

Vishay Siliconix

## Dual N-Channel 2.5-V (G-S) MOSFET

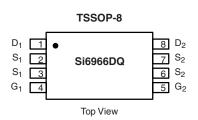
PRODUCT SUMMARY				
V <sub>DS</sub> (V)	<b>R<sub>DS(on)</sub> (</b> Ω)	I <sub>D</sub> (A)		
20	0.030 at $V_{GS}$ = 4.5 V	4.5		
	0.040 at V <sub>GS</sub> = 2.5 V	3.9		

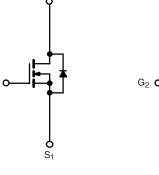
#### FEATURES

- Halogen-free Option Available
- TrenchFET<sup>®</sup> Power MOSFETs: 2.5 V Rated



RoHS\*







 $D_2$ 

Ordering Information:	Si6966DQ-T1
	Si6966DQ-T1-GE3 (Lead (Pb)-free and Halogen-free)

N-Channel MOSFET

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ABSOLUTE MAXIMUM RATINGS T<sub>A</sub> = 25 °C, unless otherwise noted Parameter Symbol 10 s **Steady State** Unit **Drain-Source Voltage** V<sub>DS</sub> 20 ٧ V<sub>GS</sub> Gate-Source Voltage ± 12 T<sub>A</sub> = 25 °C 4.5 4.0 Continuous Drain Current (T<sub>J</sub> = 150 °C)<sup>a</sup>  $I_D$ T<sub>A</sub> = 70 °C 3.6 3.0 А **Pulsed Drain Current**  $I_{DM}$ 30 1.25 0.75  $I_S$ Continuous Source Current (Diode Conduction)<sup>a</sup> T<sub>A</sub> = 25 °C 1.14 0.83  $P_D$ w Maximum Power Dissipation<sup>a</sup> T<sub>A</sub> = 70 °C 0.73 0.53 T<sub>J</sub>, T<sub>stg</sub> Operating Junction and Storage Temperature Range - 55 to 150 °C

THERMAL RESISTANCE RATINGS								
Parameter		Symbol	Typical	Maximum	Unit			
	t ≤ 10 s	- R <sub>thJA</sub> R <sub>thJF</sub>	86	110				
Maximum Junction-to-Ambient <sup>a</sup>	Steady State		124	150	°C/W			
Maximum Junction-to-Foot (Drain)	Steady State		52	65				

Notes:

a. Surface Mounted on FR4 board.

For SPICE model information via the Worldwide Web: http://www.vishay.com/www/product/spice.htm.

\* Pb containing terminations are not RoHS compliant, exemptions may apply.

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Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static							
Gate Threshold Voltage	V <sub>GS(th)</sub>	$V_{DS} = V_{GS}, I_D = 250 \ \mu A$	0.6		1.4	V	
Gate-Body Leakage	I <sub>GSS</sub>	$V_{DS} = 0 V, V_{GS} = \pm 12 V$			± 100	nA	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	$V_{DS} = 20 \text{ V}, \text{ V}_{GS} = 0 \text{ V}$			1	μΑ	
		$V_{DS} = 20 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 55 ^{\circ}\text{C}$			25		
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	$V_{DS} \geq 5$ V, $V_{GS}$ = 4.5 V	30			А	
	Б	$V_{GS} = 4.5 \text{ V}, \text{ I}_{D} = 4.5 \text{ A}$		0.021	0.030	Ω	
Drain-Source On-State Resistance <sup>a</sup>	R <sub>DS(on)</sub>	$V_{GS} = 2.5 \text{ V}, \text{ I}_{D} = 3.9 \text{ A}$		0.030	0.040		
Forward Transconductance <sup>a</sup>	9 <sub>fs</sub>	$V_{DS} = 10 \text{ V}, \text{ I}_{D} = 4.5 \text{ A}$		20		S	
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	$I_{S} = 1.25 \text{ A}, V_{GS} = 0 \text{ V}$		0.65	1.2	V	
Dynamic <sup>b</sup>	· · · · · ·		•				
Total Gate Charge	Qg			11.5	20	nC	
Gate-Source Charge	Q <sub>gs</sub>	$V_{DS}$ = 10 V, $V_{GS}$ = 4.5 V, $I_{D}$ = 4.5 A		1.9			
Gate-Drain Charge	Q <sub>gd</sub>			3.6			
Turn-On Delay Time	t <sub>d(on)</sub>			11	20		
Rise Time	t <sub>r</sub>	$V_{DD}$ = 10 V, $R_L$ = 10 $\Omega$		9	15	ns	
Turn-Off Delay Time	t <sub>d(off)</sub>	$\text{I}_\text{D}\cong \text{1}$ A, $\text{V}_\text{GEN}$ = 10 V, $\text{R}_\text{G}$ = 6 $\Omega$		36	55		
Fall Time	t <sub>f</sub>			11	20		
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 1.25 A, dl/dt = 100 A/μs		30	60		

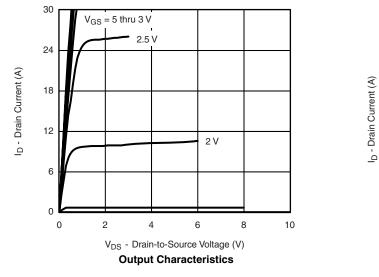
Notes:

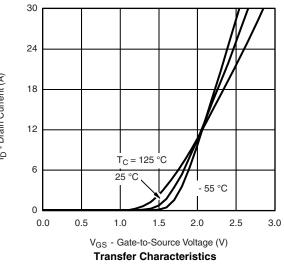
a. Pulse test; pulse width  $\leq$  300 µs, duty cycle  $\leq$  2 %.

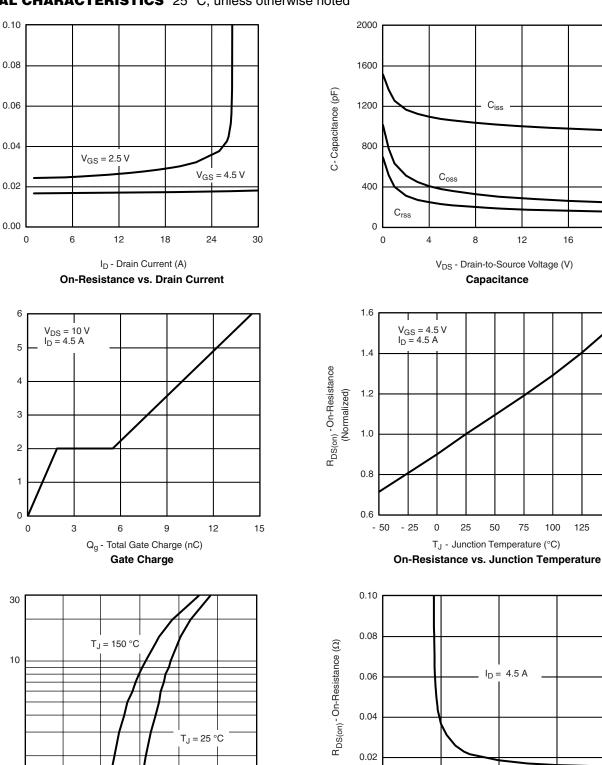
b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

### TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted







0.00

0

2

4

V<sub>GS</sub> - Gate-to-Source Voltage (V)

On-Resistance vs. Gate-to-Source Voltage

Si6966DQ

20

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### TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

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R  $_{DS(on)}$  - On-Resistance ( $\Omega$ )

V<sub>GS</sub> - Gate-to-Source Voltage (V)

Is- Source Current (A)

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1 0.0

0.2

0.4

0.6

0.8

V<sub>SD</sub> - Source-to-Drain Voltage (V)

Source-Drain Diode Forward Voltage

1.0

1.2

1.4

8

6

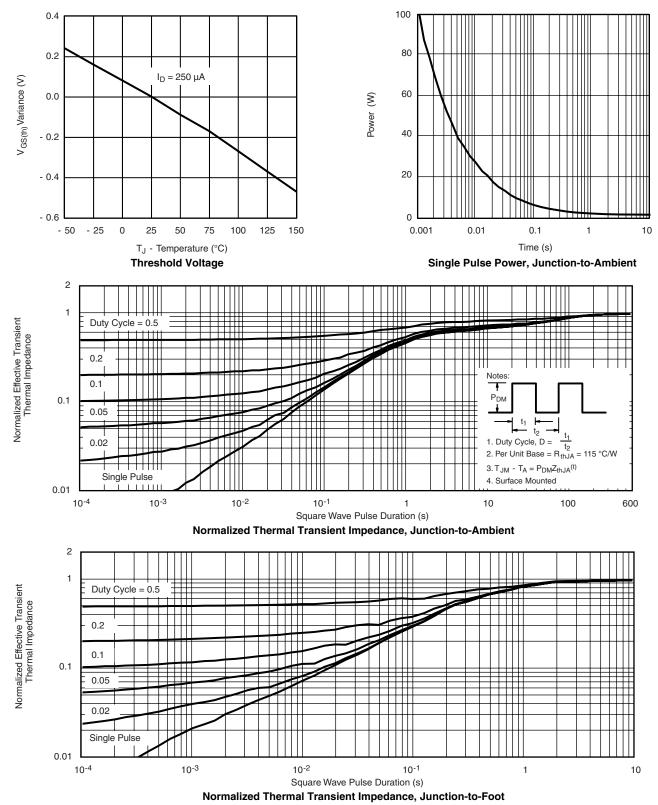
125

150

# Si6966DQ

### Vishay Siliconix

### TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see http://www.vishay.com/ppg?71808.



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