



N-Channel Reduced Q_g , Fast Switching WFET™

PRODUCT SUMMARY

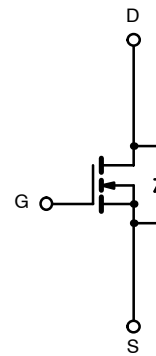
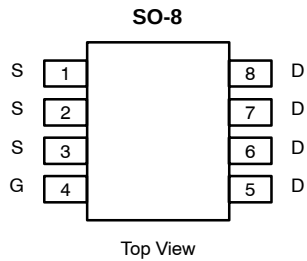
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.00975 @ $V_{GS} = 10$ V	12.5
	0.01375 @ $V_{GS} = 4.5$ V	10.0

FEATURES

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

APPLICATIONS

- High-Side DC/DC Conversion
 - Notebook
 - Server



N-Channel MOSFET

Ordering Information: Si4392DY
Si4392DY-T1 (with Tape and Reel)
Si4392DY—E3 (Lead (Pb)-Free)
Si4392DY-T1—E3 (Lead (Pb)-Free with Tape and Reel)

ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C UNLESS OTHERWISE NOTED) ^a				
Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V _{DS}	30	
Gate-Source Voltage		V _{GS}	± 20	
Continuous Drain Current (T _J = 150 °C) ^a	T _A = 25 °C	I _D	12.5	A
	T _A = 70 °C		10	
Pulsed Drain Current		I _{DM}	50	
Continuous Source Current (Diode Conduction) ^a		I _S	2.7	
Maximum Power Dissipation ^a	T _A = 25 °C	P _D	3.0	W
	T _A = 70 °C		1.9	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	–55 to 150	

THERMAL RESISTANCE RATINGS ^a				
Parameter		Typical	Maximum	Unit
Maximum Junction-to-Ambient	R_{thJA}	33	42	$^\circ\text{C/W}$
Maximum Junction-to-Foot (Drain)	R_{thJF}	16	20	

Notes

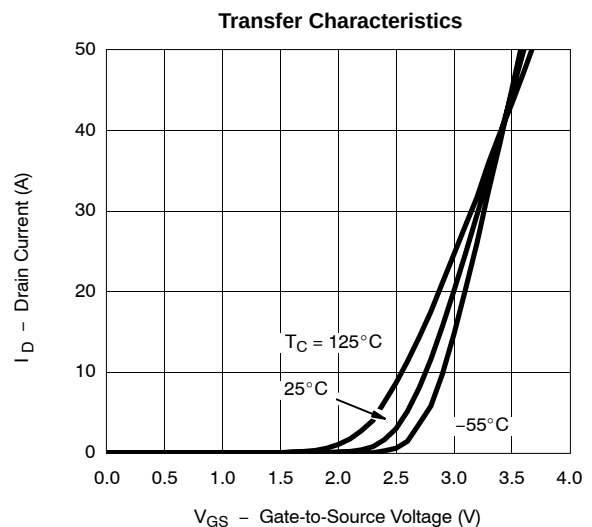
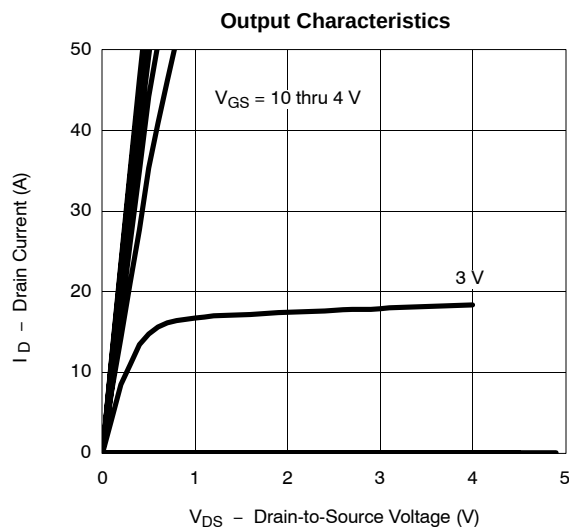
a. Surface Mounted on 1" x 1" FR4 Board, $t \leq 10$ sec

SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$	1.0		3.0	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}$, $V_{GS} = \pm 20\ \text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30\ \text{V}$, $V_{GS} = 0\ \text{V}$			1	μA
		$V_{DS} = 30\ \text{V}$, $V_{GS} = 0\ \text{V}$, $T_J = 55^\circ\text{C}$			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	$r_{DS(on)}$	$V_{GS} = 10\ \text{V}$, $I_D = 12.5\ \text{A}$		0.008	0.00975	Ω
		$V_{GS} = 4.5\ \text{V}$, $I_D = 10.0\ \text{A}$		0.011	0.01375	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\ \text{V}$, $I_D = 12.5\ \text{A}$		40		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 2.7\ \text{A}$, $V_{GS} = 0\ \text{V}$		0.73	1.1	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 15\ \text{V}$, $V_{GS} = 4.5\ \text{V}$, $I_D = 12.5\ \text{A}$		10	15	nC
Gate-Source Charge	Q_{gs}			3.5		
Gate-Drain Charge	Q_{gd}			2.6		
Gate Resistance	R_g		0.5	1.6	2.7	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15\ \text{V}$, $R_L = 15\ \Omega$ $I_D \cong 1\ \text{A}$, $V_{GEN} = 10\ \text{V}$, $R_g = 6\ \Omega$		15	25	ns
Rise Time	t_r			5	10	
Turn-Off Delay Time	$t_{d(off)}$			45	70	
Fall Time	t_f			8	15	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 2.7\ \text{A}$, $di/dt = 100\ \text{A}/\mu\text{s}$		30	60	

Notes

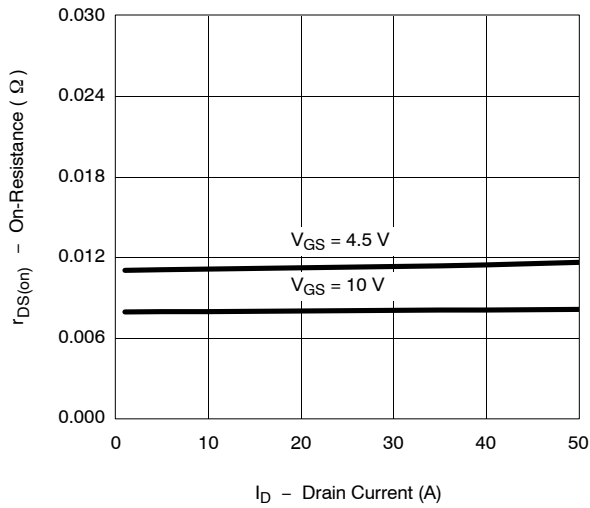
- a. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

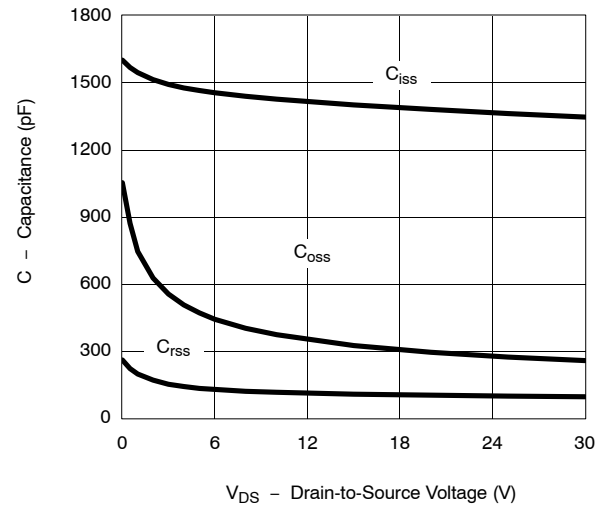


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

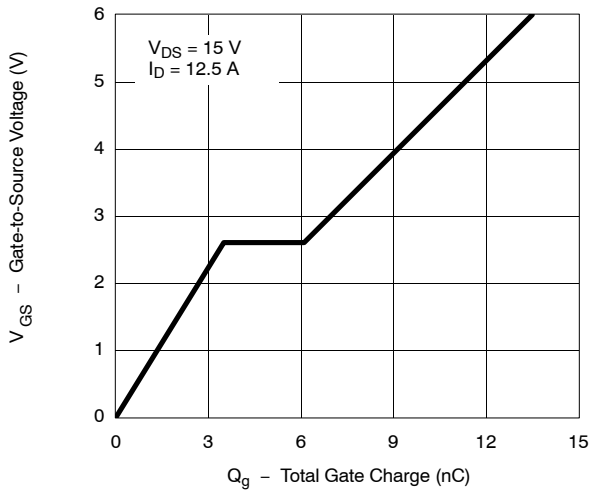
On-Resistance vs. Drain Current



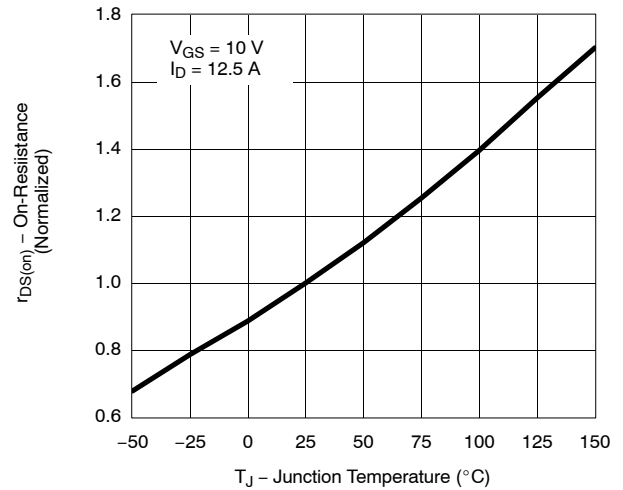
Capacitance



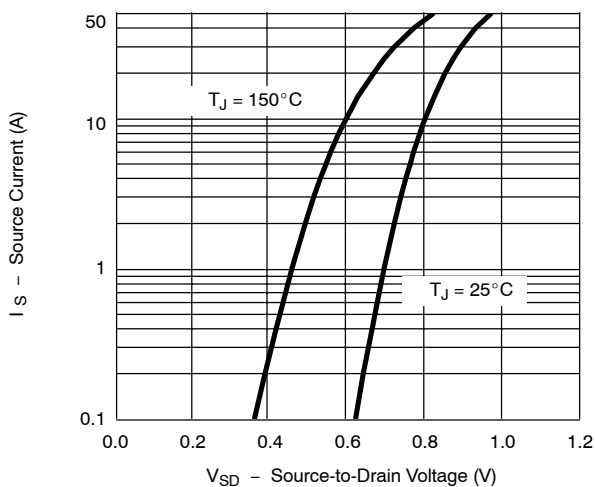
Gate Charge



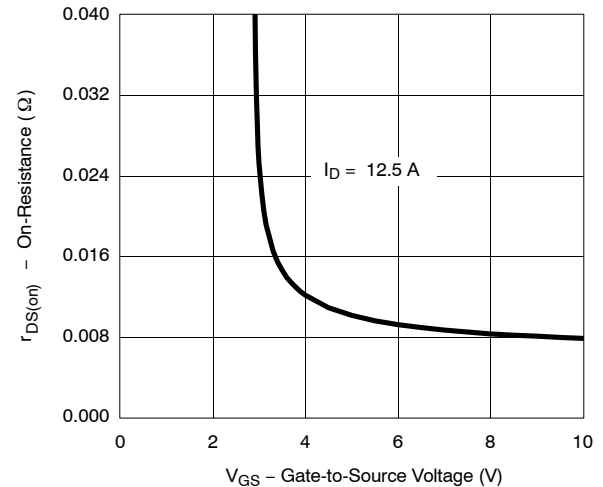
On-Resistance vs. Junction Temperature



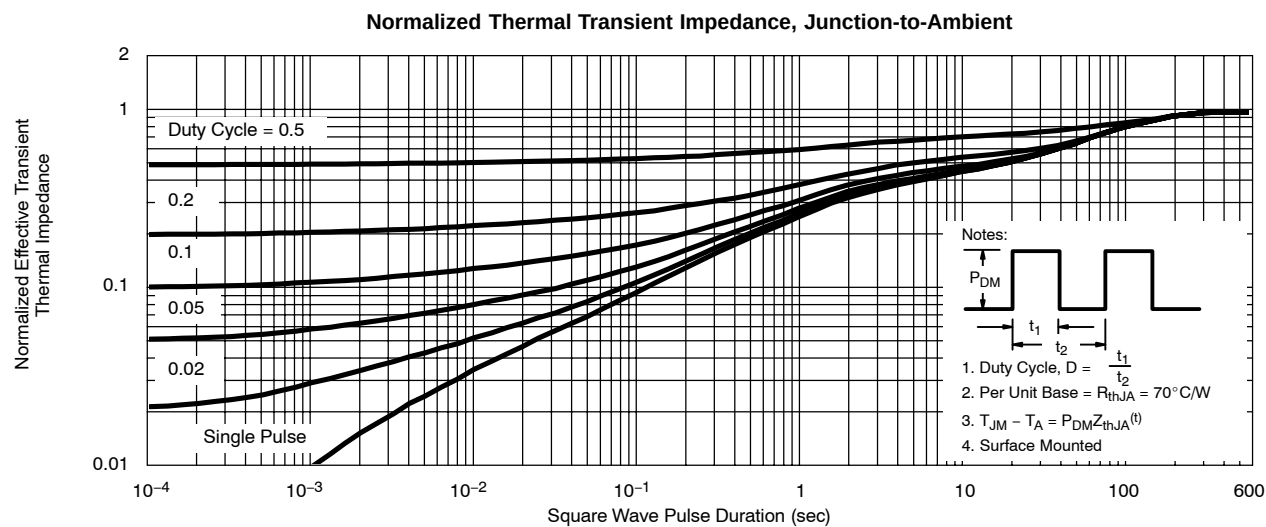
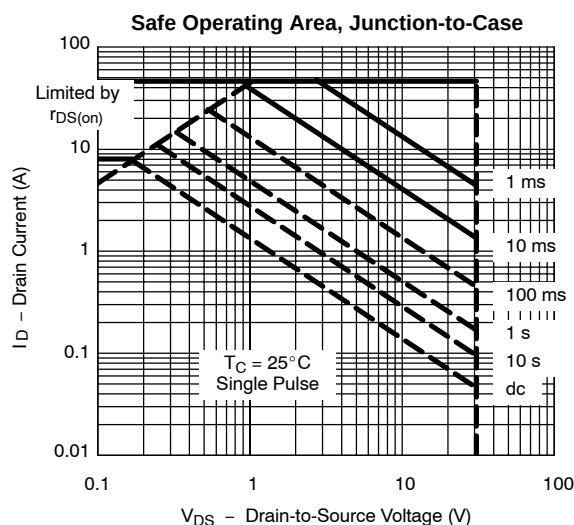
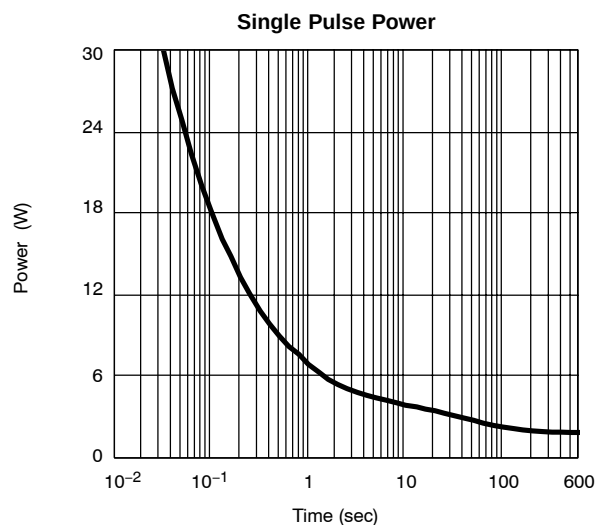
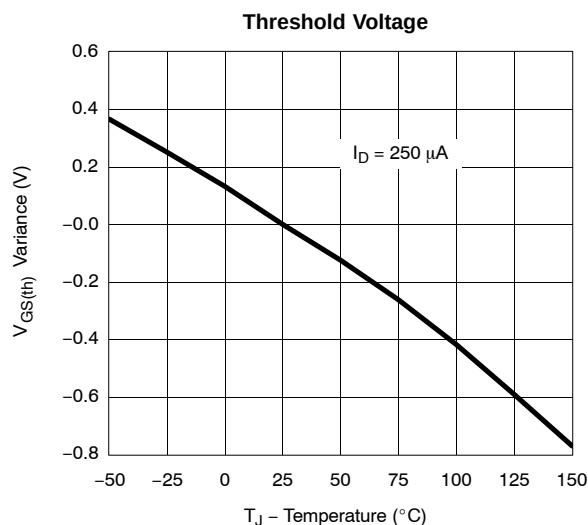
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)





TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

