

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

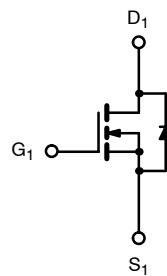
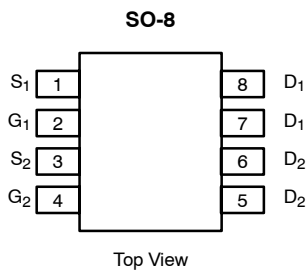
PRODUCT SUMMARY		
V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A)
30	0.0095 @ V _{GS} = 10 V	12.2
	0.016 @ V _{GS} = 4.5 V	9.4

FEATURES

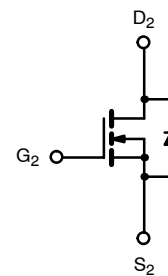
- TrenchFET® Power MOSFET
- 100% R_g Tested

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 _A = 25°C UNLESS OTHERWISE NOTED)				
Parameter	Symbol	10 secs	Steady State	Unit
Drain-Source Voltage	V _{DS}	30		V
Gate-Source Voltage	V _{GS}	± 20		
Continuous Drain Current (T _J = 150°C) ^a	T _A = 25°C	12.2	9.3	A
	T _A = 85°C	8.8	6.7	
Pulsed Drain Current	I _{DM}	30		A
Continuous Source Current (Diode Conduction) ^a	I _S	1.9	1.1	
Maximum Power Dissipation ^a	T _A = 25°C	2.3	1.3	W
	T _A = 85°C	1.2	0.7	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to 150		°C

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

Notes

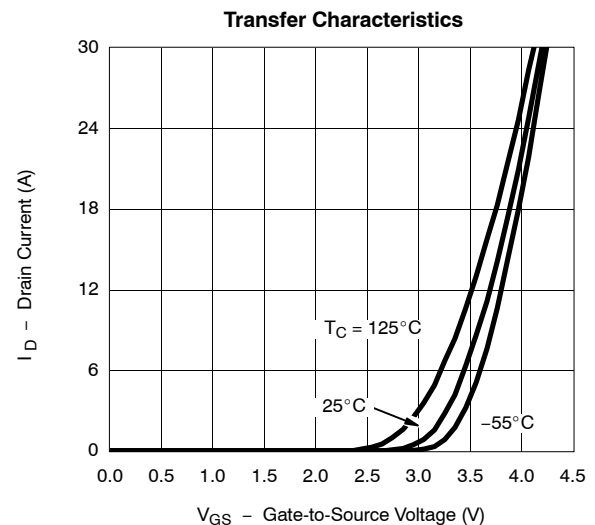
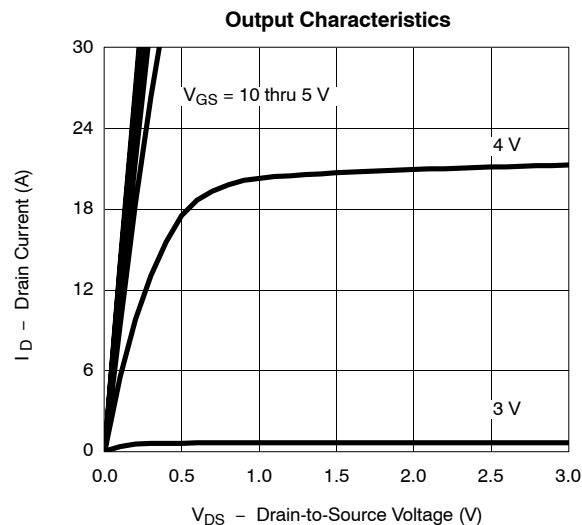
a. Surface Mounted on 1" x 1" FR4 Board.

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	1		3	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}$			1	μA
		$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 85^\circ\text{C}$			5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5 \text{ V}, V_{GS} = 10 \text{ V}$	30			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 10 \text{ V}, I_D = 12.2 \text{ A}$		0.0075	0.0095	Ω
		$V_{GS} = 4.5 \text{ V}, I_D = 9.4 \text{ A}$		0.013	0.016	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 10 \text{ V}, I_D = 12.2 \text{ A}$		32		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 1.9 \text{ A}, V_{GS} = 0 \text{ V}$		0.8	1.2	V
Dynamic^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	Ω
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	

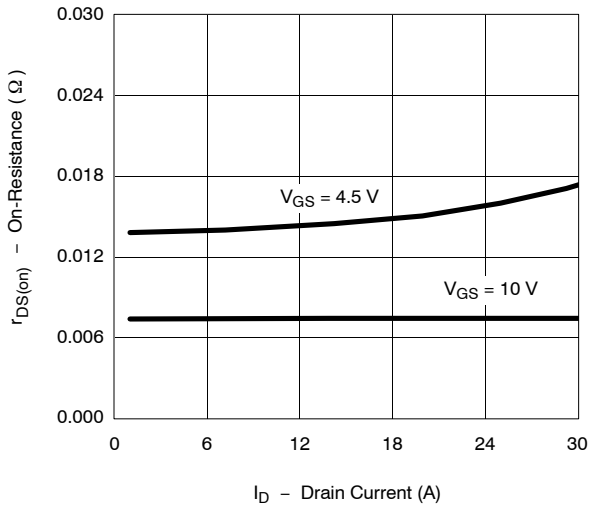
Notes

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

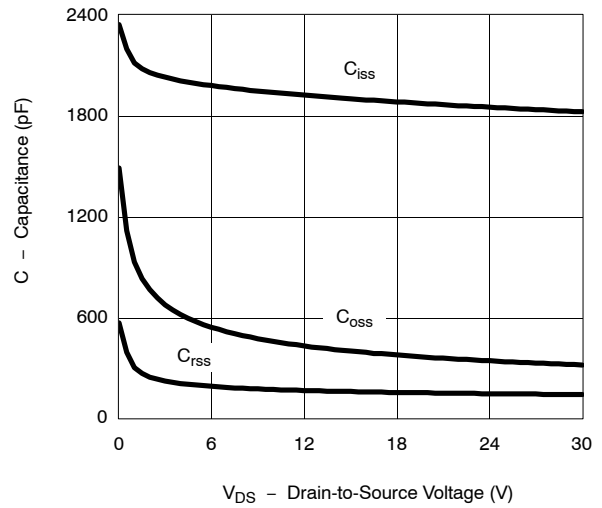
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

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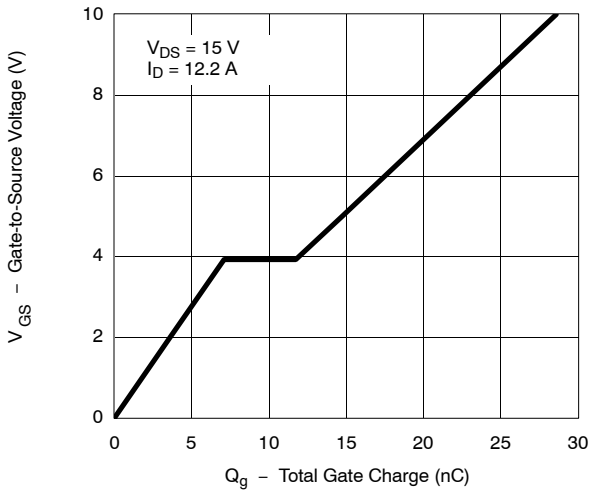
On-Resistance vs. Drain Current



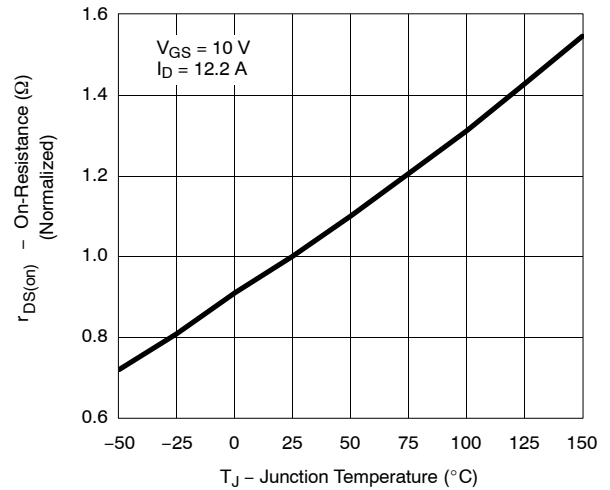
Capacitance



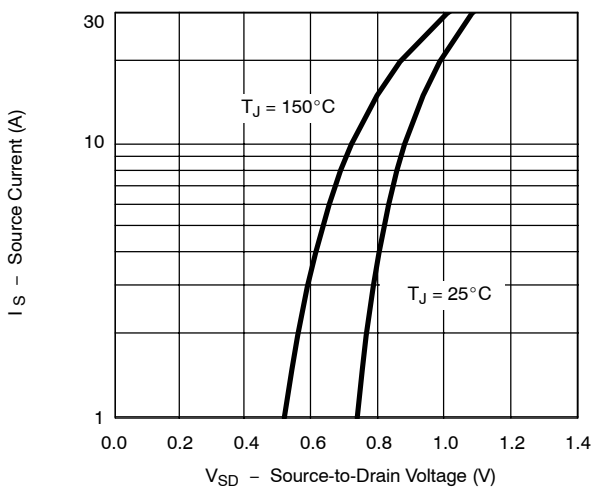
Gate Charge



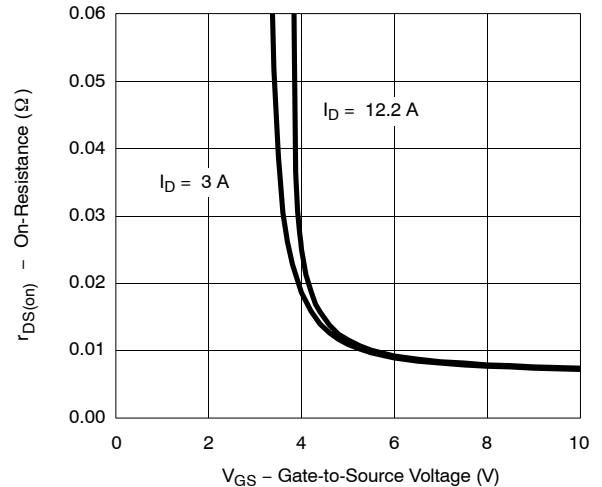
On-Resistance vs. Junction Temperature



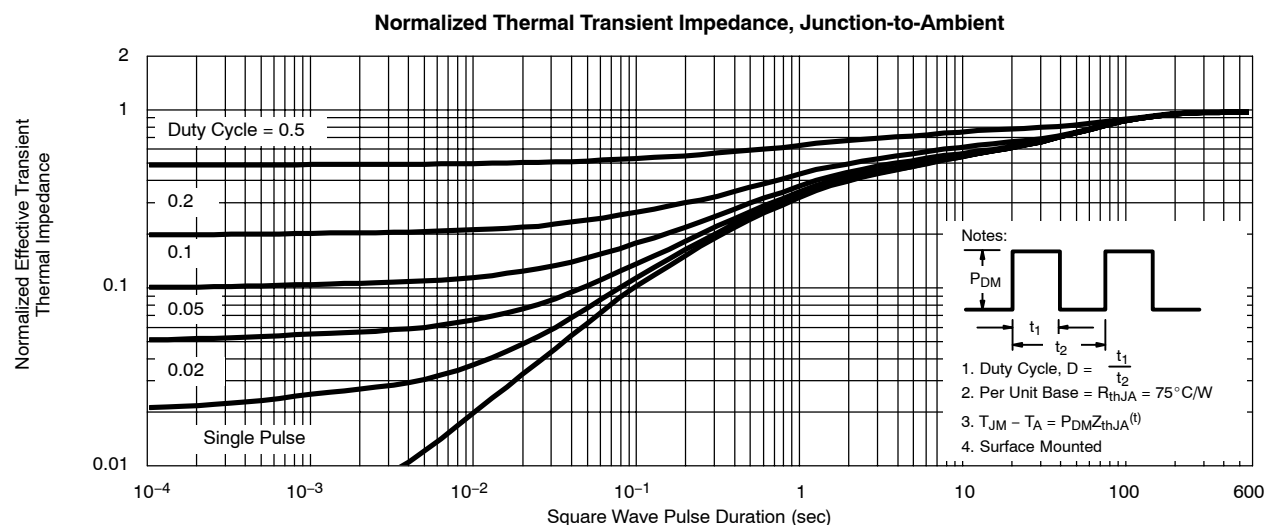
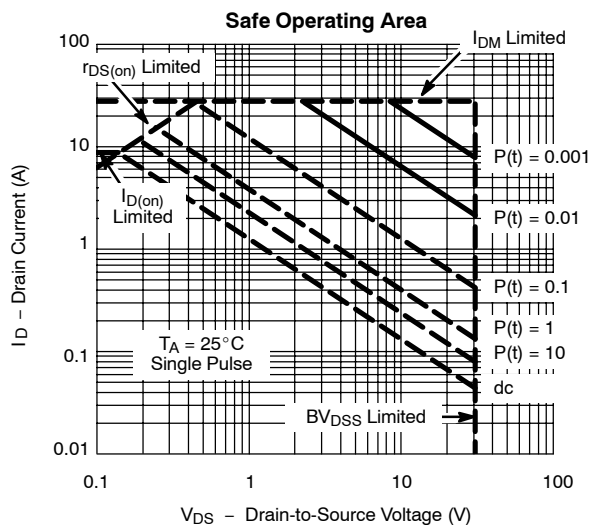
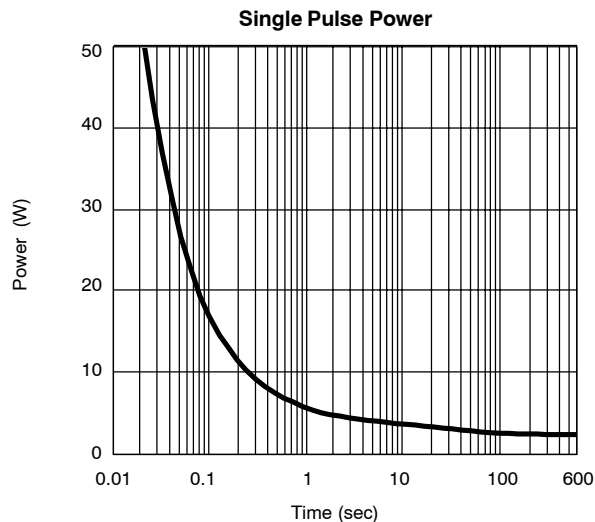
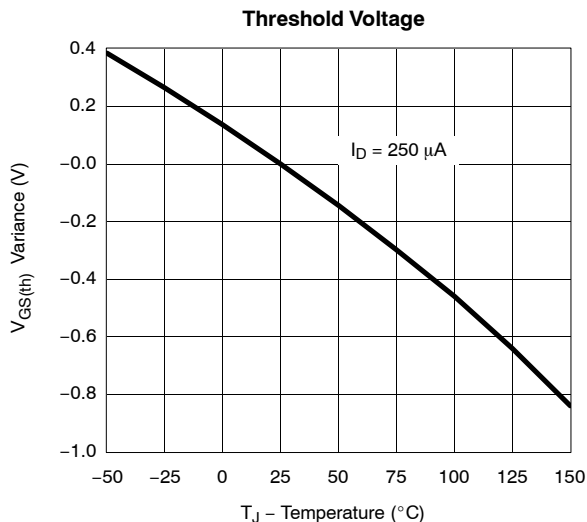
Source-Drain Diode Forward Voltage



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

