

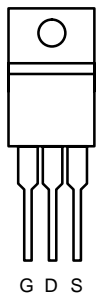


## N-Channel 75-V (D-S) 175°C MOSFET

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
75	0.008 @ $V_{GS} = 10$ V	85 <sup>a</sup>

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

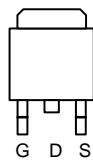
TO-220AB



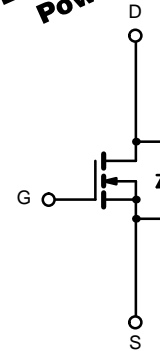
Top View  
SUP85N08-08

DRAIN connected to TAB

TO-263



Top View  
SUB85N08-08



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)			
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	75	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current ( $T_J = 175^\circ\text{C}$ )	$I_D$	$T_C = 25^\circ\text{C}$	85 <sup>a</sup>
		$T_C = 125^\circ\text{C}$	67 <sup>a</sup>
Pulsed Drain Current	$I_{DM}$	240	A
Avalanche Current	$I_{AR}$	75	
Repetitive Avalanche Energy <sup>b</sup>	$E_{AR}$	L = 0.1 mH	280
			mJ
Maximum Power Dissipation <sup>b</sup>	$P_D$	$T_C = 25^\circ\text{C}$ (TO-220AB and TO-263)	250 <sup>c</sup>
		$T_A = 25^\circ\text{C}$ (TO-263) <sup>d</sup>	3.7
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Limit	Unit
Junction-to-Ambient	$R_{thJA}$	PCB Mount (TO-263) <sup>d</sup>	40
		Free Air (TO-220AB)	62.5
Junction-to-Case	$R_{thJC}$	0.6	$^\circ\text{C/W}$

Notes

- a. Package limited.
- b. Duty cycle  $\leq 1\%$ .
- c. See SOA curve for voltage derating.
- d. When mounted on 1" square PCB (FR-4 material).



SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>DS</sub> = 0 V, I <sub>D</sub> = 250 μA	75			V
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	2.5			
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> = 60 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C			50	
		V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 175 °C			250	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 5 V, V <sub>GS</sub> = 10 V	120			A
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 30 A		0.0063	0.008	Ω
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 30 A, T <sub>J</sub> = 125 °C			0.014	
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 30 A, T <sub>J</sub> = 175 °C			0.018	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 30 A	30			S
<b>Dynamic<sup>b</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz		5800		pF
Output Capacitance	C <sub>oss</sub>			900		
Reverse Transfer Capacitance	C <sub>rss</sub>			285		
Total Gate Charge <sup>c</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 35 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 85 A		100	150	nC
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>			35		
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>			25		
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>	V <sub>DD</sub> = 35 V, R <sub>L</sub> = 0.4 Ω I <sub>D</sub> ≅ 85 A, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 2.5 Ω		20	30	ns
Rise Time <sup>c</sup>	t <sub>r</sub>			115	175	
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>			50	75	
Fall Time <sup>c</sup>	t <sub>f</sub>			80	120	
<b>Source-Drain Diode Ratings and Characteristics (T<sub>C</sub> = 25 °C)<sup>b</sup></b>						
Continuous Current	I <sub>S</sub>				85	A
Pulsed Current	I <sub>SM</sub>				240	
Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>F</sub> = 85 A, V <sub>GS</sub> = 0 V		1.0	1.5	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 85 A, di/dt = 100 A/μs		70	120	ns
Peak Reverse Recovery Current	I <sub>RM(REC)</sub>			4	7	A
Reverse Recovery Charge	Q <sub>rr</sub>				0.14	0.30

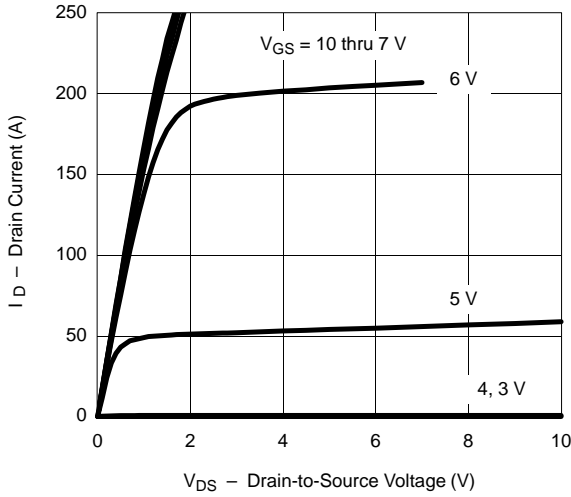
Notes

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

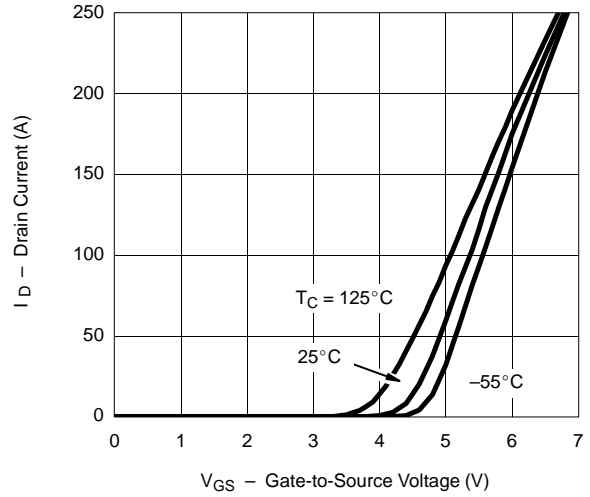


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

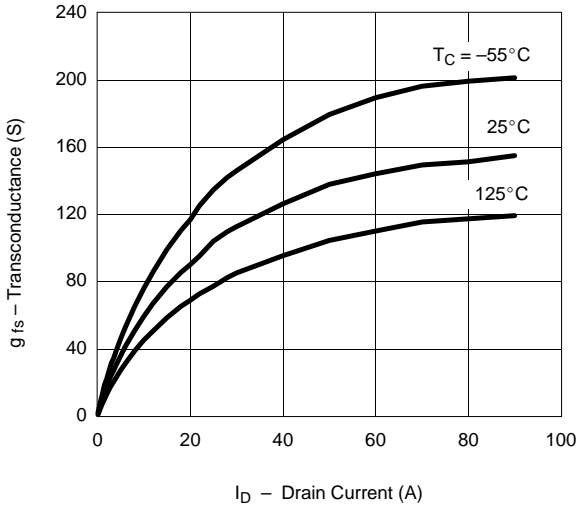
**Output Characteristics**



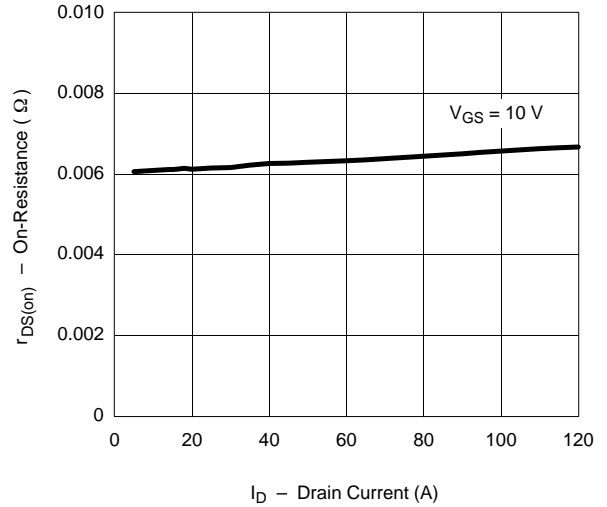
**Transfer Characteristics**



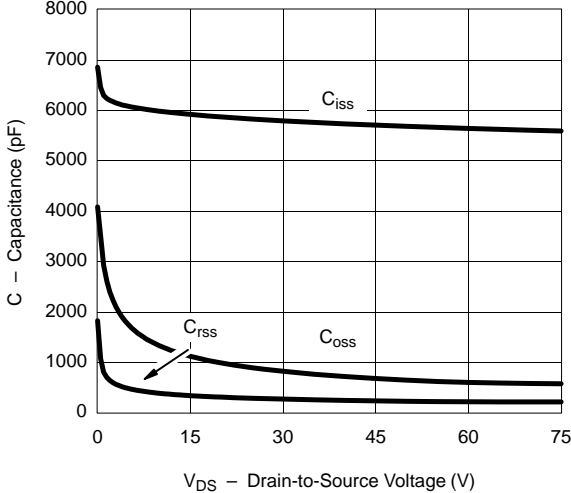
**Transconductance**



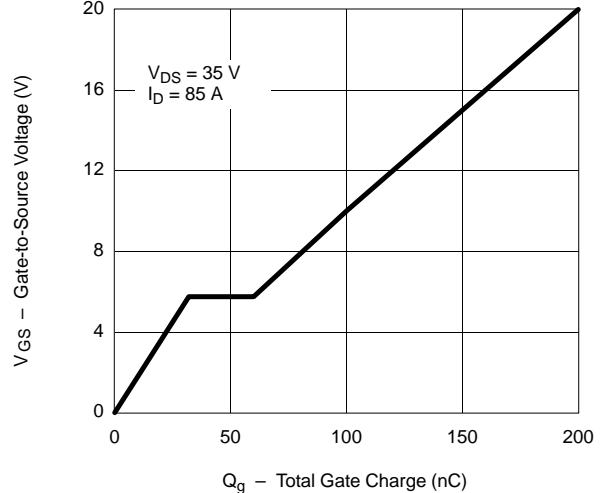
**On-Resistance vs. Drain Current**



**Capacitance**

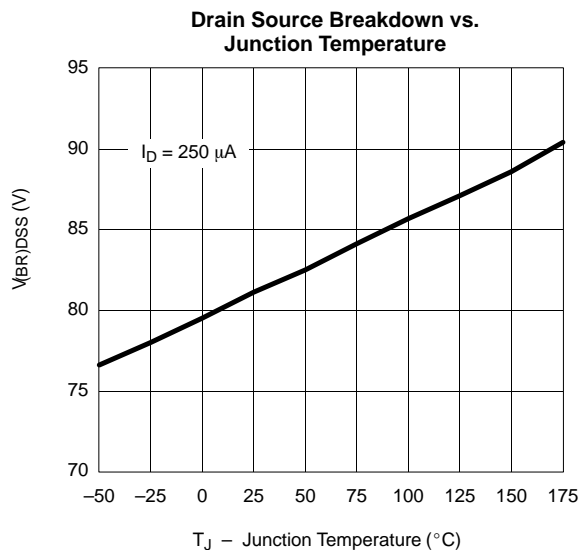
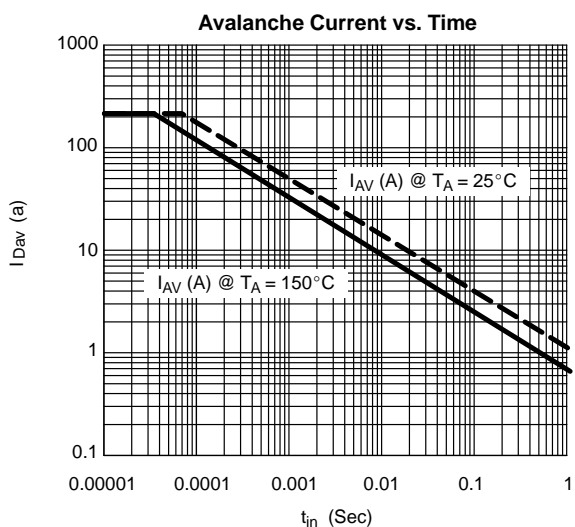
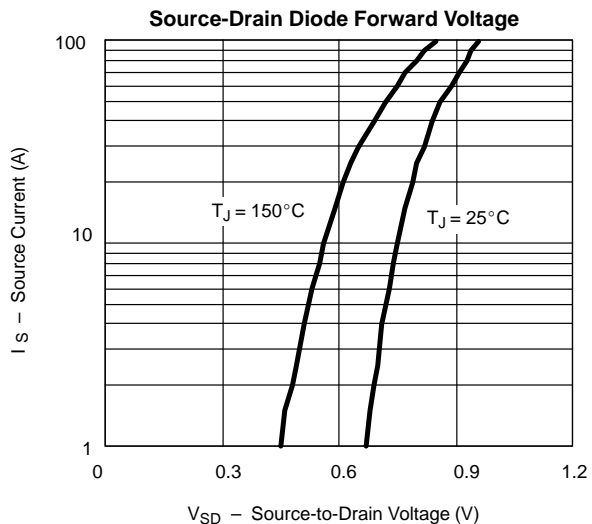
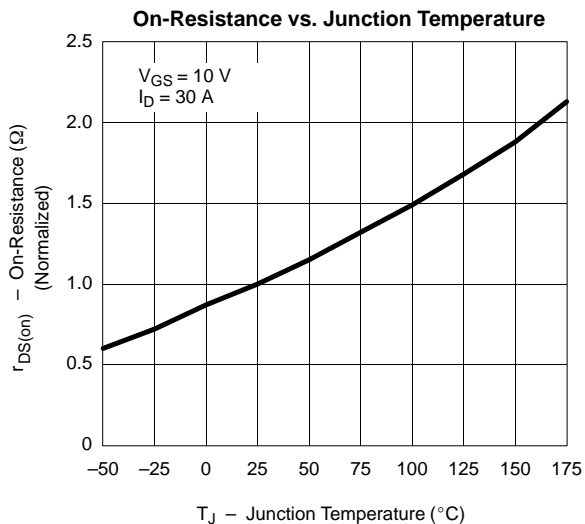


**Gate Charge**





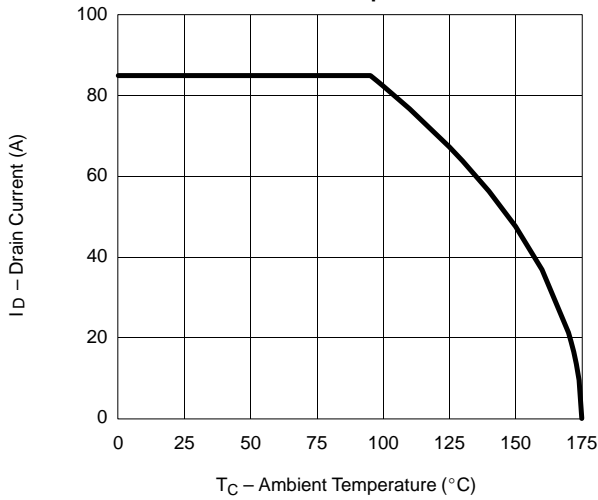
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**



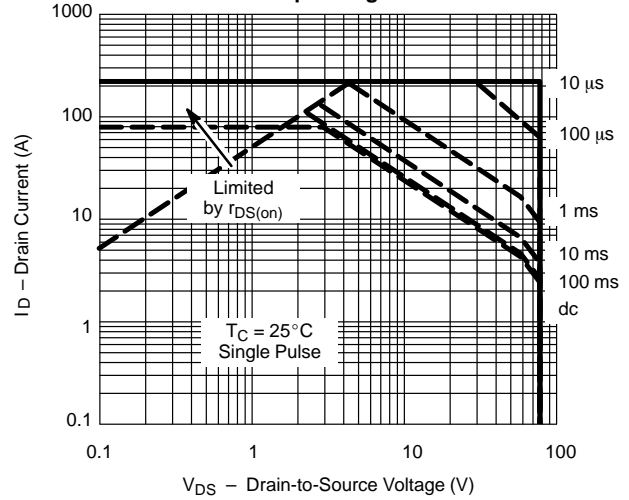


**THERMAL RATINGS**

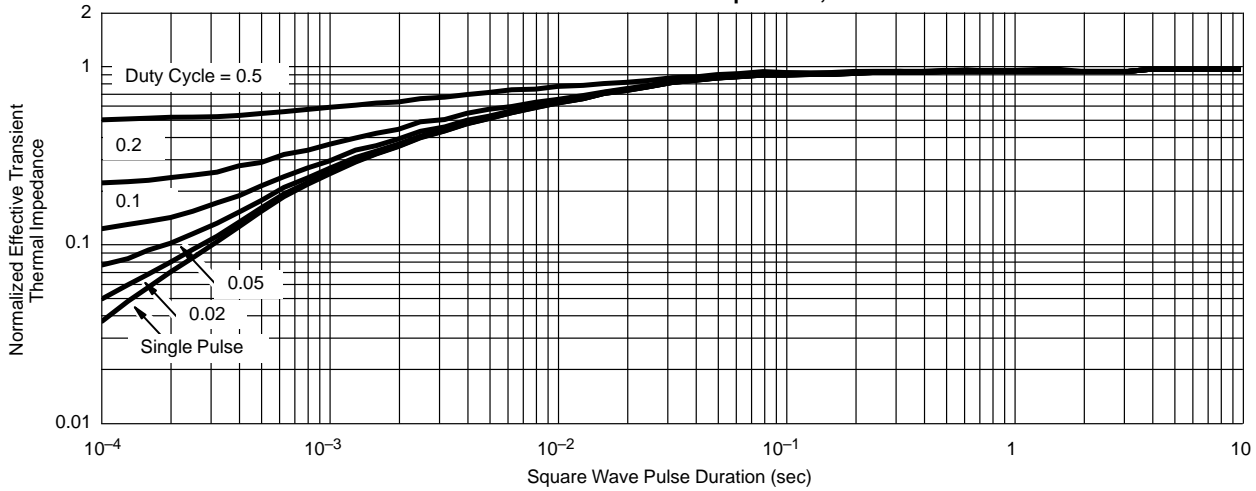
Maximum Avalanche and Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case





## Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.