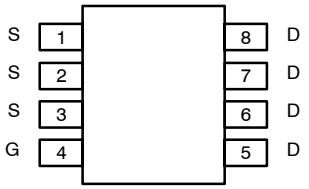
P-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
−30	0.042 @ V_{GS} = −10 V	−5.7
	0.055 @ V_{GS} = −6 V	−5.0
	0.070 @ V_{GS} = −4.5 V	−4.4

FEATURES

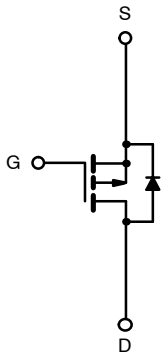
- TrenchFET® Power MOSFET

SO-8



Top View

Ordering Information: Si9435BDY
Si9435BDY-T1 (with Tape and Reel)



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	−5.7	−4.1	A
	T_A = 70°C		−4.6	−3.2	
Pulsed Drain Current		I_{DM}	−30		
continuous Source Current (Diode Conduction)[a]		I_S	−2.3	−1.1	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	2.5	1.3	W
	T_A = 70°C		1.6	0.8	
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}	40	50	°C/W
	Steady State		70	95	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	24	30	

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

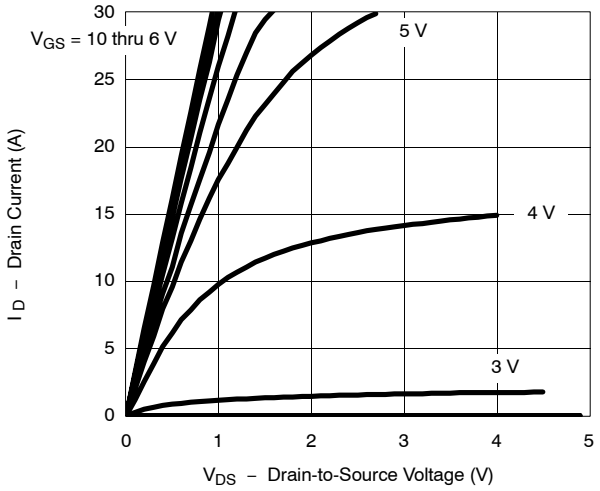
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

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		−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			−5	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} ≤ −10 V, V_{GS} = −10 V	−20			A
		V_{DS} ≤ −5 V, V_{GS} = −4.5 V	−5			
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = −10 V, I_D = −5.7 A		0.033	0.042	Ω
		V_{GS} = −6 V, I_D = −5 A		0.043	0.055	
		V_{GS} = −4.5 V, I_D = −4.4 A		0.056	0.070	
Forward Transconductance[b]	g_{fs}	V_{DS} = −15 V, I_D = −5.7 A		13		S
Diode Forward Voltage[b]	V_{SD}	I_S = −2.3 A, V_{GS} = 0 V		−0.8	−1.1	V
Dynamic[a]						
Total Gate Charge	Q_g	V_{DS} = −15 V, V_{GS} = −10 V, I_D = −3.5 A		16	24	nC
Gate-Source Charge	Q_{gs}			2.3		
Gate-Drain Charge	Q_{gd}			4.5		
Gate Resistance	R_g			8.8		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		14	25	ns
Rise Time	t_r			14	25	
Turn-Off Delay Time	$t_{d(off)}$			42	70	
Fall Time	t_f			30	50	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = −1.2 A, di/dt = 100 A/μs		30	60	

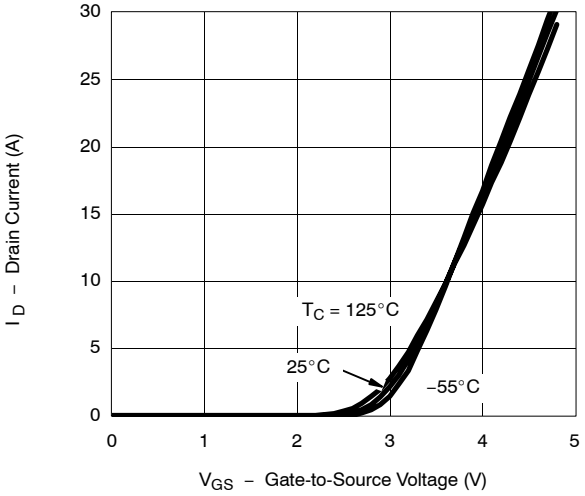
Notes
a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

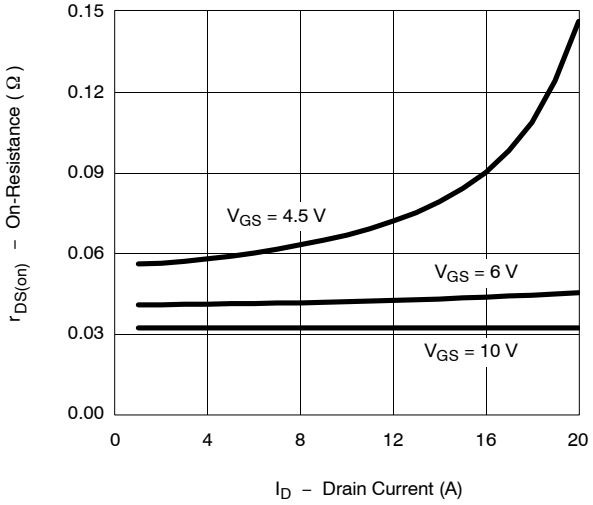
Output Characteristics



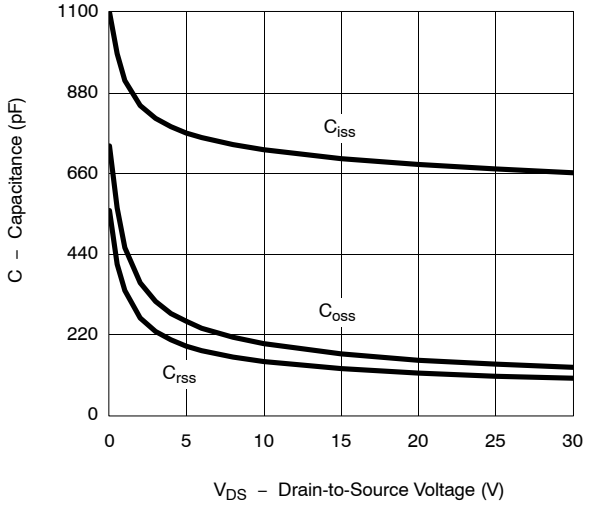
Transfer Characteristics



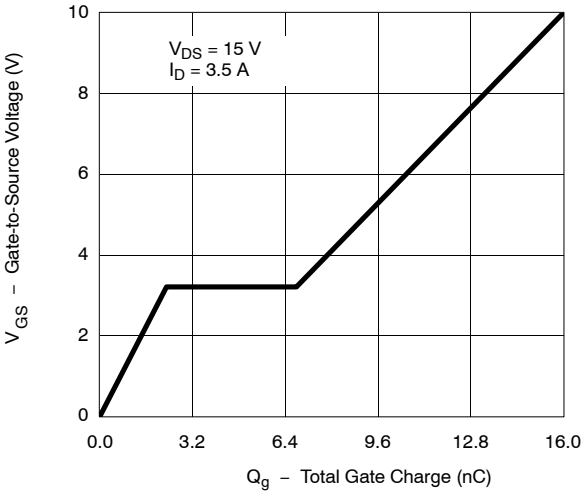
On-Resistance vs. Drain Current



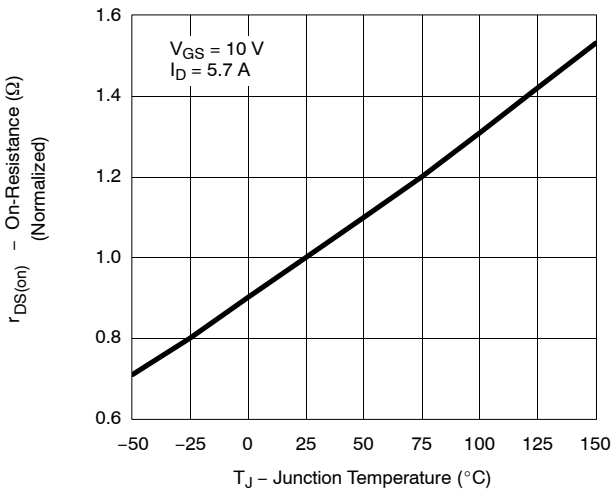
Capacitance



Gate Charge

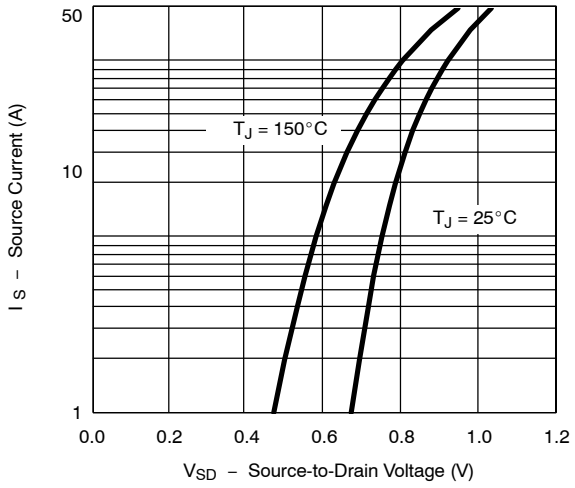


On-Resistance vs. Junction Temperature

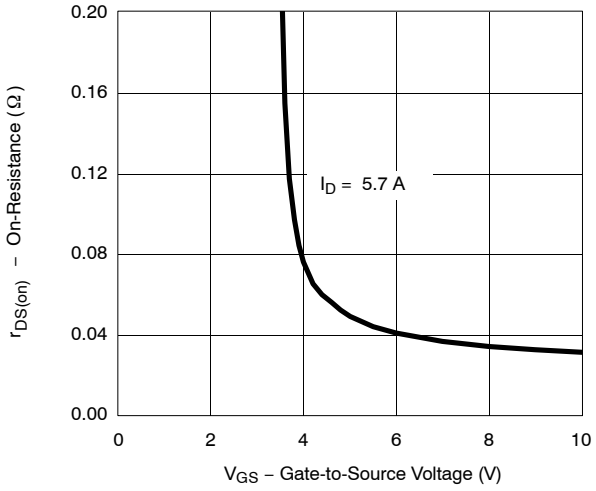


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

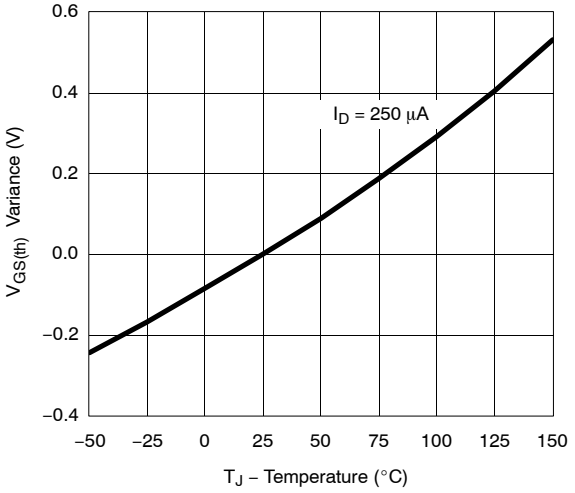
Source-Drain Diode Forward Voltage



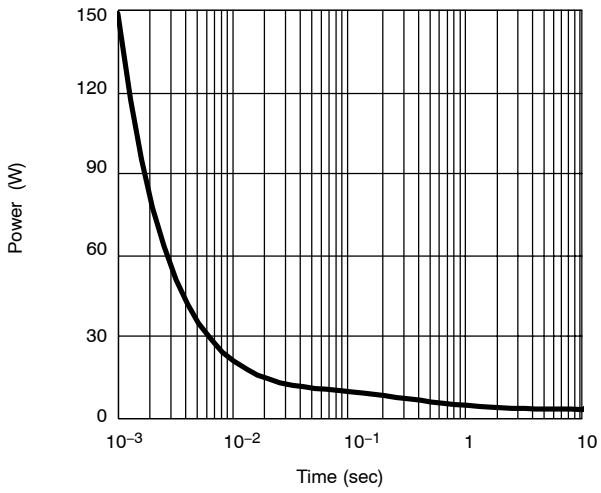
On-Resistance vs. Gate-to-Source Voltage



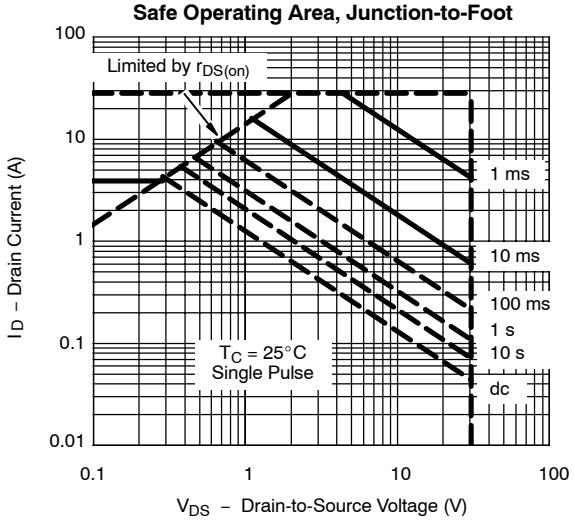
Threshold Voltage



Single Pulse Power, Junction-to-Ambient

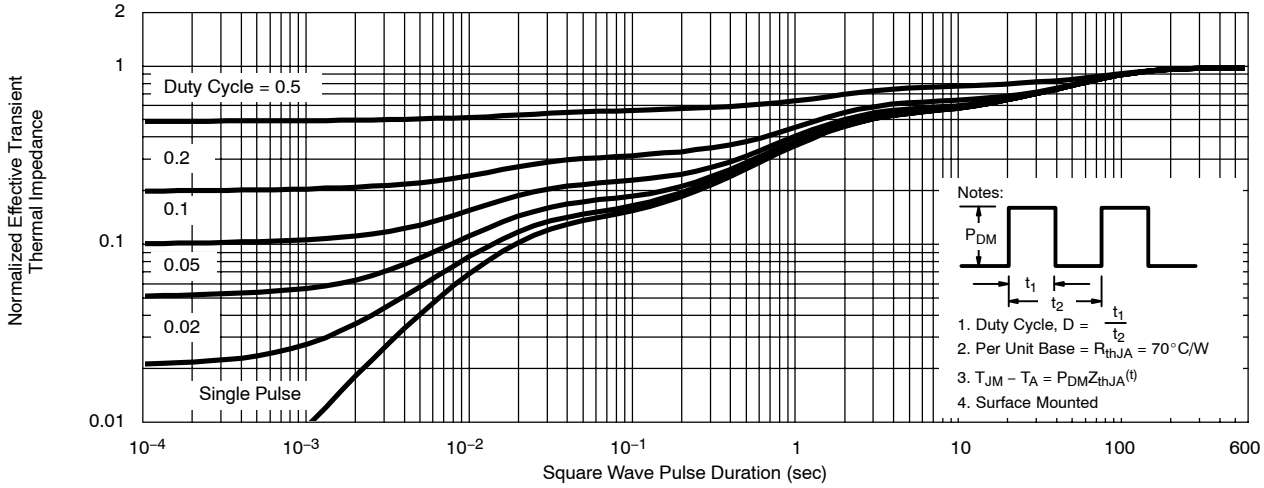


Safe Operating Area, Junction-to-Foot



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot