



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

PRODUCT SUMMARY

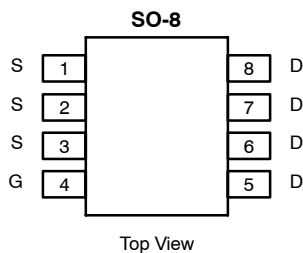
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.0120 @ $V_{GS} = 10$ V	11
	0.0175 @ $V_{GS} = 4.5$ V	9.5

FEATURES

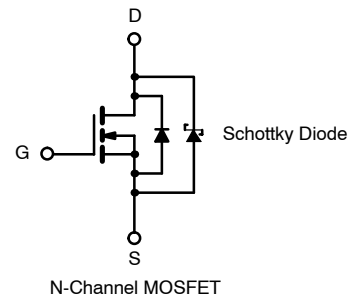
- LITTLE FOOT® Plus
- 100% R_g Tested

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°C) (MOSFET) ^a	T _A = 25°C	I _D	11	8.7	A
	T _A = 70°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 Foward Current (Schottky)		I _F	4.0	2.5	
Pulsed Foward Current (Schottky)		I _{FM}	50		
Maximum Power Dissipation (MOSFET) ^a	T _A = 25°C	P _D	2.5	1.47	W
	T _A = 70°C		1.6	0.94	
Maximum Power Dissipation (Schottky) ^a	T _A = 25°C		2.27	1.38	
	T _A = 70°C		1.45	0.88	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to 150		°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 μA	1			V
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 24 V, V _{GS} = 0 V		0.007	0.100	mA
		V _{DS} = 24 V, V _{GS} = 0 V, T _J = 100°C		1.5	10	
		V _{DS} = 24 V, V _{GS} = 0 V, T _J = 125°C		6.5	20	
On-State Drain Current ^b	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 10 V	20			A
Drain-Source On-State Resistance ^b	r _{DS(on)}	V _{GS} = 10 V, I _D = 11 A		0.0100	0.0120	Ω
		V _{GS} = 4.5 V, I _D = 9.5 A		0.0145	0.0175	
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 11 A		28		S
Schottky Diode Forward Voltage ^b	V _{SD}	I _S = 3.0 A, V _{GS} = 0 V		0.485	0.53	V
		I _S = 3.0 A, V _{GS} = 0 V, T _J = 125°C		0.416	0.47	
Dynamic ^a						
Total Gate Charge	Q _g	V _{DS} = 15 V, V _{GS} = 5 V, I _D = 11 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 V, R _L = 15 Ω I _D ≅ 1 A, V _{GEN} = 10 V, R _G = 6 Ω		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 A, di/dt = 100 A/μs		40	70	

Notes

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

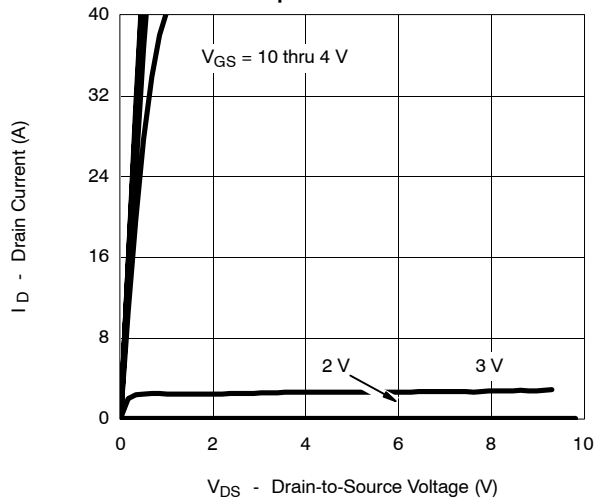
SCHOTTKY SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

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

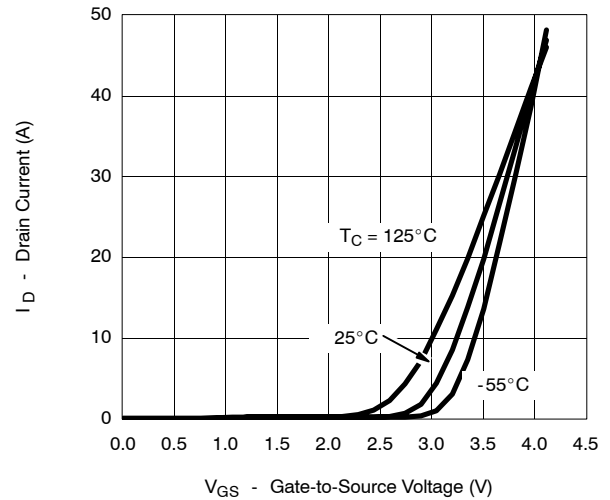


TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

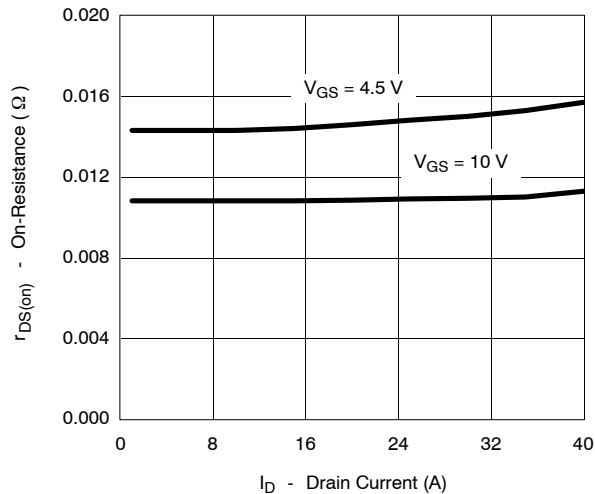
Output Characteristics



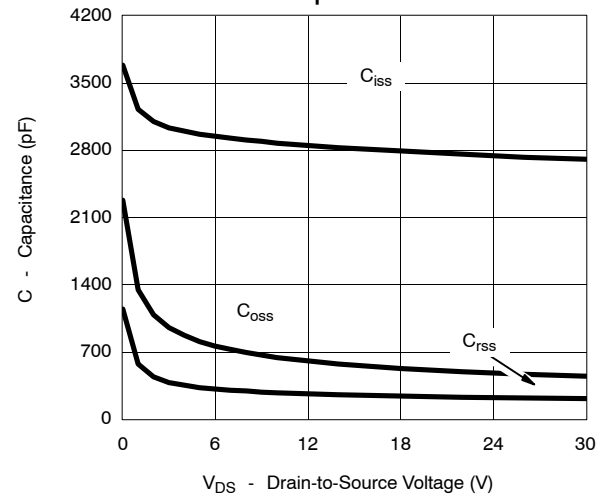
Transfer Characteristics



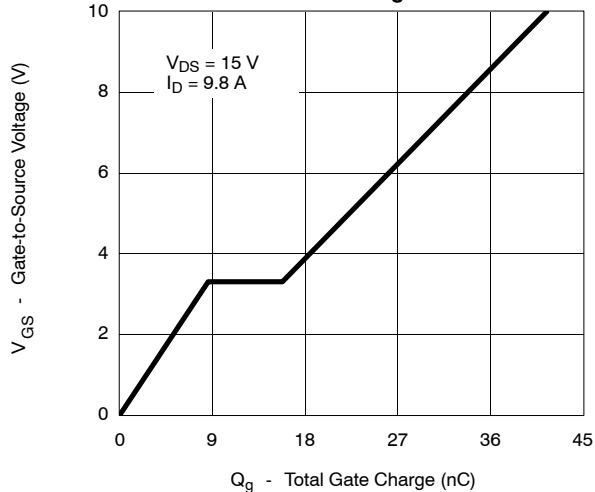
On-Resistance vs. Drain Current



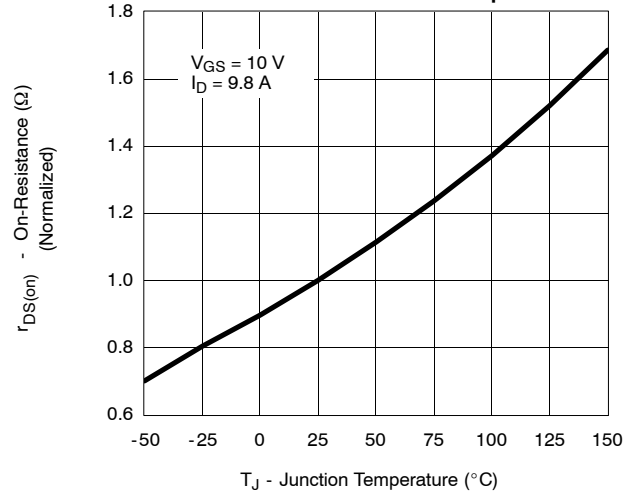
Capacitance

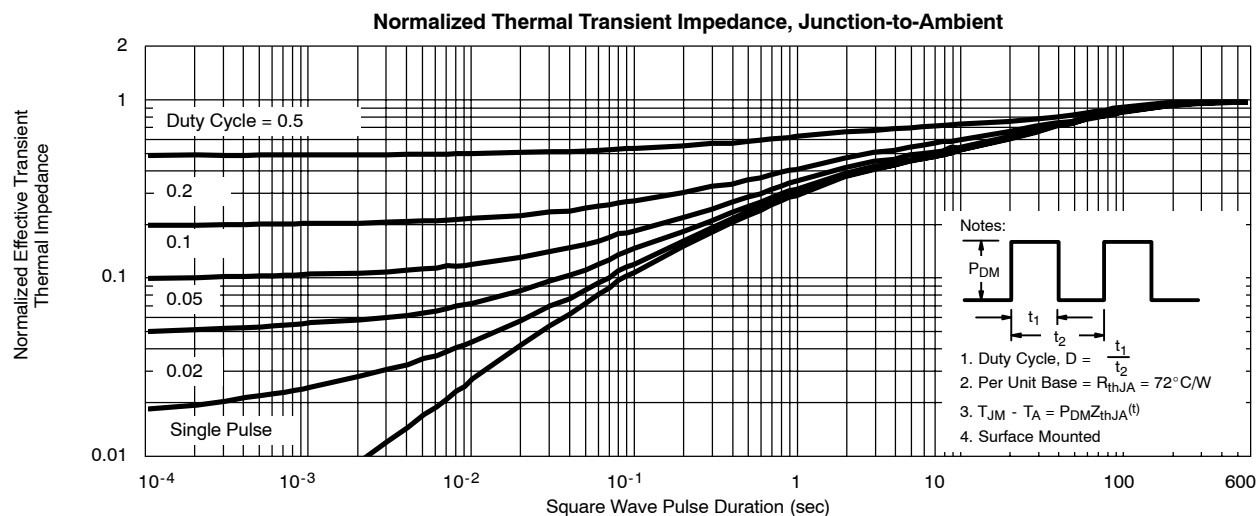
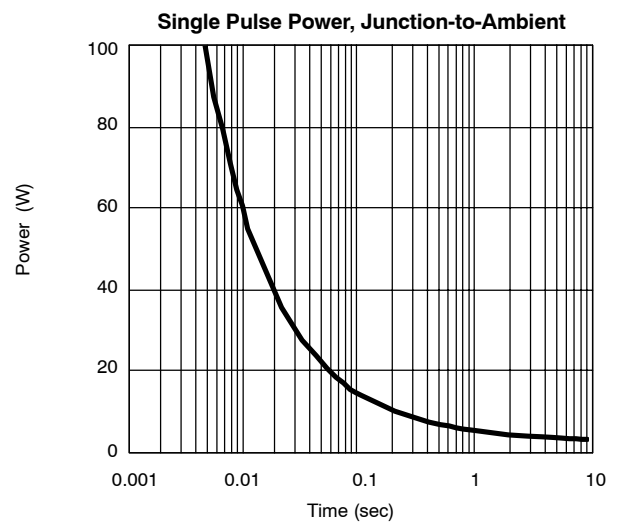
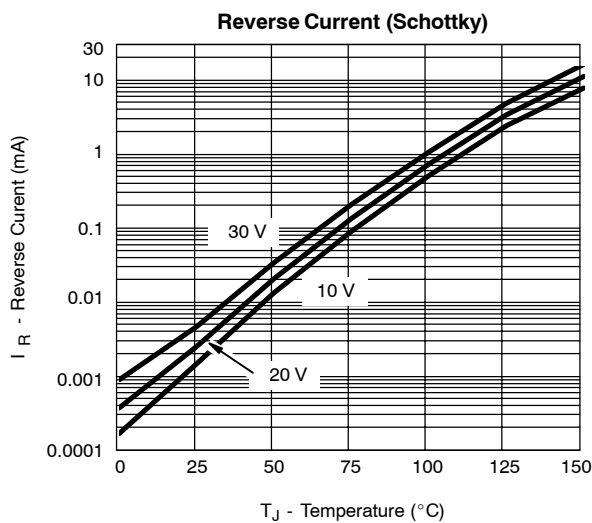
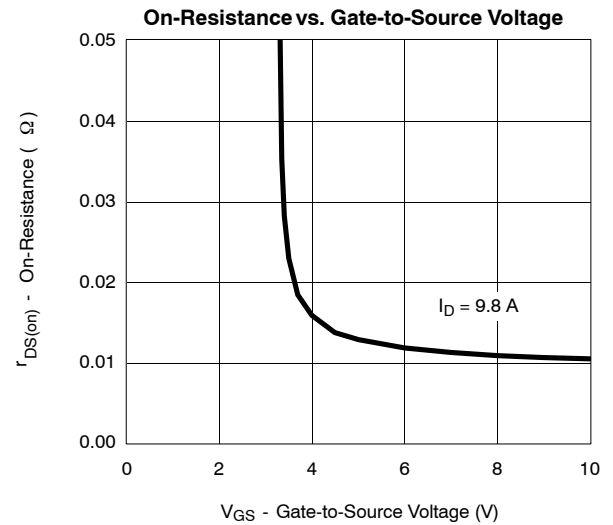
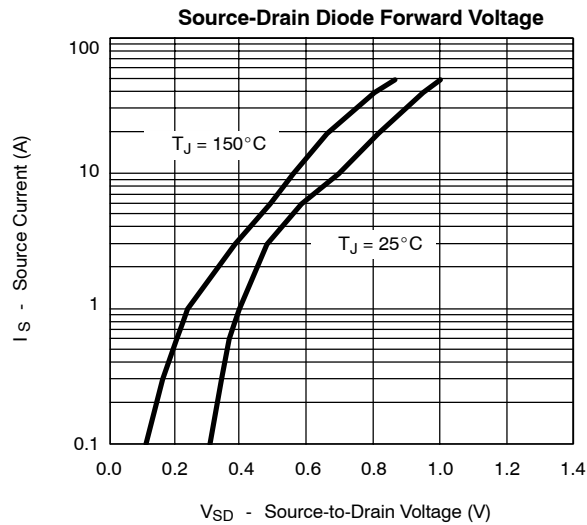


Gate Charge



On-Resistance vs. Junction Temperature



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)




TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

