



New Product

**Si7415DN**  
Vishay Siliconix

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

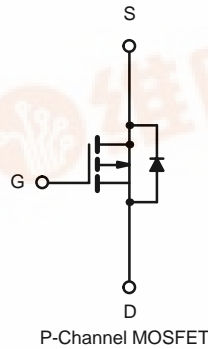
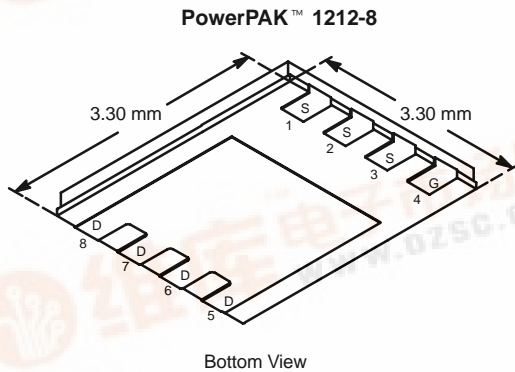
PRODUCT SUMMARY		
V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)
-60	0.065 @ V <sub>GS</sub> = -10 V	-5.7
	0.110 @ V <sub>GS</sub> = -4.5 V	-4.4

**FEATURES**

- TrenchFET® Power MOSFET
- New PowerPAK™ Package
  - Low Thermal Resistance, R<sub>thJC</sub>
  - Low 1.07-mm Profile
- Fast Switching

**APPLICATIONS**

- Load Switches
- Half-Bridge Motor Drives
- High voltage Non-Synchronous Buck Converters



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>	-60		V
Gate-Source Voltage	V <sub>GS</sub>	±20		
Continuous Drain Current (T <sub>J</sub> = 150°C) <sup>a</sup>	I <sub>D</sub>	T <sub>A</sub> = 25°C	-5.7	-3.6
		T <sub>A</sub> = 70°C	-4.6	-2.9
Pulsed Drain Current	I <sub>DM</sub>	-20		A
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
		T <sub>A</sub> = 70°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>	t ≤ 10 sec	R <sub>thJA</sub>	26	33	°C/W
	Steady State		65	81	
Maximum Junction-to-Case (Drain)	Steady State	R <sub>thJC</sub>	1.9	2.4	

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

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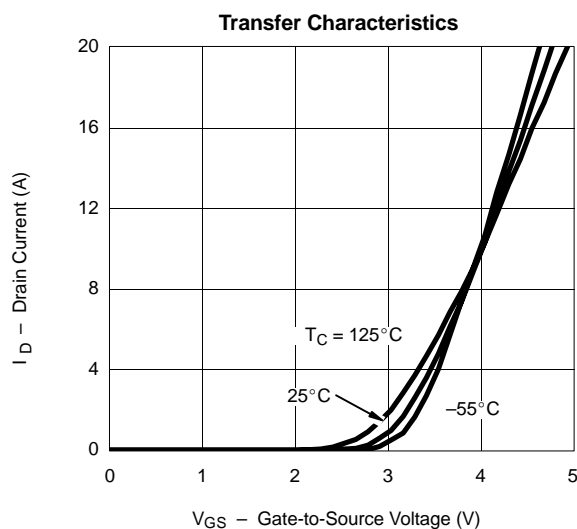
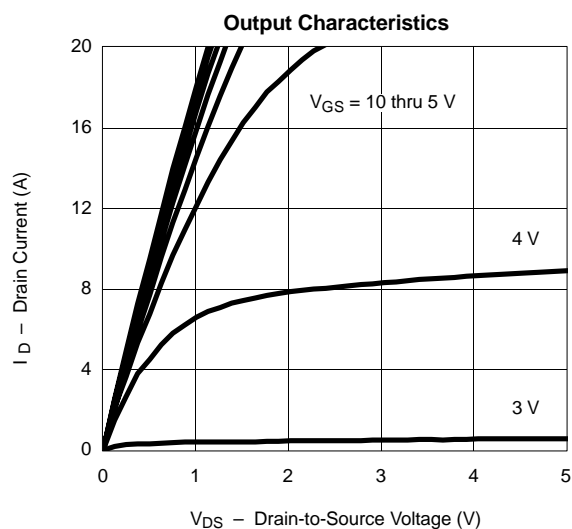
## SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)

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> = -250 μA	-1			V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -48 V, V <sub>GS</sub> = 0 V			-1	μA
		V <sub>DS</sub> = -48 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 70 °C			-5	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -10 V	-20			A
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = -10 V, I <sub>D</sub> = -5.7 A		0.054	0.065	Ω
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -4.4 A		0.090	0.110	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -15 V, I <sub>D</sub> = -5.7 A		11		S
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = -3.2 A, V <sub>GS</sub> = 0 V		-0.8	-1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -30 V, V <sub>GS</sub> = -10 V, I <sub>D</sub> = -5.7 A		15	25	nC
Gate-Source Charge	Q <sub>gs</sub>			4		
Gate-Drain Charge	Q <sub>gd</sub>			3.2		
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -30 V, R <sub>L</sub> = 30 Ω I <sub>D</sub> ≅ -1 A, V <sub>GEN</sub> = -10 V, R <sub>G</sub> = 6 Ω		12	20	ns
Rise Time	t <sub>r</sub>			12	20	
Turn-Off Delay Time	t <sub>d(off)</sub>			22	35	
Fall Time	t <sub>f</sub>			16	25	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>		I <sub>F</sub> = -3.2 A, di/dt = 100 A/μs		45	

**Notes**

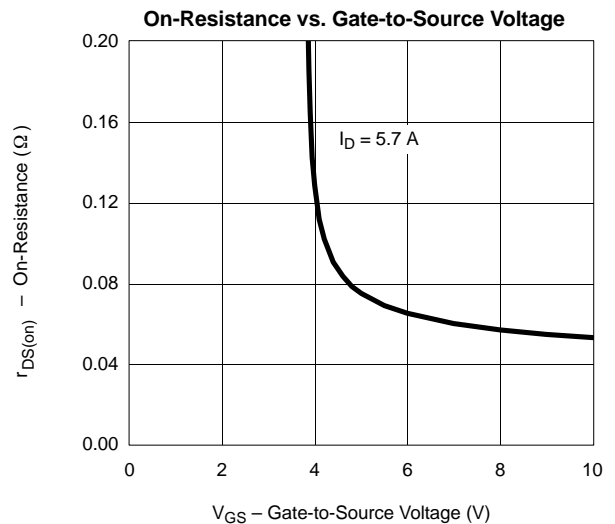
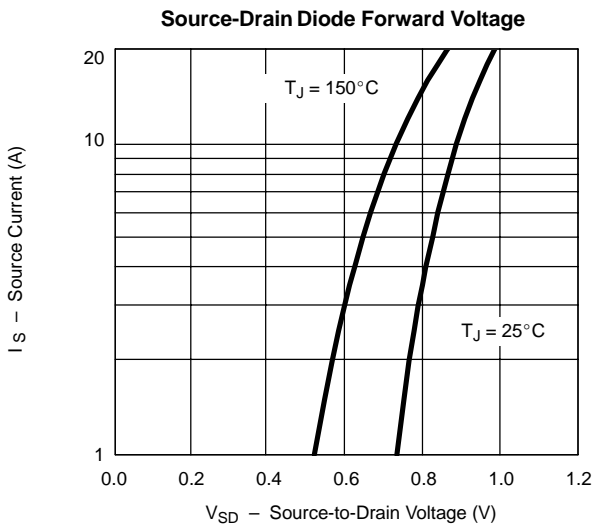
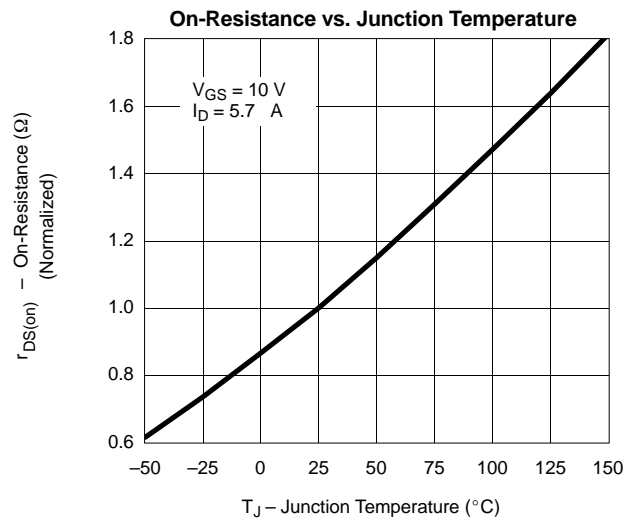
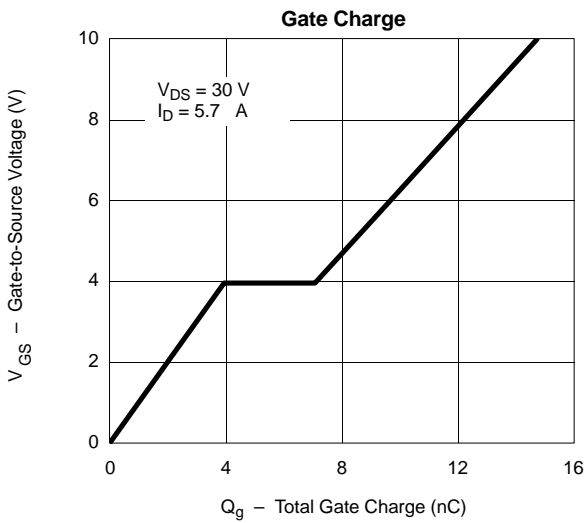
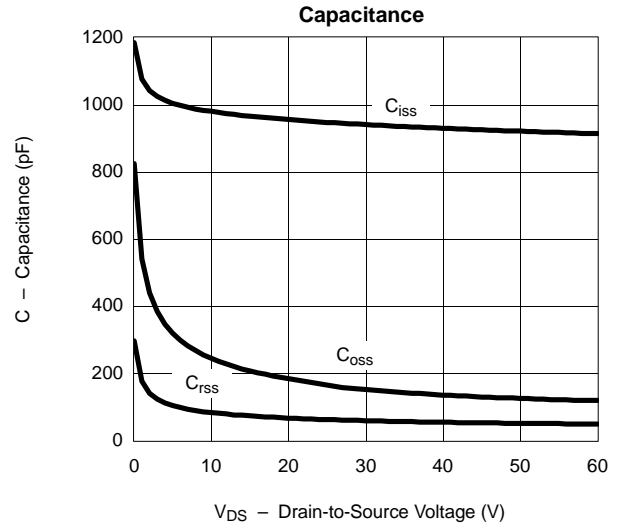
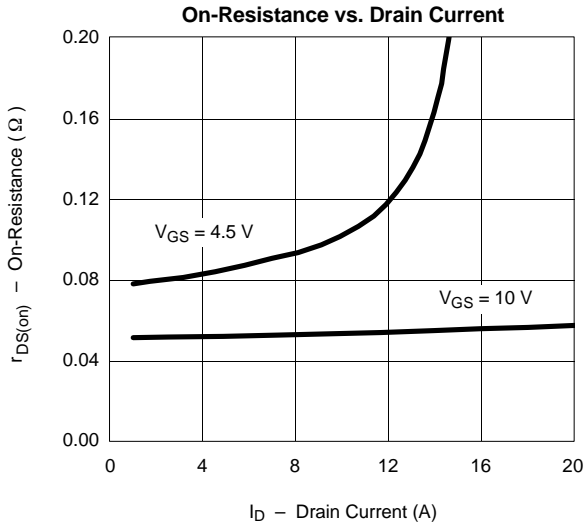
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.

## TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)





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