



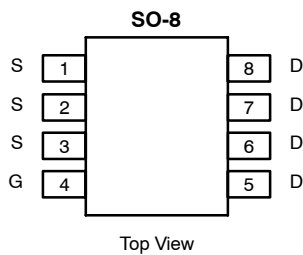
N-Channel 30-V (D-S) MOSFET with Schottky Diode

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.0120 @ $V_{GS} = 10$ V	11
	0.0175 @ $V_{GS} = 4.5$ V	9.5

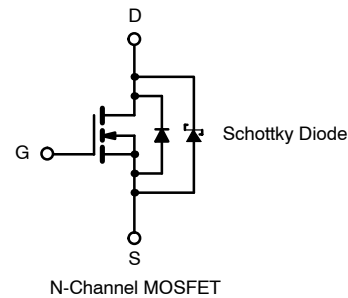
FEATURES

- LITTLE FOOT® Plus
- 100% R_g Tested

SCHOTTKY PRODUCT SUMMARY		
V_{DS} (V)	V_{SD} (V) Diode Forward Voltage	I_F (A)
30	0.53 V @ 3 A	4



Ordering Information: Si4852DY
Si4852DY-T1 (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 (MOSFET)		V_{DS}	30		V
Reverse Voltage (Schottky)		V_{DA}	30		
Gate-Source Voltage		V_{GS}	± 20		
Continuous Drain Current ($T_J = 150^\circ\text{C}$) (MOSFET) ^a	$T_A = 25^\circ\text{C}$	I_D	11	8.7	A
	$T_A = 70^\circ\text{C}$		9.0	7.0	
Pulsed Drain Current (MOSFET)		I_{DM}	50		
Continuous Source Current (MOSFET Diode Conduction) ^a		I_S	2.3	1.3	
Average Forward Current (Schottky)		I_F	4.0	2.5	
Pulsed Forward Current (Schottky)		I_{FM}	50		
Maximum Power Dissipation (MOSFET) ^a	$T_A = 25^\circ\text{C}$	P_D	2.5	1.47	W
	$T_A = 70^\circ\text{C}$		1.6	0.94	
Maximum Power Dissipation (Schottky) ^a	$T_A = 25^\circ\text{C}$		2.27	1.38	
	$T_A = 70^\circ\text{C}$		1.45	0.88	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150		$^\circ\text{C}$

THERMAL RESISTANCE RATINGS							
Parameter		Symbol	MOSFET		Schottky		Unit
			Typ	Max	Typ	Max	
Maximum Junction-to-Ambient ^a	$t \leq 10$ sec	R_{thJA}	40	50	45	55	$^\circ\text{C/W}$
	Steady-State		72	85	75	90	
Maximum Junction-to-Foot (Drain)	Steady-State	R_{thJF}	18	22	20	25	

Notes

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

MOSFET SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED).						
Parameter	Symbol	Test Condition	Min	Typ ^a	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	1			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 20\ \text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 24\ \text{V}, V_{GS} = 0\ \text{V}$		0.007	0.100	mA
		$V_{DS} = 24\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 100^\circ\text{C}$		1.5	10	
		$V_{DS} = 24\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 125^\circ\text{C}$		6.5	20	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} \geq 5\ \text{V}, V_{GS} = 10\ \text{V}$	20			A
Drain-Source On-State Resistance ^b	$r_{DS(on)}$	$V_{GS} = 10\ \text{V}, I_D = 11\ \text{A}$		0.0100	0.0120	Ω
		$V_{GS} = 4.5\ \text{V}, I_D = 9.5\ \text{A}$		0.0145	0.0175	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15\ \text{V}, I_D = 11\ \text{A}$		28		S
Schottky Diode Forward Voltage ^b	V_{SD}	$I_S = 3.0\ \text{A}, V_{GS} = 0\ \text{V}$		0.485	0.53	V
		$I_S = 3.0\ \text{A}, V_{GS} = 0\ \text{V}, T_J = 125^\circ\text{C}$		0.416	0.47	
Dynamic^a						
Total Gate Charge	Q_g	$V_{DS} = 15\ \text{V}, V_{GS} = 5\ \text{V}, I_D = 11\ \text{A}$		24	35	nC
Gate-Source Charge	Q_{gs}		9			
Gate-Drain Charge	Q_{gd}		7.5			
Gate Resistance	R_g		0.5		2.6	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15\ \text{V}, R_L = 15\ \Omega$ $I_D \cong 1\ \text{A}, V_{GEN} = 10\ \text{V}, R_G = 6\ \Omega$		17	30	ns
Rise Time	t_r		10	20		
Turn-Off Delay Time	$t_{d(off)}$		60	100		
Fall Time	t_f		18	30		
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 3.0\ \text{A}, di/dt = 100\ \text{A}/\mu\text{s}$		40	70	

Notes

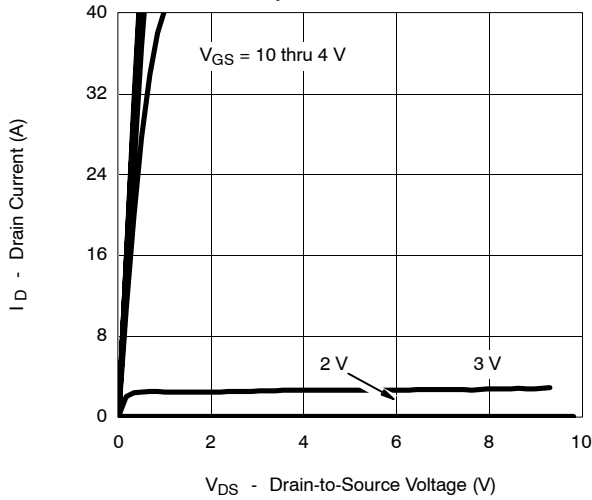
- a. Guaranteed by design, not subject to production testing.
 b. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.

SCHOTTKY SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Forward Voltage Drop	V_F	$I_F = 3.0\ \text{A}$		0.485	0.53	V
		$I_F = 3.0\ \text{A}, T_J = 125^\circ\text{C}$		0.416	0.47	
Maximum Reverse Leakage Current	I_{rm}	$V_r = 24\ \text{V}$		0.007	0.100	mA
		$V_r = 24\ \text{V}, T_J = 100^\circ\text{C}$		1.5	10	
		$V_r = -24\ \text{V}, T_J = 125^\circ\text{C}$		6.4	20	
Junction Capacitance	C_T	$V_r = 10\ \text{V}$		115		pF

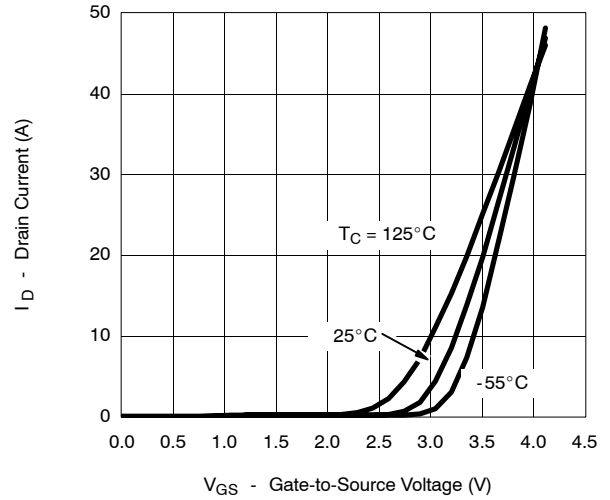


TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

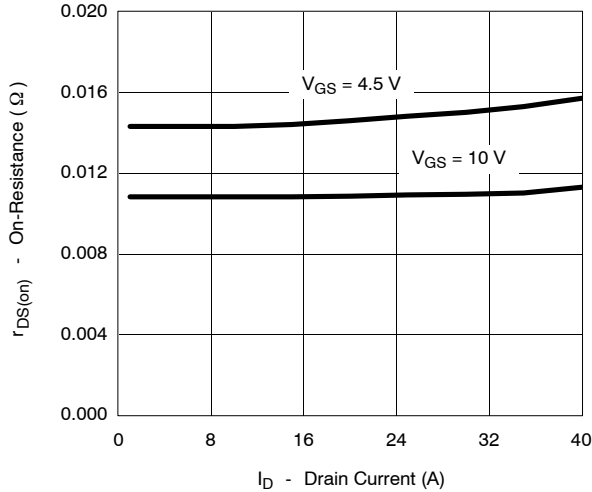
Output Characteristics



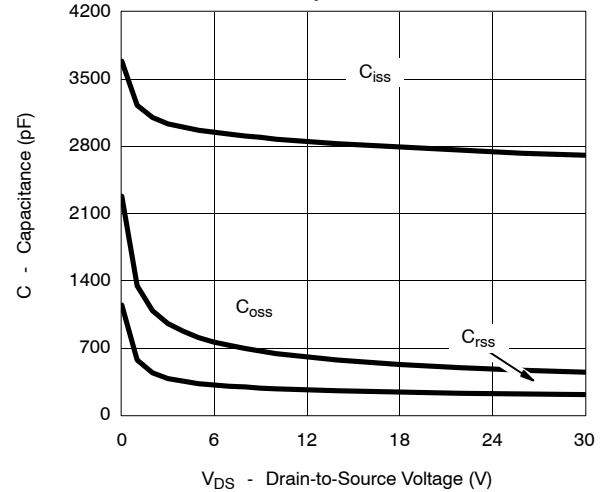
Transfer Characteristics



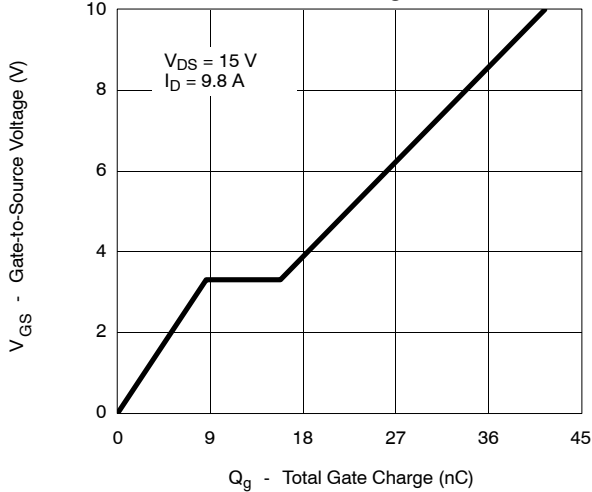
On-Resistance vs. Drain Current



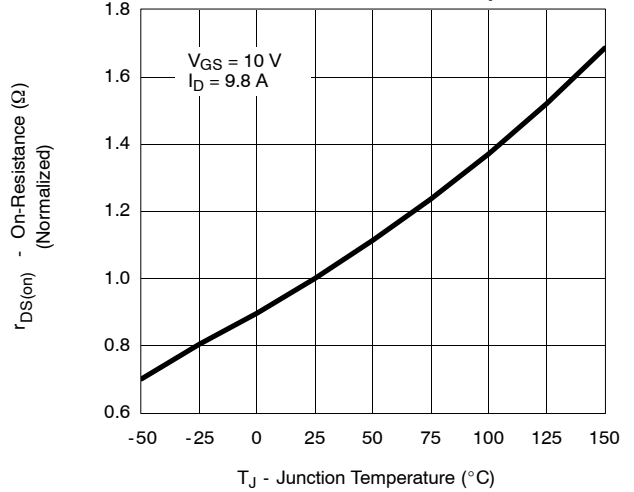
Capacitance



Gate Charge

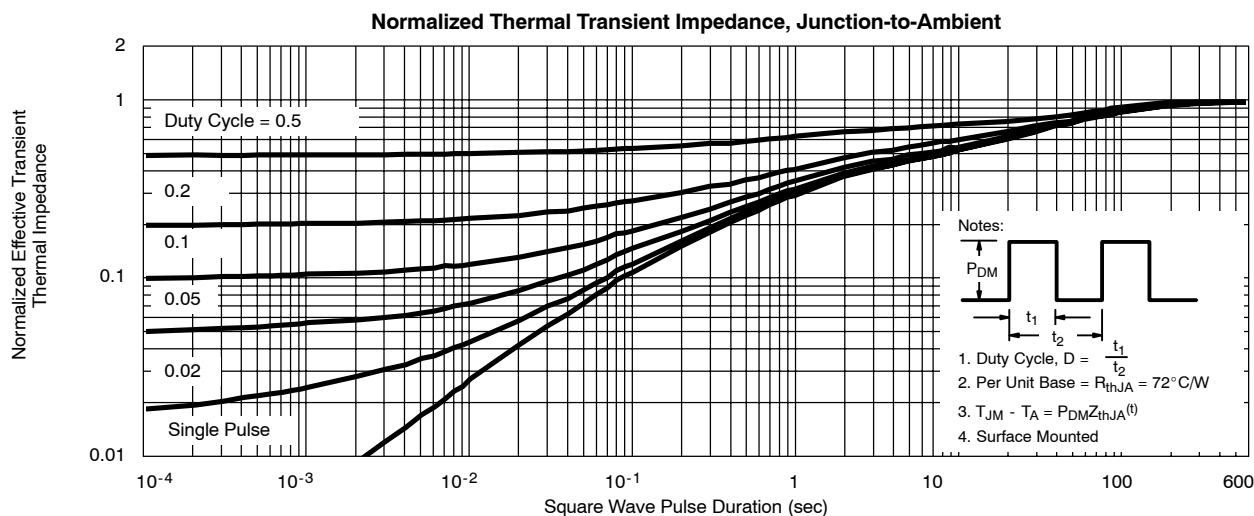
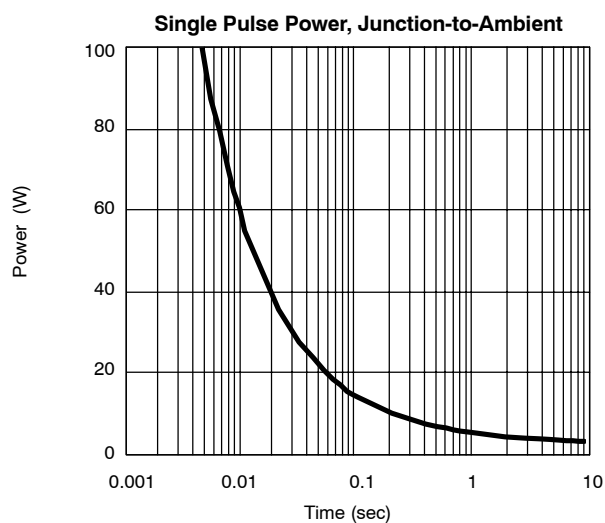
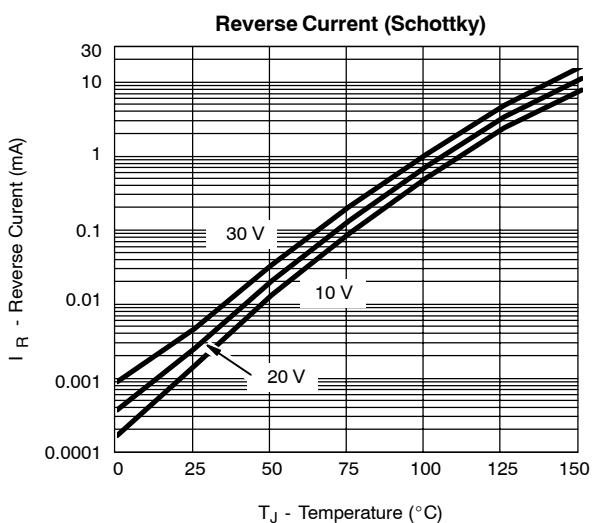
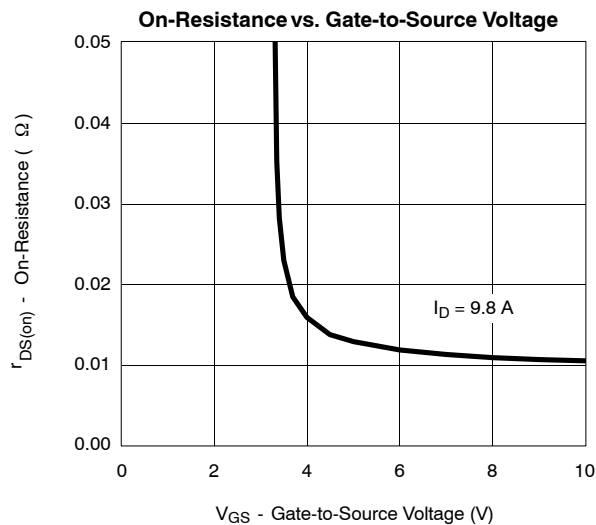
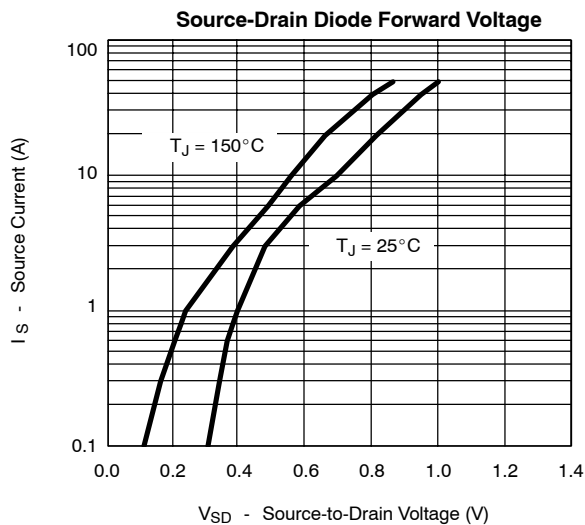


On-Resistance vs. Junction Temperature



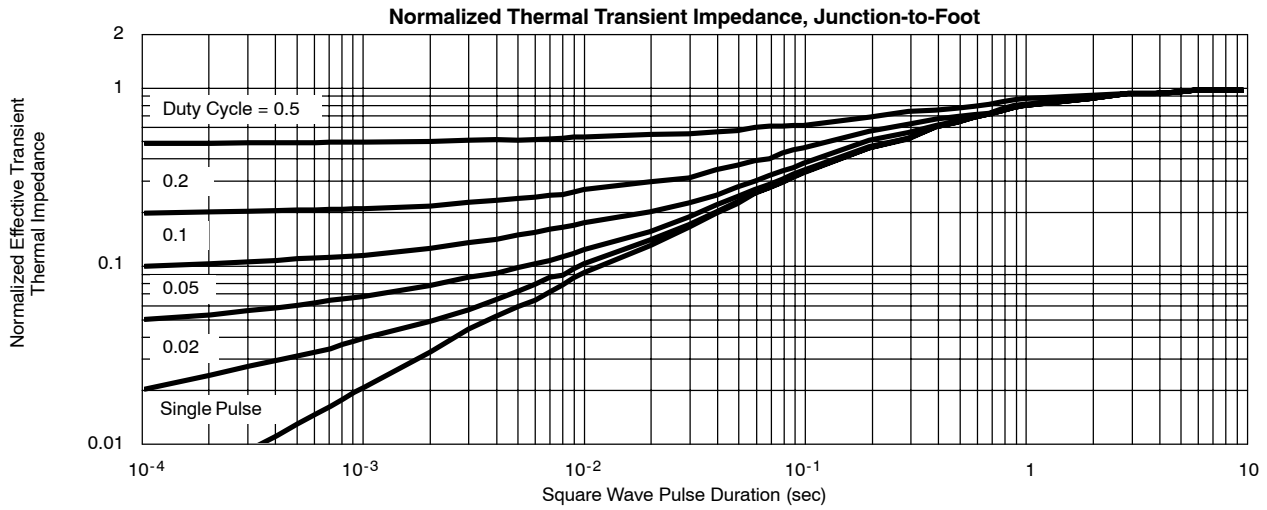


TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)





TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)





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