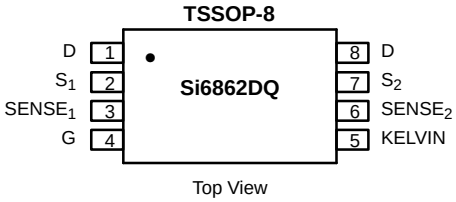
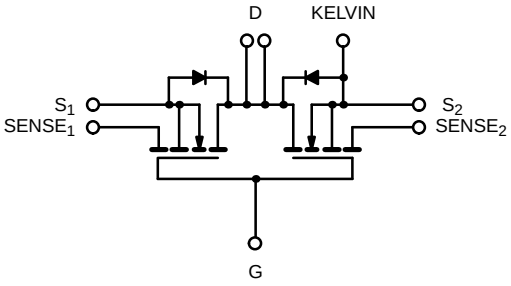
Dual N-Channel 20-V (D-S) MOSFET with Current Sense

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
20	0.026 @ V_{GS} = 4.5 V	6.6
	0.036 @ V_{GS} = 2.5 V	5.6

TrenchFET® Power MOSFETs





ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)					
Parameter		Symbol	10 secs	Steady State	Unit
Drain-Source Voltage		V_{DS}	20		V
Gate-Source Voltage		V_{GS}	±12		
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	6.6	5.2	A
	T_A = 70°C		5.2	4.2	
Pulsed Drain Current (10 μs Pulse Width)		I_{DM}	30		
Continuous Source Current (Diode Conduction)[a]		I_S	1.5	0.9	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	1.8	1.1	W
	T_A = 70°C		1.1	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	R_{thJA}	55	70	°C/W
	Steady State		93	110	
Maximum Junction-to-Foot	Steady State	R_{thJF}	36	45	

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

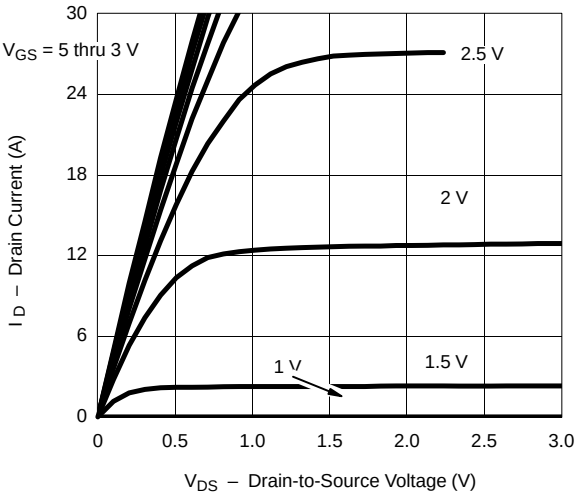
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	0.6			V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±12 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 16 V, V_{GS} = 0 V			1	μA
		V_{DS} = 16 V, V_{GS} = 0 V, T_J = 70°C			5	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 4.5 V	30			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = 4.5 V, I_D = 5.2 A		0.022	0.026	Ω
		V_{GS} = 2.5 V, I_D = 4.4 A		0.029	0.036	
Forward Transconductance[a]	g_{fs}	V_{DS} = 10 V, I_D = 5.2 A		23		S
Diode Forward Voltage[a]	V_{SD}	I_S = 0.9 A, V_{GS} = 0 V		0.8	1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 5.2 A		25	40	nC
Gate-Source Charge	Q_{gs}			3.7		
Gate-Drain Charge	Q_{gd}			8.1		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 10 V, R_L = 10 Ω I_D ≅ 1 A, V_{GEN} = 4.5 V, R_G = 6 Ω		25	50	ns
Rise Time	t_r			40	80	
Turn-Off Delay Time	$t_{d(off)}$			80	160	
Fall Time	t_f			45	90	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 0.9 A, di/dt = 100 A/μs		40	80	

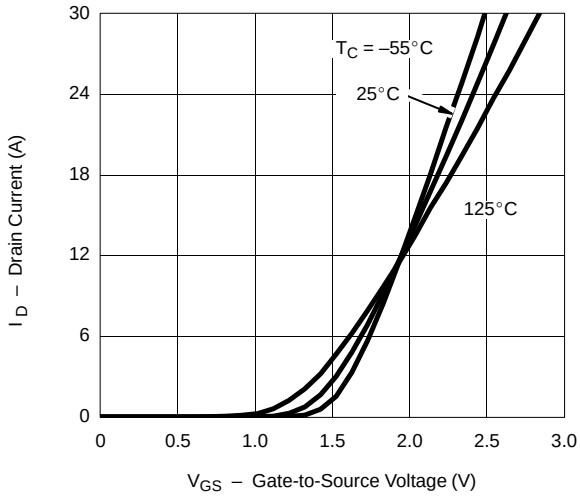
Notes
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Output Characteristics

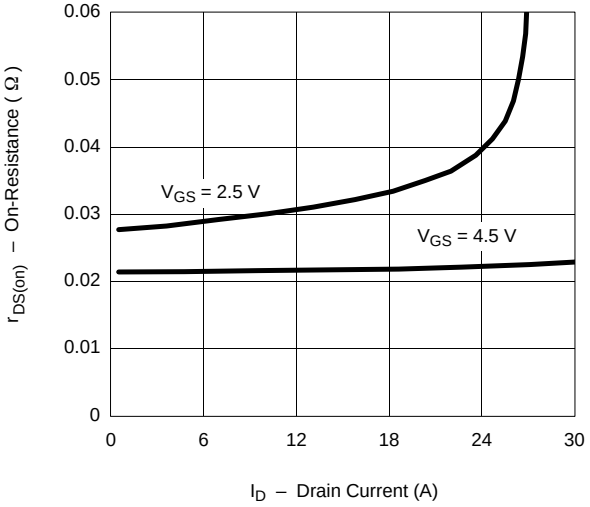


Transfer Characteristics

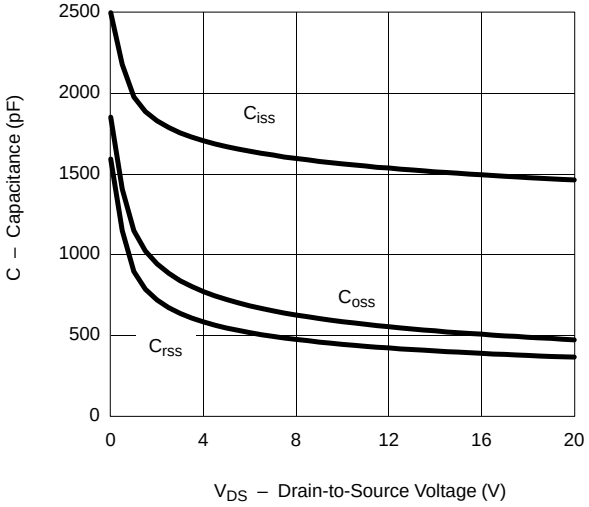


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

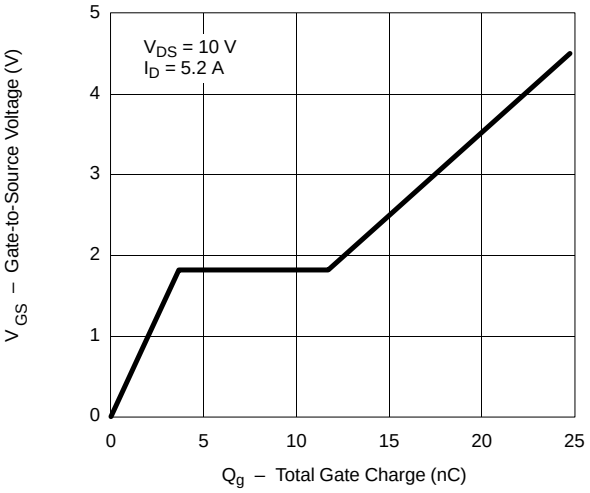
On-Resistance vs. Drain Current



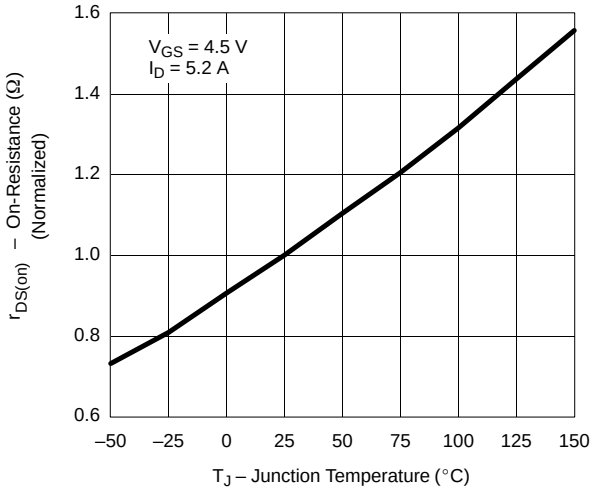
Capacitance



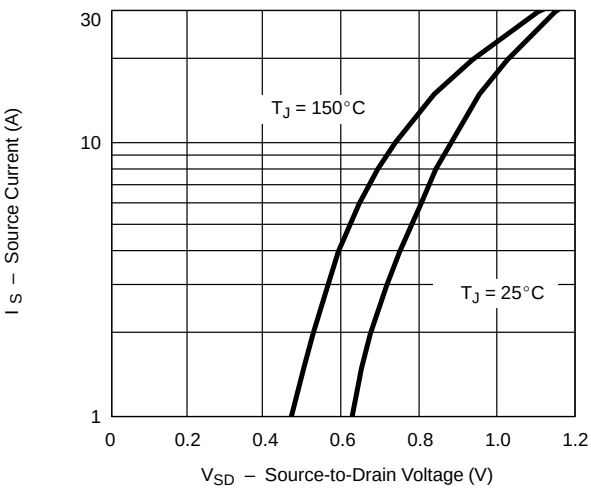
Gate Charge



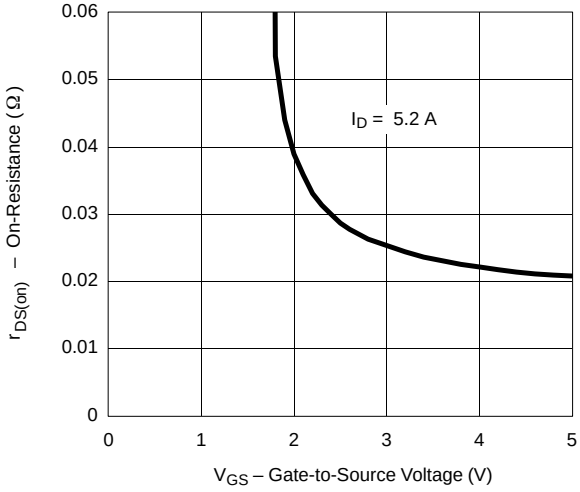
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

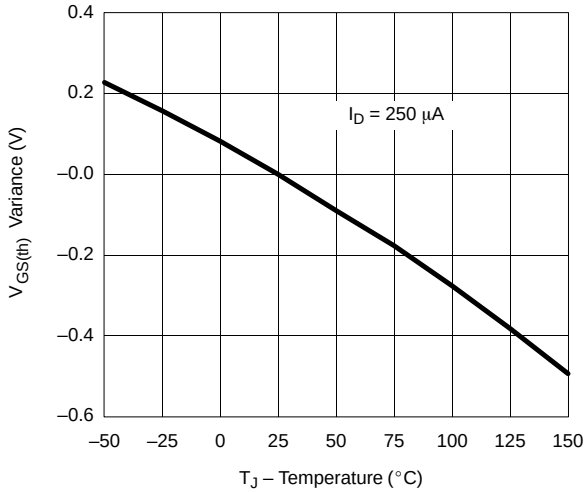


On-Resistance vs. Gate-to-Source Voltage

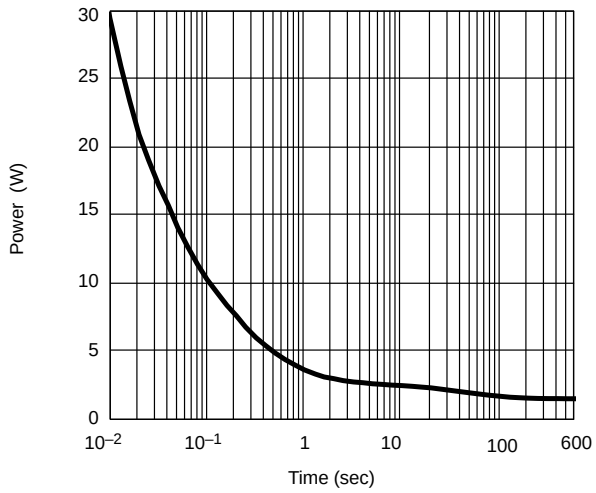


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

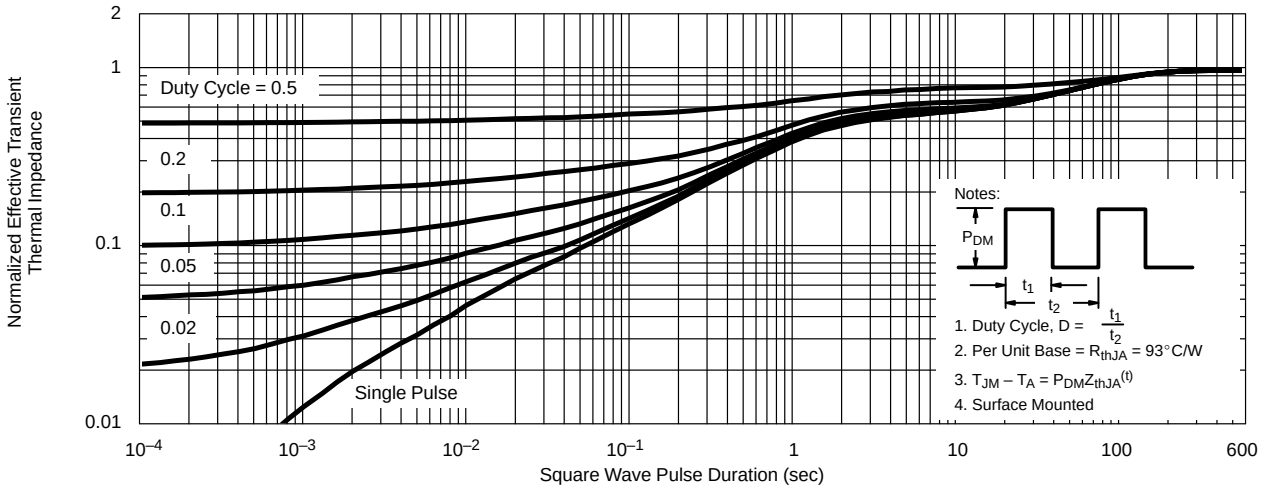
Threshold Voltage



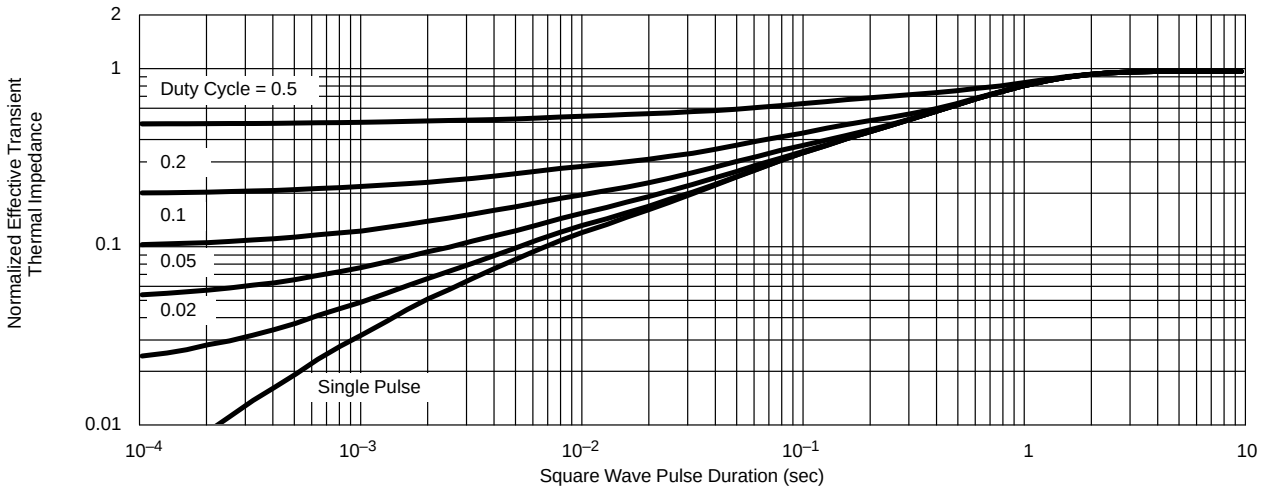
Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

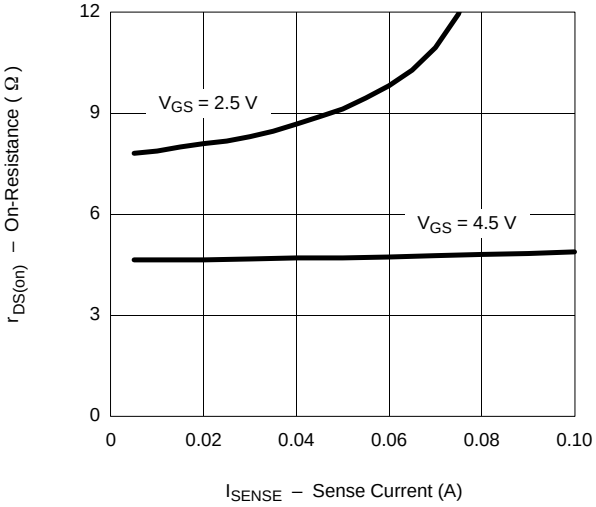


Normalized Thermal Transient Impedance, Junction-to-Foot

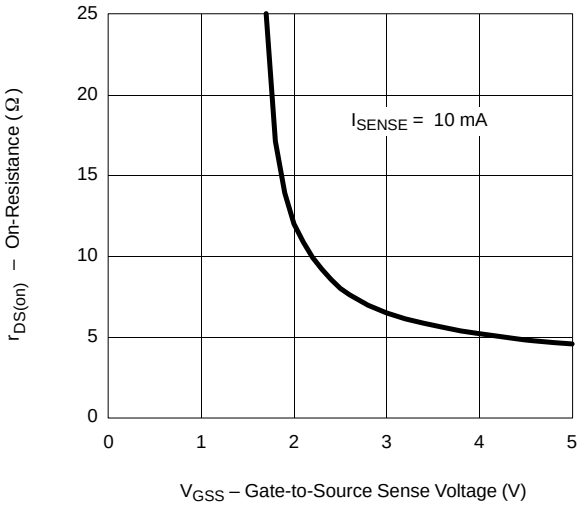


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) SENSE DIE

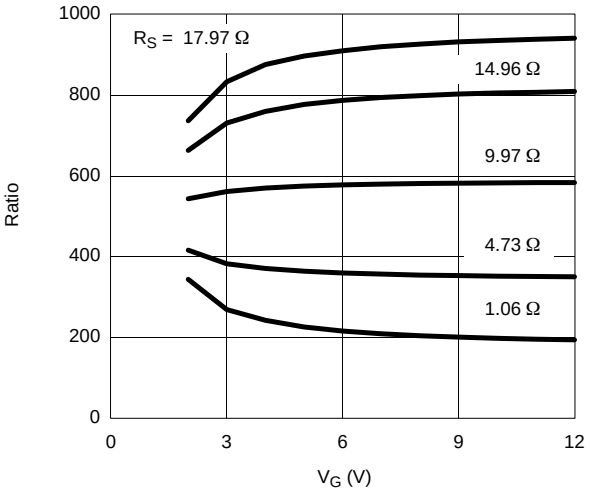
On-Resistance vs. Sense Current



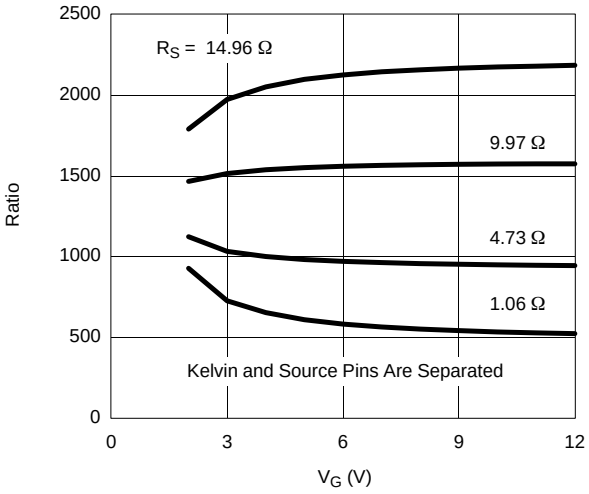
On-Resistance vs. Gate-to-Source Sense Voltage



Current Ratio (I_{MAIN}/I_S) vs. Gate Voltage (Channel-1)



Current Ratio (I_{MAIN}/I_S) vs. Gate Voltage (Channel-2)



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