

UM5059  
Rev.01

Reliability Report  
FOR  
**UM5059**

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## Conclusion

The UM5059 successfully meets the quality and reliability standards required of all Union products. In addition, Union's continuous reliability monitoring program ensures that all outgoing product will continue to meet Union's quality and reliability standards.

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### I. Device Description

#### A. General

The UM5059 ESD protection diode protects sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD) and other voltage induced transient events. The UM5059 is available in a FBP-02C package with working voltages of 5 volt. It gives designer the flexibility to protect one unidirectional line in applications where arrays are not practical. Additionally, it may be "sprinkled" around the board in applications where board space is at a premium. It may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4.

#### B. Absolute Maximum Ratings

Peak Pulse Power ( $t_p = 8/20\mu s$ ) ( $P_{pk}$ )	240 Watts
Lead Soldering Temperature ( $T_L$ )	260°C (10 sec.)
Operating Temperature ( $T_A$ )	-55 to +125 °C
Storage Temperature ( $T_{STG}$ )	-55 to +150 °C
Maximum Junction Temperature $T_{JMAX}$	150 °C

### II. Manufacturing Information

- A. Process: Bipolar
- B. Wafer Type: TVS35A
- C. Fabrication Location: P.R.China
- D. Assembly Location: P.R.China

### III. Packaging Information

- A. Package Type: FBP-02C
- B. Lead Frame: Copper
- C. Lead Finish: Solder Plate
- D. Die Attach: N/A
- E. Bondwire: Gold (1.0 mil dia.)
- F. Mold Material: Epoxy with silica filler
- G. Flammability Rating: Class UL94-V0
- I. Classification of Moisture Sensitivity

per JEDEC standard JESD22-A113: Level 1

#### IV. Die Information

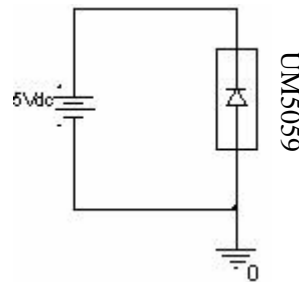
- A. Dimensions: 0.285 x 0.285 mm<sup>2</sup>
- B. Passivation: Si<sub>3</sub>N<sub>4</sub>/SiO<sub>2</sub> (Silicon nitride/ Silicon dioxide)
- C. Interconnect: Al/Si/Cu
- D. Backside Metallization: Au
- E. Minimum Metal Width: Metal 1 .2microns
- F. Minimum Metal Spacing: Metal 1 .2 microns
- G. Bondpad Dimensions: 170x170 mm<sup>2</sup>
- H. Isolation Dielectric: SiO<sub>2</sub>
- I. Die Separation Method: Wafer Saw

#### V. Reliability Evaluation

##### A. Accelerated Life Test

Sample Size	Conditions	Pass	Failure
80	T <sub>j</sub> =125°C,168hr	80	0

#### Test Circuit



##### B. Reliability evaluation test

Test Item	Test Condition	Failure Identification	Package	Sample Size	Number of Failure
Precondition JESD22-A113-D	-65-150° C,Dewell=15Min, 5 Cycle; 125° C,24h; 85° C/85%RH, 168h; 240° C, 3 Times	Electrical parameters & functionality	FBP-02C	88	0
TEMP. Cycle JESD22-A104-B	-65-150° C,Dewell=15Min, 5 Cycle, 100 Cycles	Electrical parameters & functionality	FBP-02C	20	0
Pressure Cooker JESD22-A102-C	121° C, 100%RH, 2atm, 96h	Electrical parameters & functionality	FBP-02C	20	0
Temp. & Humi. JESD22-A101-B	85° C/85%RH, 168h	Electrical parameters & functionality	FBP-02C	20	0

High Temp. Storage JESD22-A103-B	150° C, 168h	Electrical parameters & functionality	FBP-02C	20	0
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### C. ESD

The UM5059 die type has been found to have all pins able to withstand a transient pulse of  $\pm 15\text{KV}$  (Air) and 8 KV (Contact), per IEC 61000-4-2, level 4. (reference following ESD Test Circuit).

Terminal A: Pin 1 connected to terminal A.

Terminal B: Pin 2 connected to terminal B.

