

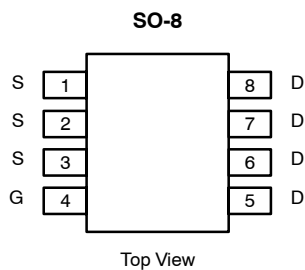


## P-Channel 30-V (D-S) MOSFET

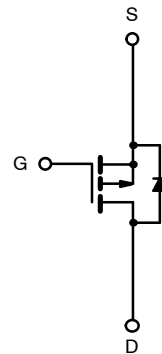
PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-30	0.042 @ $V_{GS} = -10$ V	-5.7
	0.055 @ $V_{GS} = -6$ V	-5.0
	0.070 @ $V_{GS} = -4.5$ V	-4.4

### FEATURES

- TrenchFET® Power MOSFET



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



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	10 secs	Steady State	Unit	
Drain-Source Voltage	$V_{DS}$	-30		V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$			
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	-5.7	-4.1	A
		$T_A = 70^\circ\text{C}$	-4.6	-3.2	
Pulsed Drain Current	$I_{DM}$	-30			
continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	-2.3	-1.1		
Maximum Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	2.5	1.3	W
		$T_A = 70^\circ\text{C}$	1.6	0.8	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150		$^\circ\text{C}$	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient <sup>a</sup>	$R_{thJA}$	$t \leq 10$ sec	40	50	$^\circ\text{C}/\text{W}$
		Steady State	70	95	
Maximum Junction-to-Foot (Drain)	$R_{thJF}$	24	30		

Notes

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

SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA	-1.0		-3.0	V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -30 V, V <sub>GS</sub> = 0 V			-1	μA
		V <sub>DS</sub> = -30 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 70 °C			-5	
On-State Drain Current <sup>b</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≤ -10 V, V <sub>GS</sub> = -10 V	-20			A
		V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -4.5 V	-5			
Drain-Source On-State Resistance <sup>b</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = -10 V, I <sub>D</sub> = -5.7 A		0.033	0.042	Ω
		V <sub>GS</sub> = -6 V, I <sub>D</sub> = -5 A		0.043	0.055	
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -4.4 A		0.056	0.070	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -15 V, I <sub>D</sub> = -5.7 A		13		S
Diode Forward Voltage <sup>b</sup>	V <sub>SD</sub>	I <sub>S</sub> = -2.3 A, V <sub>GS</sub> = 0 V		-0.8	-1.1	V
<b>Dynamic<sup>a</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -15 V, V <sub>GS</sub> = -10 V, I <sub>D</sub> = -3.5 A		16	24	nC
Gate-Source Charge	Q <sub>gs</sub>		2.3			
Gate-Drain Charge	Q <sub>gd</sub>		4.5			
Gate Resistance	R <sub>g</sub>			8.8		Ω
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -15 V, R <sub>L</sub> = 15 Ω I <sub>D</sub> ≅ -1 A, V <sub>GEN</sub> = -10 V, R <sub>G</sub> = 6 Ω		14	25	ns
Rise Time	t <sub>r</sub>			14	25	
Turn-Off Delay Time	t <sub>d(off)</sub>			42	70	
Fall Time	t <sub>f</sub>			30	50	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>		I <sub>F</sub> = -1.2 A, di/dt = 100 A/μs		30	

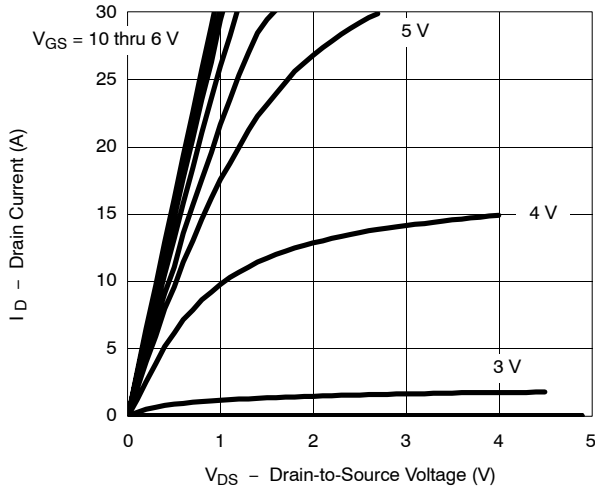
## Notes

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

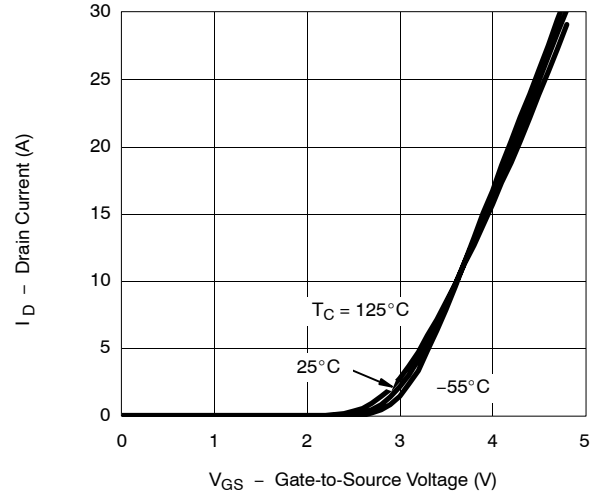


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

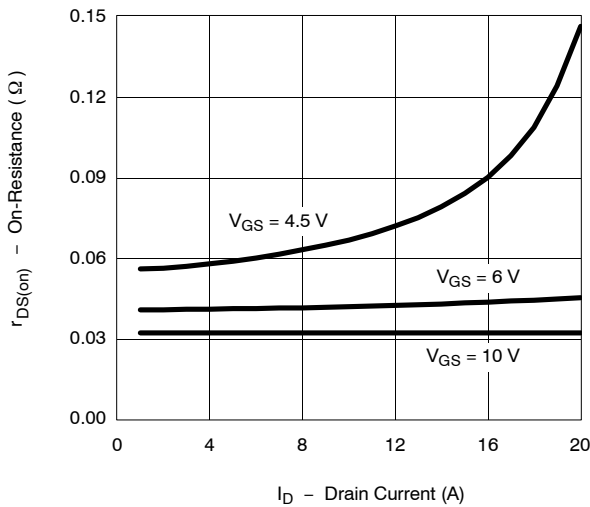
**Output Characteristics**



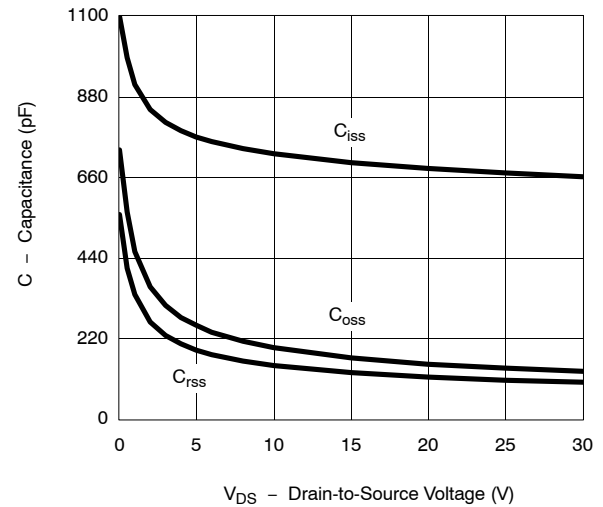
**Transfer Characteristics**



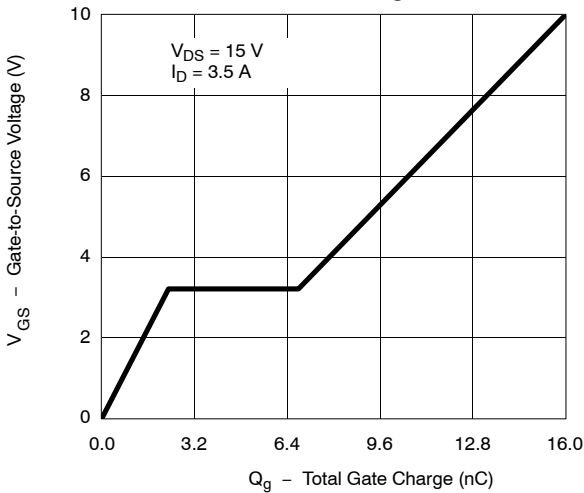
**On-Resistance vs. Drain Current**



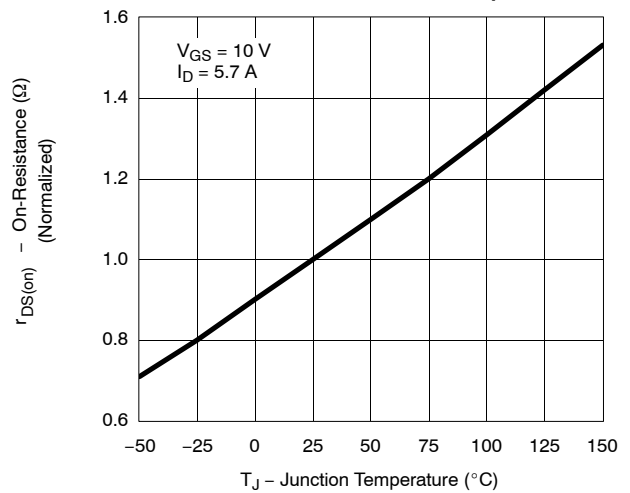
**Capacitance**



**Gate Charge**

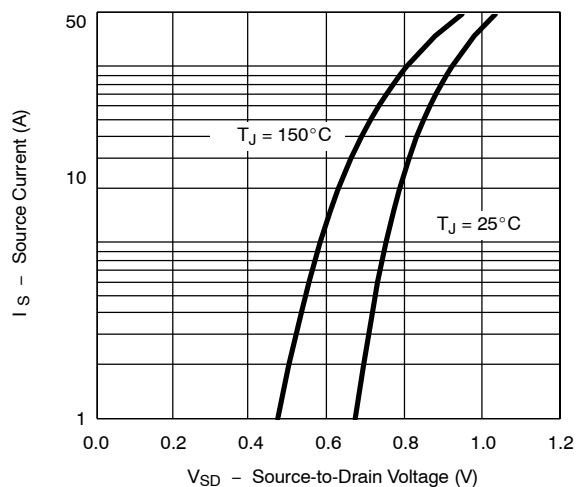


**On-Resistance vs. Junction Temperature**

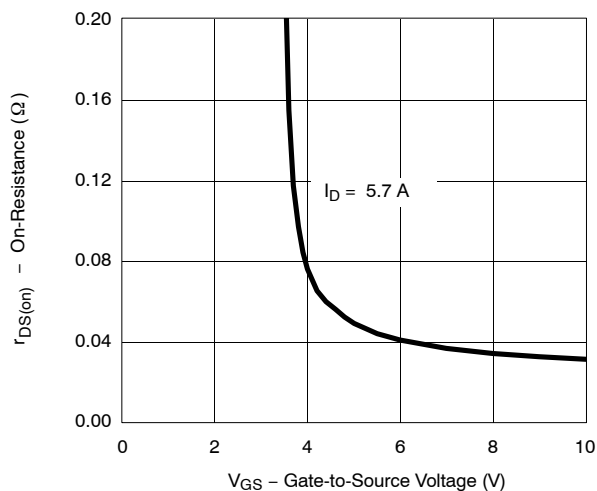


**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**

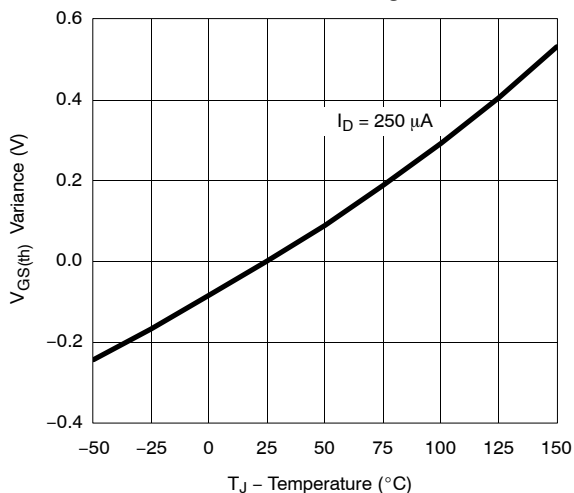
Source-Drain Diode Forward Voltage



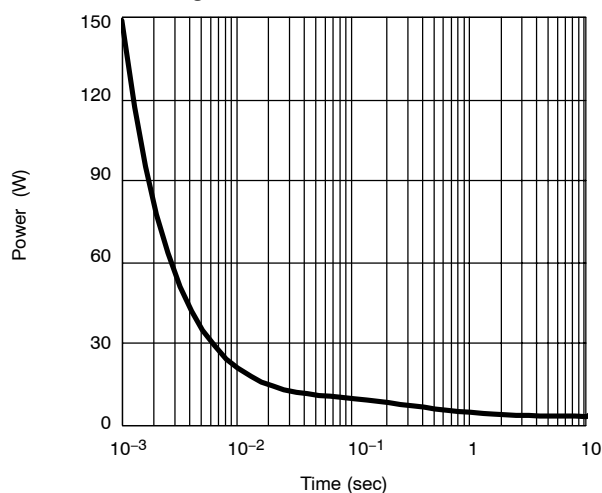
On-Resistance vs. Gate-to-Source Voltage



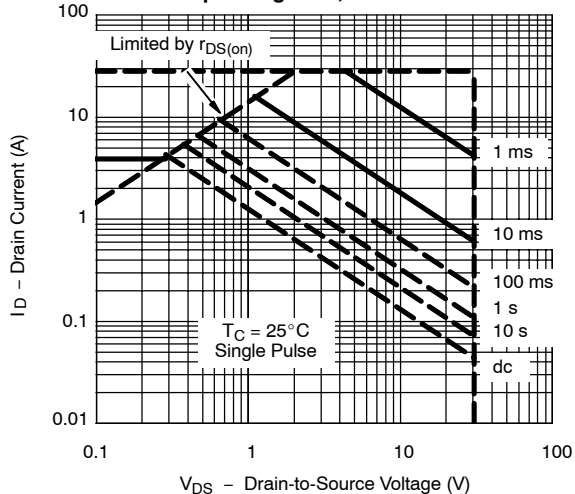
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



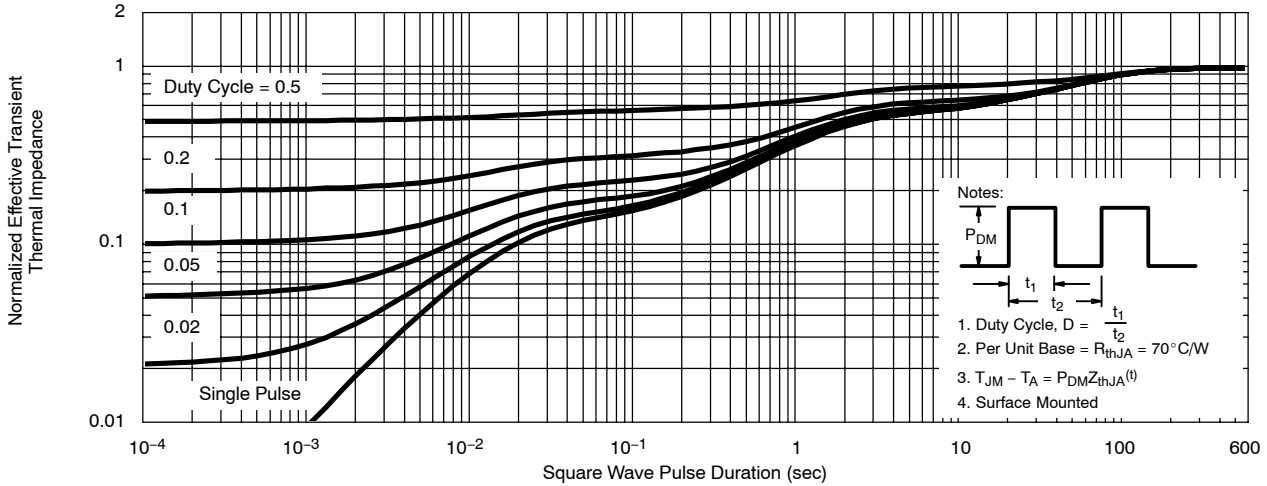
Safe Operating Area, Junction-to-Foot





**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**

Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

