

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

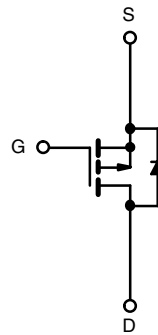
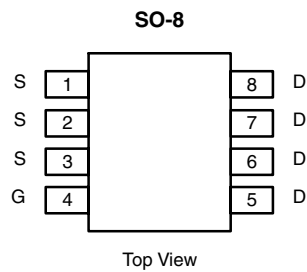
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-30	0.040 @ $V_{GS} = -10$ V	± 5.8
	0.070 @ $V_{GS} = -4.5$ V	± 4.5

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	I_D	$T_A = 25^\circ\text{C}$	± 5.8
		$T_A = 70^\circ\text{C}$	± 4.6
Pulsed Drain Current	I_{DM}	± 30	A
Continuous Source Current (Diode Conduction) ^a	I_S	-2.3	
Avalanche Current	I_{AS}	20	
Single-Pulse Avalanche Energy	E_{AS}	20	mJ
Maximum Power Dissipation ^a	P_D	$T_A = 25^\circ\text{C}$	2.5
		$T_A = 70^\circ\text{C}$	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	$^\circ\text{C}/\text{W}$

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>

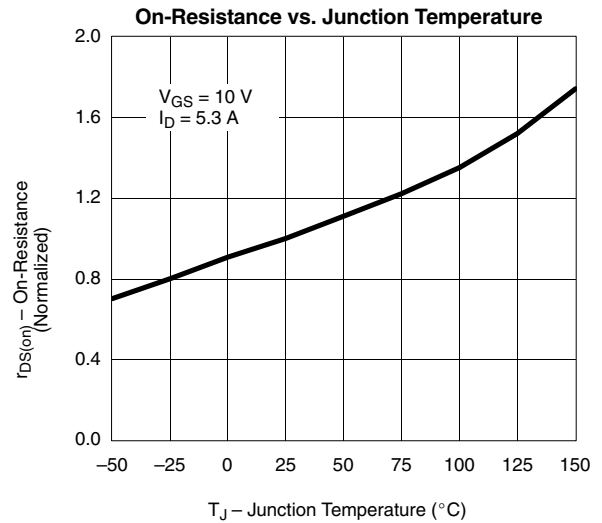
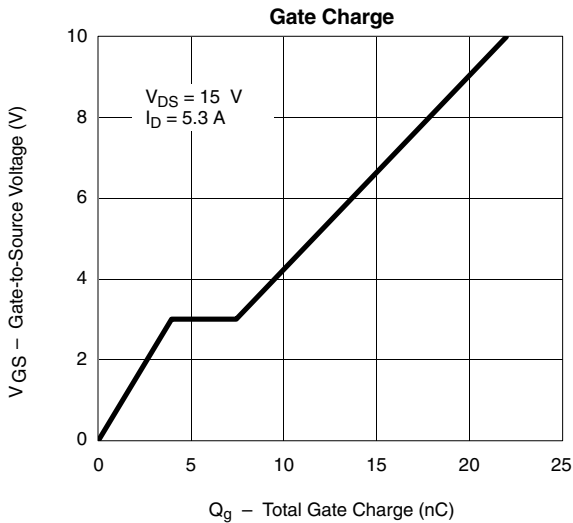
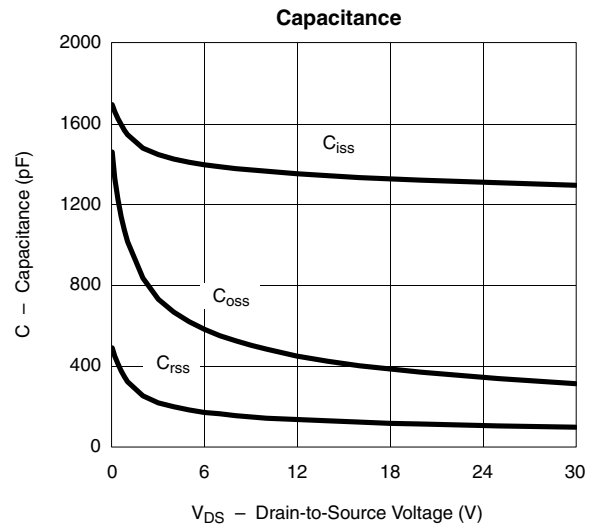
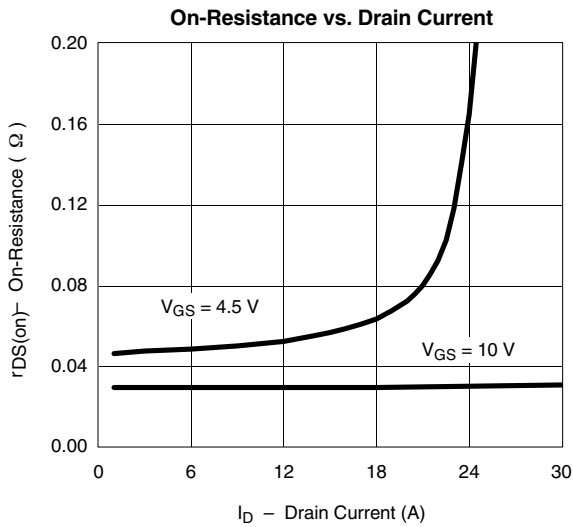
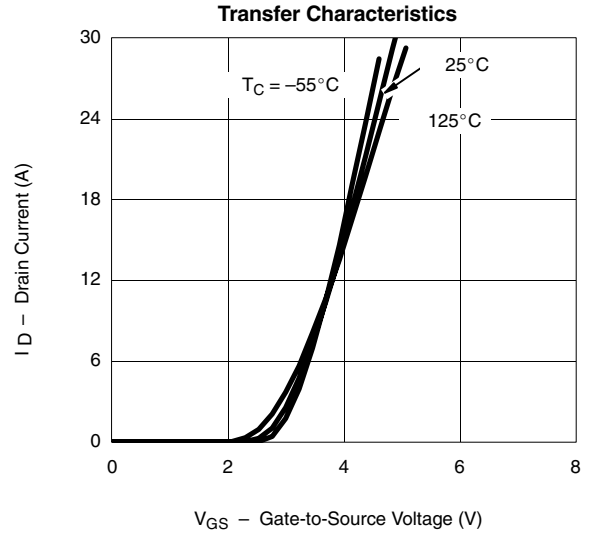
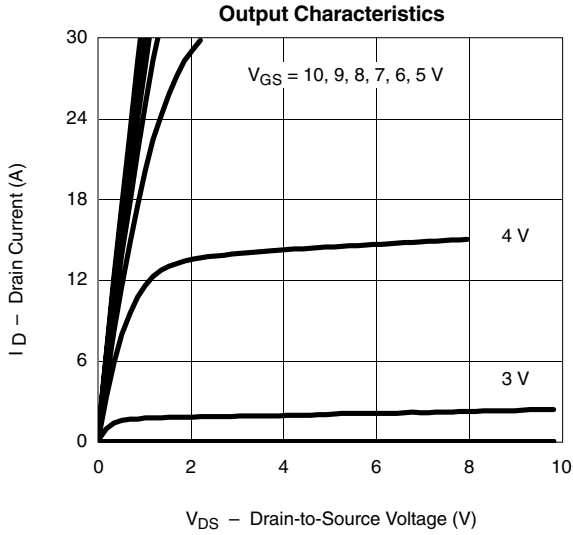
SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ ^A	Max	Unit
Static						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA	-1.0			V
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -30 V, V _{GS} = 0 V			-1	μA
		V _{DS} = -30 V, V _{GS} = 0 V, T _J = 70 °C			-25	
On-State Drain Current ^b	I _{D(on)}	V _{DS} ≤ -5 V, V _{GS} = -10 V	-30			A
		V _{DS} ≤ -5 V, V _{GS} = -4.5 V	-7			
Drain-Source On-State Resistance ^b	r _{DS(on)}	V _{GS} = -10 V, I _D = -5.3 A		0.029	0.040	Ω
		V _{GS} = -4.5 V, I _D = -2.0 A		0.047	0.070	
Forward Transconductance ^b	g _{fs}	V _{DS} = -15 V, I _D = -5.3 A		9.3		S
Diode Forward Voltage ^b	V _{SD}	I _S = -2.3 A, V _{GS} = 0 V		-0.78	-1.2	V
Dynamic^a						
Total Gate Charge	Q _g	V _{DS} = -15 V, V _{GS} = -10 V, I _D = -5.3 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 V, R _L = 15 Ω I _D ≅ -1 A, V _{GEN} = -10 V, R _G = 6 Ω		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 A, di/dt = 100 A/μs		50	

Notes

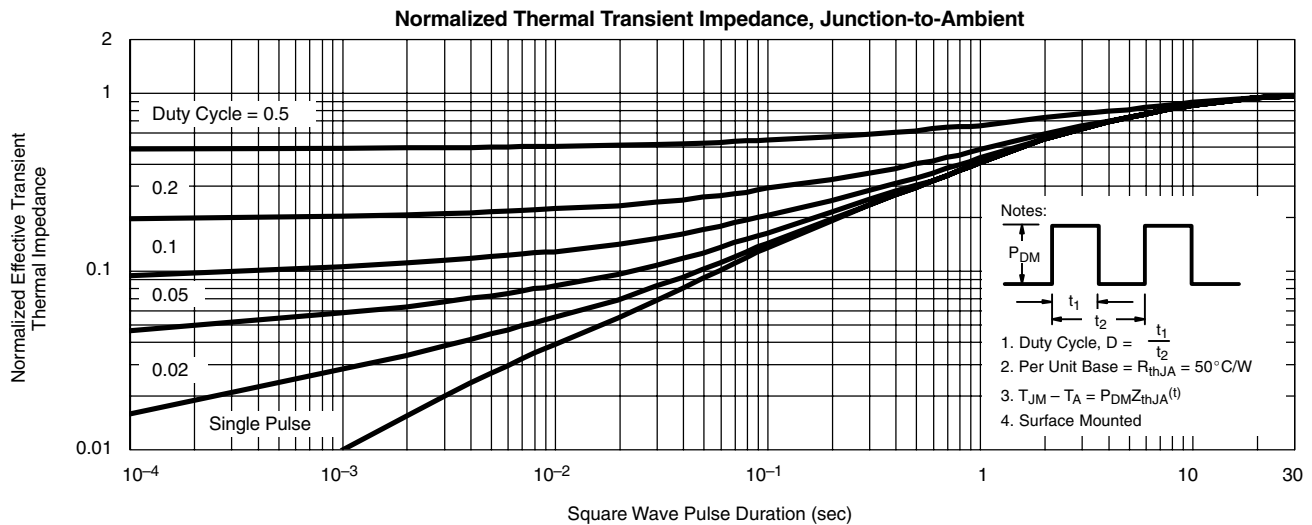
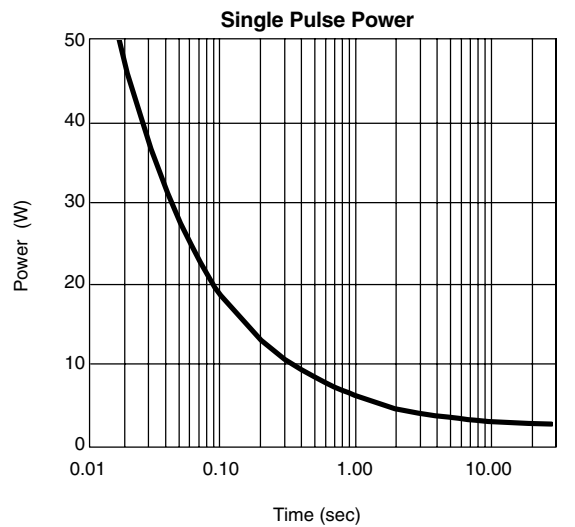
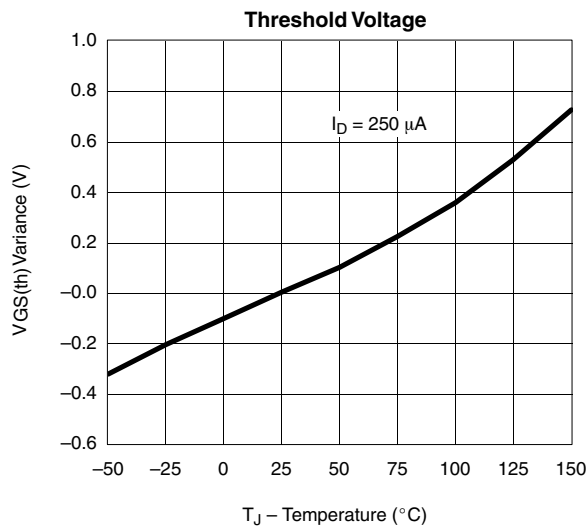
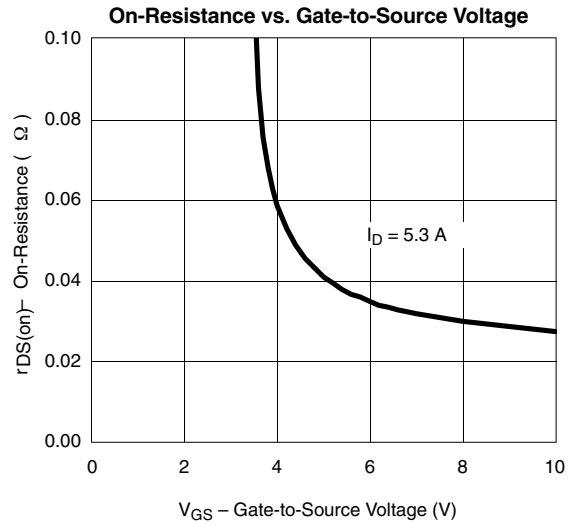
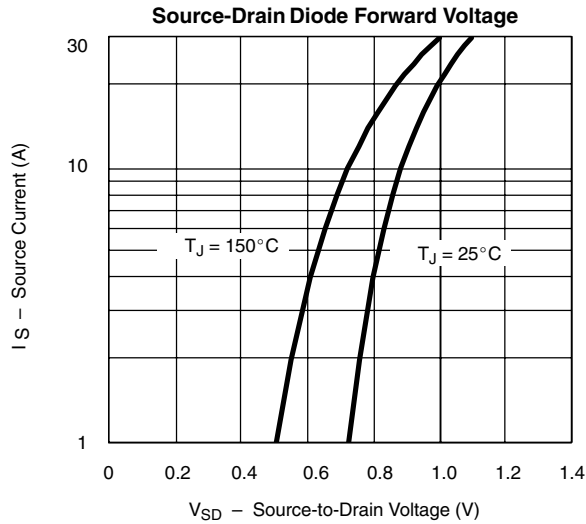
- a. Guaranteed by design, not subject to production testing.
- b. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.



TYPICAL CHARACTERISTICS (25°C UNLESS OTHERWISE NOTED)



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