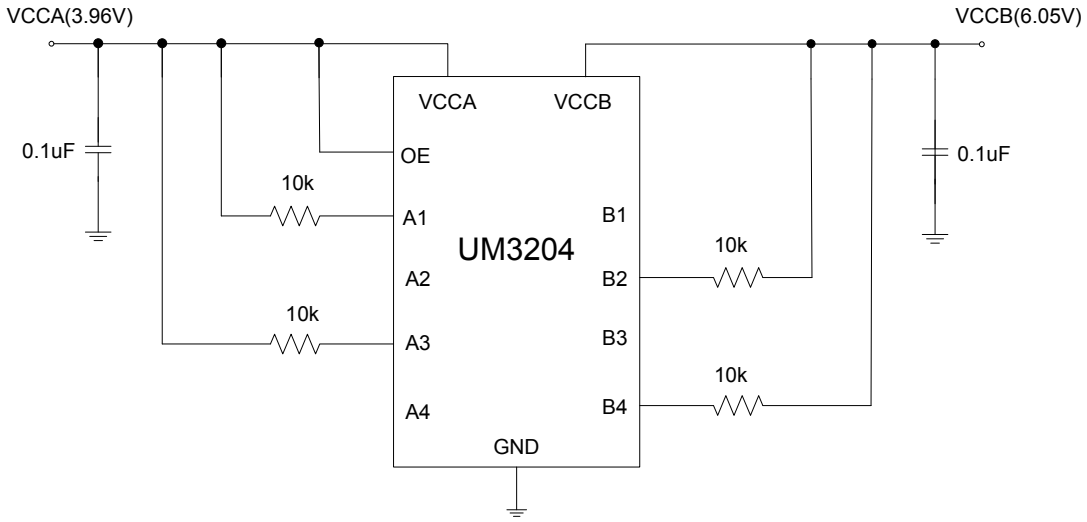
J. Die Separation Method: Wafer Saw

V. Reliability Evaluation

A. Operating Life Test

Test Item	Test Condition	Failure Identification	Package	Sample Size	Number of Failure
High Temp Operating Life JESD22-A108-B	125 ºC,168h,1.1Vcc	Electrical parameters & functionality	CSP12	77	0

Test Circuit

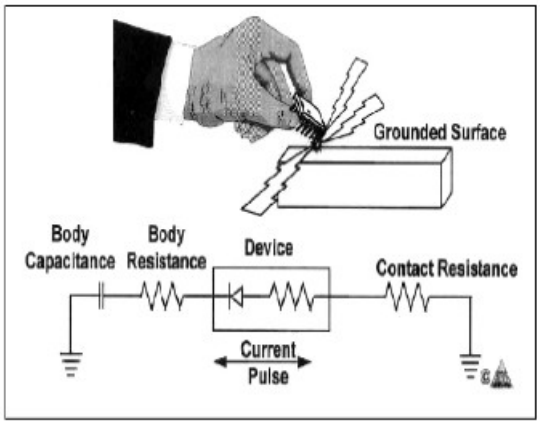


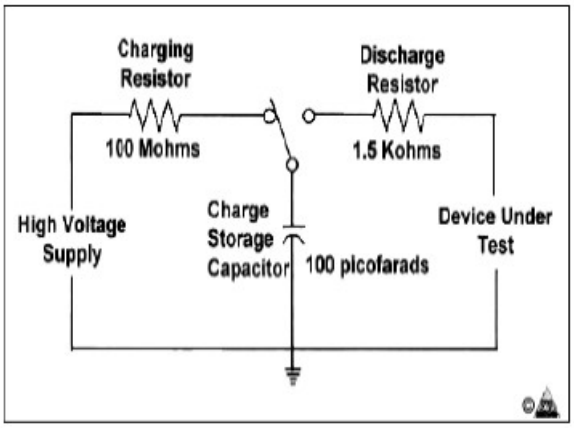
B. Reliability evaluation test

Test Item	Test Condition	Failure Identification	Package	Sample Size	Number of Failure
Precondition JESD22-A113-D	125ºC,24h,85ºC/85%RH, 168h, 260ºC,3 Times	Electrical parameters & functionality & SAT	CSP12	231	0
Temp. Cycling JESD22-A104-C	-65-150ºC,Dewell=15Min, 500 Cycles	Electrical parameters & functionality	CSP12	77	0
Autoclave JESD22-A102-C	121ºC,100%RH,2atm, 96hrs	Electrical parameters & functionality	CSP12	77	0
Unbiased Temp/Humidity JESD22-A118-B	130ºC/85%RH, 96hrs	Electrical parameters & functionality	CSP12	77	0
High Temp Storage JESD22-A103-B	150ºC,1000h	Electrical parameters & functionality	CSP12	77	0

C. ESD and Latch-Up Test

The UM3204H die type has been found to have B Port able to pass ± 5KV, other Pin pass ± 2KV ESD human body mode test. (Refer to following ESD Test Circuit). Latch-Up testing has shown that this device withstands a current of ±200mA.





--The ESD stress is developed with a 100pF capacitor discharging through a 1500Ω resistor to the device.

--The use of 1500Ω resistor implies that the human body mode approximates a current source.