

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

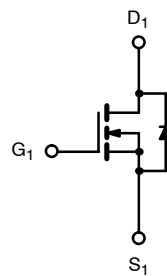
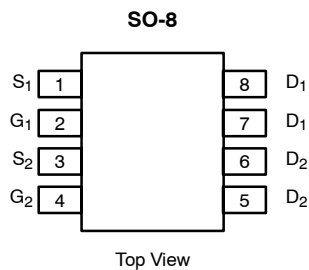
PRODUCT SUMMARY		
V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)
30	0.0095 @ V <sub>GS</sub> = 10 V	12.2
	0.016 @ V <sub>GS</sub> = 4.5 V	9.4

### FEATURES

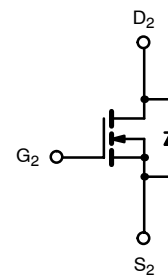
- TrenchFET® Power MOSFET
- 100% R<sub>g</sub> Tested

### APPLICATIONS

- DC/DC Conversion
- Load Switching



N-Channel MOSFET



N-Channel MOSFET

Ordering Information: Si4944DY  
Si4944DY-T1 (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>	T <sub>A</sub> = 25°C	12.2	9.3	A
	T <sub>A</sub> = 85°C	8.8	6.7	
Pulsed Drain Current	I <sub>DM</sub>	30		A
Continuous Source Current (Diode Conduction) <sup>a</sup>	I <sub>S</sub>	1.9	1.1	
Maximum Power Dissipation <sup>a</sup>	T <sub>A</sub> = 25°C	2.3	1.3	W
	T <sub>A</sub> = 85°C	1.2	0.7	
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 150		°C

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>a</sup>	t ≤ 10 sec	42	55	°C/W
	Steady State	75	95	
Maximum Junction-to-Foot (Drain)	Steady State	19	25	

Notes

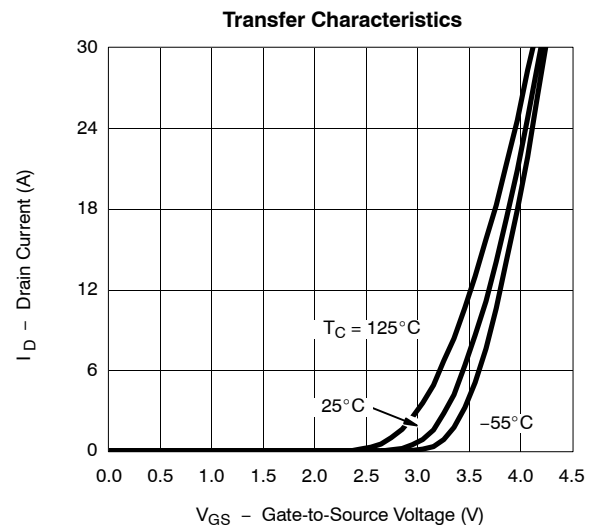
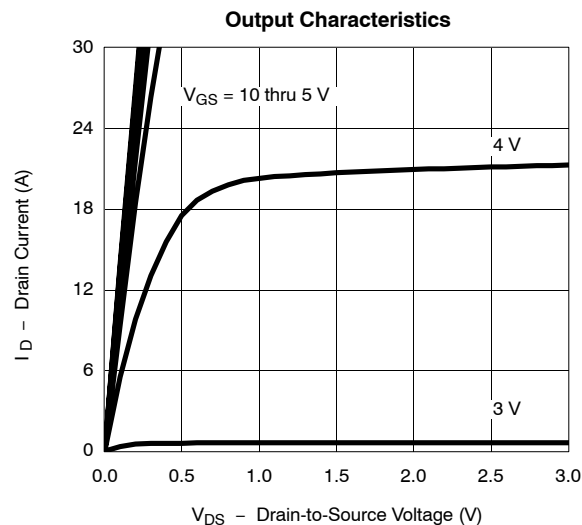
a. Surface Mounted on 1" x 1" FR4 Board.

**MOSFET SPECIFICATIONS ( $T_J = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	1		3	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	$\mu\text{A}$
		$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 85^\circ\text{C}$			5	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} \geq 5 \text{ V}, V_{GS} = 10 \text{ V}$	30			A
Drain-Source On-State Resistance <sup>a</sup>	$r_{DS(on)}$	$V_{GS} = 10 \text{ V}, I_D = 12.2 \text{ A}$		0.0075	0.0095	$\Omega$
		$V_{GS} = 4.5 \text{ V}, I_D = 9.4 \text{ A}$		0.013	0.016	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = 10 \text{ V}, I_D = 12.2 \text{ A}$		32		S
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	$I_S = 1.9 \text{ A}, V_{GS} = 0 \text{ V}$		0.8	1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = 15 \text{ V}, V_{GS} = 4.5 \text{ V}, I_D = 12.2 \text{ A}$		13.5	21	nC
Gate-Source Charge	$Q_{gs}$		7.1			
Gate-Drain Charge	$Q_{gd}$		4.7			
Gate Resistance	$R_g$	$f = 1 \text{ MHz}$	0.5	1.0	1.7	$\Omega$
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15 \text{ V}, R_L = 15 \Omega$ $I_D \cong 1 \text{ A}, V_{GEN} = 10 \text{ V}, R_G = 6 \Omega$		10	15	ns
Rise Time	$t_r$		10	15		
Turn-Off Delay Time	$t_{d(off)}$		40	60		
Fall Time	$t_f$		12	20		
Source-Drain Reverse Recovery Time	$t_{rr}$	$I_F = 1.9 \text{ A}, di/dt = 100 \text{ A}/\mu\text{s}$		45	70	

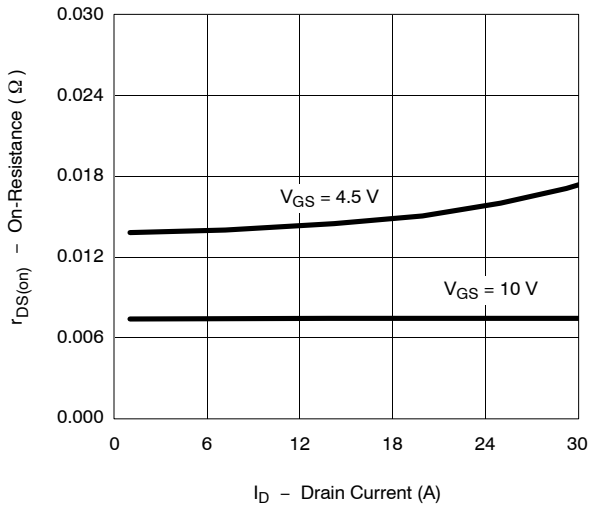
## Notes

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

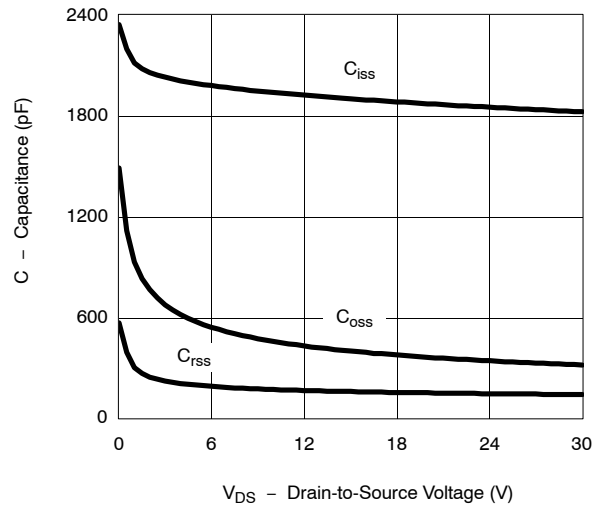
**TYPICAL CHARACTERISTICS ( $25^\circ\text{C}$  UNLESS NOTED)**

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

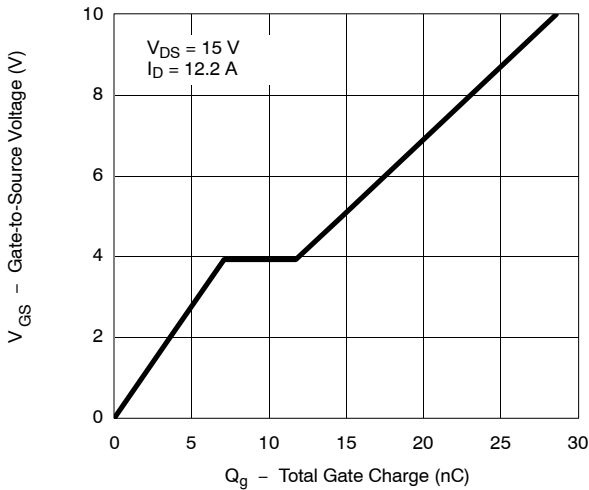
**On-Resistance vs. Drain Current**



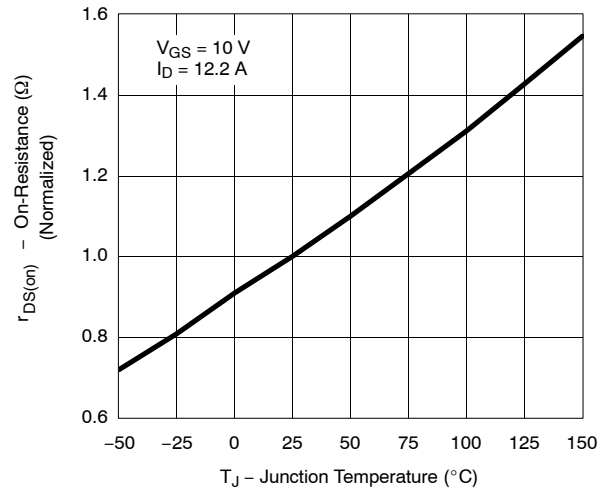
**Capacitance**



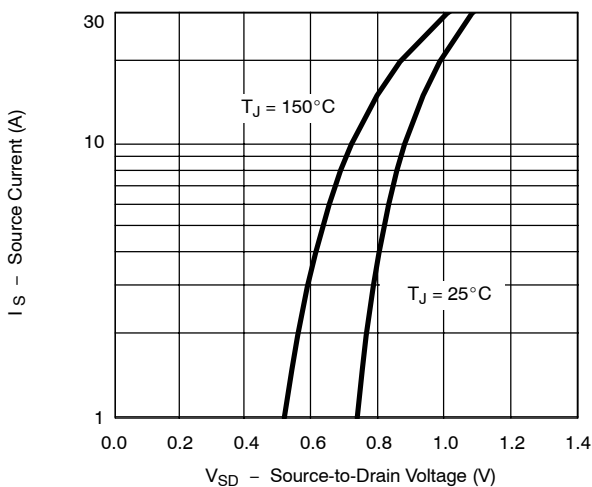
**Gate Charge**



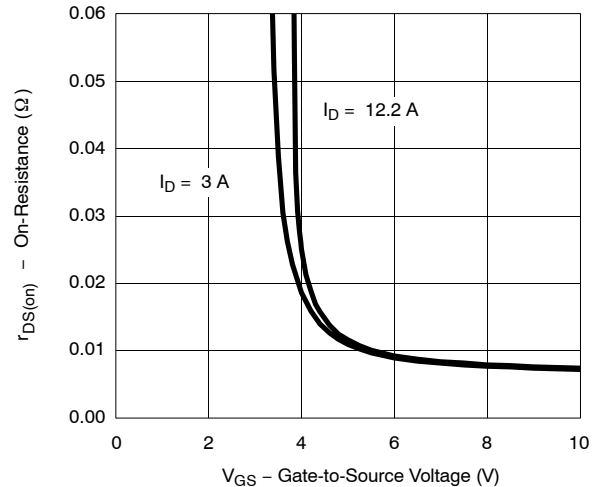
**On-Resistance vs. Junction Temperature**



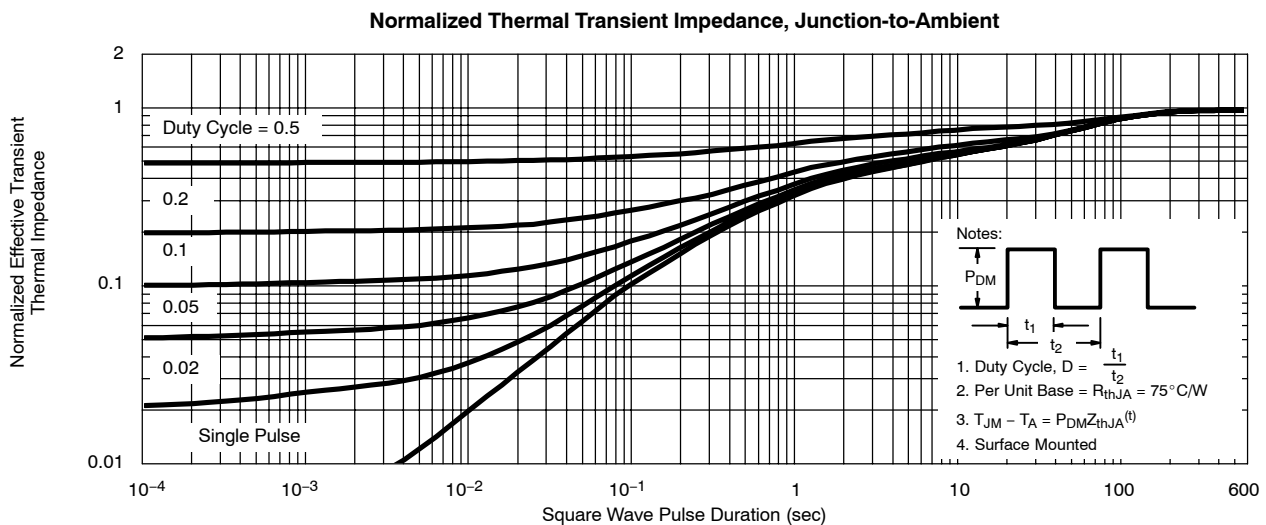
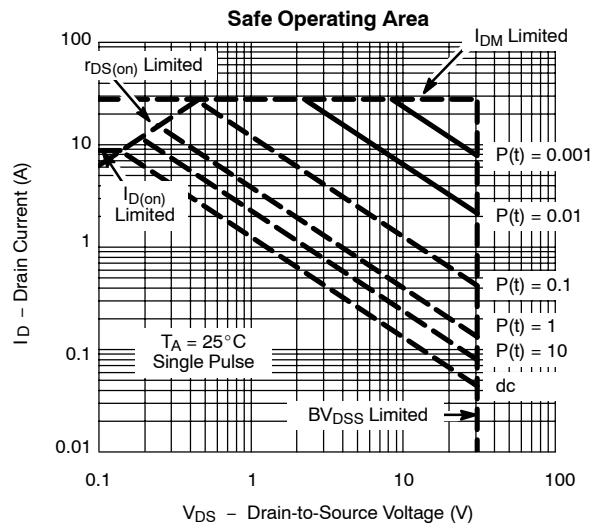
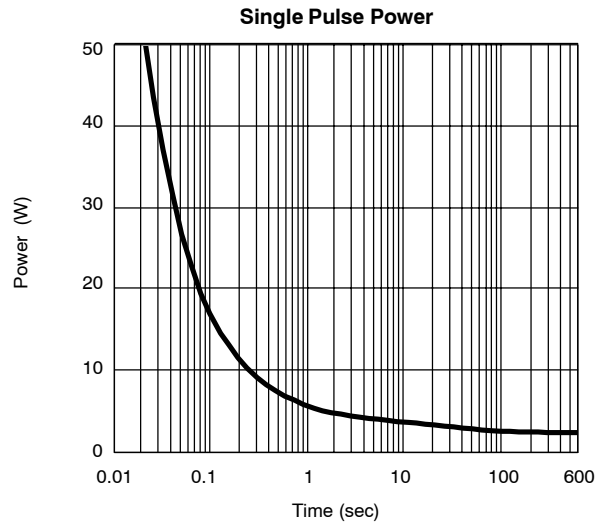
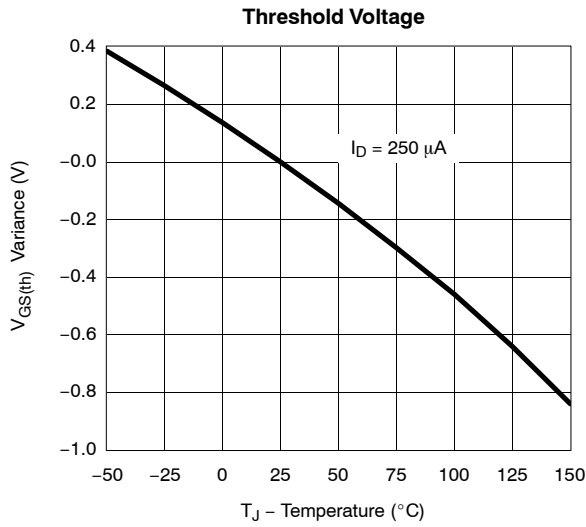
**Source-Drain Diode Forward Voltage**



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



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





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

Normalized Thermal Transient Impedance, Junction-to-Foot

