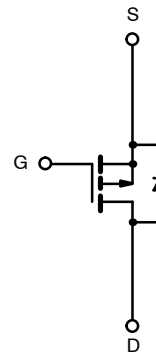
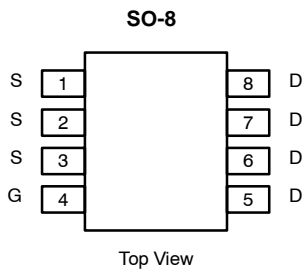




## P-Channel 20-V (D-S) MOSFET

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-20	0.040 @ $V_{GS} = -4.5$ V	-6.3
	0.055 @ $V_{GS} = -2.5$ V	-5.1



Ordering Information: Si9434BDY—E3 (Lead (Pb)-Free)  
Si9434BDY-T1—E3 (Lead (Pb)-Free 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	$V_{DS}$	-20		V	
Gate-Source Voltage	$V_{GS}$	$\pm 8$			
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	-6.3	-4.5	A
		$T_A = 70^\circ\text{C}$	-5.0	-3.6	
Pulsed Drain Current	$I_{DM}$	-20			
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	-2.3	-1.2		
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	45	50	$^\circ\text{C/W}$
		Steady State	80	95	
Maximum Junction-to-Foot (Drain)	$R_{thJF}$	20	24		

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

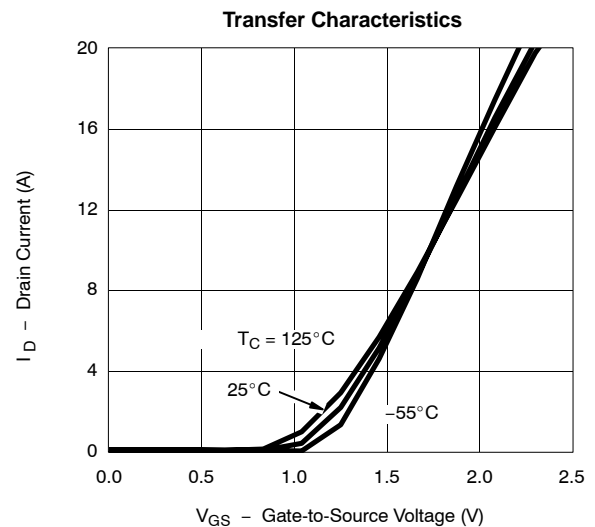
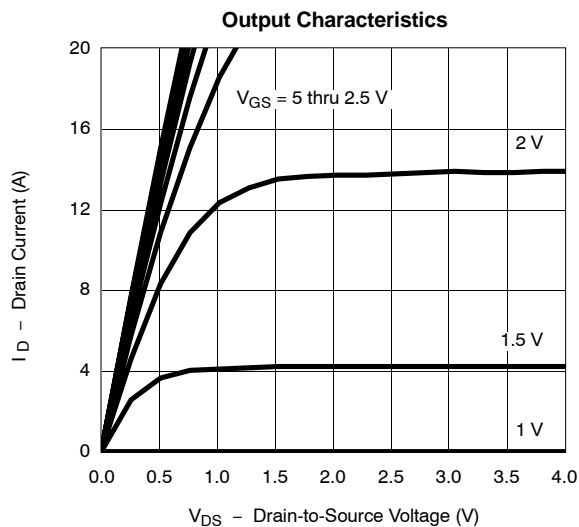


SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA	-0.45		-1.5	V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -20 V, V <sub>GS</sub> = 0 V			-1	μA
		V <sub>DS</sub> = -20 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> ≤ -5 V, V <sub>GS</sub> = -4.5 V	-20			A
		V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -2.5 V	-5			
Drain-Source On-State Resistance <sup>b</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -6.3 A		0.033	0.040	Ω
		V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -5.1 A		0.044	0.055	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -9 V, I <sub>D</sub> = -6.3 A		10		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	-1.2	V
<b>Dynamic<sup>a</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -10 V, V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -6.3 A		12	18	nC
Gate-Source Charge	Q <sub>gs</sub>			1.7		
Gate-Drain Charge	Q <sub>gd</sub>			3.5		
Gate Resistance	R <sub>g</sub>			7		Ω
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -10 V, R <sub>L</sub> = 10 Ω I <sub>D</sub> ≅ -1 A, V <sub>GEN</sub> = -4.5 V, R <sub>g</sub> = 6 Ω		15	25	ns
Rise Time	t <sub>r</sub>			45	75	
Turn-Off Delay Time	t <sub>d(off)</sub>			80	130	
Fall Time	t <sub>f</sub>			60	100	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = -2.3 A, di/dt = 100 A/μs		40	70	

Notes

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

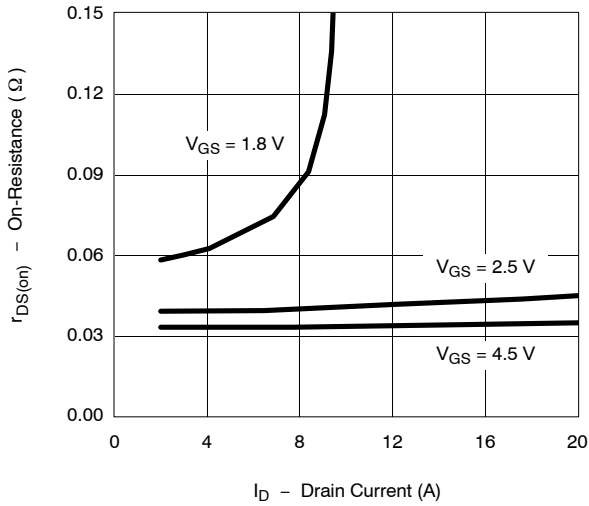
**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**



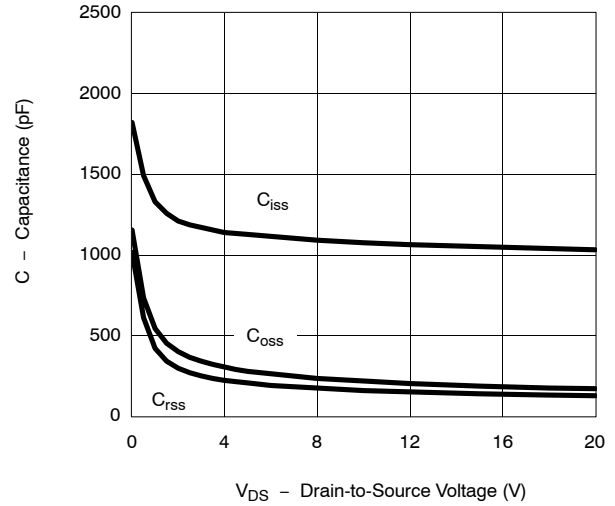


**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**

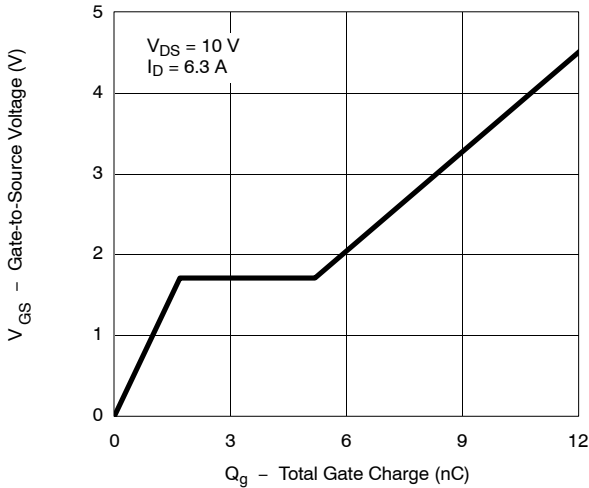
**On-Resistance vs. Drain Current**



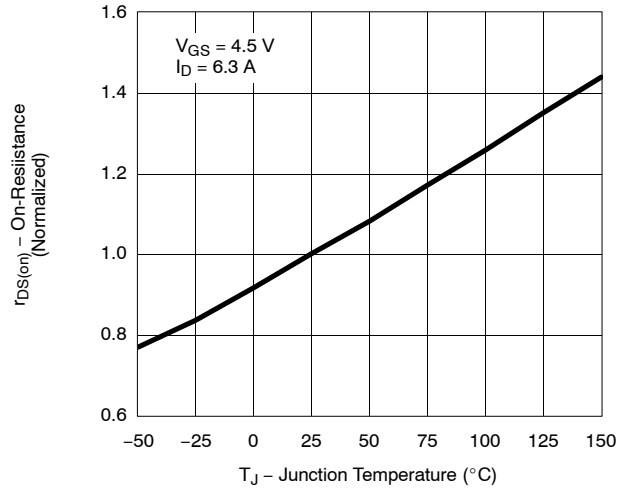
**Capacitance**



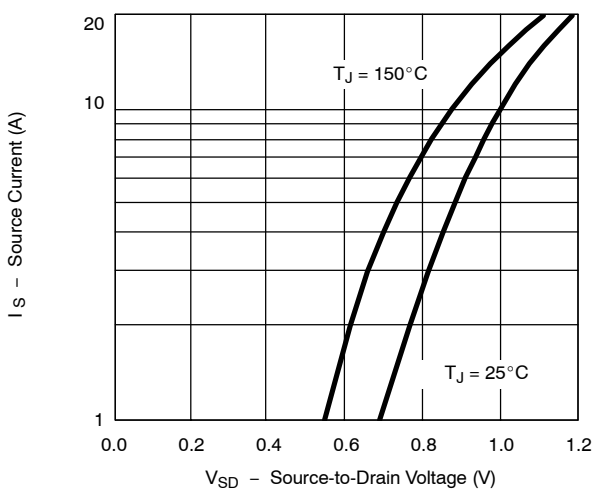
**Gate Charge**



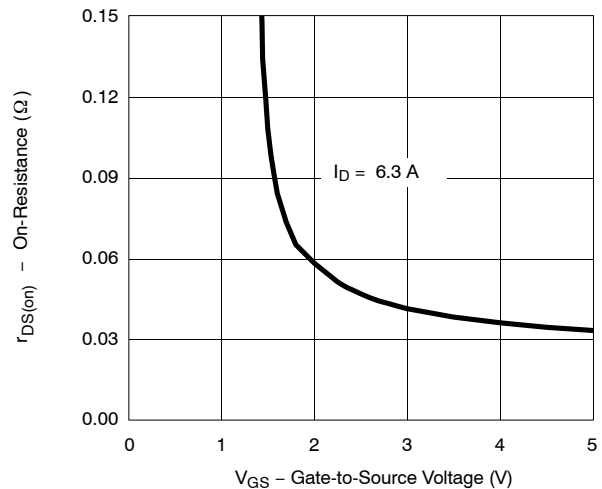
**On-Resistance vs. Junction Temperature**



**Source-Drain Diode Forward Voltage**

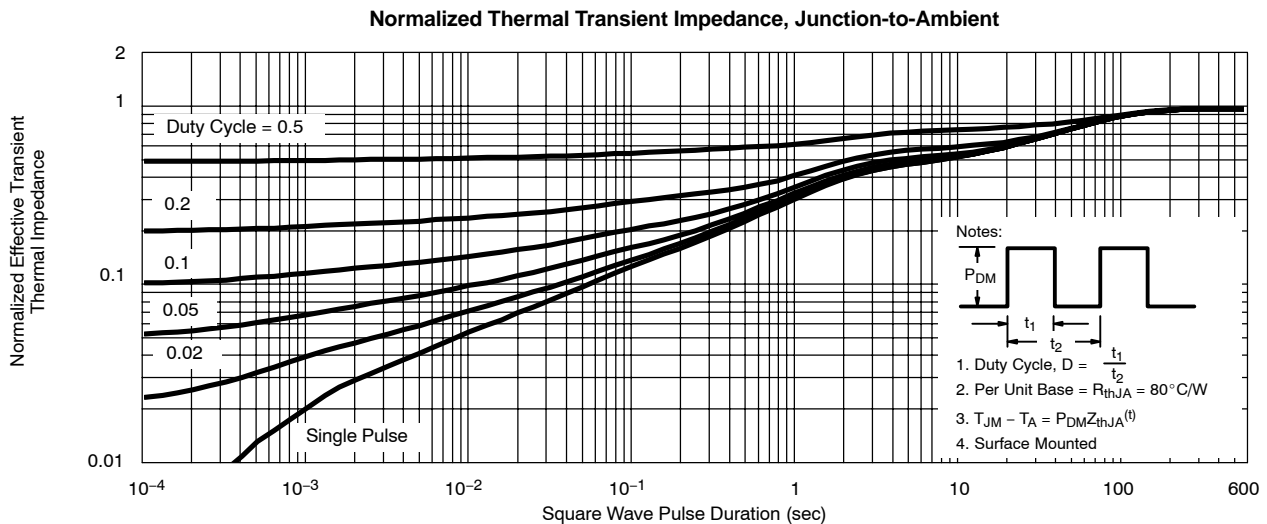
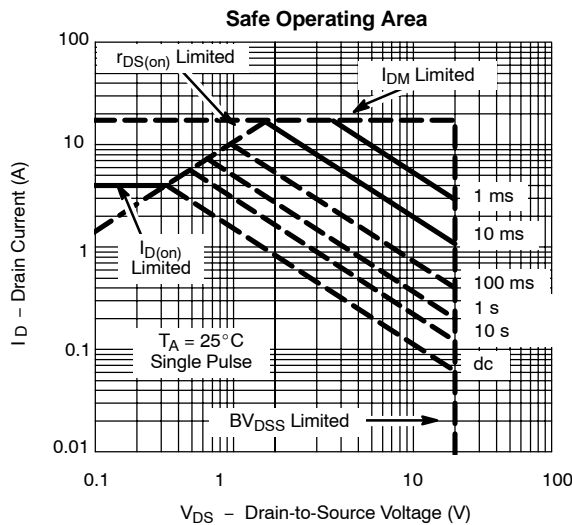
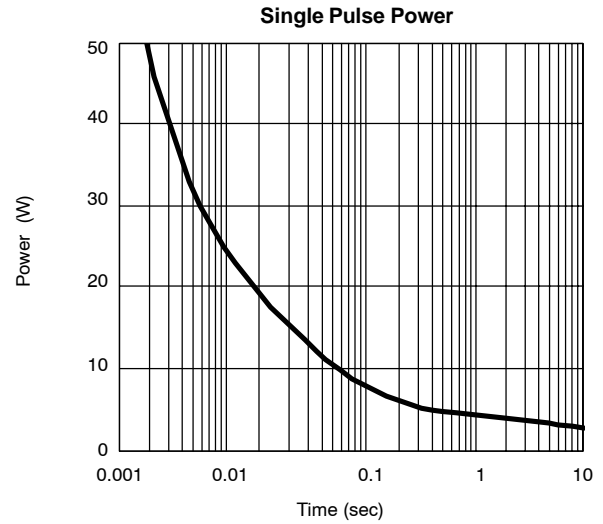
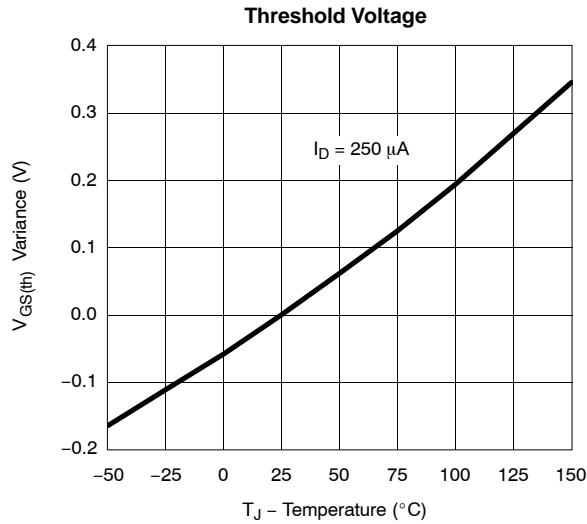


**On-Resistance vs. Gate-to-Source Voltage**



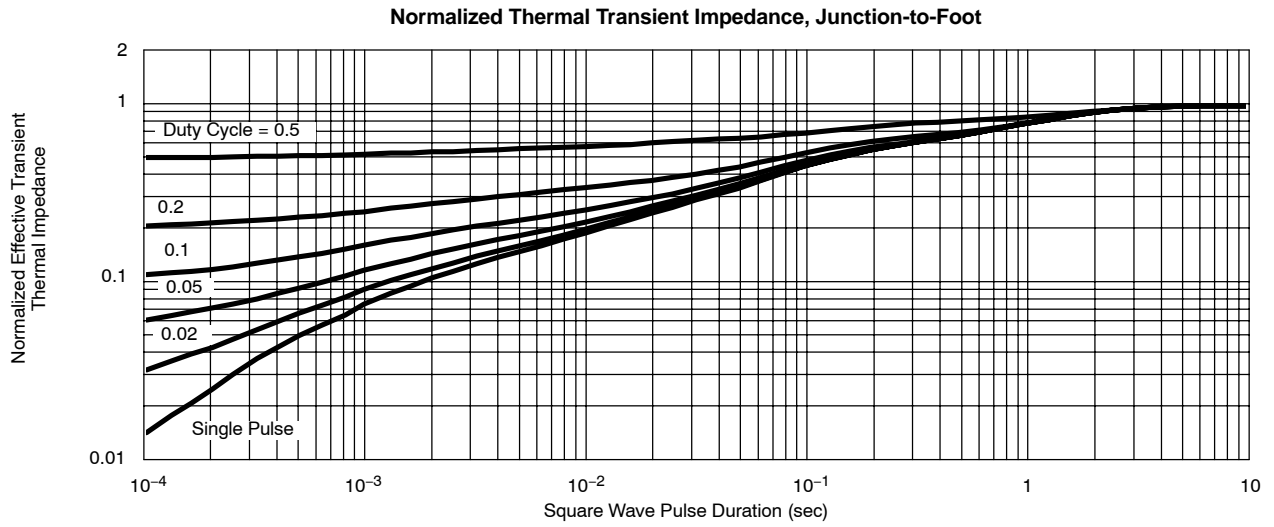


**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**





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





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