

eFuse trip current and data sheet discrepancy

I recently purchased an eFuse kit from Altronics (K6075), based on the article in the April 2017 issue (www.siliconchip.com.au/Article/10611). My intention is to fit a 2-pole, 6-position switch with appropriate resistors to provide an easily varied current tripping range.

Close inspection of the data sheets for the NIS5112 device reveals a possible discrepancy of the graphical data on page 4 compared to the data in the magazine, in Tables 2 and 3 on page 42 of the April issue.

The graph in the data sheets is a log-log graph and the lowest current shown on the graph is approx 400mA. This shows different resistor values for the lowest current trip values of 315mA, 350mA (Table 2) and 800mA (Table 3).

Have the resistance values for the above trip currents been tested?

The possible source of this discrepancy may be an error in the data sheet, in Fig.2 on page 4. The y-axis labelling for this graph starts at 0A but since it's a logarithmic axis, that's impossible and it should be labelled 0.1A instead. Hence, the lowest trip current shown on this graph should be 400mA, not 300mA.

Finally, to increase the possible range of trip currents I am thinking of placing an on/off switch in the trip resistance line (R2) to IC2, effectively halving the trip current when off. In the second column on page 41, the circuit description notes indicate that when using both ICs, one will trip before the other so the remaining IC will carry the current set by its trip limit resistor for a short period.

So, will there be any difficulty if only one of the two ICs (IC1) is in operation by itself for currents up to 5A? (C. H., via email)

- You are correct that Figure 2 in the NIS5112 data sheet is labelled incorrectly. We reproduced this graph as Fig.5 on page 43 of the April 2017 issue but you may have noticed that we corrected this error. However, we did check that the trip currents on our prototype were approximately correct for the resistor values given in Tables 2 and 3 in the article.

Considering that the trip current thresholds between individual NIS5112 ICs may vary by 56%, it's possible that yours will not trip at exactly the currents specified in those tables. It's recommended that you actually test the trip current for each setting if you need high accuracy.

To switch IC2 out of circuit, it's recommended to use the switch to disconnect its enable input (at pin 3) from the

1 μ F capacitor and S1 and connect it directly to ground instead. This can be easily done using an SPDT switch. We recommend switching IC2 out this way because open-circuiting R2 may cause erratic operation of IC2 since the sensing current cannot flow.

Alternatively, you could switch R2 between its selected value and 1k Ω so that IC2 trips at a very low current, leaving IC1 to carry the full load current.