

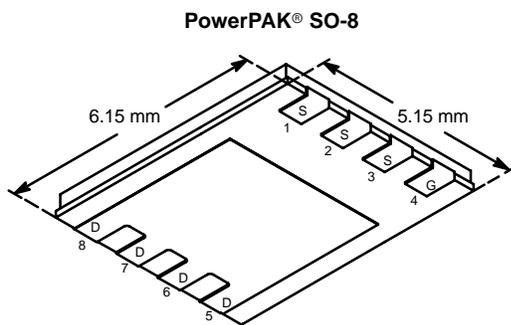


N-Channel 30-V (D-S) Fast Switching MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.0075 @ $V_{GS} = 10$ V	19
	0.010 @ $V_{GS} = 4.5$ V	17

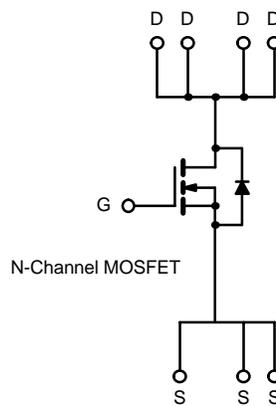
FEATURES

- TrenchFET® Power MOSFET
- High-Efficiency PWM Optimized
- 100% R_g Tested



Bottom View

Ordering Information: Si7446DP-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}	30		V
Gate-Source Voltage		V_{GS}	± 20		
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	$T_A = 25^\circ\text{C}$	I_D	19	12	A
	$T_A = 70^\circ\text{C}$		15	9	
Pulsed Drain Current		I_{DM}	50		
Continuous Source Current (Diode Conduction) ^a		I_S	4.3	1.6	
Maximum Power Dissipation ^a	$T_A = 25^\circ\text{C}$	P_D	5.2	1.9	W
	$T_A = 70^\circ\text{C}$		3.3	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	$t \leq 10$ sec	R_{thJA}	19	24	$^\circ\text{C/W}$
	Steady State		52	65	
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	1.5	1.8	

Notes

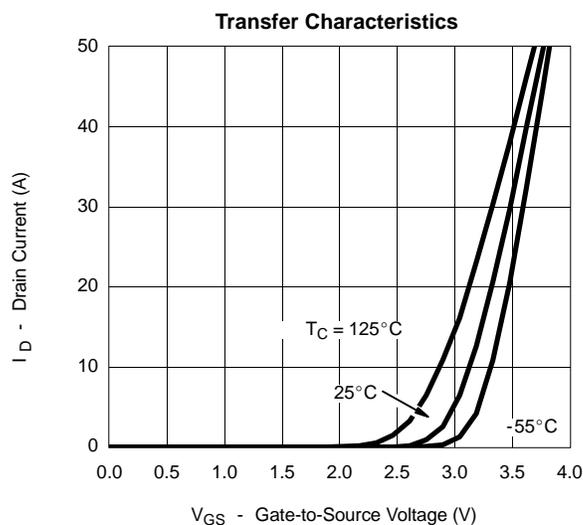
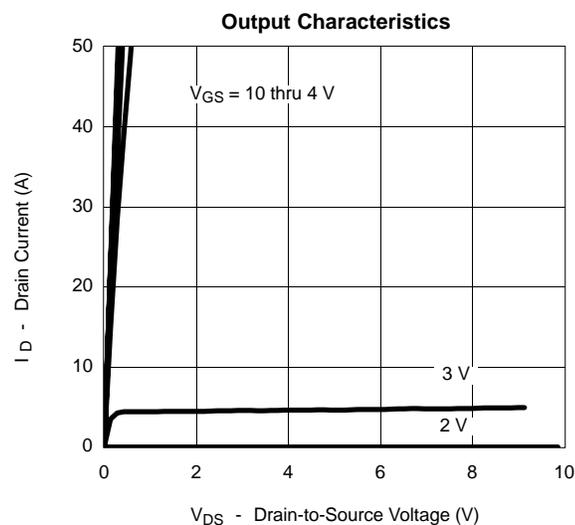
a. Surface Mounted on 1" x 1" FR4 Board.

MOSFET SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	1.0			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 24 \text{ V}, V_{GS} = 0 \text{ V}$			1	μA
		$V_{DS} = 24 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 55^\circ\text{C}$			5	
On-State Drain Current ^{NO TAG}	$I_{D(on)}$	$V_{DS} \geq 5 \text{ V}, V_{GS} = 10 \text{ V}$	40			A
Drain-Source On-State Resistance ^{NO TAG}	$r_{DS(on)}$	$V_{GS} = 10 \text{ V}, I_D = 19 \text{ A}$		0.0062	0.0075	Ω
		$V_{GS} = 4.5 \text{ V}, I_D = 17 \text{ A}$		0.0083	0.010	
Forward Transconductance ^{NO TAG}	g_{fs}	$V_{DS} = 15 \text{ V}, I_D = 19 \text{ A}$		60		S
Diode Forward Voltage ^{NO TAG}	V_{SD}	$I_S = 4.3 \text{ A}, V_{GS} = 0 \text{ V}$		0.75	1.2	V
Dynamic^{NO TAG}						
Total Gate Charge	Q_g	$V_{DS} = 15 \text{ V}, V_{GS} = 5.0 \text{ V}, I_D = 19 \text{ A}$		36	45	nC
Gate-Source Charge	Q_{gs}			14		
Gate-Drain Charge	Q_{gd}			12		
Gate-Resistance	R_g		0.5	2.4	3.1	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15 \text{ V}, R_L = 15 \Omega$ $I_D \cong 1 \text{ A}, V_{GEN} = 10 \text{ V}, R_G = 6 \Omega$		20	30	ns
Rise Time	t_r			16	25	
Turn-Off Delay Time	$t_{d(off)}$			120	180	
Fall Time	t_f			43	65	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 2.3 \text{ A}, di/dt = 100 \text{ A}/\mu\text{s}$		50	80	

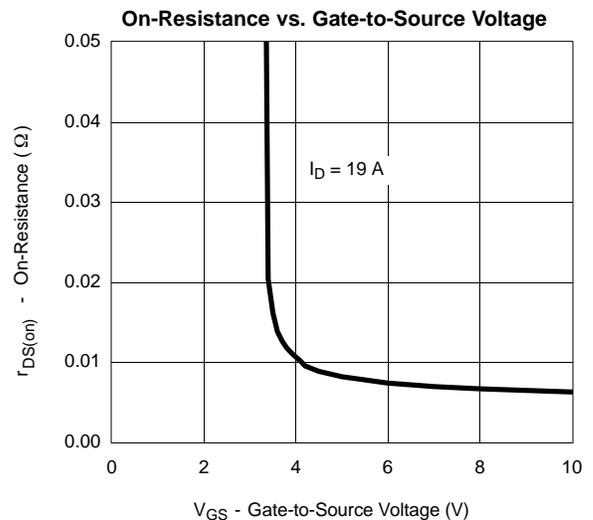
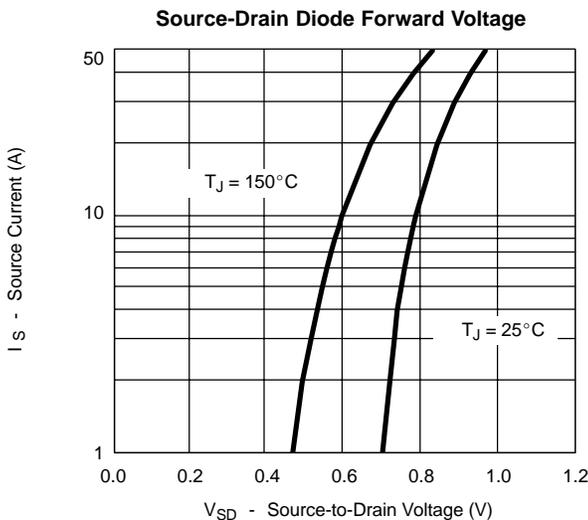
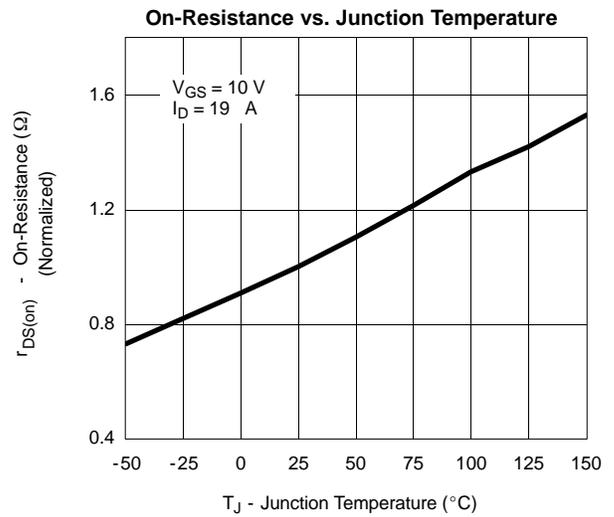
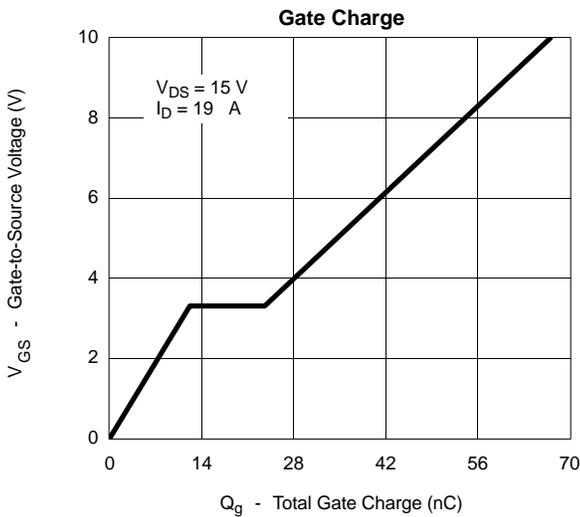
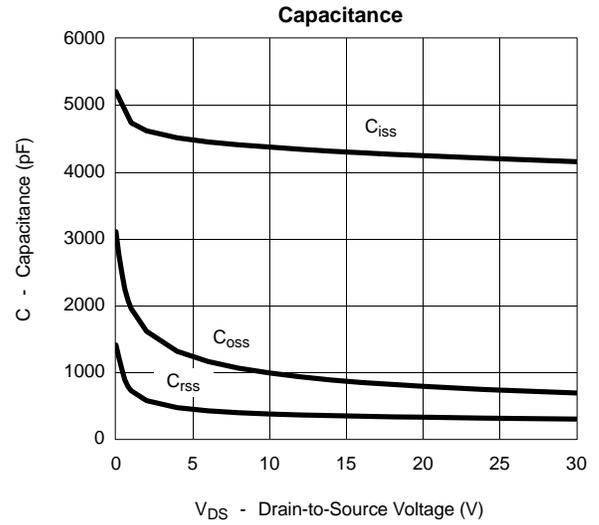
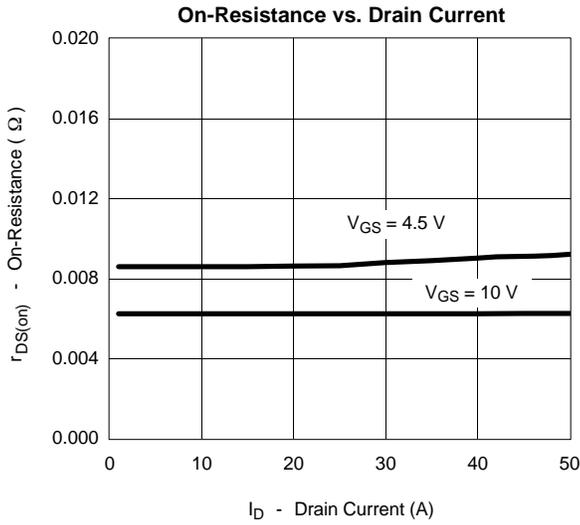
Notes

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

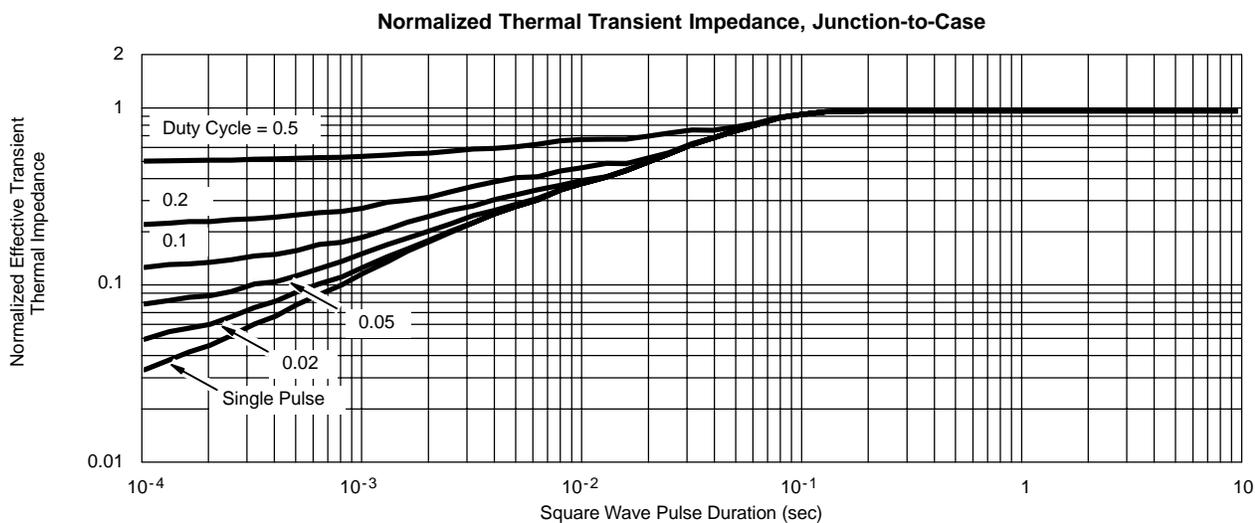
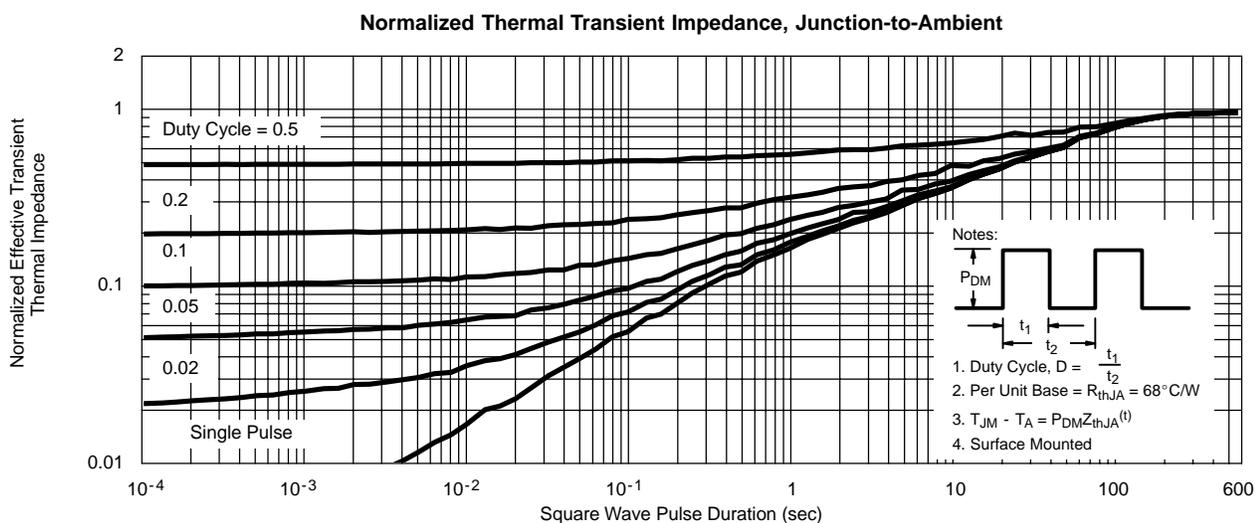
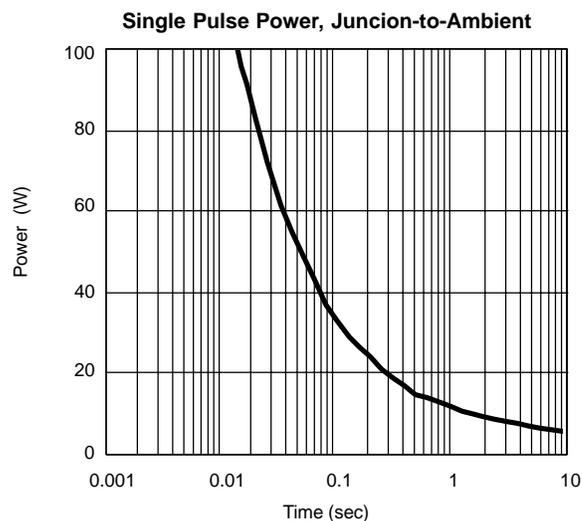
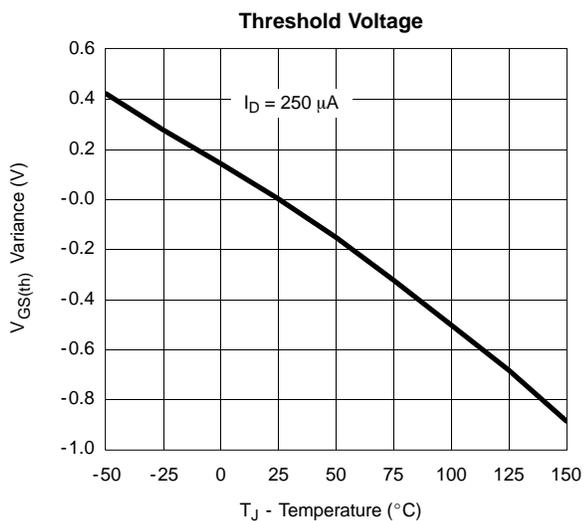
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



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