

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

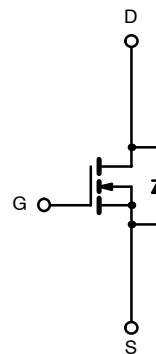
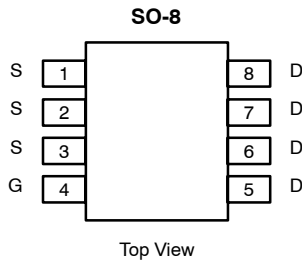
PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
250	0.155 @ $V_{GS} = 10$ V	3.0
	0.162 @ $V_{GS} = 6.0$ V	2.9

### 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	$V_{GS}$	$\pm 20$			
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	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) <sup>a</sup>	$I_S$	2.6	1.3		
Avalanche Current	$I_{AS}$	13			
Single Pulse Avalanche Energy	$E_{AS}$	8.4		mJ	
Maximum Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	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 <sup>a</sup>	$R_{thJA}$	$t \leq 10$ sec	33	40	$^\circ\text{C}/\text{W}$
		Steady State	65	80	
Maximum Junction-to-Foot (Drain)	$R_{thJF}$	17	21		

Notes

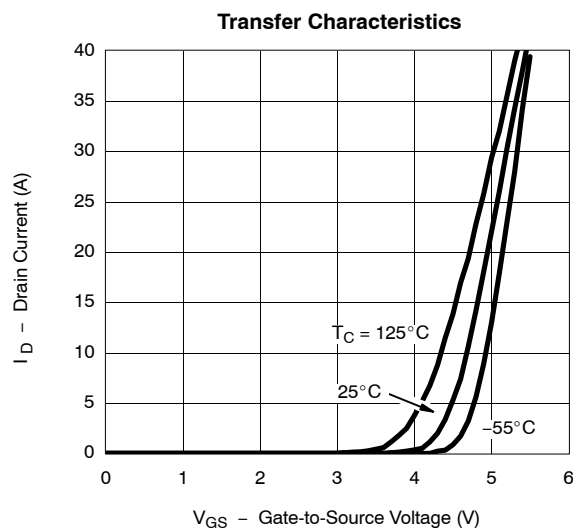
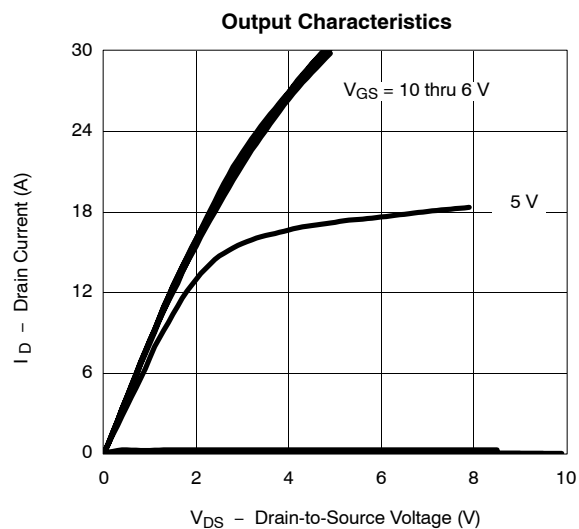
a. Surface Mounted on 1" x 1" FR4 Board.

**SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	2.0		4.0	V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 250 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 250 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C			15	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 10 V, V <sub>GS</sub> = 10 V	20			A
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 3.0 A		0.129	0.155	Ω
		V <sub>GS</sub> = 6.0 V, I <sub>D</sub> = 2.9 A		0.131	0.162	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 3.0 A		14		S
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = 2.8 A, V <sub>GS</sub> = 0 V		0.75	1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 100 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 3.0 A		34	50	nC
Gate-Source Charge	Q <sub>gs</sub>			6.8		
Gate-Drain Charge	Q <sub>gd</sub>			10.5		
Gate Resistance	R <sub>g</sub>		0.6	1.2	1.8	Ω
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 100 V, R <sub>L</sub> = 25 Ω I <sub>D</sub> = 4.0 A, V <sub>GEN</sub> = 10 V, R <sub>g</sub> = 6 Ω		16	25	ns
Rise Time	t <sub>r</sub>			23	35	
Turn-Off Delay Time	t <sub>d(off)</sub>			47	70	
Fall Time	t <sub>f</sub>			19	30	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 2.8 A, di/dt = 100 A/μs		100	150	

## Notes

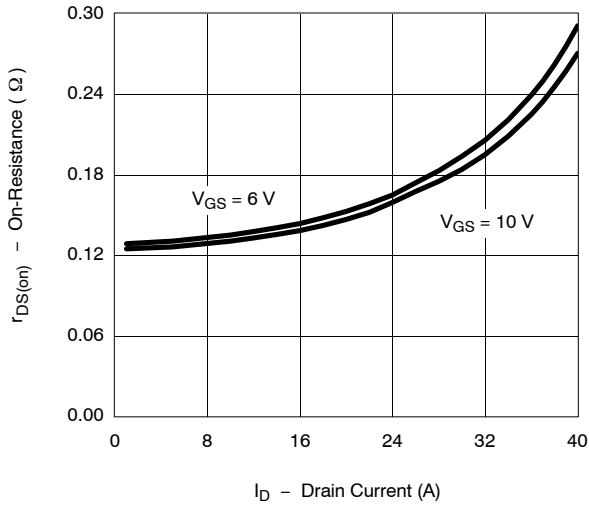
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.  
b. Guaranteed by design, not subject to production testing.

**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**

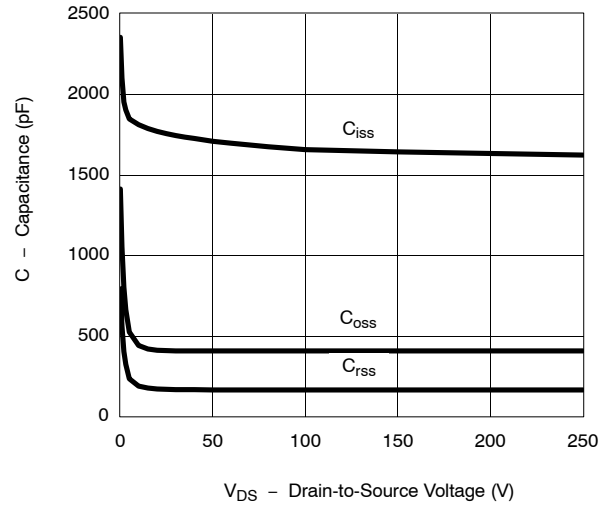


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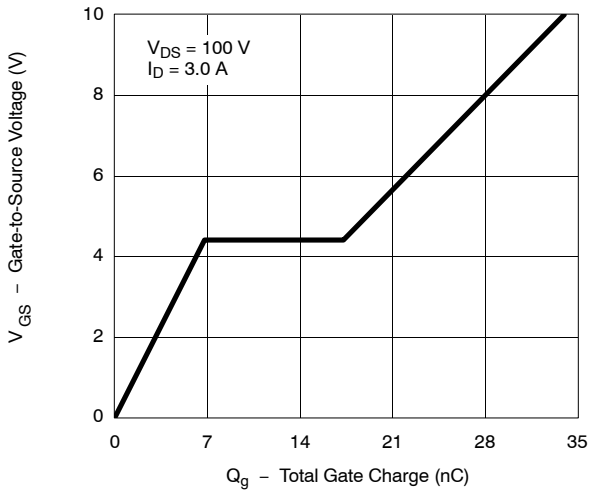
On-Resistance vs. Drain Current



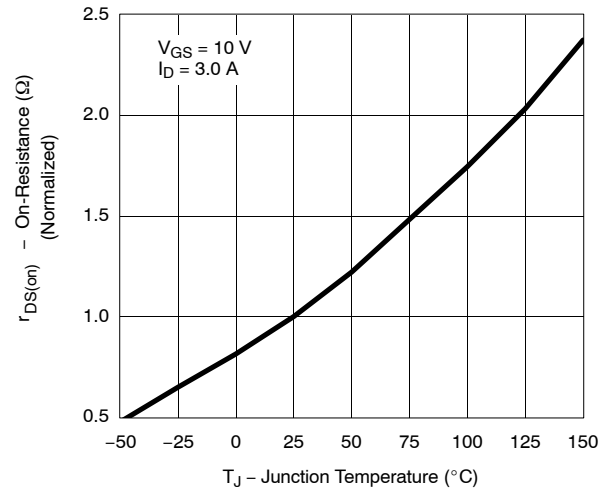
Capacitance



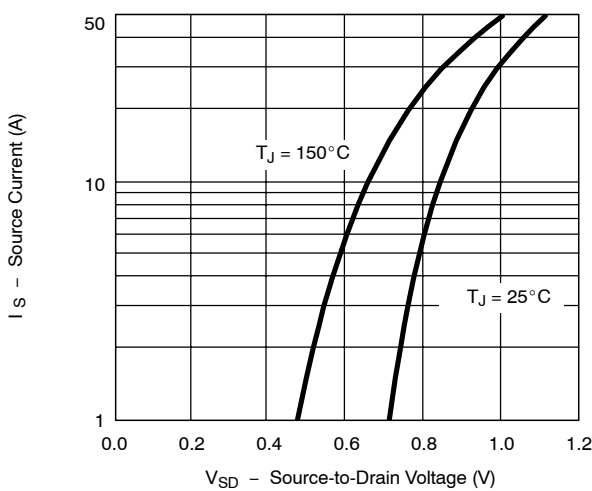
Gate Charge



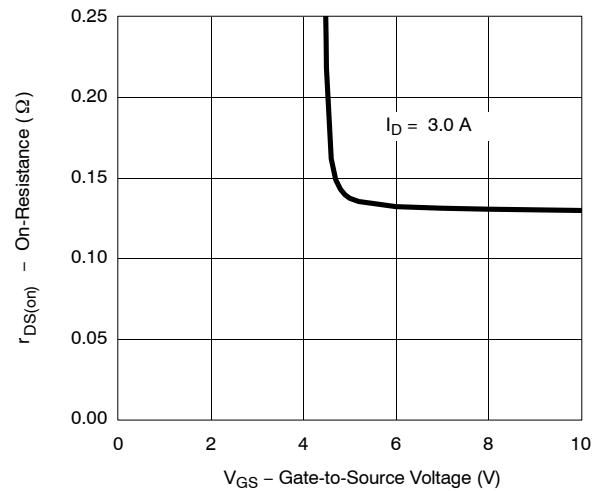
On-Resistance vs. Junction Temperature



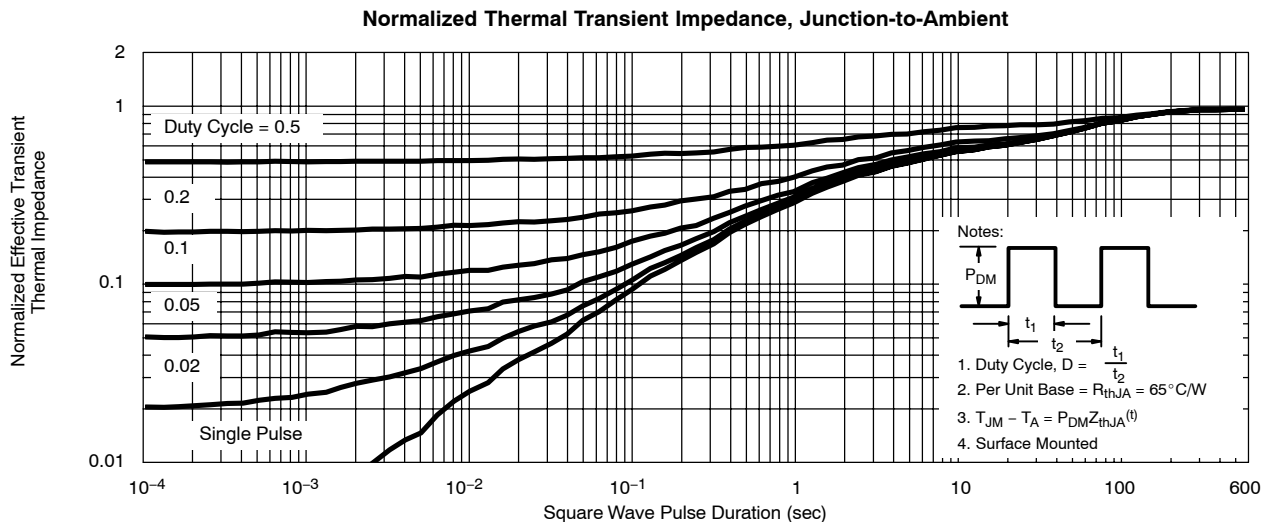
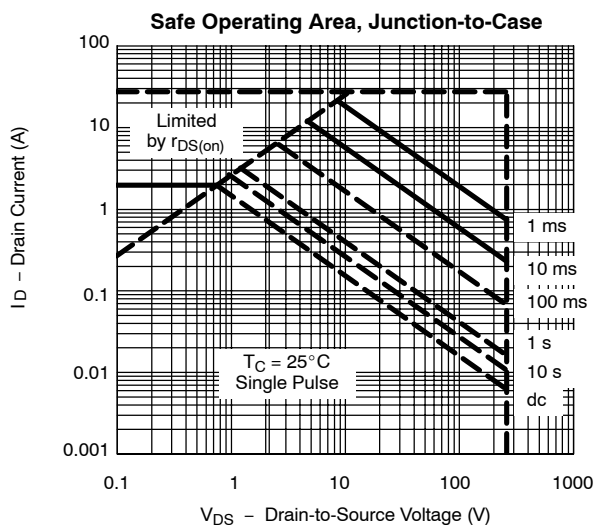
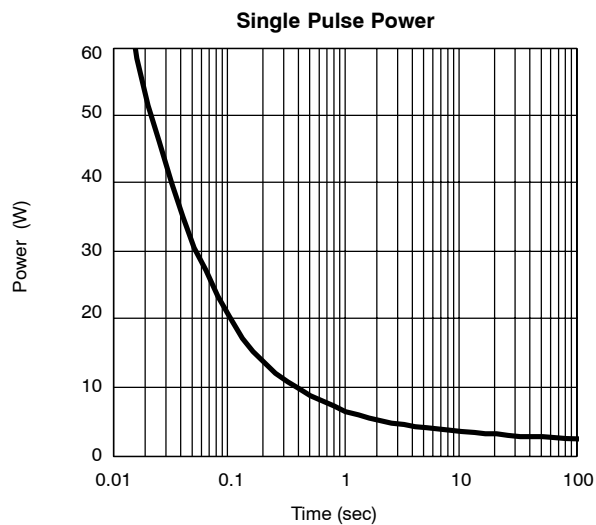
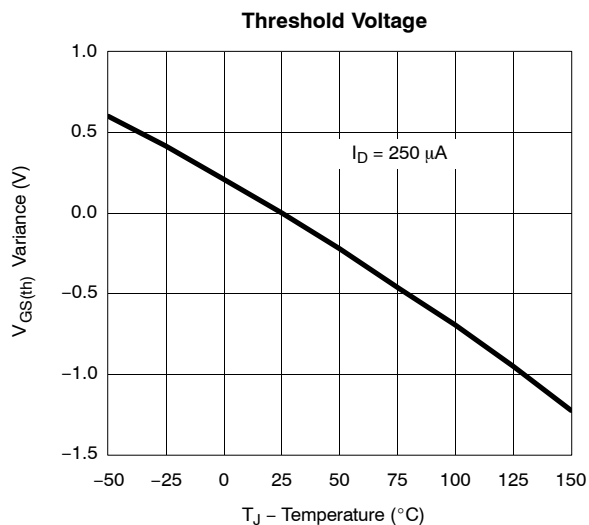
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**





**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

