

## P-Channel 12-V (D-S) MOSFET

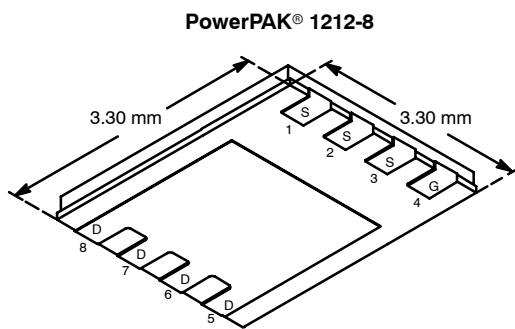
PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-12	0.016 @ $V_{GS} = -4.5$ V	-12.6
	0.022 @ $V_{GS} = -2.5$ V	-10.8
	0.029 @ $V_{GS} = -1.8$ V	-3.5

### FEATURES

- TrenchFET® Power MOSFETS: 1.8-V Rated
- New PowerPAK® Package
  - Low Thermal Resistance,  $R_{thJC}$
  - Low 1.07-mm Profile

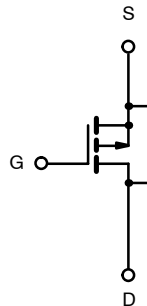
### APPLICATIONS

- Load Switch
- PA Switch
- Battery Switch



Bottom View

Ordering Information: Si7425DN-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	$V_{DS}$	-12		V	
Gate-Source Voltage	$V_{GS}$	$\pm 8$			
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	-12.6	-8.3	A
		$T_A = 85^\circ\text{C}$	-9.1	-6.0	
Pulsed Drain Current	$I_{DM}$	-25			
continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	-3.0	-1.3		
Maximum Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	3.6	1.5	W
		$T_A = 85^\circ\text{C}$	1.9	0.8	
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 <sup>a</sup>	$R_{thJA}$	$t \leq 10$ sec	28	35	$^\circ\text{C/W}$
		Steady State	65	81	
Maximum Junction-to-Case	$R_{thJC}$	2.9	3.8		

Notes

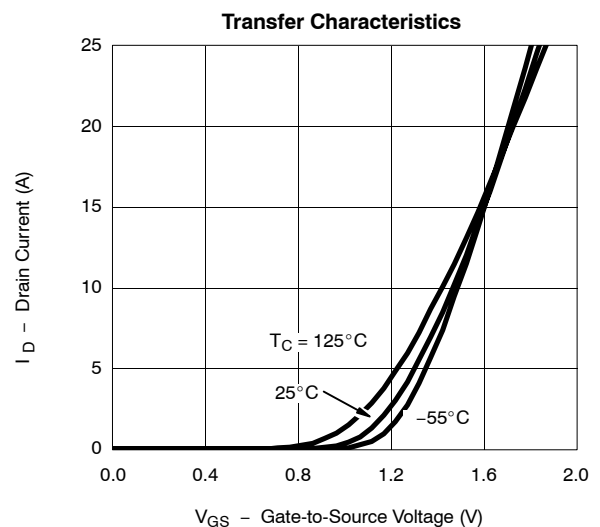
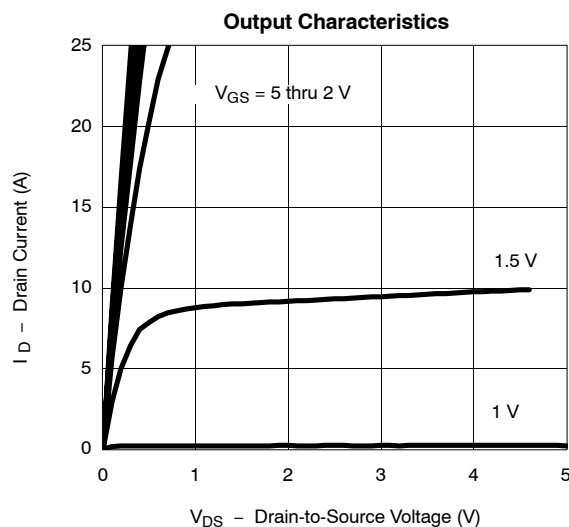
a. Surface Mounted on 1" x 1" FR4 Board.

**SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)**

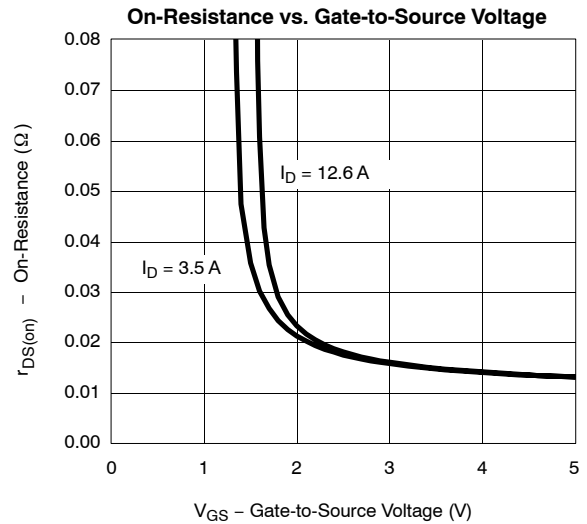
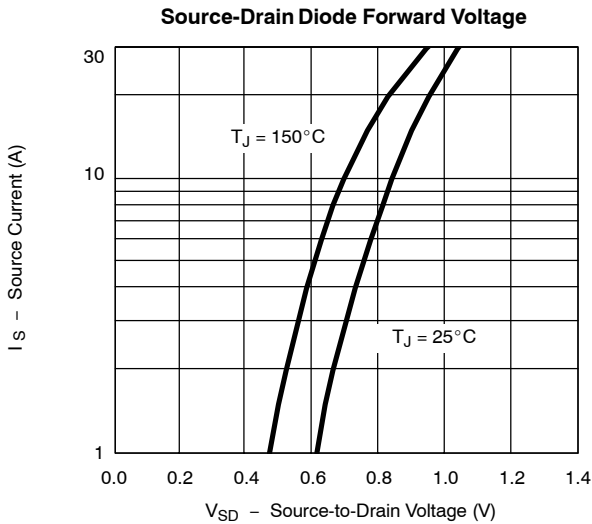
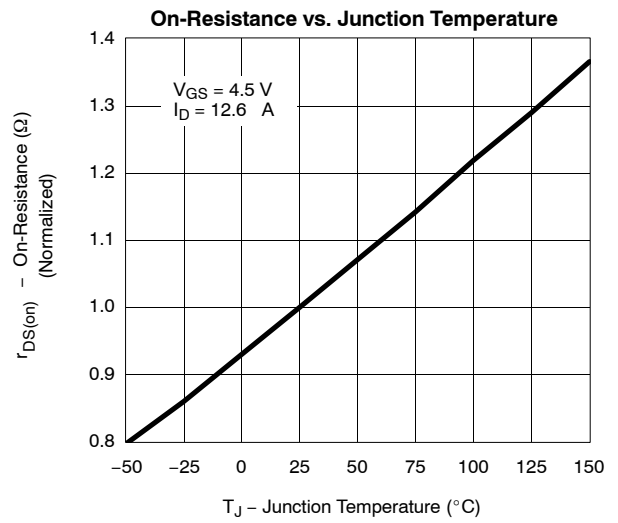
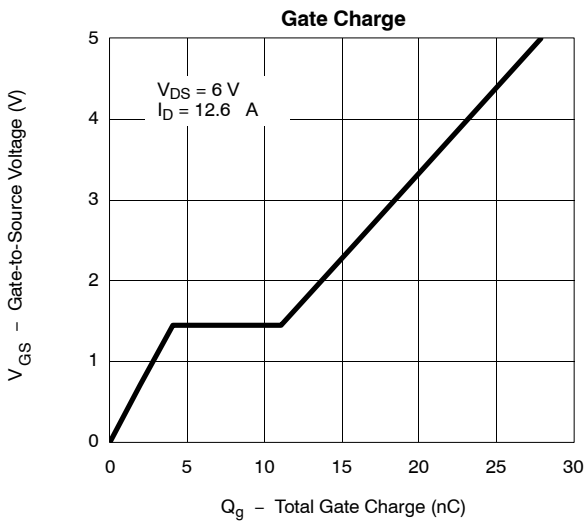
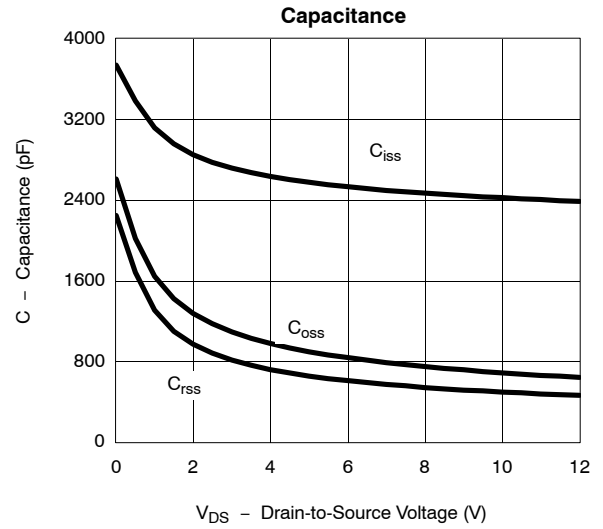
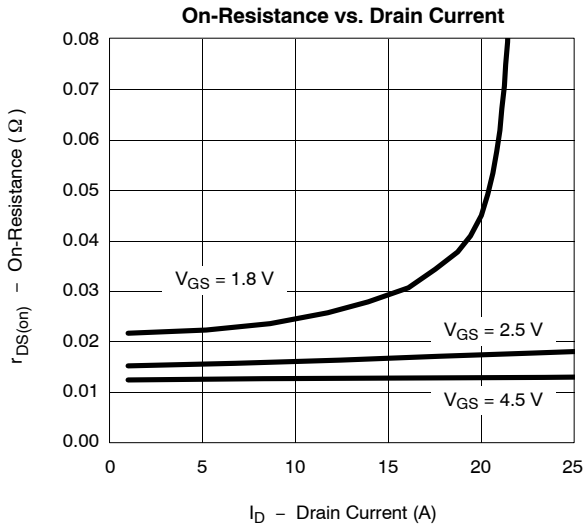
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -300 μA	-0.40		-1.0	V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -12 V, V <sub>GS</sub> = 0 V			-1	μA
		V <sub>DS</sub> = -12 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 85 °C			-5	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -4.5 V	-25			A
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -12.6 A		0.013	0.016	Ω
		V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -10.8 A		0.017	0.022	
		V <sub>GS</sub> = -1.8 V, I <sub>D</sub> = -3.5 A		0.023	0.029	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -6 V, I <sub>D</sub> = -12.6 A		38		S
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = -3.0 A, V <sub>GS</sub> = 0 V		-0.7	-1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -6 V, V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -12.6 A		26	39	nC
Gate-Source Charge	Q <sub>gs</sub>		4.1			
Gate-Drain Charge	Q <sub>gd</sub>		7.0			
Gate Resistance	R <sub>g</sub>	f = 1 MHz		5.0		Ω
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -6 V, R <sub>L</sub> = 6 Ω I <sub>D</sub> ≅ -1 A, V <sub>GEN</sub> = -4.5 V, R <sub>G</sub> = 6 Ω		30	45	ns
Rise Time	t <sub>r</sub>			55	75	
Turn-Off Delay Time	t <sub>d(off)</sub>			130	260	
Fall Time	t <sub>f</sub>			100	225	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>		I <sub>F</sub> = -3.2 A, di/dt = 100 A/μs		52	

## Notes

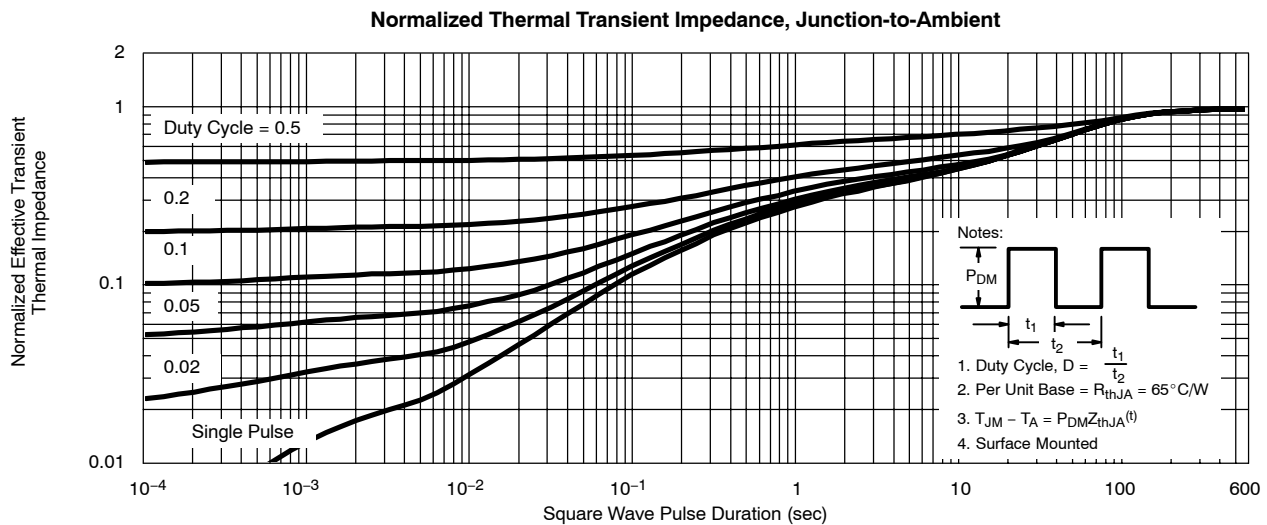
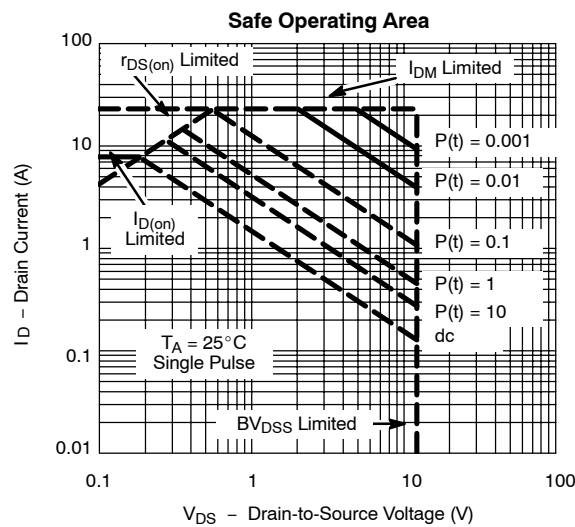
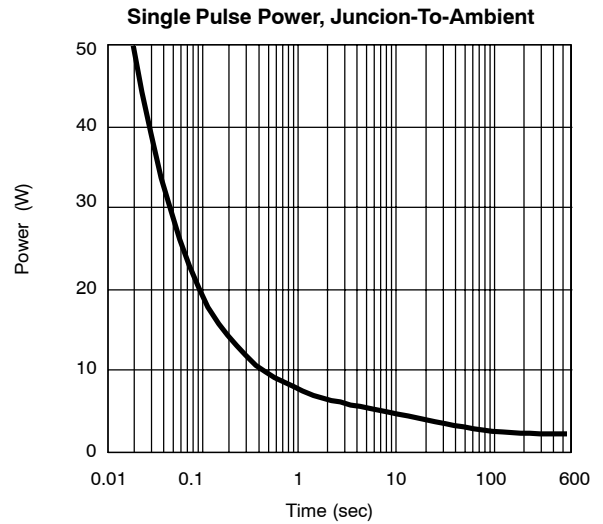
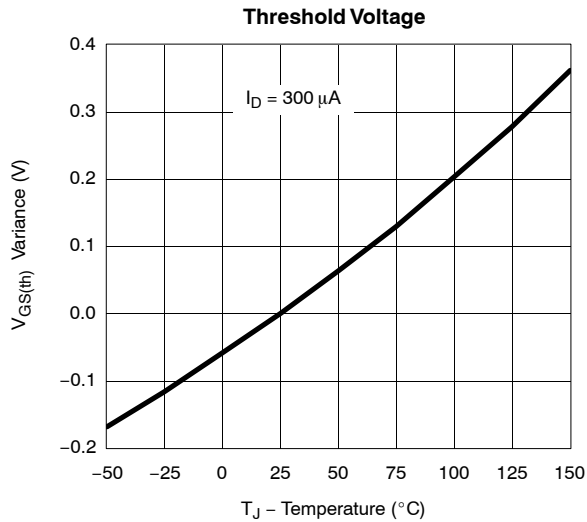
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.  
b. Guaranteed by design, not subject to production testing.

**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**

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