

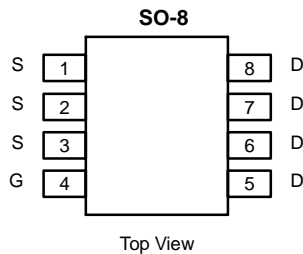


N-Channel 30-V (D-S) MOSFET

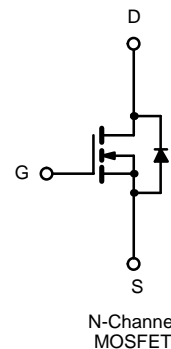
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.018 @ $V_{GS} = 10$ V	9.0
	0.028 @ $V_{GS} = 4.5$ V	7.3

FEATURES

- TrenchFET® Power MOSFET



Ordering Information: Si4416DY
Si4416DY-T1 (with Tape and Reel)



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	10 secs	Steady State	Unit	
Drain-Source Voltage	V_{DS}	30		V	
Gate-Source Voltage	V_{GS}	± 20			
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	I_D	$T_A = 25^\circ\text{C}$	9.0	6.9	A
		$T_A = 70^\circ\text{C}$	7.5	5.6	
Pulsed Drain Current (10 μs Pulse Width)	I_{DM}	50			
Continuous Source Current (Diode Conduction) ^a	I_S	2.1	1.2		
Maximum Power Dissipation ^a	P_D	$T_A = 25^\circ\text{C}$	2.5	1.4	W
		$T_A = 70^\circ\text{C}$	1.6	0.9	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150		$^\circ\text{C}$	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typ	Max	Unit	
Maximum Junction-to-Ambient ^a	R_{thJA}	$t \leq 10$ sec	40	50	$^\circ\text{C/W}$
		Steady-State	72	90	
Maximum Junction-to-Foot (Drain)	R_{thJF}	16	20		

Notes

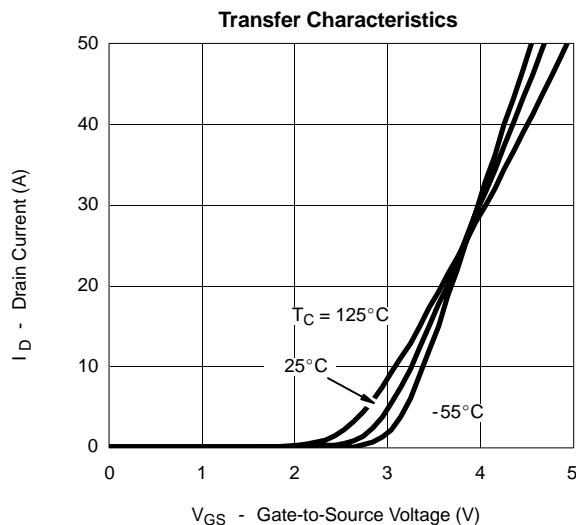
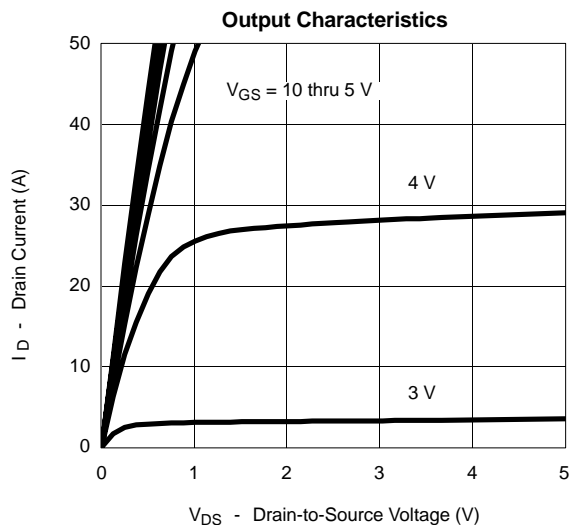
a. Surface Mounted on 1" x 1" FR4 Board.

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

Parameter	Symbol	Test Condition	Min	Typ ^a	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	1			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}	$V_{DS} = 24 \text{ V}, V_{GS} = 0 \text{ V}$			1	μA
		$V_{DS} = 24 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 55^\circ\text{C}$			25	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} \geq 5 \text{ V}, V_{GS} = 10 \text{ V}$	20			A
Drain-Source On-State Resistance ^b	$r_{DS(on)}$	$V_{GS} = 10 \text{ V}, I_D = 9.0 \text{ A}$		0.012	0.018	Ω
		$V_{GS} = 4.5 \text{ V}, I_D = 7.3 \text{ A}$		0.019	0.028	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15 \text{ V}, I_D = 9.0 \text{ A}$		23		S
Diode Forward Voltage ^b	V_{SD}	$I_S = 2.1 \text{ A}, V_{GS} = 0 \text{ V}$			1.2	V
Dynamic^a						
Gate Charge	Q_g	$V_{DS} = 15 \text{ V}, V_{GS} = 5 \text{ V}, I_D = 9.0 \text{ A}$		14	20	nC
Total Gate Charge	Q_{gt}	$V_{DS} = 15 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 9.0 \text{ A}$		24	35	
Gate-Source Charge	Q_{gs}			4.5		
Gate-Drain Charge	Q_{gd}			5.9		
Gate Resistance	R_g		0.2	1.0	2.4	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15 \text{ V}, R_L = 15 \Omega$ $I_D \cong 1 \text{ A}, V_{GEN} = 10 \text{ V}, R_G = 6 \Omega$		16	20	ns
Rise Time	t_r			10	20	
Turn-Off Delay Time	$t_{d(off)}$			34	50	
Fall Time	t_f			13	20	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 2.1 \text{ A}, di/dt = 100 \text{ A}/\mu\text{s}$		50	90	

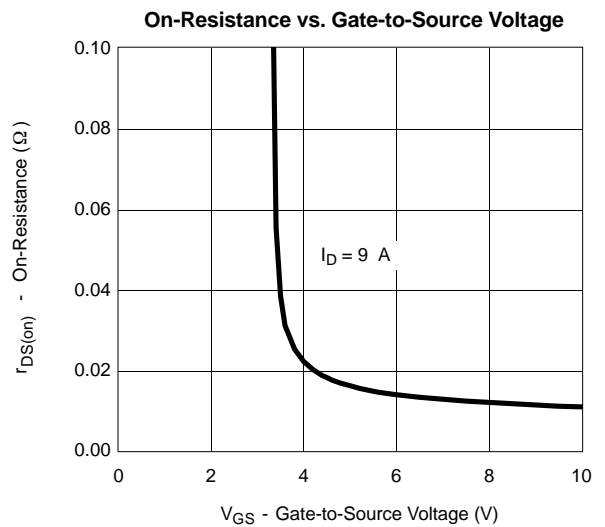
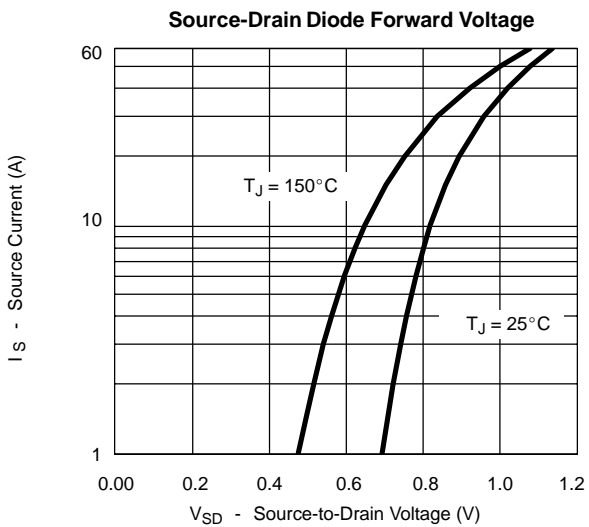
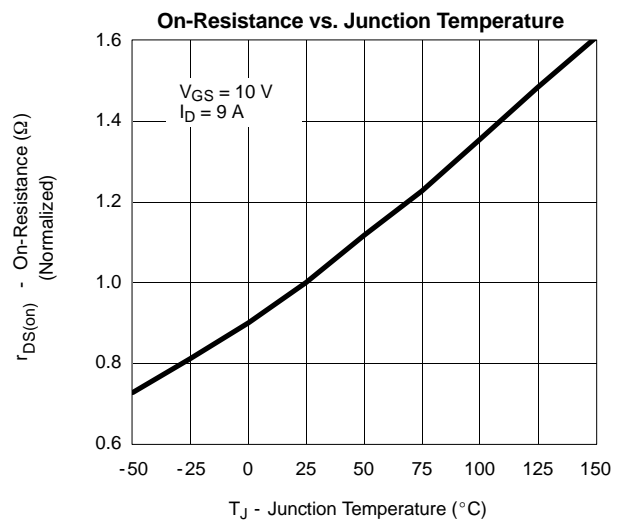
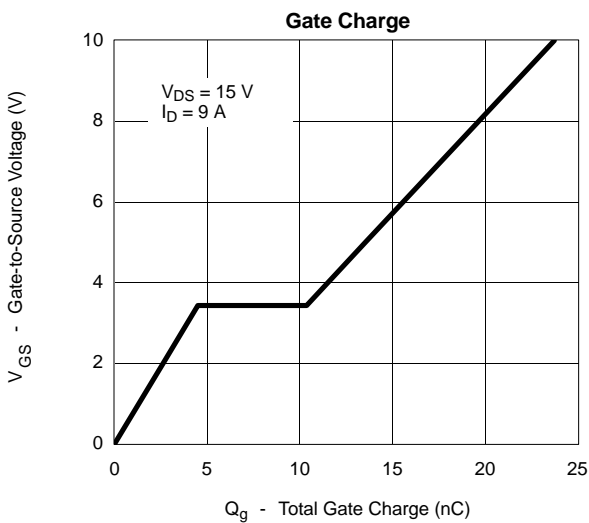
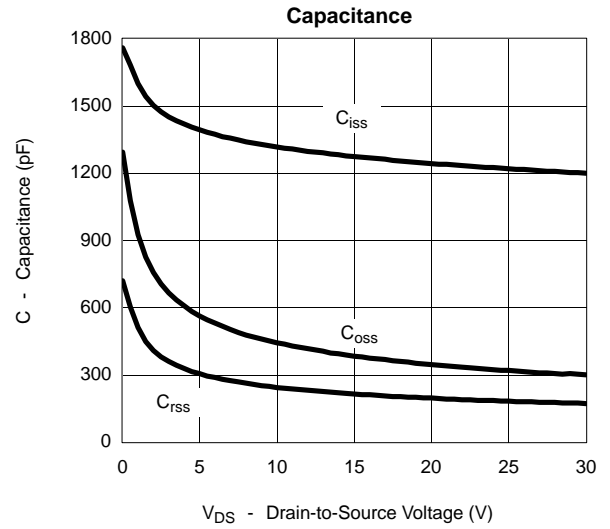
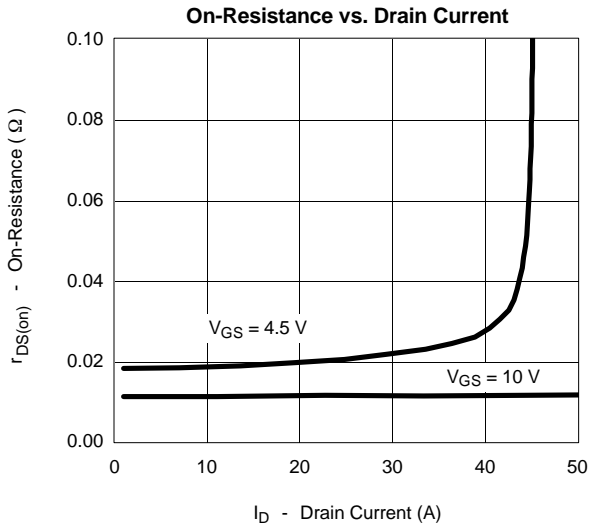
Notes

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

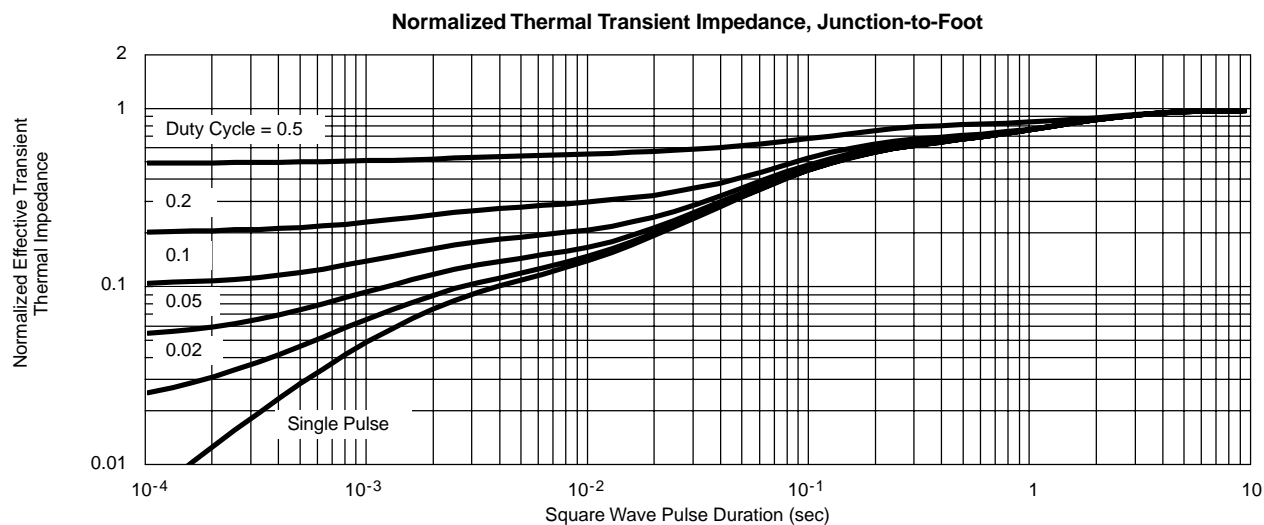
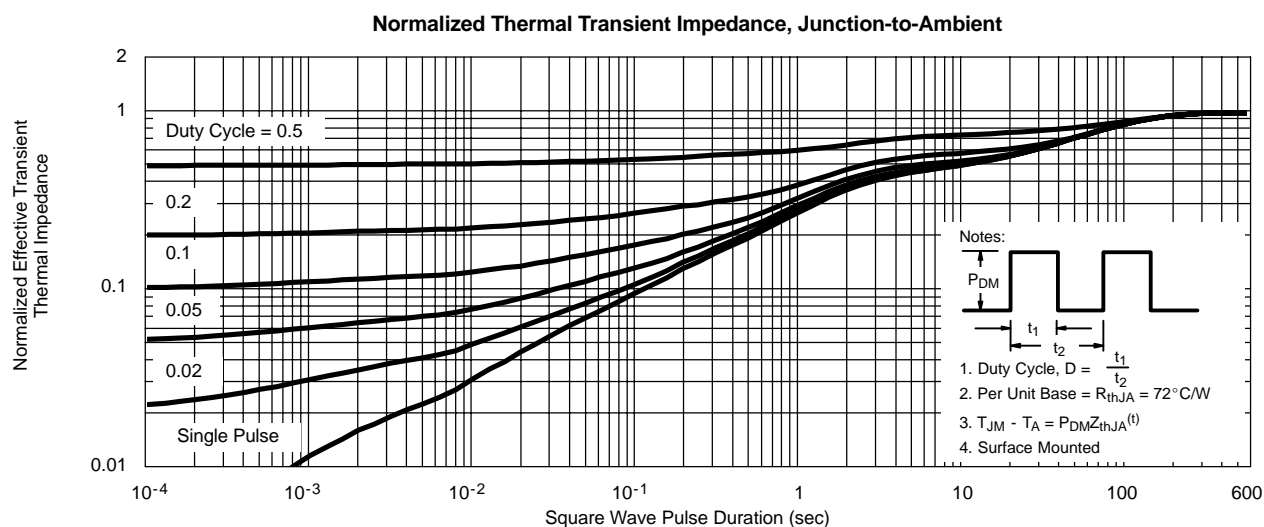
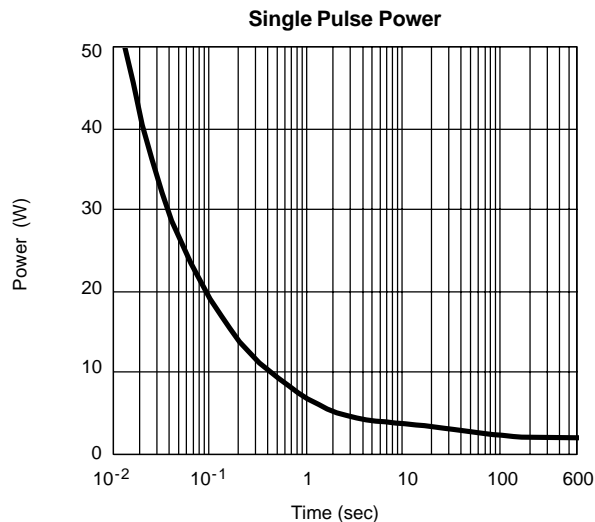
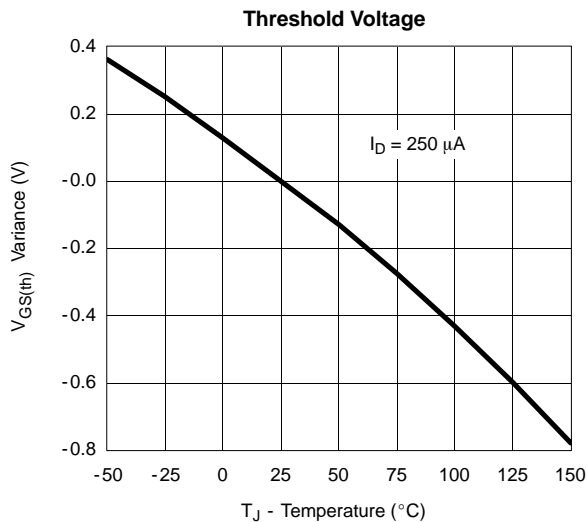
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



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