



## P-Channel 20-V (D-S) MOSFET

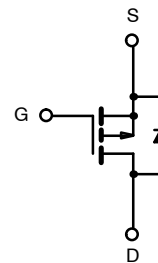
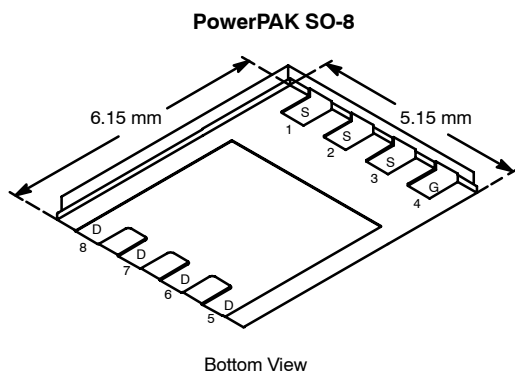
PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-20	0.0073 @ $V_{GS} = -4.5$ V	-20
	0.0090 @ $V_{GS} = -2.5$ V	-18
	0.013 @ $V_{GS} = -1.8$ V	-15

### FEATURES

- TrenchFET® Power MOSFET
- New Low Thermal Resistance PowerPAK® Package with Low 1.07-mm Profile

### APPLICATIONS

- Battery Switch for Portable Devices



P-Channel MOSFET

Ordering Information: Si7485DP-T1

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	$V_{GS}$	$\pm 8$			
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	-20	-12.5	A
		$T_A = 70^\circ\text{C}$	-16.5	-9.5	
Pulsed Drain Current	$I_{DM}$	-50			
continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	-4.5	-1.6		
Maximum Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	5	1.8	W
		$T_A = 70^\circ\text{C}$	3.2	1.1	
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	20	25	$^\circ\text{C/W}$
		Steady State	54	68	
Maximum Junction-to-Case (Drain)	$R_{thJC}$	1.7	2.2		

Notes

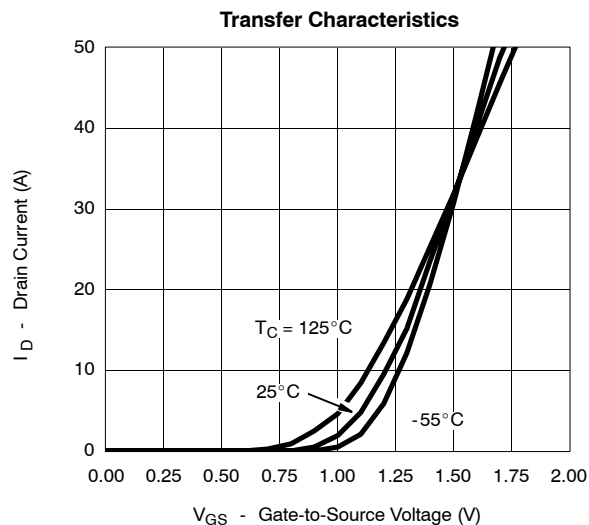
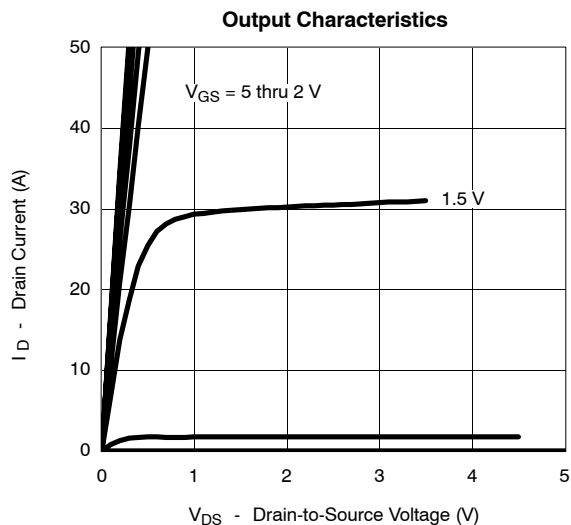
a. Surface Mounted on 1" x 1" FR4 Board.

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> = -1 mA	-0.4		-0.9	V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±8 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			-10	
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	-40			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> = -20 A		0.006	0.0073	Ω
		V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -18 A		0.0074	0.0090	
		V <sub>GS</sub> = -1.8 V, I <sub>D</sub> = -15 A		0.0106	0.013	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -15 V, I <sub>D</sub> = -20 A		80		S
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = -4.5 A, V <sub>GS</sub> = 0 V		-0.62	-1.1	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -10 V, V <sub>GS</sub> = -5 V, I <sub>D</sub> = -20 A		99	150	nC
Gate-Source Charge	Q <sub>gs</sub>			11.5		
Gate-Drain Charge	Q <sub>gd</sub>			29		
Gate-Resistance	R <sub>G</sub>			2.4		Ω
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		80	120	ns
Rise Time	t <sub>r</sub>			140	210	
Turn-Off Delay Time	t <sub>d(off)</sub>			360	540	
Fall Time	t <sub>f</sub>			170	260	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>		I <sub>F</sub> = -2.9 A, di/dt = 100 A/μs		55	

Notes

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

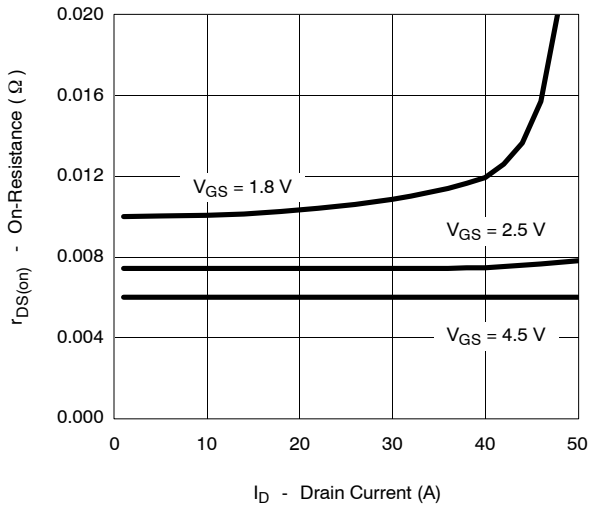
**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**



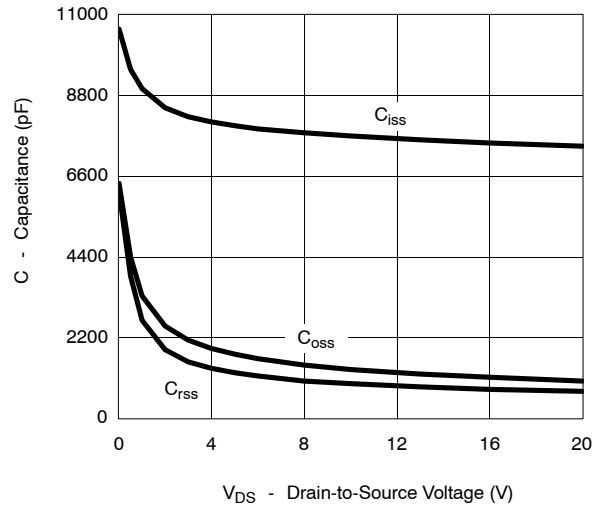


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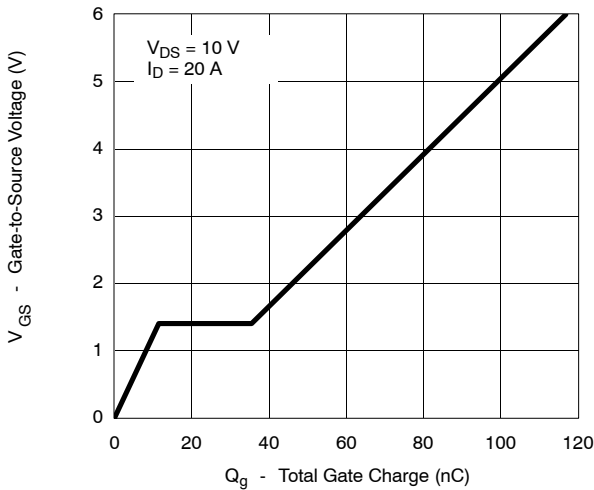
On-Resistance vs. Drain Current



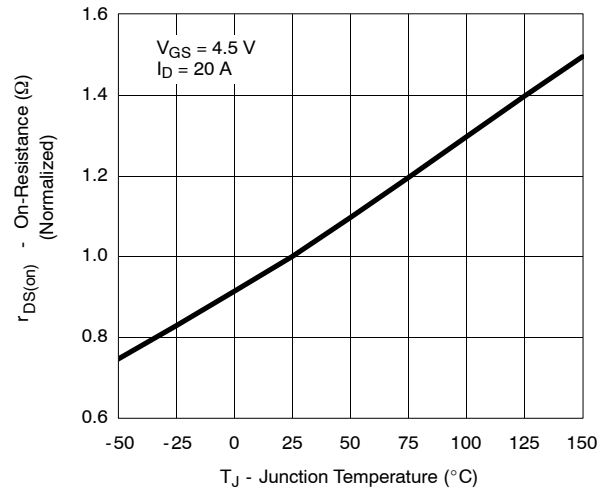
Capacitance



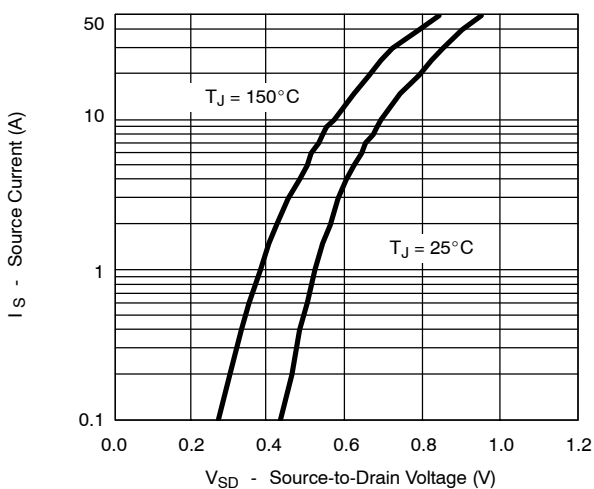
Gate Charge



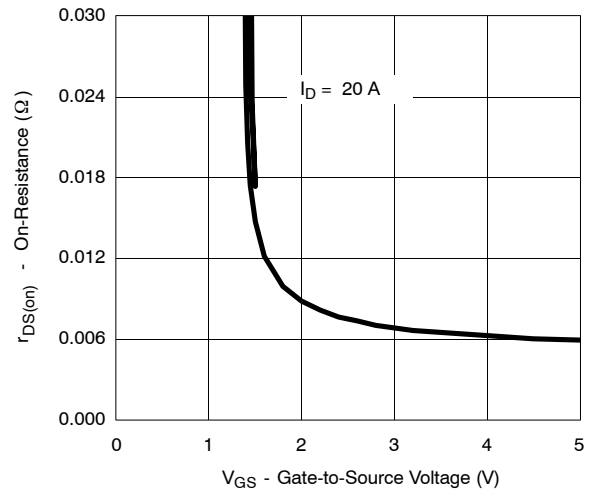
On-Resistance vs. Junction Temperature



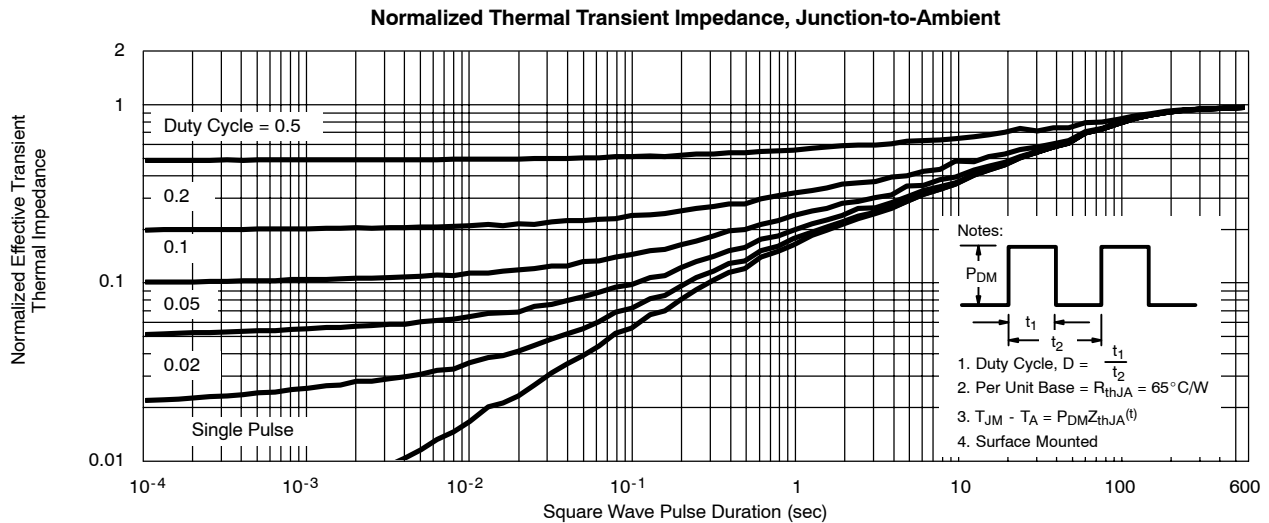
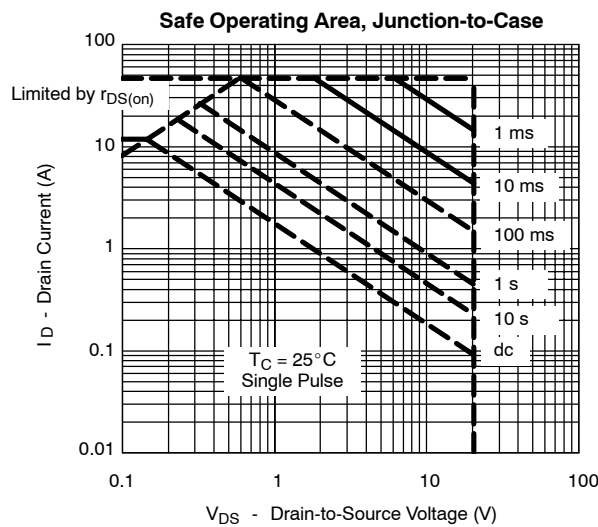
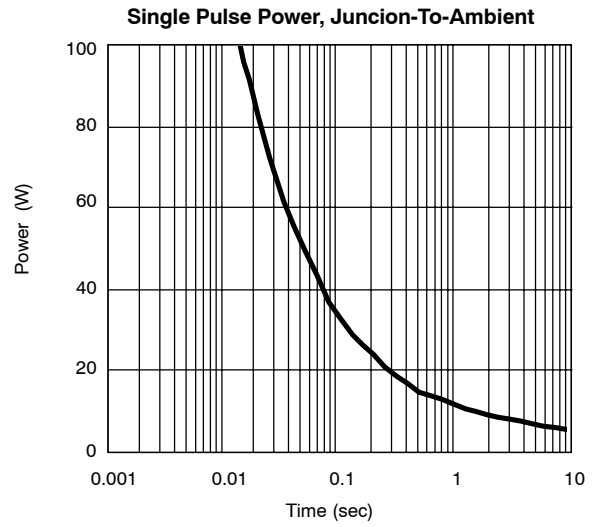
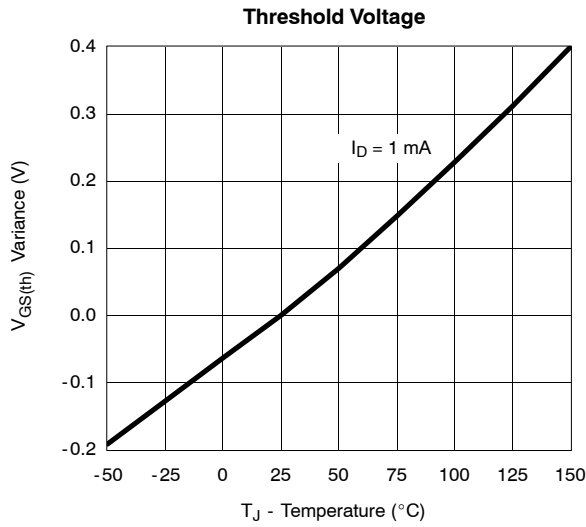
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



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