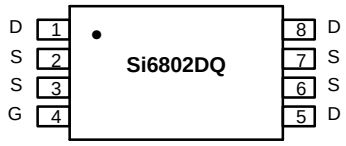
N-Channel, Reduced Q_g, Fast Switching MOSFET

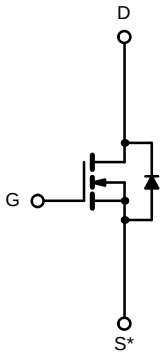
High-Efficiency PWM Optimized

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
20	0.075 @ V_{GS} = 4.5 V	±3.3
	0.110 @ V_{GS} = 3.0 V	±2.7

TSSOP-8



Top View



N-Channel MOSFET

*Source Pins 2, 3, 6, and 7 must be tied common.

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	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	±3.3	A
	T_A = 70°C		±2.6	
Pulsed Drain Current		I_{DM}	±20	
Continuous Source Current (Diode Conduction)[a]		I_S	1.25	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	1.5	W
	T_A = 70°C		1.0	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 150	°C

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Limit	Unit
Maximum Junction-to-Ambient[a]	R_{thJA}	83	°C/W

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

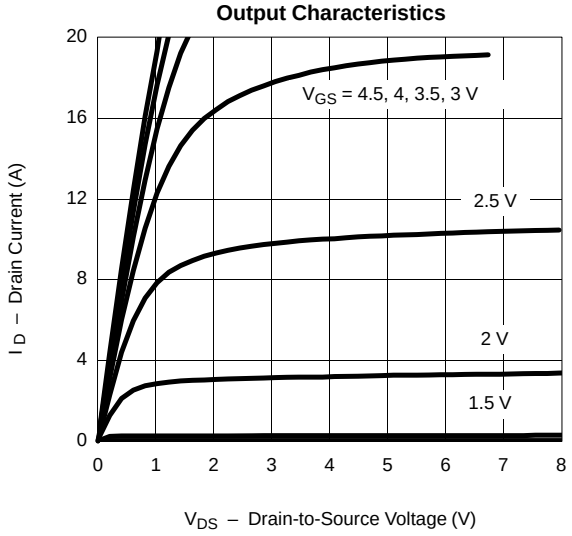
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	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} = 20 V, V_{GS} = 0 V			1	µA
		V_{DS} = 20 V, V_{GS} = 0 V, T_J = 70°C			25	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 4.5 V	15			A
		V_{DS} ≥ 5 V, V_{GS} = 3.0 V	6			
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = 4.5 V, I_D = 3.3 A		0.048	0.075	Ω
		V_{GS} = 3.0 V, I_D = 2.7 A		0.067	0.110	
Forward Transconductance[a]	g_{fs}	V_{DS} = 10 V, I_D = 3.3 A		10.3		S
Diode Forward Voltage[a]	V_{SD}	I_S = 1.25 A, V_{GS} = 0 V		0.7	1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = 6 V, V_{GS} = 4.5 V, I_D = 0.3 A		4.5	9.0	nC
Gate-Source Charge	Q_{gs}			1.0		
Gate-Drain Charge	Q_{gd}			0.7		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 6 V, R_L = 20 Ω I_D ≅ 0.3 A, V_{GEN} = 4.5 V, R_G = 6 Ω		8	20	ns
Rise Time	t_r			6	15	
Turn-Off Delay Time	$t_{d(off)}$			12	25	
Fall Time	t_f			16	30	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 1.25 A, di/dt = 100 A/µs		52	80	

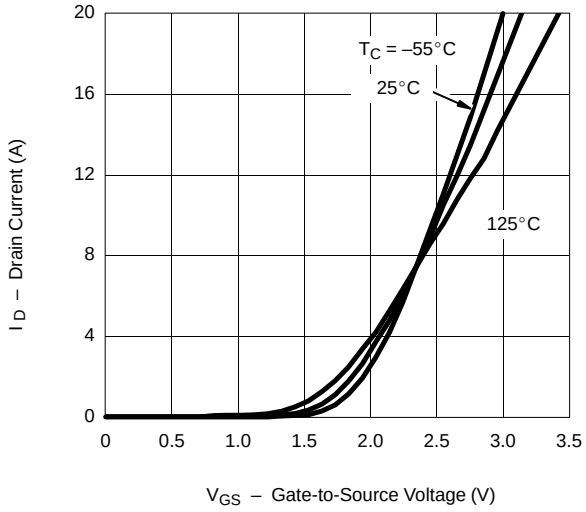
Notes
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

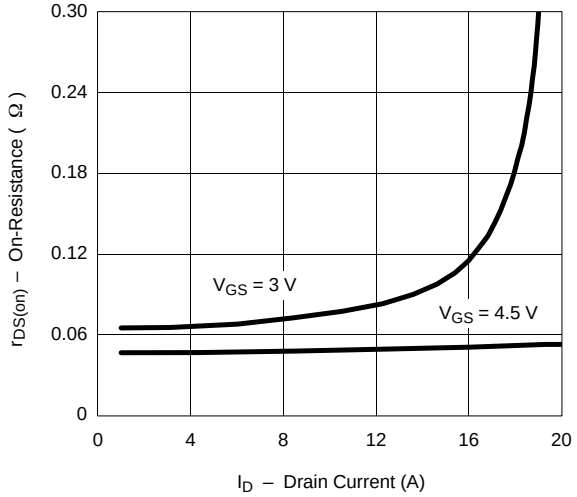
Output Characteristics



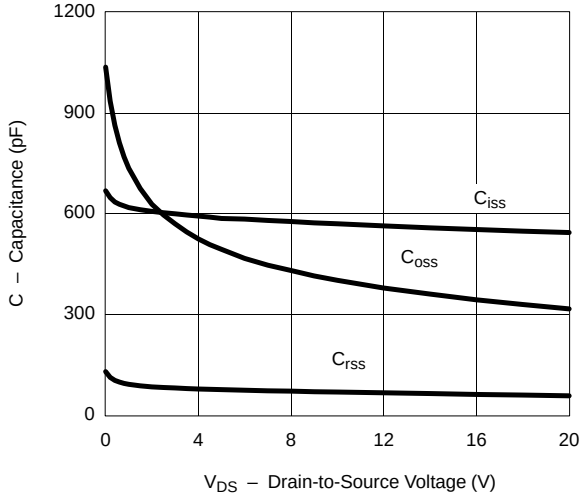
Transfer Characteristics



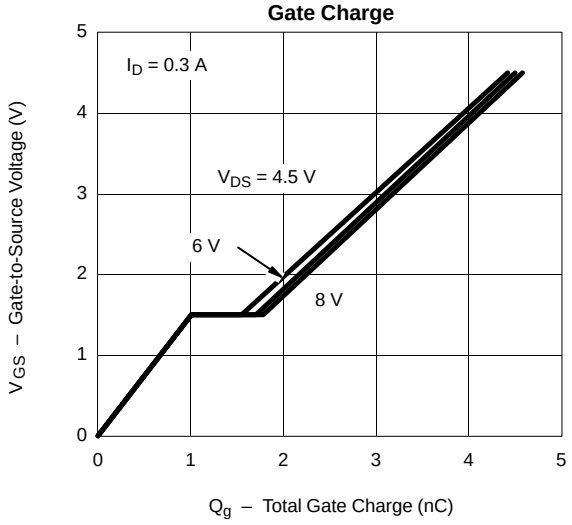
On-Resistance vs. Drain Current



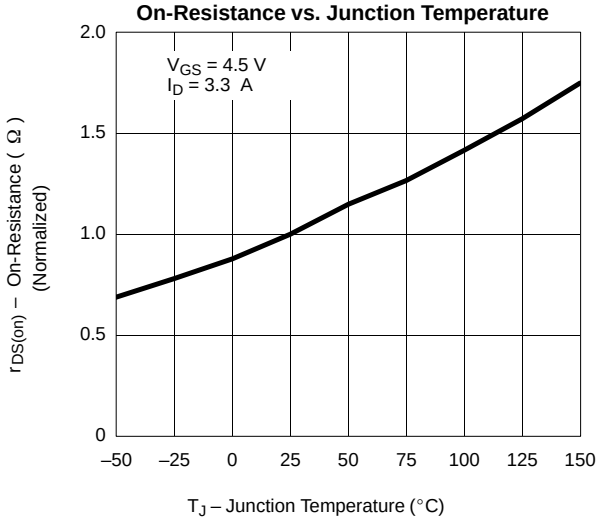
Capacitance



Gate Charge

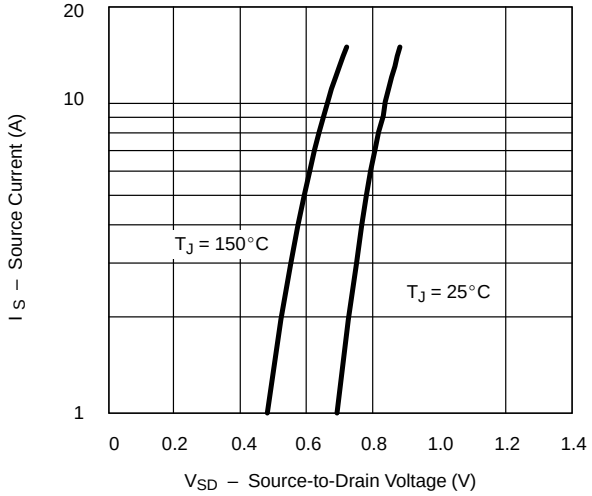


On-Resistance vs. Junction Temperature

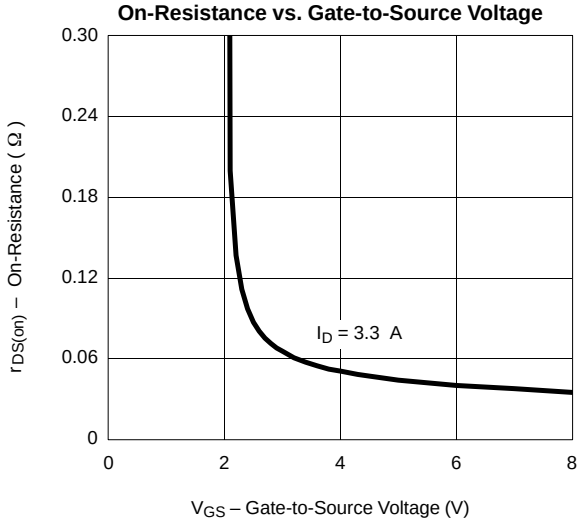


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

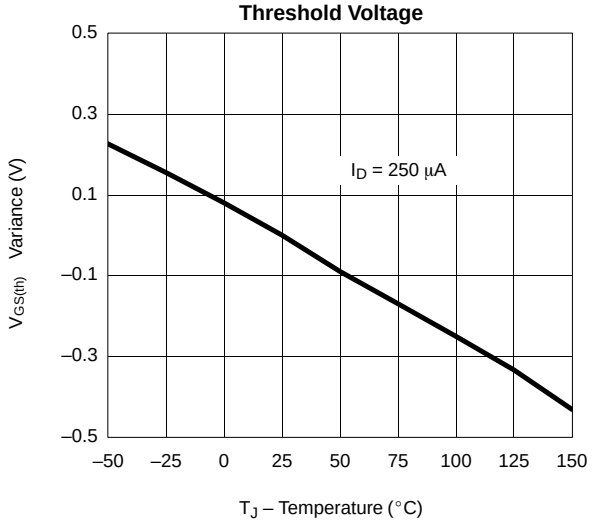
Source-Drain Diode Forward Voltage



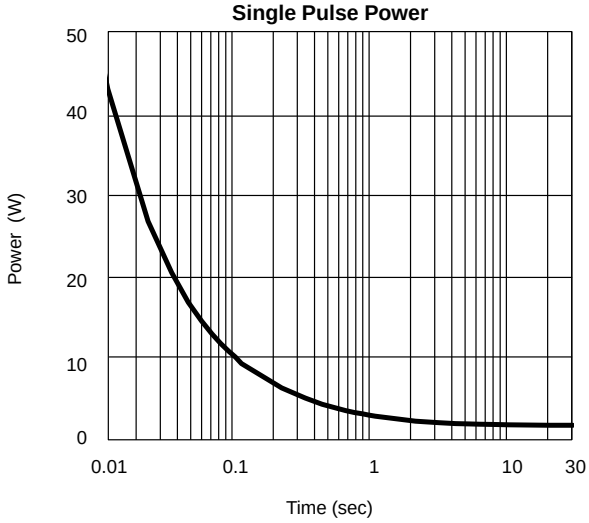
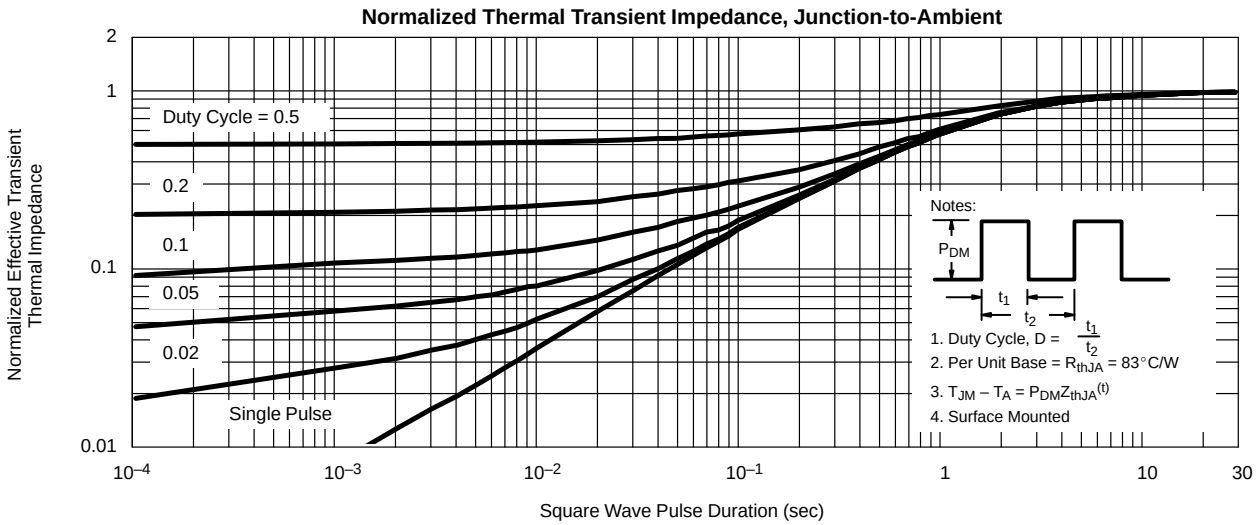
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient