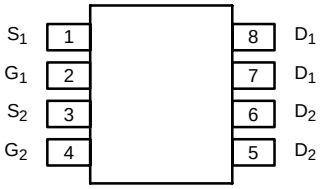
Dual N-Channel 60-V (D-S), 175°C MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
60	0.055 @ V_{GS} = 10 V	4.5
	0.075 @ V_{GS} = 4.5 V	3.9

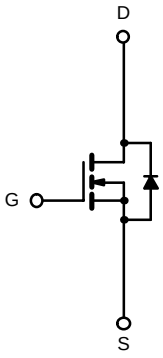
175°C Rated Maximum Junction Temperature TrenchFET® Power MOSFETs

SO-8



Top View

Ordering Information: Si4946EY
Si4946EY-T1 (with Tape and Reel)



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current (T_J = 175°C)[a]	T_A = 25°C	I_D	4.5	A
	T_A = 70°C		3.8	
Pulsed Drain Current		I_{DM}	30	
Continuous Source Current (Diode Conduction)[a]		I_S	2	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	2.4	W
	T_A = 70°C		1.7	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	°C

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Limit	Unit
Maximum Junction-to-Ambient[a]	R_{thJA}	62.5	°C/W

Notes
a. Surface Mounted on FR4 Board, t ≤ 10 sec.

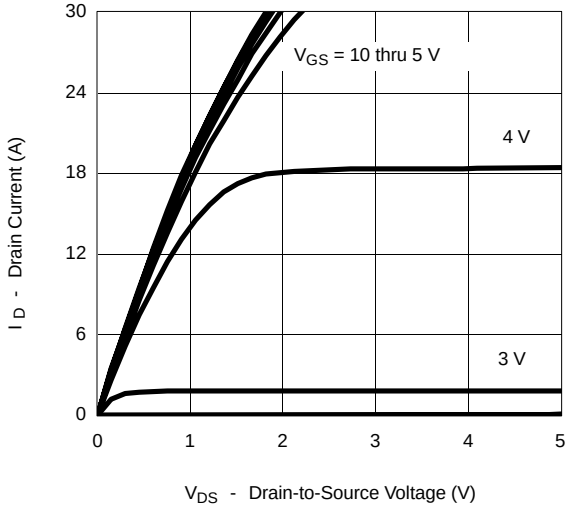
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ[a]	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	1			V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60 V, V_{GS} = 0 V			2	μA
		V_{DS} = 60 V, V_{GS} = 0 V, T_J = 55°C			25	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 10 V	20			A
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 4.5 A		0.045	0.055	Ω
		V_{GS} = 4.5 V, I_D = 3.9 A		0.055	0.075	
Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, I_D = 4.5 A		13		S
Diode Forward Voltage[b]	V_{SD}	I_S = 2 A, V_{GS} = 0 V		0.9	1.2	V
Dynamic[a]						
Total Gate Charge	Q_g	V_{DS} = 30 V, V_{GS} = 10 V, I_D = 4.5 A		19	30	nC
Gate-Source Charge	Q_{gs}			4		
Gate-Drain Charge	Q_{gd}			3		
Gate Resistance	R_g		1		3.6	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 30 V, R_L = 30 Ω I_D ≅ 1 A, V_{GEN} = 10 V, R_G = 6 Ω		13	20	ns
Rise Time	t_r			11	20	
Turn-Off Delay Time	$t_{d(off)}$			36	60	
Fall Time	t_f			11	20	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 2 A, di/dt = 100 A/μs		35	60	

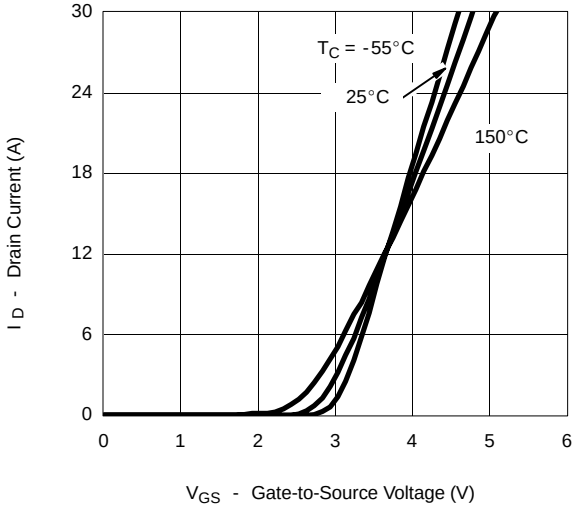
Notes
a. For design aid only; not subject to production testing.
b. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

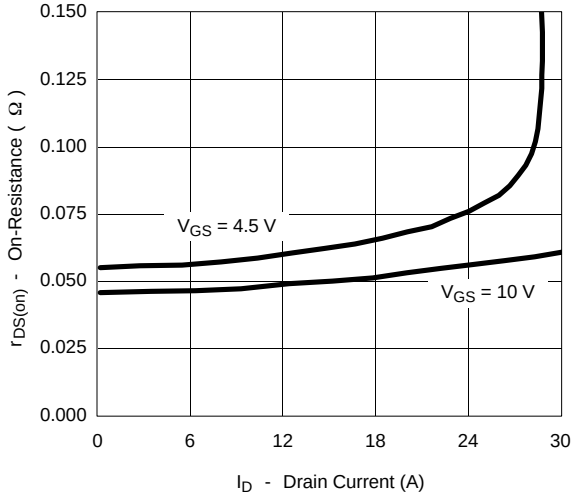
Output Characteristics



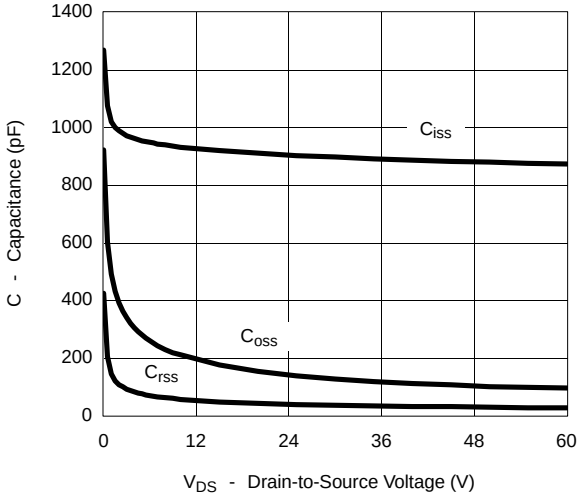
Transfer Characteristics



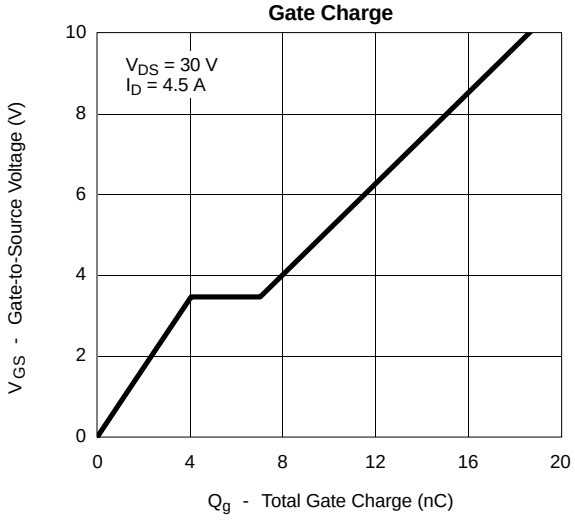
On-Resistance vs. Drain Current



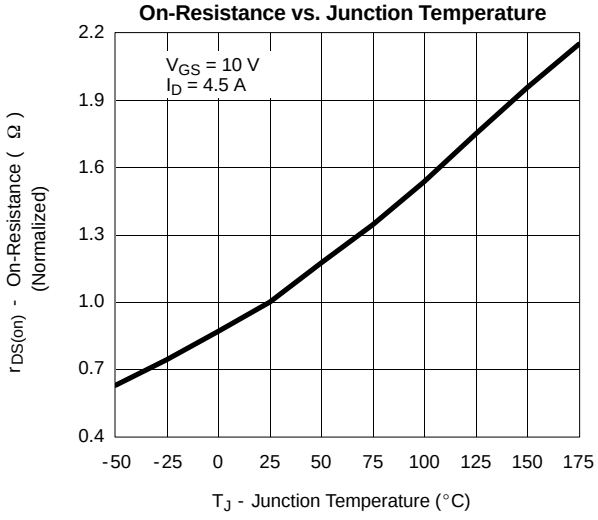
Capacitance



Gate Charge

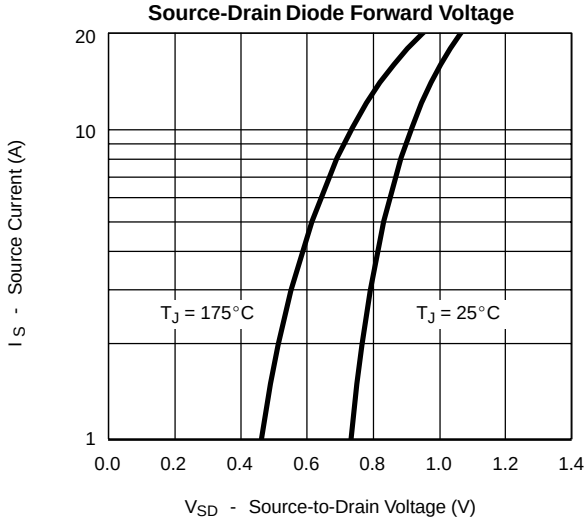


On-Resistance vs. Junction Temperature

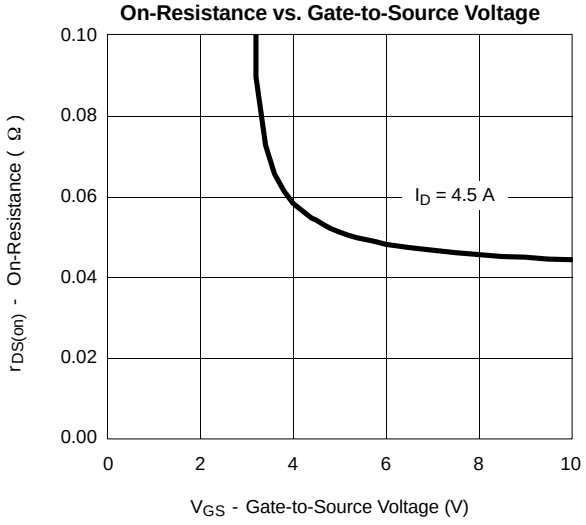


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

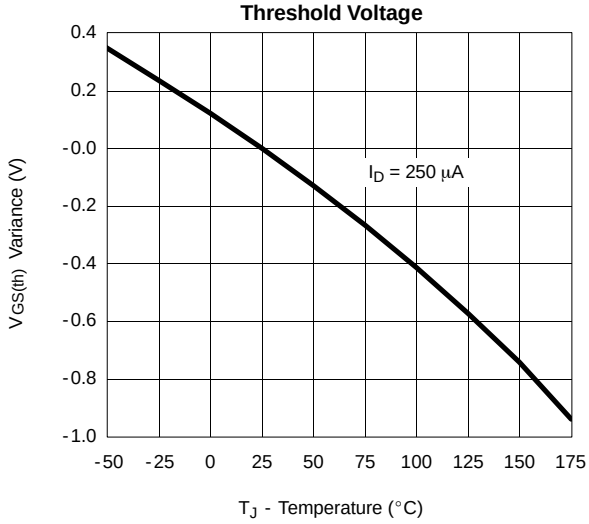
Source-Drain Diode Forward Voltage



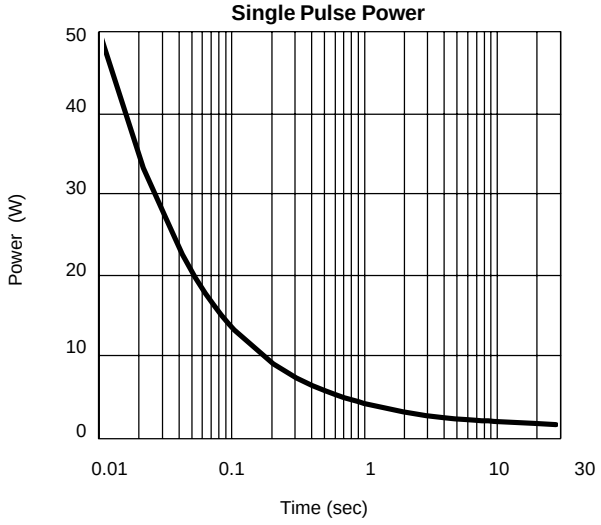
On-Resistance vs. Gate-to-Source Voltage



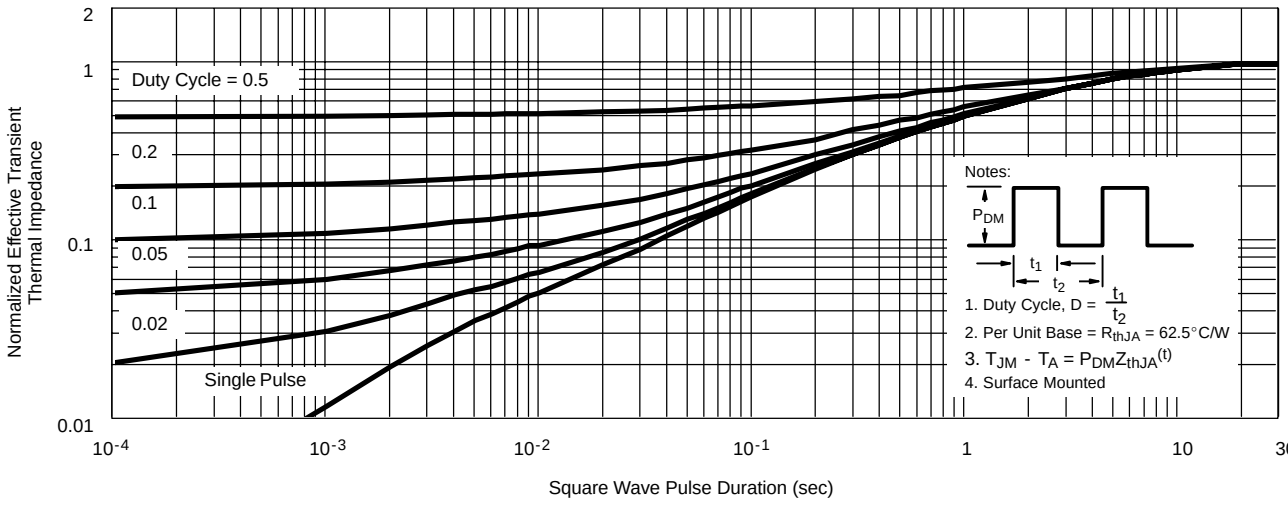
Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient



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