



N-Channel 200-V (D-S) MOSFET

PRODUCT SUMMARY

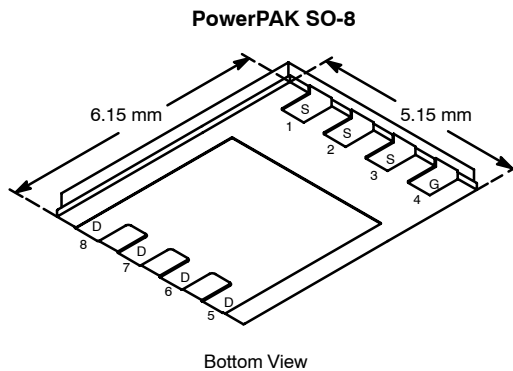
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
200	0.080 @ $V_{GS} = 10$ V	5.3
	0.090 @ $V_{GS} = 6$ V	5.0

FEATURES

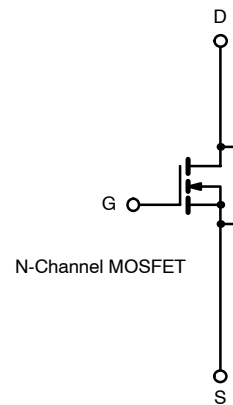
- TrenchFET® Power MOSFETS
- New Low Thermal Resistance PowerPAK® Package with Low 1.07-mm Profile
- PWM Optimized for Fast Switching
- 100% R_g Tested

APPLICATIONS

- Primary Side Switch for High Density DC/DC
- Telecom/Server 48-V DC/DC
- Industrial and 42-V Automotive



Ordering Information: Si7450DP-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}	200		V
Gate-Source Voltage		V _{GS}	± 20		
Continuous Drain Current (T _J = 150°C) ^a	T _A = 25°C	I _D	5.3	3.2	A
	T _A = 70°C		4.3	2.6	
Pulsed Drain Current		I _{DM}	40		
Avalanche Current		I _{AS}	15		
Continuous Source Current (Diode Conduction) ^a		I _S	4.3	1.6	
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	$t \leq 10$ 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

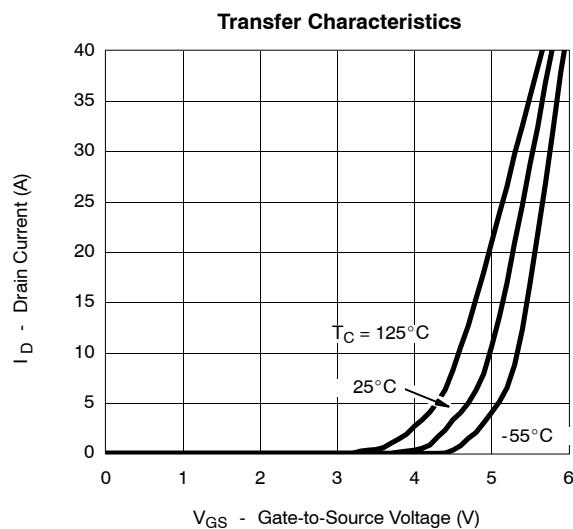
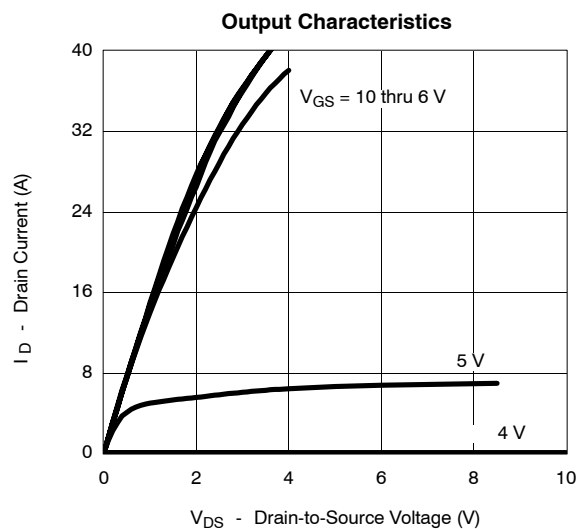
a. Surface Mounted on 1" x 1" FR4 Board.

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$	2.0			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}	$V_{DS} = 160\ \text{V}$, $V_{GS} = 0\ \text{V}$			1	μA
		$V_{DS} = 160\ \text{V}$, $V_{GS} = 0\ \text{V}$, $T_J = 55^\circ\text{C}$			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	$r_{DS(on)}$	$V_{GS} = 10\ \text{V}$, $I_D = 4.0\ \text{A}$		0.065	0.080	Ω
		$V_{GS} = 6.0\ \text{V}$, $I_D = 4.0\ \text{A}$		0.070	0.090	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\ \text{V}$, $I_D = 5\ \text{A}$		19		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 2.8\ \text{A}$, $V_{GS} = 0\ \text{V}$		0.75	1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 100\ \text{V}$, $V_{GS} = 10\ \text{V}$, $I_D = 4.0\ \text{A}$		34	42	nC
Gate-Source Charge	Q_{gs}			7.5		
Gate-Drain Charge	Q_{gd}			12.0		
Gate Resistance	R_g		0.2	0.85	1.5	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 100\ \text{V}$, $R_L = 25\ \Omega$ $I_D \approx 4.0\ \text{A}$, $V_{GEN} = 10\ \text{V}$, $R_G = 6\ \Omega$		14	20	ns
Rise Time	t_r			20	30	
Turn-Off Delay Time	$t_{d(off)}$			32	50	
Fall Time	t_f			25	35	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 2.8\ \text{A}$, $di/dt = 100\ \text{A}/\mu\text{s}$		70	100	

Notes

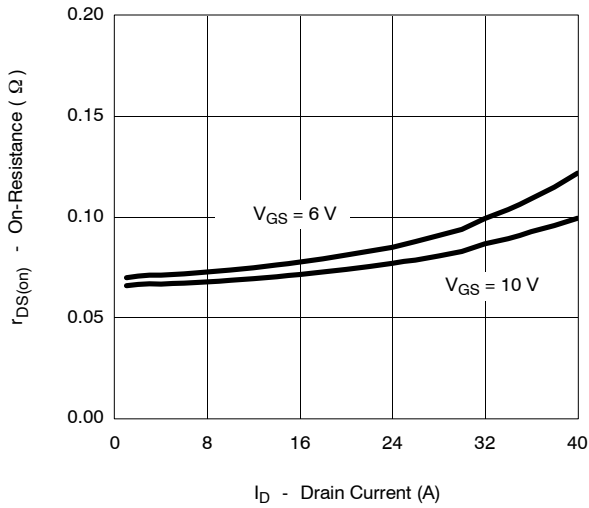
- a. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

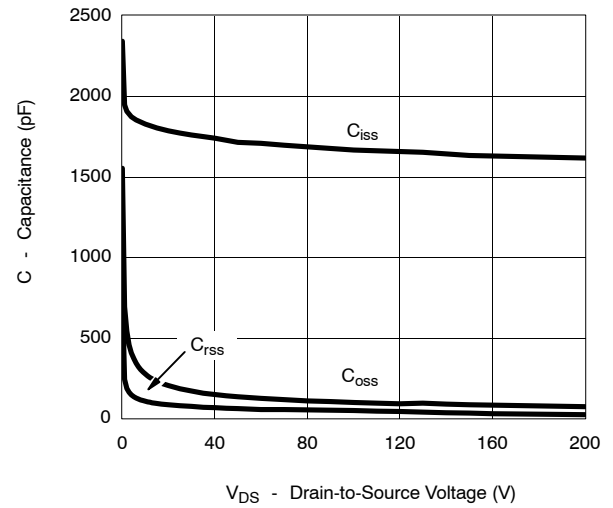


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

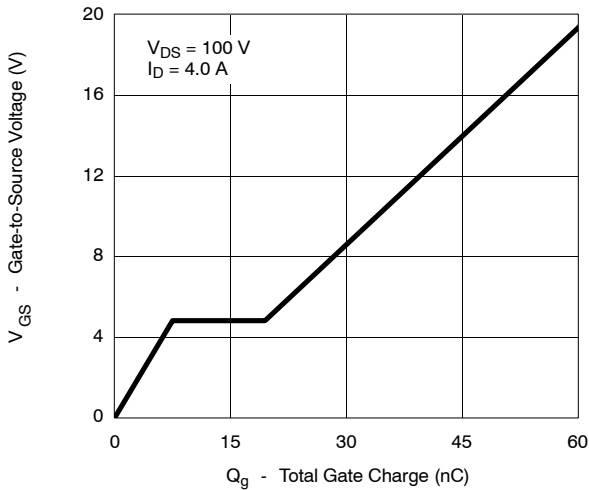
On-Resistance vs. Drain Current



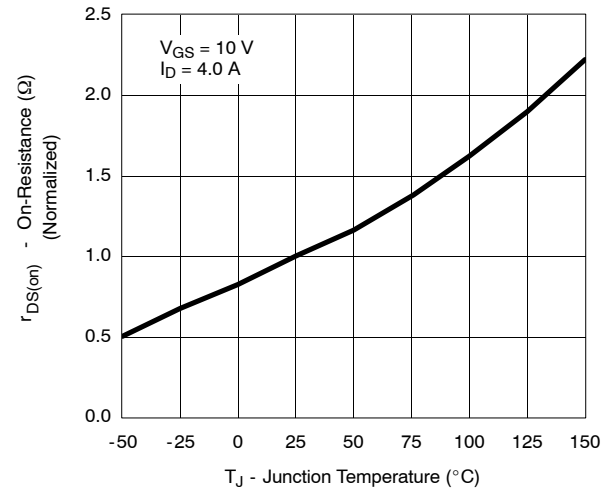
Capacitance



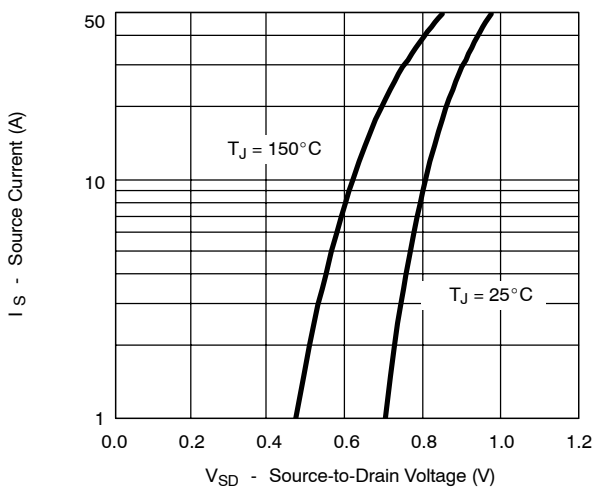
Gate Charge



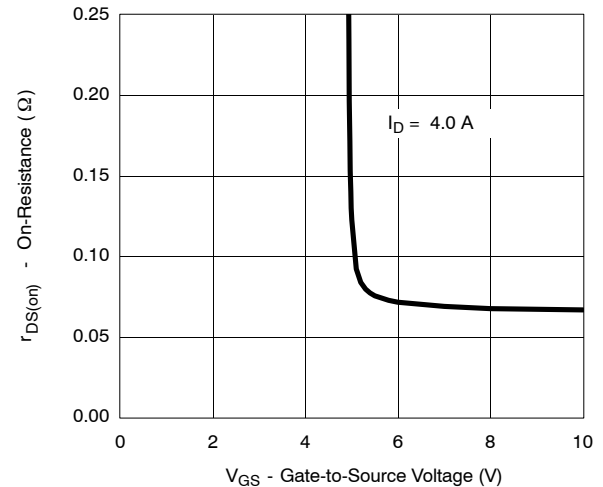
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

