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

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
–30	0.030 @ V_{GS} = –10 V	–7.2
	0.052 @ V_{GS} = –4.5 V	–5.5

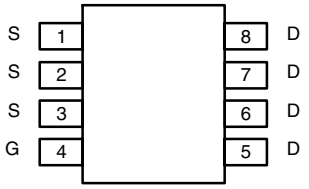
FEATURES

- TrenchFET® Power MOSFET

Pb-free Available

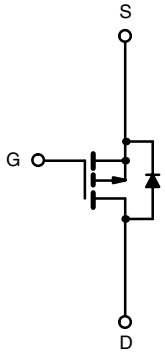
RoHS COMPLIANT

SO-8



Top View

Ordering Information: Si4431ADY-T1
Si4431ADY-T1—E3 (Lead (Pb)-free)



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)					
Parameter		Symbol	10 secs	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	–7.2	–5.3	A
	T_A = 70°C		–5.8	–4.2	
Pulsed Drain Current		I_{DM}	–30		
continuous Source Current (Diode Conduction)[a]		I_S	–2.1	–1.3	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	2.5	1.35	W
	T_A = 70°C		1.6	0.87	
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]	t ≤ 10 sec	R_{thJA}	35	50	°C/W
	Steady State		75	92	
Maximum Junction-to-Foot	Steady State	R_{thJF}	17	25	

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

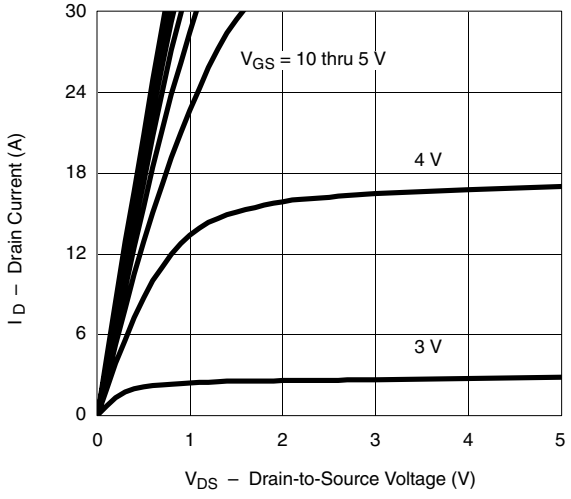
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = –250 μA	–1.0		–3.0	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			–10	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} = –5 V, V_{GS} = –10 V	–30			A
		V_{DS} = –5 V, V_{GS} = –4.5 V	–7			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = –10 V, I_D = –7.2 A		0.024	0.030	Ω
		V_{GS} = –4.5 V, I_D = –5.0 A		0.040	0.052	
Forward Transconductance[a]	g_{fs}	V_{DS} = –15 V, I_D = –7.2 A		14		S
Diode Forward Voltage[a]	V_{SD}	I_S = –2.1 A, V_{GS} = 0 V		–0.78	–1.1	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = –15 V, V_{GS} = –5 V, I_D = –7.2 A		12	20	nC
Gate-Source Charge	Q_{gs}			4.7		
Gate-Drain Charge	Q_{gd}			3.7		
Gate Resistance	R_G			3.1	4.7	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		12	20	ns
Rise Time	t_r			15	20	
Turn-Off Delay Time	$t_{d(off)}$			40	60	
Fall Time	t_f			20	25	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = –2.1 A, di/dt = 100 A/μs		30	80	

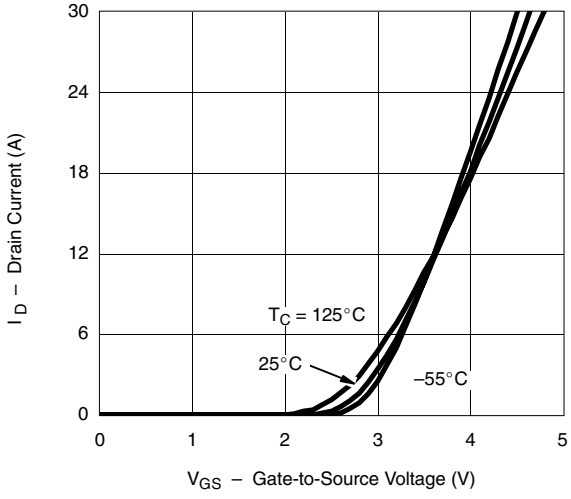
Notes
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Output Characteristics

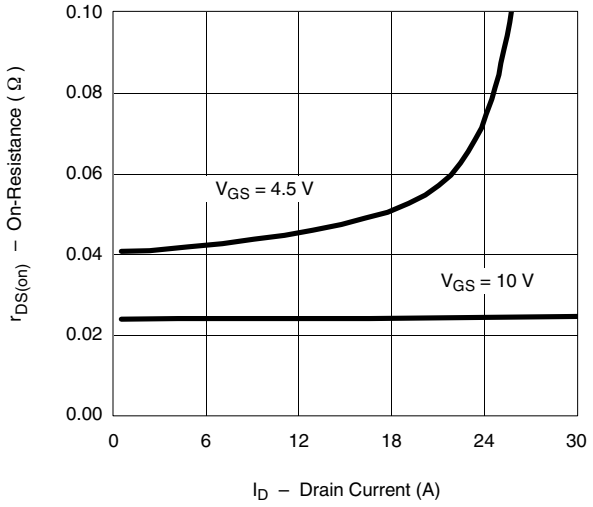


Transfer Characteristics

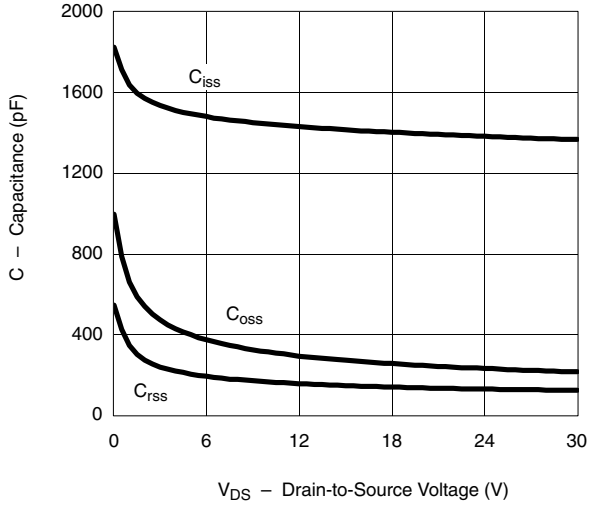


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

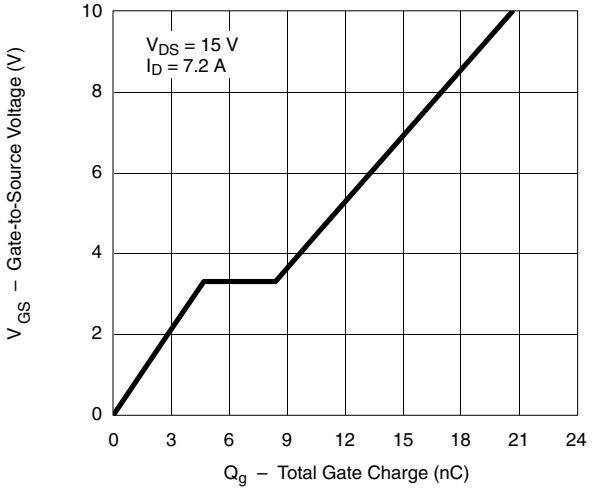
On-Resistance vs. Drain Current



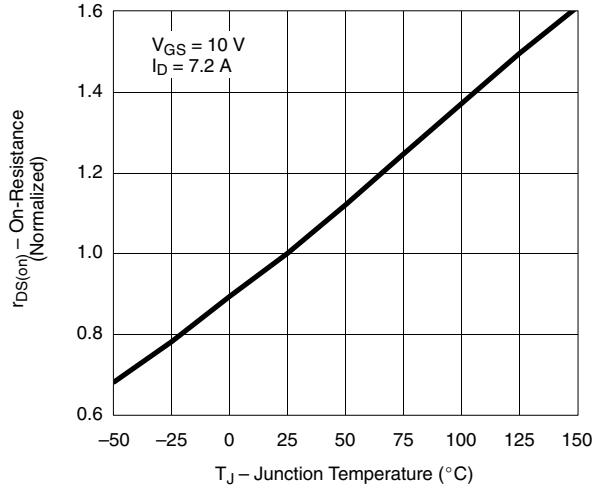
Capacitance



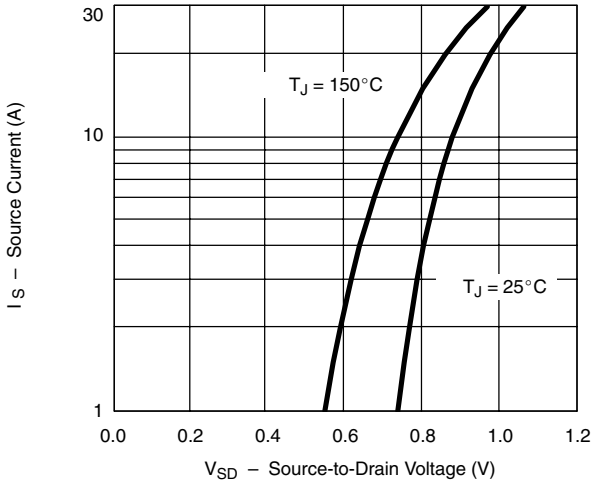
Gate Charge



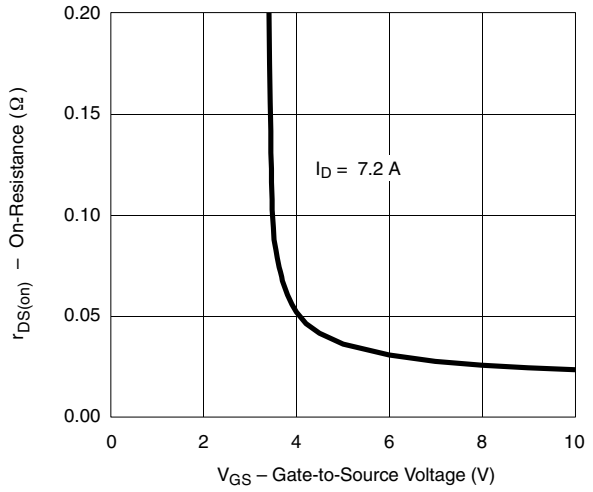
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

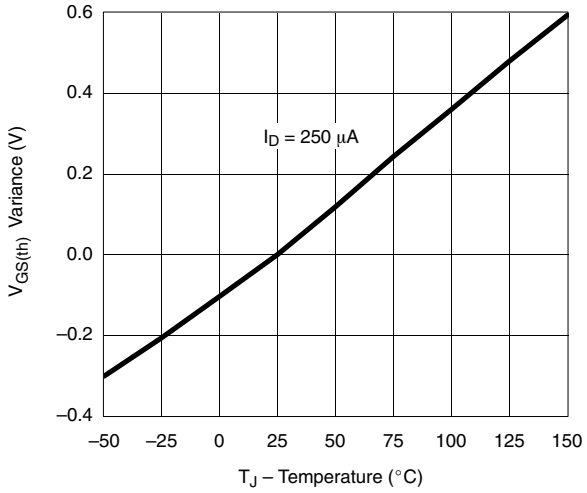


On-Resistance vs. Gate-to-Source Voltage

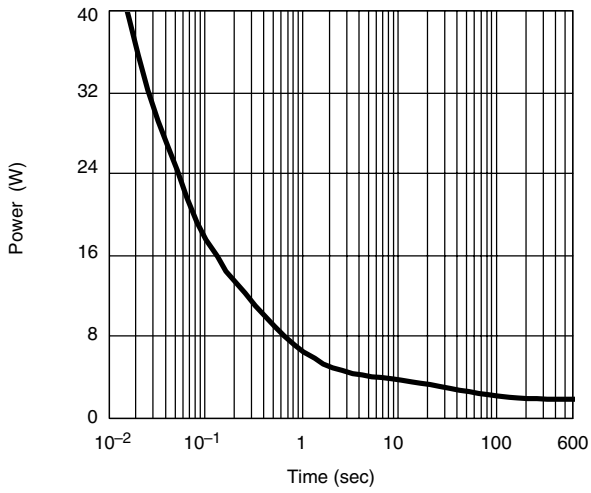


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

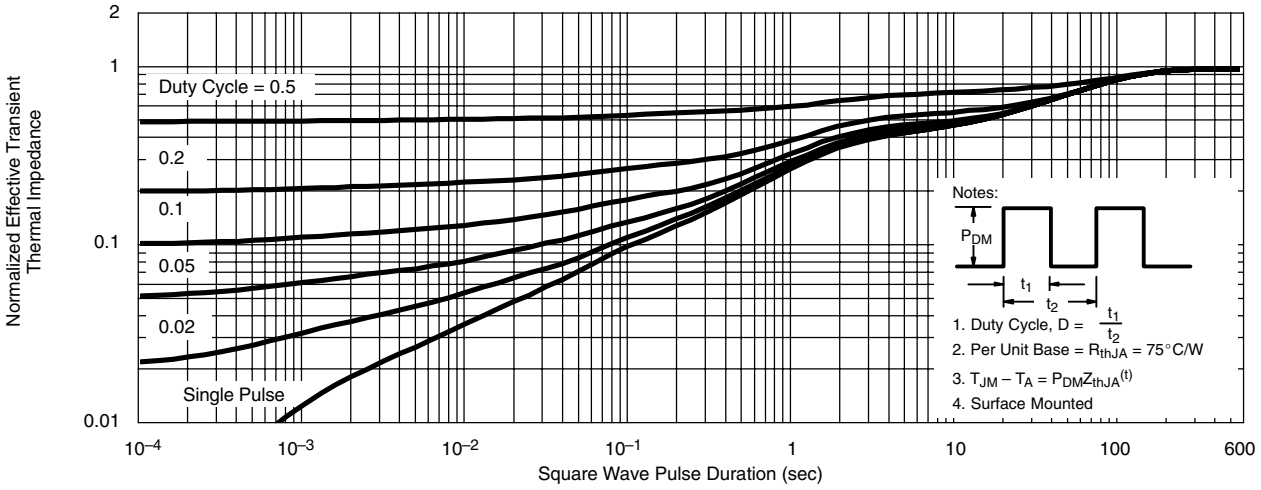
Threshold Voltage



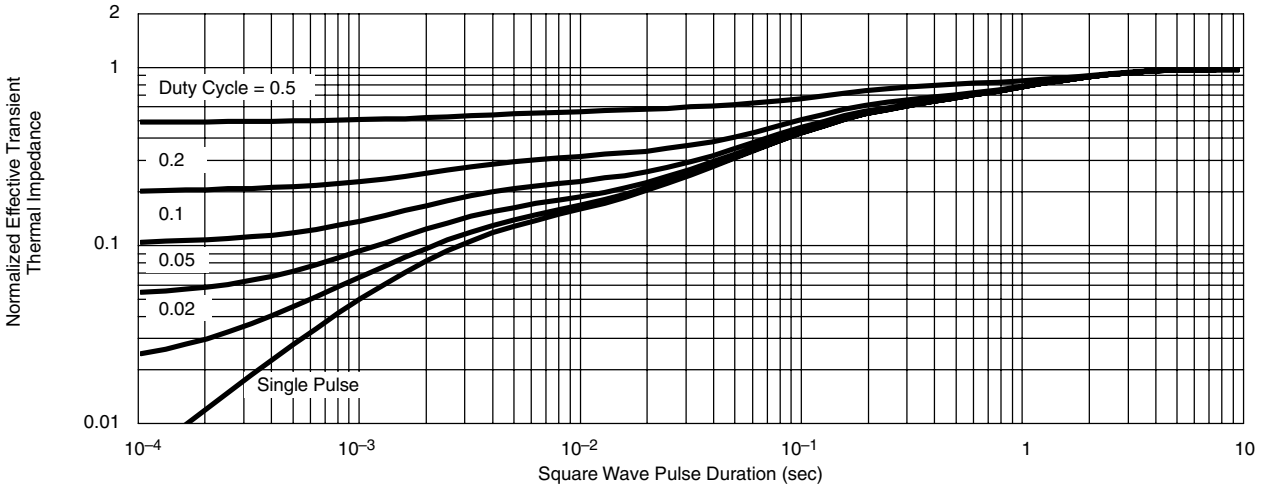
Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot



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