



N-Channel, Reduced Q_g , MOSFET with Schottky Diode

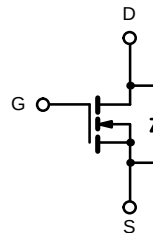
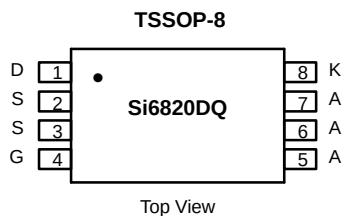
MOSFET PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
20	0.160 @ $V_{GS} = 4.5$ V	± 1.9
	0.260 @ $V_{GS} = 3.0$ V	± 1.5

SCHOTTKY PRODUCT SUMMARY

V_{KA} (V)	V_F (V) Diode Forward Voltage	I_F (A)
20	0.5 V @ 1 A	1.5

LITTLE FOOT Plus™



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage (MOSFET)		V_{DS}	20	V
Reverse Voltage (Schottky)		V_{KA}	20	
Gate-Source Voltage (MOSFET)		V_{GS}	± 12	
Continuous Drain Current ($T_J = 150^\circ\text{C}$) (MOSFET) ^{a, b}	$T_A = 25^\circ\text{C}$	I_D	± 1.9	A
	$T_A = 70^\circ\text{C}$		± 1.5	
Pulsed Drain Current (MOSFET)		I_{DM}	± 8	
Continuous Source Current (MOSFET Diode Conduction) ^{a, b}		I_S	1.0	
Average Forward Current (Schottky)		I_F	1.5	
Pulsed Forward Current (Schottky)		I_{FM}	30	
Maximum Power Dissipation (MOSFET) ^{a, b}	$T_A = 25^\circ\text{C}$	P_D	1.2	W
	$T_A = 70^\circ\text{C}$		0.76	
Maximum Power Dissipation (Schottky) ^{a, b}	$T_A = 25^\circ\text{C}$		1.0	
	$T_A = 70^\circ\text{C}$		0.64	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter	Device	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ($t \leq 10$ sec) ^a	MOSFET	R_{thJA}		105	$^\circ\text{C/W}$
	Schottky			125	
Maximum Junction-to-Ambient ($t = \text{steady state}$) ^a	MOSFET		115		
	Schottky		130		

Notes

- a. Surface Mounted on FR4 Board.
b. $t \leq 10$ sec.

MOSFET SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	0.6			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 12\ \text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20\ \text{V}, V_{GS} = 0\ \text{V}$			1	μA
		$V_{DS} = 20\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 55^\circ\text{C}$			25	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\ \text{V}, V_{GS} = 4.5\ \text{V}$	6			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 4.5\ \text{V}, I_D = 1.9\ \text{A}$		0.085	0.160	Ω
		$V_{GS} = 3.0\ \text{V}, I_D = 1.5\ \text{A}$		0.115	0.260	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\ \text{V}, I_D = 1.9\ \text{A}$		5		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 1.0\ \text{A}, V_{GS} = 0\ \text{V}$		0.77	1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 3.5\ \text{V}, V_{GS} = 4.5\ \text{V}, I_D = 0.3\ \text{A}$		2.1	3.5	nC
Gate-Source Charge	Q_{gs}			0.43		
Gate-Drain Charge	Q_{gd}			0.30		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 3.5\ \text{V}, R_L = 11.5\ \Omega$ $I_D \approx 0.3\ \text{A}, V_{GEN} = 4.5\ \text{V}, R_G = 6\ \Omega$		8	20	ns
Rise Time	t_r			10	20	
Turn-Off Delay Time	$t_{d(off)}$			12	25	
Fall Time	t_f			6	15	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 1.0\ \text{A}, di/dt = 100\ \text{A}/\mu\text{s}$		31	60	

Notes

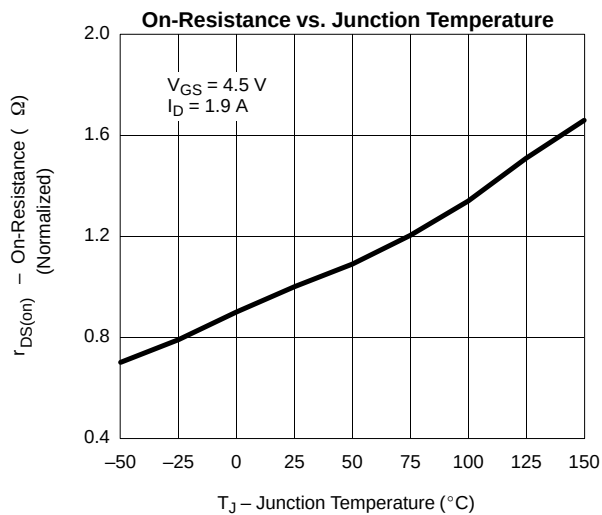
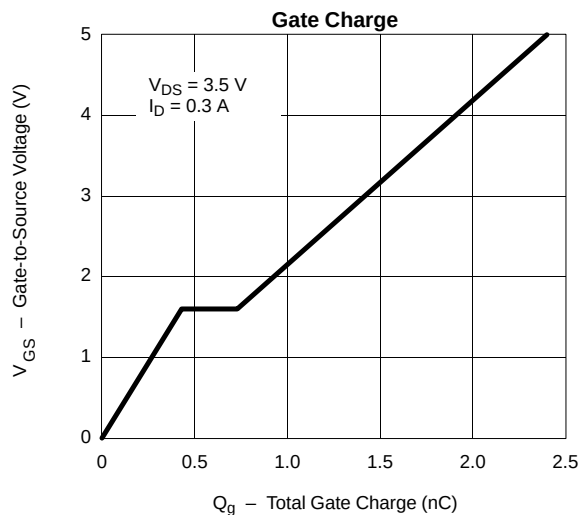
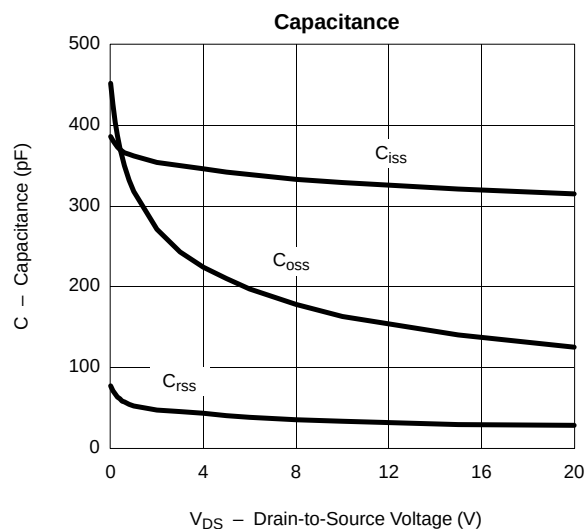
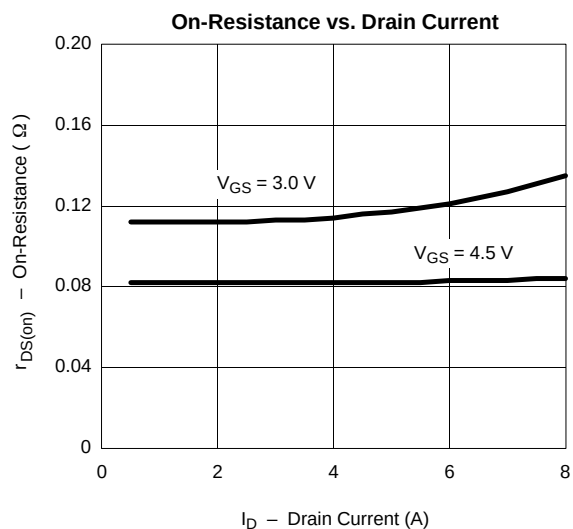
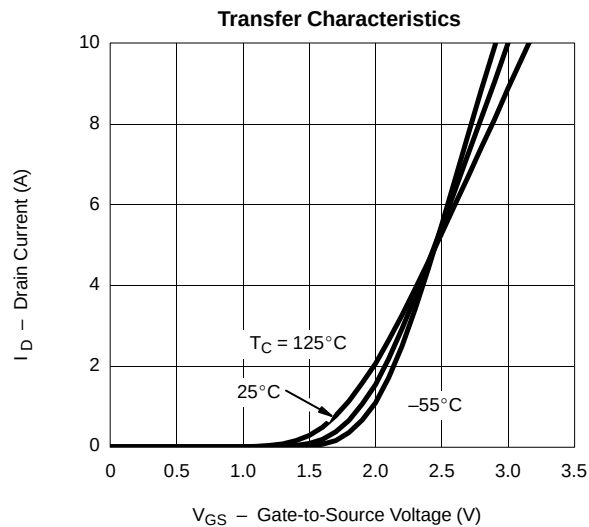
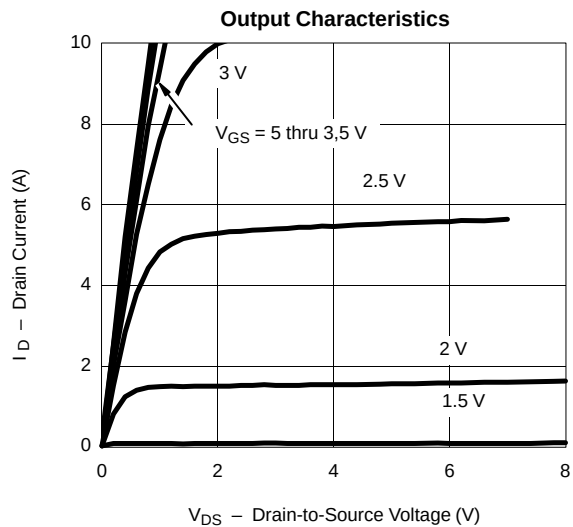
- a. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
b. Guaranteed by design, not subject to production testing.

SCHOTTKY SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Forward Voltage Drop	V_F	$I_F = 1\ \text{A}$		0.45	0.50	V
		$I_F = 1\ \text{A}, T_J = 125^\circ\text{C}$		0.36	0.42	
Maximum Reverse Leakage Current	I_{rm}	$V_r = 20\ \text{V}$		0.003	0.100	mA
		$V_r = 20\ \text{V}, T_J = 75^\circ\text{C}$		0.1	1	
		$V_r = 20\ \text{V}, T_J = 125^\circ\text{C}$		2	10	
Junction Capacitance	C_T	$V_r = 10\ \text{V}$		62		pF



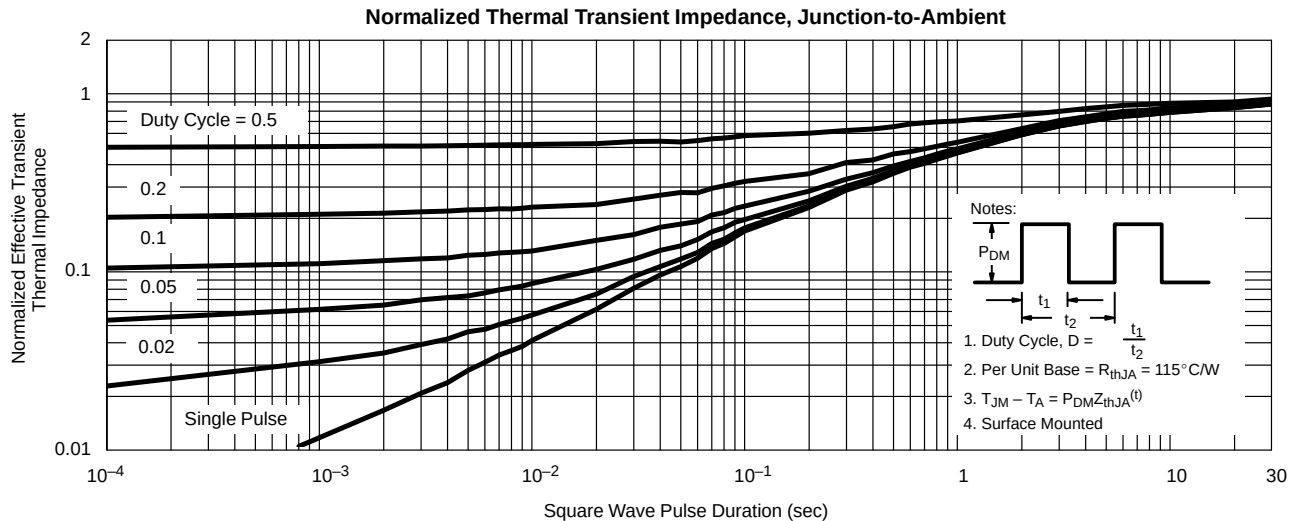
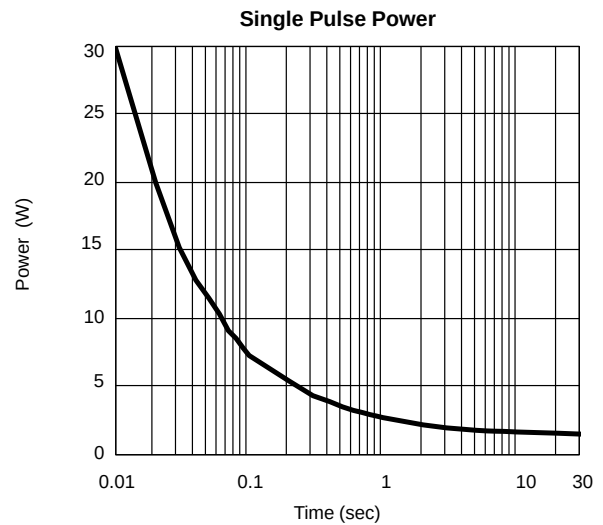
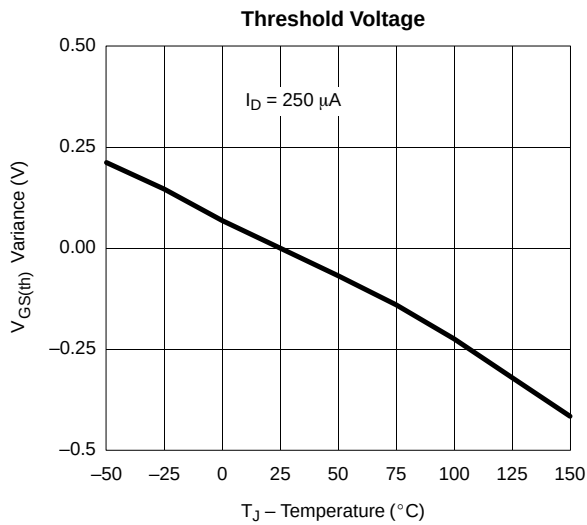
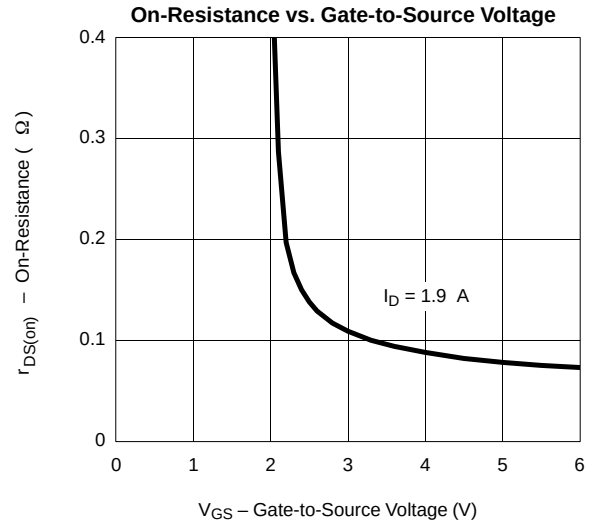
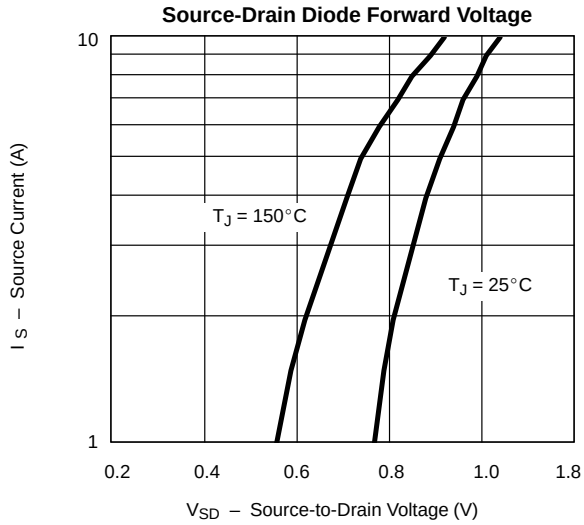
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

MOSFET



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