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New Release

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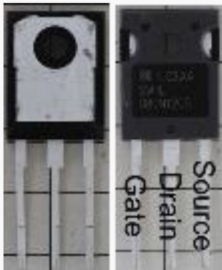
ON SEMICONDUCTOR NVHL080N120SC1 AUTOMOTIVE CERTIFIED 1,200V SiC MOSFET SHORT CIRCUIT ROBUSTNESS ANALYSIS REPORT

February 2020. The short-circuit (SC) capability of power transistors, especially SiC power MOSFETs, is one of the most critical reliability-related specifications. Compared to Si-based IGBTs, the size of the SiC transistor is smaller. This leads to significant reduction in SC endurance time (tsc).



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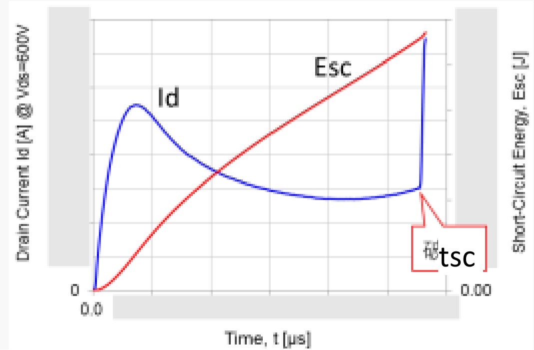

Drain current waveform and short-circuit energy (Esc)

Abstract

This is the first published short-circuit robustness analysis report that examines the correlation between short circuit robustness and the physical structure of the NVHL080N120SC1 device. This device is compliant with the AEC Q101 automotive standard.

The report includes:

- Identification of the mechanisms limiting short-circuit capability, measurements, physical analysis results, and extraction of the critical temperature (Tj(crit)) at the onset of failure.
- Comparison of short-circuit robustness with other makers' 1,200V SiC MOSFETs. Examination of the differences in semiconductor structure, process, and their effect on short circuit robustness.
- Comparison of the electrical characteristics (off-state leakage current and temperature dependence) with other makers, and identification of differences and limitations .

Use value of the evaluation results in this report

- The minimum response time of the short-circuit protection circuit can be estimated.
- The internal device temperature can be estimated by performing electrothermal SPICE simulation using measured short-circuit drain current waveform and endurance time ($t_{sc,\,f}$).

Report price: $6,500

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Table of Contents

	Page
Summary	
Background, purpose and executive summary	3
Physical analysis results	
Device structure and material analysis	5
Table 1. Summary of each parameter	6
Short circuit robustness evaluation	
Evaluation circuit	7
Evaluation conditions	9
Short circuit robustness evaluation results	
Voltage and current waveforms	10
Table 3. Summary of measurement results	17
Discussion for evaluation results	
Peak drain current (Isc,pk) vs. drain voltage (Vds)	19
Short circuit endurance time (tsc) vs. drain voltage (Vds)	20
Short circuit energy (Esc,f) vs drain voltage (Vds)	21
Short circuit endurance time(tsc) vs power dissipation (Pd = Id x Vds)	22
Gate leakage current considerations during SC	23
Estimation of junction temperature (ΔTj) rise	27
Thermal impedance	30
Comparison of transistor structure and electrical characteristics	33
Comparison of Onsemi’s and Wolfspeed’s 1,200V transistors	
Electrical characteristic	35
Drain current at short circuit mode	37
Conclusion	39
Appendix	
References	40