

N-Channel 40-V (D-S) MOSFET

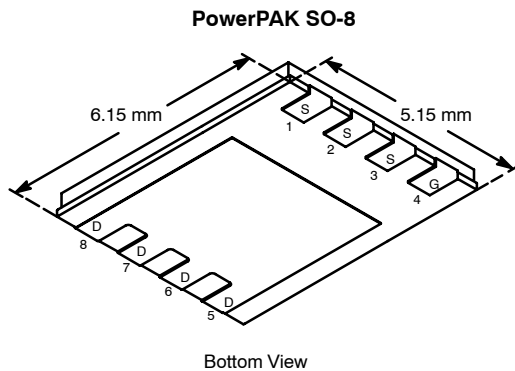
PRODUCT SUMMARY		
V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A)
40	0.007 @ V _{GS} = 10 V	20
	0.0095 @ V _{GS} = 4.5 V	17

FEATURES

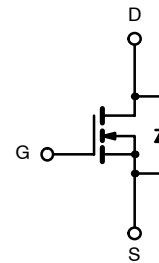
- TrenchFET® Power MOSFET
- New Low Thermal Resistance PowerPAK® Package with Low 1.07-mm Profile
- PWM Optimized for Fast Switching
- 100% R_g Tested

APPLICATIONS

- Synchronous Rectifier



Ordering Information: Si7884DP-T1



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C UNLESS OTHERWISE NOTED)					
Parameter		Symbol	10 secs	Steady State	Unit
Drain-Source Voltage		V _{DS}	40		V
Gate-Source Voltage		V _{GS}	± 20		
Continuous Drain Current (T _J = 150 °C) ^a	T _A = 25 °C	I _D	20	12	A
	T _A = 70 °C		16	10	
Pulsed Drain Current		I _{DM}	50		
Avalanche Current		I _{AS}	30		
L = 0.1 mH					
Continuous Source Current (Diode Conduction) ^a		I _S	4.7	1.7	
Maximum Power Dissipation ^a	T _A = 25 °C	P _D	5.2	1.9	W
	T _A = 70 °C		3.3	1.2	
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}	19	24	°C/W
	Steady State		52	65	
Maximum Junction-to-Case (Drain)		R _{thJC}	1.2	1.8	

Notes

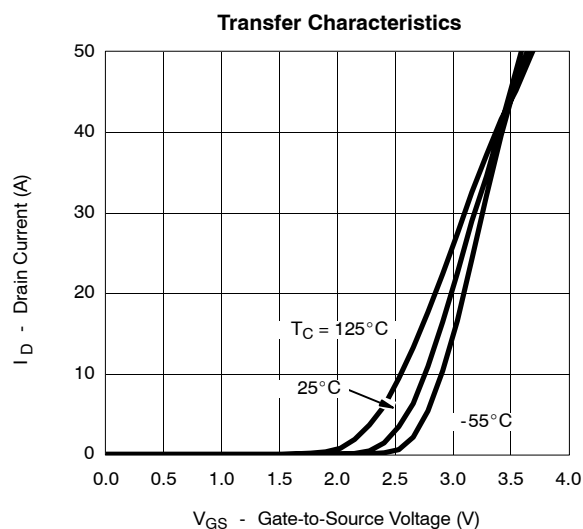
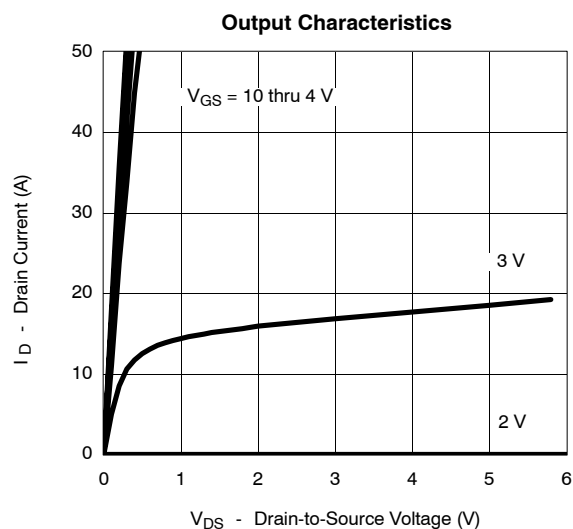
a. Surface Mounted on 1" x 1" FR4 Board.

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	1.0		3.0	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} = 32 V, V _{GS} = 0 V			1	μA
		V _{DS} = 32 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	50			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 14 A		0.0055	0.007	Ω
		V _{GS} = 4.5 V, I _D = 12 A		0.0075	0.0095	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 14 A		50		S
Diode Forward Voltage ^a	V _{SD}	I _S = 2.8 A, V _{GS} = 0 V		0.75	1.1	V
Dynamic^b						
Total Gate Charge	Q _g	V _{DS} = 20 V, V _{GS} = 5 V, I _D = 14 A		18.5	28	nC
Gate-Source Charge	Q _{gs}		6			
Gate-Drain Charge	Q _{gd}		7.5			
Gate Resistance	R _g		0.2	0.8	1	Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = 20 V, R _L = 20 Ω I _D ≅ 1 A, V _{GEN} = 10 V, R _G = 6 Ω		15	30	ns
Rise Time	t _r		10	20		
Turn-Off Delay Time	t _{d(off)}		50	100		
Fall Time	t _f		20	40		
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 2.8 A, di/dt = 100 A/μs		30	60	

Notes

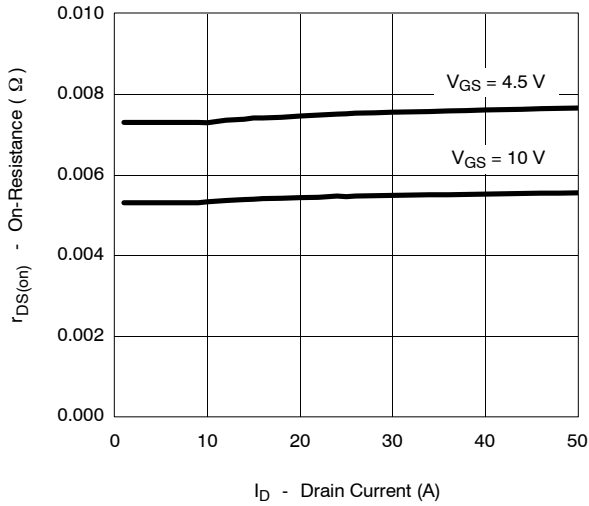
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

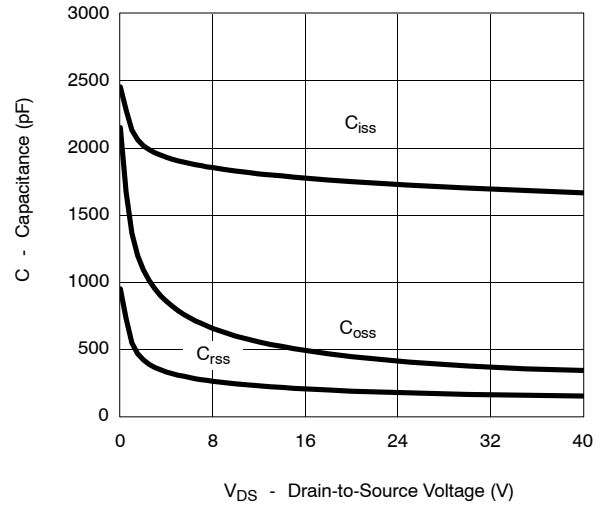


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

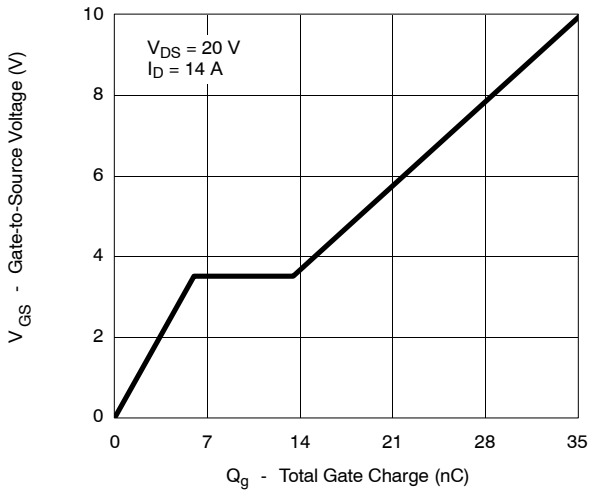
On-Resistance vs. Drain Current



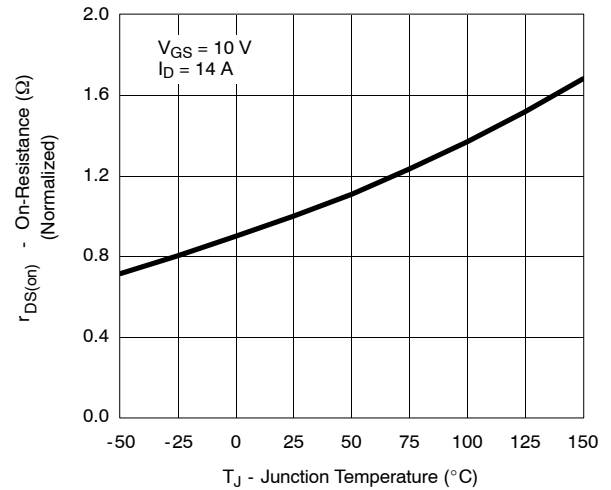
Capacitance



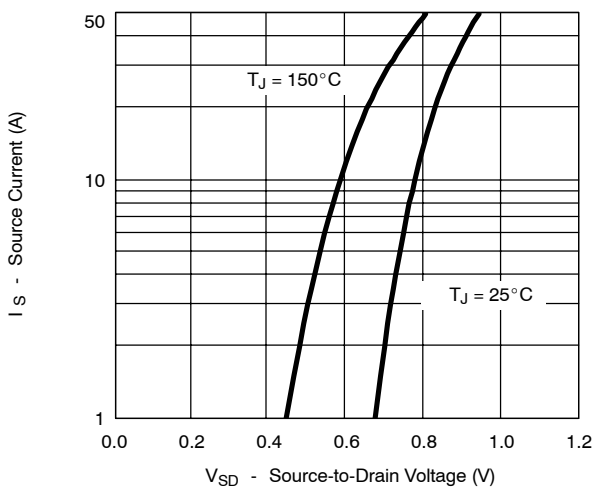
Gate Charge



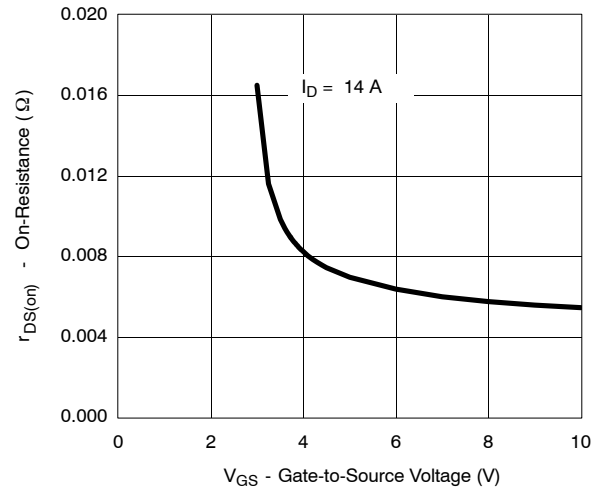
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

