

**Description**

SEE testing of the ISL7119RH was performed at Texas A&M University (TAMU) March 8, 2010. This report provides a brief summary of the results. These tests were carried out to determine SEL/SEB susceptibility and to assess the basic SET characteristics of the part. They were not intended to provide an exhaustive characterization of the part.

**SEE Test Results**

**Single-Event Latch-Up and Single-Event Breakdown**

No latch-up or breakdown was observed up to an LET of 108MeV.cm<sup>2</sup>/mg at +125°C with V<sub>DD</sub> = ±18V.

**Single-Event Transient Performance**

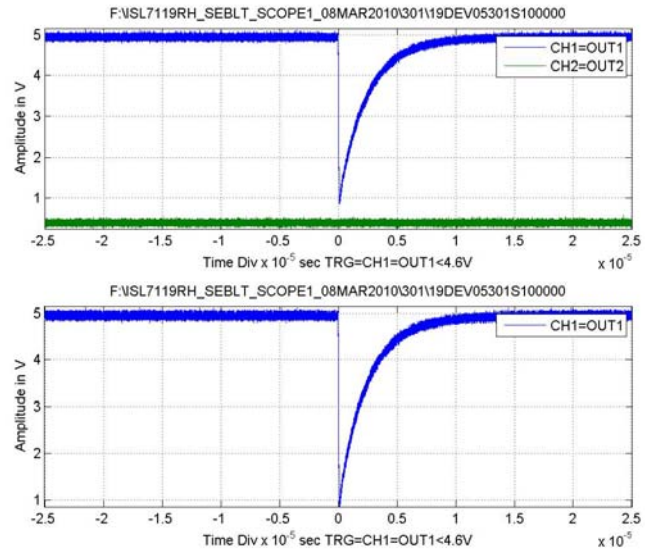
First, SET tests were performed to a fluence of 2 x 10<sup>6</sup> cm<sup>-2</sup> with a comparator input overdrive of 0.1V at +25°C and ±15V supplies. The input overdrive (OD) is defined as the differential input voltage applied to the comparator. The SET rate for a given LET is expected to be a direct function of the input OD. For test purposes, the definition of SET was a rising transient in excess of 0.8V or a falling transient in excess of 4.6V.

- LET of 86.4MeV.cm<sup>2</sup>/mg . . . . . ~420 SET events
- LET of 42.8MeV.cm<sup>2</sup>/mg . . . . . ~215 SET events
- LET of 16.8MeV.cm<sup>2</sup>/mg . . . . . ~120 SET events
- LET of 8.4MeV.cm<sup>2</sup>/mg . . . . . ~15 SET events

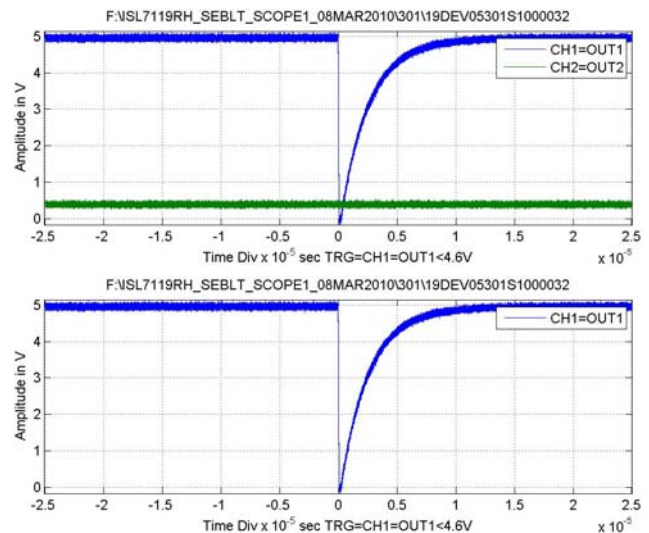
Next, SET tests were performed to a fluence of 2 x 10<sup>6</sup> cm<sup>-2</sup> with a comparator input overdrive (OD) of 0.7V at +25°C and ±15V supplies. The definition of SET again was a rising transient in excess of 0.8V or a falling transient in excess of 4.6V.

- LET of 42.8MeV.cm<sup>2</sup>/mg . . . . . ~20 SET events
- LET of 16.8MeV.cm<sup>2</sup>/mg . . . . . ~0 SET events
- LET of 8.4MeV.cm<sup>2</sup>/mg . . . . . ~0 SET events

Figures 1 through 3 show representative SET waveforms at an LET of 42.84MeV.cm<sup>2</sup>/mg, with an approximate pulse width of 5µs. This SET event vs. LET data was then plotted in a cross section vs. LET curve, see Figure 4.



**FIGURE 1. REPRESENTATIVE SET WAVEFORM, LET OF 42.84MeV.cm<sup>2</sup>/mg**



**FIGURE 2. REPRESENTATIVE SET WAVEFORM, LET OF 42.84MeV.cm<sup>2</sup>/mg**

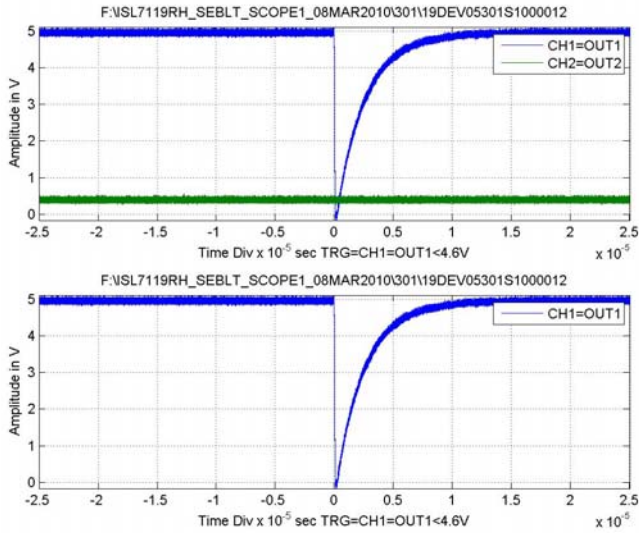


FIGURE 3. REPRESENTATIVE SET WAVEFORM, LET OF 42.84MeV.cm<sup>2</sup>/mg

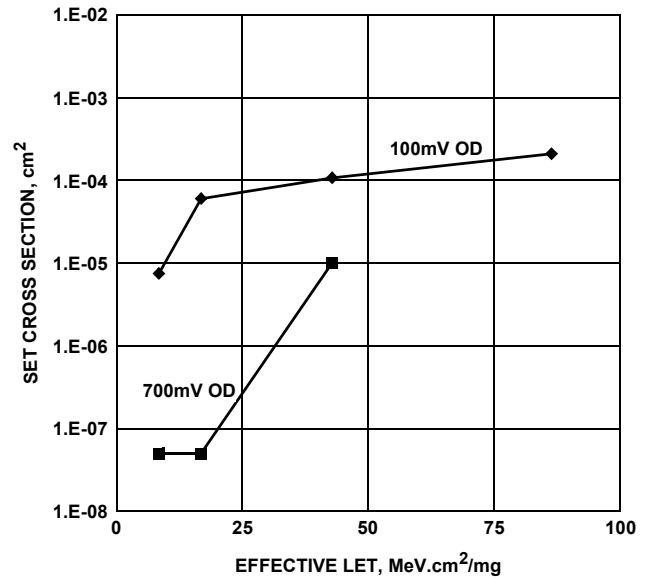


FIGURE 5. SET CROSS SECTION vs EFFECTIVE LET CURVE

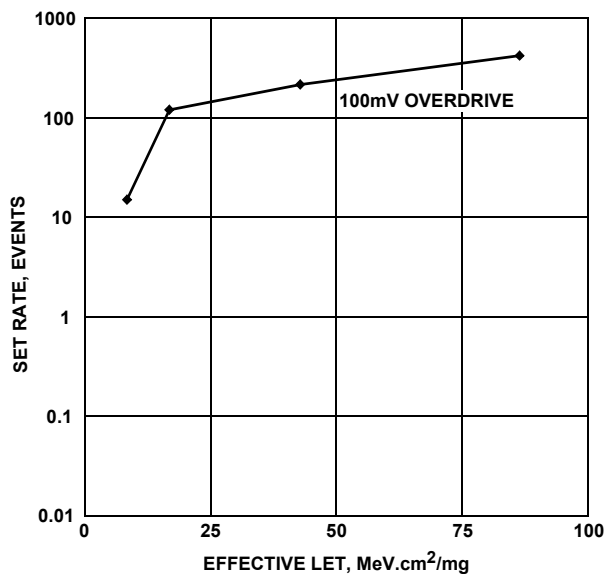


FIGURE 4. SET EVENT vs LET DATA

Figure 5 ISL7119RH SET cross section as a function of LET and input overdrive (OD). The input OD is defined as the differential input voltage of the comparator. The upper curve represents the 100mV OD results, while the lower curve represents the 700mV OD data. The SET rate for a given LET is a direct function of the input OD.

### Summary

The ISL7119RH was found to be free of destructive effects such as single-event latch-up and single-event burnout up to a high LET of 108MeV.cm<sup>2</sup>/mg at worst-case conditions of +125°C ambient temperature and ±18V supplies. This was an expected result as the part uses dielectrically isolated fabrication technology. The part showed single-event transients with the SET rate, a function of the input overdrive as expected.

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1001 Murphy Ranch Road, Milpitas, CA 95035, U.S.A.  
Tel: +1-408-432-8888, Fax: +1-408-434-5351

**Renesas Electronics Canada Limited**  
9251 Yonge Street, Suite 8309 Richmond Hill, Ontario Canada L4C 9T3  
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**Renesas Electronics Europe Limited**  
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K  
Tel: +44-1628-651-700, Fax: +44-1628-651-804

**Renesas Electronics Europe GmbH**  
Arcadiastrasse 10, 40472 Düsseldorf, Germany  
Tel: +49-211-6503-0, Fax: +49-211-6503-1327

**Renesas Electronics (China) Co., Ltd.**  
Room 1709 Quantum Plaza, No.27 ZhichunLu, Haidian District, Beijing, 100191 P. R. China  
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

**Renesas Electronics (Shanghai) Co., Ltd.**  
Unit 301, Tower A, Central Towers, 555 Langao Road, Putuo District, Shanghai, 200333 P. R. China  
Tel: +86-21-2226-0888, Fax: +86-21-2226-0999

**Renesas Electronics Hong Kong Limited**  
Unit 1601-1611, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong  
Tel: +852-2265-6688, Fax: +852-2886-9022

**Renesas Electronics Taiwan Co., Ltd.**  
13F, No. 363, Fu Shing North Road, Taipei 10543, Taiwan  
Tel: +886-2-8175-9600, Fax: +886-2-8175-9670

**Renesas Electronics Singapore Pte. Ltd.**  
80 Bendemeer Road, Unit #06-02 Hyflux Innovation Centre, Singapore 339949  
Tel: +65-6213-0200, Fax: +65-6213-0300

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Unit 1207, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia  
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**Renesas Electronics India Pvt. Ltd.**  
No.777C, 100 Feet Road, HAL 2nd Stage, Indiranagar, Bangalore 560 038, India  
Tel: +91-80-67208700, Fax: +91-80-67208777

**Renesas Electronics Korea Co., Ltd.**  
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Tel: +82-2-558-3737, Fax: +82-2-558-5338