

SM05
Rev.01

Reliability Report
FOR
SM05

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UNION SEMICONDUCTOR, INC.

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Conclusion

The SM05 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 SM05 of TVS diode array is designed to protect sensitive electronics from damage or latch-up due to ESD, for use in applications where board space is at a premium. The dual-junction common-anode design allows the user to protect one bidirectional data line or two unidirectional lines.

The SM05 may be used to meet the immunity requirements of IEC 61000-4-2, level 4.

B. Absolute Maximum Ratings

Peak Pulse Power ($t_p = 8/20\mu s$) (P_{pk})	300 Watts
Thermal Resistance, Junction to Ambient ($R_{\theta JA}$)	556 °C/W
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: SOT23

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

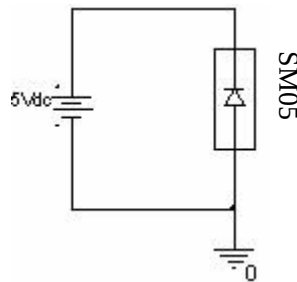
- A. Dimensions: 0.285 x 0.59 mm²
- B. Passivation: Si₃N₄/SiO₂ (Silicon nitride/ Silicon dioxide)
- C. Interconnect: Al/Si/Cu
- D. Backside Metallization: Au
- E. Minimum Metal Width: Metal 1 .2microns
- F. Minimum Metal Spacing: Metal 1 .2 microns
- G. Bondpad Dimensions: 170x170 mm²
- H. Isolation Dielectric: SiO₂
- I. Die Separation Method: Wafer Saw

V. Reliability Evaluation

A. Accelerated Life Test

Sample Size	Conditions	Pass	Failure
80	T _j =125°C,168hr	80	0

Test Circuit



B. Reliability evaluation test

Test Item	Test Condition	Failure Identifi-cation	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	SOT23	100	0
TEMP. Cycle JESD22-A104-B	-65-150° C,Dewell=15Min, 5 Cycle, 100 Cycles	Electrical parameters & functionality	SOT23	25	0
Pressure Cooker JESD22-A102-C	121° C, 100%RH, 2atm, 96h	Electrical parameters & functionality	SOT23	25	0
Temp. & Humi. JESD22-A101-B	85° C/85%RH, 168h	Electrical parameters & functionality	SOT23	25	0
High Temp. Storage	150° C, 168h	Electrical	SOT23	25	0

JESD22-A103-B		parameters & functionality			
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C. ESD

The SM05 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: Each pin individually connected to terminal A except Pin 3 with the other pins floating.

Terminal B: Pin 3 connected to terminal B.

