

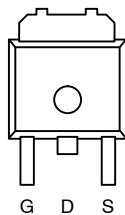


## N-Channel 100-V (D-S) 175°C MOSFET

**175°C Rated**  
Maximum Junction Temperature  
**TrenchFET®**  
Power MOSFETs

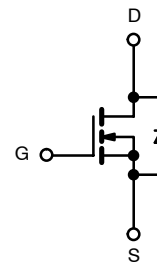
PRODUCT SUMMARY			
V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)	Q <sub>g</sub> (Typ)
100	0.200 @ V <sub>GS</sub> = 10 V	6.5	2.7
	0.225 @ V <sub>GS</sub> = 4.5 V	6.0	

TO-252



Top View

Drain Connected to Tab



N-Channel MOSFET

Order Number: SUD06N10-225L  
SUD06N10-225L—E3 (Lead (Pb)-Free)

ABSOLUTE MAXIMUM RATINGS (T <sub>A</sub> = 25°C UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V <sub>DS</sub>	100	V
Gate-Source Voltage		V <sub>GS</sub>	± 20	
Continuous Drain Current (T <sub>J</sub> = 175°C) <sup>b</sup>	T <sub>C</sub> = 25°C	I <sub>D</sub>	6.5	A
	T <sub>C</sub> = 125°C		3.75	
Pulsed Drain Current		I <sub>DM</sub>	8.0	
Continuous Source Current (Diode Conduction)		I <sub>S</sub>	6.5	
Avalanche Current		I <sub>AR</sub>	5.0	
Repetitive Avalanche Energy (Duty Cycle ≤ 1%)	L = 0.1 mH	E <sub>AR</sub>	1.25	
Maximum Power Dissipation	T <sub>C</sub> = 25°C	P <sub>D</sub>	20 <sup>b</sup>	W
	T <sub>A</sub> = 25°C		1.5 <sup>a</sup>	
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>stg</sub>	-55 to 175	°C

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient <sup>a</sup>	t ≤ 10 sec	R <sub>thJA</sub>	40	50	°C/W
	Steady State		80	100	
Junction-to-Case		R <sub>thJC</sub>	6.0	7.5	

Notes

- a. Surface Mounted on 1" x1" FR4 Board.
- b. See SOA curve for voltage derating.

SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	100			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	1.0		3.0	
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> = 100 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 100 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C			50	
		V <sub>DS</sub> = 100 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 175 °C			250	
On-State Drain Current <sup>b</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = 5 V, V <sub>GS</sub> = 10 V	8.0			A
Drain-Source On-State Resistance <sup>b</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 3 A		0.160	0.200	Ω
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 3 A, T <sub>J</sub> = 125 °C			0.350	
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 3 A, T <sub>J</sub> = 175 °C			0.450	
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 1.0 A		0.180	0.225	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 3 A		8.5		S
<b>Dynamic<sup>a</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, F = 1 MHz		240		pF
Output Capacitance	C <sub>oss</sub>			42		
Reverse Transfer Capacitance	C <sub>rss</sub>			17		
Total Gate Charge <sup>c</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 50 V, V <sub>GS</sub> = 5 V, I <sub>D</sub> = 6.5 A		2.7	4.0	nC
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>			0.6		
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>			0.7		
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>	V <sub>DD</sub> = 50 V, R <sub>L</sub> = 7.5 Ω I <sub>D</sub> ≅ 6.5 A, V <sub>GEN</sub> = 10 V, R <sub>g</sub> = 2.5 Ω		7	11	ns
Rise Time <sup>c</sup>	t <sub>r</sub>			8	12	
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>			8	12	
Fall Time <sup>c</sup>	t <sub>f</sub>			9	14	
<b>Source-Drain Diode Ratings and Characteristic (T<sub>C</sub> = 25 °C)</b>						
Pulsed Current	I <sub>SM</sub>				8.0	A
Diode Forward Voltage <sup>b</sup>	V <sub>SD</sub>	I <sub>F</sub> = 6.5 A, V <sub>GS</sub> = 0 V		0.9	1.3	V
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 6.5 A, di/dt = 100 A/μs		35	60	ns

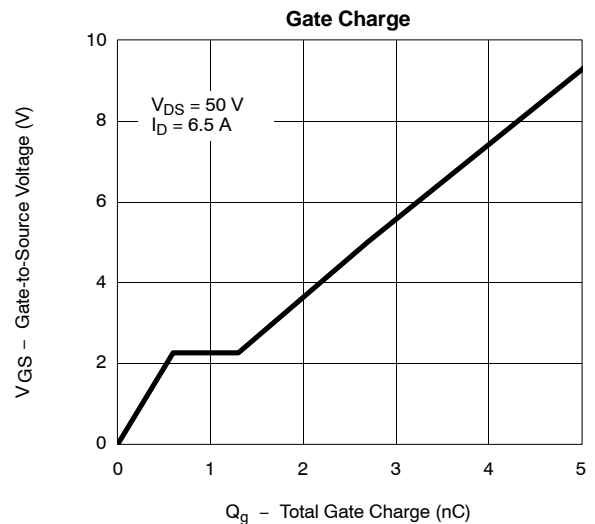
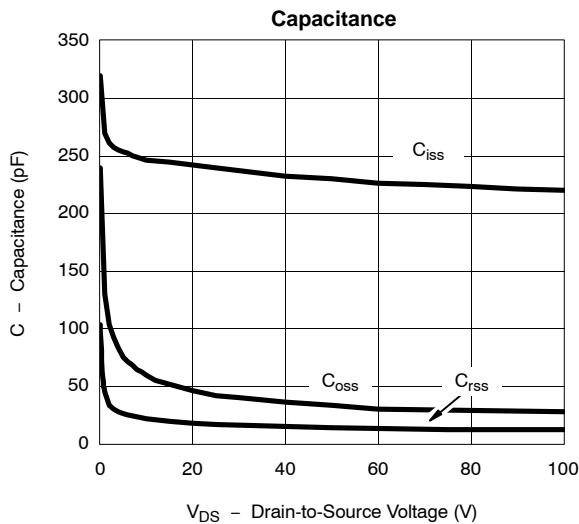
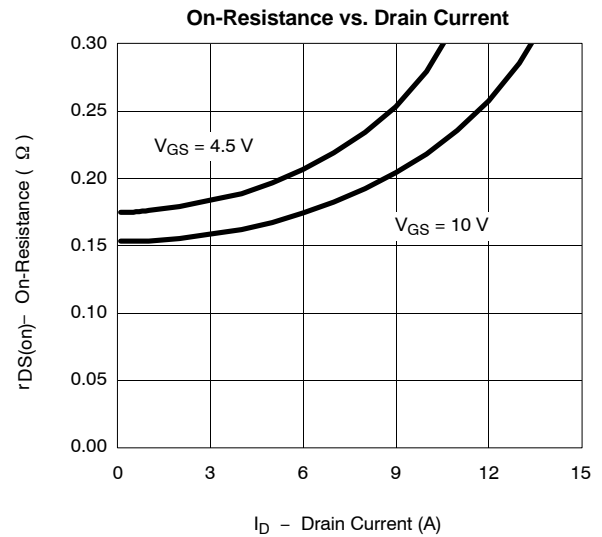
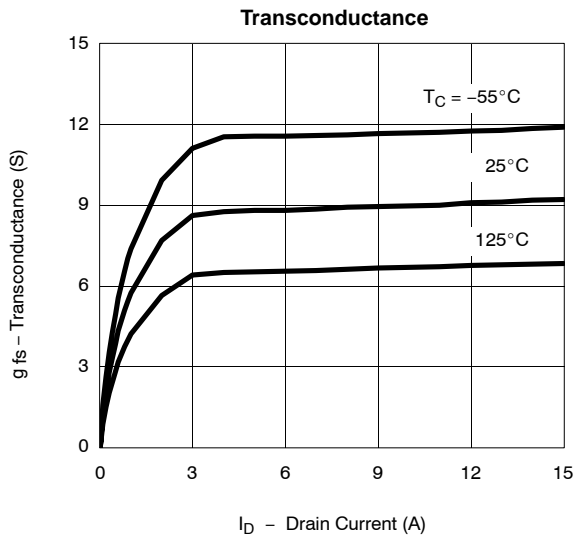
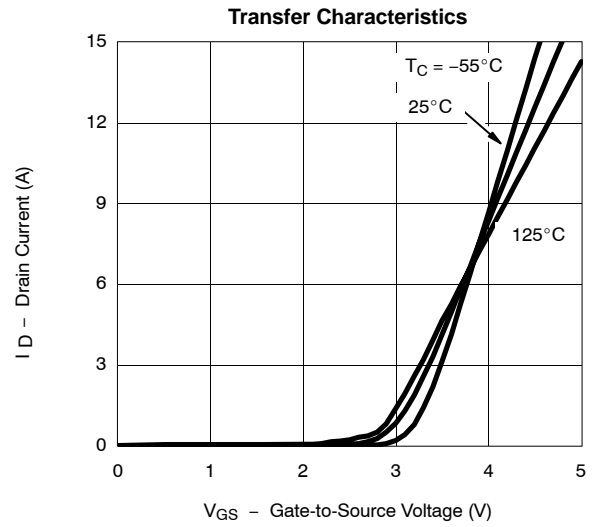
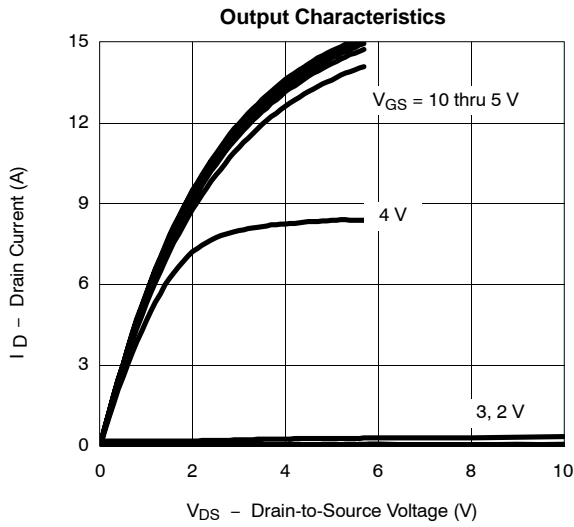
## Notes

- Guaranteed by design, not subject to production testing.
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

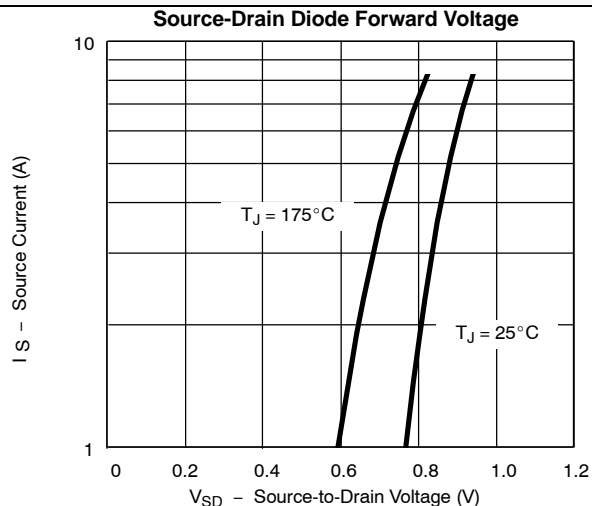
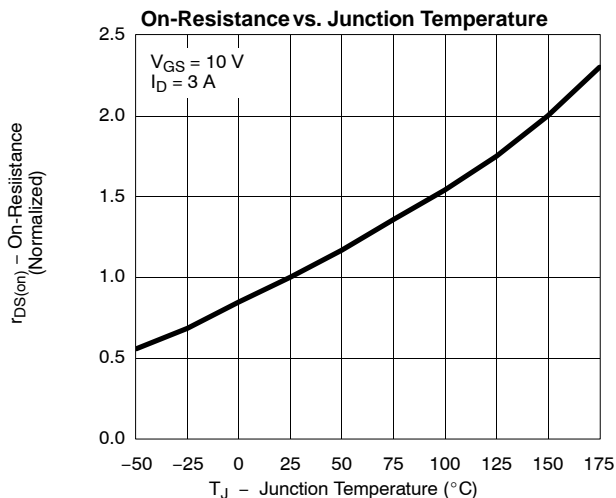


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

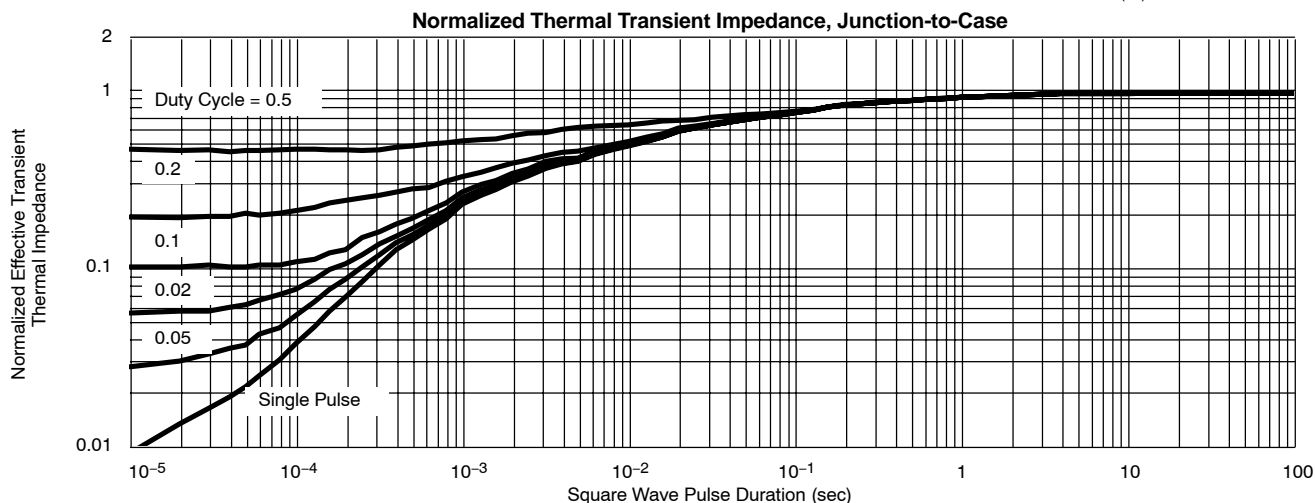
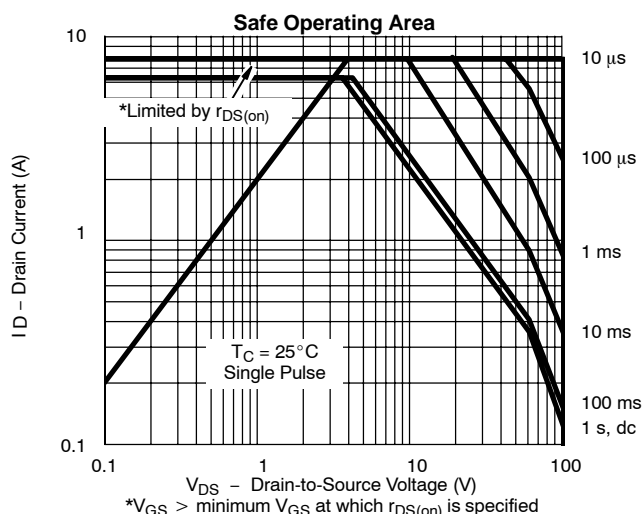
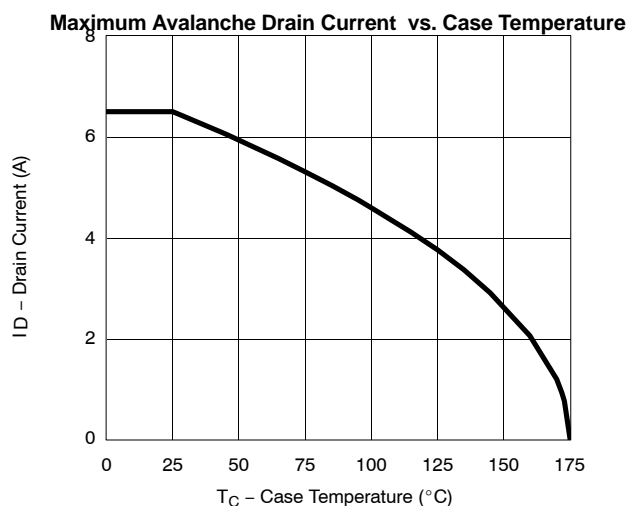




### TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



### THERMAL RATINGS



Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see <http://www.vishay.com/ppg?71253>.



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