

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

PRODUCT SUMMARY		
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)
30	0.022 at V _{GS} = 10 V	7.5
	0.030 at V _{GS} = 4.5 V	6.5

FEATURES

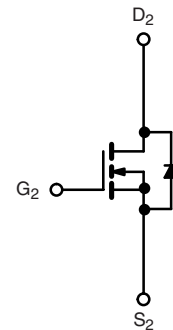
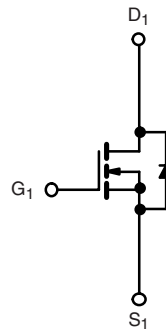
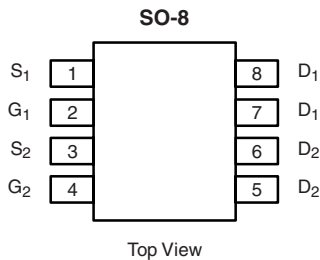
- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET® Power MOSFET
- PWM Optimized
- 100 % R_g Tested
- Compliant to RoHS Directive 2002/95/EC



RoHS
COMPLIANT
HALOGEN
FREE
Available

APPLICATIONS

- Symmetrical Buck-Boost DC/DC Converter



Ordering Information: Si4804BDY-T1-E3 (Lead (Pb)-free)
Si4804BDY-T1-GE3 (Lead (Pb)-free and Halogen-free)

N-Channel MOSFET

N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T _A = 25 °C, unless otherwise noted					
Parameter	Symbol	10 s	Steady State	Unit	
Drain-Source Voltage	V _{DS}	30		V	
Gate-Source Voltage	V _{GS}	± 20			
Continuous Drain Current (T _J = 150 °C) ^a	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) ^a	I _S	1.7	0.9		
Single Pulse Avalanche Current	I _{AS}	L = 0.1 mH	10		
Single Pulse Avalanche Energy			E _{AS}	5	
Maximum Power Dissipation ^a	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 ^a	R _{thJA}	t ≤ 10 s	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.

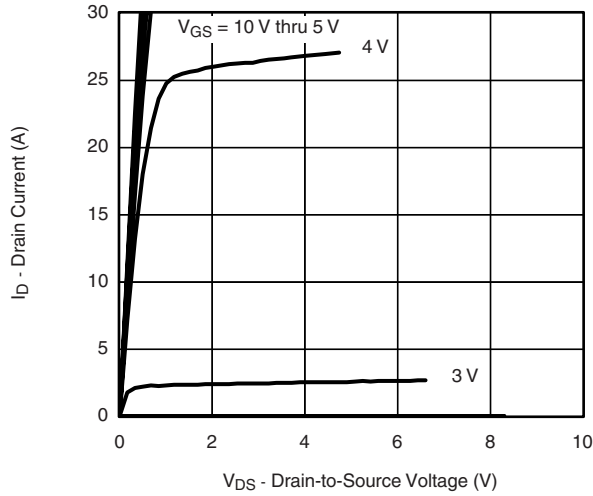
MOSFET SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ. ^a	Max.	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	0.8		3.0	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30\text{ V}$, $V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 30\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 85\text{ }^\circ\text{C}$			15	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} = 5\text{ V}$, $V_{GS} = 10\text{ V}$	20			A
Drain-Source On-State Resistance ^b	$R_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 7.5\text{ A}$		0.017	0.022	Ω
		$V_{GS} = 4.5\text{ V}$, $I_D = 6.5\text{ A}$		0.024	0.030	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15\text{ V}$, $I_D = 7.5\text{ A}$		19		S
Diode Forward Voltage ^b	V_{SD}	$I_S = 1\text{ A}$, $V_{GS} = 0\text{ V}$		0.75	1.2	V
Dynamic^a						
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	Ω
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}	$I_F = 1.7\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$		35	55	

Notes:

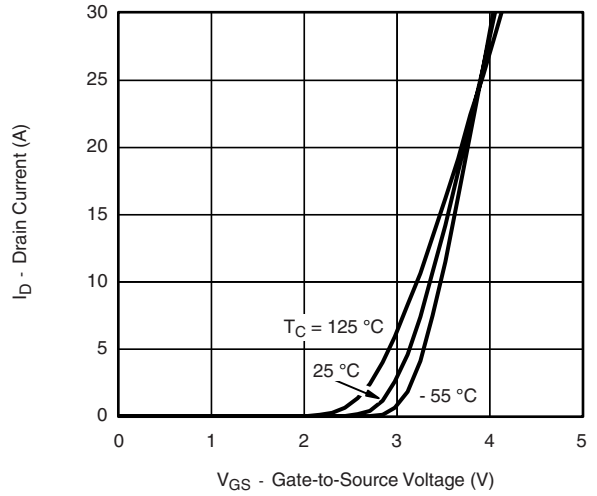
- a. Guaranteed by design, not subject to production testing.
 b. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

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.

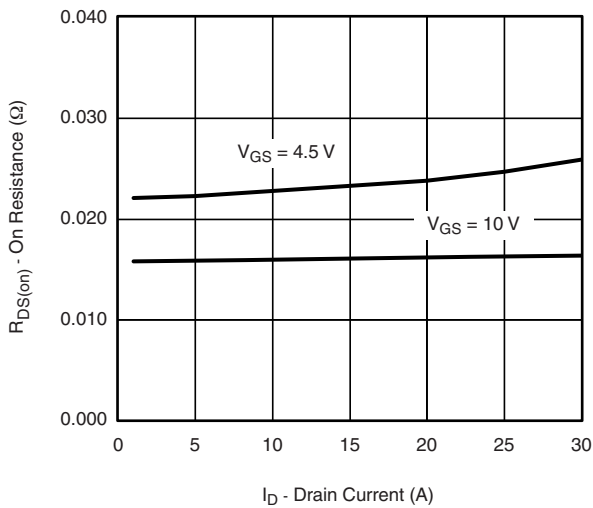
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



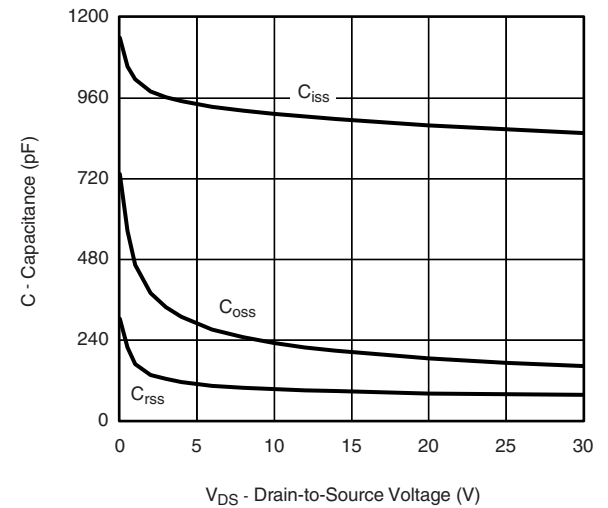
Output Characteristics



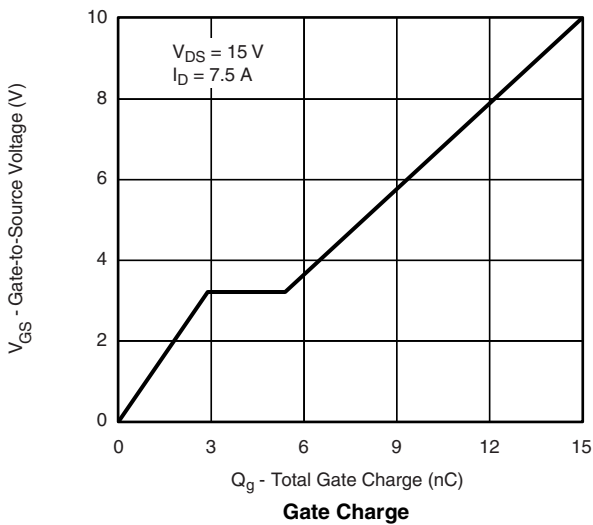
Transfer Characteristics



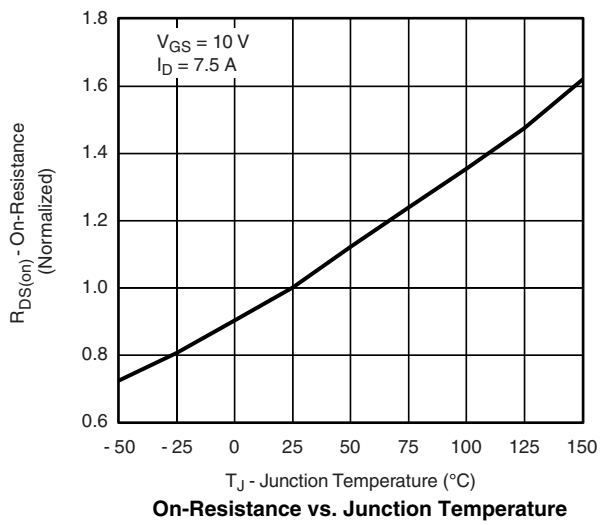
On-Resistance vs. Drain Current



Capacitance

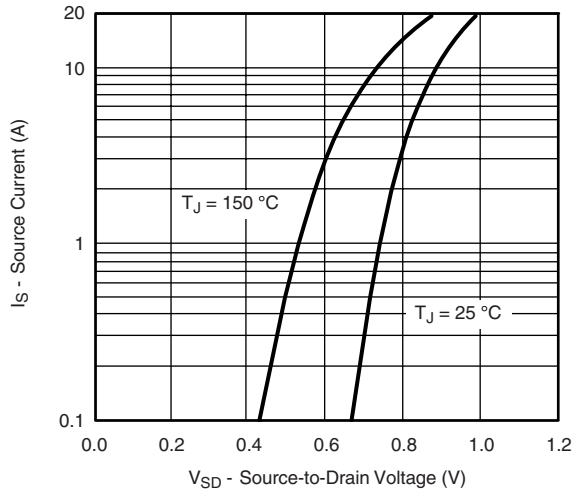


Gate Charge

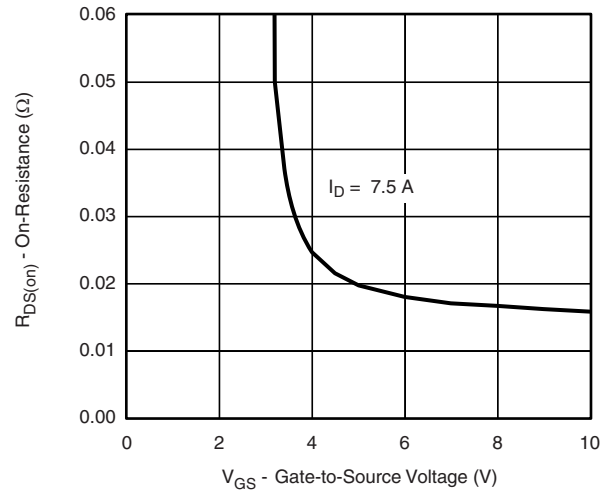


On-Resistance vs. Junction Temperature

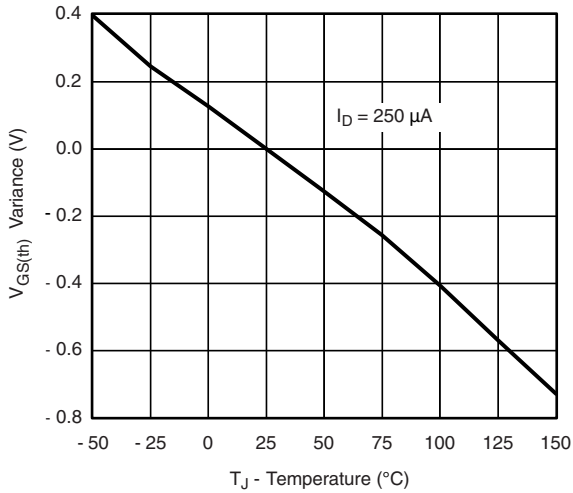
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



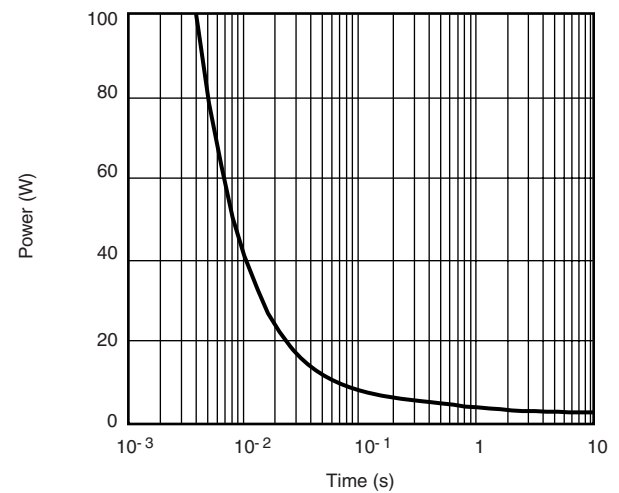
Source-Drain Diode Forward Voltage



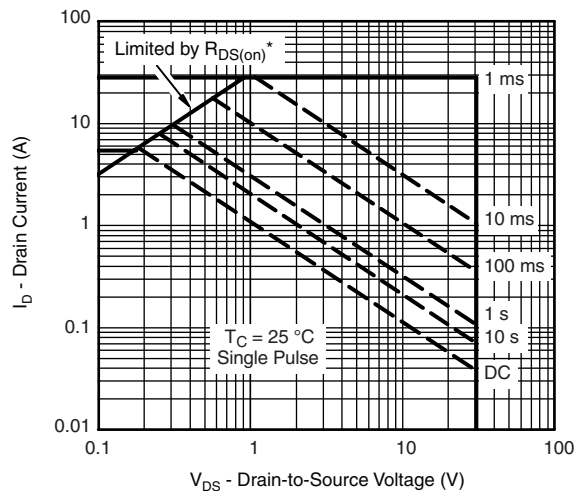
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



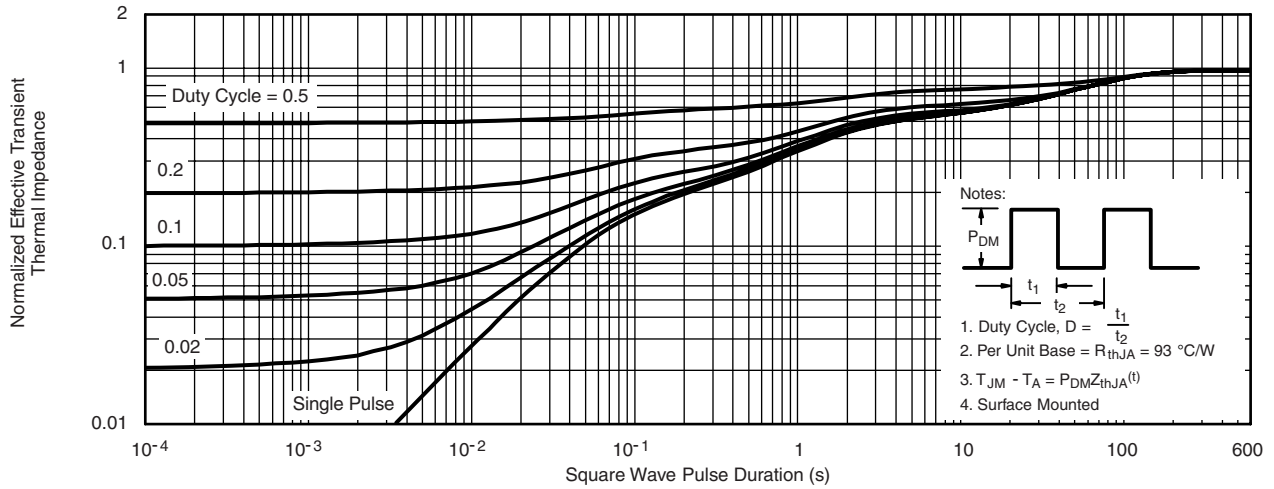
Single Pulse Power, Junction-to-Ambient



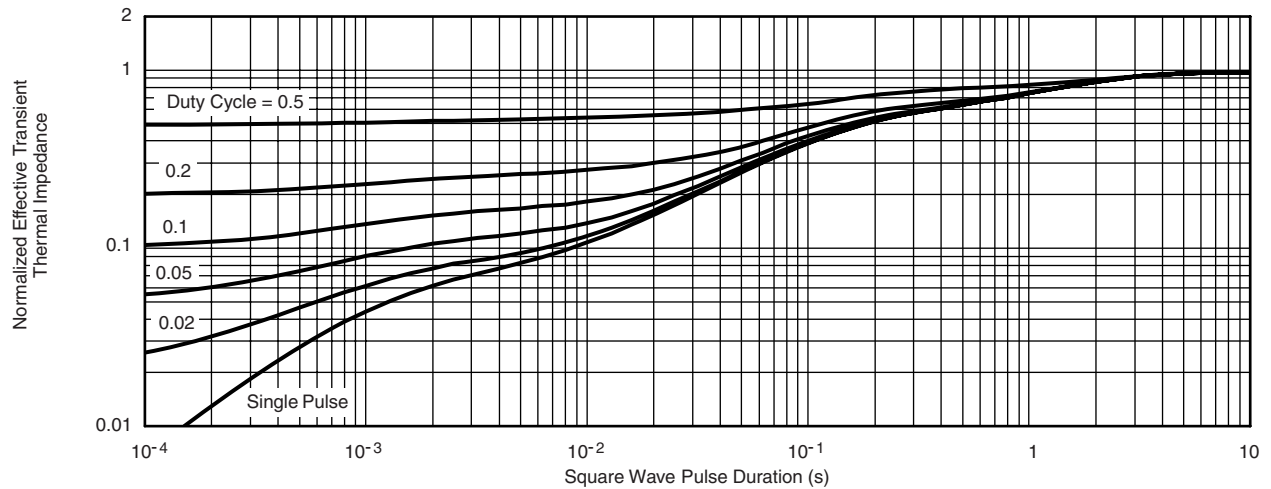
* $V_{DS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Foot

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

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