

## Dual N-Channel 30-V (D-S) MOSFET

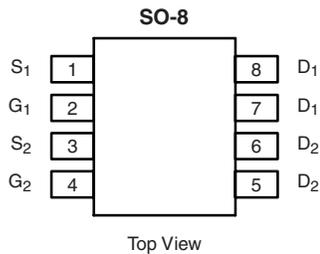
PRODUCT SUMMARY		
$V_{DS}$ (V)	$R_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
30	0.025 at $V_{GS} = 10$ V	$\pm 6.9$
	0.035 at $V_{GS} = 4.5$ V	$\pm 5.8$

### FEATURES

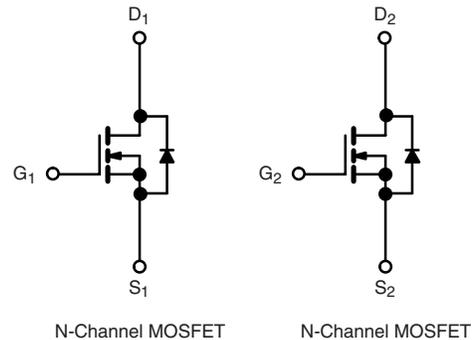
- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET<sup>®</sup> Power MOSFETs
- 100 %  $R_g$  Tested
- Compliant to RoHS Directive 2002/95/EC



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
Available



**Ordering Information:** Si4920DY-T1-E3 (Lead (Pb)-free)  
Si4920DY-T1-GE3 (Lead (Pb)-free and Halogen-free)



ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted				
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	$V_{DS}$	30	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$		
Continuous Drain Current ( $T_J = 150$ °C) <sup>a</sup>	$I_D$	$T_A = 25$ °C	$\pm 6.9$	A
		$T_A = 70$ °C	$\pm 5.5$	
Pulsed Drain Current (10 $\mu$ s Pulse Width)	$I_{DM}$	$\pm 40$		
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	1.7		
Maximum Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25$ °C	2	W
		$T_A = 70$ °C	1.3	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	- 55 to 150	°C	

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Limit	Unit
Maximum Junction-to-Ambient <sup>a</sup>	$R_{thJA}$	62.5	°C/W

Notes:

a. Surface Mounted on FR4 board,  $t \leq 10$  s.

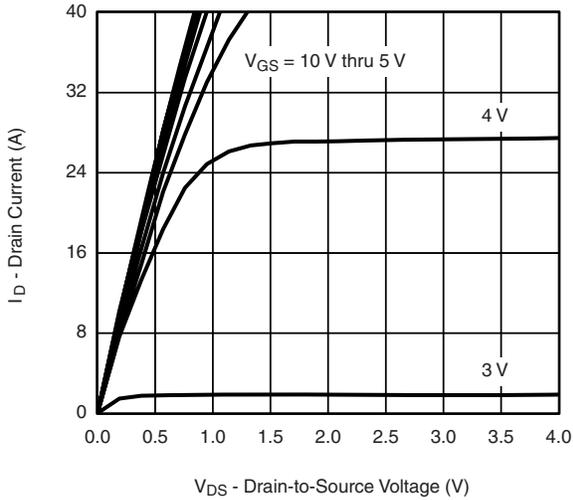
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$			1	$\mu\text{A}$
		$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			25	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$	20			A
Drain-Source On-State Resistance <sup>a</sup>	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 6.9\text{ A}$		0.020	0.025	$\Omega$
		$V_{GS} = 4.5\text{ V}, I_D = 5.8\text{ A}$		0.026	0.035	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = 15\text{ V}, I_D = 6.9\text{ A}$		25		S
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	$I_S = 1.7\text{ A}, V_{GS} = 0\text{ V}$			1.2	V
<b>Dynamic<sup>b</sup></b>						
Gate Charge	$Q_g$	$V_{DS} = 15\text{ V}, V_{GS} = 5\text{ V}, I_D = 6.9\text{ A}$		15	23	nC
Total Gate Charge	$Q_{gt}$	$V_{DS} = 15\text{ V}, V_{GS} = 10\text{ V}, I_D = 6.9\text{ A}$		30	50	
Gate-Source Charge	$Q_{gs}$			7.5		
Gate-Drain Charge	$Q_{gd}$			3.5		
Gate Resistance	$R_g$	$f = 1\text{ MHz}$		2	3	$\Omega$
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15\text{ V}, R_L = 15\text{ }\Omega$ $I_D \cong 1\text{ A}, V_{GEN} = 10\text{ V}, R_g = 6\text{ }\Omega$		12	20	ns
Rise Time	$t_r$			10	20	
Turn-Off Delay Time	$t_{d(off)}$			60	90	
Fall Time	$t_f$			15	30	
Source-Drain Reverse Recovery Time	$t_{rr}$	$I_F = 1.7\text{ A}, dI/dt = 100\text{ A}/\mu\text{s}$		50	90	

## Notes:

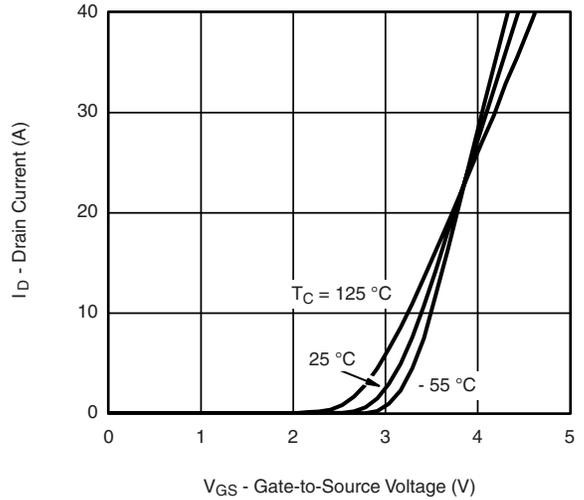
- a. Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .  
b. Guaranteed by design, not subject to production testing.

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.

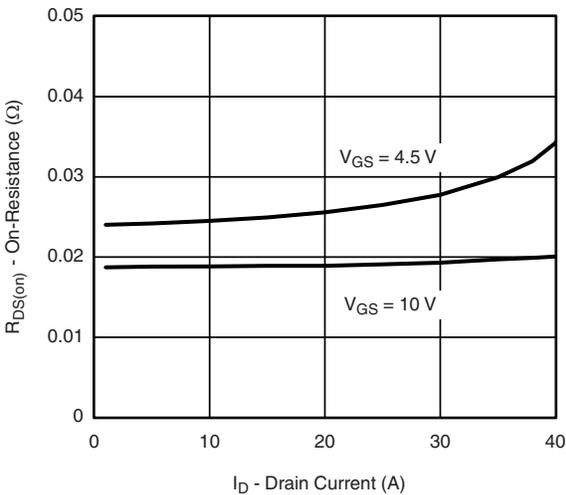
## TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



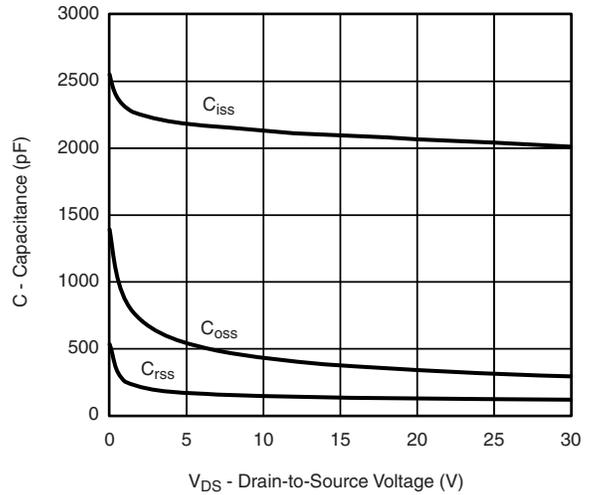
$V_{DS}$  - Drain-to-Source Voltage (V)  
**Output Characteristics**



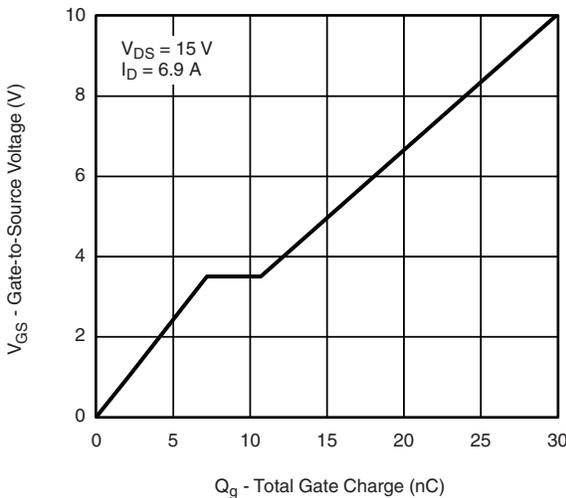
$V_{GS}$  - Gate-to-Source Voltage (V)  
**Transfer Characteristics**



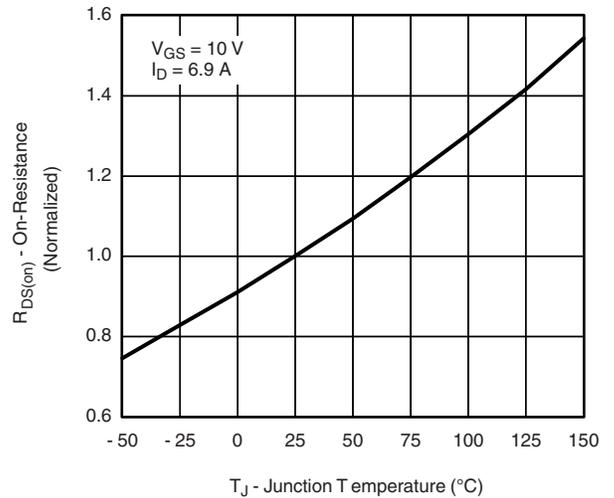
$I_D$  - Drain Current (A)  
**On-Resistance vs. Drain Current**



$V_{DS}$  - Drain-to-Source Voltage (V)  
**Capacitance**

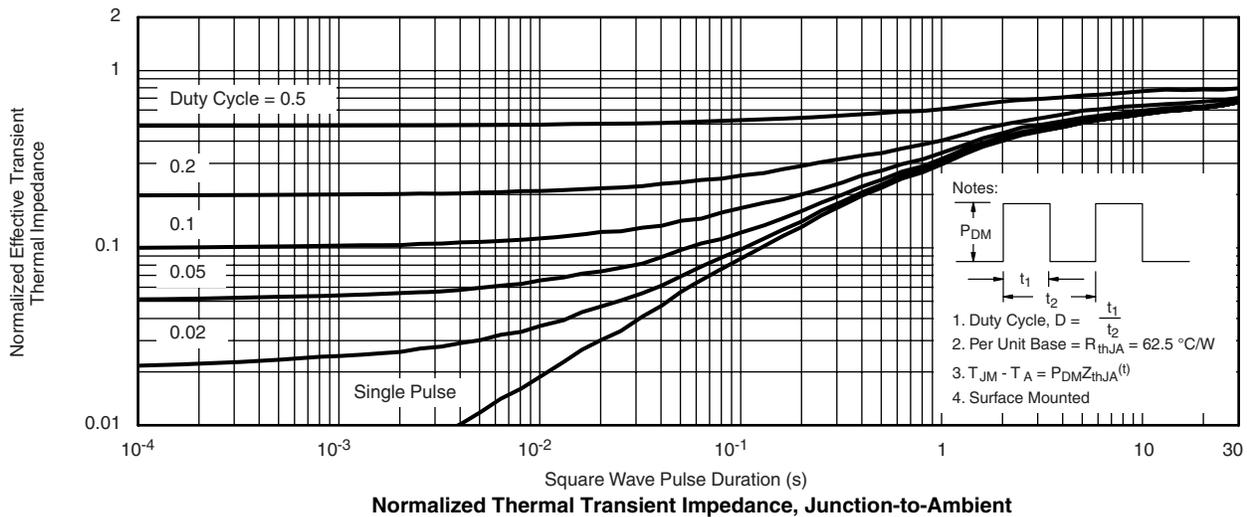
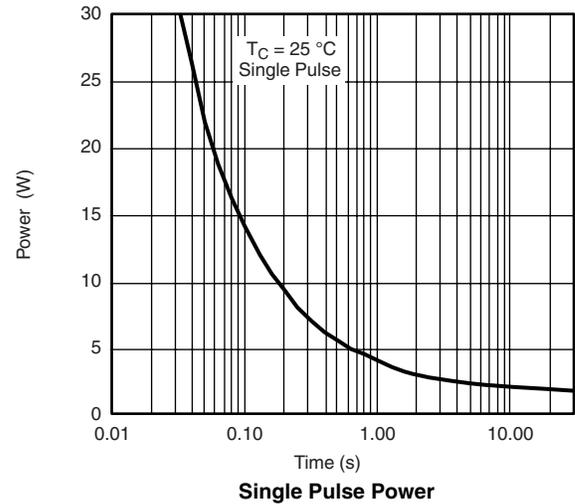
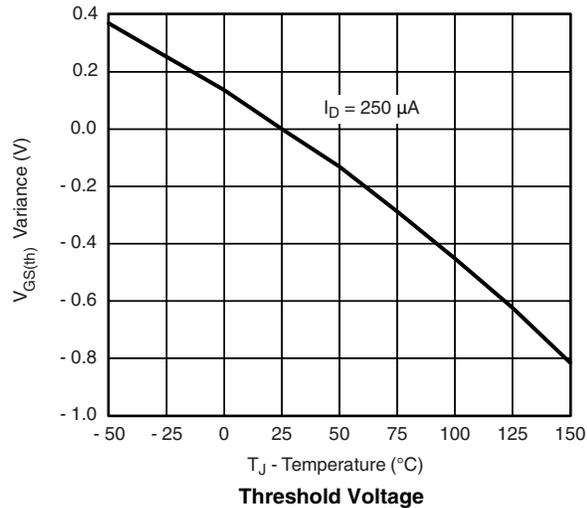
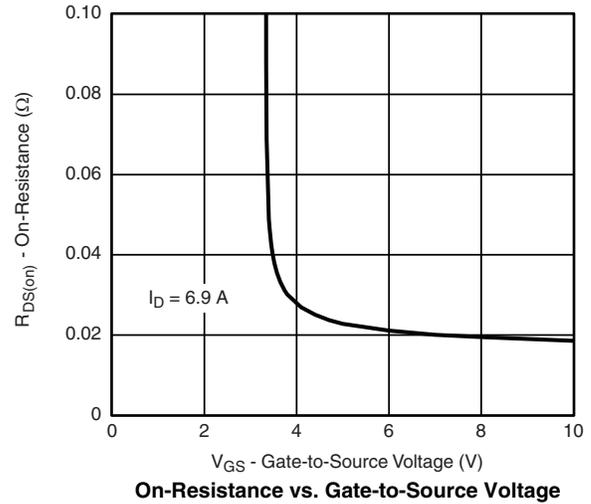
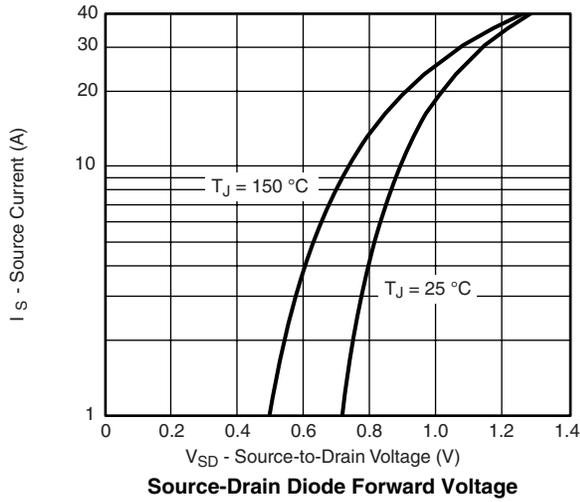


$Q_g$  - Total Gate Charge (nC)  
**Gate Charge**



$T_J$  - Junction Temperature ( $^{\circ}\text{C}$ )  
**On-Resistance vs. Junction Temperature**

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



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