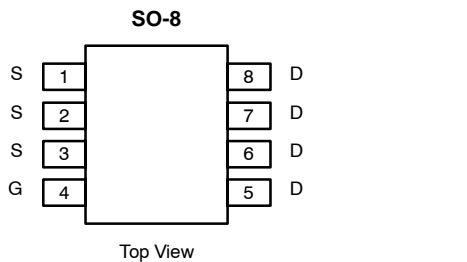




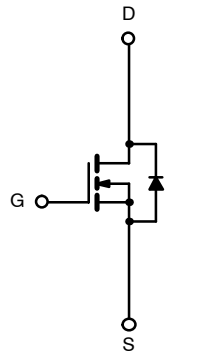
## N-Channel Reduced $Q_g$ , Fast Switching MOSFET

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
60	0.022 @ $V_{GS} = 10$ V	8.5
	0.031 @ $V_{GS} = 4.5$ V	7.2

**175°C Rated**  
Maximum Junction Temperature  
**TrenchFET®**  
Power MOSFETS



Ordering Information: Si4850EY  
Si4850EY—E3 (Lead Free)  
Si4850EY-T1 (with Tape and Reel)  
Si4850EY-T1—E3 (Lead Free 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		$V_{DS}$	60		V
Gate-Source Voltage		$V_{GS}$	$\pm 20$		
Continuous Drain Current ( $T_J = 175^\circ\text{C}$ ) <sup>a</sup>	$T_A = 25^\circ\text{C}$	$I_D$	8.5	6.0	A
	$T_A = 70^\circ\text{C}$		7.1	5.0	
Pulsed Drain Current		$I_{DM}$	40		
Avalanche Current		$I_{AS}$	15		
Repetitive Avalanche Energy		$E_{AS}$	11		mJ
Maximum Power Dissipation <sup>a</sup>	$T_A = 25^\circ\text{C}$	$P_D$	3.3	1.7	W
	$T_A = 70^\circ\text{C}$		2.3	1.2	
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>	$t \leq 10$ sec	$R_{thJA}$	36	45	$^\circ\text{C}/\text{W}$
	Steady State		75	90	
Maximum Junction-to-Foot (Drain)	Steady State	$R_{thJF}$	17	20	

Notes

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

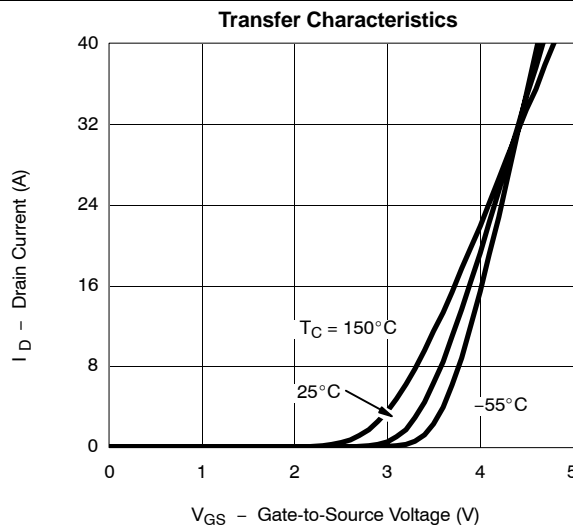
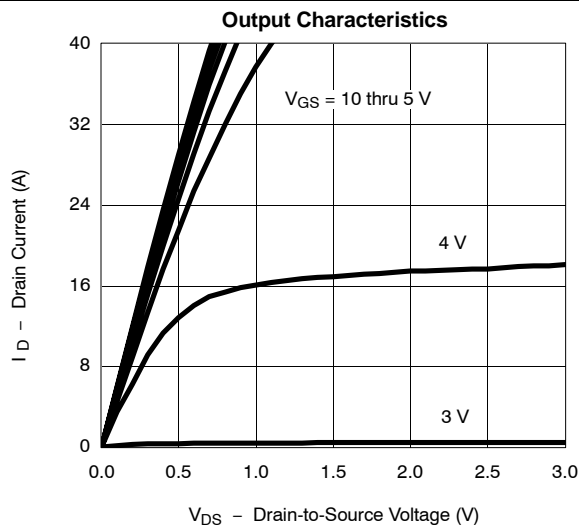
**SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	60			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	1			
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> = 60 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °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	40			A
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 6.0 A		0.018	0.022	Ω
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 6.0 A, T <sub>J</sub> = 125 °C		0.031	0.037	
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 6.0 A, T <sub>J</sub> = 175 °C		0.039	0.047	
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 5.1 A		0.025	0.031	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 6.0 A		25		S
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = 1.7 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> = 30 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 6.0 A		18	27	nC
Gate-Source Charge	Q <sub>gs</sub>			3.4		
Gate-Drain Charge	Q <sub>gd</sub>			5.3		
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> = 0.1 V, f = 5 MHz	0.5	1.4	2.4	Ω
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 30 V, R <sub>L</sub> = 30 Ω I <sub>D</sub> ≅ 1 A, V <sub>GEN</sub> = 10 V, R <sub>g</sub> = 6 Ω		10	20	ns
Rise Time	t <sub>r</sub>			10	20	
Turn-Off Delay Time	t <sub>d(off)</sub>			25	50	
Fall Time	t <sub>f</sub>			12	24	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 1.7 A, di/dt = 100 A/μs		50	80	

Notes

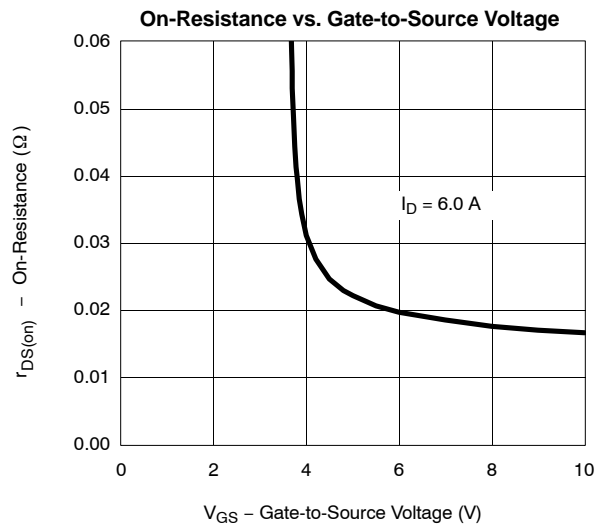
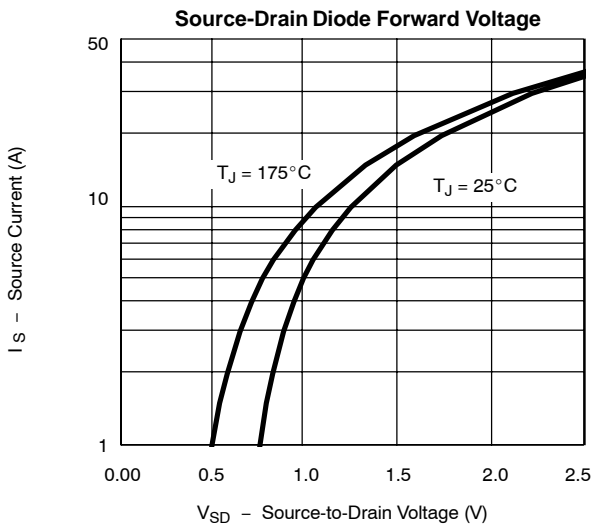
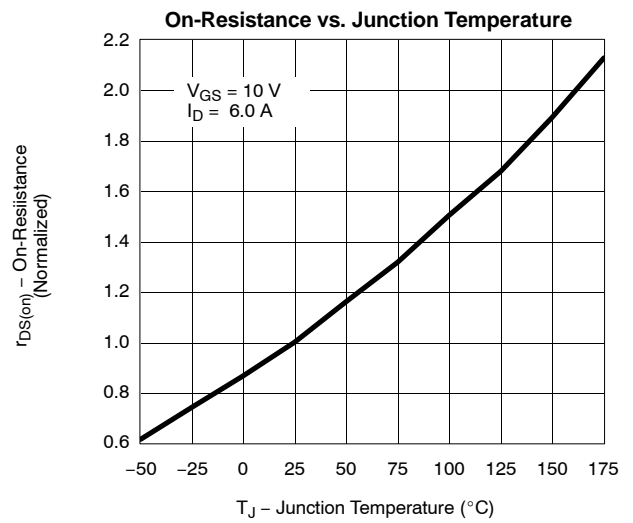
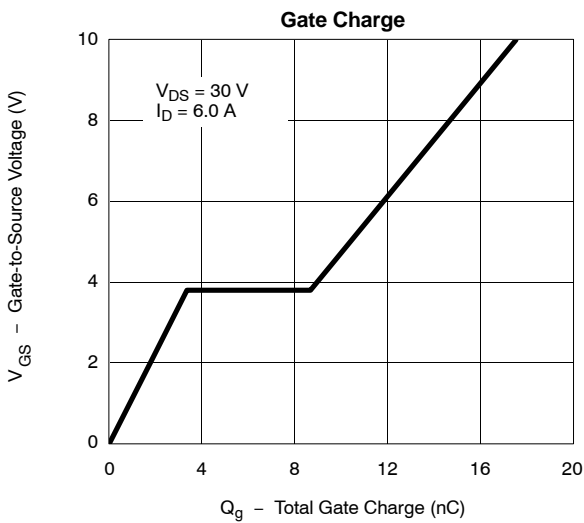
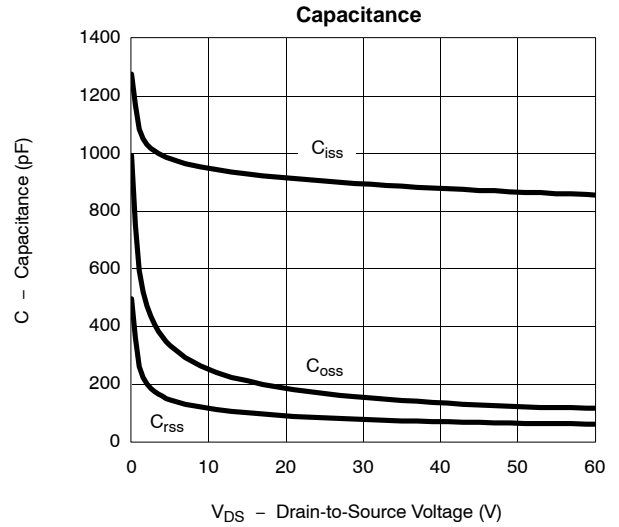
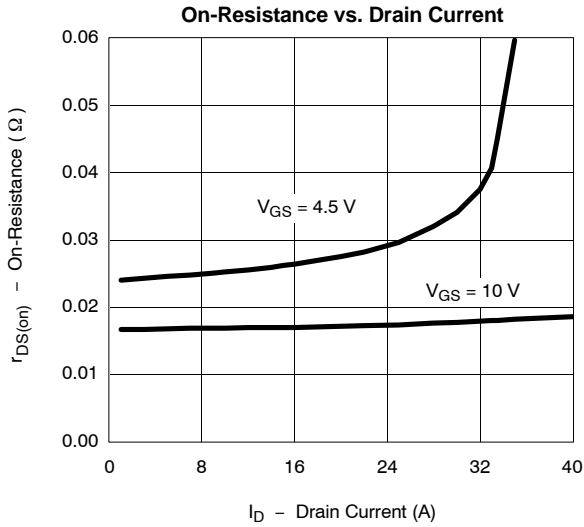
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.

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





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



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

