

## Dual N-Channel 30-V (D-S) MOSFET

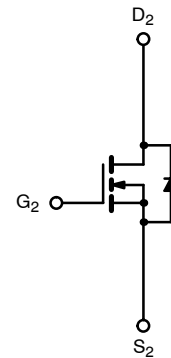
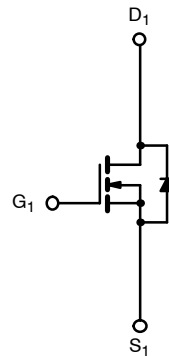
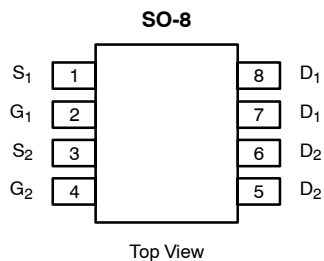
PRODUCT SUMMARY		
V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)
30	0.022 @ V <sub>GS</sub> = 10 V	7.5
	0.030 @ V <sub>GS</sub> = 4.5 V	6.5

### FEATURES

- Trench FET® Power MOSFET
- PWM Optimized
- 100% R<sub>g</sub> Tested

### APPLICATIONS

- Symmetrical Buck-Boost DC/DC Converter



Ordering Information: Si4804BDY—E3 (Lead Free)  
Si4804BDY:T1—E3 (Lead Free with Tape and Reel)

ABSOLUTE MAXIMUM RATINGS (T <sub>A</sub> = 25°C UNLESS OTHERWISE NOTED)				
Parameter	Symbol	10 secs	Steady State	Unit
Drain-Source Voltage	V <sub>DS</sub>	30		V
Gate-Source Voltage	V <sub>GS</sub>	± 20		
Continuous Drain Current (T <sub>J</sub> = 150°C) <sup>a</sup>	I <sub>D</sub>	T <sub>A</sub> = 25°C	7.5	A
		T <sub>A</sub> = 70°C	6.0	
Pulsed Drain Current	I <sub>DM</sub>	30		A
Continuous Source Current (Diode Conduction) <sup>a</sup>	I <sub>S</sub>	1.7	0.9	
Maximum Power Dissipation <sup>a</sup>	P <sub>D</sub>	T <sub>A</sub> = 25°C	2.0	W
		T <sub>A</sub> = 70°C	1.3	
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 150		°C

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	Limits		Unit
		Typ	Max	
Maximum Junction-to-Ambient <sup>a</sup>	t ≤ 10 sec	52	62.5	°C/W
	Steady-State	93	110	
Maximum Junction-to-Foot (Drain)	Steady-State	35	40	

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

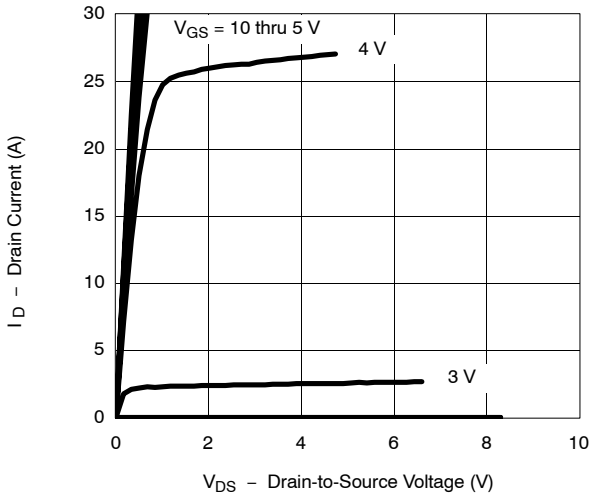
<b>MOSFET SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED).</b>						
Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	0.8		3.0	V
Gate-Body Leakage	I <sub>GSS</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> = 85 °C			15	
On-State Drain Current <sup>b</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>b</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 7.5 A		0.017	0.022	Ω
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 6.5 A		0.024	0.030	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 7.5 A		19		S
Diode Forward Voltage <sup>b</sup>	V <sub>SD</sub>	I <sub>S</sub> = 1 A, V <sub>GS</sub> = 0 V		0.75	1.2	V
<b>Dynamic<sup>a</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 7.5 A		7	11	nC
Gate-Source Charge	Q <sub>gs</sub>			2.9		
Gate-Drain Charge	Q <sub>gd</sub>			2.5		
Gate Resistance	R <sub>g</sub>		0.5	1.5	2.6	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		9	15	ns
Rise Time	t <sub>r</sub>			10	17	
Turn-Off Delay Time	t <sub>d(off)</sub>			19	30	
Fall Time	t <sub>f</sub>			9	15	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 1.7 A, di/dt = 100 A/μs	Ch-1	35	55	

## Notes

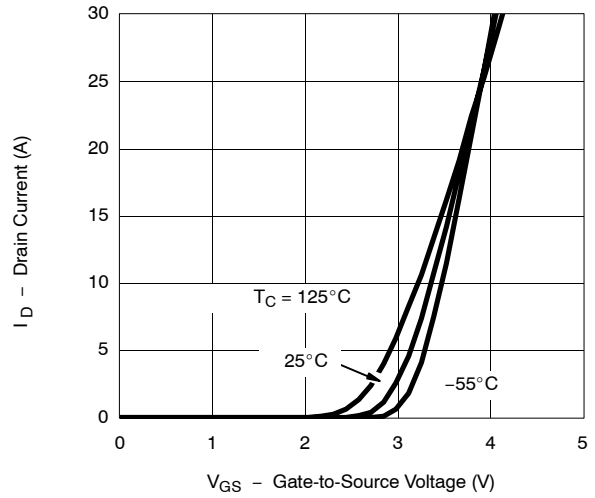
- a. Guaranteed by design, not subject to production testing.  
 b. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.

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

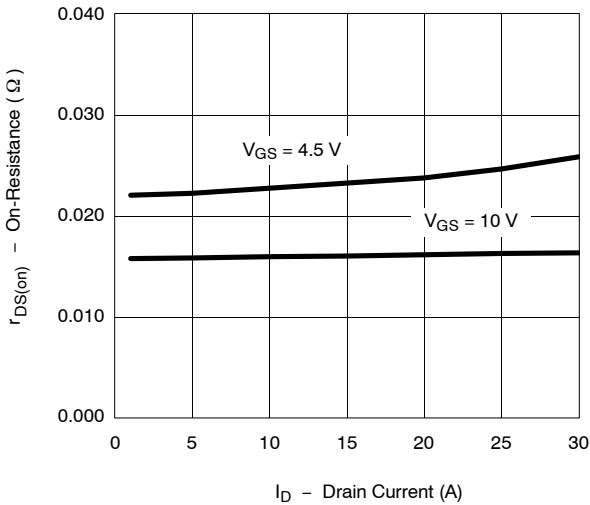
**Output Characteristics**



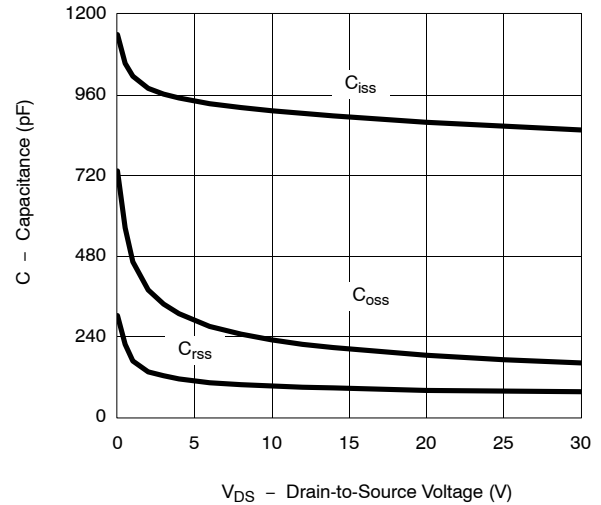
**Transfer Characteristics**



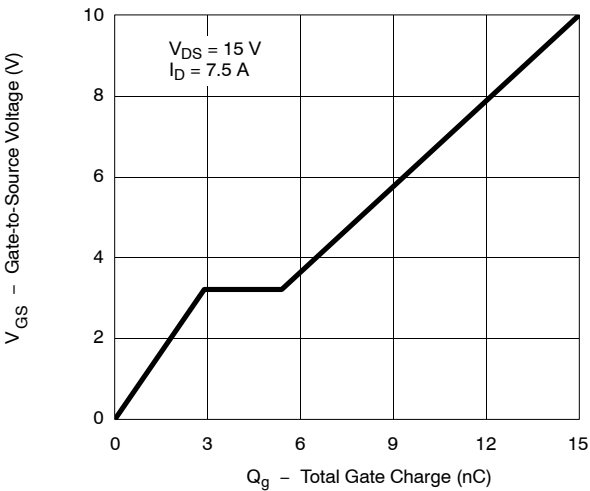
**On-Resistance vs. Drain Current**



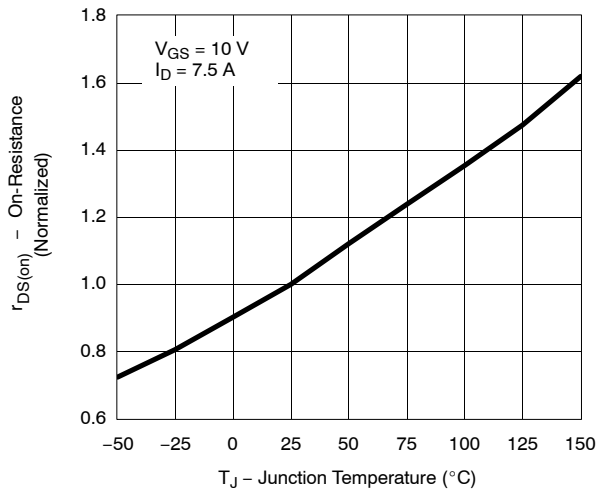
**Capacitance**



**Gate Charge**

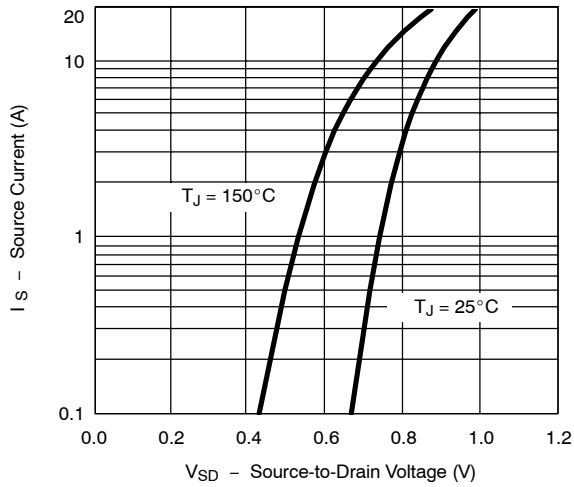


**On-Resistance vs. Junction Temperature**

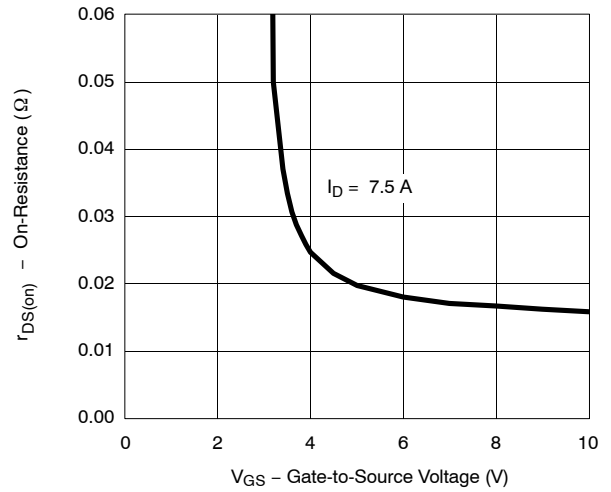


**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**

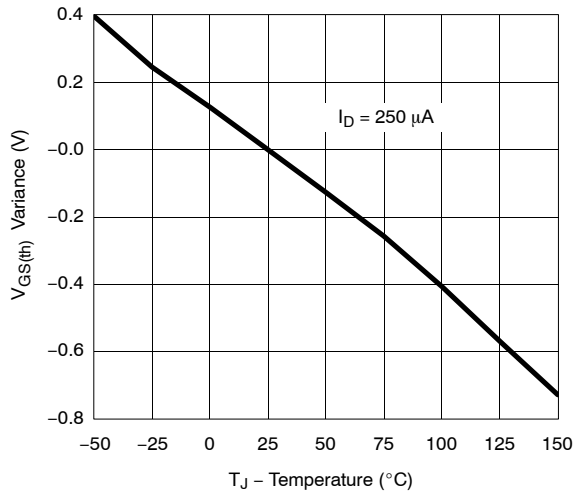
**Source-Drain Diode Forward Voltage**



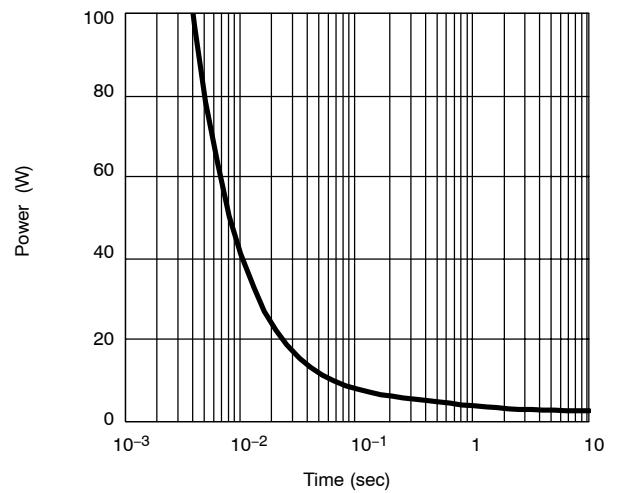
**On-Resistance vs. Gate-to-Source Voltage**



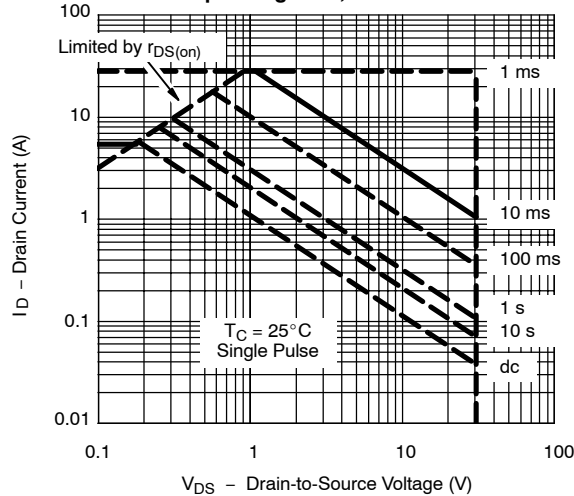
**Threshold Voltage**



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



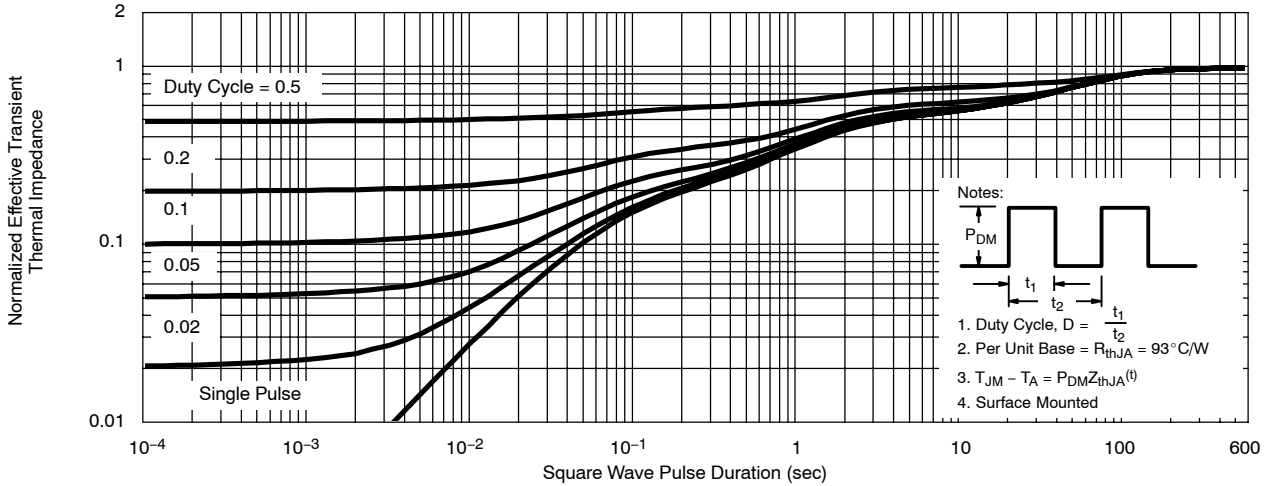
**Safe Operating Area, Junction-to-Foot**





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

**Normalized Thermal Transient Impedance, Junction-to-Ambient**



**Normalized Thermal Transient Impedance, Junction-to-Foot**

