



## P-Channel 60-V (D-S) MOSFET

## PRODUCT SUMMARY

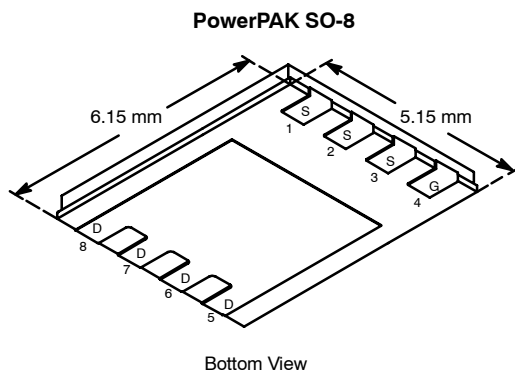
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-60	0.0145 @ $V_{GS} = -10$ V	-14.4
	0.019 @ $V_{GS} = -4.5$ V	-12.6

## FEATURES

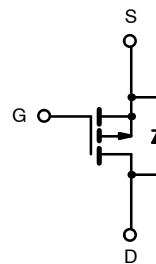
- TrenchFET® Power MOSFET
- New Low Thermal Resistance PowerPAK® Package with Low 1.07-mm Profile

## APPLICATIONS

- Automotive
  - 12-V Boardnet
  - High-Side Switches
  - Motor Drives



Ordering Information: Si7461DP-T1—E3



P-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 <sub>DS</sub>	-60		V
Gate-Source Voltage		V <sub>GS</sub>	± 20		
Continuous Drain Current (T <sub>J</sub> = 150°C) <sup>a</sup>	T <sub>A</sub> = 25°C	I <sub>D</sub>	-14.4	-8.6	A
	T <sub>A</sub> = 70°C		-11.5	-6.9	
Pulsed Drain Current		I <sub>DM</sub>	-60		
Continuous Source Current (Diode Conduction) <sup>a</sup>		I <sub>S</sub>	-4.5	-1.6	
Avalanche Current	L = 0.1 mH	I <sub>AS</sub>	50		mJ
Single Pulse Avalanche Energy		E <sub>AS</sub>	125		
Maximum Power Dissipation <sup>a</sup>	T <sub>A</sub> = 25°C	P <sub>D</sub>	5.4	1.9	W
	T <sub>A</sub> = 70°C		3.4	1.2	
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>stg</sub>	-55 to 150		°C

## THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>a</sup>	$t \leq 10$ 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.

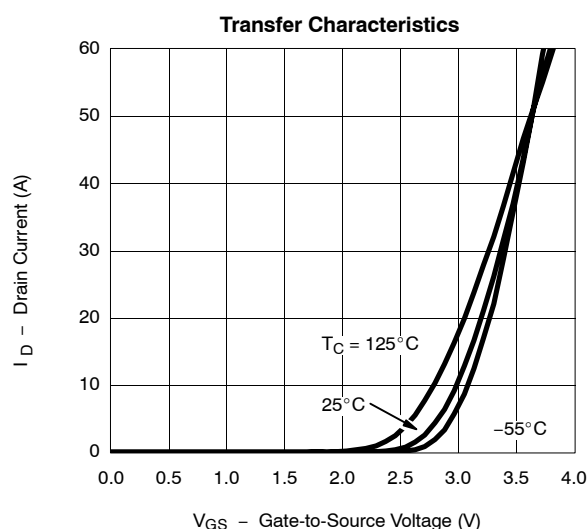
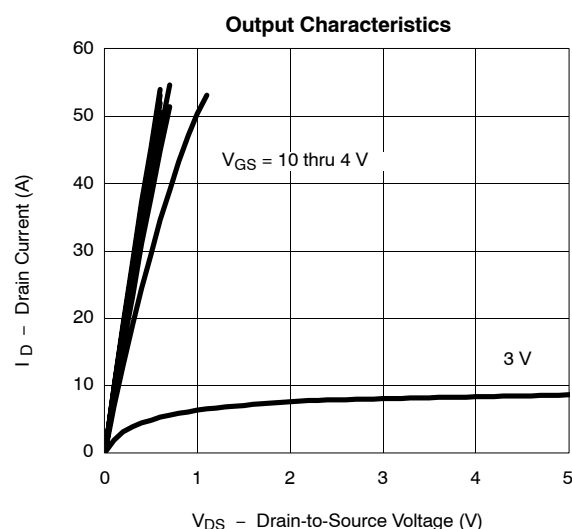
**SPECIFICATIONS ( $T_J = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)**

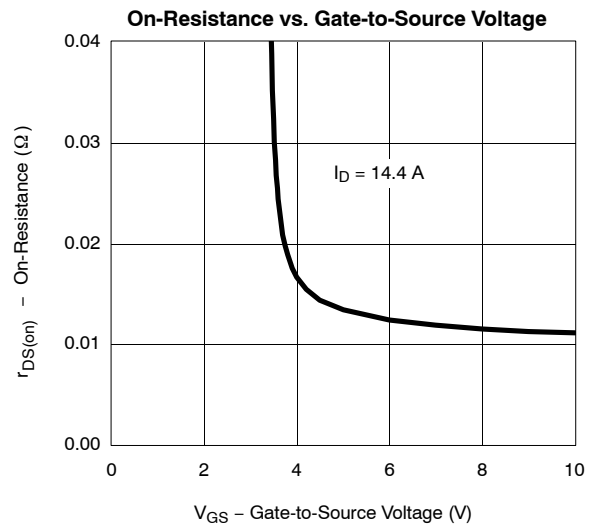
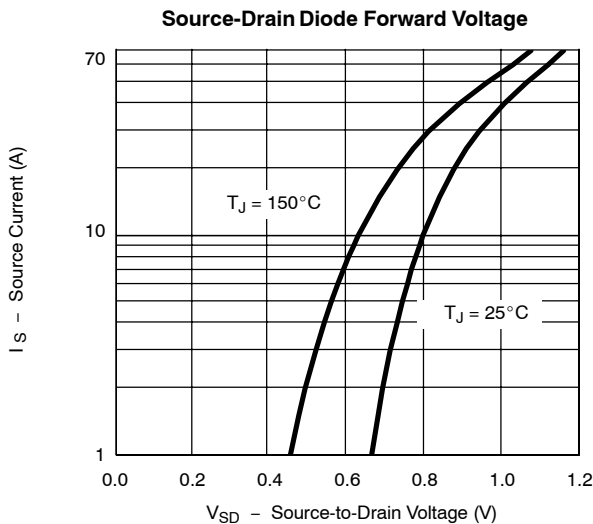
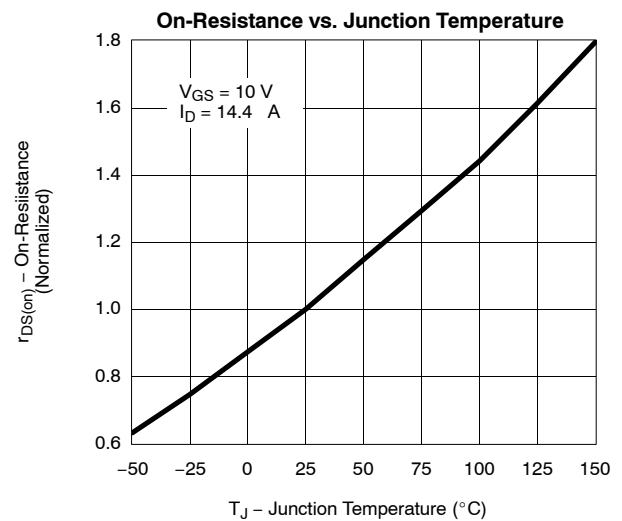
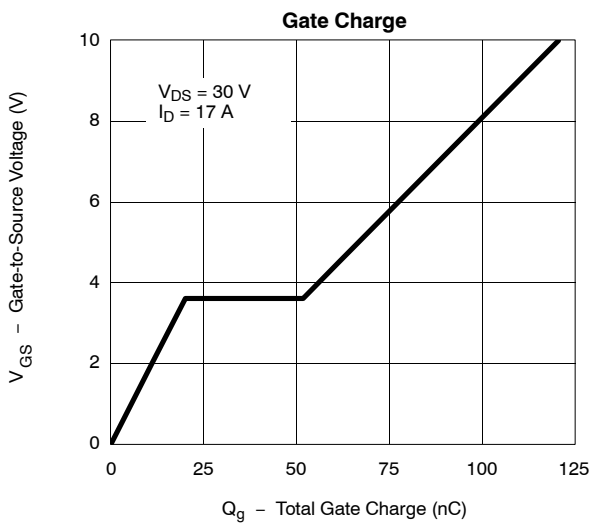
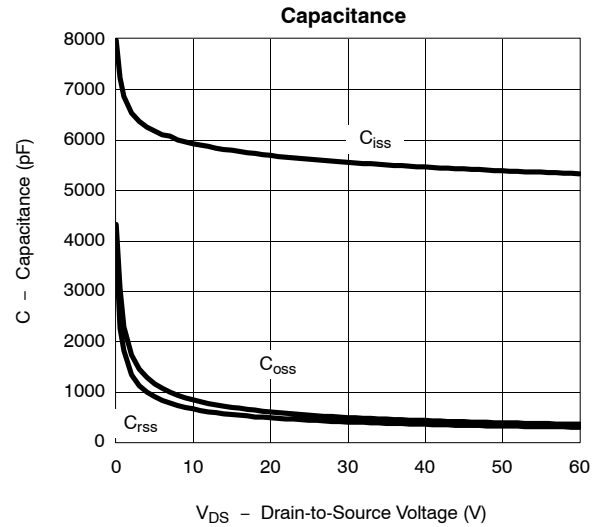
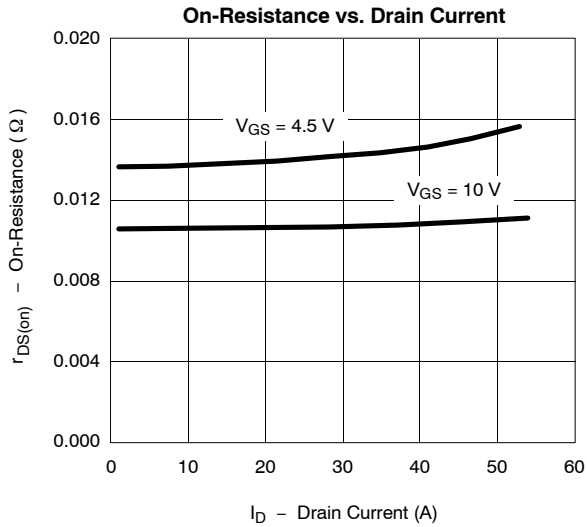
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-1		-3	V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 20\ \text{V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -60\ \text{V}, V_{GS} = 0\ \text{V}$			-1	$\mu\text{A}$
		$V_{DS} = -60\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 70^\circ\text{C}$			-10	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} \leq -5\ \text{V}, V_{GS} = -10\ \text{V}$	-40			A
Drain-Source On-State Resistance <sup>a</sup>	$r_{DS(on)}$	$V_{GS} = -10\ \text{V}, I_D = -14.4\ \text{A}$		0.0115	0.0145	$\Omega$
		$V_{GS} = -4.5\ \text{V}, I_D = -12.6\ \text{A}$		0.015	0.019	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -15\ \text{V}, I_D = -14.4\ \text{A}$		31		S
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	$I_S = -4.5\ \text{A}, V_{GS} = 0\ \text{V}$		-0.8	-1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = -30\ \text{V}, V_{GS} = -10\ \text{V}, I_D = -14.4\ \text{A}$		121	190	nC
Gate-Source Charge	$Q_{gs}$			20		
Gate-Drain Charge	$Q_{gd}$			32		
Gate-Resistance	$R_g$			3		$\Omega$
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -30\ \text{V}, R_L = 30\ \Omega$ $I_D \cong -1\ \text{A}, V_{GEN} = -10\ \text{V}, R_g = 6\ \Omega$		20	30	ns
Rise Time	$t_r$			20	30	
Turn-Off Delay Time	$t_{d(off)}$			205	310	
Fall Time	$t_f$			90	135	
Source-Drain Reverse Recovery Time	$t_{rr}$	$I_F = -4.5\ \text{A}, di/dt = 100\ \text{A}/\mu\text{s}$		45	70	

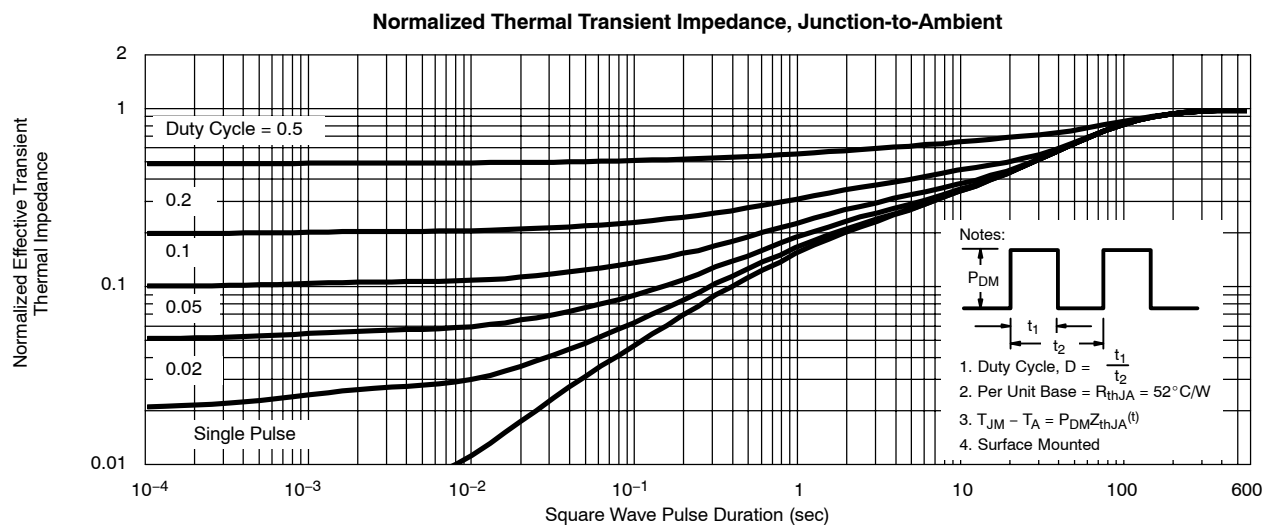
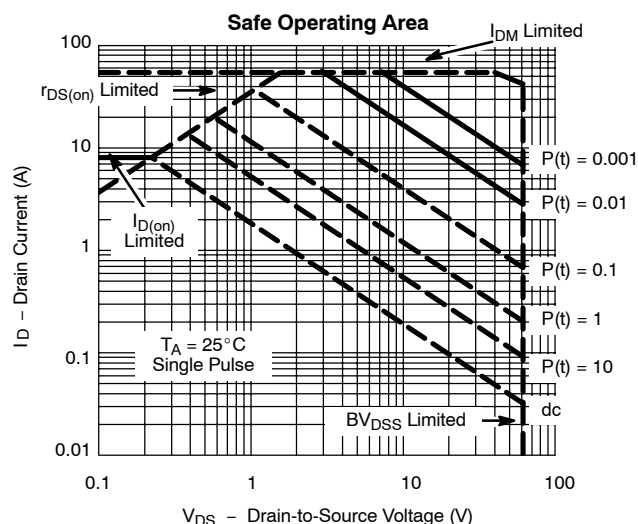
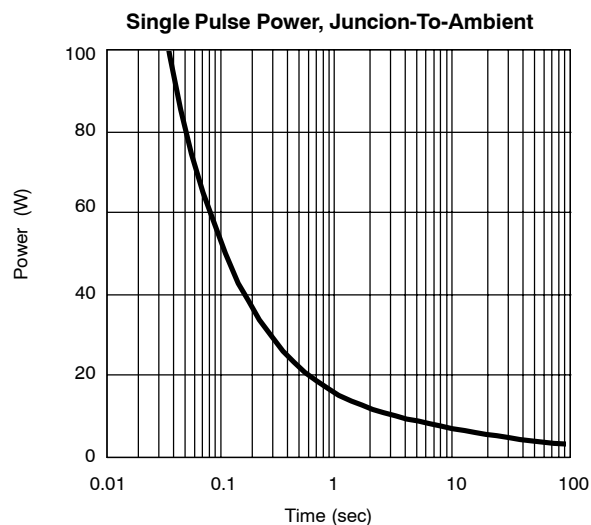
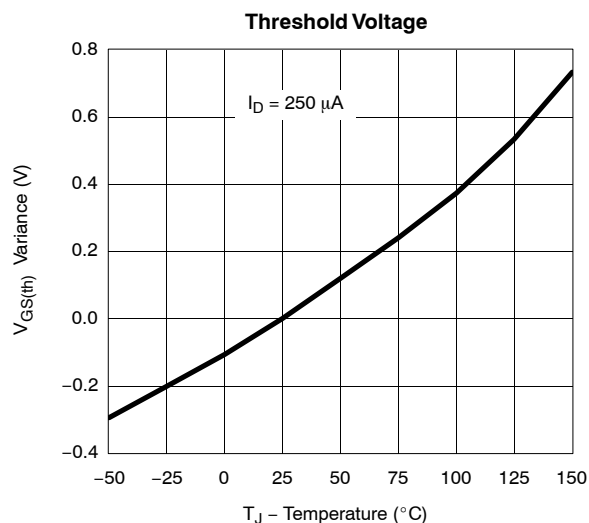
## Notes

a. Pulse test; pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .

b. Guaranteed by design, not subject to production testing.

**TYPICAL CHARACTERISTICS ( $25^\circ\text{C}$  UNLESS NOTED)**

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