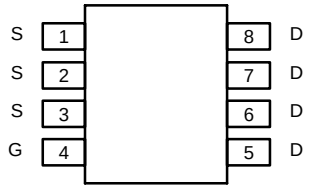
N-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.024 @ V_{GS} = 10 V	8.1
	0.033 @ V_{GS} = 4.5 V	6.9

FEATURES

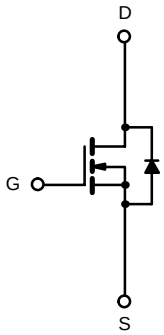
- TrenchFET® Power MOSFETS

SO-8



Top View

Ordering Information: Si9410BDY
Si9410BDY-T1 (with Tape and Reel)



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25°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	8.1	6.2	A
	T_A = 70°C		6.5	5.0	
Pulsed Drain Current (10 µs Pulse Width)		I_{DM}	30		
Continuous Source Current (Diode Conduction)[a]		I_S	2.1	1.2	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	2.5	1.5	W
	T_A = 70°C		1.6	0.9	
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}	40	50	°C/W
	Steady State		70	85	
Maximum Junction-to-Foot	Steady State	R_{thJF}	20	24	

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

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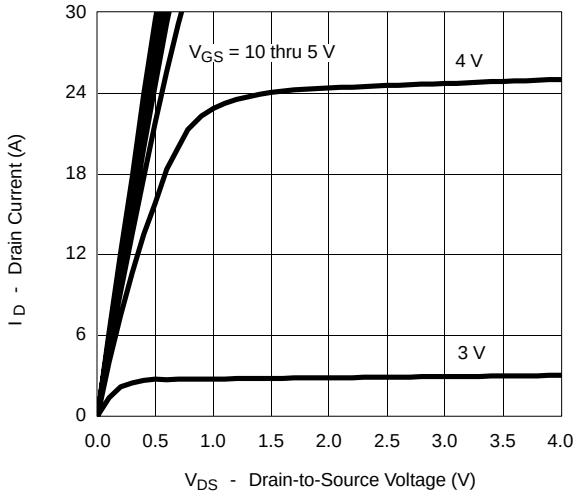
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250$ µA	1.0		3.0	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0$ V, $V_{GS} = \pm 20$ V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 24$ V, $V_{GS} = 0$ V			1	µA
		$V_{DS} = 24$ V, $V_{GS} = 0$ V, $T_J = 55$°C			5	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \geq 5$ V, $V_{GS} = 10$ V	30			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	$V_{GS} = 10$ V, $I_D = 8.1$ A		0.019	0.024	Ω
		$V_{GS} = 4.5$ V, $I_D = 6.9$ A		0.026	0.033	
Forward Transconductance[a]	g_{fs}	$V_{DS} = 15$ V, $I_D = 8.1$ A		20		S
Diode Forward Voltage[a]	V_{SD}	$I_S = 2.1$ A, $V_{GS} = 0$ V		0.8	1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	$V_{DS} = 15$ V, $V_{GS} = 10$ V, $I_D = 8.1$ A		15	23	nC
Gate-Source Charge	Q_{gs}			3.2		
Gate-Drain Charge	Q_{gd}			2.5		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15$ V, $R_L = 15$ Ω $I_D \cong 1$ A, $V_{GEN} = 10$ V, $R_G = 6$ Ω		10	15	ns
Rise Time	t_r			15	25	
Turn-Off Delay Time	$t_{d(off)}$			30	45	
Fall Time	t_f			11	20	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 2.1$ A, di/dt = 100 A/µs		25	50	

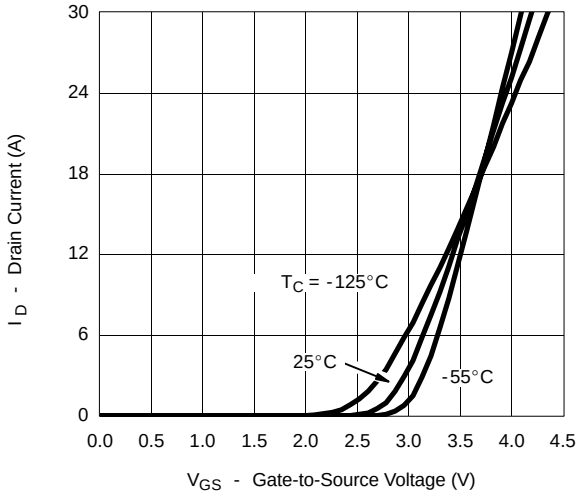
Notes
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Output Characteristics



Transfer Characteristics



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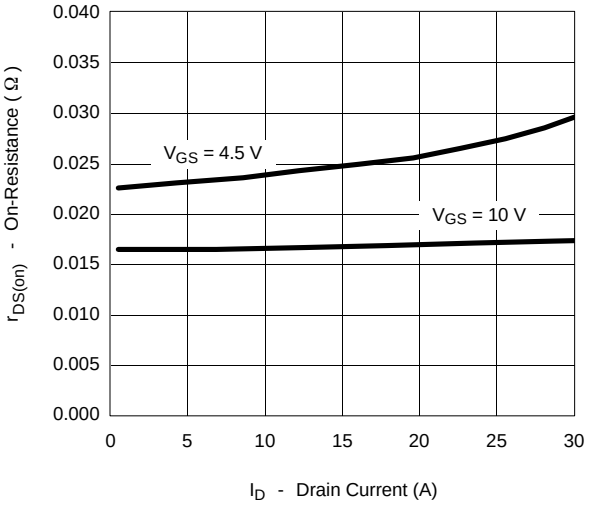
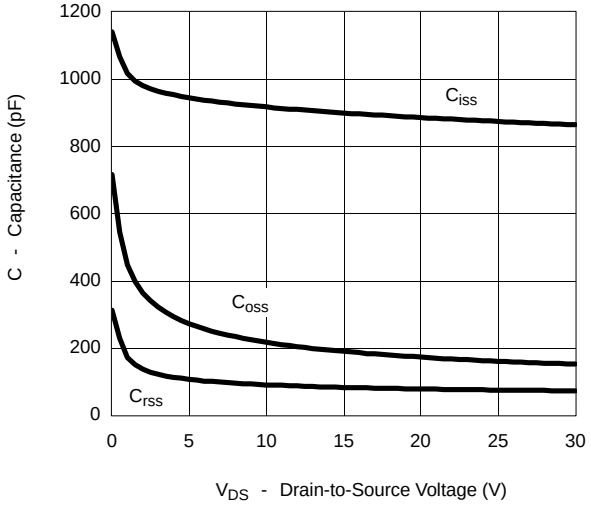
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

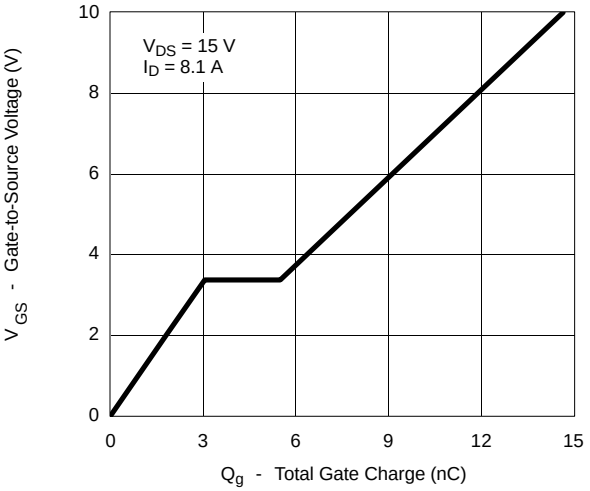
On-Resistance vs. Drain Current



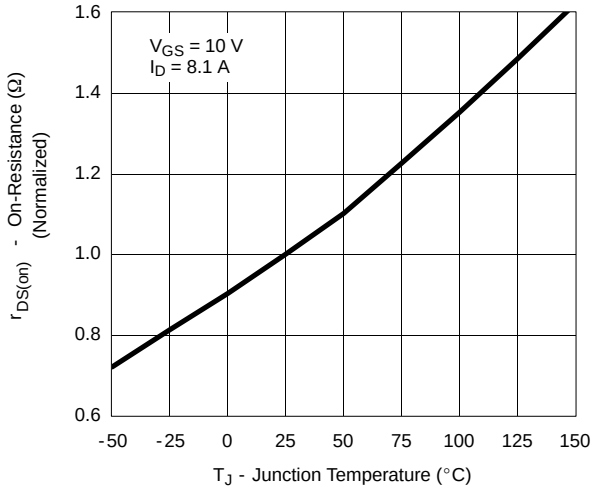
Capacitance



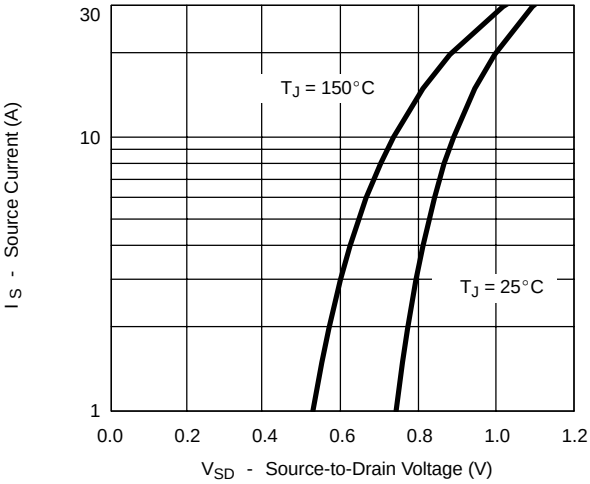
Gate Charge



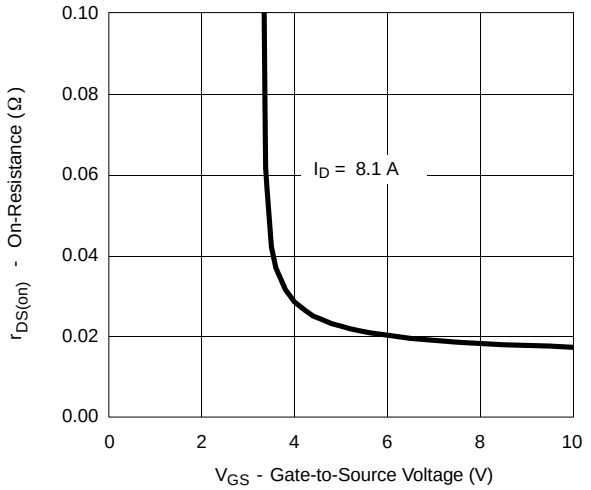
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



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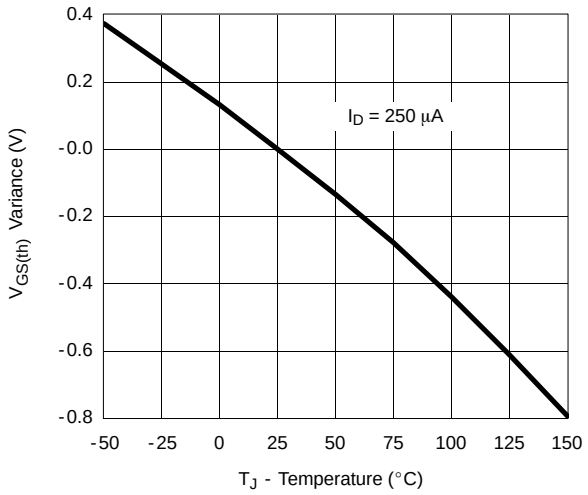
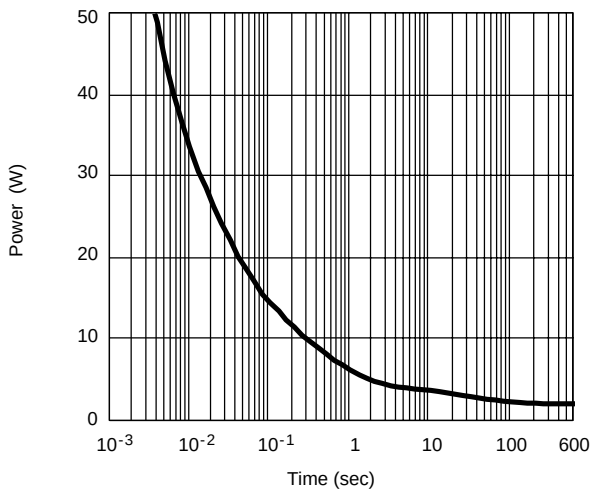
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

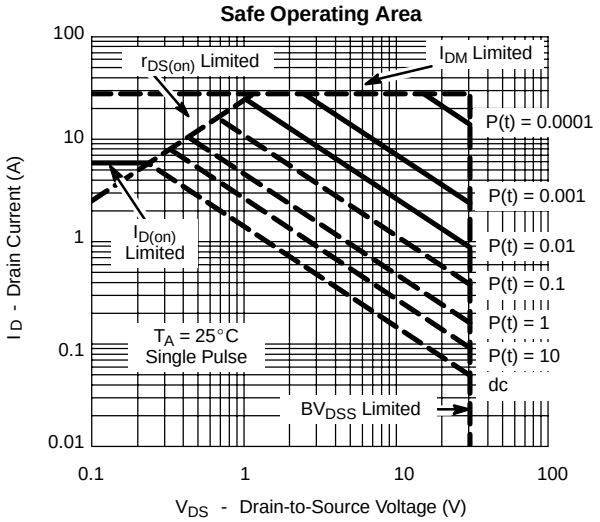
Threshold Voltage



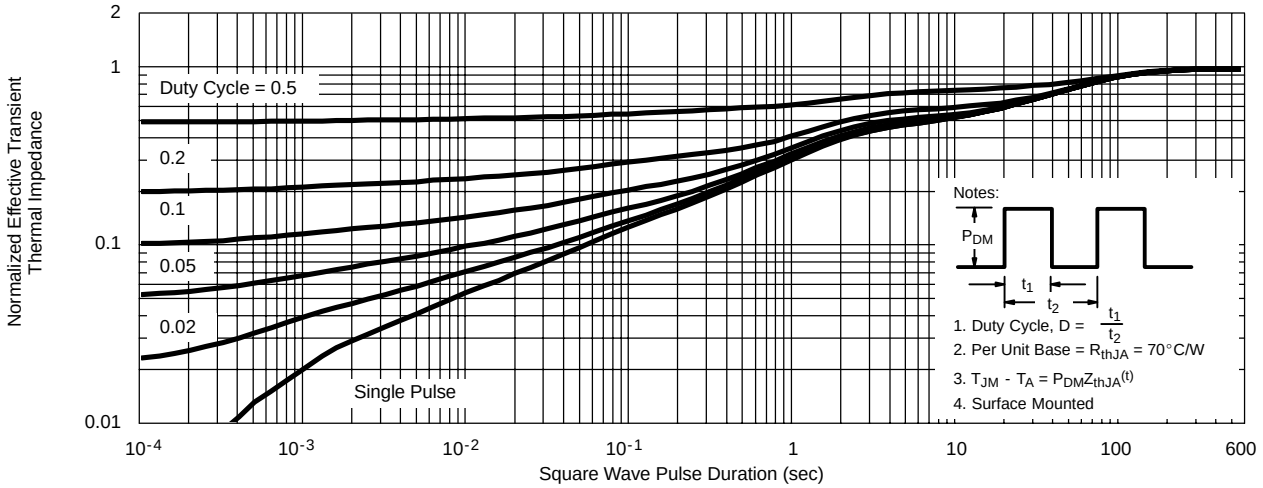
Single Pulse Power



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient



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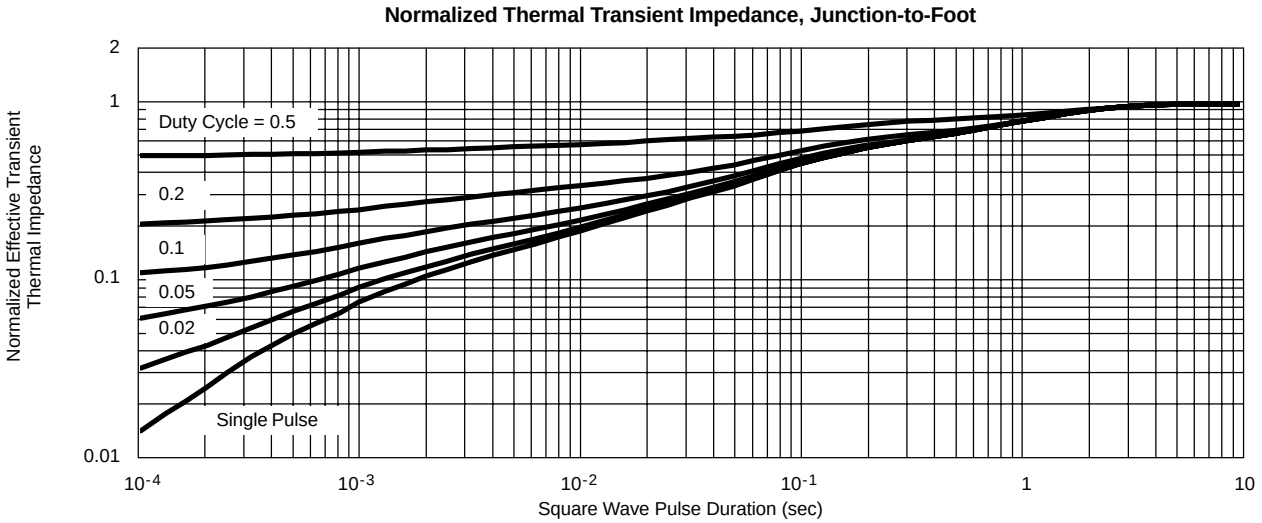
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



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