

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

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
30	0.022 at $V_{GS} = 10$ V	7.5
	0.030 at $V_{GS} = 4.5$ V	6.5

### FEATURES

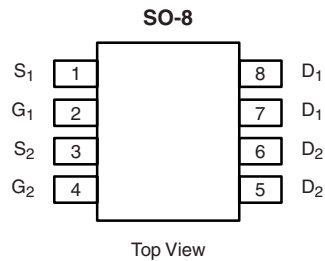
- TrenchFET<sup>®</sup> Power MOSFET
- PWM Optimized
- 100 %  $R_g$  Tested



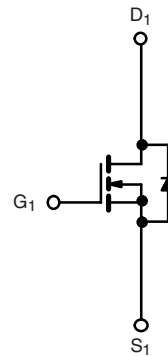
**RoHS**  
COMPLIANT

### APPLICATIONS

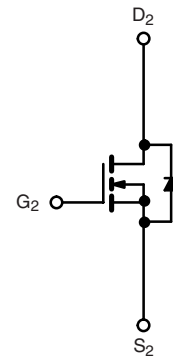
- Symmetrical Buck-Boost DC/DC Converter



Ordering Information: Si4804BDY-T1-E3 (Lead (Pb)-free)



N-Channel MOSFET



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted					
Parameter	Symbol	10 sec	Steady State	Unit	
Drain-Source Voltage	$V_{DS}$	30		V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$			
Continuous Drain Current ( $T_J = 150$ °C) <sup>a</sup>	$I_D$	$T_A = 25$ °C	7.5	5.7	A
		$T_A = 70$ °C	6.0	4.6	
Pulsed Drain Current	$I_{DM}$	30			
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	1.7	0.9		
Maximum Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25$ °C	2.0	1.1	W
		$T_A = 70$ °C	1.3	0.7	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	- 55 to 150		°C	

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

Notes:

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

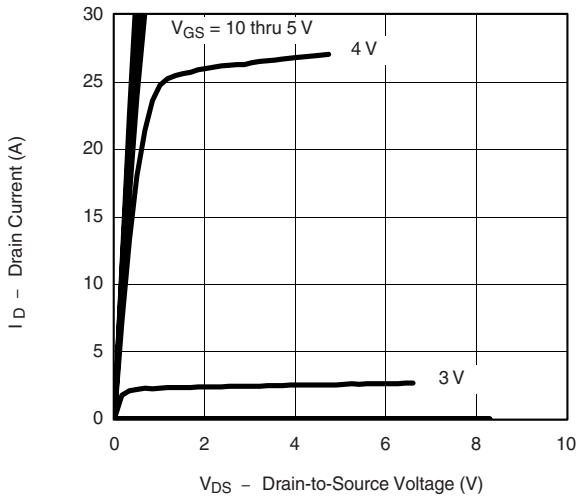
<b>MOSFET SPECIFICATIONS</b> $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	0.8		3.0	V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$			1	$\mu\text{A}$
		$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}, T_J = 85\text{ }^\circ\text{C}$			15	
On-State Drain Current <sup>b</sup>	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	20			A
Drain-Source On-State Resistance <sup>b</sup>	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 7.5\text{ A}$		0.017	0.022	$\Omega$
		$V_{GS} = 4.5\text{ V}, I_D = 6.5\text{ A}$		0.024	0.030	
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = 15\text{ V}, I_D = 7.5\text{ A}$		19		S
Diode Forward Voltage <sup>b</sup>	$V_{SD}$	$I_S = 1\text{ A}, V_{GS} = 0\text{ V}$		0.75	1.2	V
<b>Dynamic<sup>a</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = 15\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 7.5\text{ A}$		7	11	nC
Gate-Source Charge	$Q_{gs}$			2.9		
Gate-Drain Charge	$Q_{gd}$			2.5		
Gate Resistance	$R_g$		0.5	1.5	2.6	$\Omega$
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15\text{ V}, R_L = 15\text{ }\Omega$ $I_D \cong 1\text{ A}, V_{GEN} = 10\text{ V}, R_g = 6\text{ }\Omega$		9	15	ns
Rise Time	$t_r$			10	17	
Turn-Off Delay Time	$t_{d(off)}$			19	30	
Fall Time	$t_f$			9	15	
Source-Drain Reverse Recovery Time	$t_{rr}$	$I_F = 1.7\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$	Ch-1		35	55

## Notes:

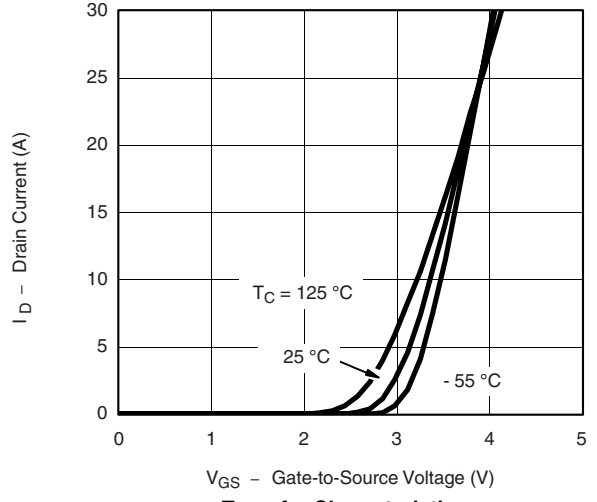
- a. Guaranteed by design, not subject to production testing.  
b. Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

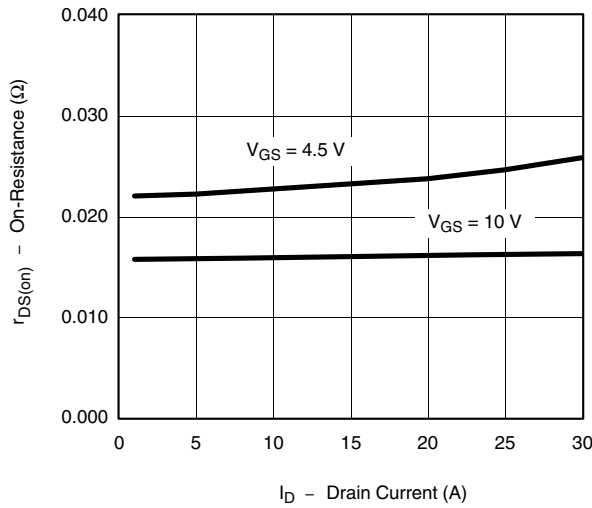
**TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted



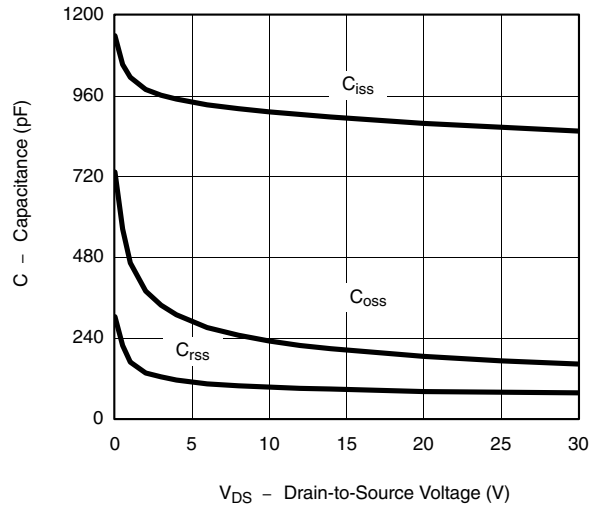
**Output Characteristics**



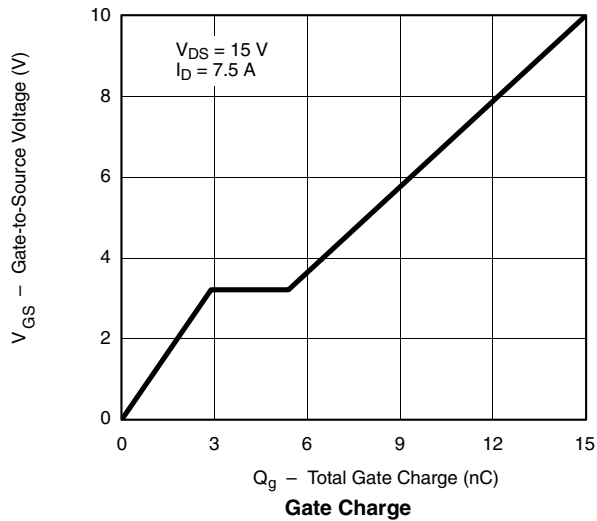
**Transfer Characteristics**



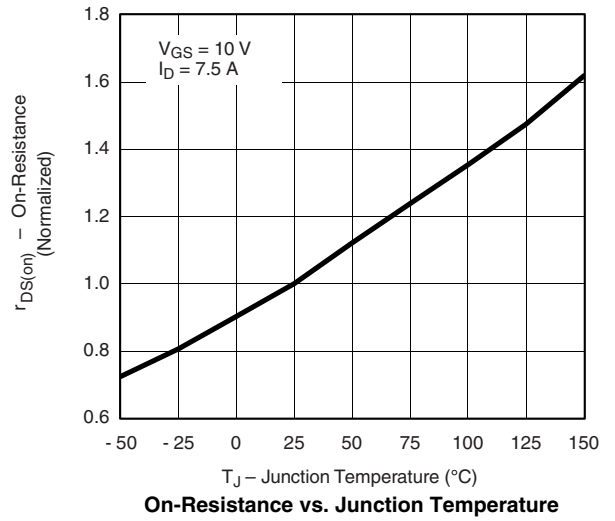
**On-Resistance vs. Drain Current**



**Capacitance**

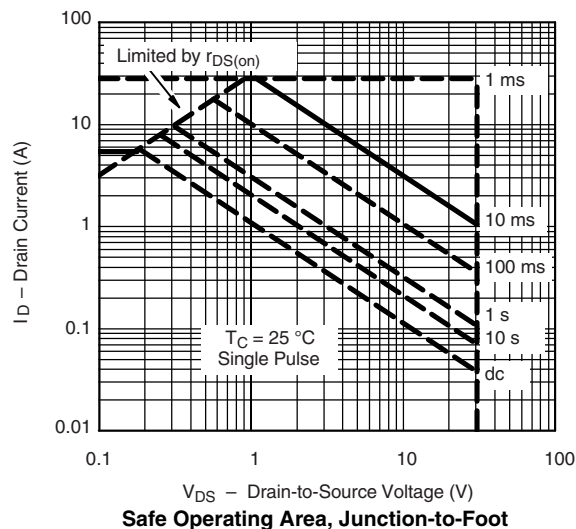
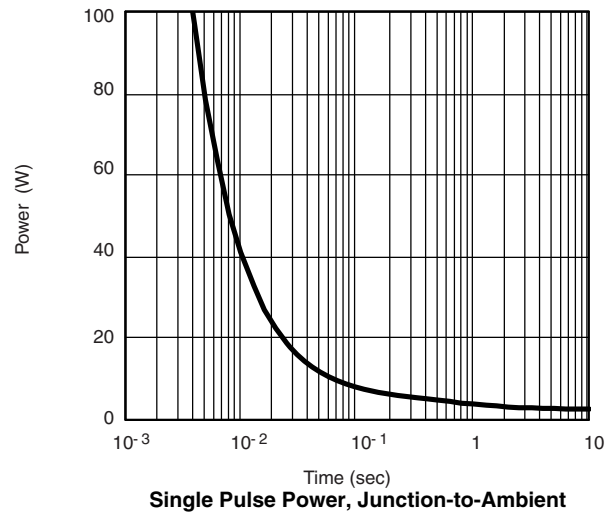
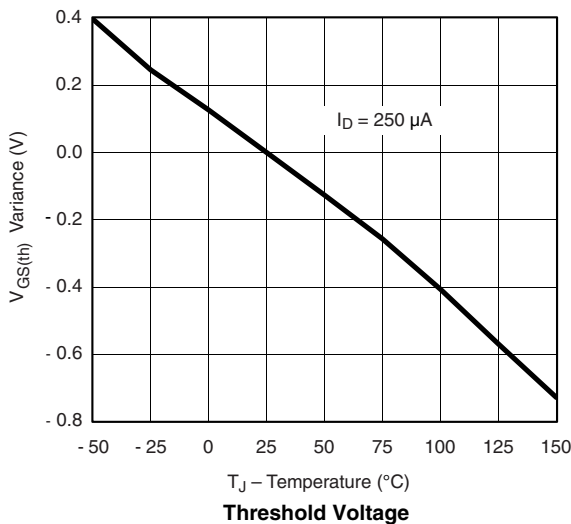
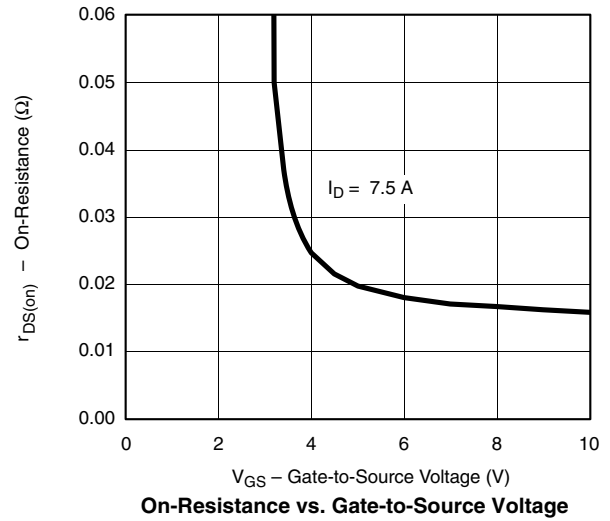
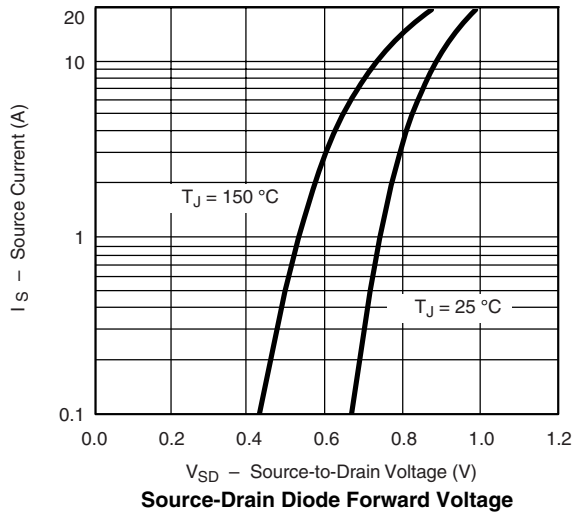


**Gate Charge**

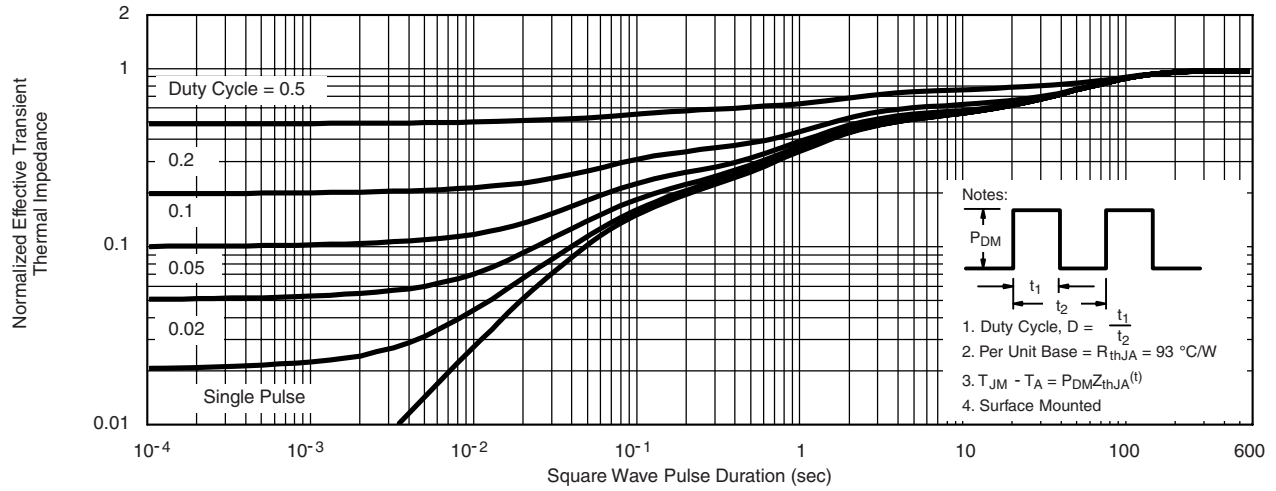


**On-Resistance vs. Junction Temperature**

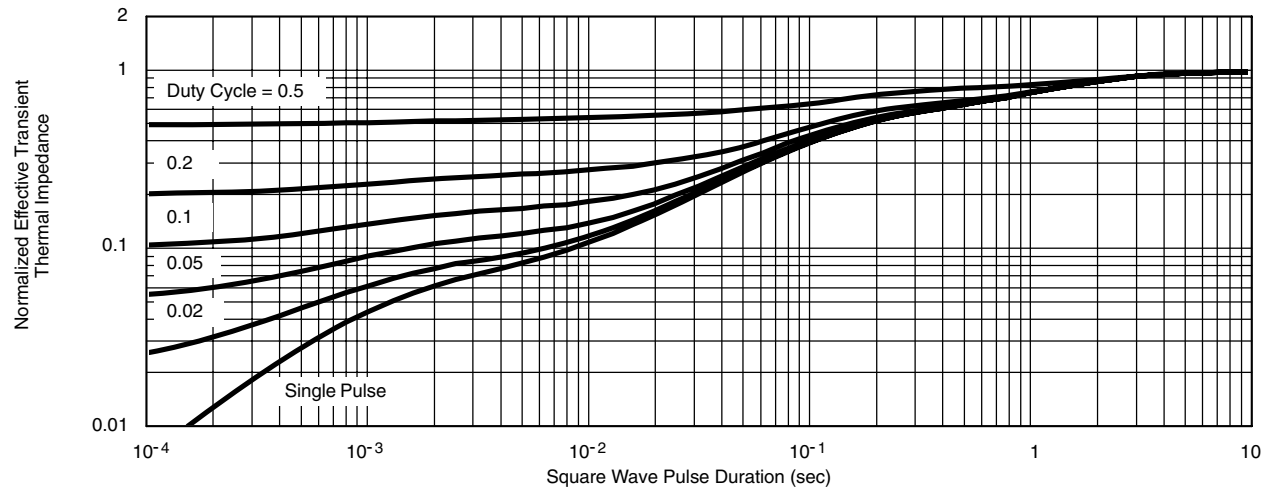
**TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted



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



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

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