

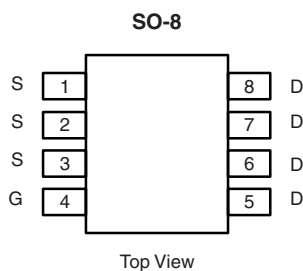
N-Channel 30-V MOSFET

PRODUCT SUMMARY

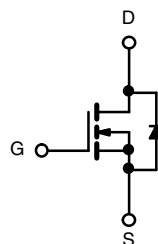
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ.)
30	0.0045 at $V_{GS} = 10$ V	20	24
	0.006 at $V_{GS} = 4.5$ V	17	

FEATURES

- TrenchFET® Power MOSFETS
- 100 % R_g Tested


RoHS
COMPLIANT


Ordering Information: Si4430BDY-T1-E3 (Lead (Pb)-free)



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted

Parameter		Symbol	10 s	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	20	14	A
	T _A = 70 °C		16	11	
Pulsed Drain Current		I _{DM}	± 60		
Continuous Source Current (Diode Conduction) ^a		I _S	2.7	1.40	
Avalanche Current	L = 0.1 mH	I _{AS}	40		
Single Pulse Avalanche Energy		E _{AS}	80		mJ
Maximum Power Dissipation ^a	T _A = 25 °C	P _D	3.0	1.6	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 (MOSFET) ^a	R_{thJA}	34	41	°C/W
		67	80	
Maximum Junction-to-Foot (Drain)	R_{thJF}	15	19	

Notes:

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

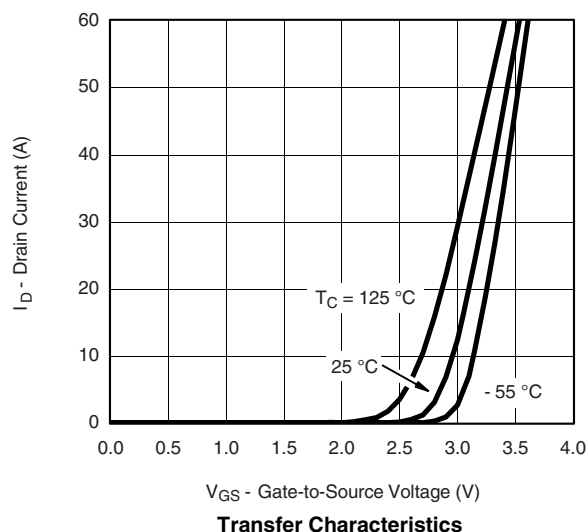
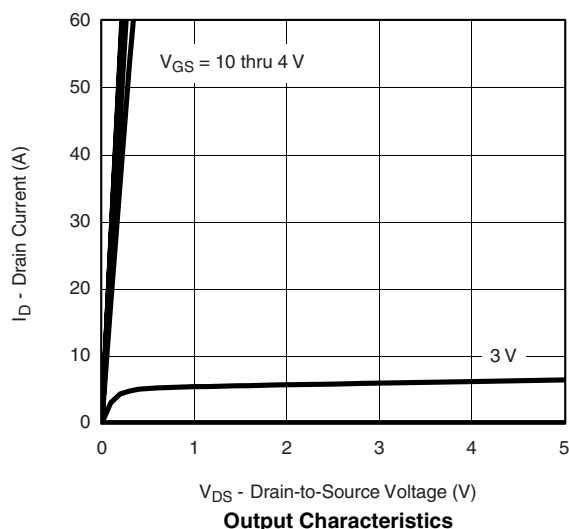
MOSFET SPECIFICATIONS $T_J = 25^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$	1.0		3.0	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}$, $V_{GS} = \pm 20\ \text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30\ \text{V}$, $V_{GS} = 0\ \text{V}$			1	μA
		$V_{DS} = 30\ \text{V}$, $V_{GS} = 0\ \text{V}$, $T_J = 70^\circ\text{C}$			10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\ \text{V}$, $V_{GS} = 10\ \text{V}$	40			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\ \text{V}$, $I_D = 20\ \text{A}$		0.0037	0.0045	Ω
		$V_{GS} = 4.5\ \text{V}$, $I_D = 17\ \text{A}$		0.0048	0.006	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\ \text{V}$, $I_D = 20\ \text{A}$		80		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 2.7\ \text{A}$, $V_{GS} = 0\ \text{V}$		0.72	1.1	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 15\ \text{V}$, $V_{GS} = 4.5\ \text{V}$, $I_D = 20\ \text{A}$		24	36	nC
Gate-Source Charge	Q_{gs}			10.5		
Gate-Drain Charge	Q_{gd}			7.5		
Gate Resistance	R_g		0.5	1.1	1.7	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15\ \text{V}$, $R_L = 15\ \Omega$ $I_D \approx 1\ \text{A}$, $V_{GEN} = 10\ \text{V}$, $R_g = 6\ \Omega$		20	30	ns
Rise Time	t_r			14	22	
Turn-Off Delay Time	$t_{d(off)}$			60	90	
Fall Time	t_f			18	30	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 2.7\ \text{A}$, $dI/dt = 100\ \text{A}/\mu\text{s}$		35	50	nC
	Q_{rr}			32	50	

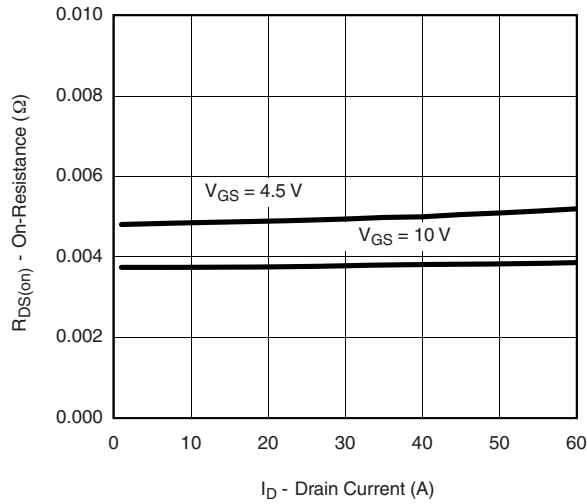
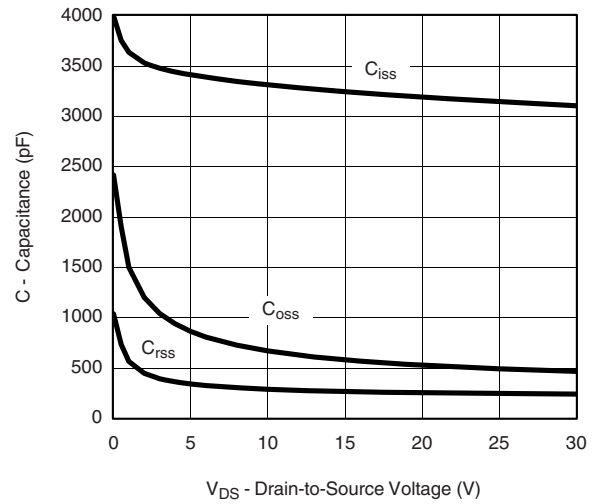
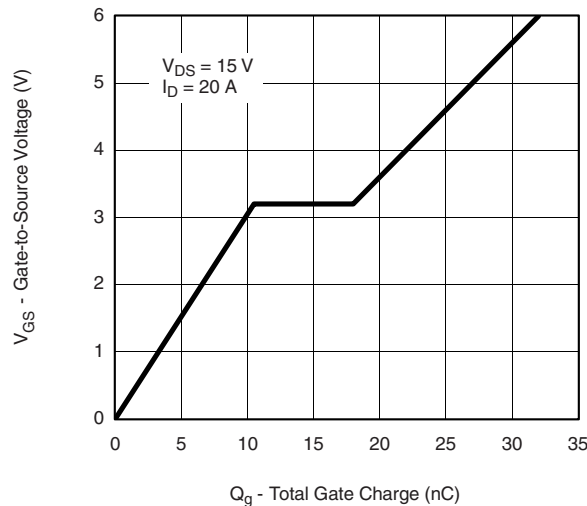
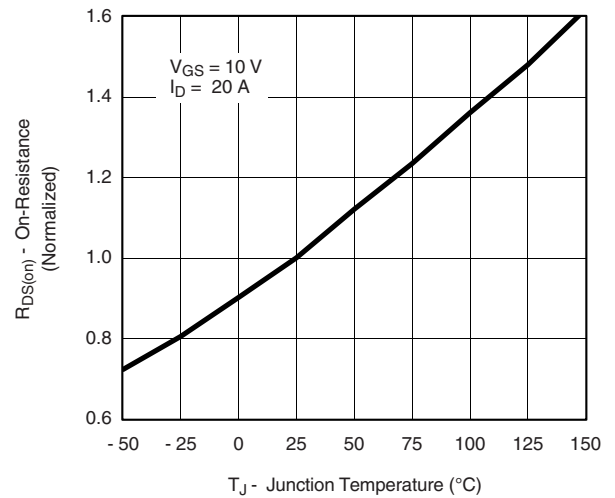
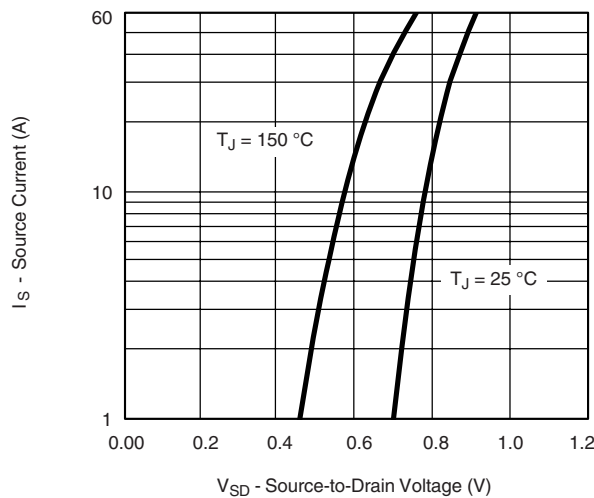
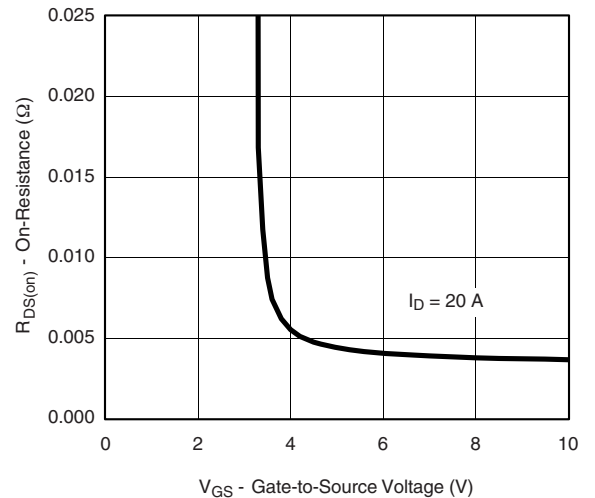
Notes:

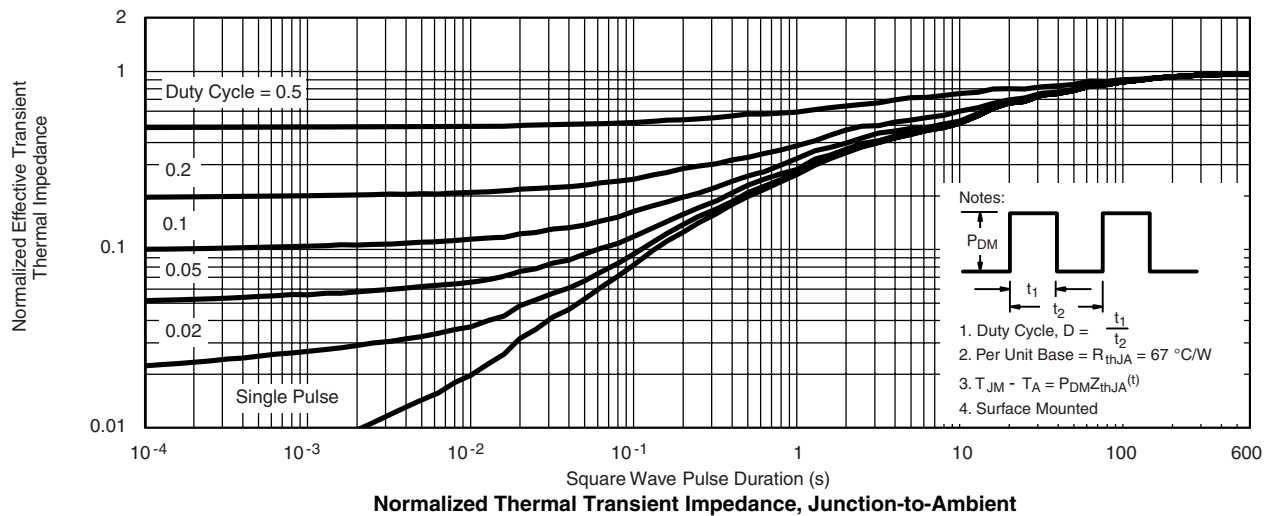
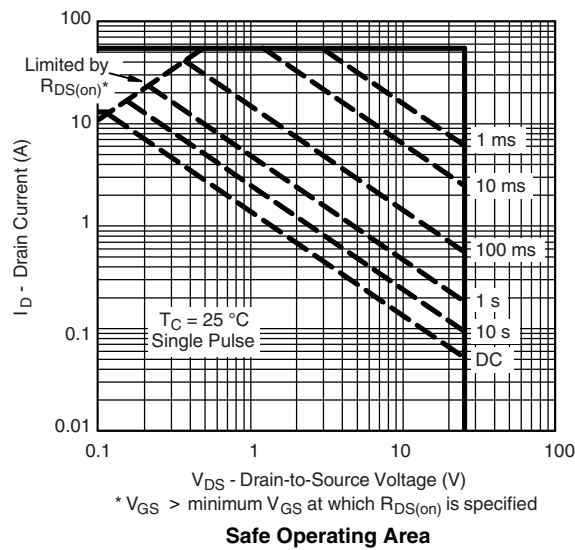
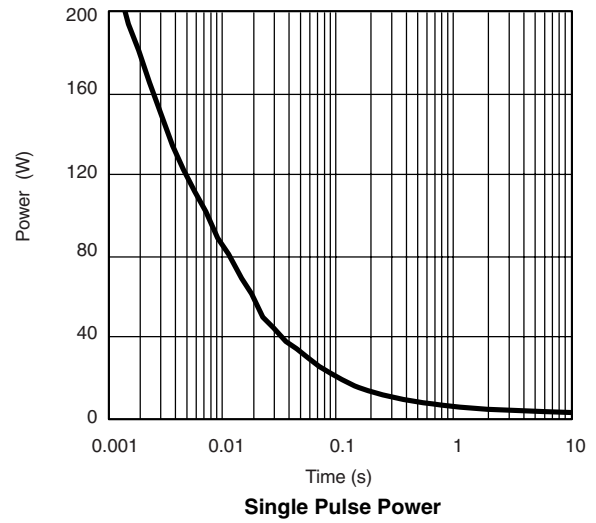
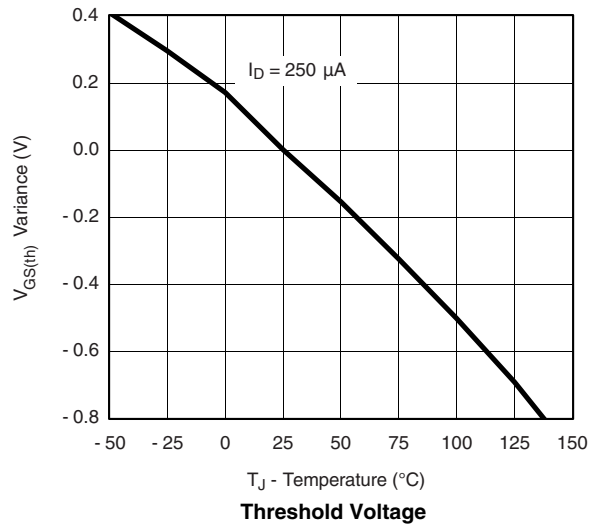
a. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.

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.

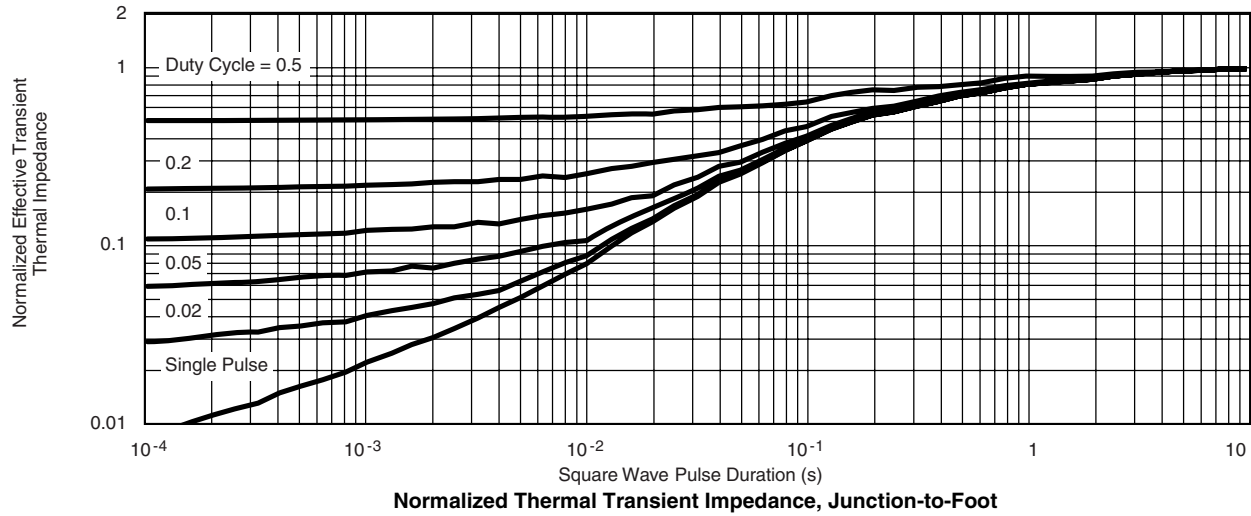
TYPICAL CHARACTERISTICS 25°C , unless otherwise noted

**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



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