

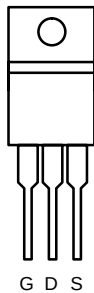


N-Channel 30-V (D-S) 175°C MOSFET

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A) ^a
30	0.007 @ $V_{GS} = 10$ V	85 ^a
	0.01 @ $V_{GS} = 4.5$ V	75

175°C Rated
Maximum Junction Temperature
TrenchFET®
Power MOSFETs

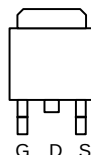
TO-220AB



DRAIN connected to TAB

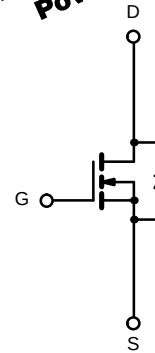
Top View
SUP85N03-07P

TO-263



Top View

SUB85N03-07P



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 175^\circ\text{C}$)	$T_C = 25^\circ\text{C}$	I_D	85 ^a	A
	$T_C = 100^\circ\text{C}$		64	
Pulsed Drain Current		I_{DM}	240	
Avalanche Current		I_{AR}	75	mJ
Repetitive Avalanche Energy ^b		E_{AR}	280	
Maximum Power Dissipation ^b	$T_C = 25^\circ\text{C}$ (TO-220AB and TO-263)	P_D	107 ^c	W
	$T_A = 25^\circ\text{C}$ (TO-263) ^d		3.75	
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	PCB Mount (TO-263) ^d	R_{thJA}	40	$^\circ\text{C/W}$
	Free Air (TO-220AB)		62.5	
Junction-to-Case		R_{thJC}	1.4	

Notes

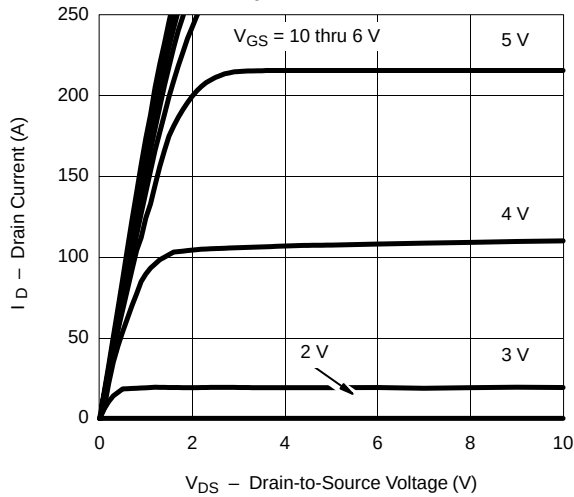
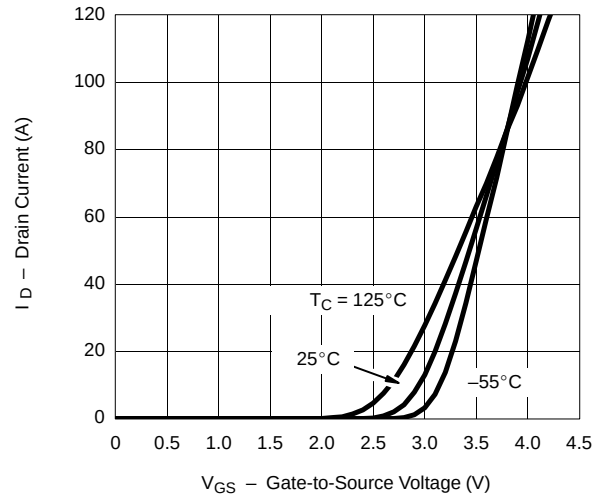
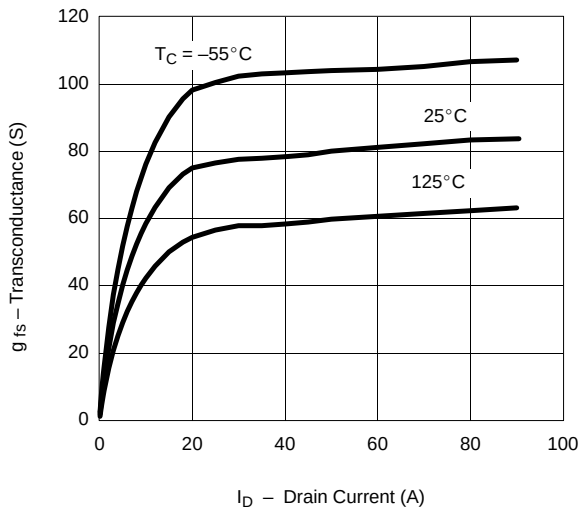
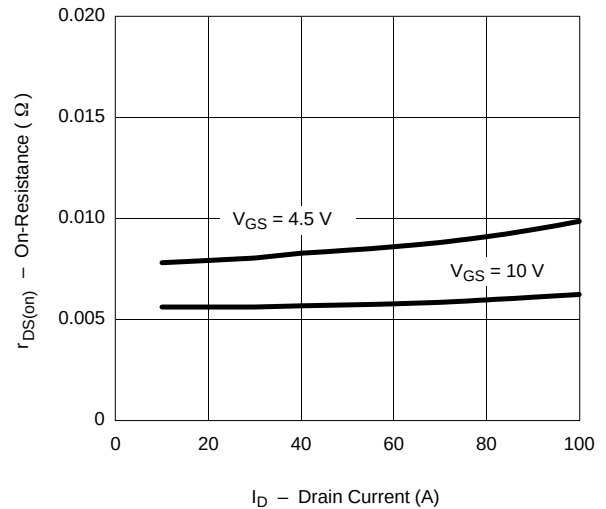
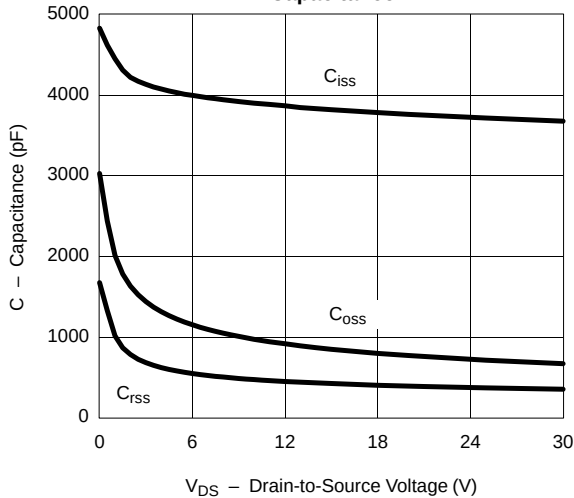
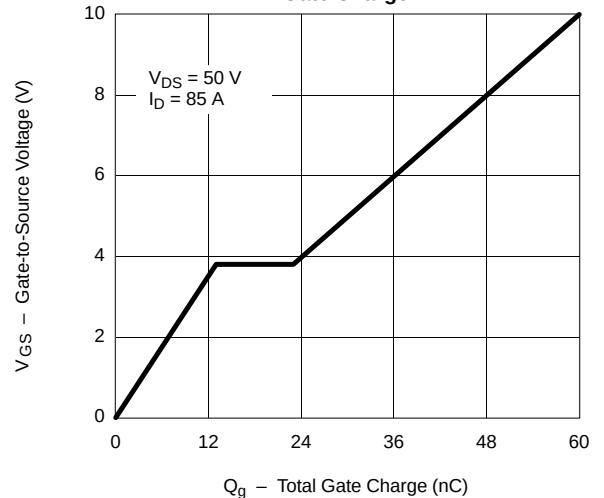
- Package limited.
- Duty cycle $\leq 1\%$.
- See SOA curve for voltage derating.
- When mounted on 1" square PCB (FR-4 material).

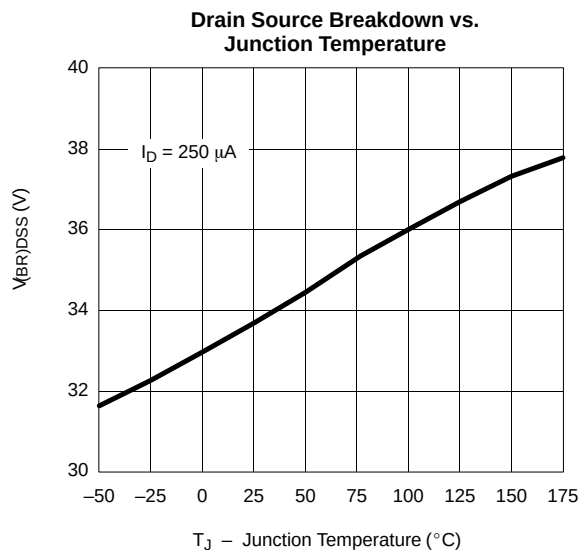
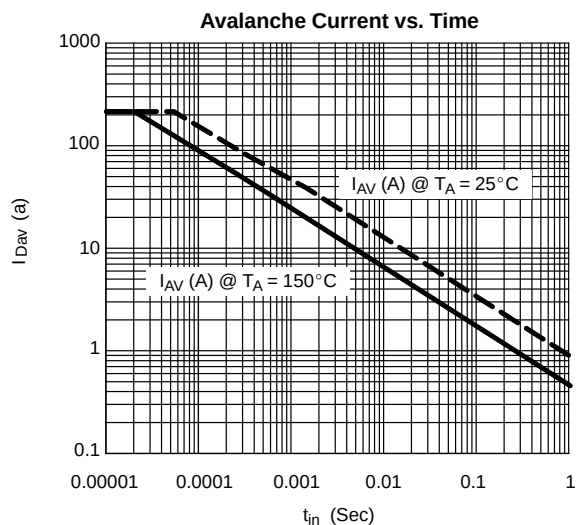
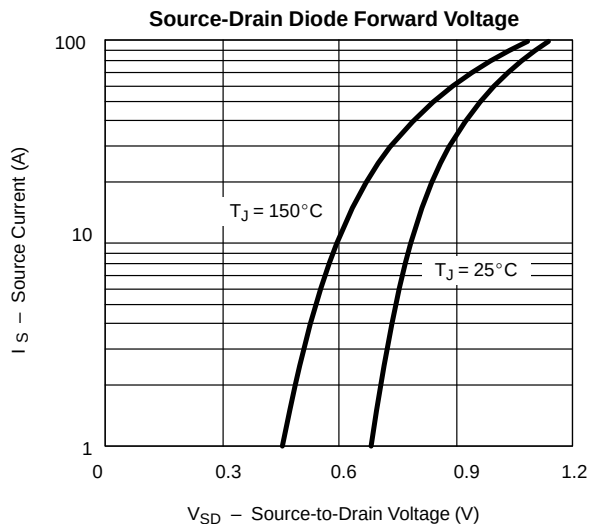
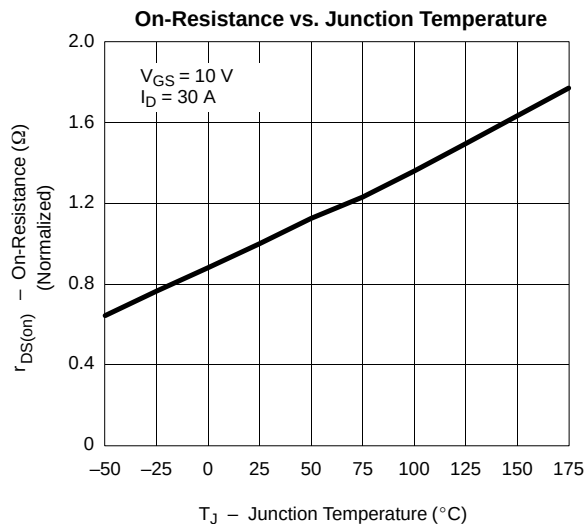


SPECIFICATIONS (T _J =25° C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{DS} = 0 V, I _D = 250 μA	30			V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1	2		
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V			1	μA
		V _{DS} = 30 V, V _{GS} = 0 V, T _J = 125° C			50	
		V _{DS} = 30 V, V _{GS} = 0 V, T _J = 175° C			250	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 10 V	120			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 30 A		0.006	0.007	Ω
		V _{GS} = 10 V, I _D = 30 A, T _J = 125° C			0.011	
		V _{GS} = 10 V, I _D = 30 A, T _J = 175° C			0.015	
		V _{GS} = 4.5 V, I _D = 20 A			0.01	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 30 A	20			S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		3720		pF
Output Capacitance	C _{oss}			715		
Reverse Transfer Capacitance	C _{rss}			370		
Total Gate Charge ^b	Q _g	V _{DS} = 15 V, V _{GS} = 10 V, I _D = 85 A		60	120	nC
Gate-Source Charge ^b	Q _{gs}			13		
Gate-Drain Charge ^b	Q _{gd}			10		
Turn-On Delay Time ^b	t _{d(on)}	V _{DD} = 15 V, R _L = 0.18 Ω I _D ≈ 85 A, V _{GEN} = 10 V, R _G = 2.5 Ω		11	25	ns
Rise Time ^b	t _r			70	140	
Turn-Off Delay Time ^b	t _{d(off)}			50	100	
Fall Time ^b	t _f			105	200	
Source-Drain Diode Ratings and Characteristics (T _C = 25° C) ^c						
Continuous Current	I _S				85	A
Pulsed Current	I _{SM}				200	
Forward Voltage ^a	V _{SD}	I _F = 85 A, V _{GS} = 0 V		1.2	1.5	V
Reverse Recovery Time	t _{rr}	I _F = 85 A, di/dt = 100 A/μs		55	100	ns

Notes

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

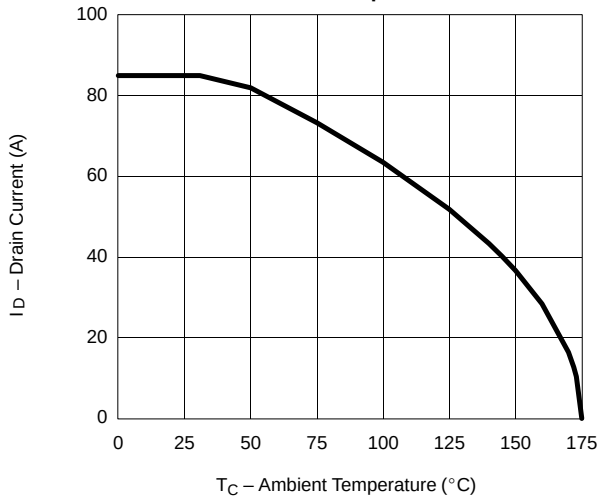
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)****Output Characteristics****Transfer Characteristics****Transconductance****On-Resistance vs. Drain Current****Capacitance****Gate Charge**

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)


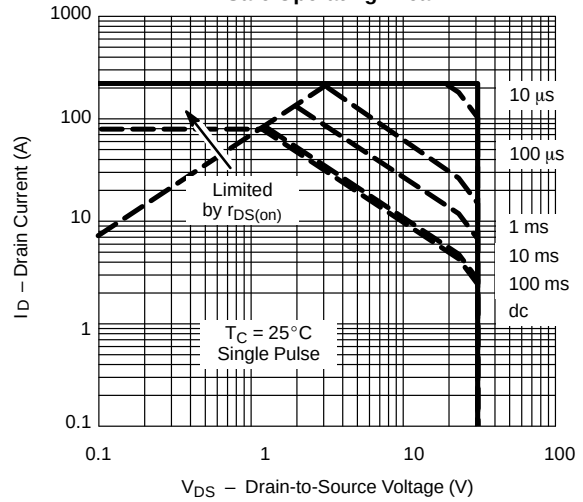


THERMAL RATINGS

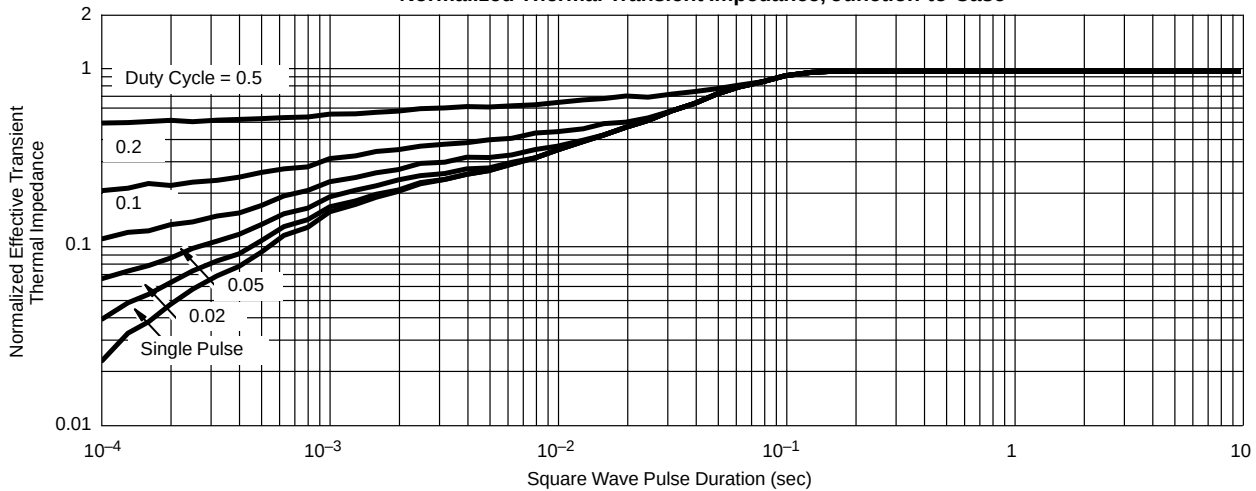
Maximum Avalanche and Drain Current
vs. Case Temperature



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.