



## Dual N-Channel 75-V (D-S) MOSFET

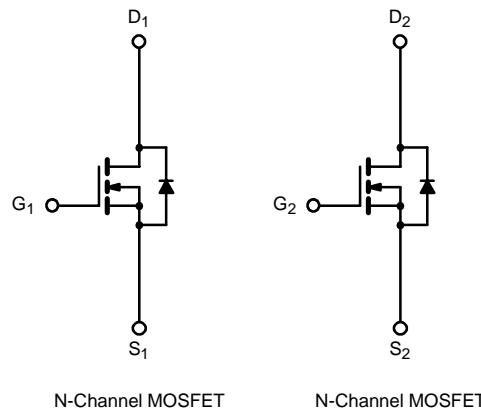
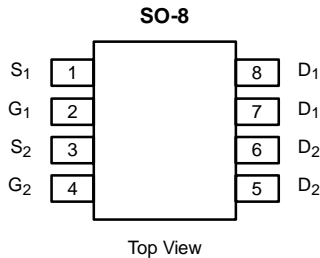
PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
75	0.048 @ $V_{GS} = 10$ V	4.8
	0.062 @ $V_{GS} = 4.5$ V	4.2

### FEATURES

- TrenchFET® Power MOSFET
- 175°C Maximum Junction Temperature
- High-Efficiency PWM Optimized

### APPLICATIONS

- Automotive Such As:
  - High-Side Switch
  - Motor Drives
  - 42-V Battery



Ordering Information: Si4992EY—E3  
Si4992EY-T1—E3 (with Tape and Reel)

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter	Symbol	10 secs	Steady State	Unit
Drain-Source Voltage	$V_{DS}$	75		V
Gate-Source Voltage	$V_{GS}$	$\pm 20$		
Continuous Drain Current ( $T_J = 175^\circ\text{C}$ ) <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	4.8	3.6
		$T_A = 85^\circ\text{C}$	3.7	2.8
Continuous Source Current <sup>a</sup>	$I_S$	2	1.1	A
Pulsed Drain Current	$I_{DM}$	20		
Avalanche Current	$I_{AS}$	8		
Single Avalanche Energy (Duty Cycle $\leq 1\%$ )	$E_{AS}$	3.2		mJ
Maximum Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	2.4	
		$T_A = 85^\circ\text{C}$	1.4	0.8
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 175		$^\circ\text{C}$

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>a</sup>	$R_{thJA}$	$t \leq 10$ sec	50	62.5
		Steady State	85	110
Maximum Junction-to-Foot (Drain)	$R_{thJF}$	31	37	$^\circ\text{C/W}$

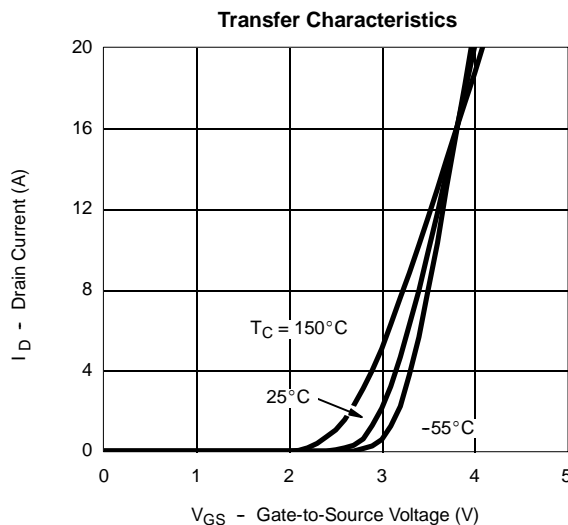
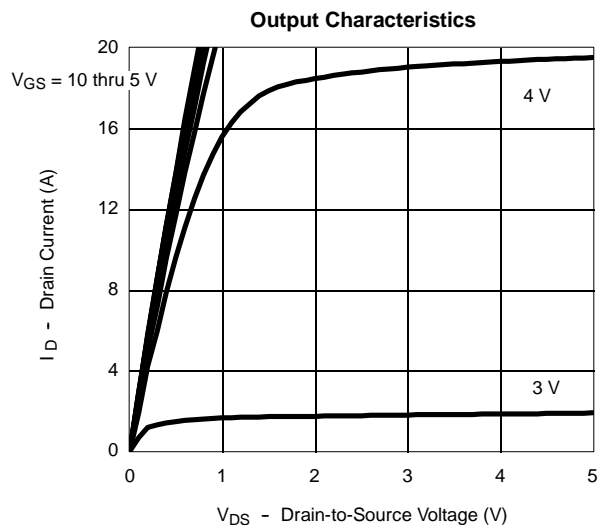
Notes  
a. Surface Mounted on 1" x 1" FR4 Board.

SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	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	1		3	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> = 75 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 75 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 85 °C			20	
On-State Drain Current <sup>a</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>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 4.8 A		0.039	0.048	Ω
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 4.2 A		0.050	0.062	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 4.8 A		16		S
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = 2.4 A, V <sub>GS</sub> = 0 V		0.8	1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 38 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 4.8 A		14	21	nC
Gate-Source Charge	Q <sub>gs</sub>			2.4		
Gate-Drain Charge	Q <sub>gd</sub>			3.5		
Gate Resistance	R <sub>g</sub>	f = 1 MHz		3.6		Ω
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 38 V, R <sub>L</sub> = 38 Ω I <sub>D</sub> ≅ 1 A, V <sub>GEN</sub> = 10 V, R <sub>g</sub> = 6 Ω		7	15	ns
Rise Time	t <sub>r</sub>			10	15	
Turn-Off Delay Time	t <sub>d(off)</sub>			22	35	
Fall Time	t <sub>f</sub>			10	15	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 2.4 A, di/dt = 100 A/μs		25	50	

Notes

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

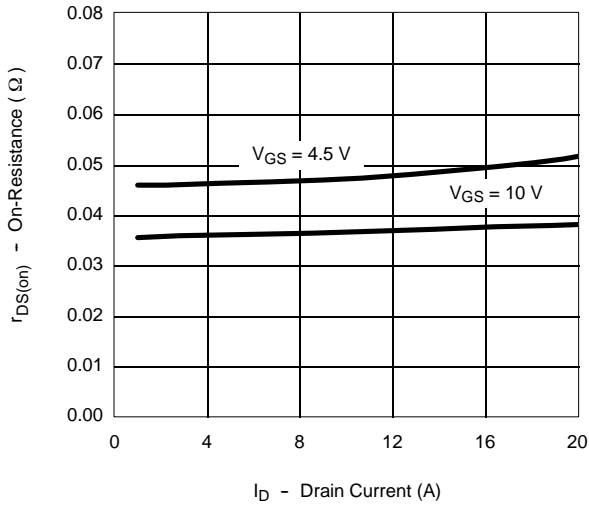
**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**



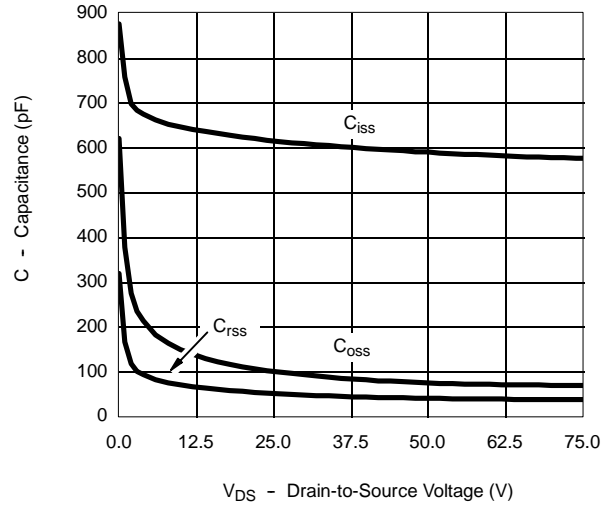


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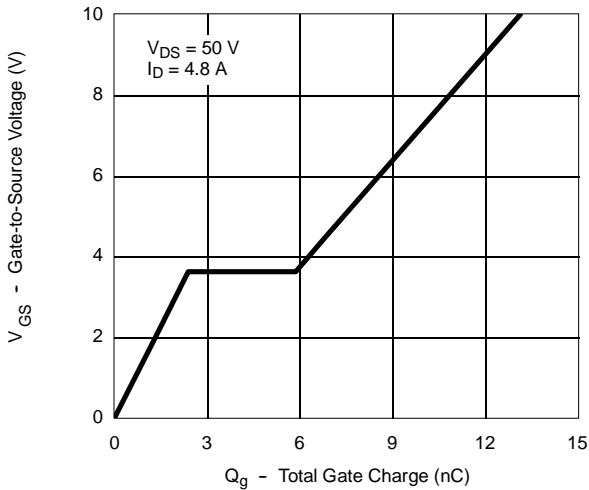
On-Resistance vs. Drain Current



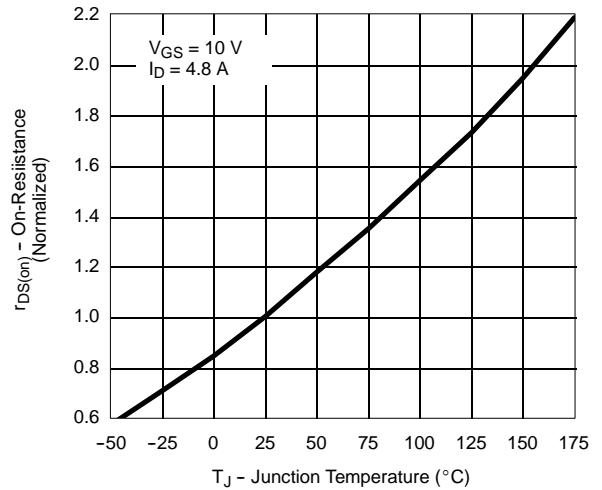
Capacitance



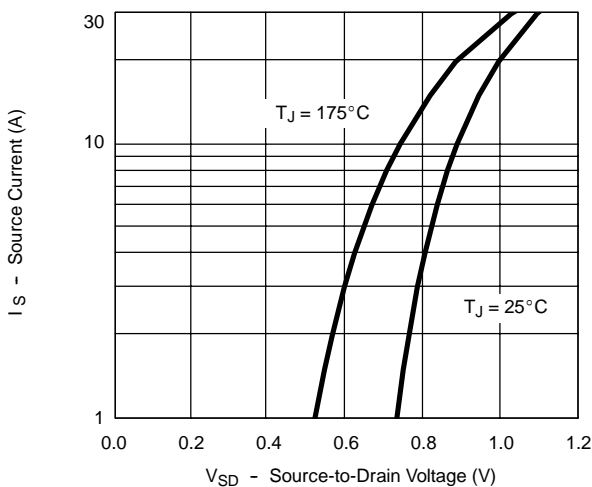
Gate Charge



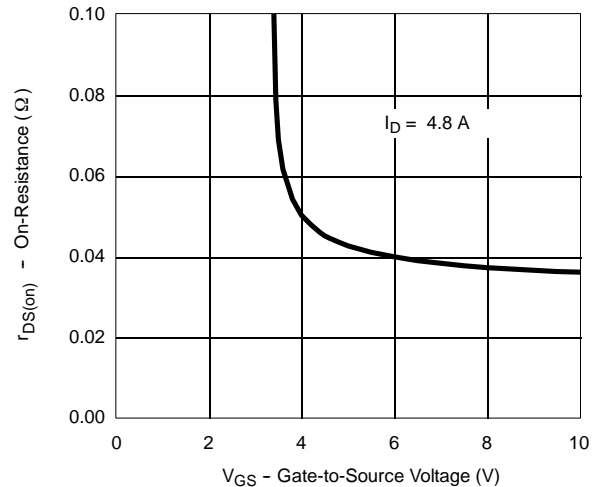
On-Resistance vs. Junction Temperature



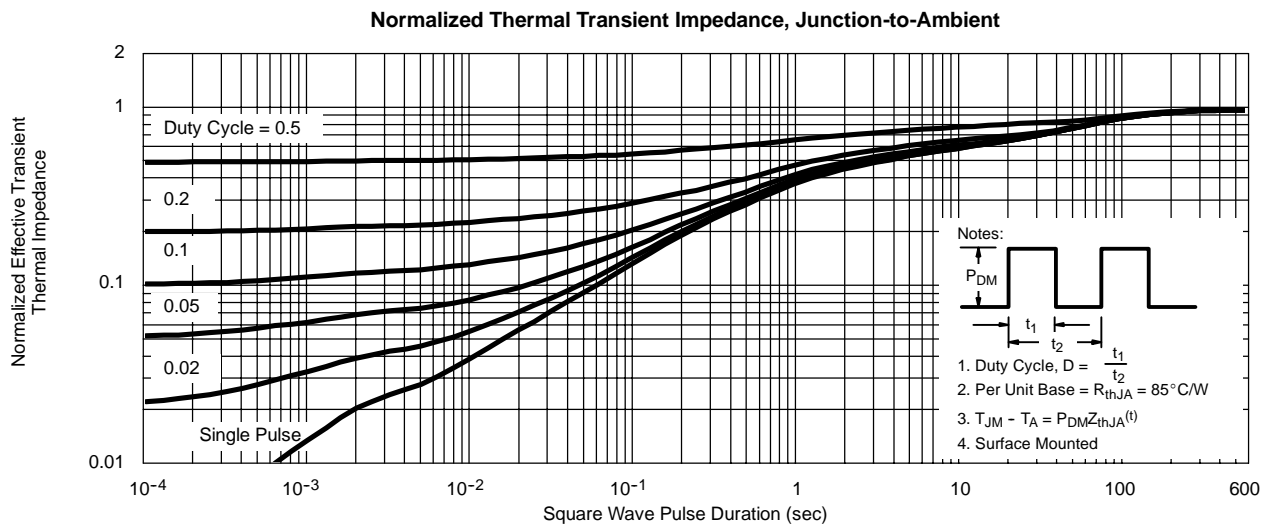
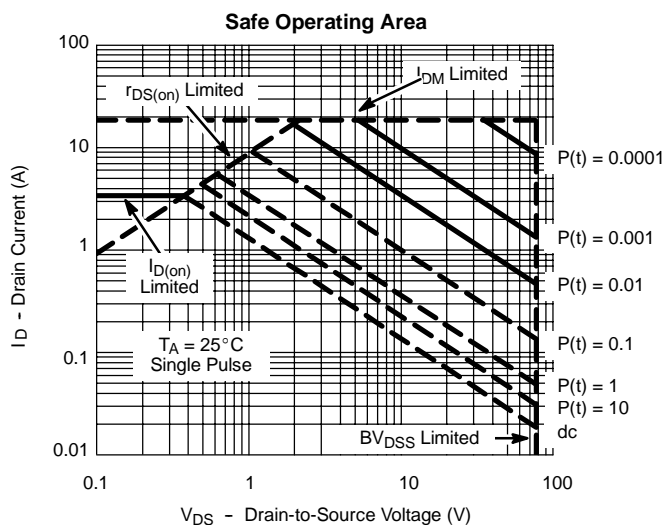
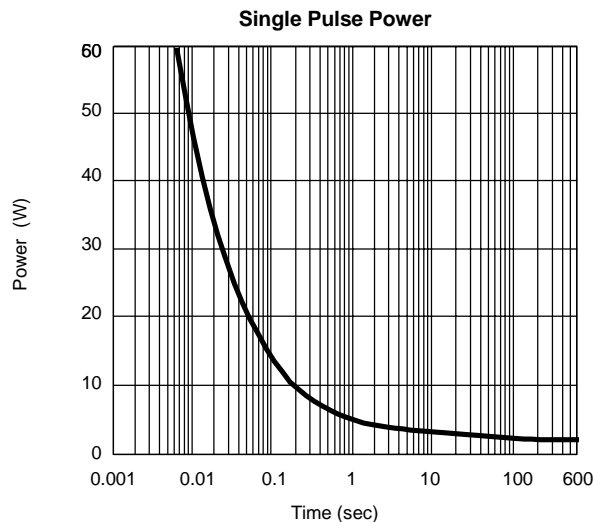
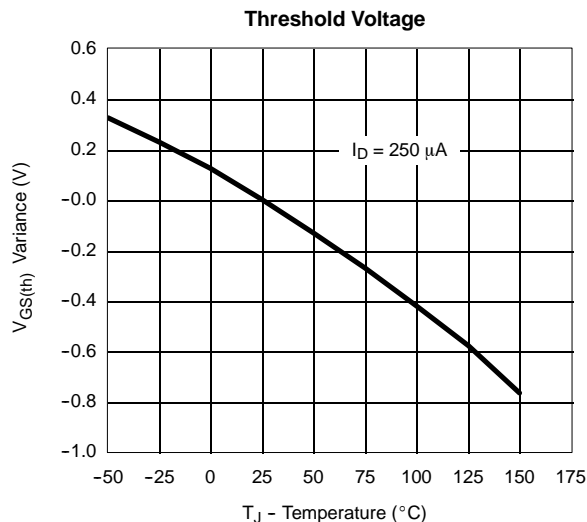
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



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