

N-Channel Reduced Q_{gd} , Fast Switching WFET[®]

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.0032 at $V_{GS} = 10$ V	25
	0.0036 at $V_{GS} = 4.5$ V	22

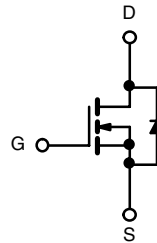
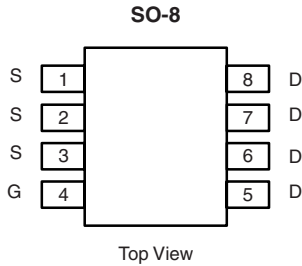
FEATURES

- Extremely Low Q_{gd} WFET Technology for Switching Losses Improvement
- TrenchFET[®] Gen II Power MOSFET
- 100 % R_g Tested



APPLICATIONS

- Low-Side DC/DC Conversion
- Notebook, Server, VRM Module
- Fixed Telecom



Ordering Information: Si4368DY-T1-E3 (Lead (Pb)-free)

ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted					
Parameter	Symbol	10 sec	Steady State	Unit	
Drain-Source Voltage	V_{DS}	30		V	
Gate-Source Voltage	V_{GS}	± 12			
Continuous Drain Current ($T_J = 150$ °C) ^a	I_D	$T_A = 25$ °C	25	17	A
		$T_A = 70$ °C	20	13	
Pulsed Drain Current (10 μ s Pulse Width)	I_{DM}	70			
Continuous Source Current (Diode Conduction) ^a	I_S	2.9	1.3		
Avalanch Current	I_{AS}	50		W	
Maximum Power Dissipation ^a	P_D	$T_A = 25$ °C	3.5		
		$T_A = 70$ °C	2.2	1	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150		°C	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^a	R_{thJA}	$t \leq 10$ sec	29	35	°C/W
		Steady State	67	80	
Maximum Junction-to-Foot (Drain)	R_{thJF}	13	16		

Notes:

a. Surface Mounted on 1" x 1" FR4 Board.

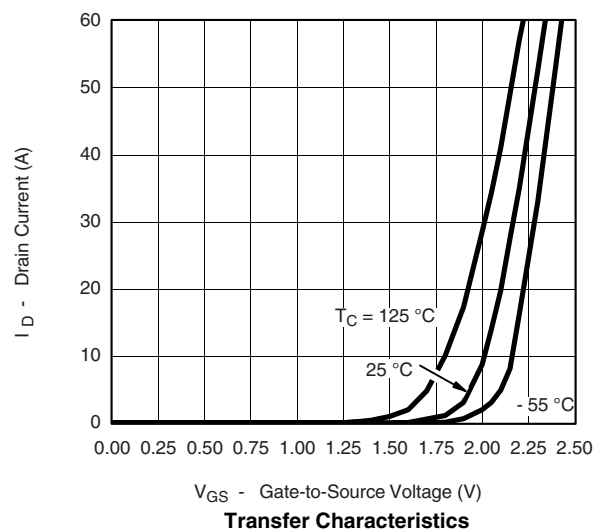
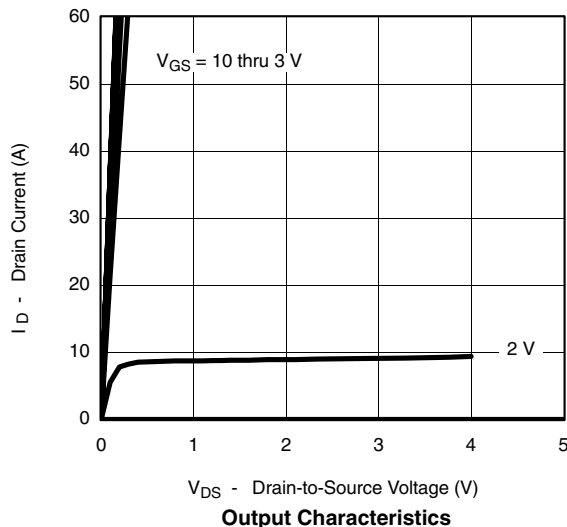
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	0.6		1.8	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 12\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30\text{ V}$, $V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 30\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 55\text{ }^\circ\text{C}$			5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}$, $V_{GS} = 10\text{ V}$	30			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 25\text{ A}$		0.0026	0.0032	Ω
		$V_{GS} = 4.5\text{ V}$, $I_D = 22\text{ A}$		0.0029	0.0036	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\text{ V}$, $I_D = 25\text{ A}$		150		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 2.9\text{ A}$, $V_{GS} = 0\text{ V}$		0.66	1.1	V
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = 15\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1\text{ MHz}$		8340		μF
Output Capacitance	C_{oss}			850		
Reverse Transfer Capacitance	C_{rss}			355		
Total Gate Charge	Q_g	$V_{DS} = 15\text{ V}$, $V_{GS} = 4.5\text{ V}$, $I_D = 20\text{ A}$		53	80	nC
Gate-Source Charge	Q_{gs}			17.5		
Gate-Drain Charge	Q_{gd}			6.5		
Gate Resistance	R_g	$f = 1\text{ MHz}$	0.8	1.2	1.8	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15\text{ V}$, $R_L = 15\text{ }\Omega$ $I_D \cong 1\text{ A}$, $V_{GEN} = 10\text{ V}$, $R_g = 6\text{ }\Omega$		25	38	ns
Rise Time	t_r			20	30	
Turn-Off Delay Time	$t_{d(off)}$			172	260	
Fall Time	t_f			41	62	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 2.9\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$		42	60	

Notes:

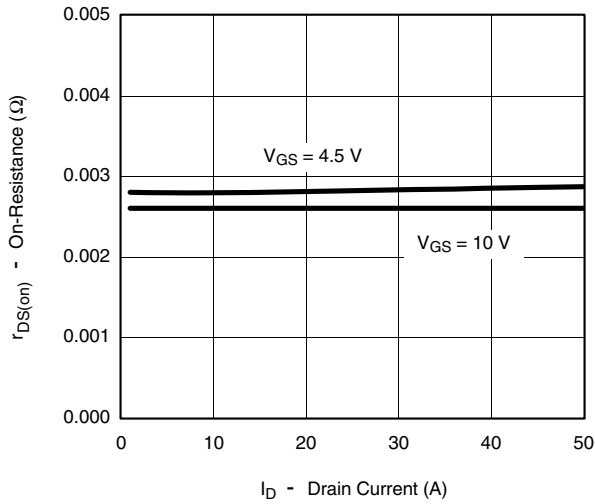
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- b. Guaranteed by design, not subject to production testing.

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.

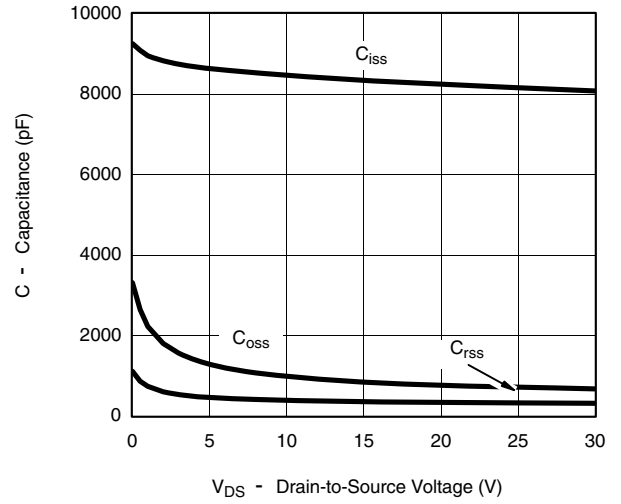
TYPICAL CHARACTERISTICS $25\text{ }^\circ\text{C}$, unless otherwise noted



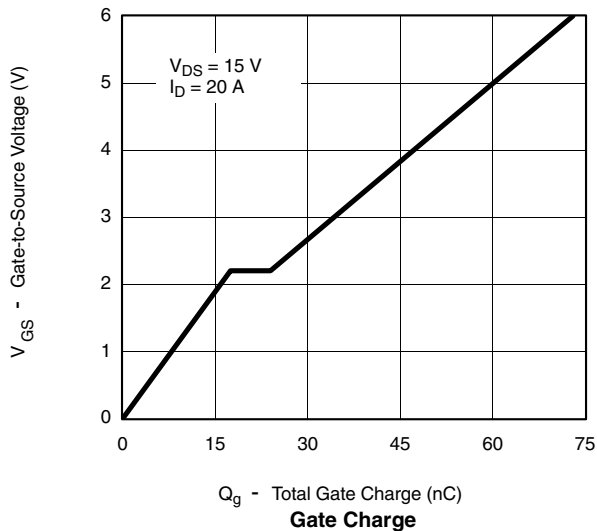
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



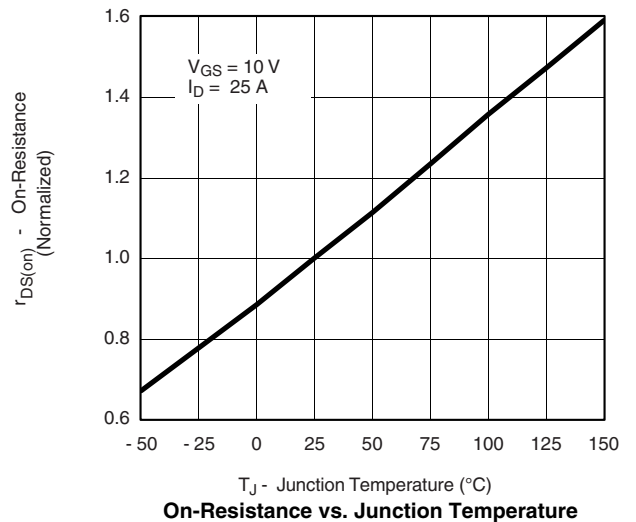
On-Resistance vs. Drain Current



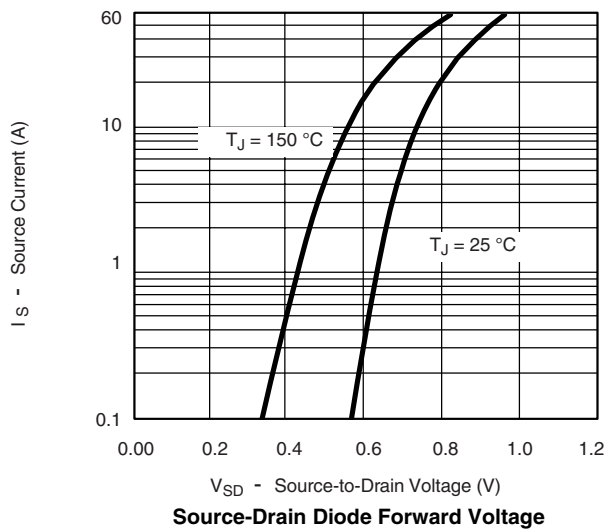
Capacitance



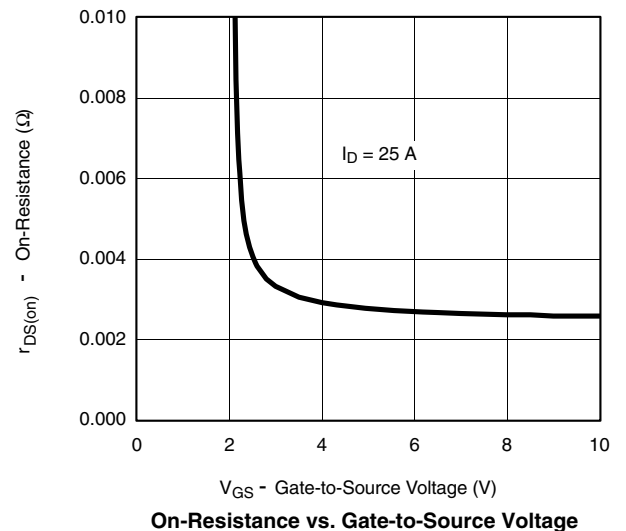
Gate Charge



On-Resistance vs. Junction Temperature

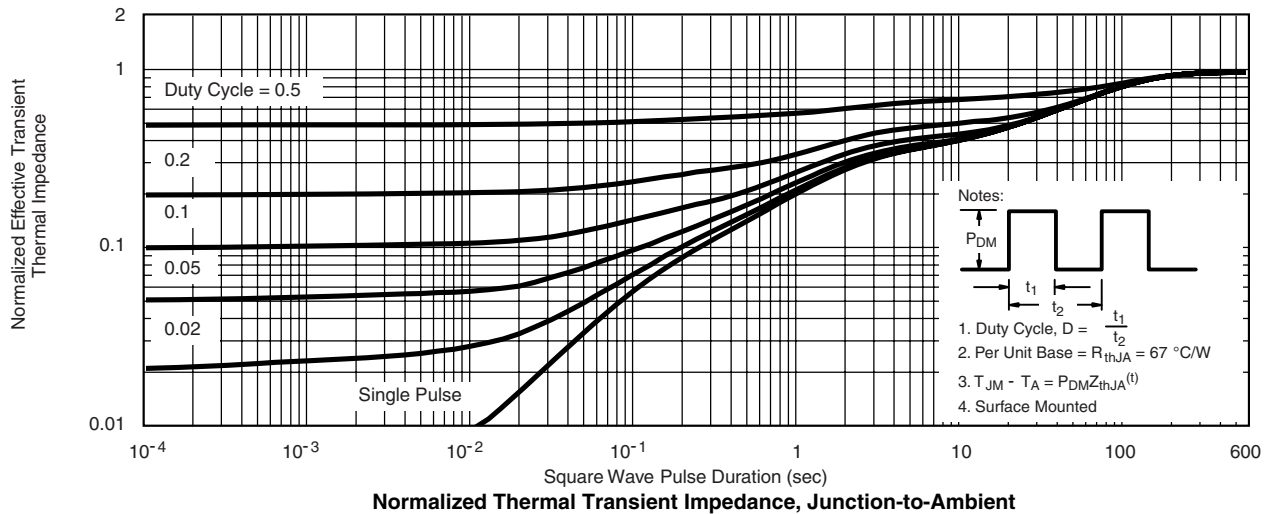
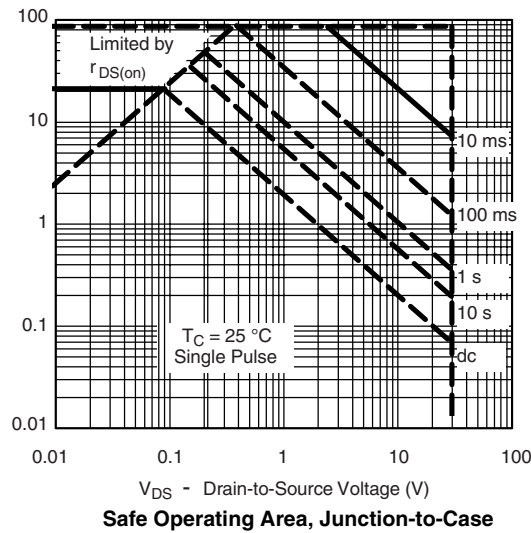
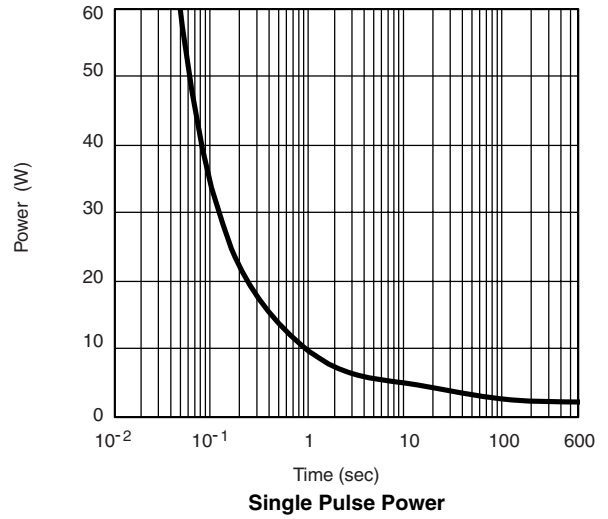
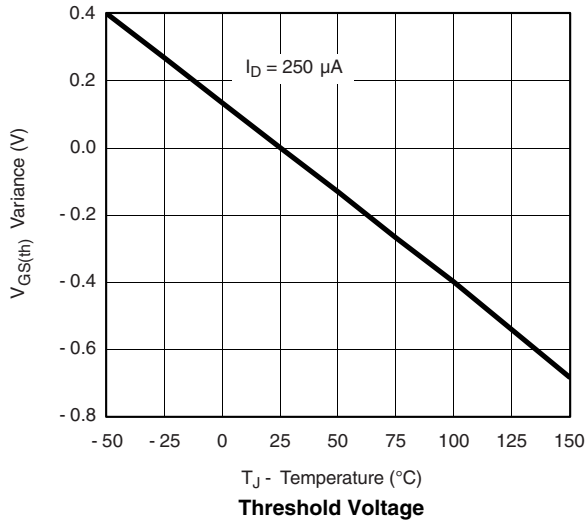


Source-Drain Diode Forward Voltage



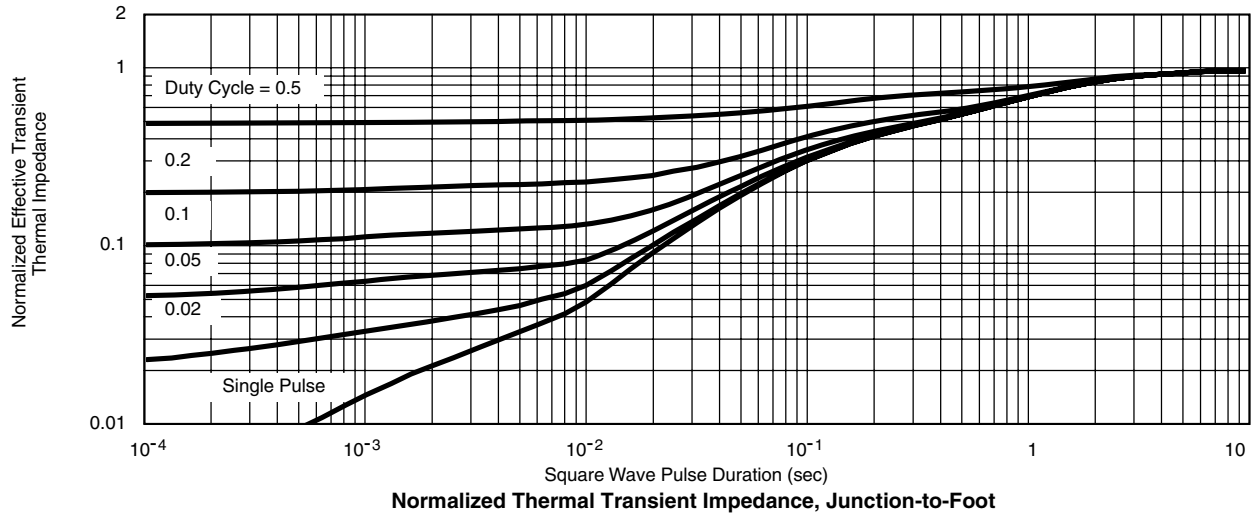
On-Resistance vs. Gate-to-Source Voltage

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted





TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



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