



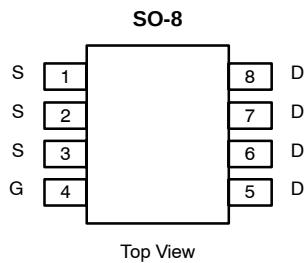
N-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY

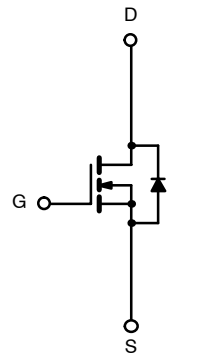
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.009 @ $V_{GS} = 10$ V	13.5
	0.013 @ $V_{GS} = 4.5$ V	11

FEATURES

- TrenchFET® Power MOSFET
- 100% R_g Tested



Ordering Information: Si4420DY
Si4420DY-T1 (with Tape and Reel)



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter		Symbol	10 sec	Steady State	Unit
Drain-Source Voltage		V _{DS}	30		V
Gate-Source Voltage		V _{GS}	± 20		
Continuous Drain Current (T _J = 150°C) ^a	T _A = 25°C	I _D	13.5	9.5	A
	T _A = 70°C		10.8	7.5	
Pulsed Drain Current		I _{DM}	50		
Continuous Source Current (Diode Conduction) ^a		I _S	2.7	1.36	
Maximum Power Dissipation ^a	T _A = 25°C	P _D	3.0	1.5	W
	T _A = 70°C		1.9	0.95	
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	$t < 10$ sec	R_{thJA}	33	42	$^\circ\text{C/W}$
	Steady State		70	84	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	16	21	

Notes

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

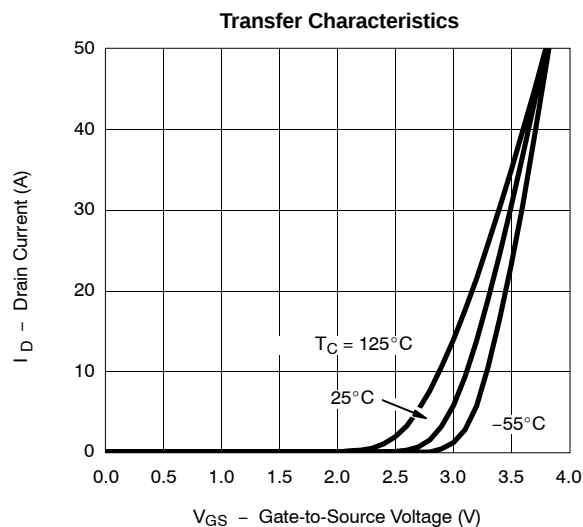
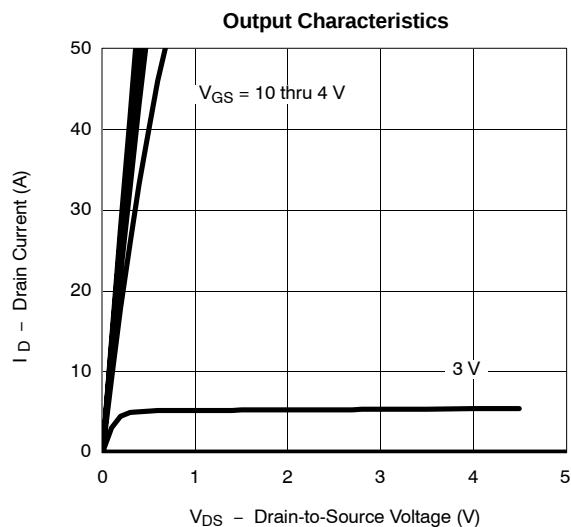
For SPICE model information via the Worldwide Web: <http://www.vishay.com/www/product/spice.htm>

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	2.0	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	$r_{DS(on)}$	$V_{GS} = 10\ \text{V}, I_D = 13.5\ \text{A}$		0.0075	0.009	Ω
		$V_{GS} = 4.5\ \text{V}, I_D = 11\ \text{A}$		0.010	0.013	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\ \text{V}, I_D = 13.5\ \text{A}$		50		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 2.3\ \text{A}, V_{GS} = 0\ \text{V}$			1.1	V
Dynamic^b						
Gate Charge	Q_g	$V_{DS} = 15\ \text{V}, V_{GS} = 5\ \text{V}, I_D = 13.5\ \text{A}$		29	45	nC
Total Gate Charge	Q_{gt}	$V_{DS} = 15\ \text{V}, V_{GS} = 10\ \text{V}, I_D = 13.5\ \text{A}$		58	90	
Gate-Source Charge	Q_{gs}			12		
Gate-Drain Charge	Q_{gd}			9.5		
Gate Resistance	R_g		0.5	2.1	4.6	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15\ \text{V}, R_L = 15\ \Omega$ $I_D \cong 1\ \text{A}, V_{GEN} = 10\ \text{V}, R_g = 6\ \Omega$		22	35	ns
Rise Time	t_r			13	20	
Turn-Off Delay Time	$t_{d(off)}$			82	125	
Fall Time	t_f			30	45	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 2.3\ \text{A}, di/dt = 100\ \text{A}/\mu\text{s}$		50	75	

Notes

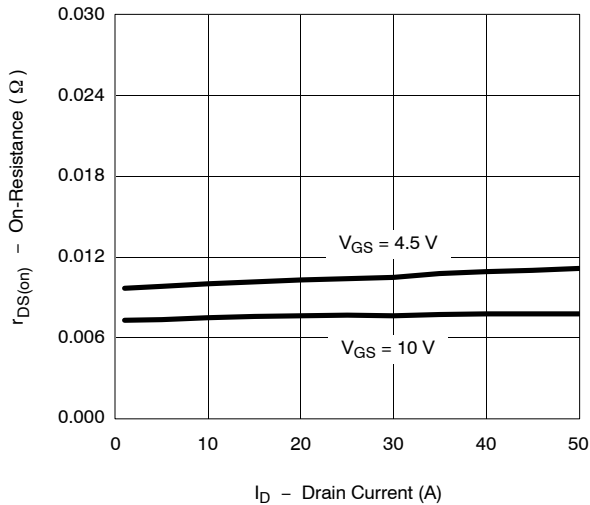
- a. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

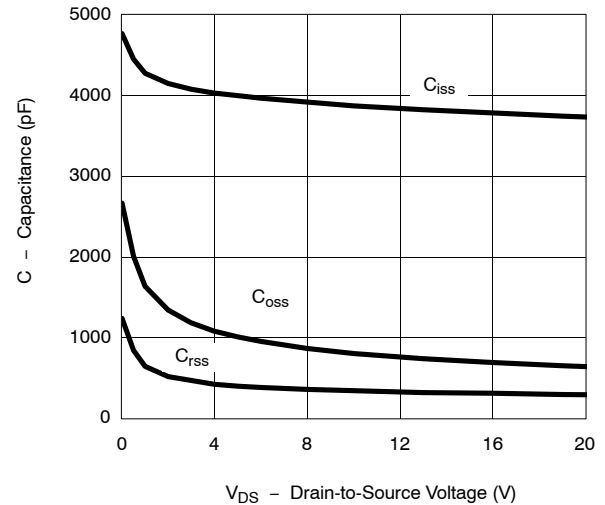


TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

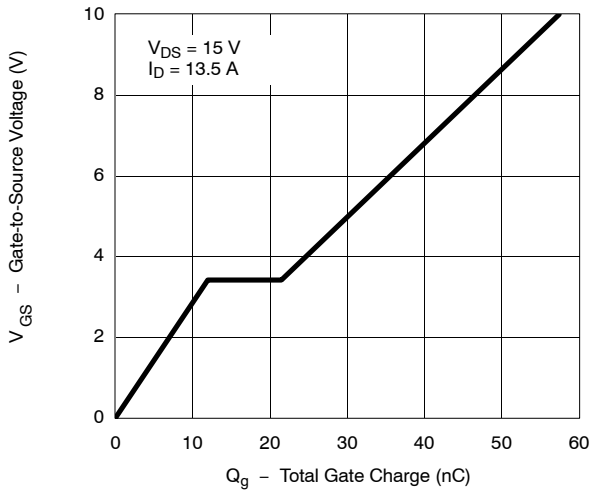
On-Resistance vs. Drain Current



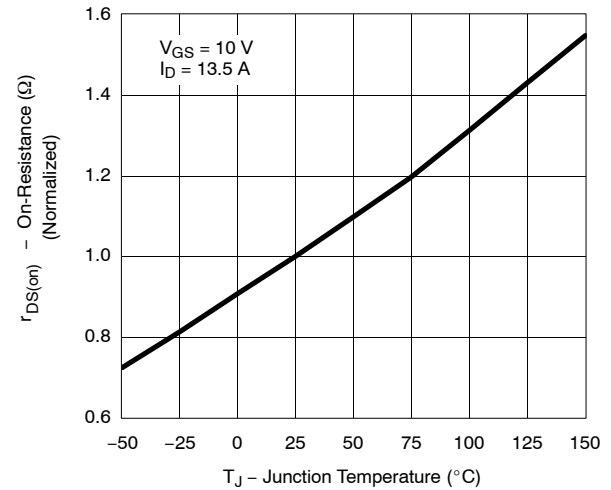
Capacitance



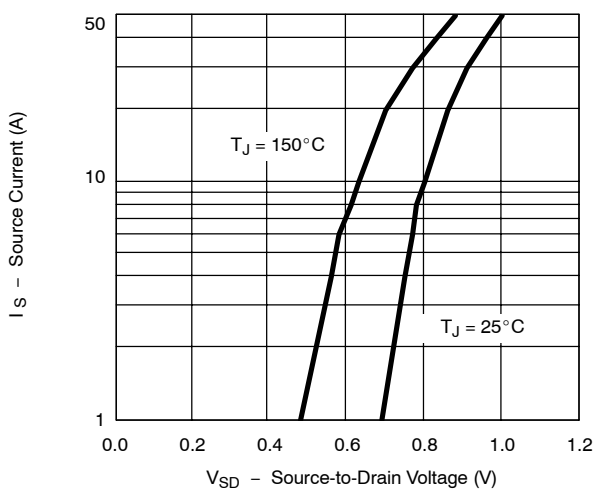
Gate Charge



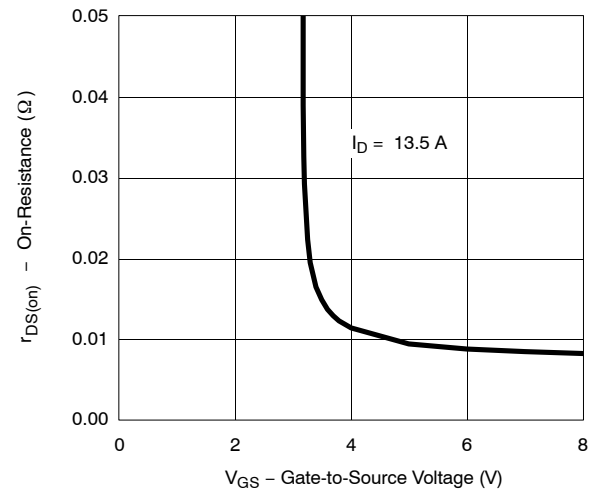
On-Resistance vs. Junction Temperature



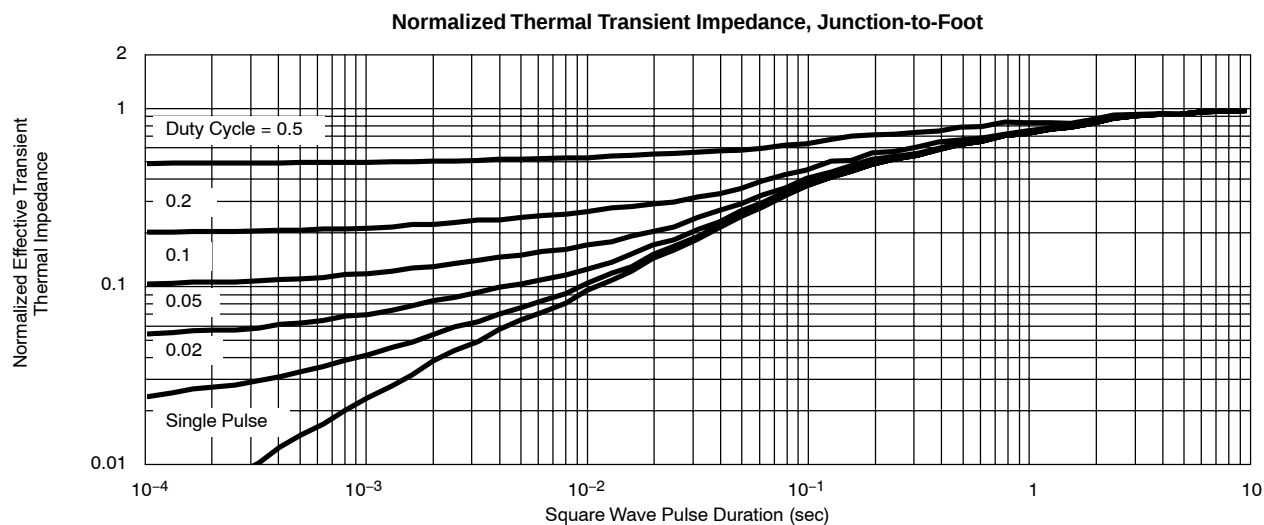
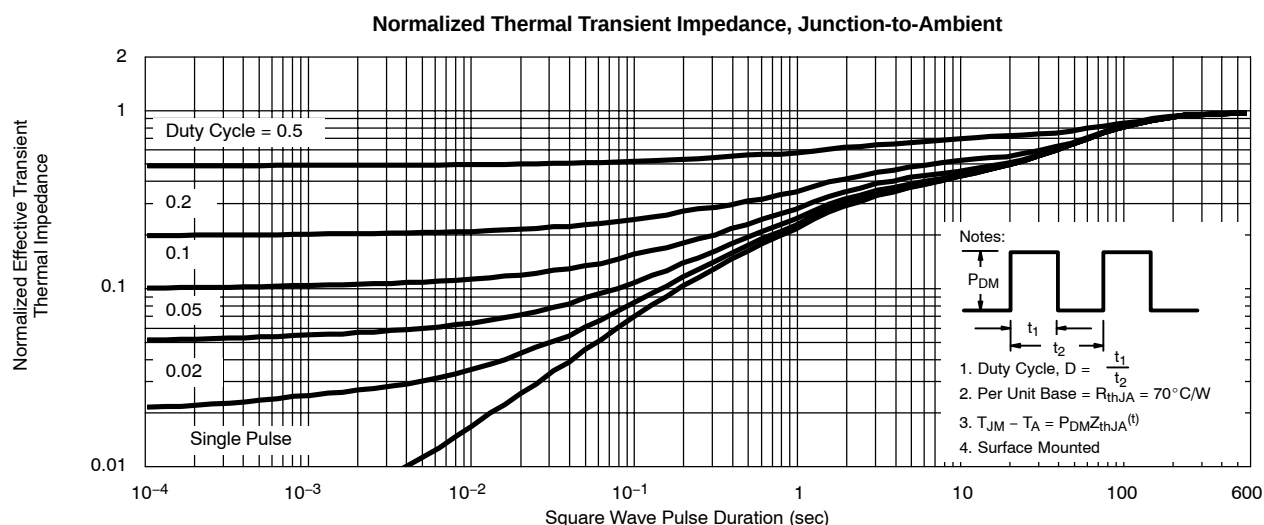
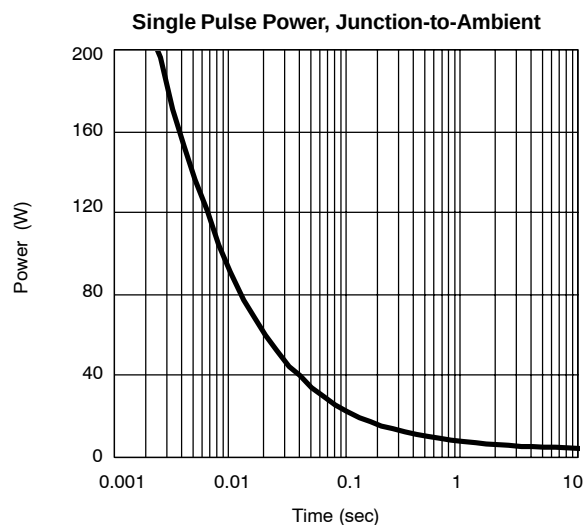
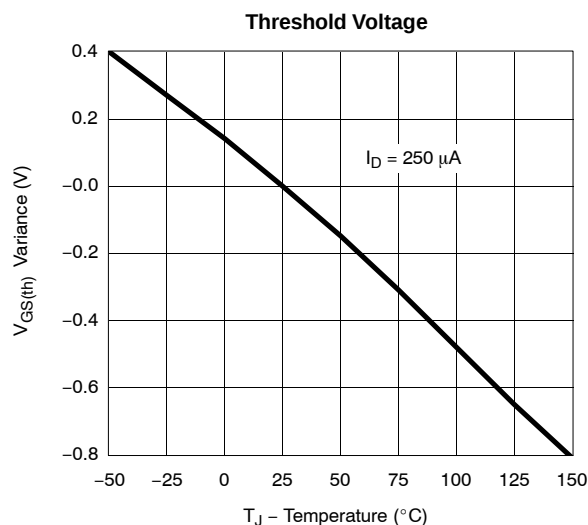
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)





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