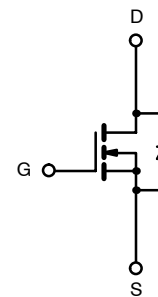
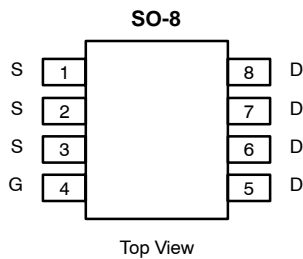




## N-Channel Reduced $Q_g$ , Fast Switching MOSFET

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
30	0.0185 @ $V_{GS} = 10$ V	9
	0.030 @ $V_{GS} = 4.5$ V	7

**TrenchFET<sup>®</sup>**  
Power MOSFETs  
**High-Efficiency**  
PWM Optimized



N-Channel MOSFET

Ordering Information: Si4800BDY  
Si4800BDY-T1 (with Tape and Reel)  
Si4800BDY—E3 (Lead (Pb)-Free)  
Si4800BDY-T1—E3 (Lead (Pb)-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	$V_{DS}$	30		V
Gate-Source Voltage	$V_{GS}$	$\pm 25$		
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a, b</sup>	$I_D$	$T_A = 25^\circ\text{C}$	9	6.5
		$T_A = 70^\circ\text{C}$	7.0	5.0
Pulsed Drain Current (10 $\mu\text{s}$ Pulse Width)	$I_{DM}$	40		A
Continuous Source Current (Diode Conduction) <sup>a, b</sup>	$I_S$	2.3		
Maximum Power Dissipation <sup>a, b</sup>	$P_D$	$T_A = 25^\circ\text{C}$	2.5	1.3
		$T_A = 70^\circ\text{C}$	1.6	0.8
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150		$^\circ\text{C}$

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	Limits		Unit
		Typ	Max	
Maximum Junction-to-Ambient <sup>a</sup>	$t \leq 10$ sec	$R_{thJA}$	40	50
	Steady-State		70	95
Maximum Junction-to-Foot (Drain)	Steady-State	$R_{thJF}$	24	30

Notes

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

**MOSFET 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	0.8		1.8	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	I <sub>DSS</sub>	V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55° C			5	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 5 V, V <sub>GS</sub> = 10 V	30			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		0.0155	0.0185	Ω
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 7 A		0.023	0.030	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 9 A		16		S
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = 2.3 A, V <sub>GS</sub> = 0 V		0.75	1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 5.0 V, I <sub>D</sub> = 9 A		8.7	13	nC
Gate-Source Charge	Q <sub>gs</sub>			1.5		
Gate-Drain Charge	Q <sub>gd</sub>			3.5		
Gate Resistance	R <sub>g</sub>		0.5	1.4	2.2	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		7	15	ns
Rise Time	t <sub>r</sub>			12	20	
Turn-Off Delay Time	t <sub>d(off)</sub>			32	50	
Fall Time	t <sub>f</sub>			14	25	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 2.3 A, di/dt = 100 A/μs		30	60	

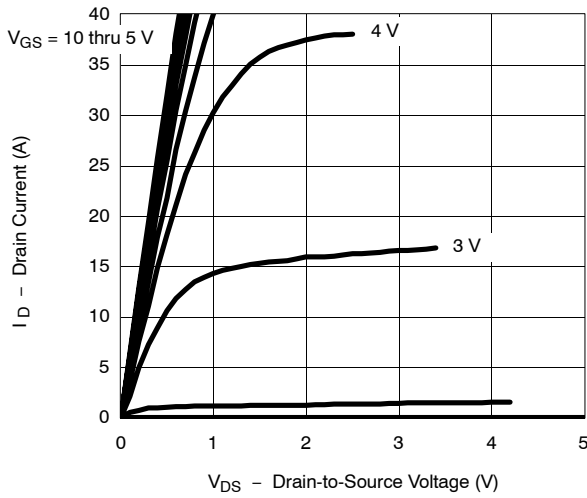
## Notes

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

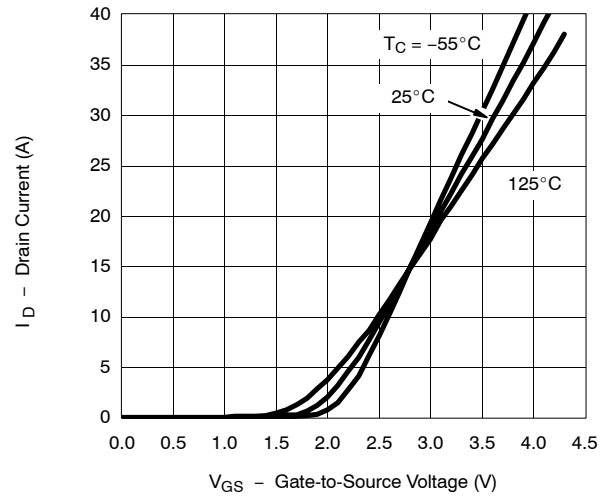


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

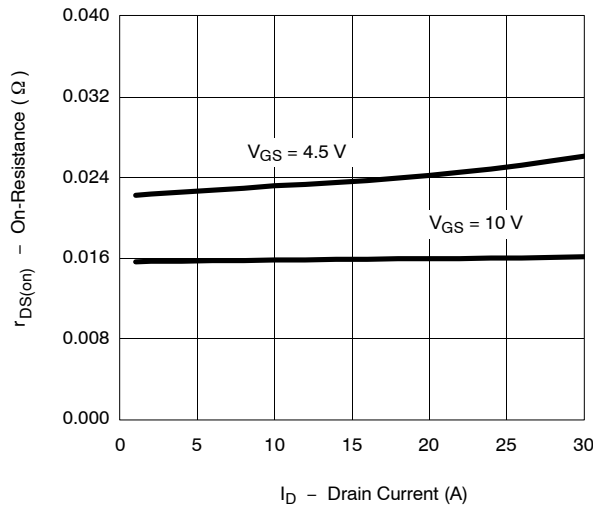
**Output Characteristics**



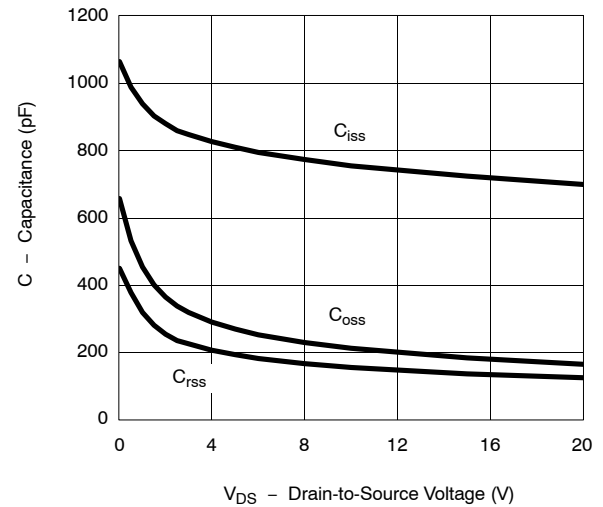
**Transfer Characteristics**



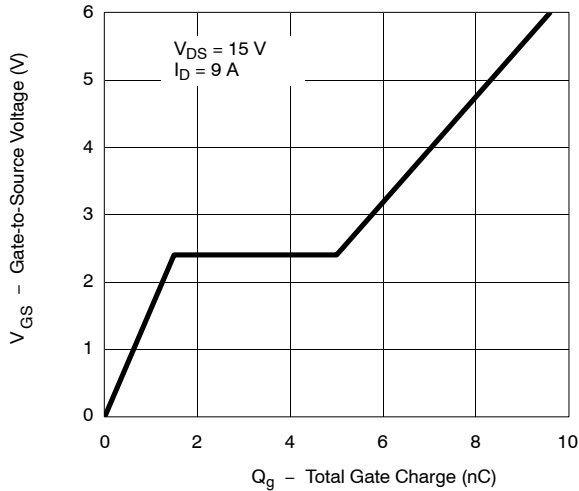
**On-Resistance vs. Drain Current**



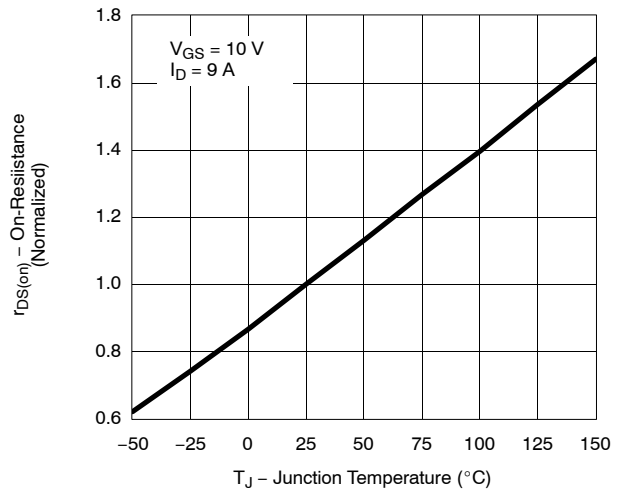
**Capacitance**



**Gate Charge**

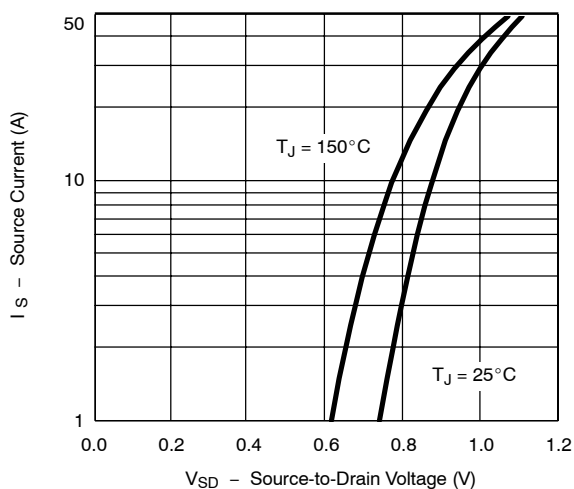


**On-Resistance vs. Junction Temperature**

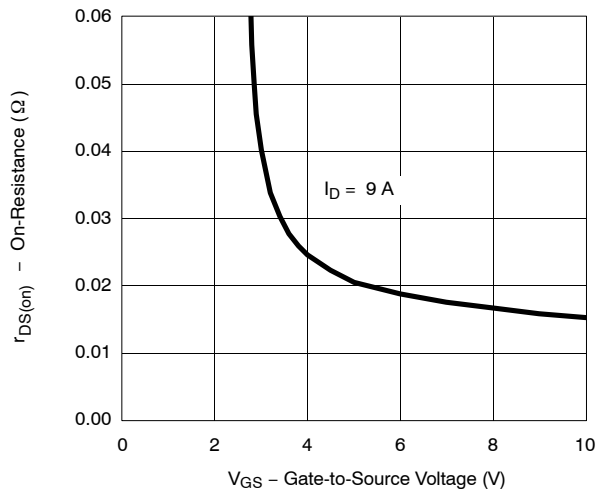


**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**

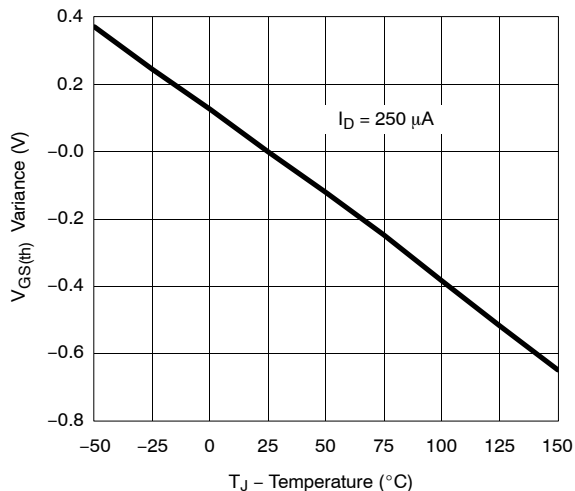
**Source-Drain Diode Forward Voltage**



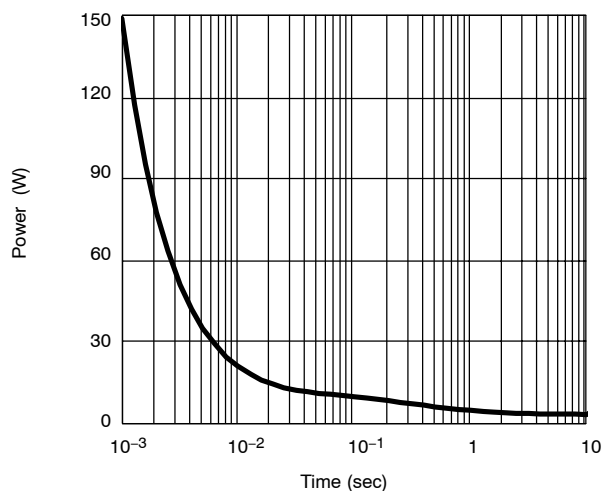
**On-Resistance vs. Gate-to-Source Voltage**



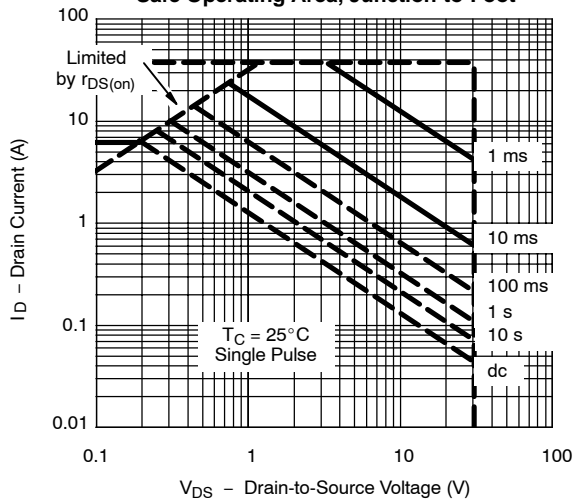
**Threshold Voltage**



**Single Pulse Power, Junction-to-Ambient**



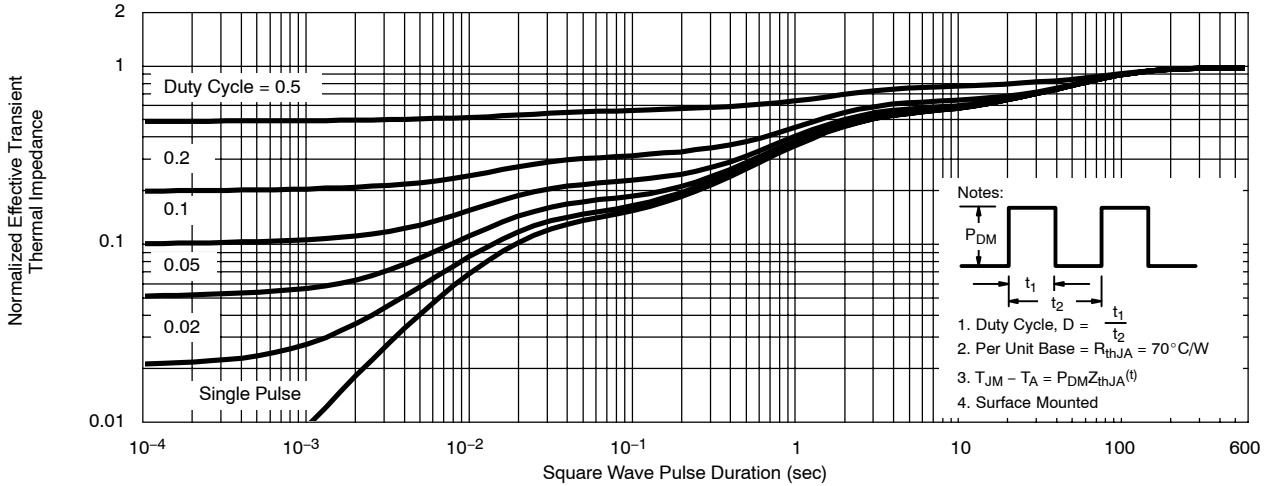
**Safe Operating Area, Junction-to-Foot**





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

Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

