

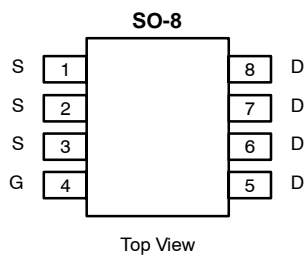
## N-Channel 30-V (D-S) MOSFET with Schottky Diode

MOSFET PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
30	0.018 @ $V_{GS} = 10$ V	9
	0.028 @ $V_{GS} = 4.5$ V	7.3

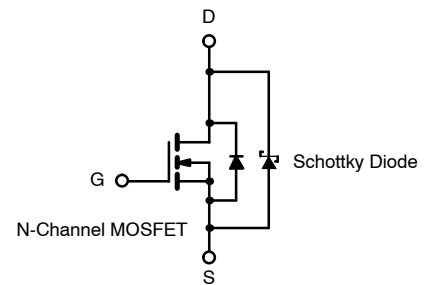
SCHOTTKY PRODUCT SUMMARY		
$V_{DS}$ (V)	$V_{SD}$ (V) Diode Forward Voltage	$I_F$ (A)
30	0.50 V @ 1.0 A	1.4

### FEATURES

- LITTLE FOOT® Plus Power MOSFET
- 100%  $R_g$  Tested



Ordering Information:  
 Si4812DY  
 Si4812DY-T1 (with Tape and Reel)  
 Si4812DY—E3 (Lead (Pb)-Free)  
 Si4812DY-T1—E3 (Lead (Pb)-Free with Tape and Reel)



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	Limit		Unit	
		10 sec	Steady State		
Drain-Source Voltage (MOSFET)	$V_{DS}$	30		V	
Reverse Voltage (Schottky)		30			
Gate-Source Voltage (MOSFET)	$V_{GS}$	$\pm 20$			
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) (MOSFET) <sup>a, b</sup>	$I_D$	$T_A = 25^\circ\text{C}$	9	6.9	A
		$T_A = 70^\circ\text{C}$	7.5	5.6	
Pulsed Drain Current (MOSFET)	$I_{DM}$	50			
Continuous Source Current (MOSFET Diode Conduction) <sup>a, b</sup>	$I_S$	2.1	1.2		
Average Forward Current (Schottky)	$I_F$	1.4	0.8		
Pulsed Forward Current (Schottky)	$I_{FM}$	30			
Maximum Power Dissipation (MOSFET) <sup>a, b</sup>	$P_D$	$T_A = 25^\circ\text{C}$	2.5	1.4	W
		$T_A = 70^\circ\text{C}$	1.6	0.9	
Maximum Power Dissipation (Schottky) <sup>a, b</sup>	$P_D$	$T_A = 25^\circ\text{C}$	2.0	1.2	
		$T_A = 70^\circ\text{C}$	1.3	0.8	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150		$^\circ\text{C}$	

THERMAL RESISTANCE RATINGS					
Parameter	Device	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ( $t \leq 10$ sec) <sup>a</sup>	MOSFET	$R_{thJA}$	40	50	$^\circ\text{C/W}$
	Schottky		50	60	
Maximum Junction-to-Ambient ( $t = \text{steady state}$ ) <sup>a</sup>	MOSFET		72	90	
	Schottky		85	100	

**Notes**

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

For SPICE model information via the Worldwide Web: <http://www.vishay.com/www/product/spice.htm>

**MOSFET + SCHOTTKY SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)**

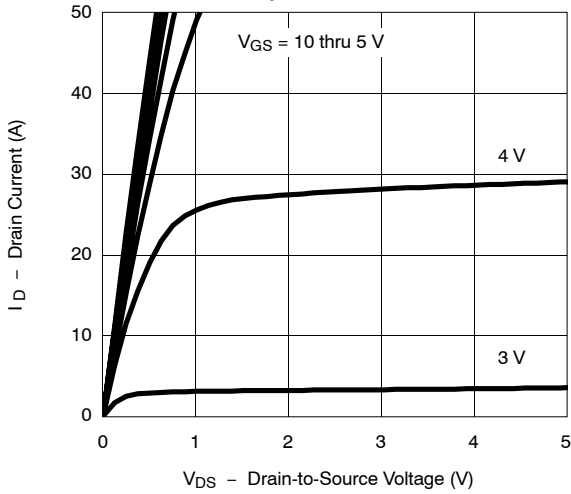
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	1		3	V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V			±100	nA
Zero Gate Voltage Drain Current (MOSFET + Schottky)	I <sub>DSS</sub>	V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V		0.004	0.100	mA
		V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 100 °C		0.7	10	
		V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C		3.0	20	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 5 V, V <sub>GS</sub> = 10 V	20			A
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 9 A		0.012	0.018	Ω
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 7.3 A		0.019	0.028	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 9 A		23		S
Schottky Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = 1.0 A, V <sub>GS</sub> = 0 V		0.45	0.50	V
		I <sub>S</sub> = 1.0 A, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C		0.33	0.42	
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 5 V, I <sub>D</sub> = 9 A		13	24	nC
Gate-Source Charge	Q <sub>gs</sub>			4		
Gate-Drain Charge	Q <sub>gd</sub>			5.7		
Gate Resistance	R <sub>g</sub>		0.2		2.4	Ω
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 15 V, R <sub>L</sub> = 15 Ω I <sub>D</sub> ≅ 1 A, V <sub>GEN</sub> = 10 V, R <sub>g</sub> = 6 Ω		16	25	ns
Rise Time	t <sub>r</sub>			10	20	
Turn-Off Delay Time	t <sub>d(off)</sub>			35	50	
Fall Time	t <sub>f</sub>			13	20	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 1.0 A, di/dt = 100 A/μs		35	70	

**Notes**

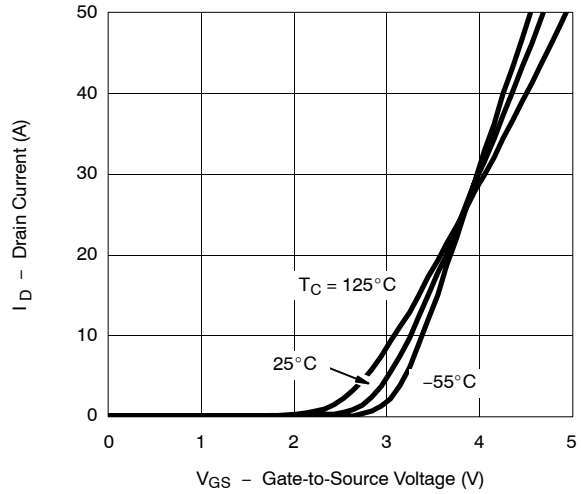
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.  
b. Guaranteed by design, not subject to production testing.

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

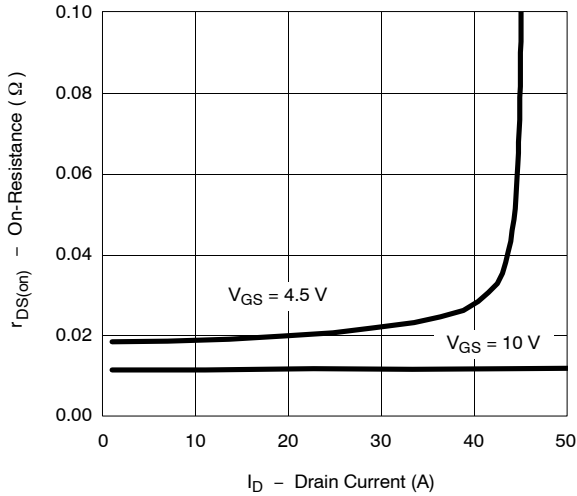
**Output Characteristics**



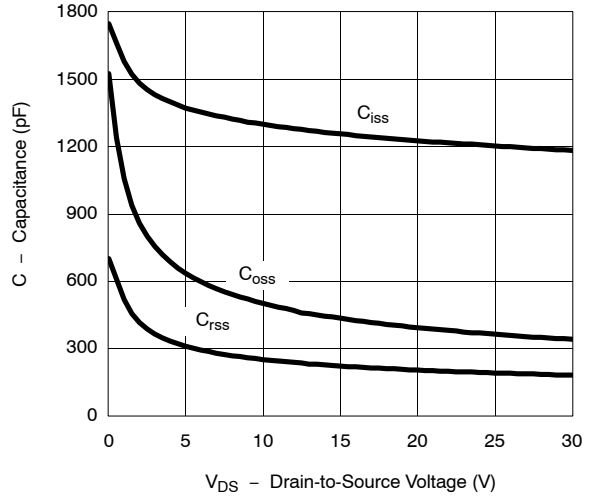
**Transfer Characteristics**



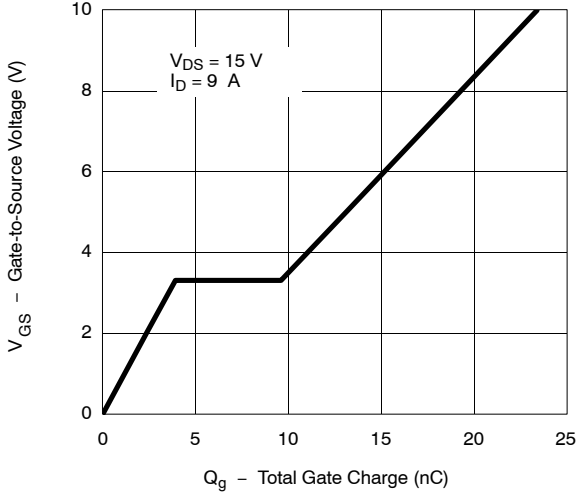
**On-Resistance vs. Drain Current**



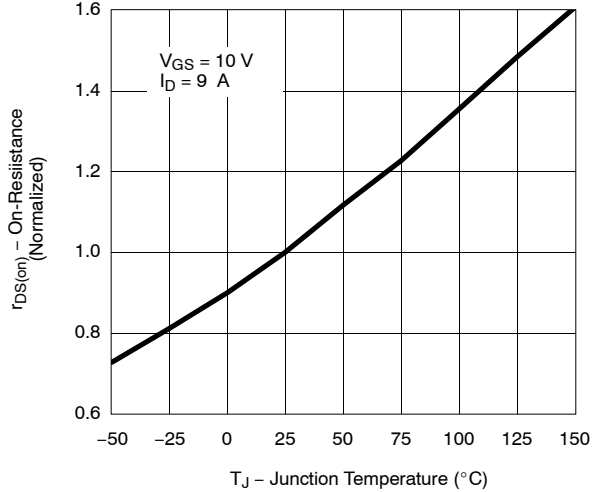
**Capacitance**



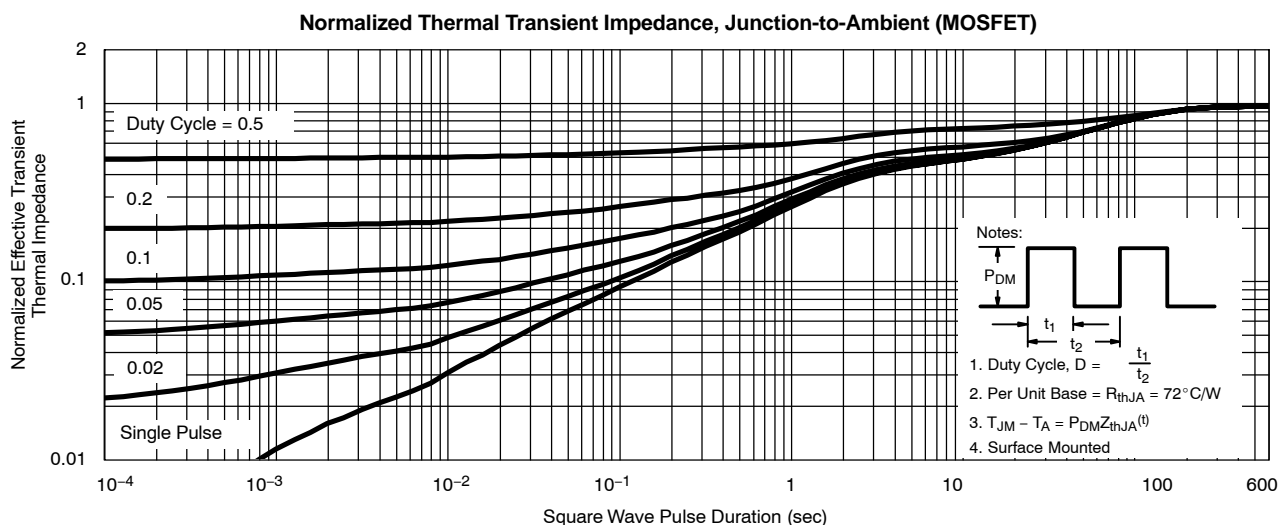
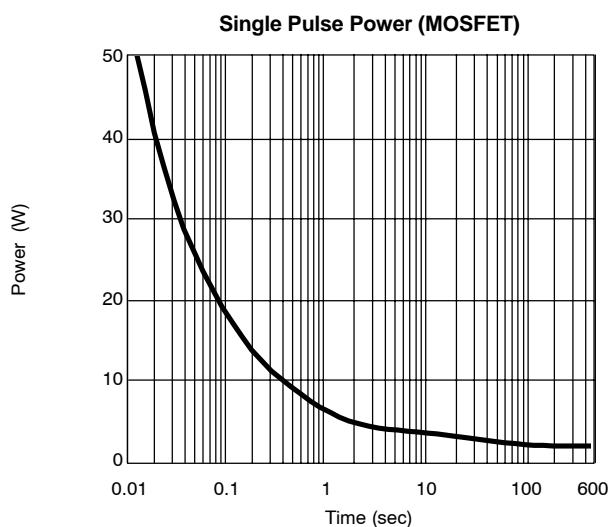
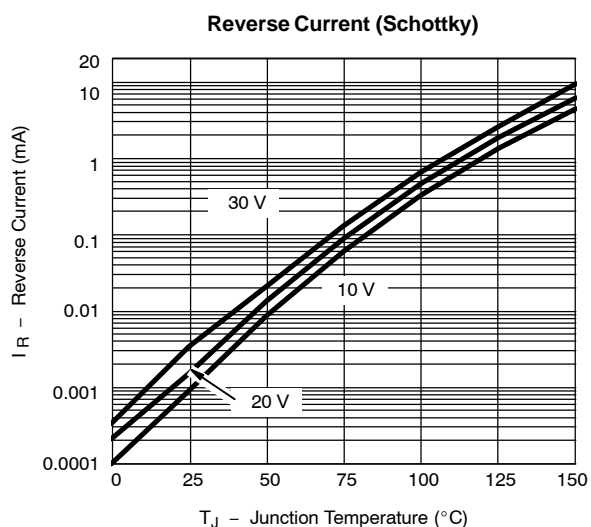
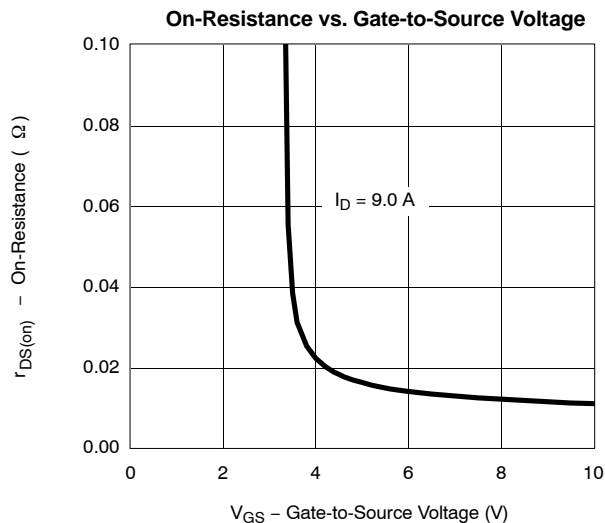
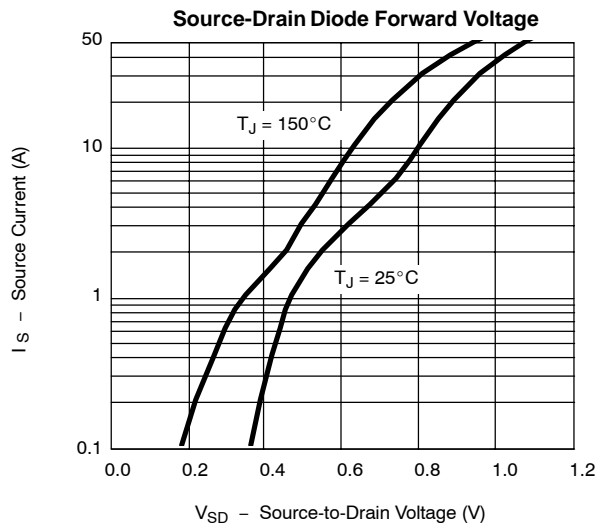
**Gate Charge**



**On-Resistance vs. Junction Temperature**



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



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

