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

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-20	0.0077 @ V_{GS} = -4.5 V	-19
	0.0094 @ V_{GS} = -2.5 V	-17
	0.0125 @ V_{GS} = -1.8 V	-15

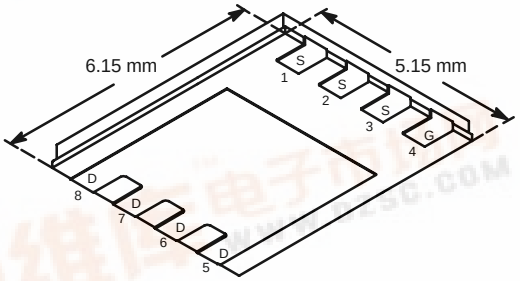
FEATURES

- TrenchFET® Power MOSFET
- New Low Thermal Resistance PowerPAK® Package with Low 1.07-mm Profile
- 100% R_g Tested

APPLICATIONS

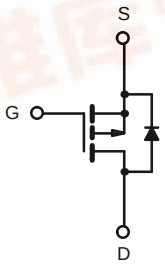
- Load Switch Battery Applications

PowerPAK SO-8



Bottom View

Ordering Information: Si7445DP-T1



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)					
Parameter		Symbol	10 secs	Steady State	Unit
Drain-Source Voltage		V_{DS}	-20		V
Gate-Source Voltage		V_{GS}	±8		
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	-19	-12	A
	T_A = 70°C		-15	-9	
Pulsed Drain Current		I_{DM}	-50		
continuous Source Current (Diode Conduction)[a]		I_S	-4.3	-1.6	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	5.4	1.9	W
	T_A = 70°C		3.4	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}	18	23	°C/W
	Steady State		52	65	
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	1.0	1.3	

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

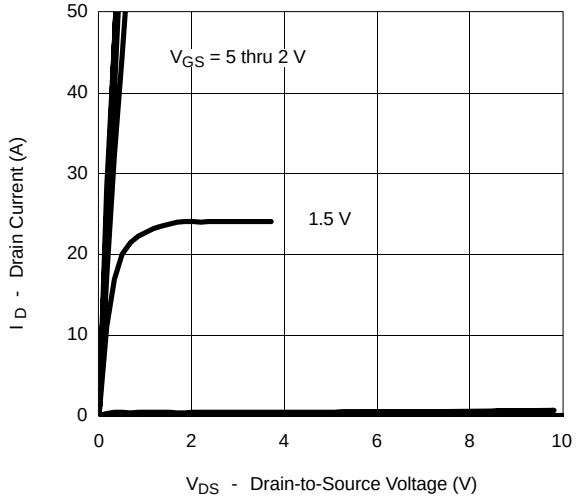
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250 μA	-0.45			V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -16 V, V_{GS} = 0 V			-1	μA
		V_{DS} = -16 V, V_{GS} = 0 V, T_J = 70°C			-10	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≤ -5 V, V_{GS} = -4.5 V	-40			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = -4.5 V, I_D = -19 A		0.0064	0.0077	Ω
		V_{GS} = -2.5 V, I_D = -17 A		0.0078	0.0094	
		V_{GS} = -1.8 V, I_D = -10 A		0.0105	0.0125	
Forward Transconductance[a]	g_{fs}	V_{DS} = -15 V, I_D = -19 A		75		S
Diode Forward Voltage[a]	V_{SD}	I_S = -4.3 A, V_{GS} = 0 V		-0.65	-1.1	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = -15 V, V_{GS} = -5 V, I_D = -19 A		92	140	nC
Gate-Source Charge	Q_{gs}			19		
Gate-Drain Charge	Q_{gd}			16.5		
Gate-Resistance	R_g		1	2	3.4	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = -15 V, R_L = 15 Ω I_D ≅ -1 A, V_{GEN} = -4.5 V, R_G = 6 Ω		40	60	ns
Rise Time	t_r			45	65	
Turn-Off Delay Time	$t_{d(off)}$			400	600	
Fall Time	t_f			190	290	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = -4.3 A, di/dt = 100 A/μs		50	80	

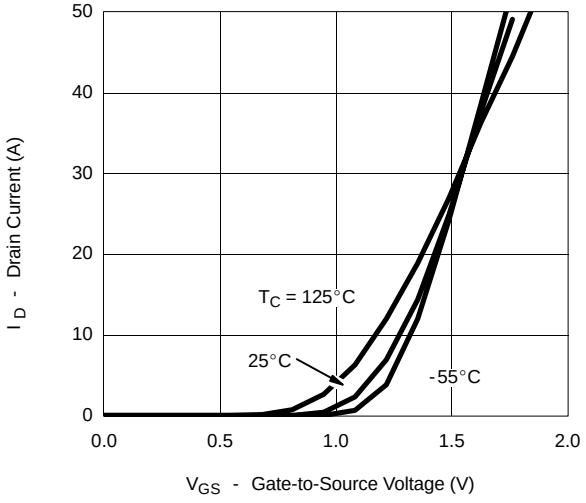
Notes
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Output Characteristics

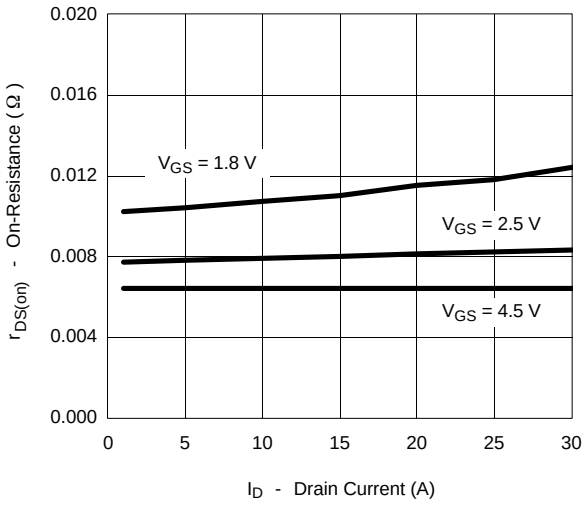


Transfer Characteristics

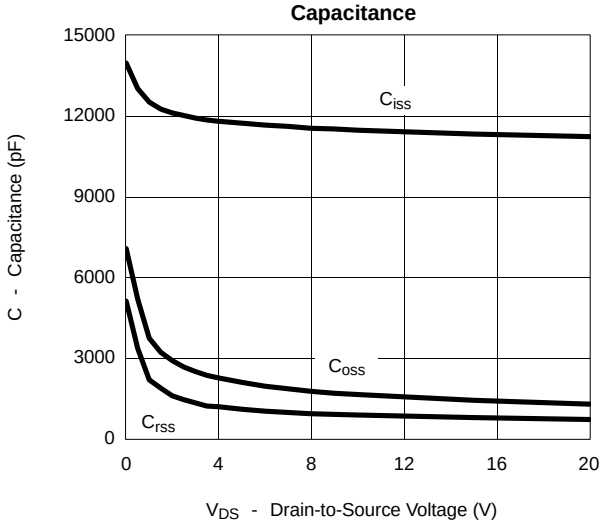


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

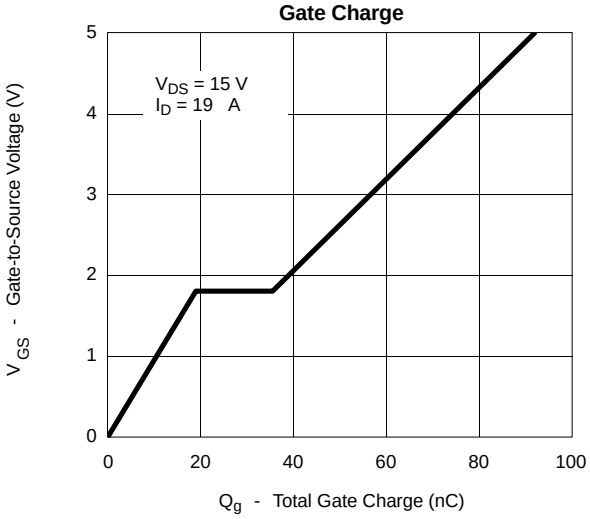
On-Resistance vs. Drain Current



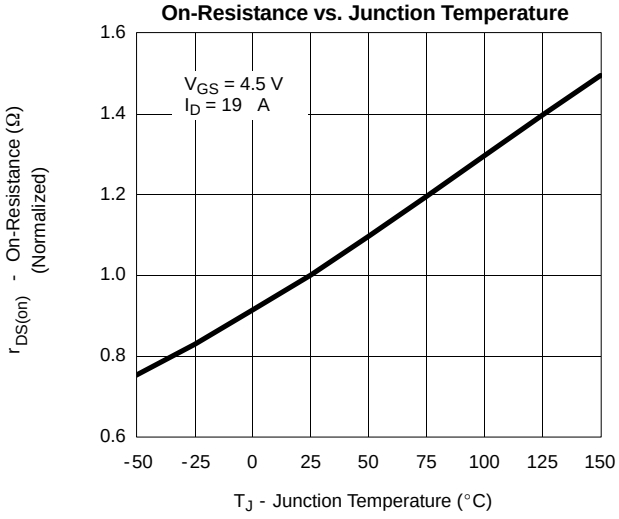
Capacitance



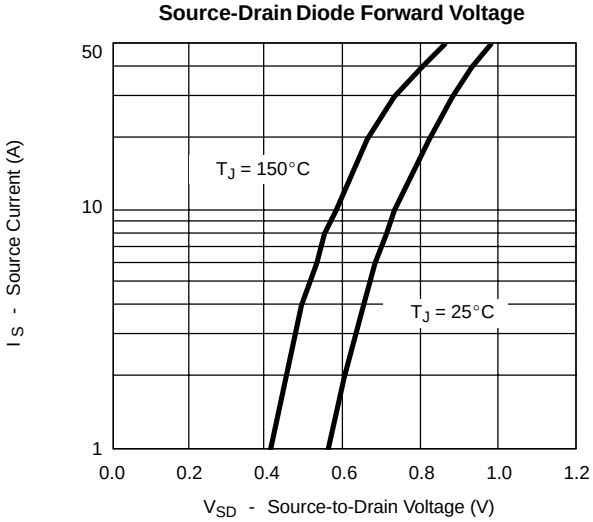
Gate Charge



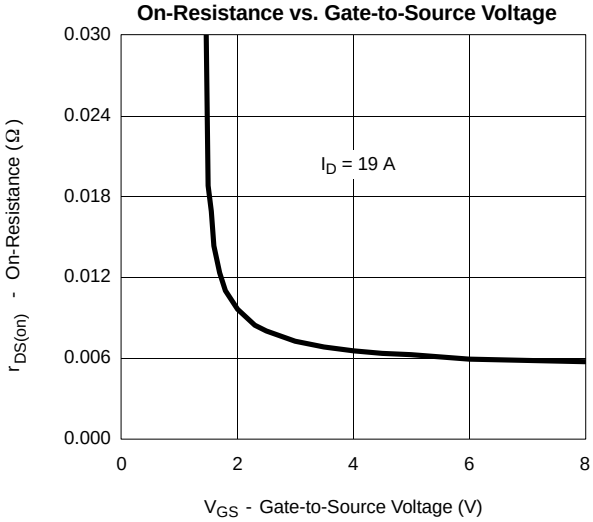
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

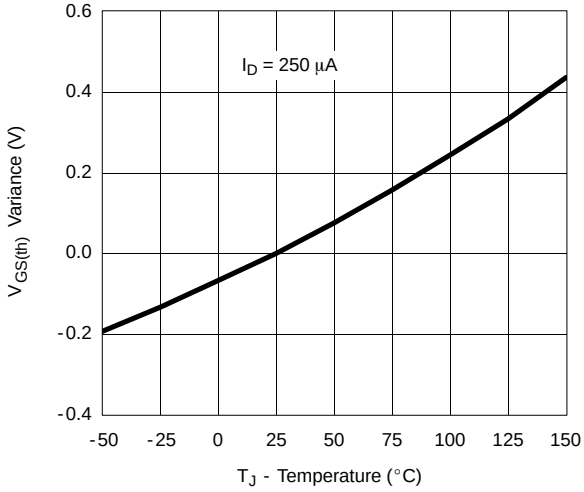


On-Resistance vs. Gate-to-Source Voltage

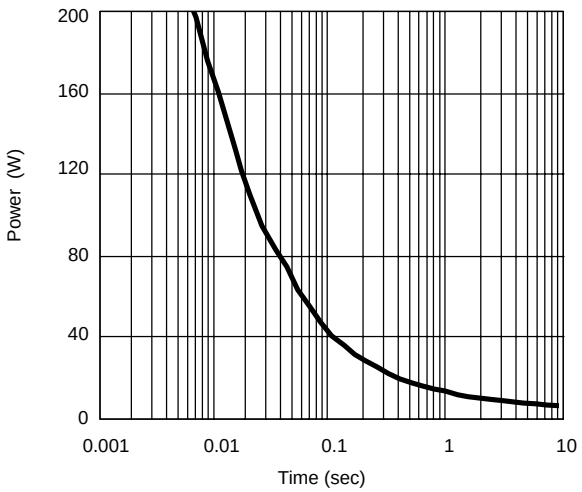


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

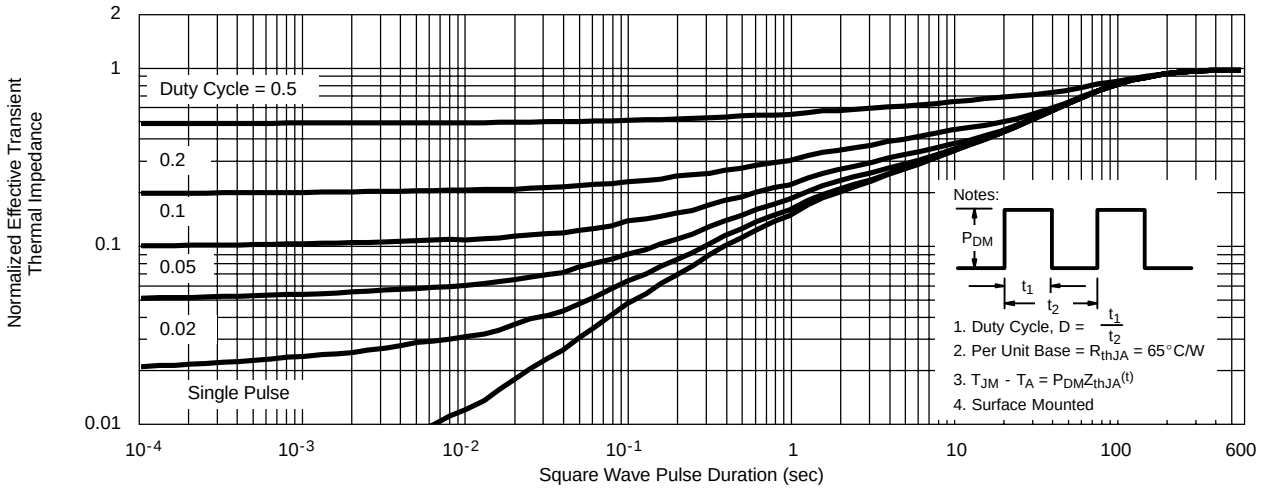
Threshold Voltage



Single Pulse Power, Juncion-To-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case