



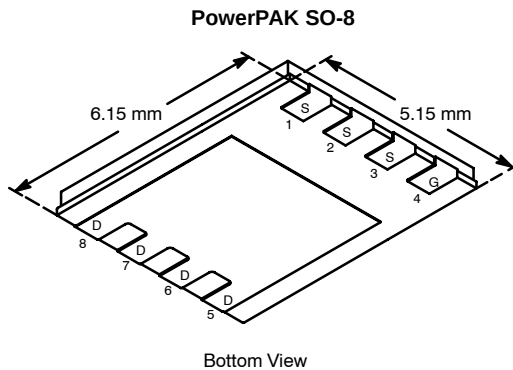
N-Channel 40-V (D-S) Fast Switching MOSFET

PRODUCT SUMMARY

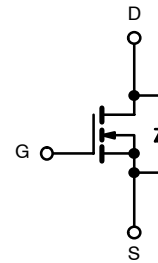
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ)
40	0.0061 @ $V_{GS} = 10$ V	23.6	105

FEATURES

- TrenchFET® Power MOSFET
- New Low Thermal Resistance PowerPAK® Package with Low 1.07-mm Profile
- 100% R_g Tested
- High Threshold Voltage At High Temperature



Ordering Information: Si7444DP-T1—E3



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}	40		V
Gate-Source Voltage		V _{GS}	± 20		
Continuous Drain Current (T _J = 150°C) ^a	T _A = 25 °C	I _D	23.6	14	A
	T _A = 70 °C		18.9	11.2	
Pulsed Drain Current		I _{DM}	60		
Continuous Source Current (Diode Conduction) ^a		I _S	4.5	1.6	
Avalanche Current		I _{AS}	45		
Avalanche Energy		E _{AS}	100		mJ
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	$t \leq 10$ sec	R_{thJA}	18	23	$^\circ\text{C/W}$
	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.

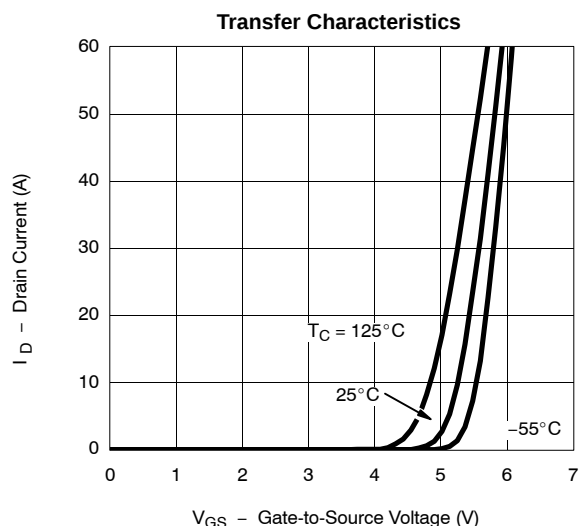
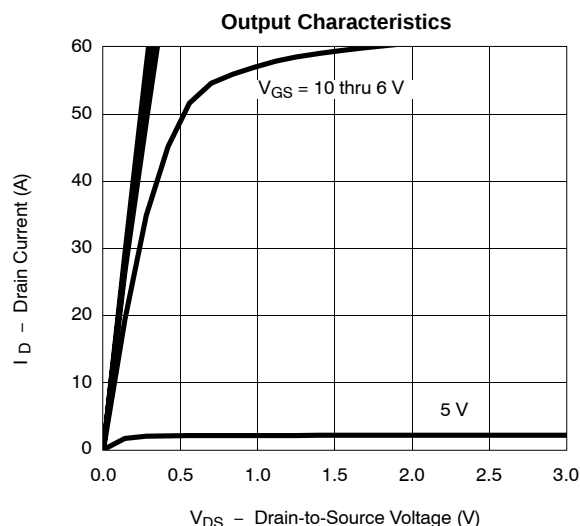
MOSFET SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

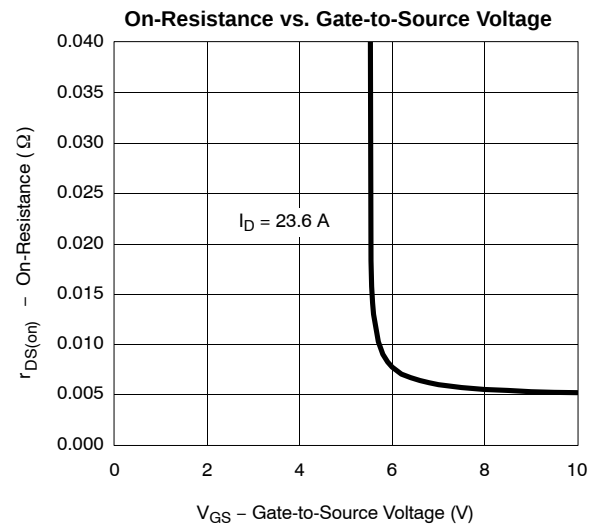
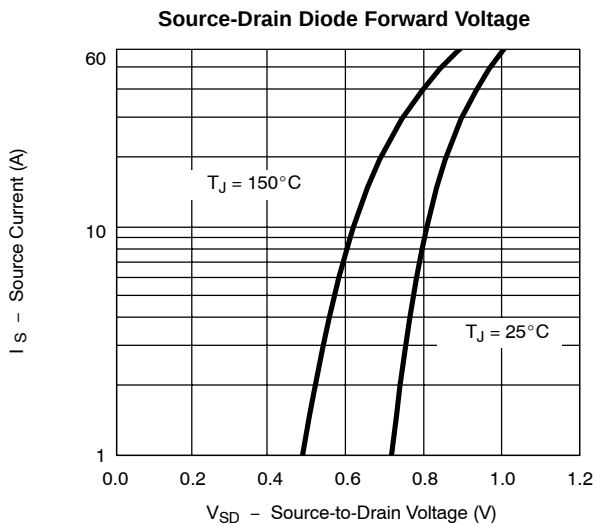
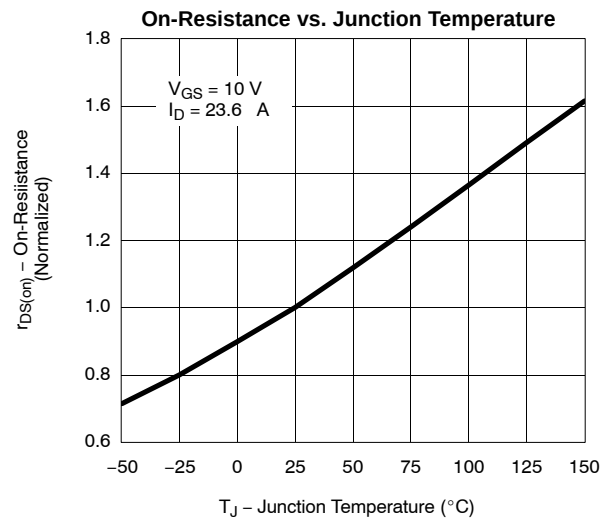
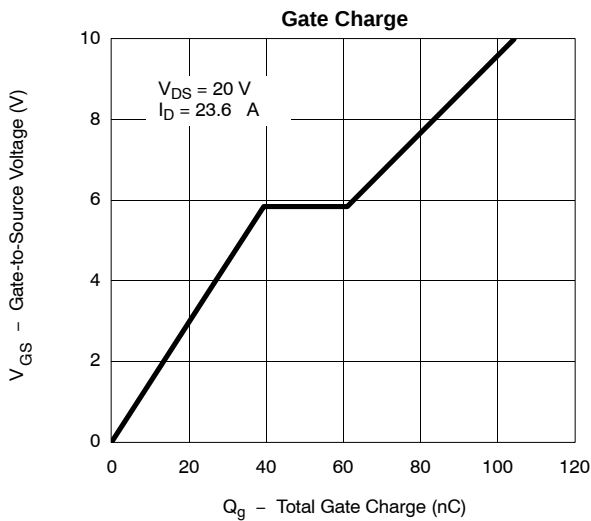
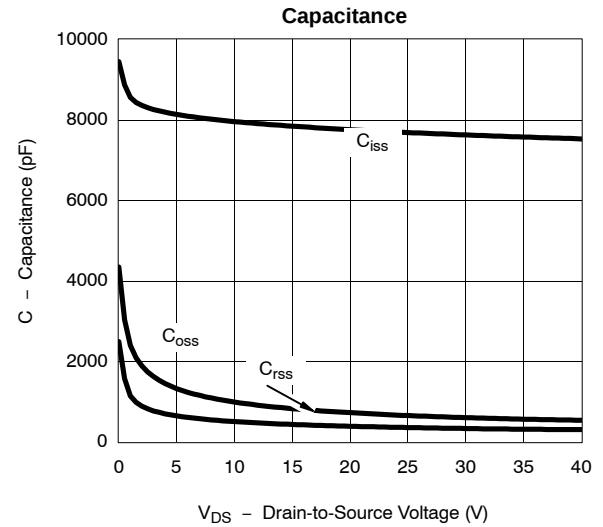
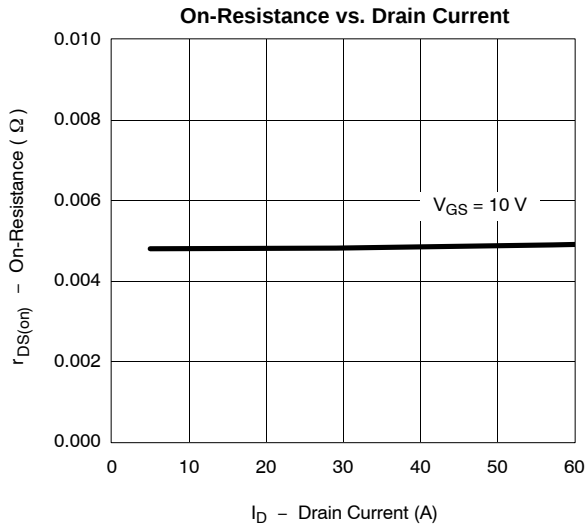
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$	3.4		4.5	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}$, $V_{GS} = \pm 20\ \text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 40\ \text{V}$, $V_{GS} = 0\ \text{V}$			1	μA
		$V_{DS} = 40\ \text{V}$, $V_{GS} = 0\ \text{V}$, $T_J = 55^\circ\text{C}$			5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\ \text{V}$, $V_{GS} = 10\ \text{V}$	40			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 10\ \text{V}$, $I_D = 23.6\ \text{A}$		0.005	0.0061	Ω
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\ \text{V}$, $I_D = 23.6\ \text{A}$		56		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 4.5\ \text{A}$, $V_{GS} = 0\ \text{V}$		0.76	1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 20\ \text{V}$, $V_{GS} = 10\ \text{V}$, $I_D = 23.6\ \text{A}$		105	160	nC
Gate-Source Charge	Q_{gs}			39.4		
Gate-Drain Charge	Q_{gd}			21.7		
Gate Resistance	R_g	$f = 1\ \text{MHz}$	0.5	1.0	1.5	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 20\ \text{V}$, $R_L = 20\ \Omega$ $I_D \cong 1\ \text{A}$, $V_{GEN} = 10\ \text{V}$, $R_g = 6\ \Omega$		45	70	ns
Rise Time	t_r			30	45	
Turn-Off Delay Time	$t_{d(off)}$			90	135	
Fall Time	t_f			45	70	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 4.5\ \text{A}$, $di/dt = 100\ \text{A}/\mu\text{s}$		45	70	

Notes

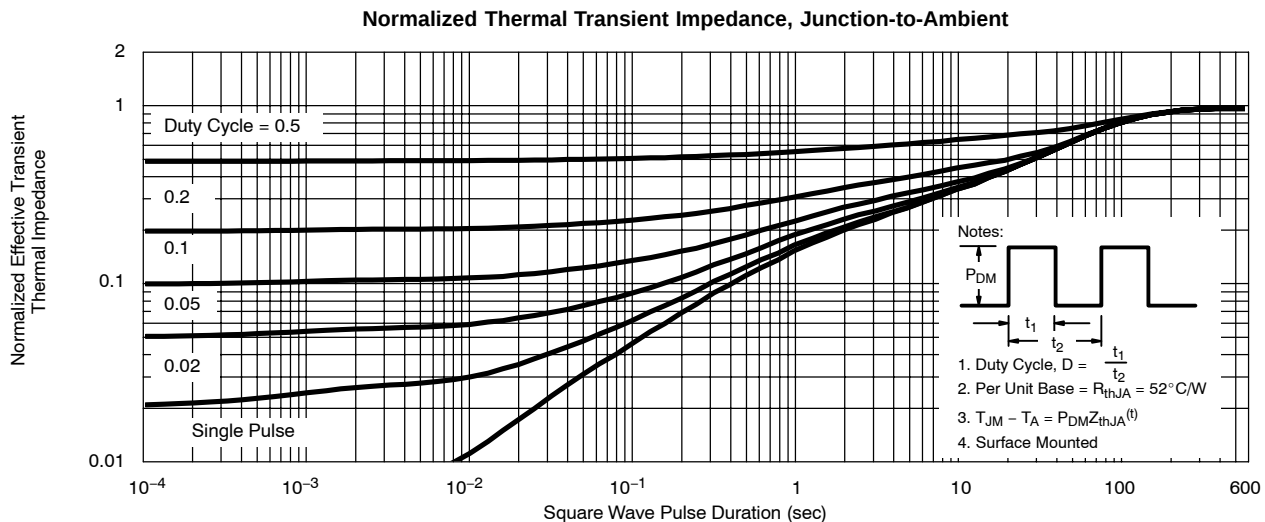
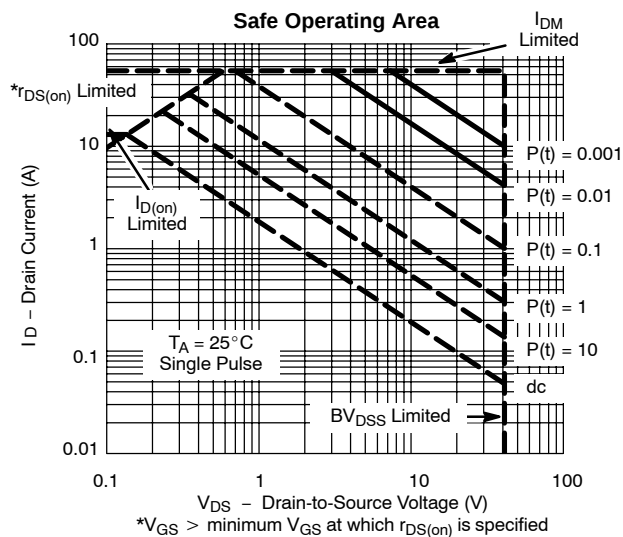
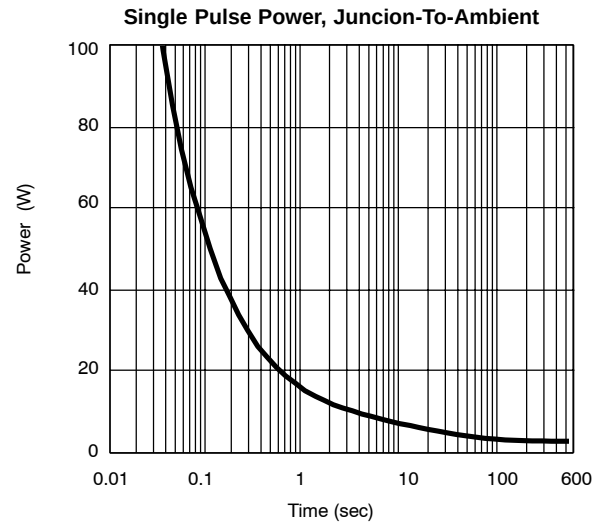
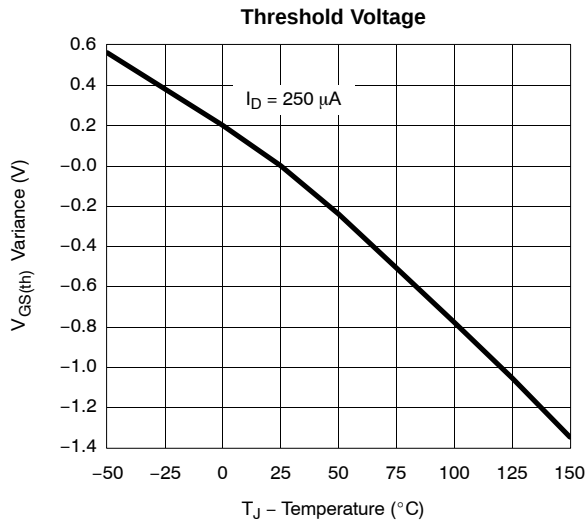
- a. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

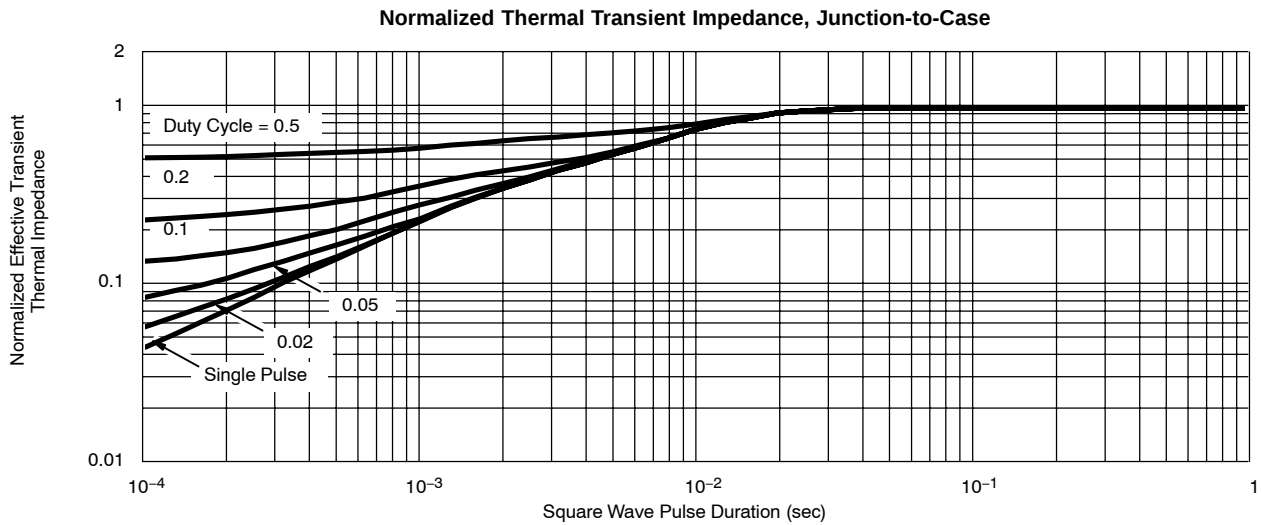
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