

UM8511  
Rev.01

Reliability Report  
FOR  
**UM8511**

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UNION SEMICONDUCTOR, INC.

Written by

Fang JJ  
Product Engineer

Approved by

Ivan  
Product Manager

## Conclusion

The UM8511 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 UM8511 is a (L-C) low pass filter array with integrated TVS diodes. It is designed to suppress unwanted EMI signals and provide electrostatic discharge (ESD) protection in portable electronic equipment. This device utilizes solid-state silicon-avalanche technology for superior clamping performance and DC electrical characteristics. They have been optimized for protection of color LCD and camera lines in cellular phones and other portable electronics. The device consists of eight identical circuits comprised of TVS diodes for ESD protection, and a C-L-C network for EMI filtering. A typical inductor value of 17nH and a capacitor value of 12pF are used to achieve 19dB minimum attenuation from 800MHz to 2.7GHz. The TVS diodes provide effective suppression of ESD voltages in excess of  $\pm 15\text{kV}$  (air discharge) and  $\pm 8\text{kV}$  (contact discharge) per IEC 61000-4-2, level 4.

### B. Absolute Maximum Ratings

|                                             |                 |
|---------------------------------------------|-----------------|
| Lead Soldering Temperature ( $T_L$ )        | 260°C (10 sec.) |
| Operating Temperature ( $T_{op}$ )          | -40 to +85 °C   |
| Storage Temperature ( $T_{STG}$ )           | -55 to +150 °C  |
| Maximum Junction Temperature ( $T_{JMAX}$ ) | 125 °C          |

## **II. Manufacturing Information**

- A. Process: Bipolar
- B. Wafer Type: UU033-BM
- C. Fabrication Location: Tai Wan
- D. Assembly Location: P.R.China

## **III. Packaging Information**

- A. Package Type: DFN3.3\*1.3-16L
- B. Lead Frame: COPPER
- C. Lead Finish: NIPDAU
- D. Die Attach: Conductive Epoxy
- E. Bond wire: Gold (0.8 mil)
- F. Mold Material: G770HCD
- G. Flammability Rating: Class UL94-V0
- I. Classification of Moisture Sensitivity  
per JEDEC standard JESD22-A113: Level 1

## **IV. Die Information**

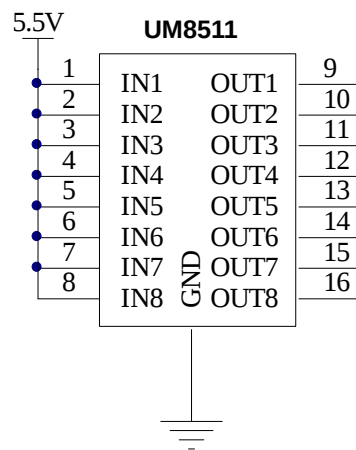
- A. Dimensions:  $1090 \times 420 \text{ } \mu\text{m}^2$  (2 Dies)
- B. Passivation:  $\text{Si}_3\text{N}_4/\text{SiO}_2$  (Silicon nitride/ Silicon dioxide)
- C. Interconnect: Al/Si/Cu
- D. Backside Metallization: Ag
- E. Minimum Metal Width: Metal  $3.0 \text{ } \mu\text{m}$
- F. Minimum Metal Spacing: Metal  $3.0 \text{ } \mu\text{m}$
- G. Bond pad Dimensions:  $70 \times 70 \text{ } \mu\text{m}^2$
- H. Isolation Dielectric:  $\text{SiO}_2$
- I. 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<br>JESD22-A108-B | 125 °C,168h,<br>1.1Vcc | Electrical parameters & functionality | DFN16   | 77          | 0                 |

### Test Circuit



### B. Reliability evaluation test

| Test Item                               | Test Condition                               | Failure Identification                      | Package | Sample Size | Number of Failure |
|-----------------------------------------|----------------------------------------------|---------------------------------------------|---------|-------------|-------------------|
| Precondition<br>JESD22-A113-D           | 125°C,24h,85°C/85%RH,<br>168h, 260°C,3 Times | Electrical parameters & functionality & SAT | DFN16   | 231         | 0                 |
| Temp. Cycling<br>JESD22-A104-C          | -65-150°C,Dewell=15Min,<br>1000 Cycles       | Electrical parameters & functionality       | DFN16   | 77          | 0                 |
| Autoclave<br>JESD22-A102-C              | 121°C,100%RH,2atm,<br>96hrs                  | Electrical parameters & functionality       | DFN16   | 77          | 0                 |
| Unbiased Temp/Humidity<br>JESD22-A118-B | 130°C/85%RH, 96hrs                           | Electrical parameters & functionality       | DFN16   | 77          | 0                 |
| High Temp Storage<br>JESD22-A103-B      | 150°C,1000h                                  | Electrical parameters & functionality       | DFN16   | 77          | 0                 |

### C. ESD

The UM8511 die type has been found to have all pins able to withstand a transient pulse of  $\pm 15\text{KV}$  (Air) and  $8\text{KV}$  (Contact), per IEC 61000-4-2, level 4. (Reference following ESD Test Circuit).

Terminal A: I/O Pin connected to terminal A.

Terminal B: GND connected to terminal B.

