

N-Channel 40-V (D-S) MOSFET

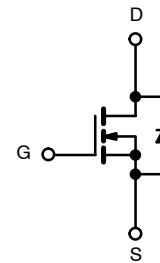
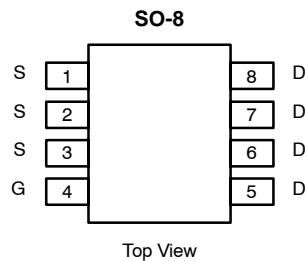
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
40	0.009 @ $V_{GS} = 10$ V	14
	0.012 @ $V_{GS} = 4.5$ V	12

FEATURES

- TrenchFET® Power MOSFET
- 100% R_g Tested



Pb-free
Available



Ordering Information: Si4840DY
Si4840DY-T1 (with Tape and Reel)
Si4840DY—E3 (Lead (Pb)-Free)
Si4840DY-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	Unit	
Drain-Source Voltage	V_{DS}	40		V	
Gate-Source Voltage	V_{GS}	± 20			
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	I_D	$T_A = 25^\circ\text{C}$	14	10	A
		$T_A = 70^\circ\text{C}$	11	8	
Pulsed Drain Current	I_{DM}	50			
Avalanche Current	I_{AS}	30			
Avalanche Energy (Single Pulse)	E_{AS}	L = 0.1 mH	45		mJ
Continuous Source Current (Diode Conduction) ^a			I_S	2.8	1.4
Maximum Power Dissipation ^a	P_D	$T_A = 25^\circ\text{C}$	3.1	1.56	W
		$T_A = 70^\circ\text{C}$	2.0	1.0	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150		$^\circ\text{C}$	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^a	R_{thJA}	$t \leq 10$ sec	33	40	$^\circ\text{C/W}$
		Steady State	65	80	
Maximum Junction-to-Foot (Drain)	R_{thJF}	17	21		

Notes

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



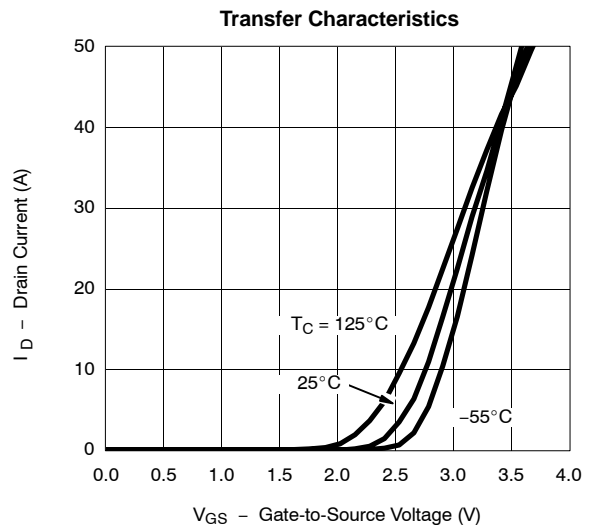
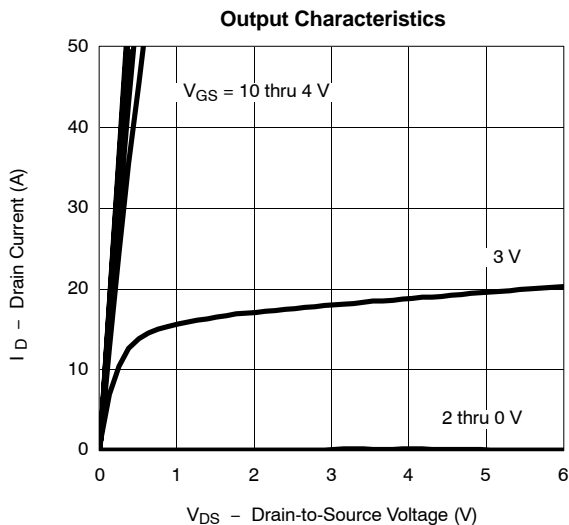
SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1.0		3.0	V
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 40 V, V _{GS} = 0 V			1	μA
		V _{DS} = 40 V, V _{GS} = 0 V, T _J = 55 °C			5	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 10 V	50			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 14 A		0.0075	0.009	Ω
		V _{GS} = 4.5 V, I _D = 12 A		0.0095	0.012	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 14 A		50		S
Diode Forward Voltage ^a	V _{SD}	I _S = 2.8 A, V _{GS} = 0 V		0.75	1.1	V
Dynamic^b						
Total Gate Charge	Q _g	V _{DS} = 20 V, V _{GS} = 5 V, I _D = 14 A		18.5	28	nC
Gate-Source Charge	Q _{gs}			6		
Gate-Drain Charge	Q _{gd}			7.5		
Gate Resistance	R _g		0.2	0.8	1.2	Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = 20 V, R _L = 20 Ω I _D ≅ 1 A, V _{GEN} = 10 V, R _G = 6 Ω		15	30	ns
Rise Time	t _r			10	20	
Turn-Off Delay Time	t _{d(off)}			50	100	
Fall Time	t _f			20	40	
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 2.8 A, di/dt = 100 A/μs		30	60	

Notes

- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 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.

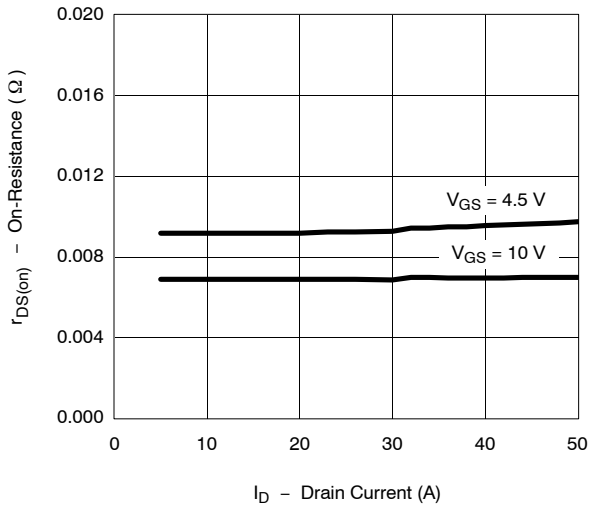
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



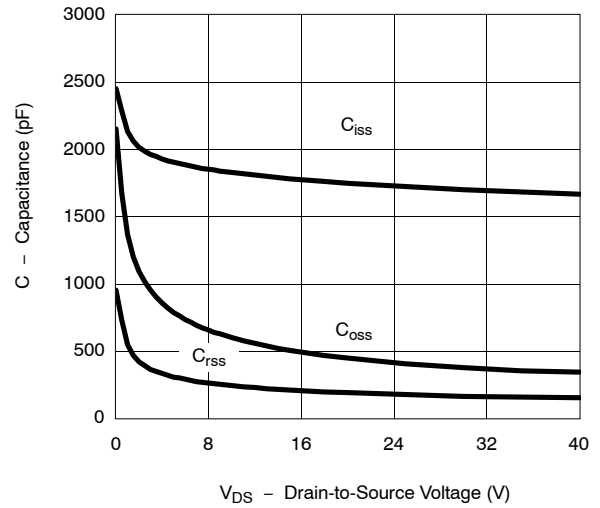


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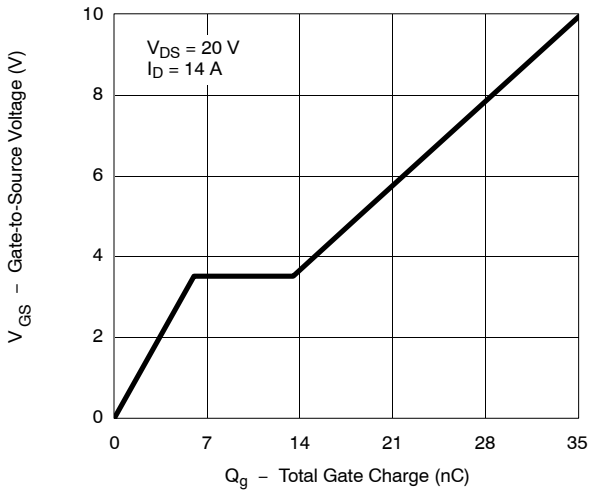
On-Resistance vs. Drain Current



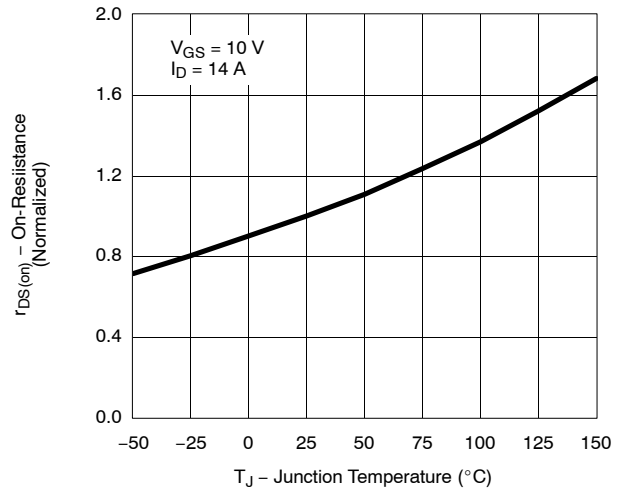
Capacitance



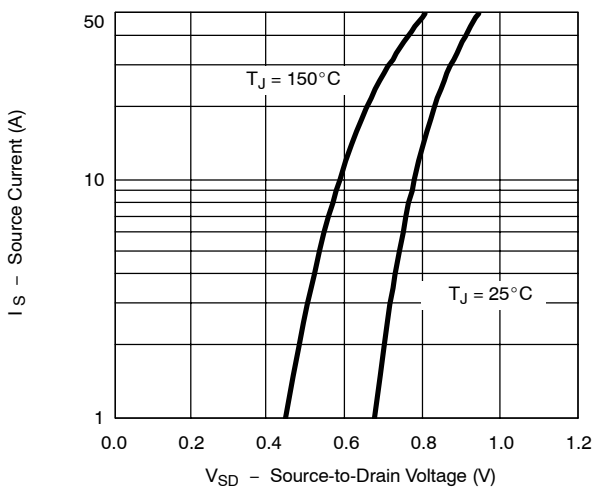
Gate Charge



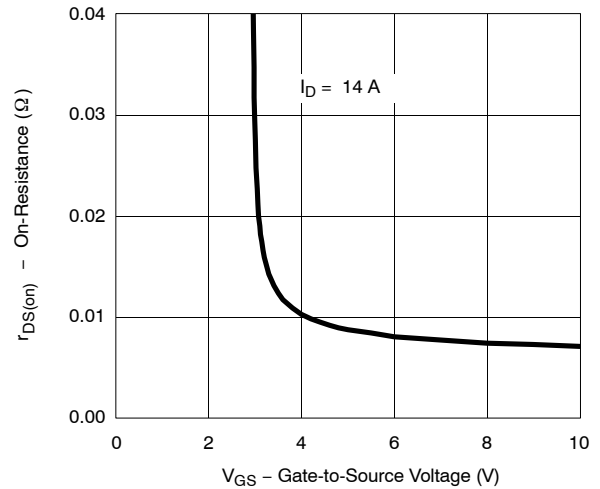
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

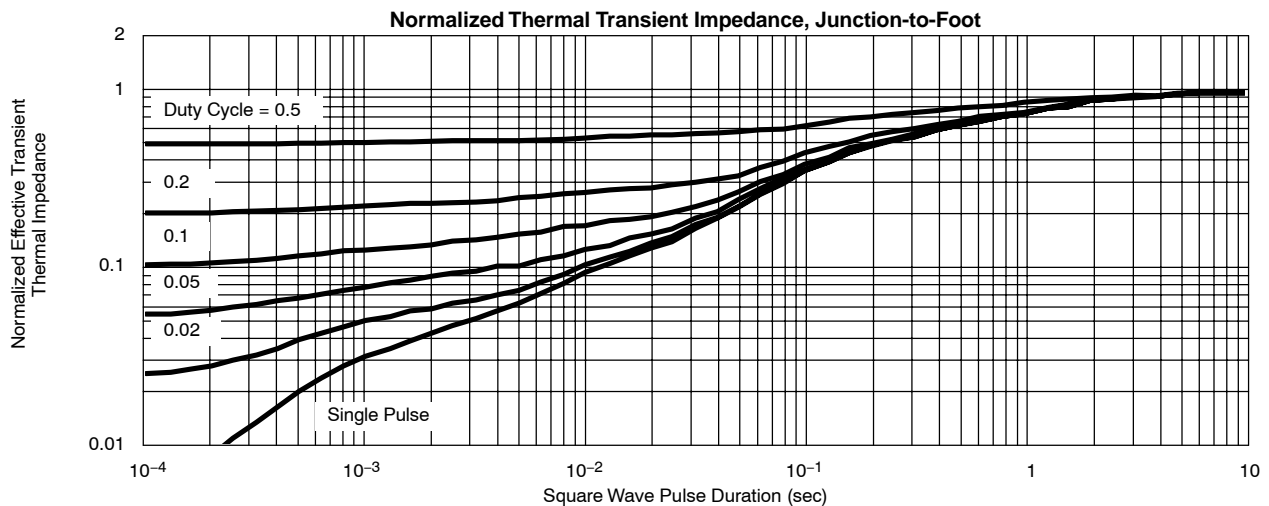
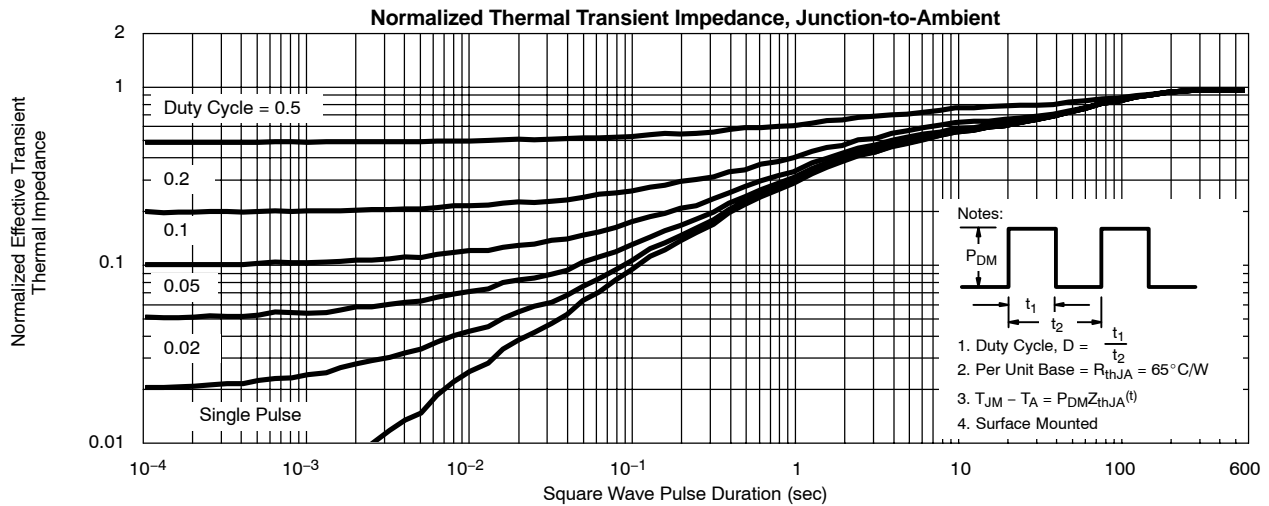
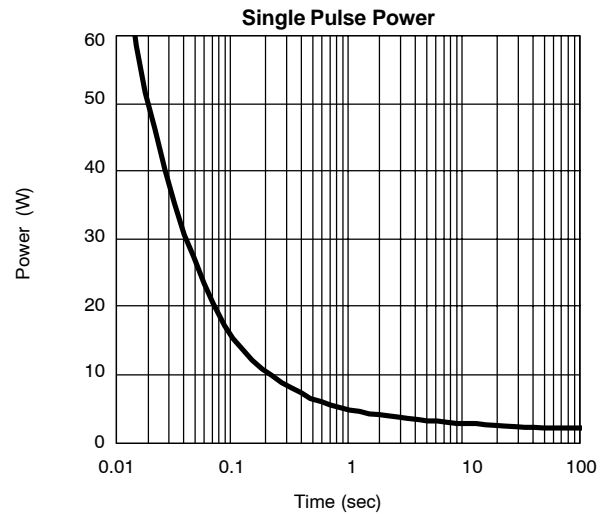
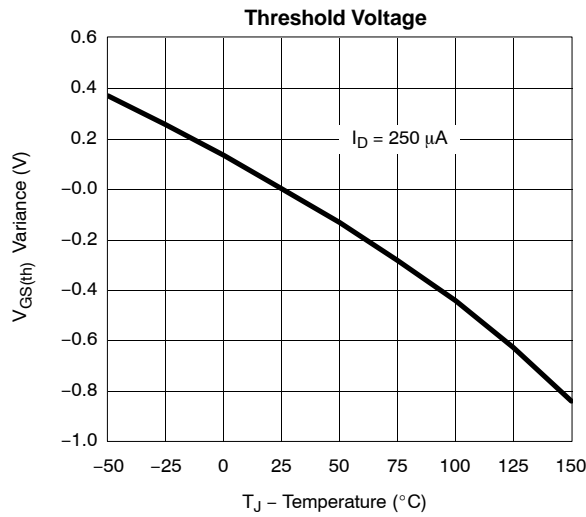


On-Resistance vs. Gate-to-Source Voltage





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