

P-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY

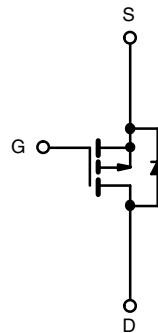
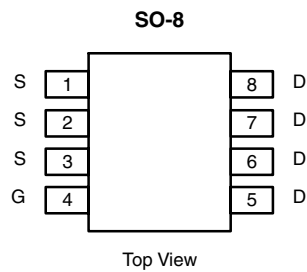
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-30	0.040 @ $V_{GS} = -10$ V	± 5.8
	0.070 @ $V_{GS} = -4.5$ V	± 4.5

FEATURES

- TrenchFET® Power MOSFET
- 100% UIS Tested



RoHS
COMPLIANT



Ordering Information: Si4431DY-T1
Si4431DY-T1—E3 (Lead (Pb)-Free)

P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	$T_A = 25^\circ\text{C}$	I_D	± 5.8	A
	$T_A = 70^\circ\text{C}$		± 4.6	
Pulsed Drain Current		I_{DM}	± 30	
Continuous Source Current (Diode Conduction) ^a		I_S	-2.3	
Avalanche Current	$L = 0.1$ mH	I_{AS}	20	mJ
		E_{AS}	20	
Maximum Power Dissipation ^a	$T_A = 25^\circ\text{C}$	P_D	2.5	W
	$T_A = 70^\circ\text{C}$		1.6	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Limit	Unit
Maximum Junction-to-Ambient ^a	R_{thJA}	50	$^\circ\text{C/W}$

Notes

a. Surface Mounted on FR4 Board, $t \leq 10$ sec.

For SPICE model information via the Worldwide Web: <http://www.siliconix.com/www/product/spice.htm>

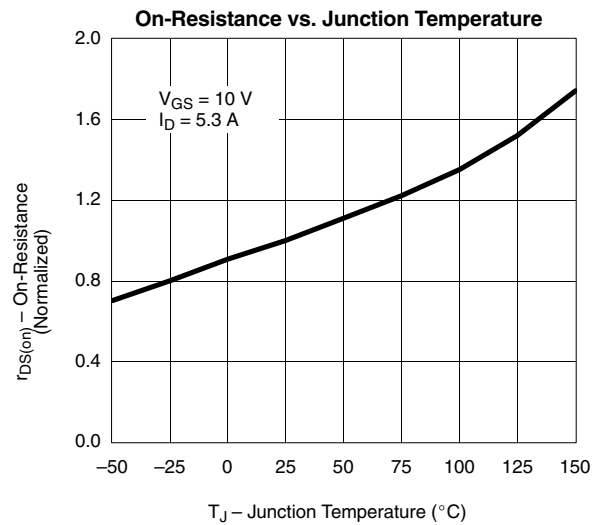
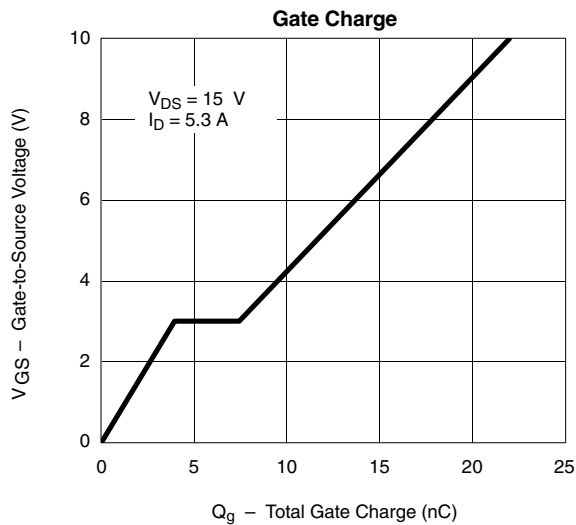
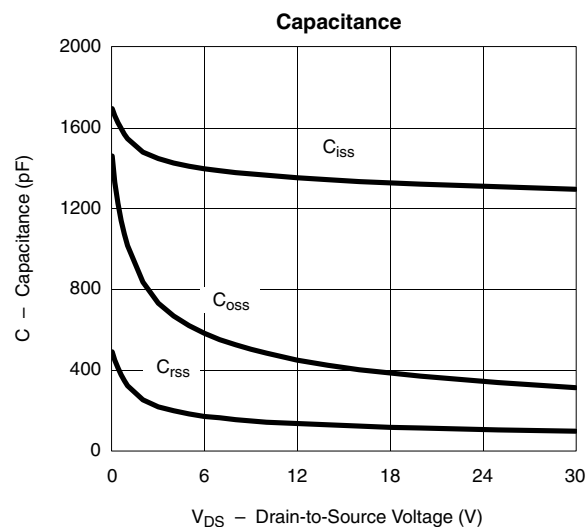
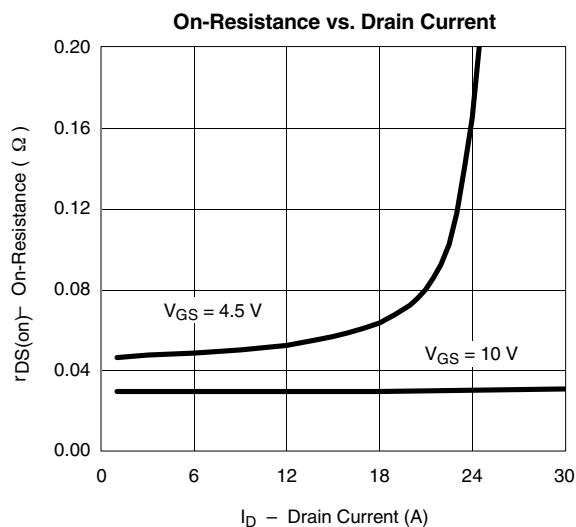
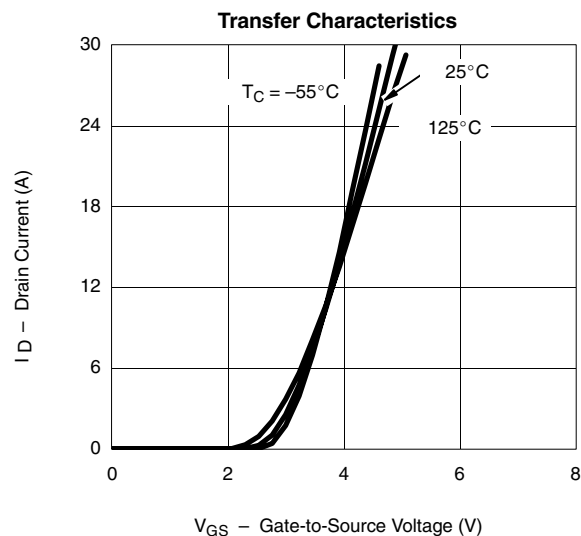
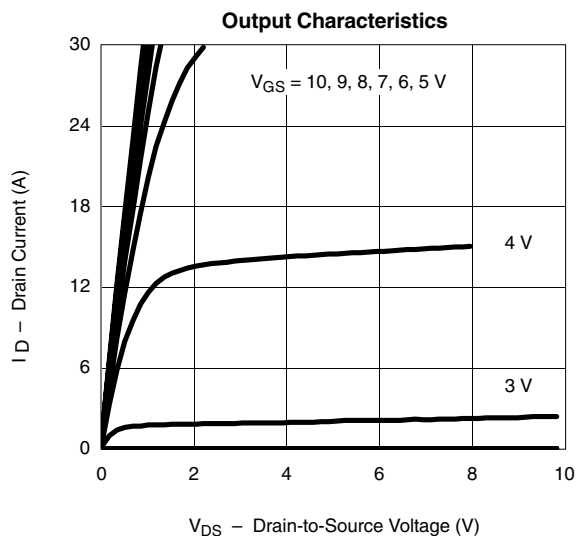
SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ ^A	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-1.0			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 20\ \text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30\ \text{V}, V_{GS} = 0\ \text{V}$			-1	μA
		$V_{DS} = -30\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 70^\circ\text{C}$			-25	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} \leq -5\ \text{V}, V_{GS} = -10\ \text{V}$	-30			A
		$V_{DS} \leq -5\ \text{V}, V_{GS} = -4.5\ \text{V}$	-7			
Drain-Source On-State Resistance ^b	$r_{DS(on)}$	$V_{GS} = -10\ \text{V}, I_D = -5.3\ \text{A}$		0.029	0.040	Ω
		$V_{GS} = -4.5\ \text{V}, I_D = -2.0\ \text{A}$		0.047	0.070	
Forward Transconductance ^b	g_{fs}	$V_{DS} = -15\ \text{V}, I_D = -5.3\ \text{A}$		9.3		S
Diode Forward Voltage ^b	V_{SD}	$I_S = -2.3\ \text{A}, V_{GS} = 0\ \text{V}$		-0.78	-1.2	V
Dynamic^a						
Total Gate Charge	Q_g	$V_{DS} = -15\ \text{V}, V_{GS} = -10\ \text{V}, I_D = -5.3\ \text{A}$		22	35	nC
Gate-Source Charge	Q_{gs}			3.95		
Gate-Drain Charge	Q_{gd}			3.5		
Gate Resistance	R_g			4.5	6.1	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\ \text{V}, R_L = 15\ \Omega$ $I_D \cong -1\ \text{A}, V_{GEN} = -10\ \text{V}, R_G = 6\ \Omega$		11.5	20	ns
Rise Time	t_r			12	20	
Turn-Off Delay Time	$t_{d(off)}$			38	55	
Fall Time	t_f			15	25	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = -2.3\ \text{A}, di/dt = 100\ \text{A}/\mu\text{s}$		50	80	

Notes

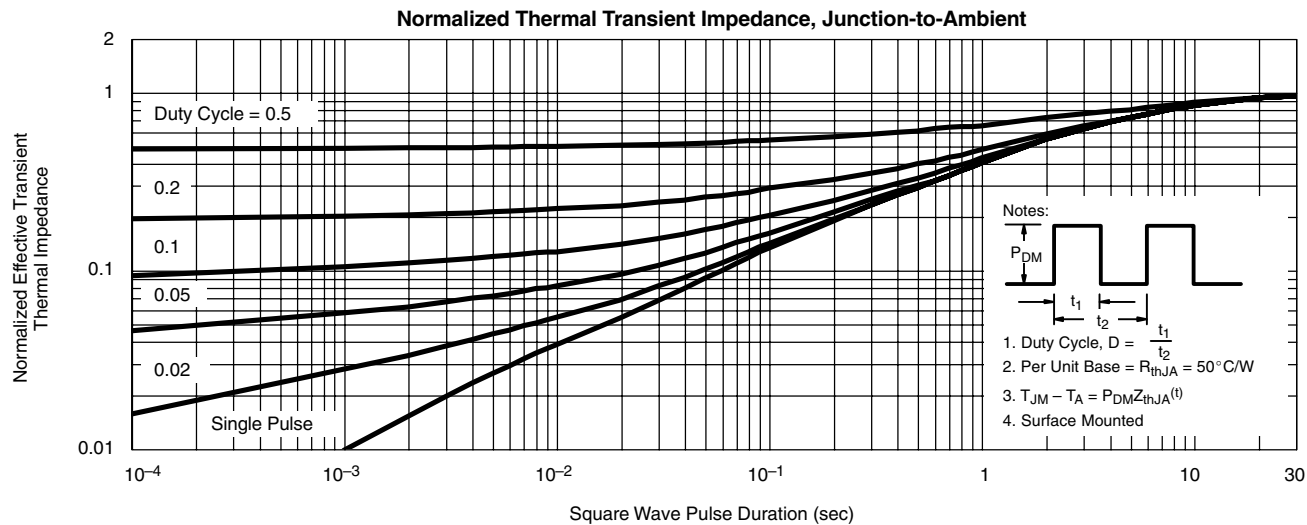
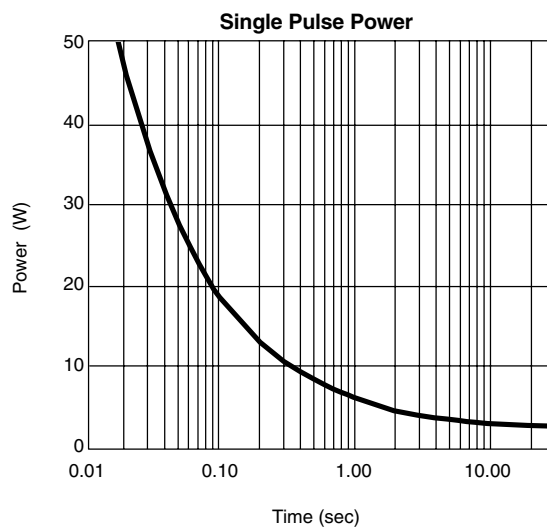
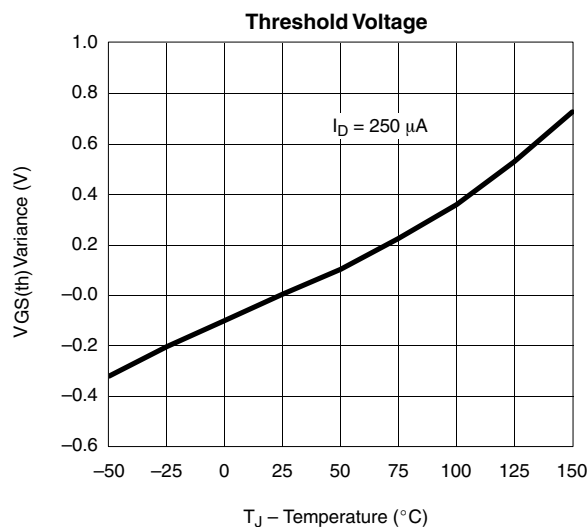
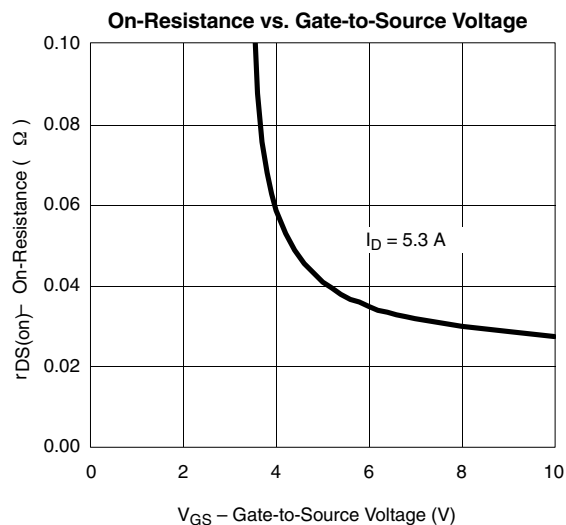
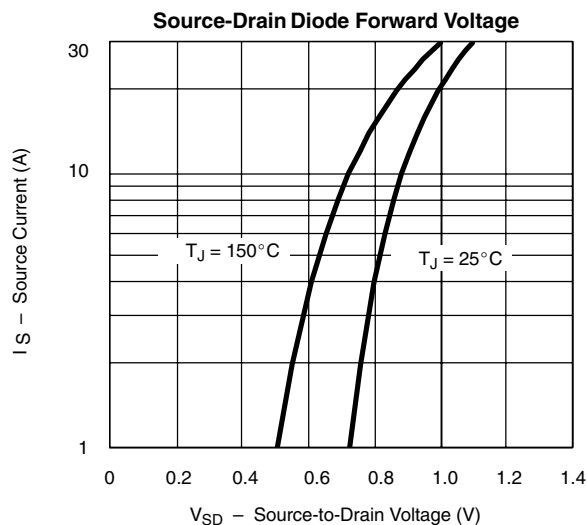
- Guaranteed by design, not subject to production testing.
- Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.



TYPICAL CHARACTERISTICS (25°C UNLESS OTHERWISE NOTED)



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