

N-Channel 150-V (D-S) MOSFET

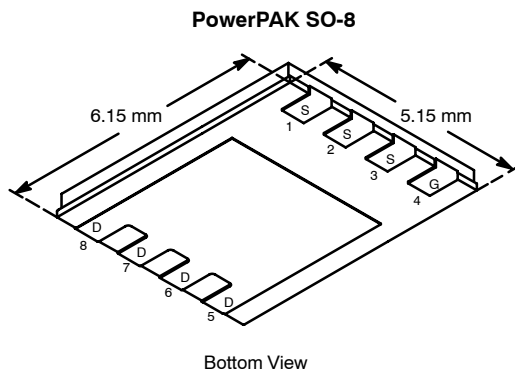
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
150	0.085 @ $V_{GS} = 10$ V	4.8
	0.095 @ $V_{GS} = 6.0$ V	4.5

FEATURES

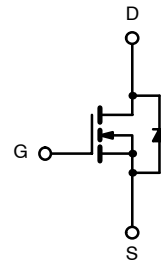
- TrenchFET® Power MOSFET for Fast Switching
- PWM Optimized
- New Low Thermal Resistance PowerPAK® Package with Low 1.07-mm Profile
- 100% R_g Tested

APPLICATIONS

- DC/DC Power Supply Primary Side Switch
- Automotive and Industrial Motor Drives



Ordering Information: Si7898DP-T1



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	10 secs	Steady State	Unit	
Drain-Source Voltage	V_{DS}	150		V	
Gate-Source Voltage	V_{GS}	± 20			
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	I_D	$T_A = 25^\circ\text{C}$	4.8	3.0	A
		$T_A = 70^\circ\text{C}$	3.8	2.4	
Pulsed Drain Current	I_{DM}	25			
Avalanch Current	I_{AS}	10			
Continuous Source Current (Diode Conduction) ^a		I_S	4.1	1.6	
Maximum Power Dissipation ^a	P_D	$T_A = 25^\circ\text{C}$	5.0	1.9	W
		$T_A = 70^\circ\text{C}$	3.2	1.2	
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 ^a	R_{thJA}	$t \leq 10$ sec	20	25	$^\circ\text{C/W}$
		Steady State	52	65	
Maximum Junction-to-Case (Drain)	R_{thJC}	2.1	2.6		

Notes

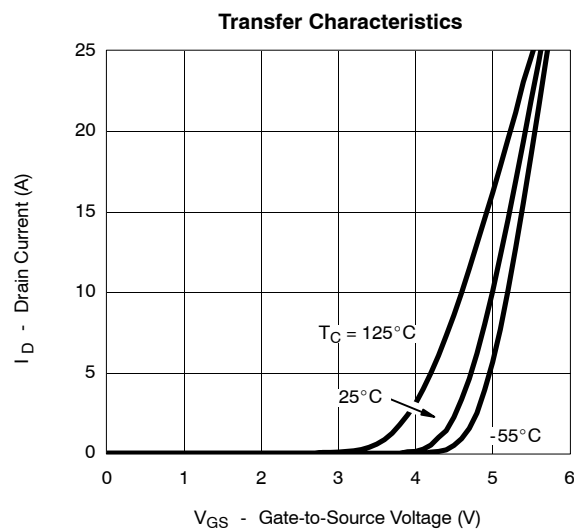
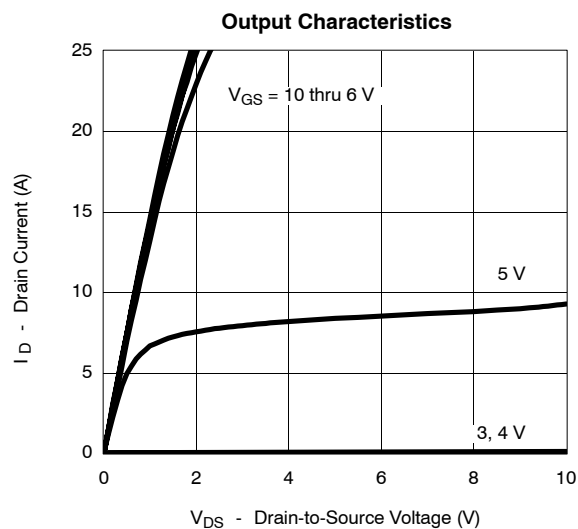
a. Surface Mounted on 1" x 1" FR4 Board.

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	2.0		4.0	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} = 120 V, V _{GS} = 0 V			1	μA
		V _{DS} = 120 V, V _{GS} = 0 V, T _J = 55°C			5	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 10 V	25			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 3.5 A		0.068	0.085	Ω
		V _{GS} = 6.0 V, I _D = 3.0 A		0.076	0.095	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 5 A		15		S
Diode Forward Voltage ^a	V _{SD}	I _S = 2.5 A, V _{GS} = 0 V		0.75	1.2	V
Dynamic^b						
Total Gate Charge	Q _g	V _{DS} = 75 V, V _{GS} = 10 V, I _D = 3.5 A		17	21	nC
Gate-Source Charge	Q _{gs}			3.2		
Gate-Drain Charge	Q _{gd}			6.0		
Gate Resistance	R _g		0.5	0.85	2.5	Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = 75 V, R _L = 21 Ω I _D ≅ 3.5 A, V _{GEN} = 10 V, R _G = 6 Ω		9.0	14	ns
Rise Time	t _r			10	15	
Turn-Off Delay Time	t _{d(off)}			24	35	
Fall Time	t _f			17	25	
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 2.5 A, di/dt = 100 A/μs		45	70	

Notes

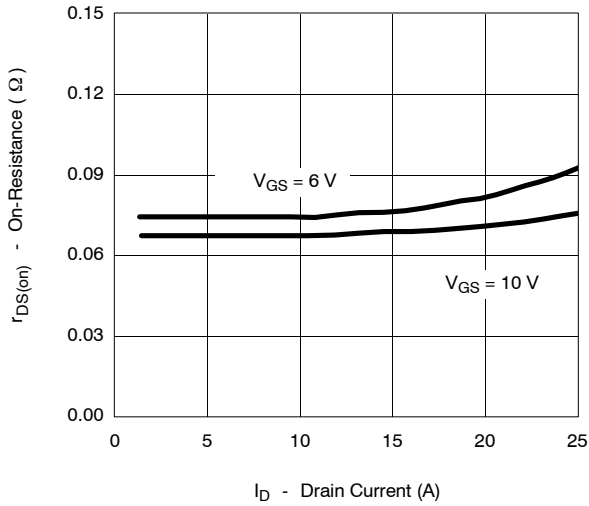
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

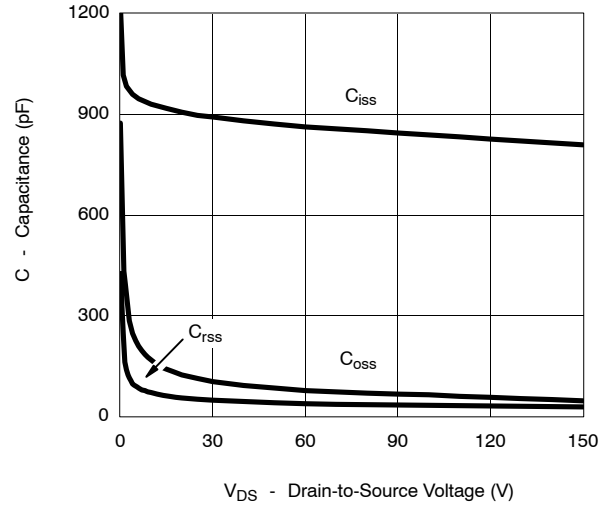


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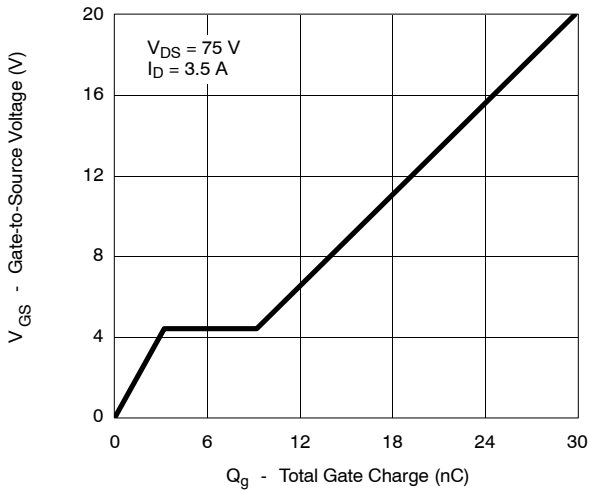
On-Resistance vs. Drain Current



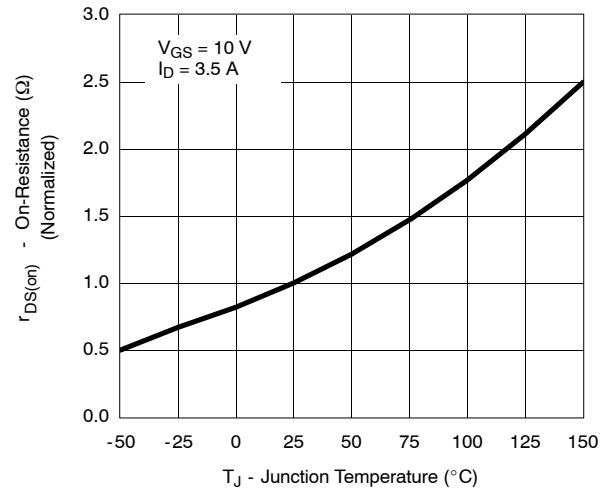
Capacitance



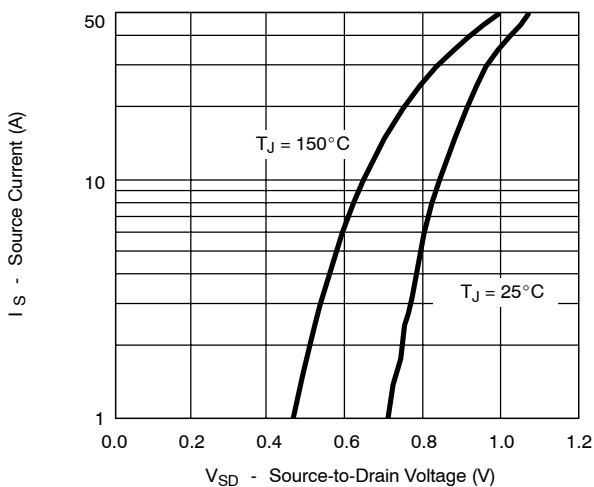
Gate Charge



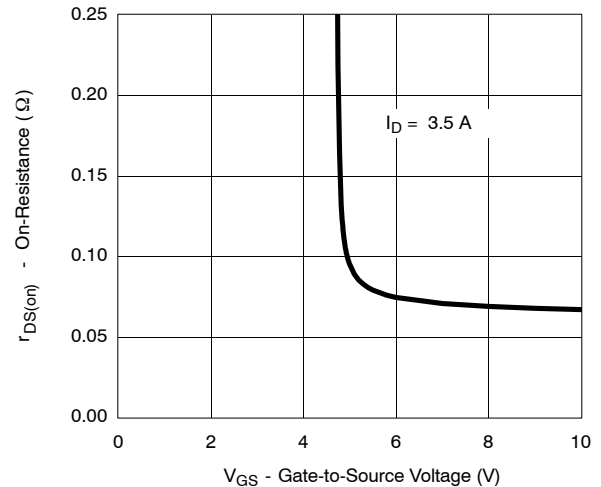
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

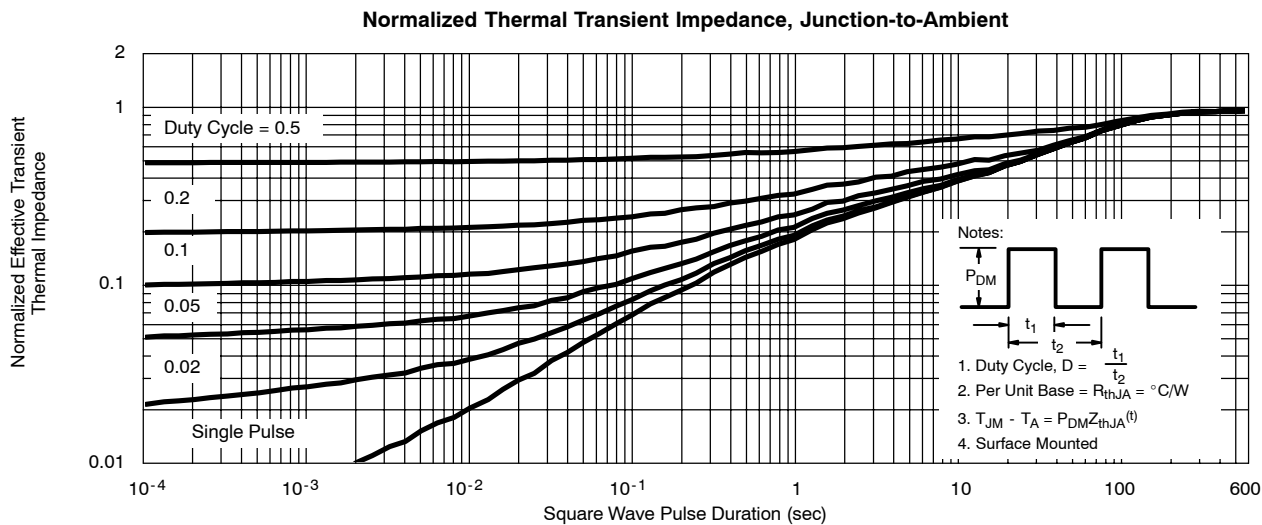
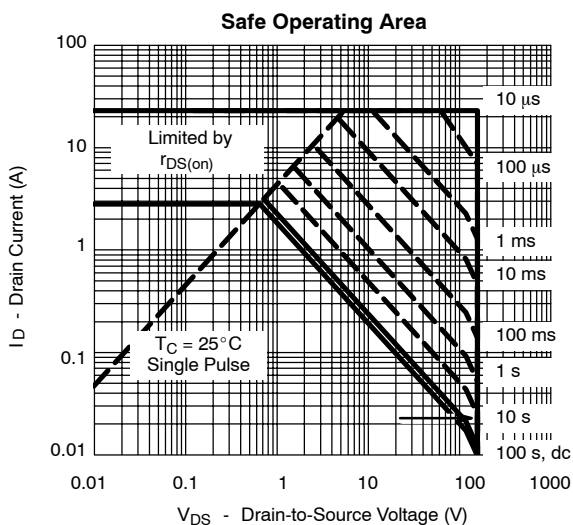
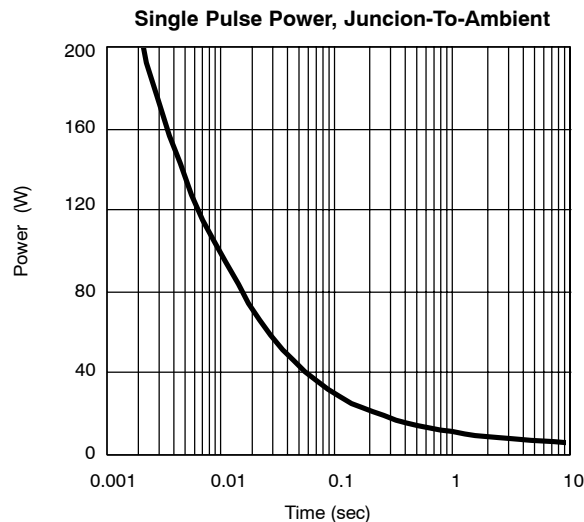
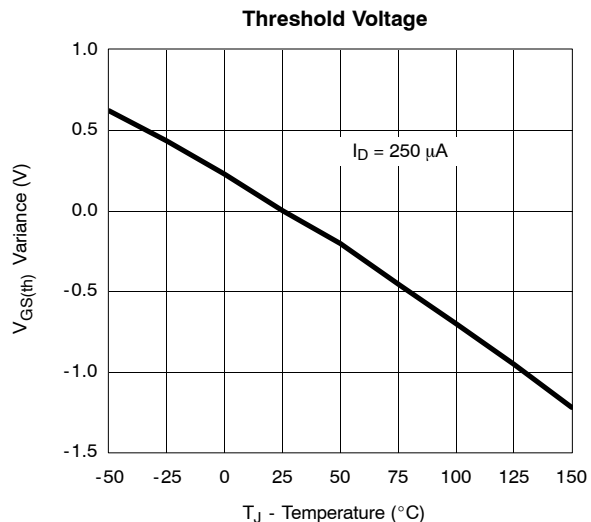


On-Resistance vs. Gate-to-Source Voltage





TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)





TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

