



**Si7405DN**  
Vishay Siliconix

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

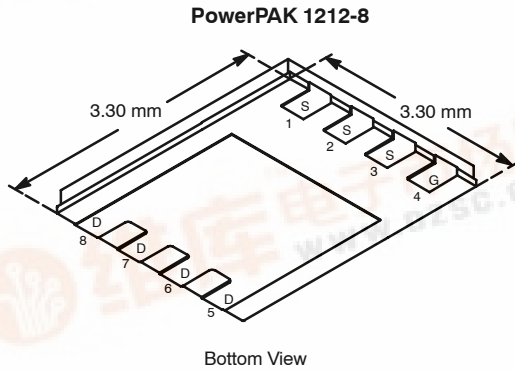
PRODUCT SUMMARY		
V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)
-12	0.016 @ V <sub>GS</sub> = -4.5 V	-13
	0.022 @ V <sub>GS</sub> = -2.5 V	-11
	0.028 @ V <sub>GS</sub> = -1.8 V	-9.8

**FEATURES**

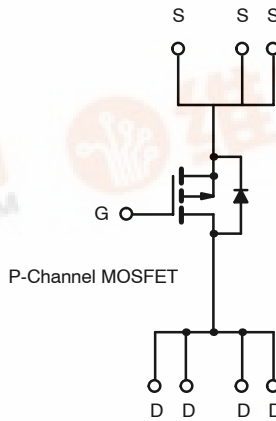
- TrenchFET® Power MOSFETS: 1.8-V Rated
- New PowerPAK® Package
  - Low Thermal Resistance, R<sub>thJC</sub>
  - Low 1.07-mm Profile

**APPLICATIONS**

- Load Switch
- Power Switch
- PA Switch



Ordering Information: Si7405DN-T1



ABSOLUTE MAXIMUM RATINGS (T <sub>A</sub> = 25°C UNLESS OTHERWISE NOTED)					
Parameter	Symbol	10 secs	Steady State	Unit	
Drain-Source Voltage	V <sub>DS</sub>	-12		V	
Gate-Source Voltage	V <sub>GS</sub>	±8			
Continuous Drain Current (T <sub>J</sub> = 150°C) <sup>a</sup>	I <sub>D</sub>	T <sub>A</sub> = 25°C	-13	-8.3	A
		T <sub>A</sub> = 85°C	-9.4	-6.0	
Pulsed Drain Current	I <sub>DM</sub>	-30			
continuous Source Current (Diode Conduction) <sup>a</sup>	I <sub>S</sub>	-3.2	-1.3		
Maximum Power Dissipation <sup>a</sup>	P <sub>D</sub>	T <sub>A</sub> = 25°C	3.8	1.5	W
		T <sub>A</sub> = 85°C	2.0	0.8	
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>	R <sub>thJA</sub>	t ≤ 10 sec	26	33	°C/W
		Steady State	65	81	
Maximum Junction-to-Case	R <sub>thJC</sub>	1.9	2.4		

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

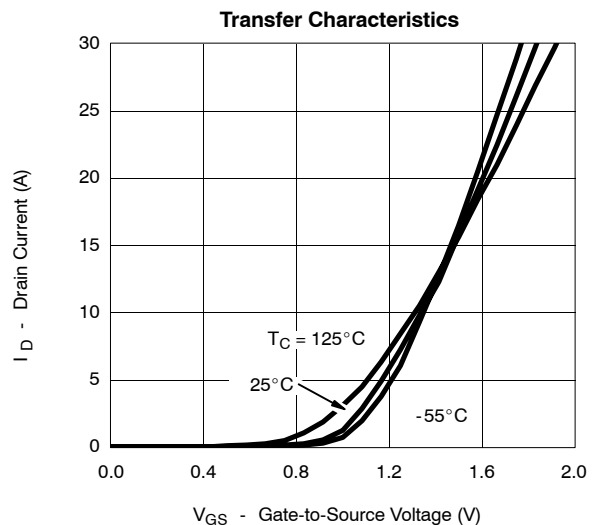
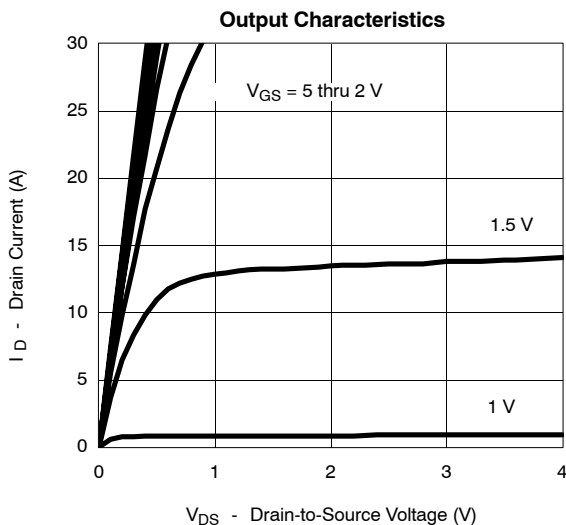


<b>SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)</b>						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -2 mA	-0.45			V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</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	-30			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> = -13 A		0.013	0.016	Ω
		V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -11 A		0.018	0.022	
		V <sub>GS</sub> = -1.8 V, I <sub>D</sub> = -3 A		0.022	0.028	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -6 V, I <sub>D</sub> = -13 A		35		S
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = -3.2 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> = -13 A		35	50	nC
Gate-Source Charge	Q <sub>gs</sub>			6.6		
Gate-Drain Charge	Q <sub>gd</sub>			7.7		
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		25	40	ns
Rise Time	t <sub>r</sub>			50	75	
Turn-Off Delay Time	t <sub>d(off)</sub>			175	260	
Fall Time	t <sub>f</sub>			150	225	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>		I <sub>F</sub> = -3.2 A, di/dt = 100 A/μs		30	

Notes

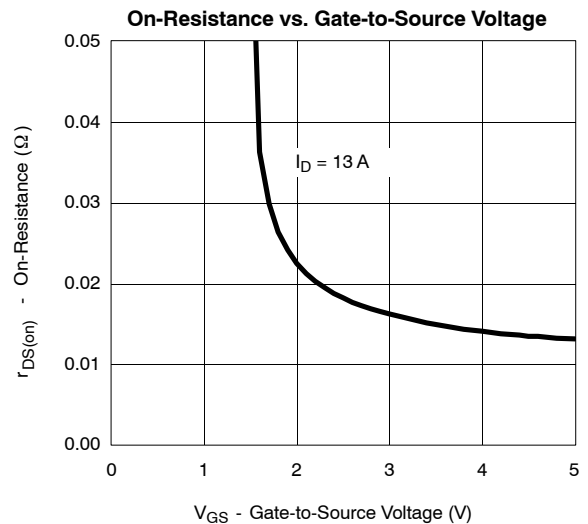
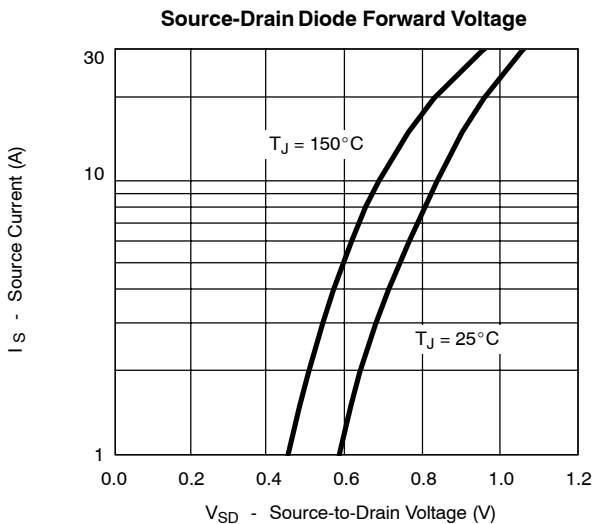
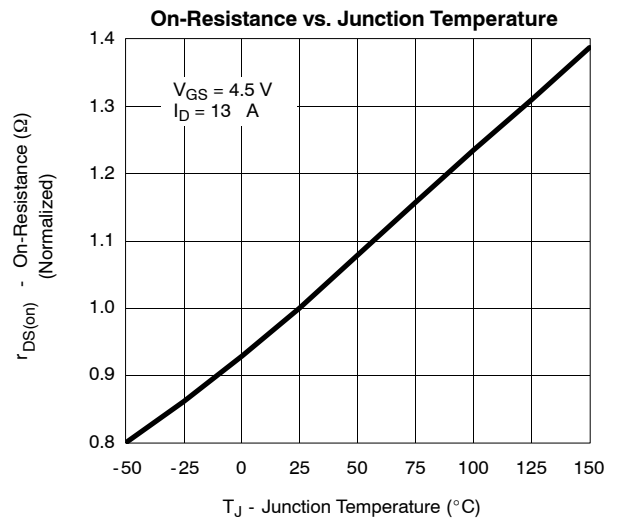
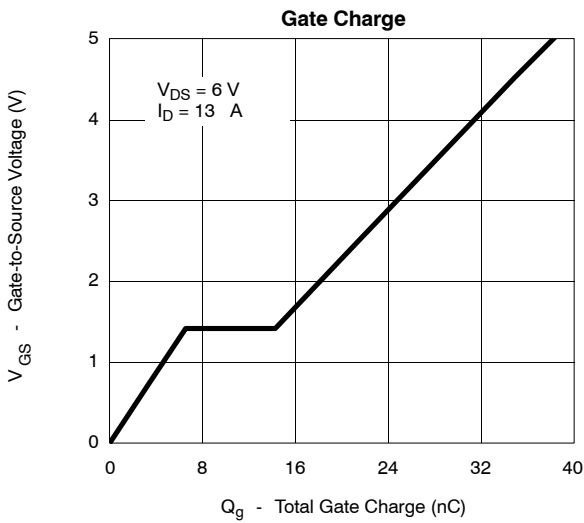
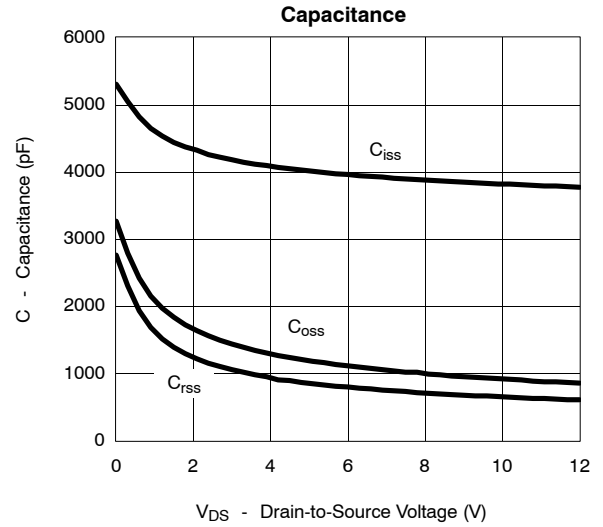
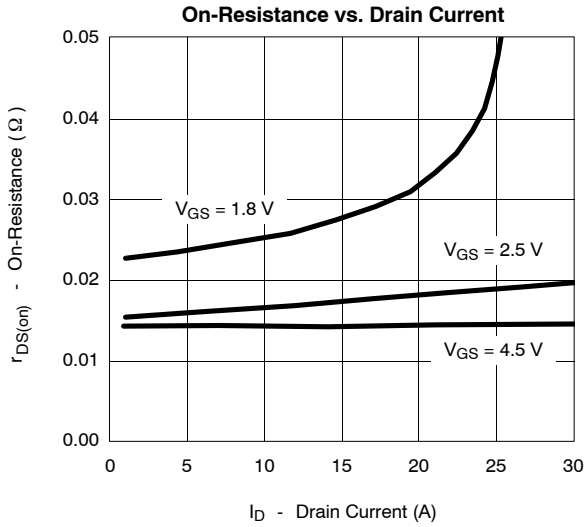
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.

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





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