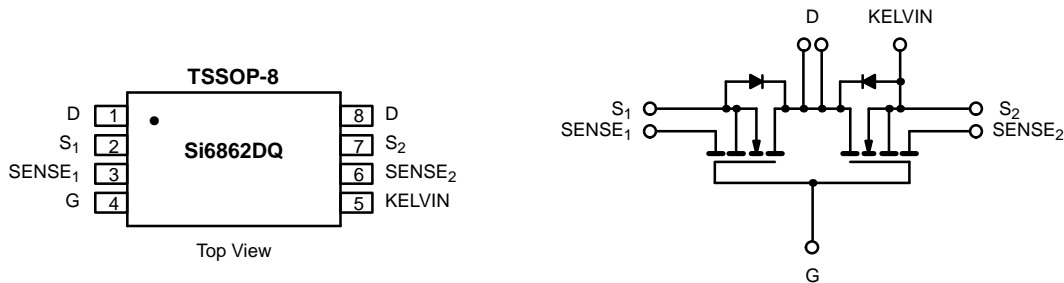




## Dual N-Channel 20-V (D-S) MOSFET with Current Sense

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

**TrenchFET<sup>®</sup>**  
Power MOSFETs



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	10 secs	Steady State	Unit	
Drain-Source Voltage	$V_{DS}$	20		V	
Gate-Source Voltage	$V_{GS}$	$\pm 12$			
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	6.6	5.2	A
		$T_A = 70^\circ\text{C}$	5.2	4.2	
Pulsed Drain Current (10 $\mu\text{s}$ Pulse Width)	$I_{DM}$	30			
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	1.5	0.9	W	
Maximum Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	1.8		1.1
		$T_A = 70^\circ\text{C}$	1.1		0.7
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150		$^\circ\text{C}$	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient <sup>a</sup>	$R_{thJA}$	$t \leq 10$ sec	55	70	$^\circ\text{C/W}$
		Steady State	93	110	
Maximum Junction-to-Foot	$R_{thJF}$	36	45		

Notes

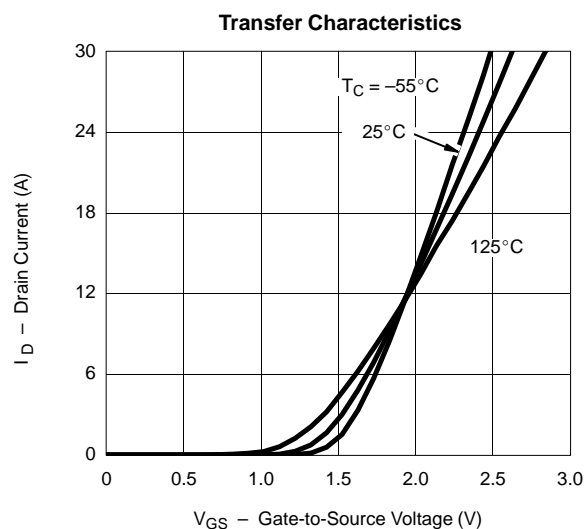
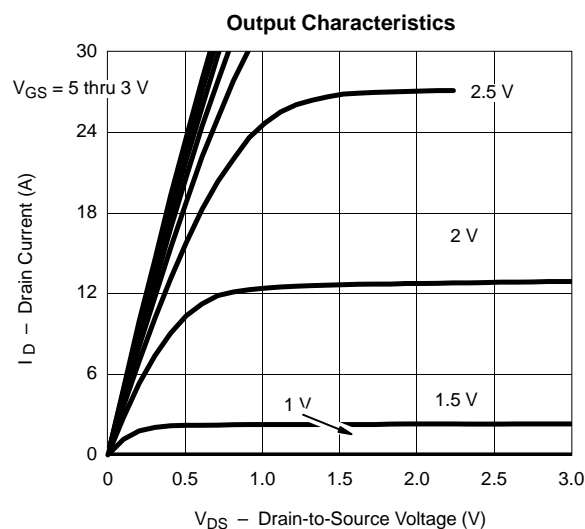
a. Surface Mounted on 1" x 1" FR4 Board.


**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	0.6			V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 12 V			± 100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 16 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 16 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 70 °C			5	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 5 V, V <sub>GS</sub> = 4.5 V	30			A
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 5.2 A		0.022	0.026	Ω
		V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 4.4 A		0.029	0.036	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 5.2 A		23		S
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = 0.9 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> = 10 V, V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 5.2 A		25	40	nC
Gate-Source Charge	Q <sub>gs</sub>			3.7		
Gate-Drain Charge	Q <sub>gd</sub>			8.1		
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 10 V, R <sub>L</sub> = 10 Ω I <sub>D</sub> ≅ 1 A, V <sub>GEN</sub> = 4.5 V, R <sub>G</sub> = 6 Ω		25	50	ns
Rise Time	t <sub>r</sub>			40	80	
Turn-Off Delay Time	t <sub>d(off)</sub>			80	160	
Fall Time	t <sub>f</sub>			45	90	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 0.9 A, di/dt = 100 A/μs		40	80	

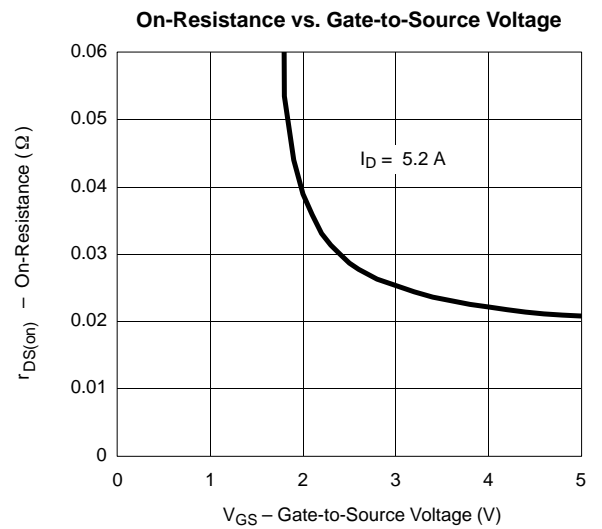
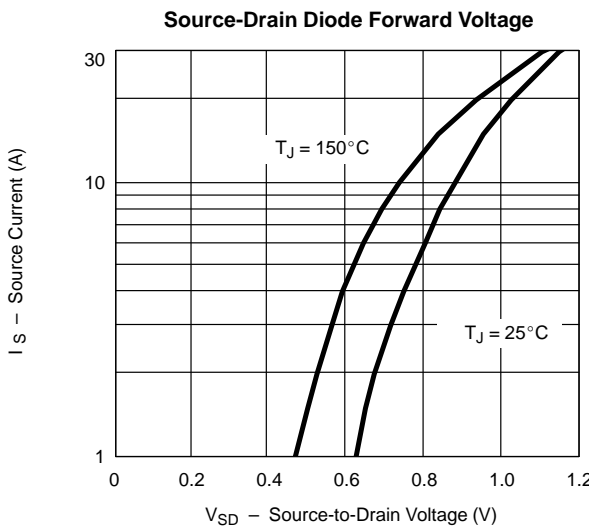
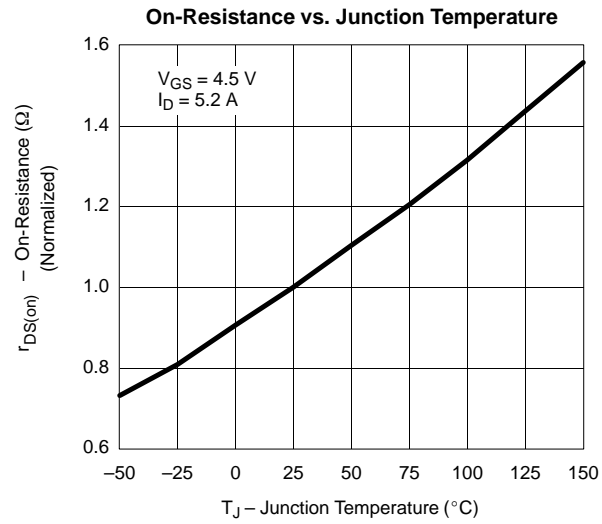
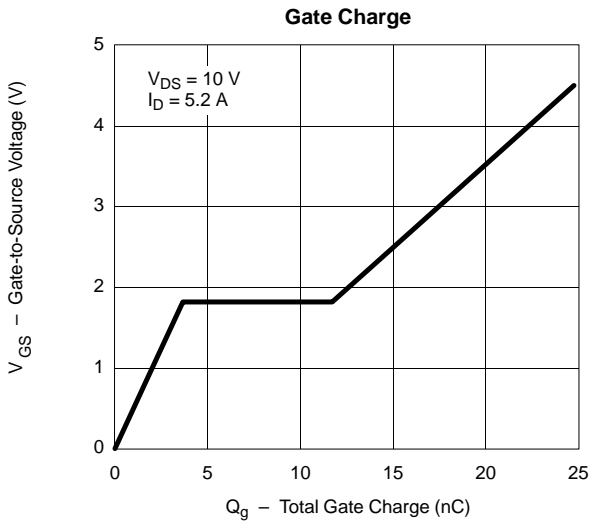
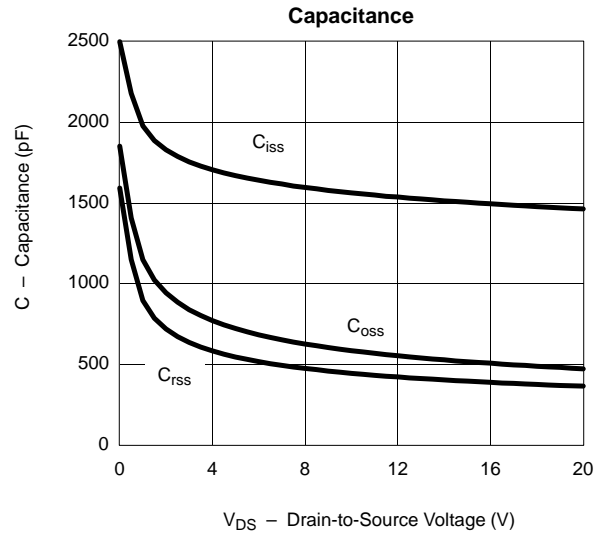
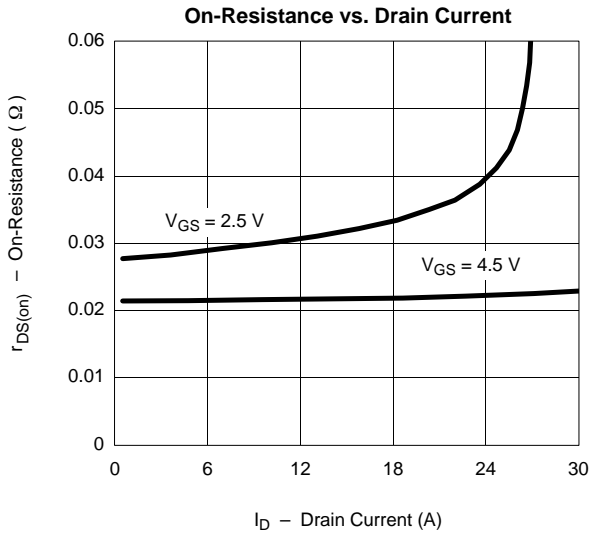
## Notes

- 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)**


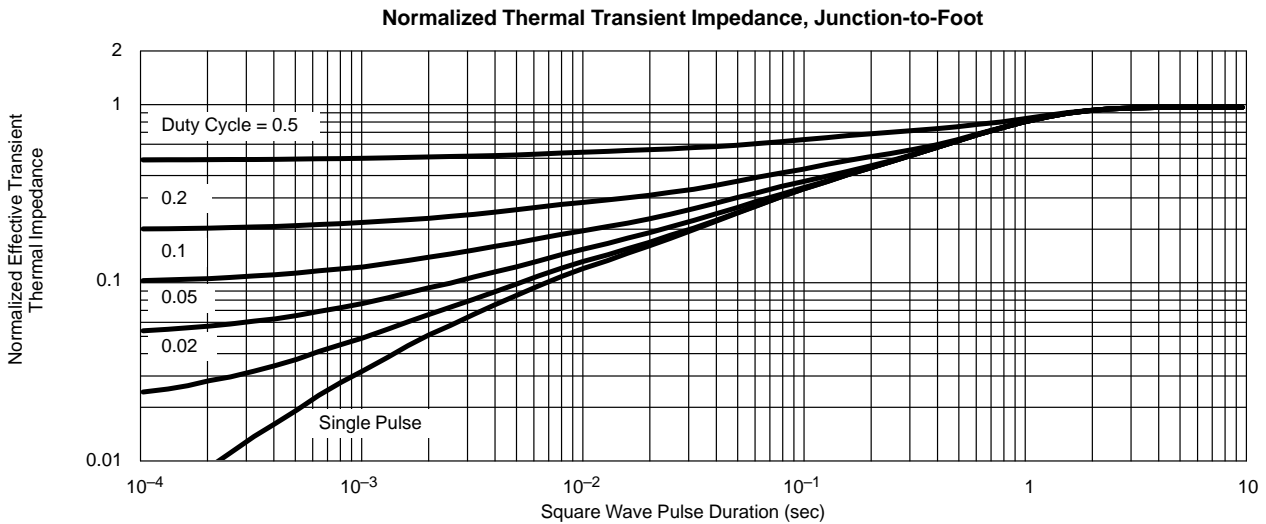
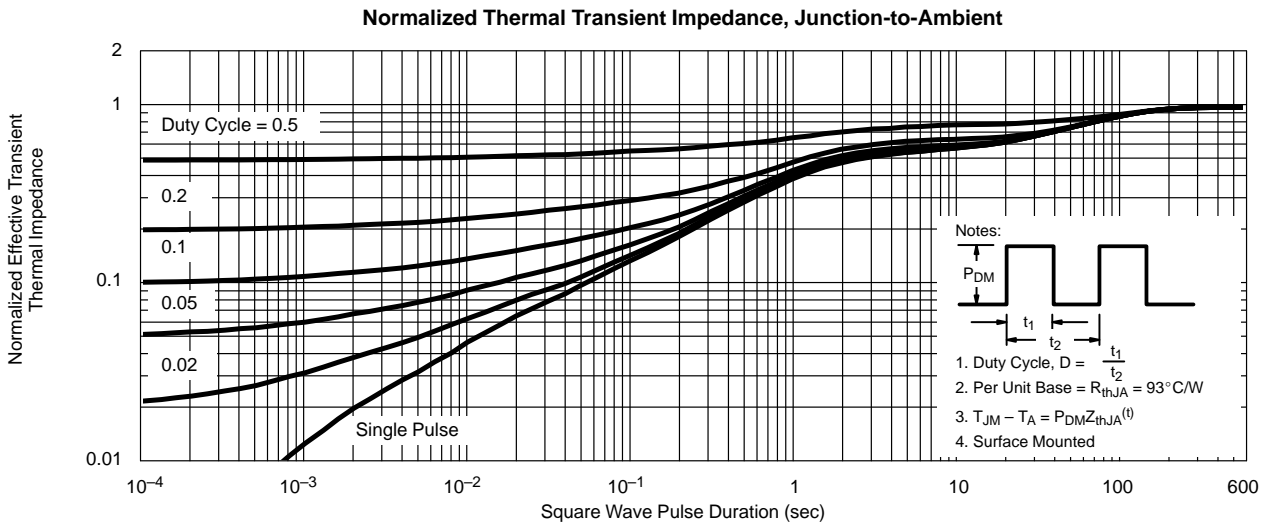
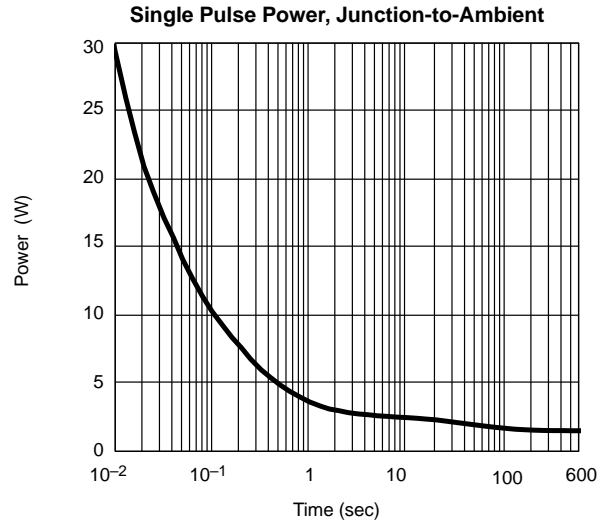
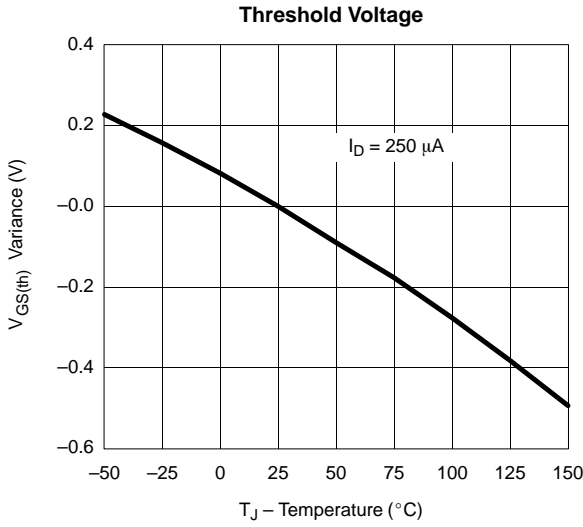


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**





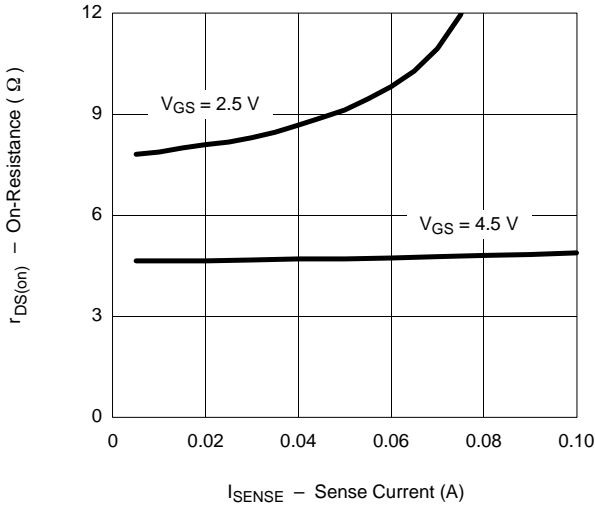
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**



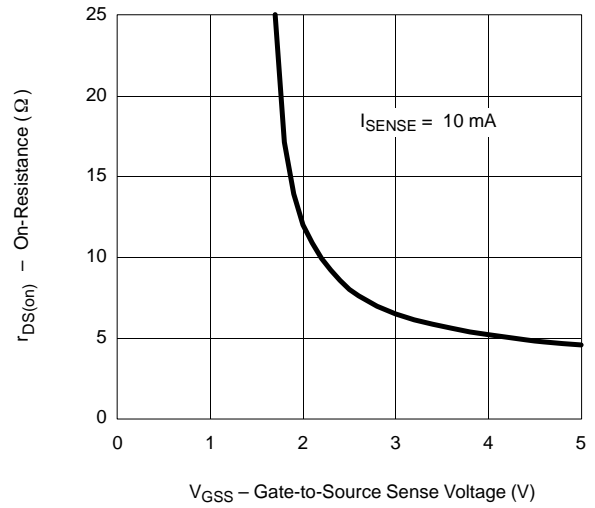


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) SENSE DIE**

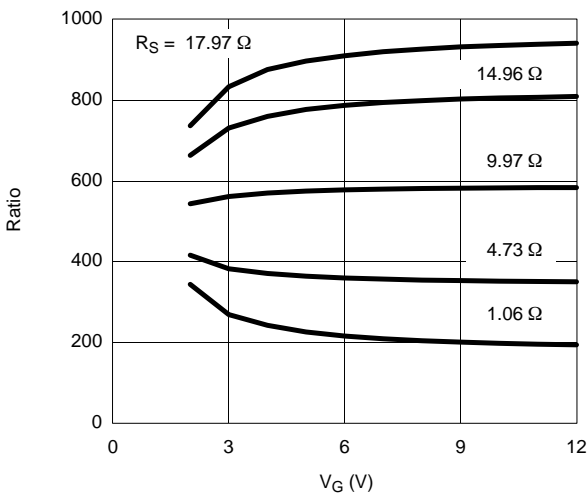
On-Resistance vs. Sense Current



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)

