

N-Channel 250-V (D-S) MOSFET

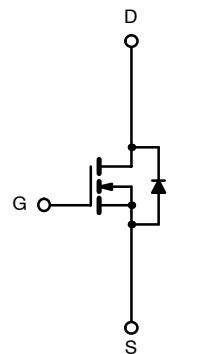
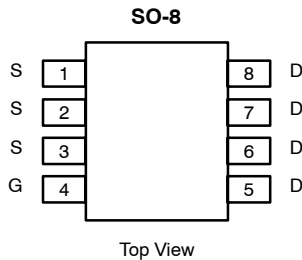
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
250	0.155 @ $V_{GS} = 10$ V	3.0
	0.162 @ $V_{GS} = 6.0$ V	2.9

FEATURES

- PWM-Optimized TrenchFET® Power MOSFET
- 100% R_g Tested
- Avalanche Tested

APPLICATIONS

- Primary Side Switch In:
 - Telecom Power Supplies
 - Distributed Power Architectures
 - Miniature Power Modules



Ordering Information: Si4434DY—E3
Si4434DY-T1—E3 (with Tape and Reel)

N-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}	250		V	
Gate-Source Voltage	V_{GS}	± 20			
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	I_D	$T_A = 25^\circ\text{C}$	3.0	2.1	A
		$T_A = 70^\circ\text{C}$	2.4	1.7	
Pulsed Drain Current	I_{DM}	30			
Continuous Source Current (Diode Conduction) ^a	I_S	2.6	1.3		
Avalanche Current	I_{AS}	13			
Single Pulse Avalanche Energy	E_{AS}	8.4		mJ	
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	$^\circ\text{C}/\text{W}$
		Steady State	65	80	
Maximum Junction-to-Foot (Drain)	R_{thJF}	17	21		

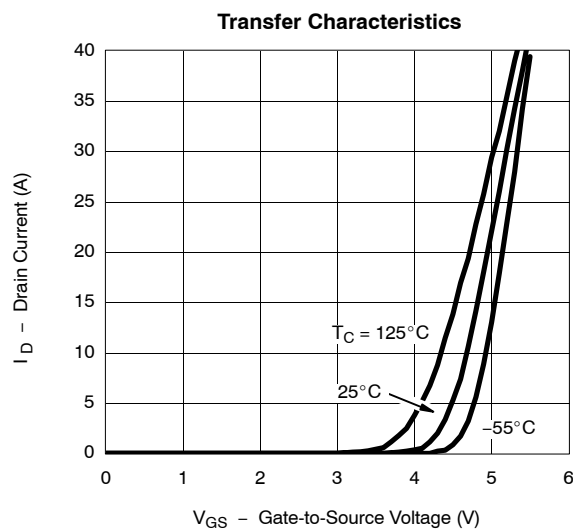
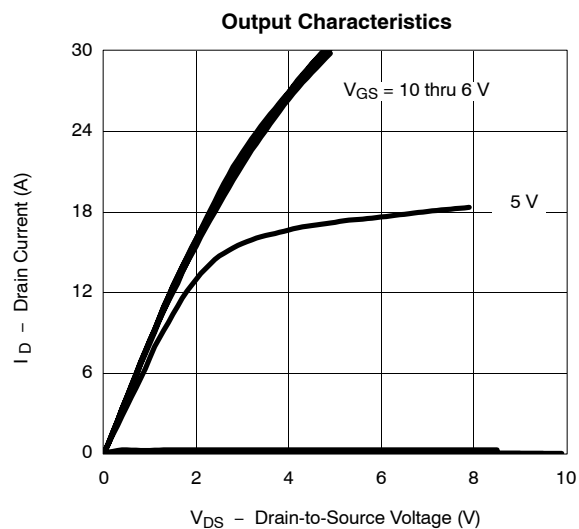
Notes
a. Surface Mounted on 1" x 1" FR4 Board.

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	2.0		4.0	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} = 250 V, V _{GS} = 0 V			1	μA
		V _{DS} = 250 V, V _{GS} = 0 V, T _J = 55 °C			15	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 10 V, V _{GS} = 10 V	20			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 3.0 A		0.129	0.155	Ω
		V _{GS} = 6.0 V, I _D = 2.9 A		0.131	0.162	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 3.0 A		14		S
Diode Forward Voltage ^a	V _{SD}	I _S = 2.8 A, V _{GS} = 0 V		0.75	1.2	V
Dynamic^b						
Total Gate Charge	Q _g	V _{DS} = 100 V, V _{GS} = 10 V, I _D = 3.0 A		34	50	nC
Gate-Source Charge	Q _{gs}			6.8		
Gate-Drain Charge	Q _{gd}			10.5		
Gate Resistance	R _g		0.6	1.2	1.8	Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = 100 V, R _L = 25 Ω I _D ≈ 4.0 A, V _{GEN} = 10 V, R _g = 6 Ω		16	25	ns
Rise Time	t _r			23	35	
Turn-Off Delay Time	t _{d(off)}			47	70	
Fall Time	t _f			19	30	
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 2.8 A, di/dt = 100 A/μs		100	150	

Notes

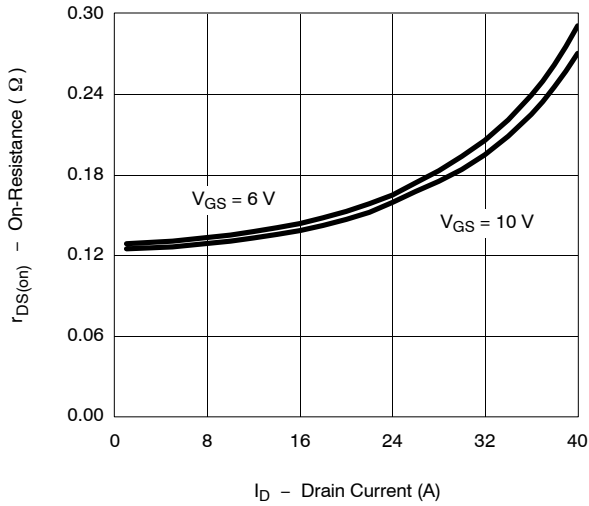
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

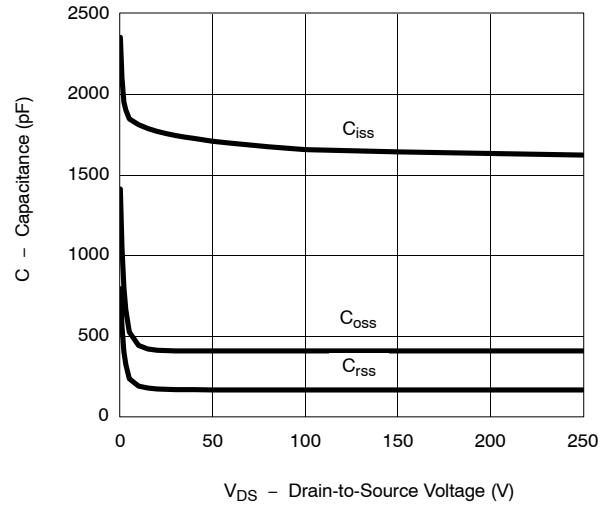


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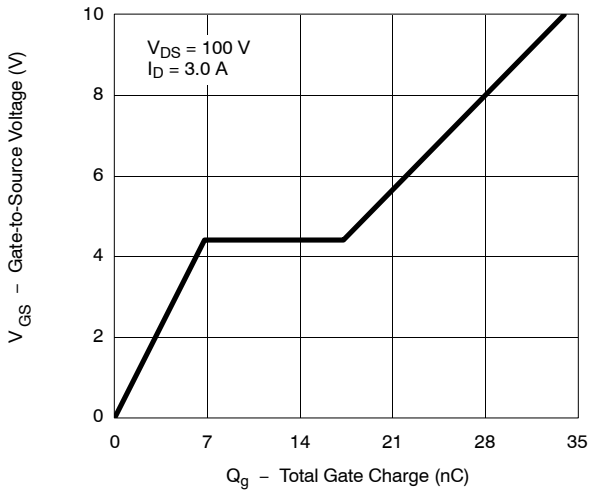
On-Resistance vs. Drain Current



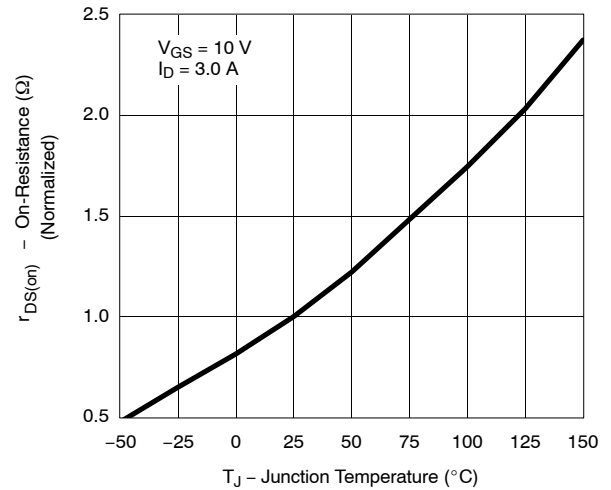
Capacitance



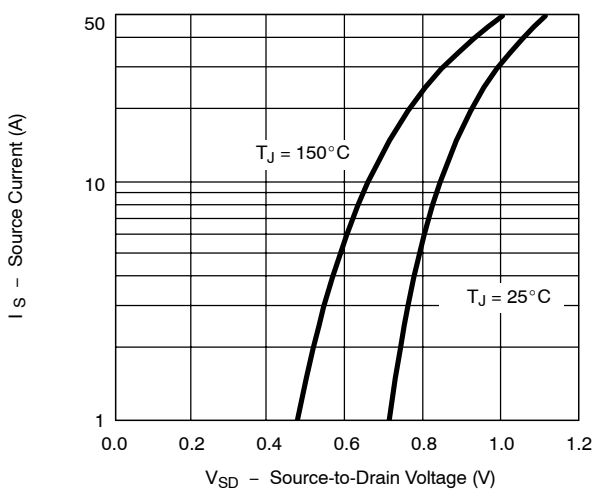
Gate Charge



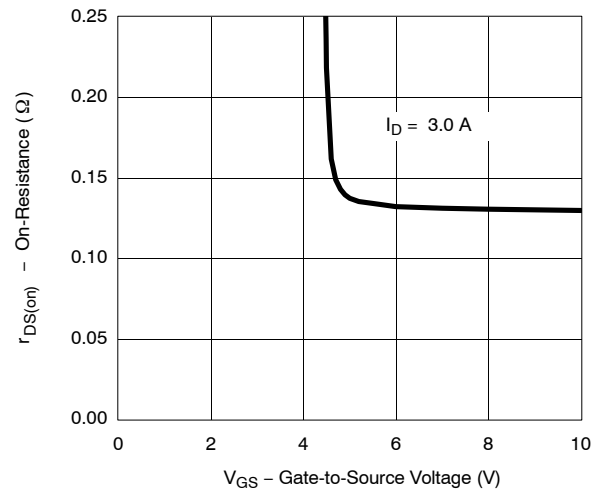
On-Resistance vs. Junction Temperature



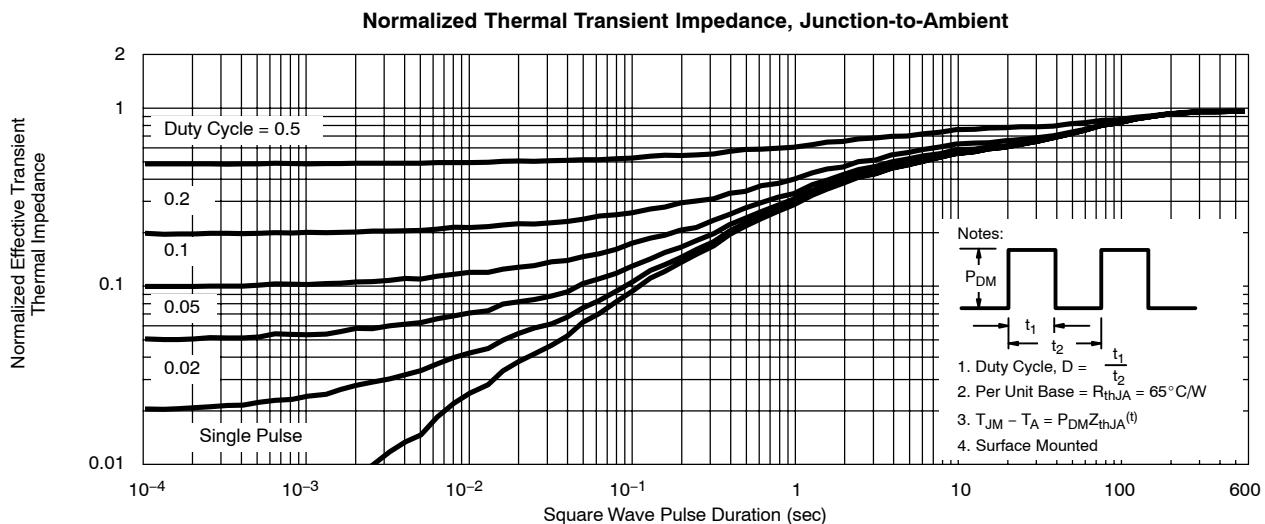
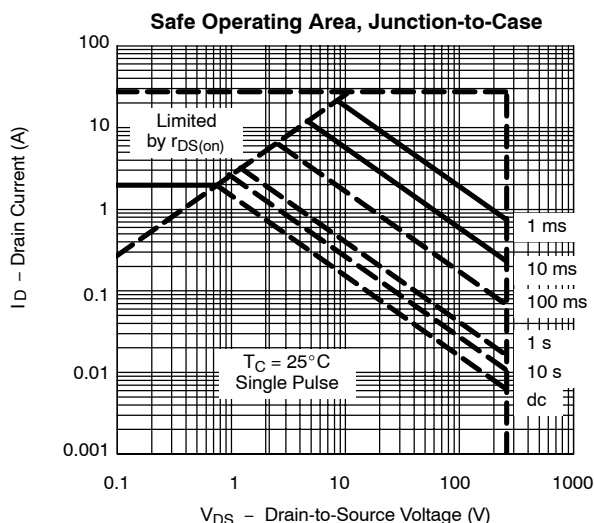
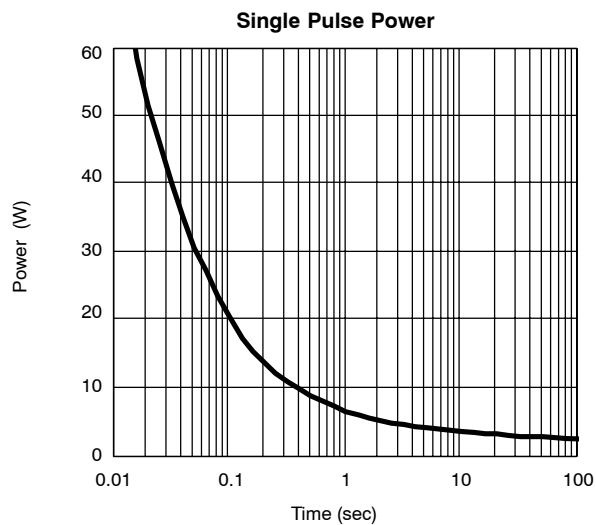
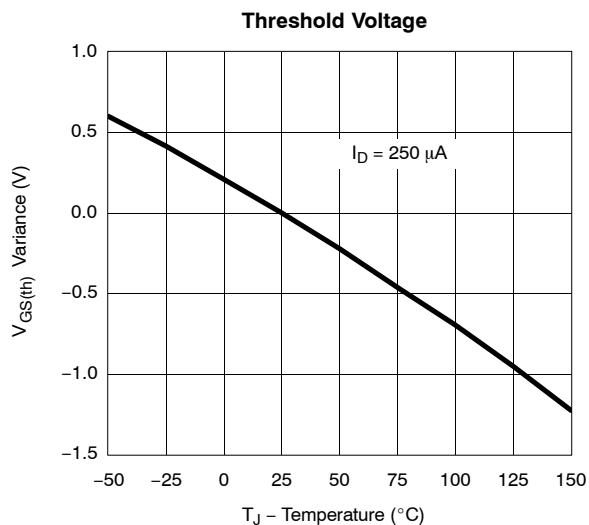
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)





TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

