

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

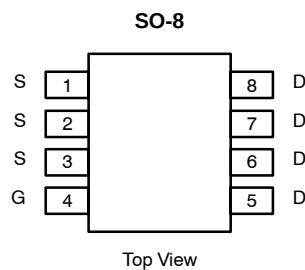
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-30	0.014 @ $V_{GS} = -10$ V	-11
	0.023 @ $V_{GS} = -4.5$ V	-8.5

FEATURES

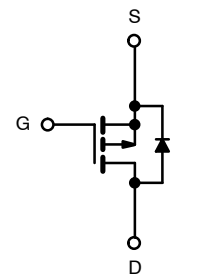
- TrenchFET® Power MOSFET



Pb-free
Available



Ordering Information: Si4425DY
Si4425DY-T1 (with Tape and Reel)
Si4425DY—E3 (Lead (Pb)-Free)
Si4425DY-T1—E3 (Lead (Pb)-Free with Tape and Reel)



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	10 secs	Steady State
Drain-Source Voltage		V_{DS}	-30	
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	$T_A = 25^\circ\text{C}$	I_D	-11	-8
	$T_A = 70^\circ\text{C}$		-8.7	-6.5
Pulsed Drain Current		I_{DM}	-50	
continuous Source Current (Diode Conduction) ^a		I_S	-2.7	-1.36
Maximum Power Dissipation ^a	$T_A = 25^\circ\text{C}$	P_D	3.0	1.5
	$T_A = 70^\circ\text{C}$		1.9	0.95
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	

THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Typical	Maximum
Maximum Junction-to-Ambient ^a	$t \leq 10$ sec	R_{thJA}	33	42
	Steady State		70	84
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	16	21

Notes

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

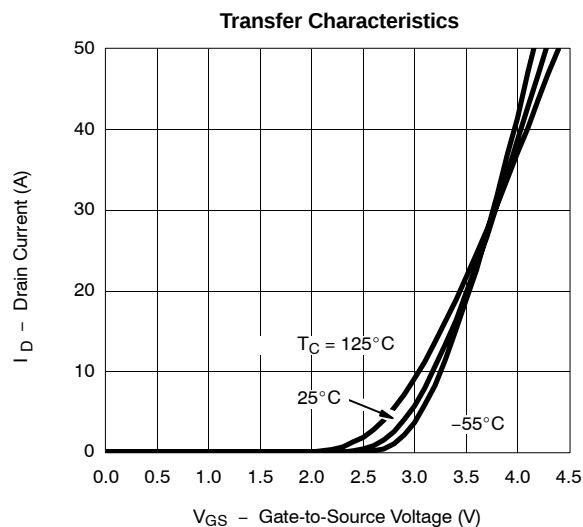
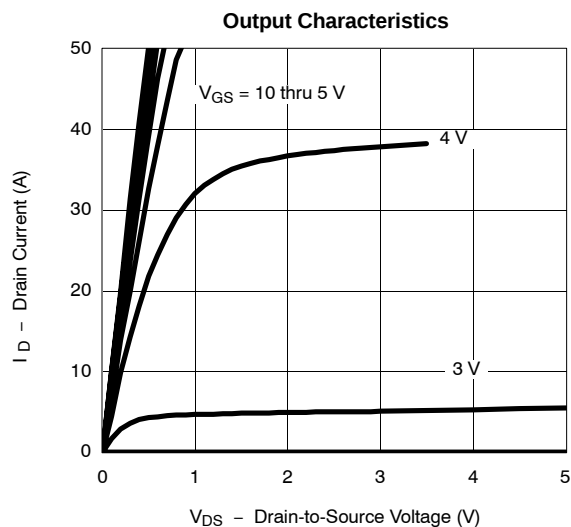
SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

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	-1.9	-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
		$V_{DS} = -30\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 70^\circ\text{C}$			-10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = -5\ \text{V}, V_{GS} = -10\ \text{V}$	-30			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = -10\ \text{V}, I_D = -11\ \text{A}$		0.010	0.014	Ω
		$V_{GS} = -4.5\ \text{V}, I_D = 8.5\ \text{A}$		0.017	0.023	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\ \text{V}, I_D = -11\ \text{A}$		23		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -2.7\ \text{A}, V_{GS} = 0\ \text{V}$		-0.75	-1.1	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -15\ \text{V}, V_{GS} = -4.5\ \text{V}, I_D = -11\ \text{A}$		33	50	nC
Gate-Source Charge	Q_{gs}			10		
Gate-Drain Charge	Q_{gd}			13		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\ \text{V}, R_L = 10\ \Omega$ $I_D \cong -1\ \text{A}, V_{GEN} = -10\ \text{V}, R_g = 6\ \Omega$		20	30	ns
Rise Time	t_r			15	25	
Turn-Off Delay Time	$t_{d(off)}$			95	150	
Fall Time	t_f			44	65	
Gate Resistance	R_g			3.2		Ω
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = -2.1\ \text{A}, di/dt = 100\ \text{A}/\mu\text{s}$		50	80	ns

Notes

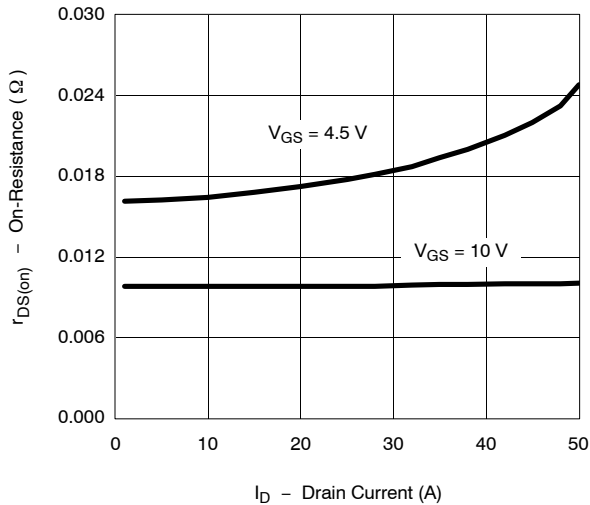
- a. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
b. Guaranteed by design, not subject to production testing.

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.

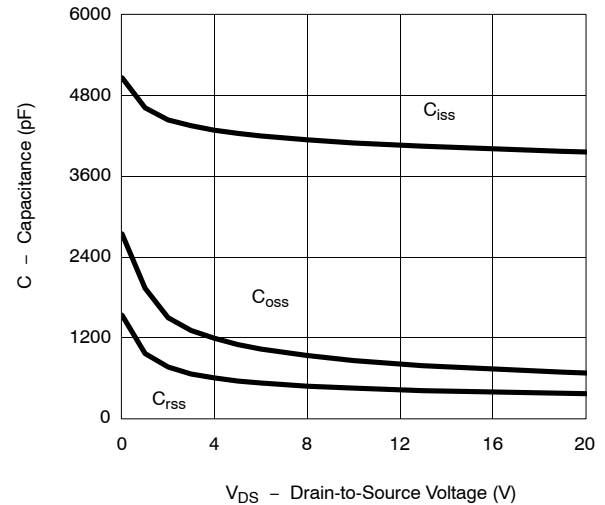
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

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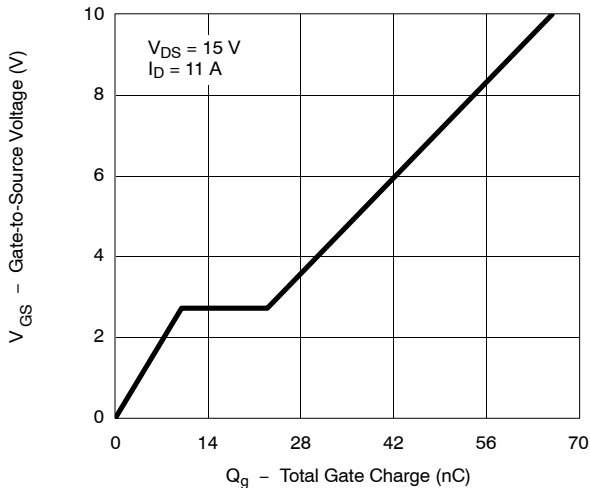
On-Resistance vs. Drain Current



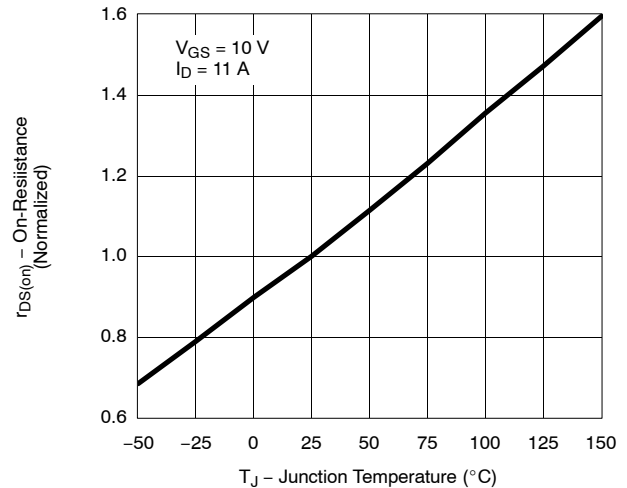
Capacitance



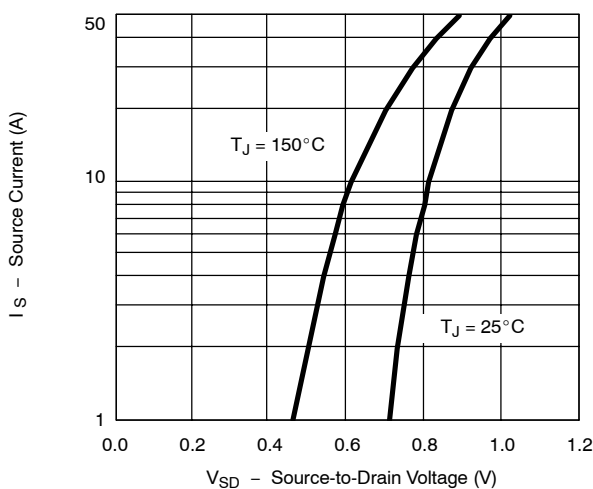
Gate Charge



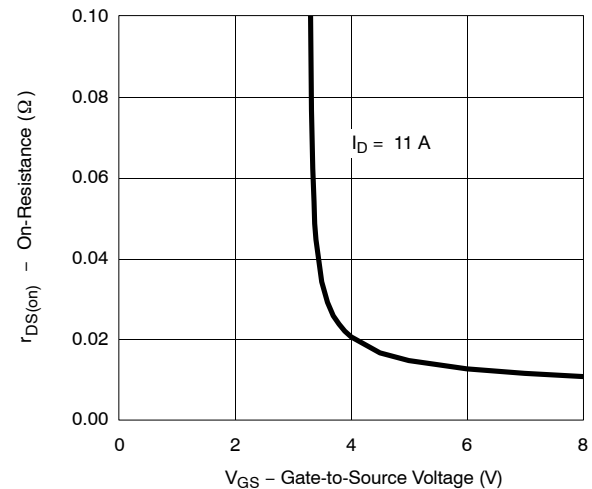
On-Resistance vs. Junction Temperature



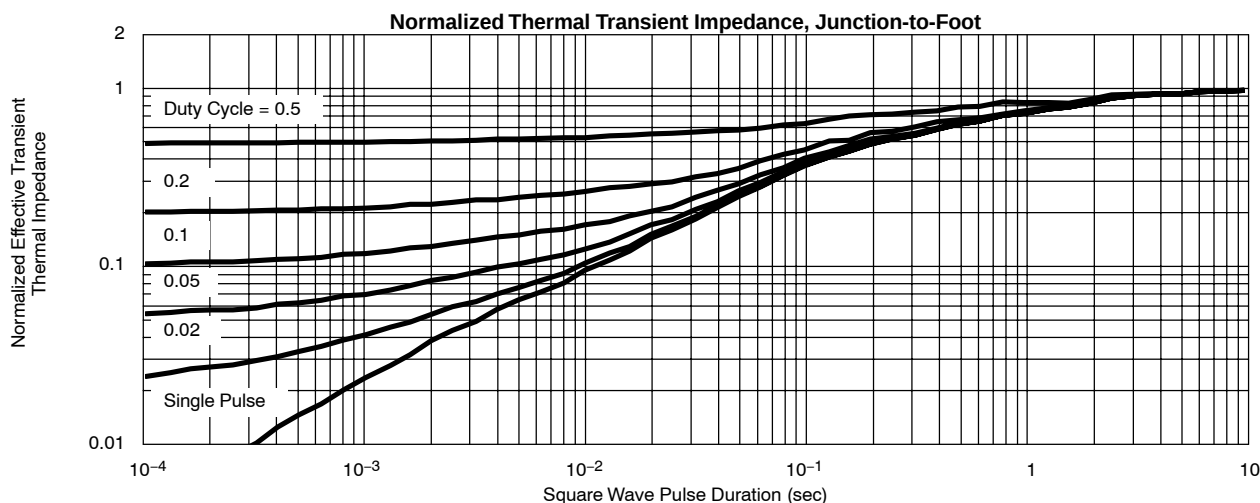
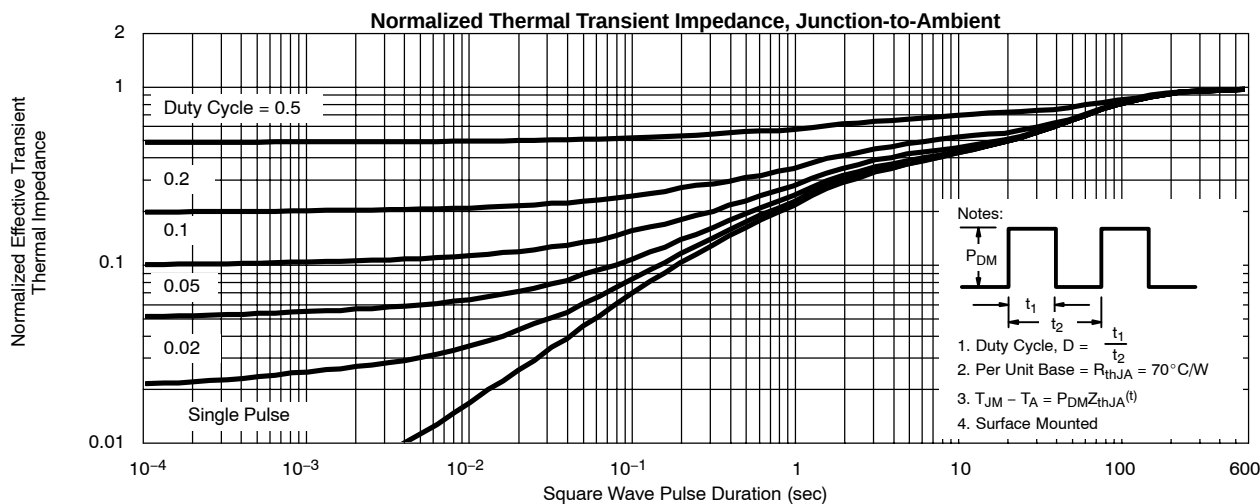
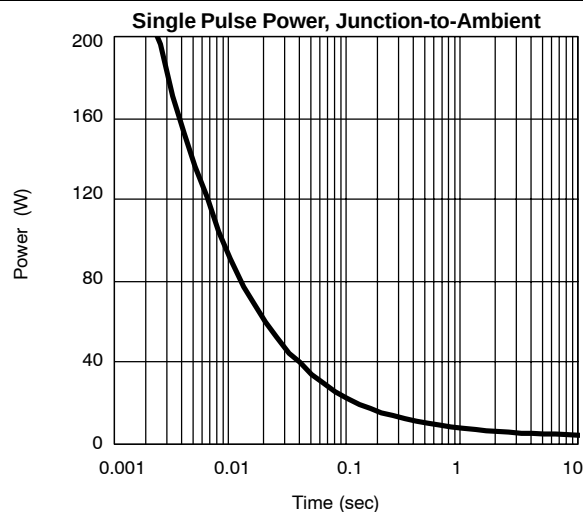
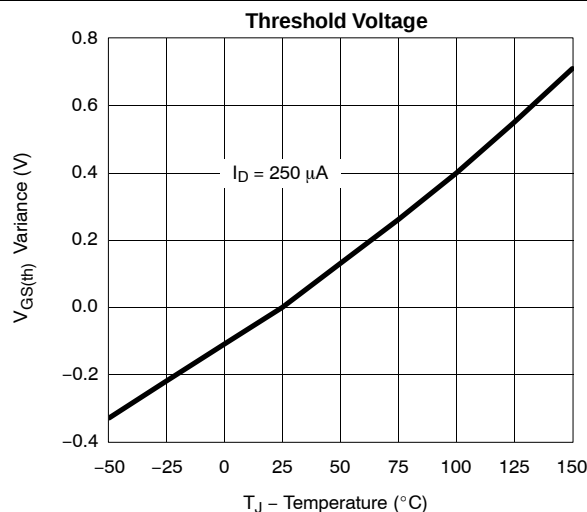
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



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