



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

PRODUCT SUMMARY		
V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A)
250	0.155 at V _{GS} = 10 V	3.0
	0.162 at V _{GS} = 6.0 V	2.9

FEATURES

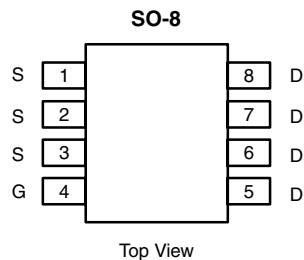
- PWM-Optimized TrenchFET[®] Power MOSFET
- 100 % R_G Tested
- Avalanche Tested



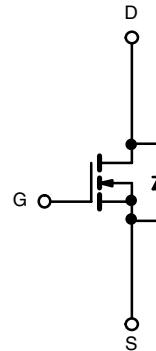
RoHS
COMPLIANT

APPLICATIONS

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



Ordering Information: Si4434DY-T1-E3 (Lead (Pb)-free)



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T _A = 25 °C, unless otherwise noted					
Parameter	Symbol	10 sec	Steady State	Unit	
Drain-Source Voltage	V _{DS}	250		V	
Gate-Source Voltage	V _{GS}	± 20			
Continuous Drain Current (T _J = 150 °C) ^a	I _D	T _A = 25 °C	3.0	2.1	A
		T _A = 70 °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		mJ	
Single Pulse Avalanche Energy		E _{AS}	8.4		
Maximum Power Dissipation ^a	P _D	T _A = 25 °C	3.1	1.56	W
		T _A = 70 °C	2.0	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	R _{thJA}	t ≤ 10 sec	33	40	°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.



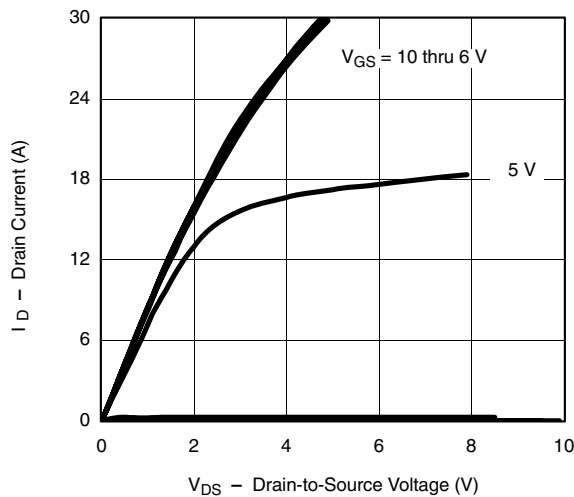
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2.0		4.0	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 250\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 250\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			15	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 10\text{ V}, V_{GS} = 10\text{ V}$	20			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 3.0\text{ A}$		0.129	0.155	Ω
		$V_{GS} = 6.0\text{ V}, I_D = 2.9\text{ A}$		0.131	0.162	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 3.0\text{ A}$		14		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 2.8\text{ A}, V_{GS} = 0\text{ V}$		0.75	1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 100\text{ V}, V_{GS} = 10\text{ V}, I_D = 3.0\text{ A}$		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	$t_{d(on)}$	$V_{DD} = 100\text{ V}, R_L = 25\text{ }\Omega$ $I_D \cong 4.0\text{ A}, V_{GEN} = 10\text{ V}, R_g = 6\text{ }\Omega$		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}	$I_F = 2.8\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		100	150	

Notes:

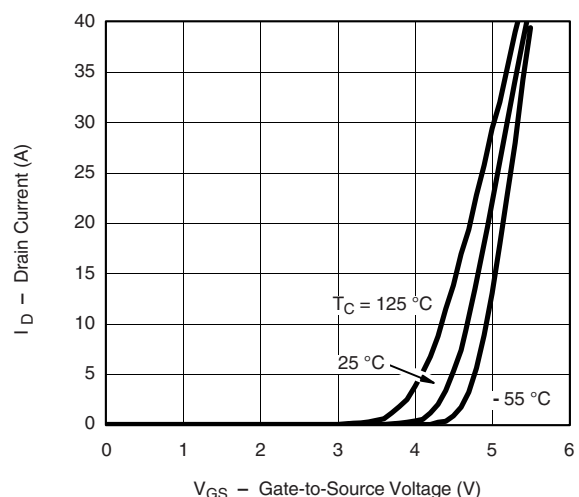
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- b. Guaranteed by design, not subject to production testing.

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 $25\text{ }^\circ\text{C}$, unless otherwise noted



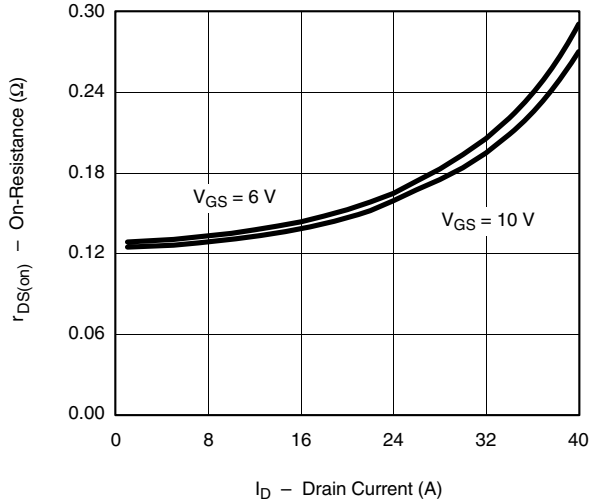
Output Characteristics



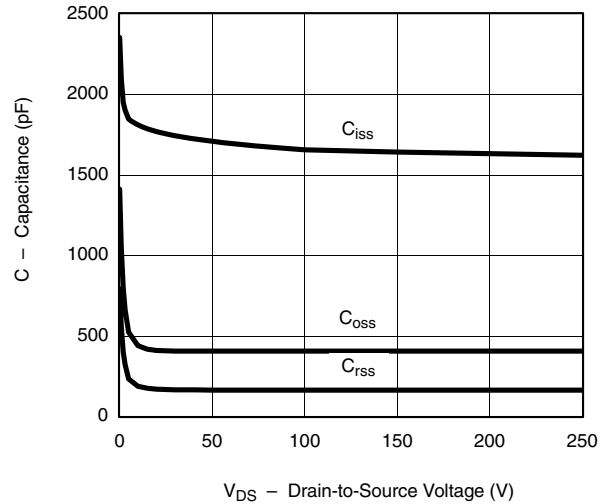
Transfer Characteristics



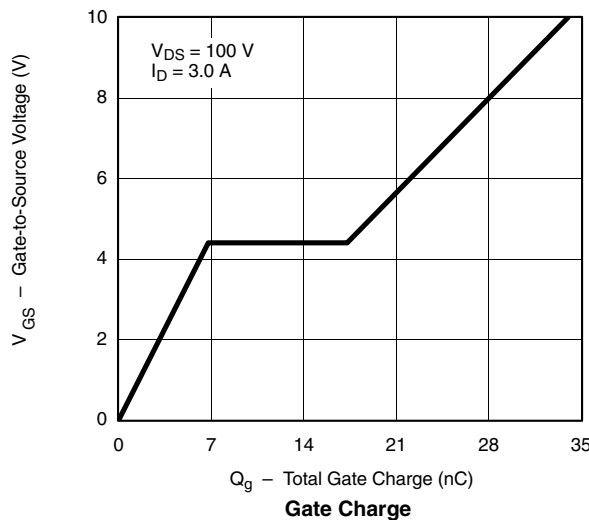
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



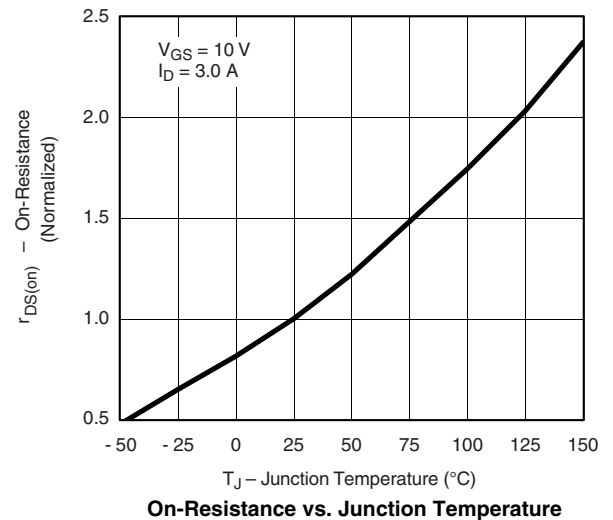
On-Resistance vs. Drain Current



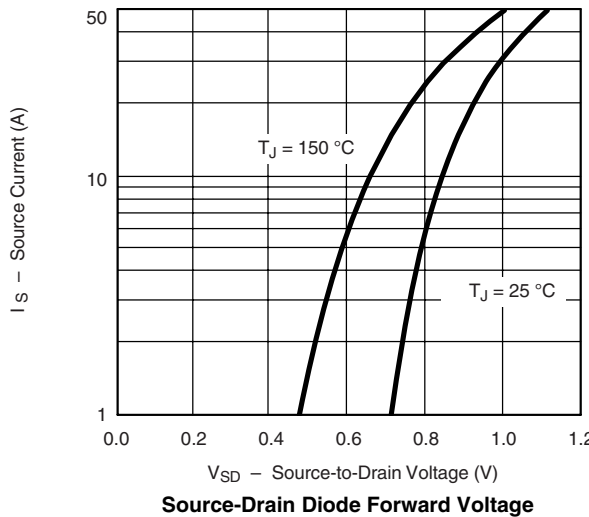
Capacitance



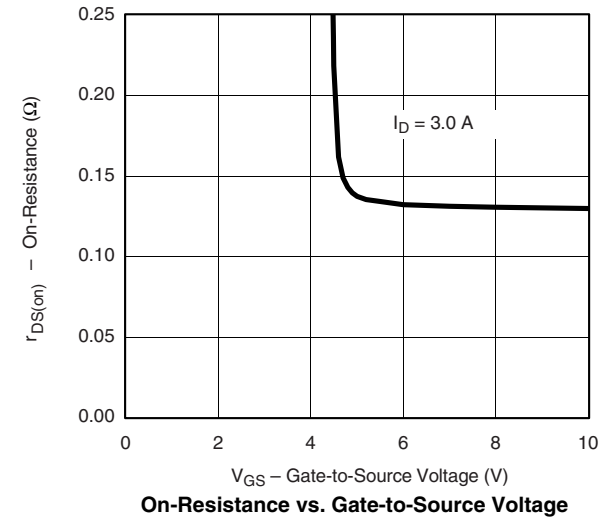
Gate Charge



On-Resistance vs. Junction Temperature



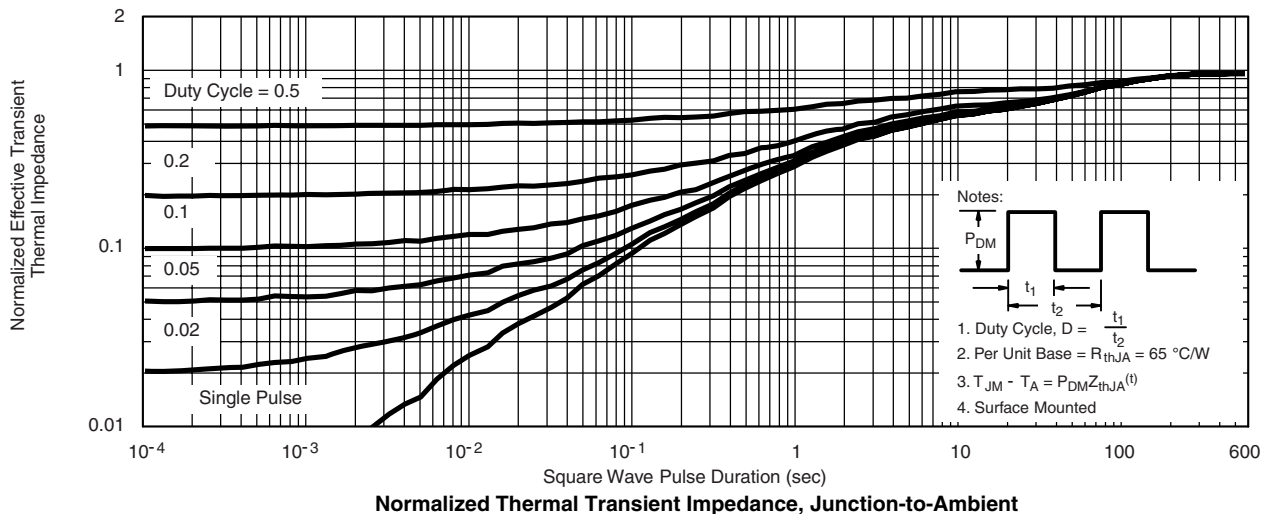
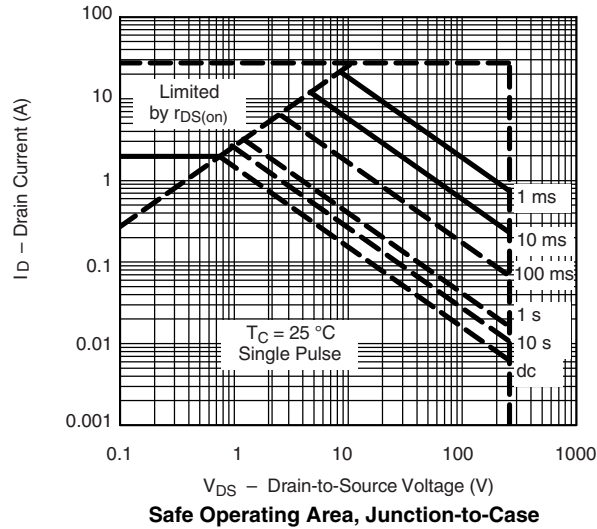
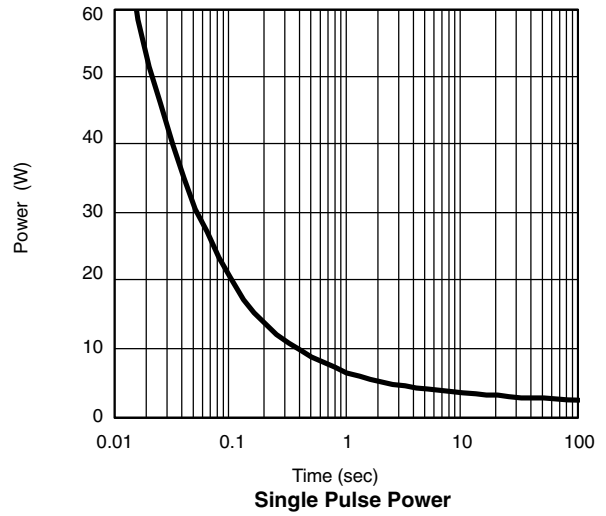
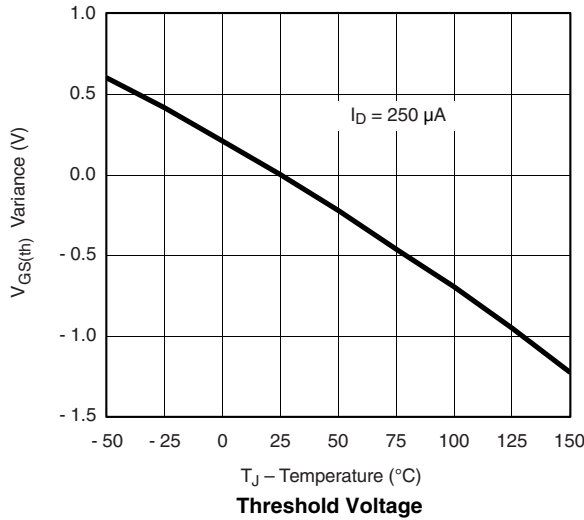
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage

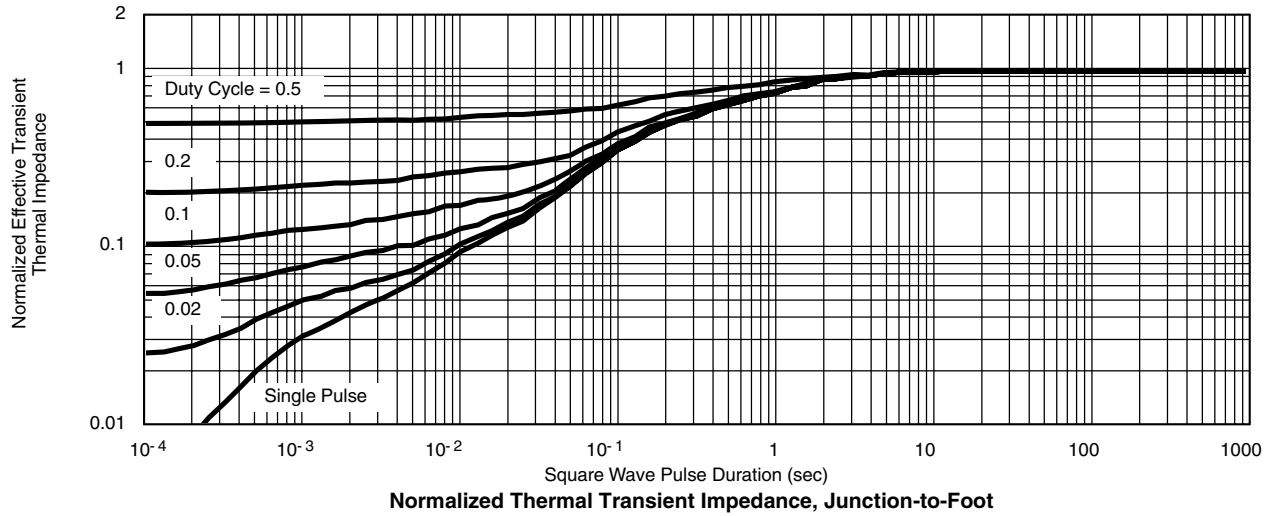


TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted





TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



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