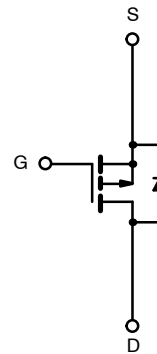
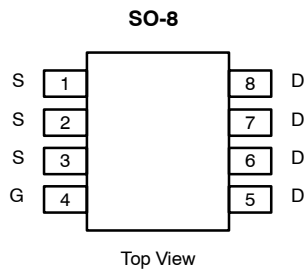




P-Channel 20-V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-20	0.040 @ $V_{GS} = -4.5$ V	-6.2
	0.060 @ $V_{GS} = -2.7$ V	-5.0



P-Channel MOSFET

Ordering Information: Si9433BDY—E3 (Lead Free)
Si9433BDYT1—E3 (Lead Free with Tape and Reel)

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}	± 12		
Continuous Drain Current (T _J = 150°C) ^a	T _A = 25 °C	I _D	−6.2	−4.5	A
	T _A = 70 °C		−5.0	−3.5	
Pulsed Drain Current		I _{DM}	−20		
Continuous Source Current (Diode Conduction) ^a		I _S	−2.3	−1.2	
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	$t \leq 10$ sec	R_{thJA}	45	50	$^\circ\text{C/W}$
	Steady State		80	95	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	20	24	

Notes

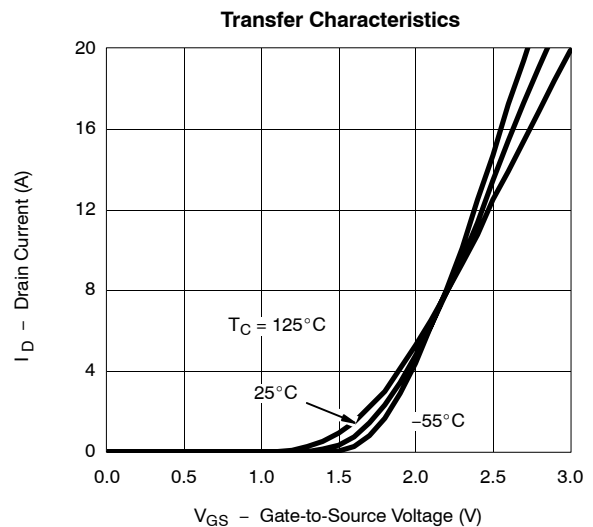
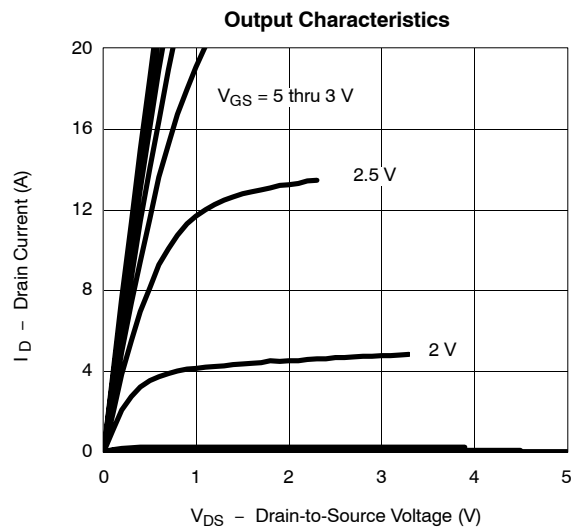
a. Surface Mounted on FR4 Board, $t \leq 10$ sec.

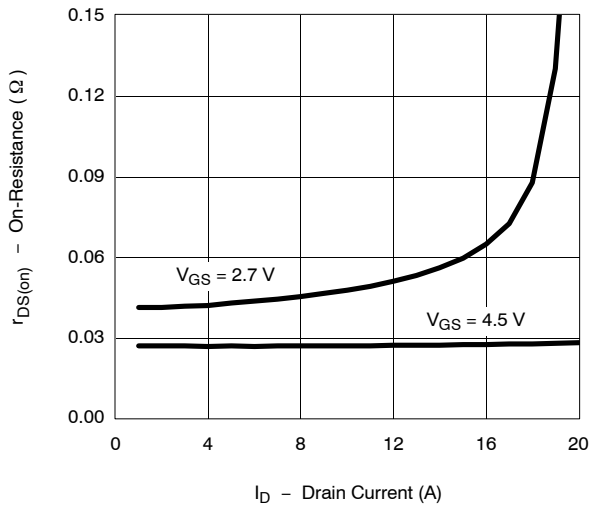
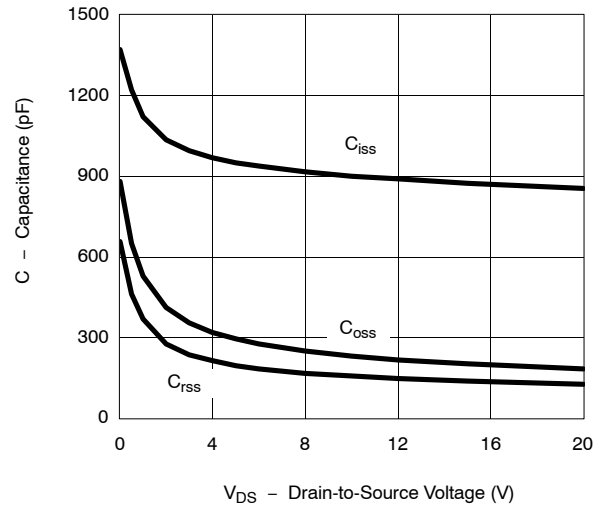
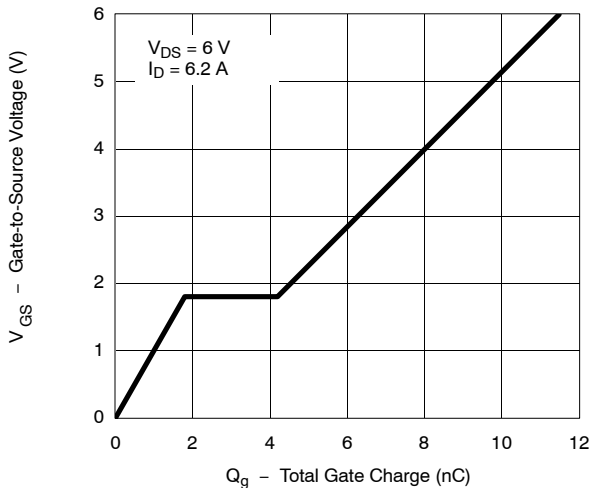
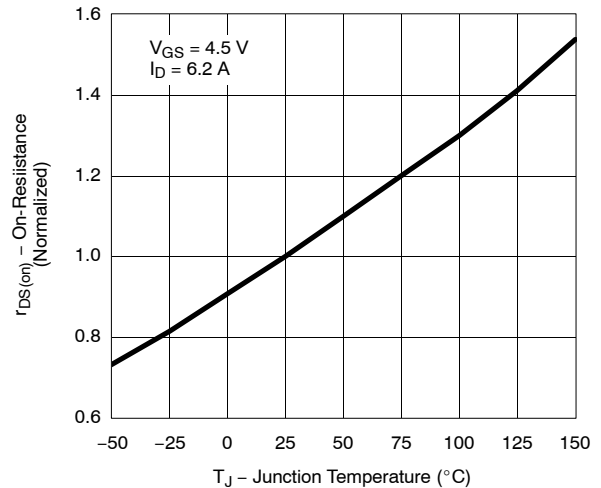
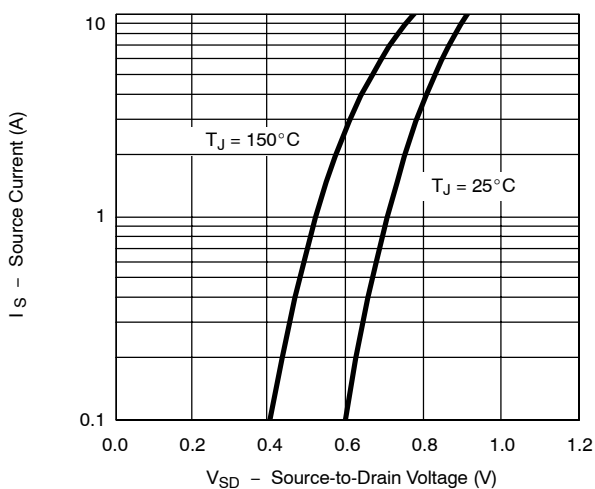
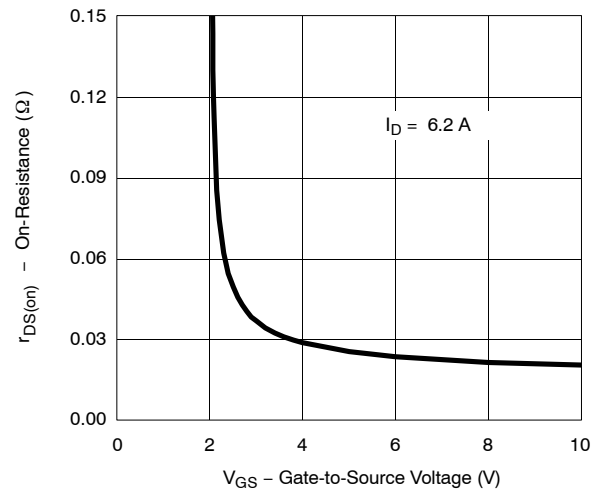
SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ ^a	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-0.6		-1.5	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 12\ \text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -20\ \text{V}, V_{GS} = 0\ \text{V}$			-1	μA
		$V_{DS} = -20\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 70^\circ\text{C}$			-10	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} \leq -5\ \text{V}, V_{GS} = -4.5\ \text{V}$	-20			A
		$V_{DS} \leq -5\ \text{V}, V_{GS} = -2.7\ \text{V}$	-5			
Drain-Source On-State Resistance ^b	$r_{DS(on)}$	$V_{GS} = -4.5\ \text{V}, I_D = -6.2\ \text{A}$		0.030	0.040	Ω
		$V_{GS} = -2.7\ \text{V}, I_D = -5.0\ \text{A}$		0.050	0.060	
Forward Transconductance ^b	g_{fs}	$V_{DS} = -9\ \text{V}, I_D = -6.2\ \text{A}$		15		S
Diode Forward Voltage ^b	V_{SD}	$I_S = -2.6\ \text{A}, V_{GS} = 0\ \text{V}$		-0.76	-1.1	V
Dynamic^a						
Total Gate Charge	Q_g	$V_{DS} = -6\ \text{V}, V_{GS} = -4.5\ \text{V}, I_D = -6.2\ \text{A}$		8.8	14	nC
Gate-Source Charge	Q_{gs}			1.8		
Gate-Drain Charge	Q_{gd}			2.4		
Gate Resistance	R_g			8.5		Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -6\ \text{V}, R_L = 6\ \Omega$ $I_D \approx -1\ \text{A}, V_{GEN} = -4.5\ \text{V}, R_g = 6\ \Omega$		40	60	ns
Rise Time	t_r			55	85	
Turn-Off Delay Time	$t_{d(off)}$			65	100	
Fall Time	t_f			30	45	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = -2.3\ \text{A}, di/dt = 100\ \text{A}/\mu\text{s}$		35	55	

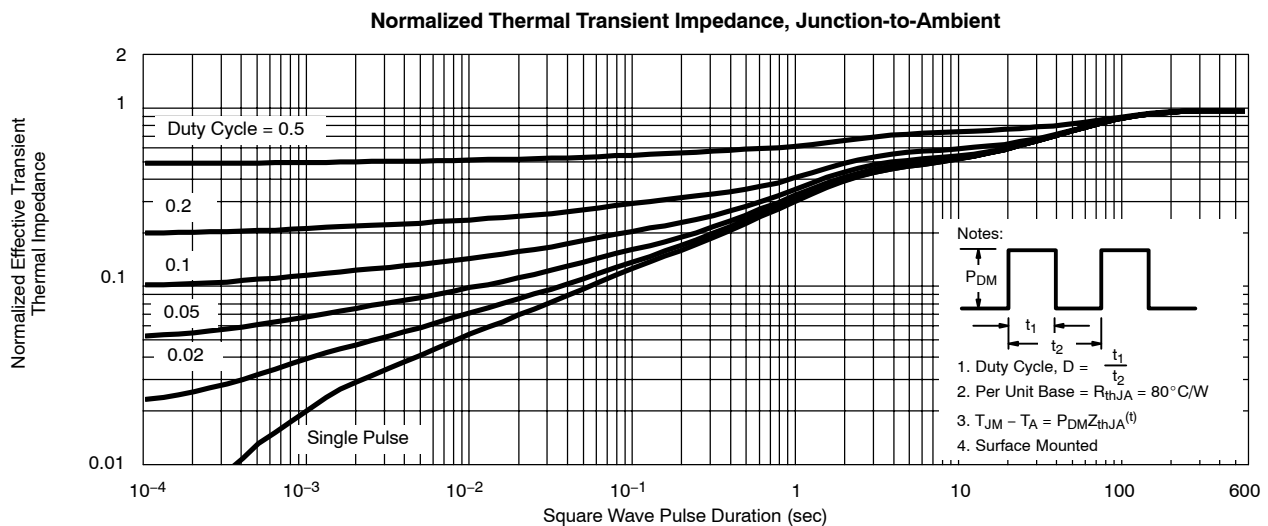
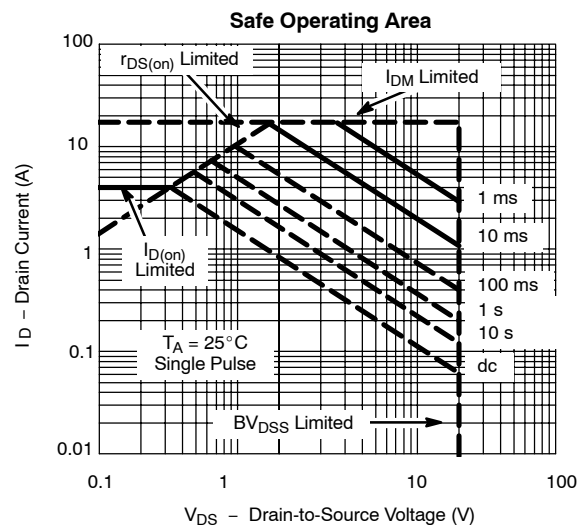
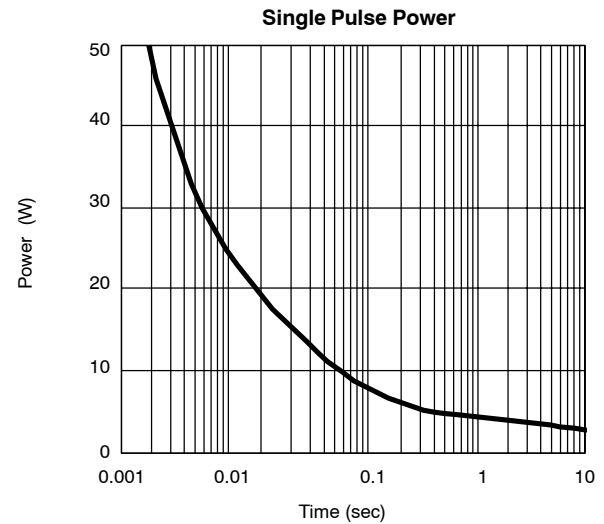
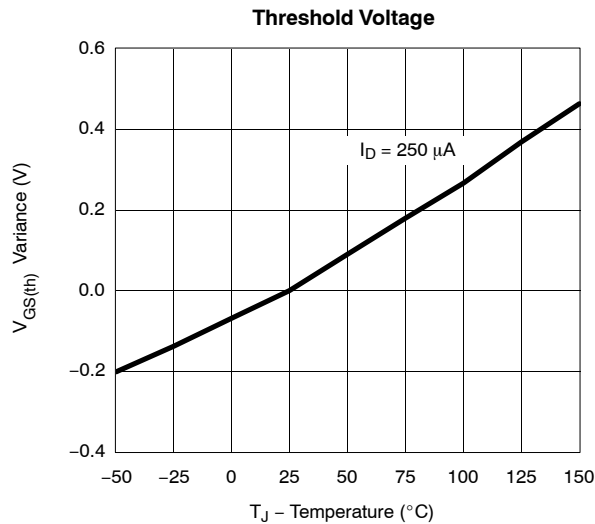
Notes

- a. For design aid only; not subject to production testing.
b. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.

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)

