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Long-Term Reliability of SiC MOSFET Gate Threshold Voltage

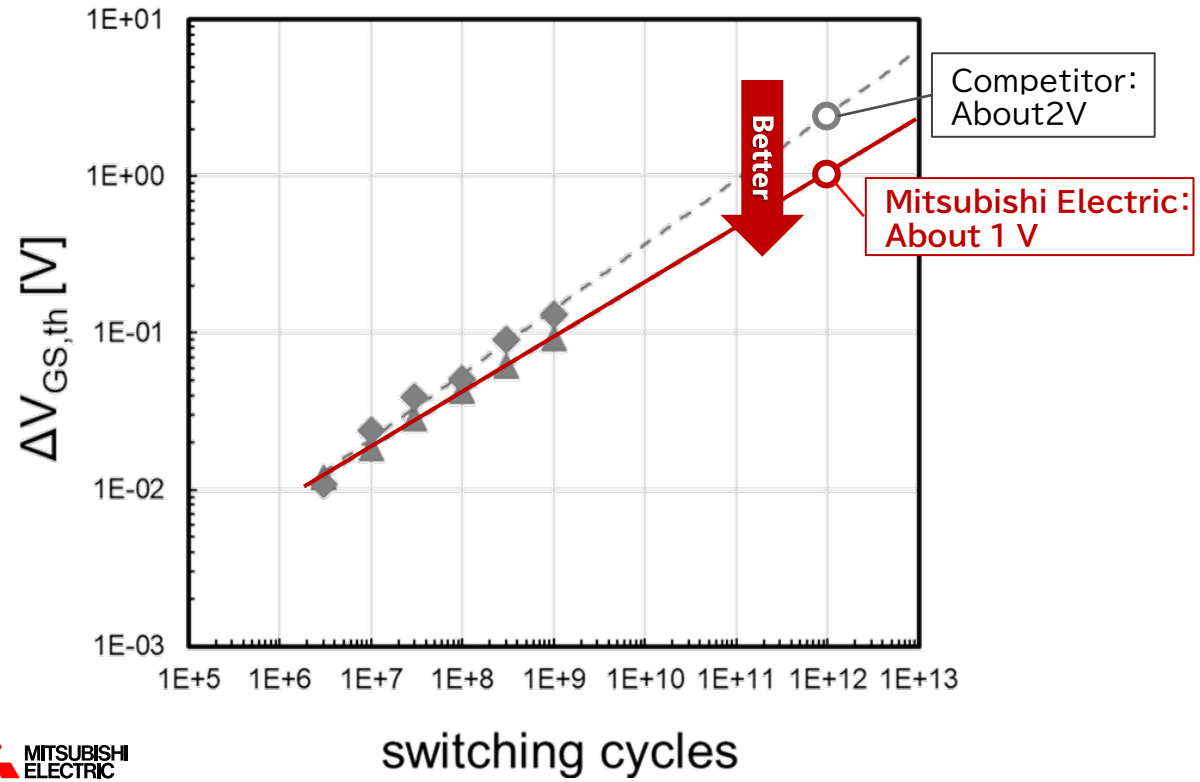
MITSUBISHI ELECTRIC CORPORATION

Long-Term Reliability of SiC MOSFET Gate Threshold Voltage

Our trench SiC MOSFET suppresses gate threshold voltage variation caused by AC stress more effectively than competing trench MOSFETs. This minimizes parameter drift over long-term operation, enabling stable operation and extended service life of power electronic equipment.

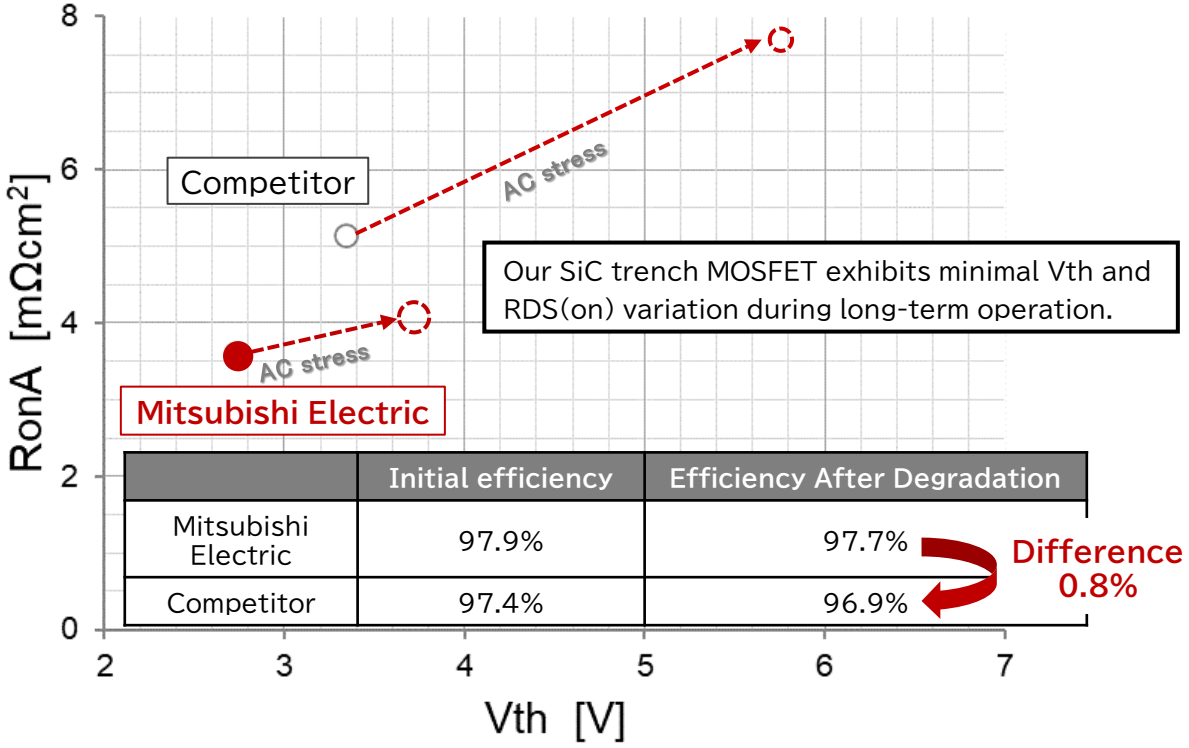
Threshold voltage shift under AC stress

VGS= +20V / -10V, VDS=0V, temperature= 175˚C,
f= 100kHz, switching cycles= $1x10^{12}$ cycles, duty= 50%



Estimated Power Loss Increase Due to Vth Variation

・An increase in Vth leads to higher channel resistance and increased RDS(on).
・Our chip minimizes power conversion efficiency degradation over long-term use.



	Initial efficiency	Efficiency After Degradation
Mitsubishi Electric	97.9%	97.7%
Competitor	97.4%	96.9%

Difference 0.8%

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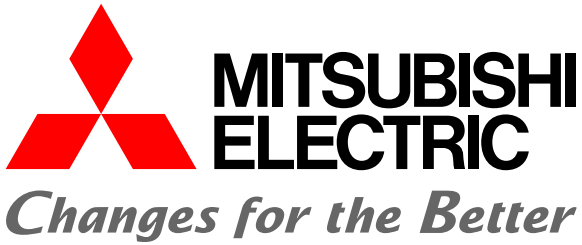
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