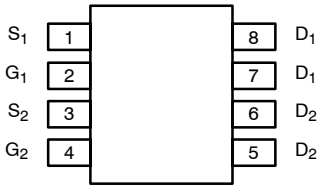
Dual P-Channel 2.5-V (G-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
−12	0.035 @ V_{GS} = −4.5 V	−6.4
	0.056 @ V_{GS} = −2.5 V	−5.1

FEATURES

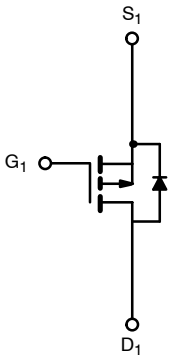
- TrenchFET® Power MOSFET

SO-8

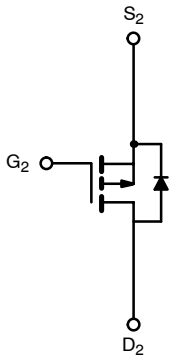


Top View

Ordering Information: Si9934BDY—E3
Si9934BDY-T1—E3 (with Tape and Reel)



P-Channel MOSFET



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}	−12		V
Gate-Source Voltage		V_{GS}	±8		V
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	−6.4	−4.8	A
	T_A = 70°C		−5.1	−3.9	
Pulsed Drain Current		I_{DM}	−20		A
continuous Source Current (Diode Conduction)[a]		I_S	−1.7	−0.9	A
Maximum Power Dissipation[a]	T_A = 25°C	P_D	2.0	1.1	W
	T_A = 70°C		1.3	0.7	
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}	55	62.5	°C/W
	Steady State		90	110	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	33	40	

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

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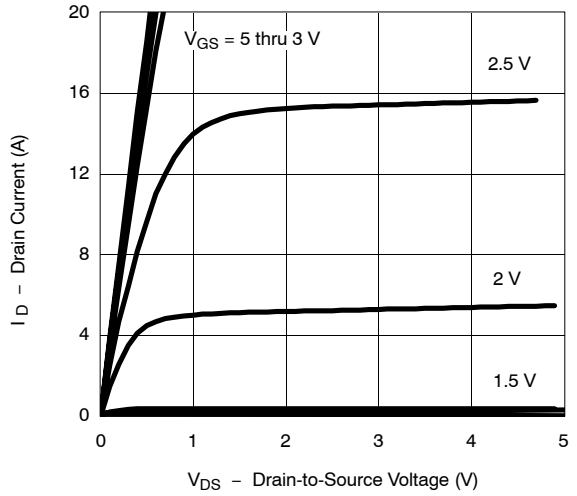
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = -250$ µA	−0.6		−1.4	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0$ V, $V_{GS} = \pm 8$ V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -12$ V, $V_{GS} = 0$ V			−1	µA
		$V_{DS} = -12$ V, $V_{GS} = 0$ V, $T_J = 55°C$			−5	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} = -5$ V, $V_{GS} = -4.5$ V	−20			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	$V_{GS} = -4.5$ V, $I_D = -6.4$ A		0.028	0.035	Ω
		$V_{GS} = -2.5$ V, $I_D = -1.8$ A		0.044	0.056	
Forward Transconductance[a]	g_{fs}	$V_{DS} = -10$ V, $I_D = -6.4$ A		17		S
Diode Forward Voltage[a]	V_{SD}	$I_S = -1.7$ A, $V_{GS} = 0$ V		−0.8	−1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	$V_{DS} = 6$ V, $V_{GS} = -4.5$ V, $I_D = -6.4$ A		13	20	nC
Gate-Source Charge	Q_{gs}			2.6		
Gate-Drain Charge	Q_{gd}			4.0		
Gate Resistance	R_g			9		Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 6$ V, $R_L = 6$ Ω $I_D \cong -1$ A, $V_{GEN} = -4.5$ V, $R_g = 6$ Ω		19	30	ns
Rise Time	t_r			35	55	
Turn-Off Delay Time	$t_{d(off)}$			80	120	
Fall Time	t_f			50	75	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = -1.7$ A, di/dt = 100 A/µs		40	80	

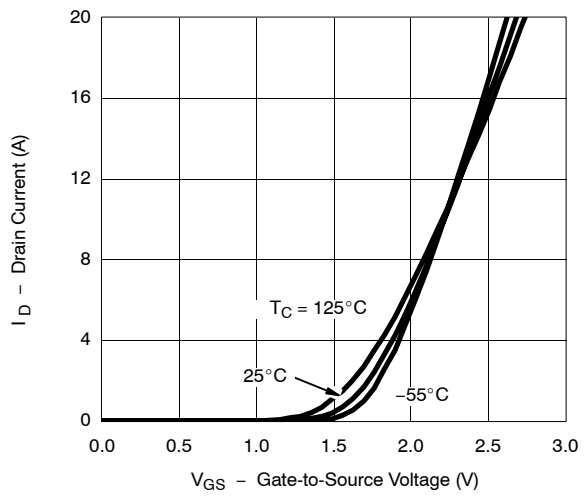
Notes
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Output Characteristics



Transfer Characteristics



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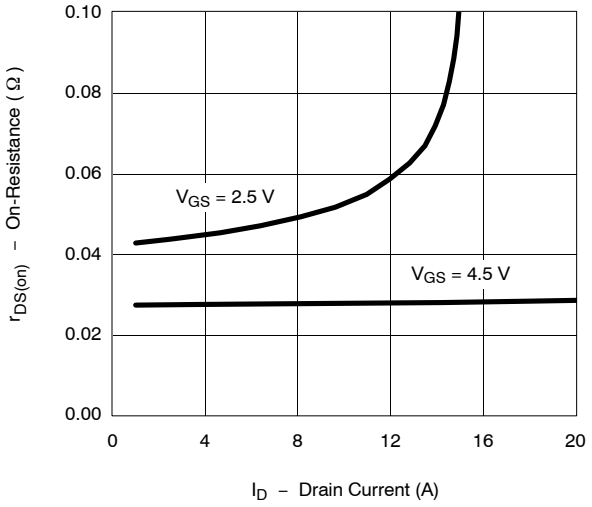
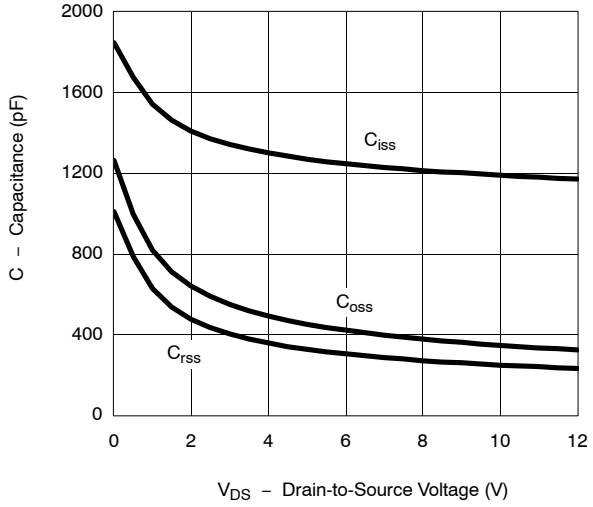
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

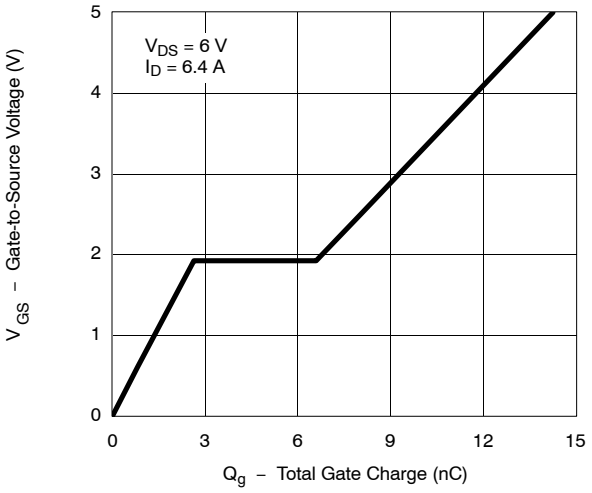
On-Resistance vs. Drain Current



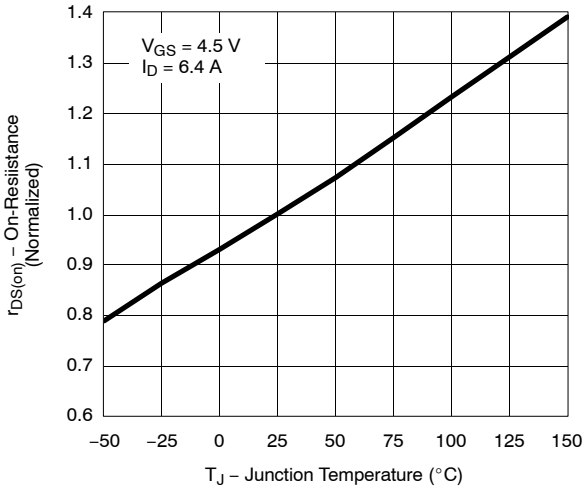
Capacitance



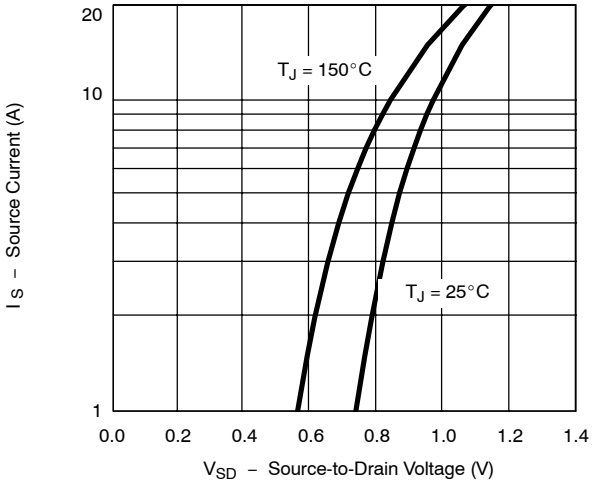
Gate Charge



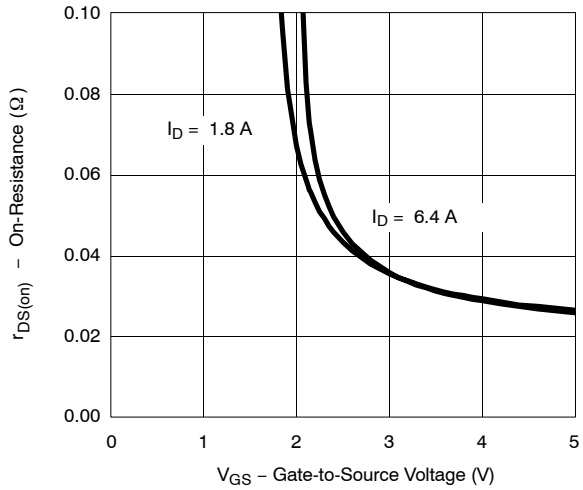
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



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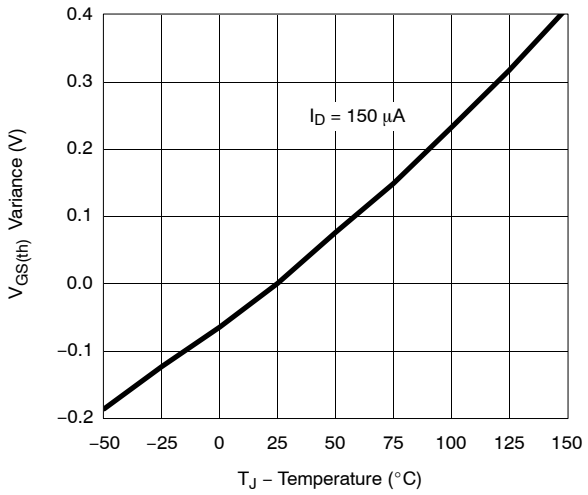
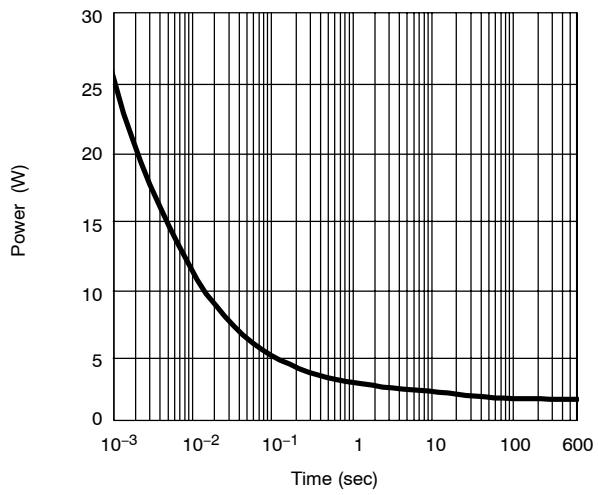
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

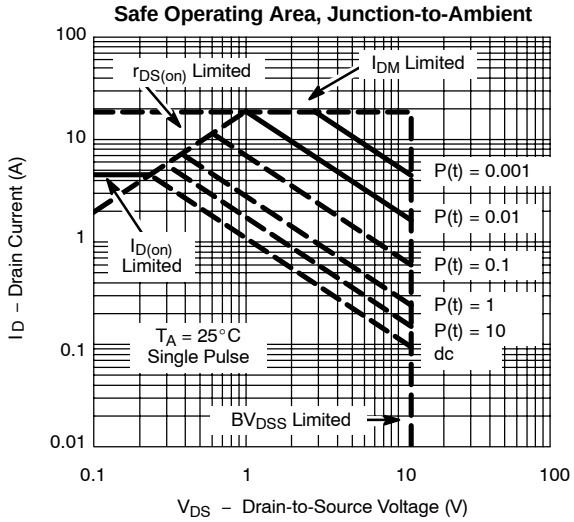
Threshold Voltage



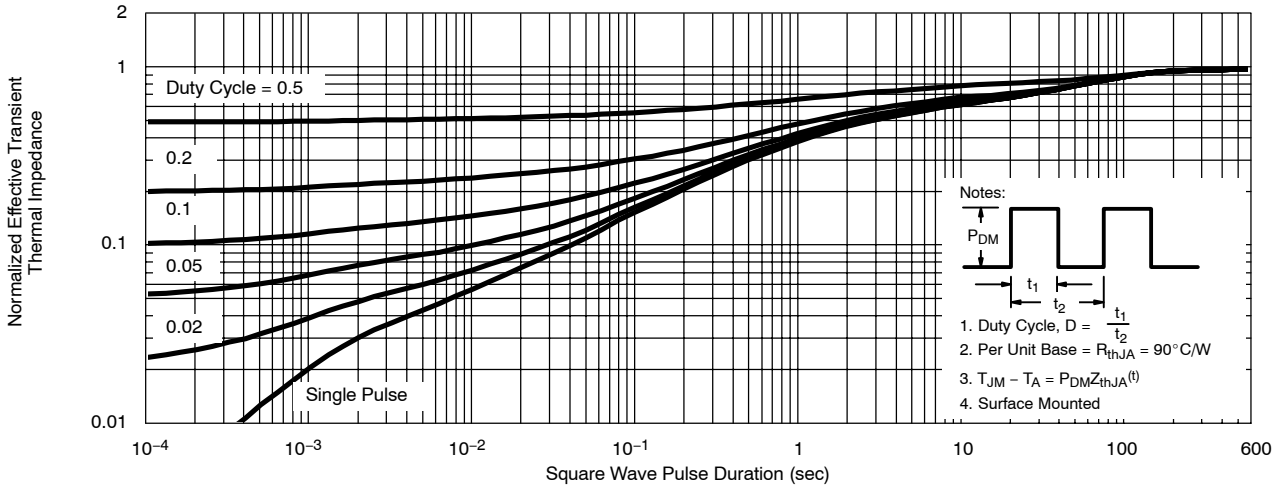
Single Pulse Power



Safe Operating Area, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient



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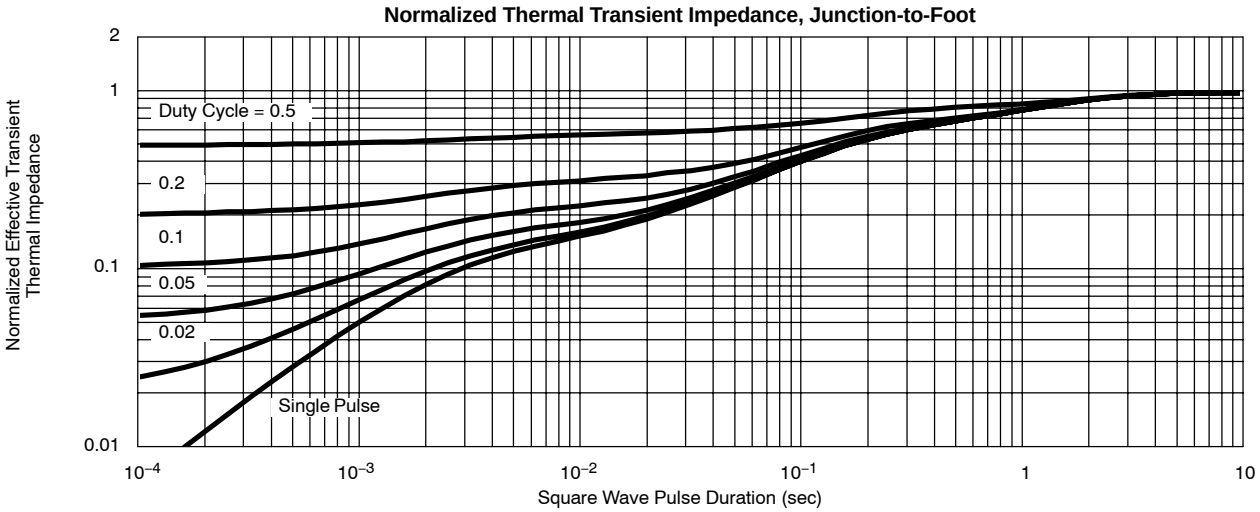
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



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