



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

PRODUCT SUMMARY

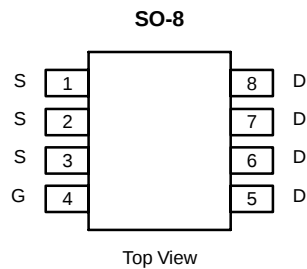
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-30	0.0075 @ $V_{GS} = -10$ V	-17

FEATURES

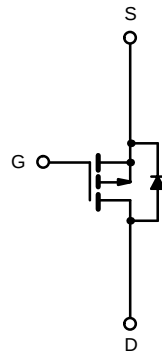
- TrenchFET® Power MOSFETS
- 100% R_g Tested

APPLICATIONS

- Battery and Load Switching
 - Notebook Computers
 - Notebook Battery Packs



Ordering Information: Si4405DY
Si4405DY-T1 (with Tape and Reel)



P-Channel MOSFET

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°C) ^a	T _A = 25°C	I _D	-17	-11	A
	T _A = 70°C		-13	-9	
Pulsed Drain Current		I _{DM}	-60		
continuous Source Current (Diode Conduction) ^a		I _S	-2.9	-1.30	
Maximum Power Dissipation ^a	T _A = 25°C	P _D	3.5	1.6	W
	T _A = 70°C		2.1	1.0	
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	$t \leq 10$ sec	R_{thJA}	29	35	$^\circ\text{C/W}$
	Steady State		67	80	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	13	16	

Notes

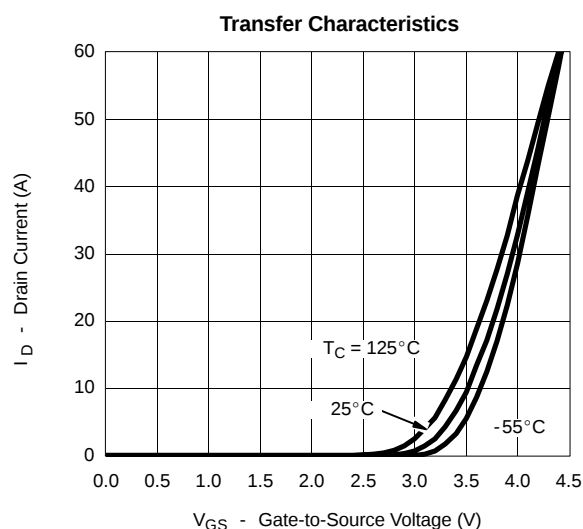
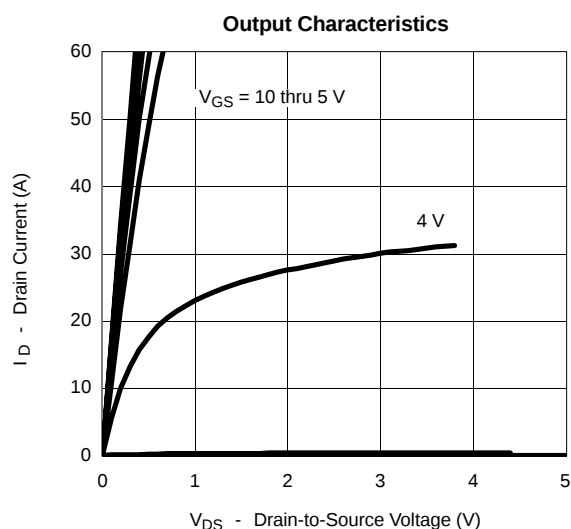
a. Surface Mounted on 1" x 1" FR4 Board.

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		-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}	$V_{DS} = -24\ \text{V}, V_{GS} = 0\ \text{V}$			-1	μA
		$V_{DS} = -24\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 70^\circ\text{C}$			-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	$r_{DS(on)}$	$V_{GS} = -10\ \text{V}, I_D = -17\ \text{A}$		0.006	0.0075	Ω
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\ \text{V}, I_D = -17\ \text{A}$		47		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -2.9\ \text{A}, V_{GS} = 0\ \text{V}$		-0.75	-1.1	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -15\ \text{V}, V_{GS} = -10\ \text{V}, I_D = -17\ \text{A}$		105	160	nC
Gate-Source Charge	Q_{gs}			17.5		
Gate-Drain Charge	Q_{gd}			29.5		
Gate Resistance	R_g		3	4	6.5	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\ \text{V}, R_L = 15\ \Omega$ $I_D \cong -1\ \text{A}, V_{GEN} = -10\ \text{V}, R_G = 6\ \Omega$		25	40	ns
Rise Time	t_r			15	25	
Turn-Off Delay Time	$t_{d(off)}$			190	285	
Fall Time	t_f			80	120	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = -2.9\ \text{A}, di/dt = 100\ \text{A}/\mu\text{s}$		70	110	

Notes

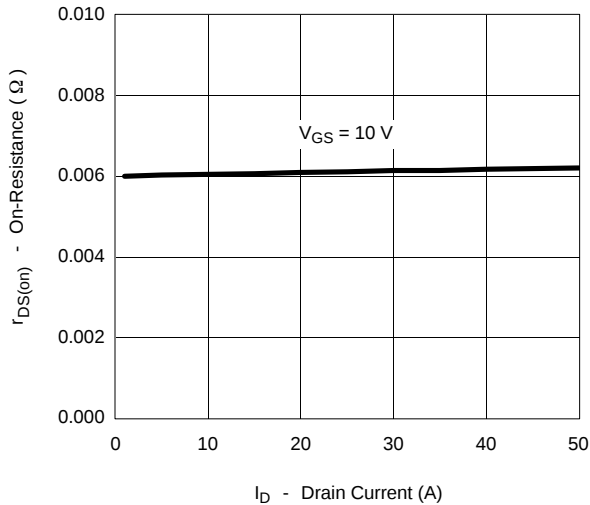
- a. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

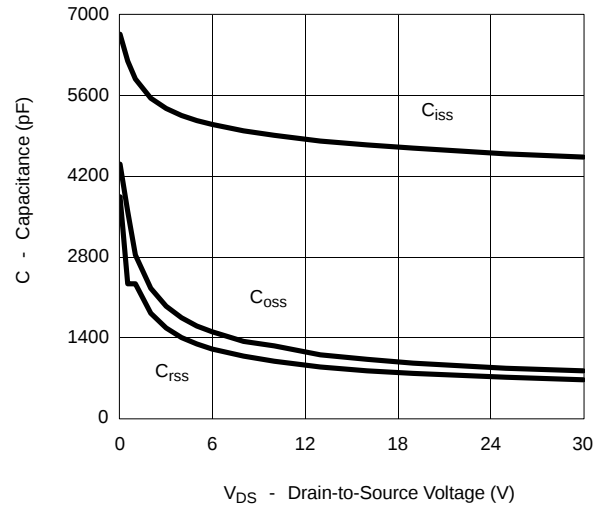


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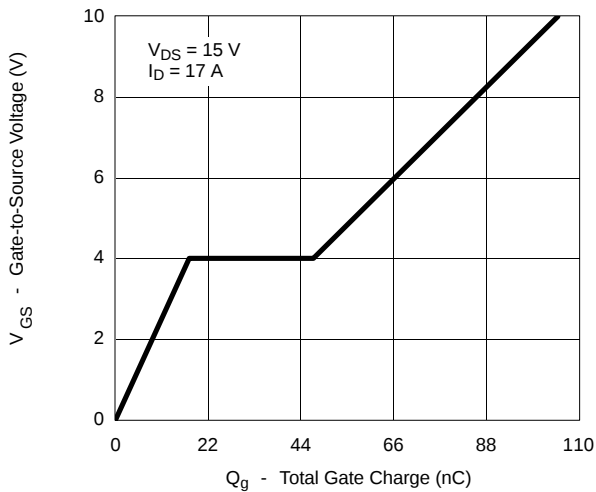
On-Resistance vs. Drain Current



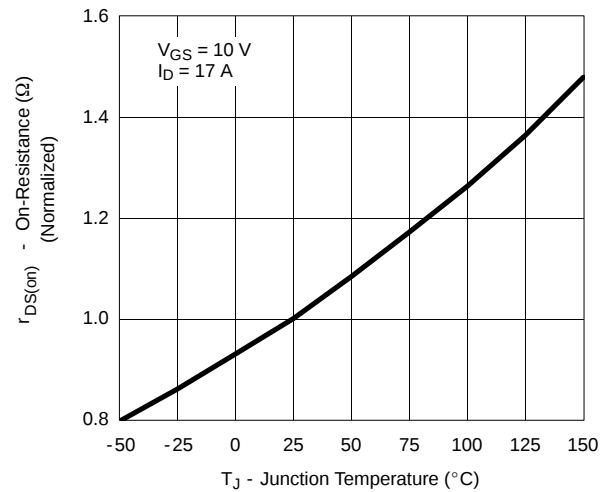
Capacitance



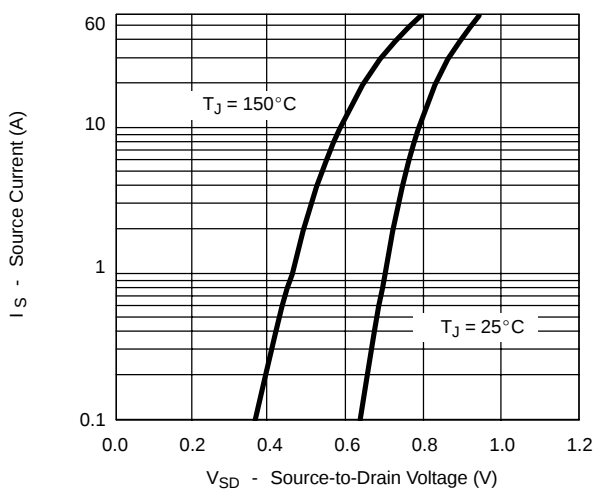
Gate Charge



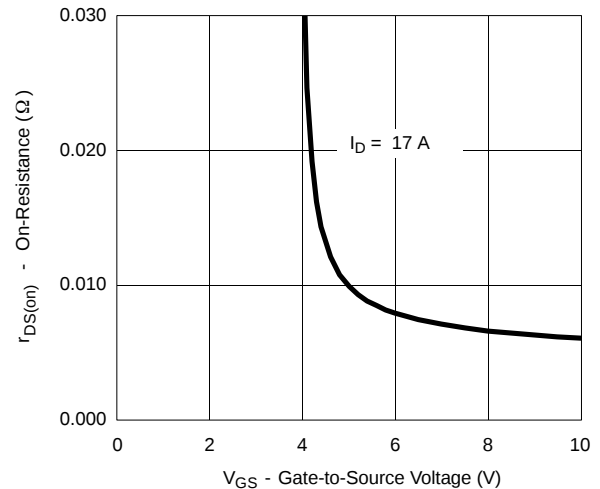
On-Resistance vs. Junction Temperature



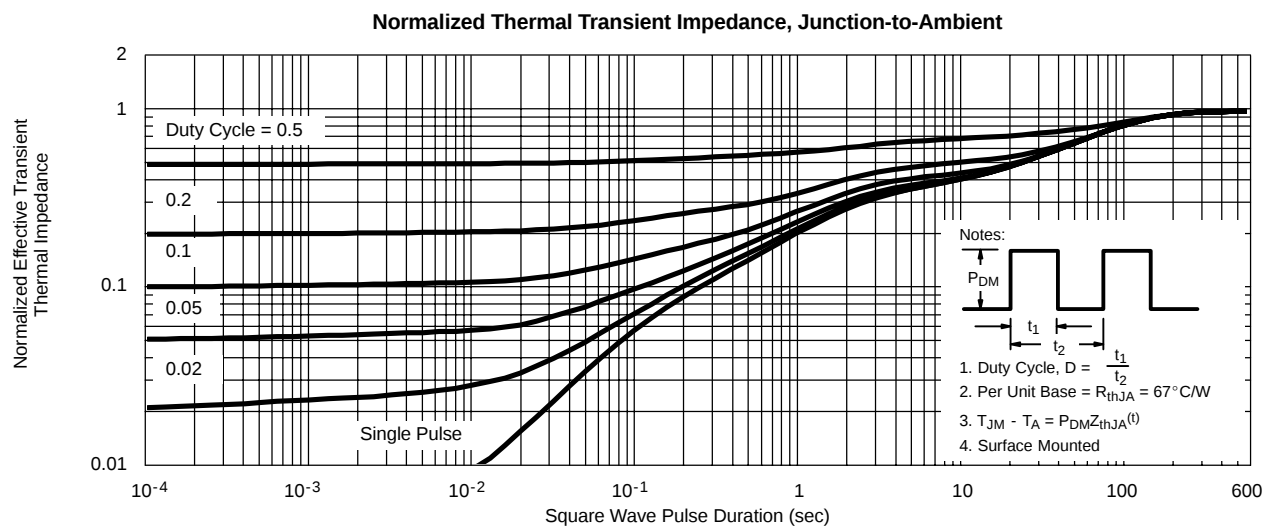
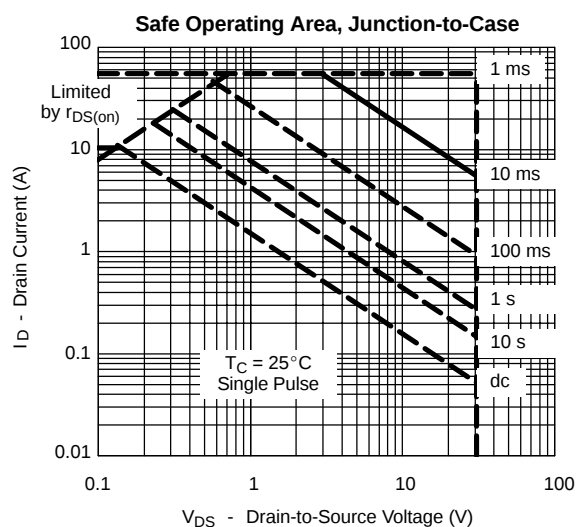
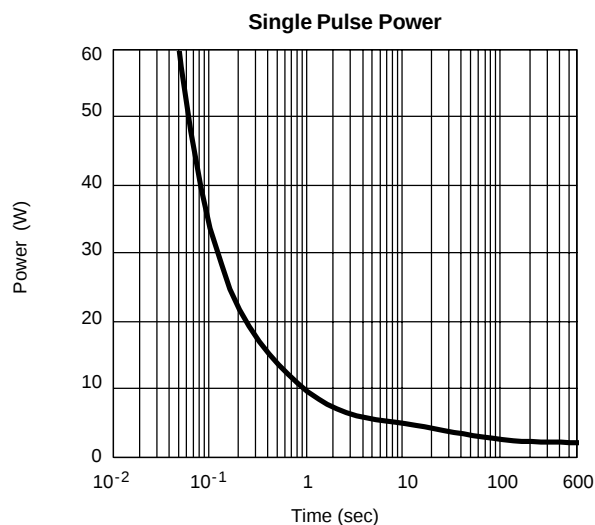
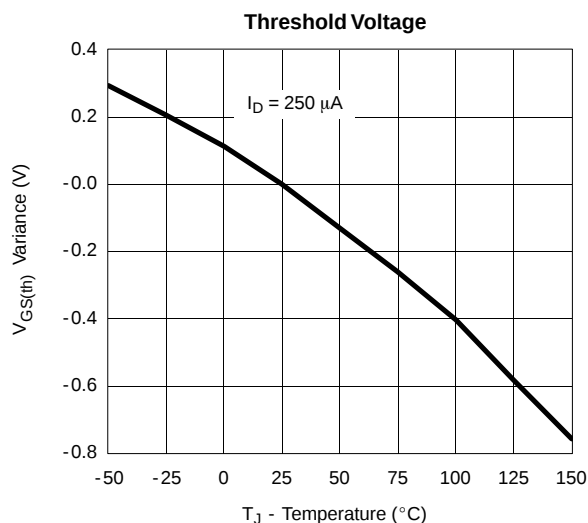
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)





TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

