



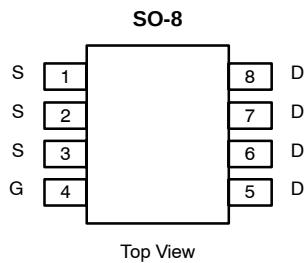
N-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY

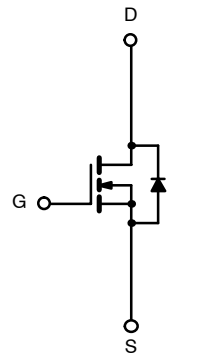
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.009 @ $V_{GS} = 10$ V	13.5
	0.013 @ $V_{GS} = 4.5$ V	11

FEATURES

- TrenchFET® Power MOSFET
- 100% R_g Tested



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



N-Channel MOSFET

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>

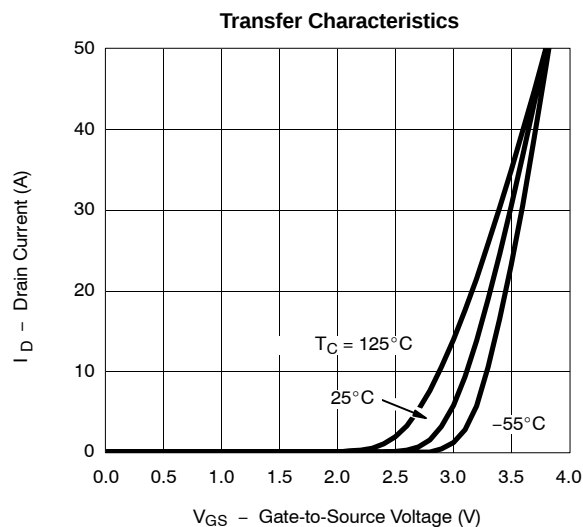
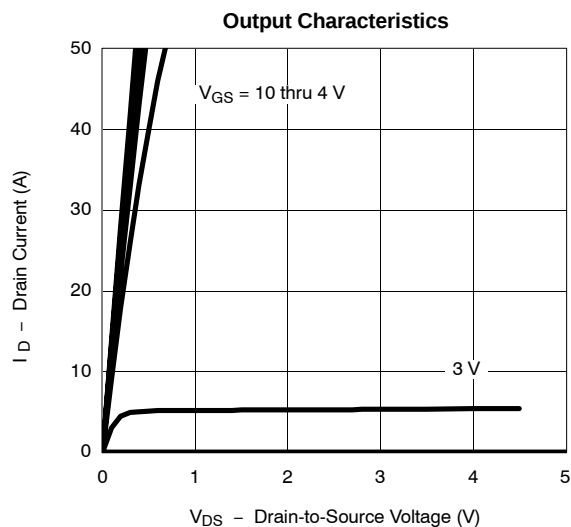
SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

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 $\leq 2\%$.

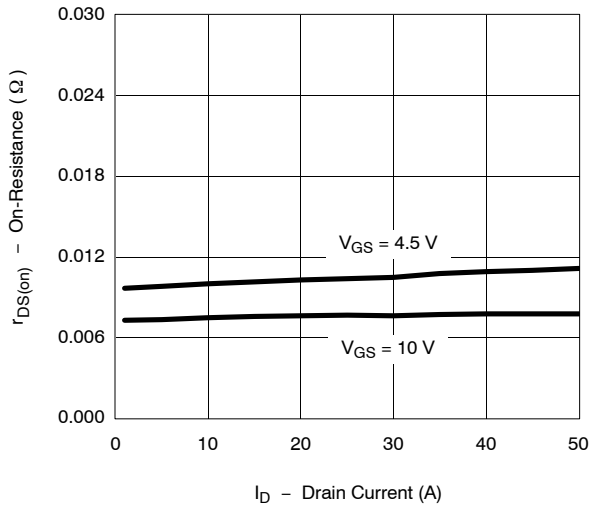
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

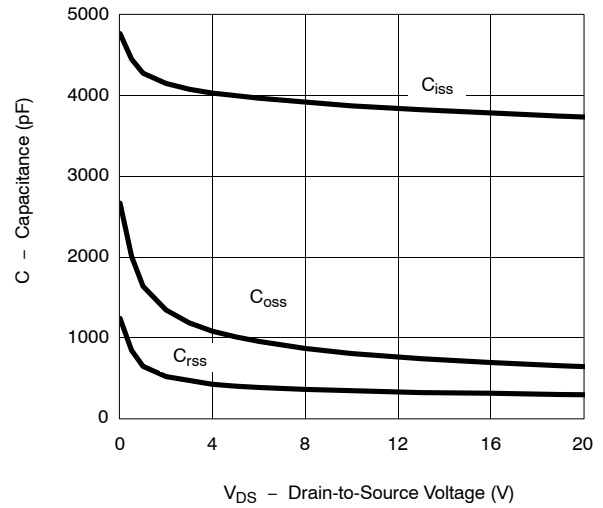


TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

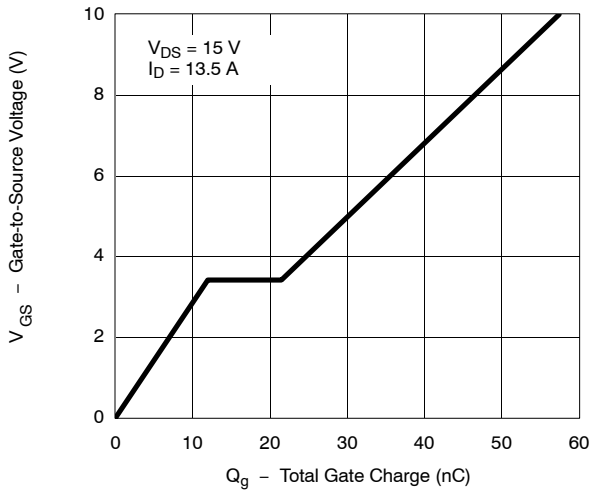
On-Resistance vs. Drain Current



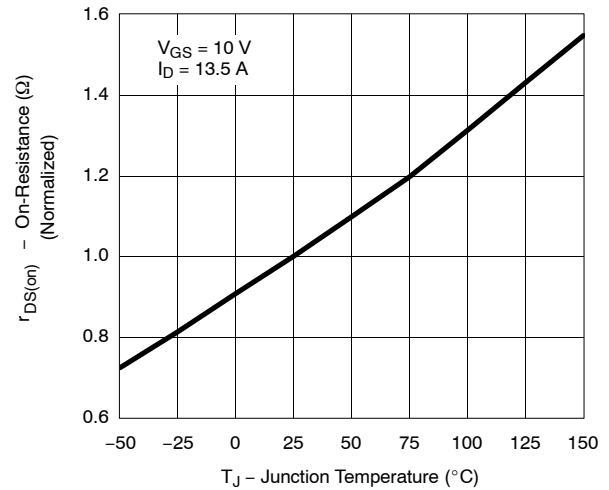
Capacitance



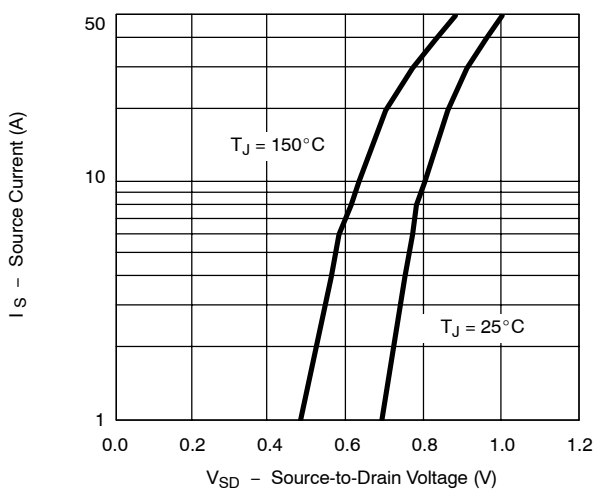
Gate Charge



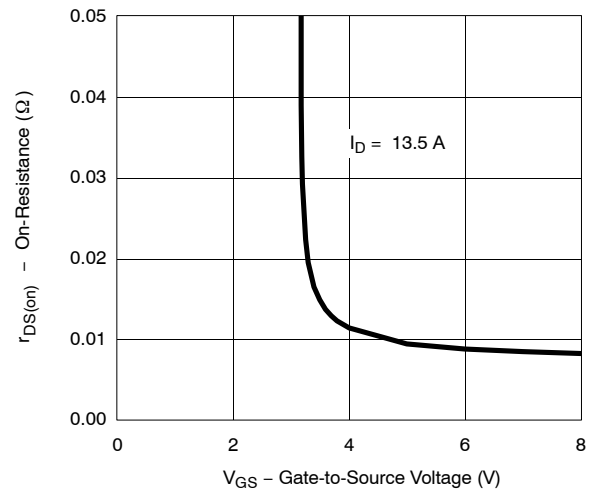
On-Resistance vs. Junction Temperature



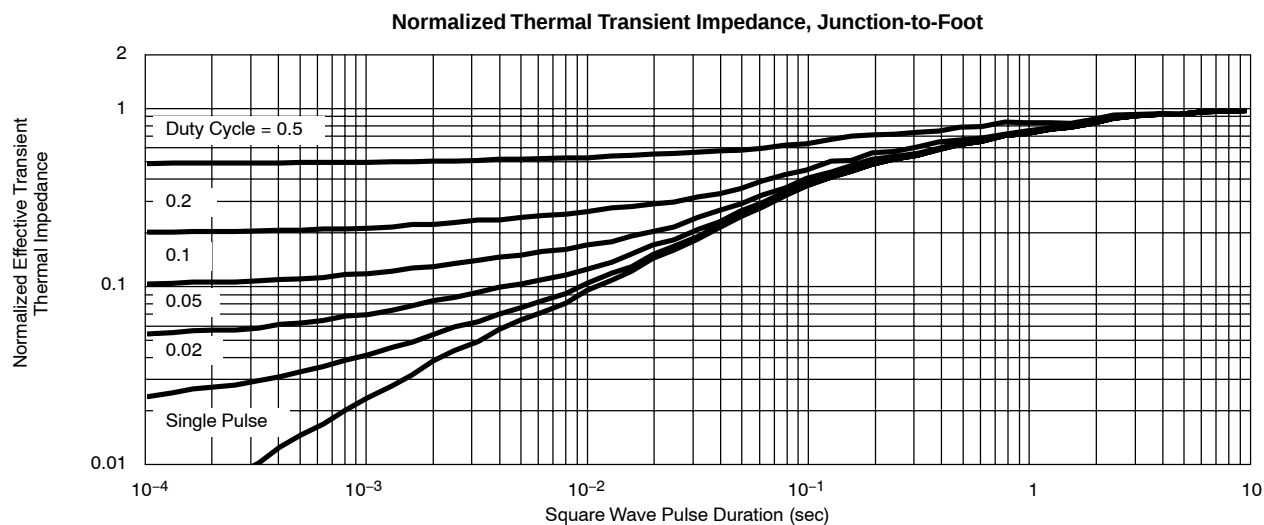
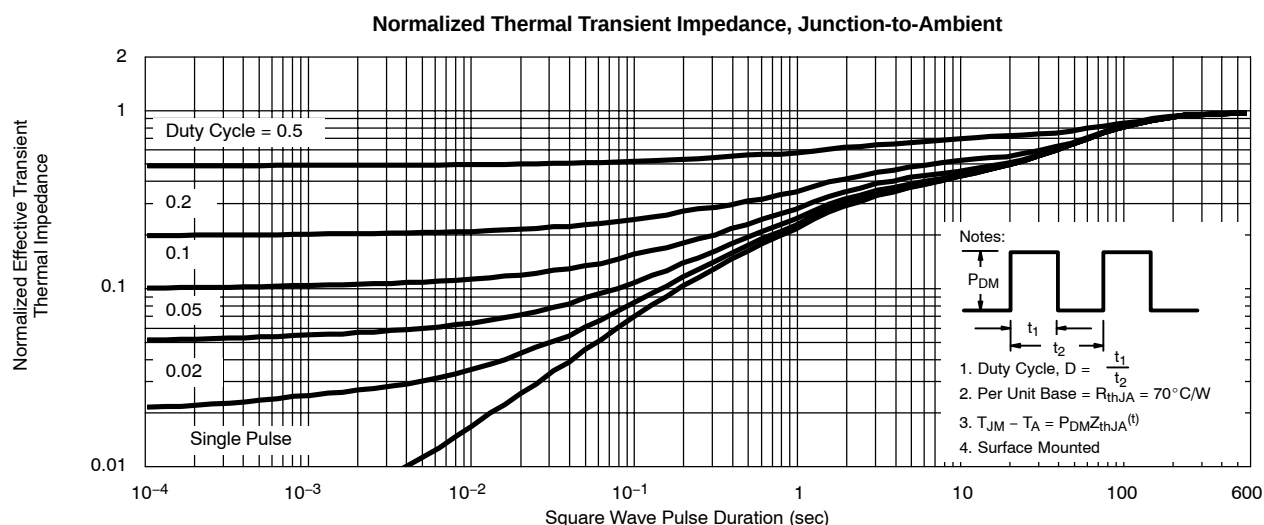
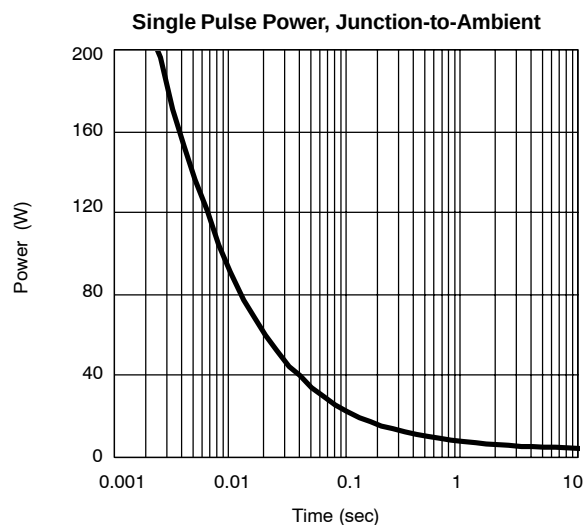
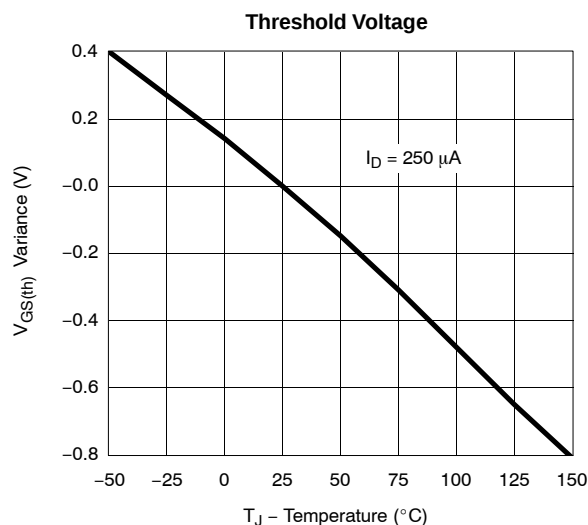
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)





Notice

Specifications of the products displayed herein are subject to change without notice. Vishay Intertechnology, Inc., or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Vishay's terms and conditions of sale for such products, Vishay assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of Vishay products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Vishay for any damages resulting from such improper use or sale.