



New Product

SUP/SUB85N03-07P

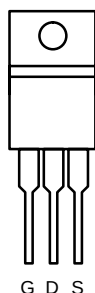
Vishay Siliconix

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

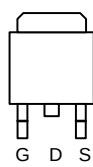
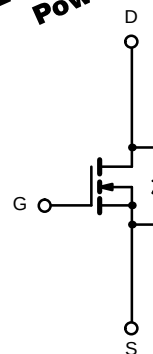
175°C Rated
Maximum Junction Temperature
TrenchFET®
Power MOSFETs

TO-220AB

Top View
SUP85N03-07P

DRAIN connected to TAB

TO-263

Top View
SUB85N03-07P

N-Channel MOSFET

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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).

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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

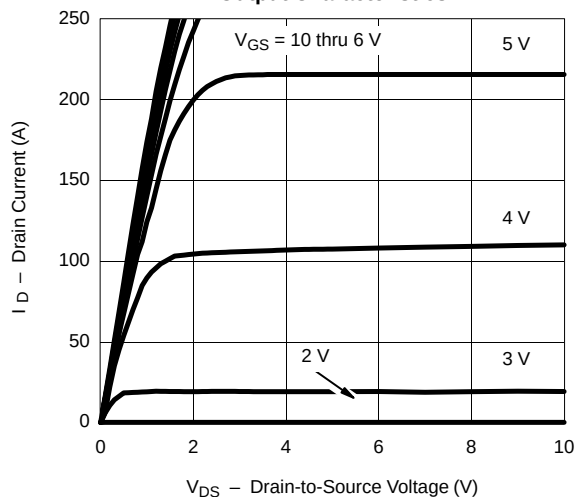
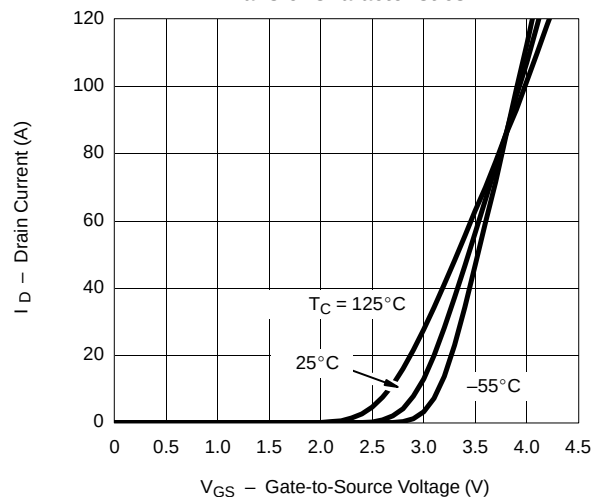
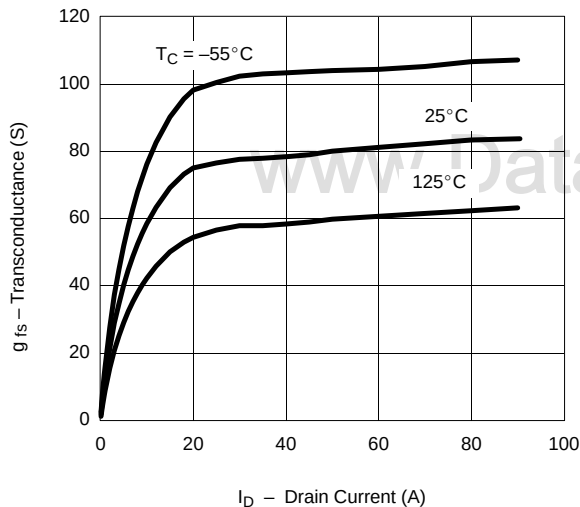
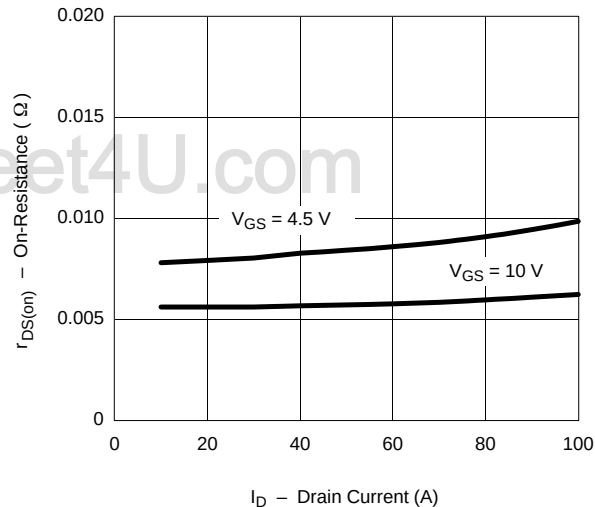
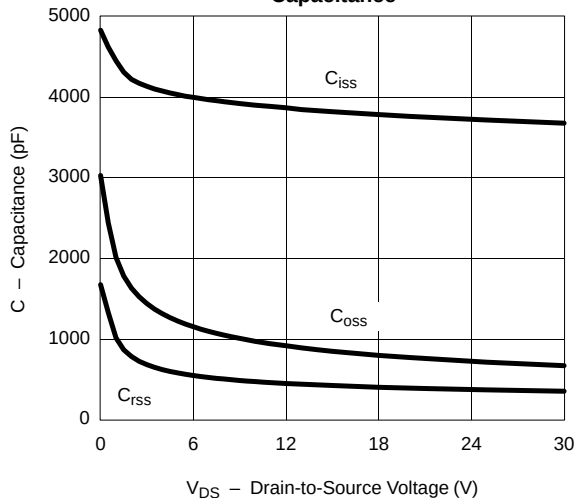
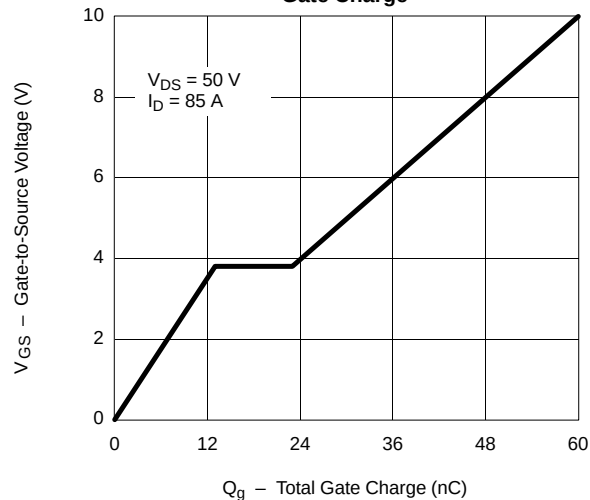
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Independent of operating temperature.
c. Guaranteed by design, not subject to production testing.

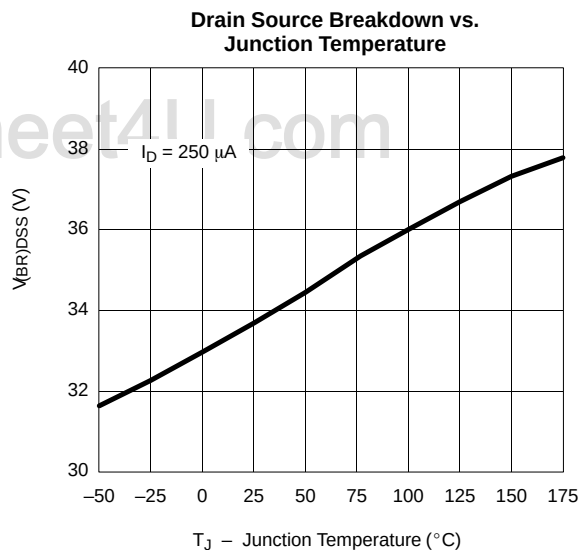
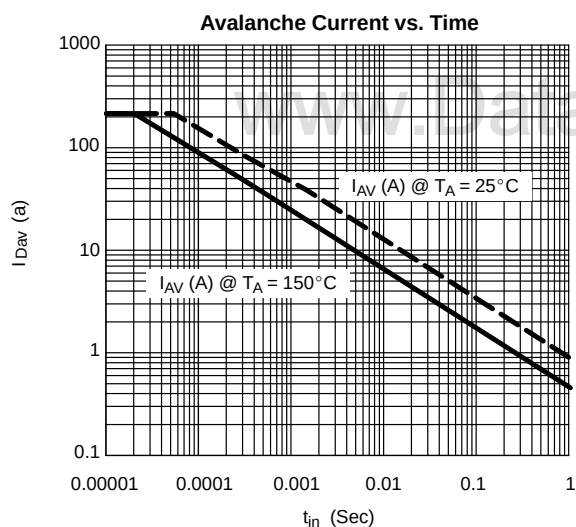
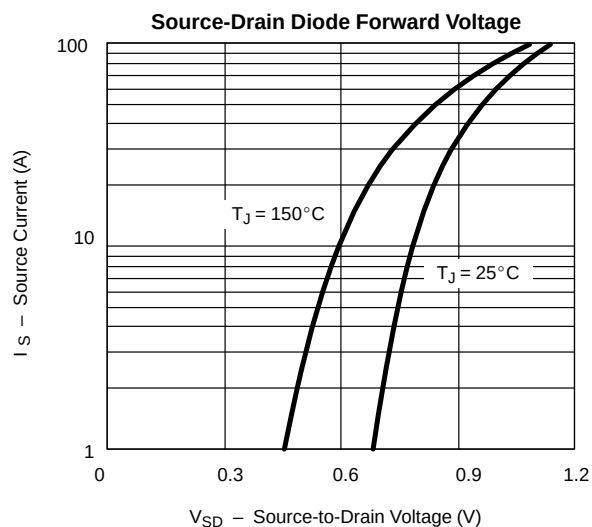
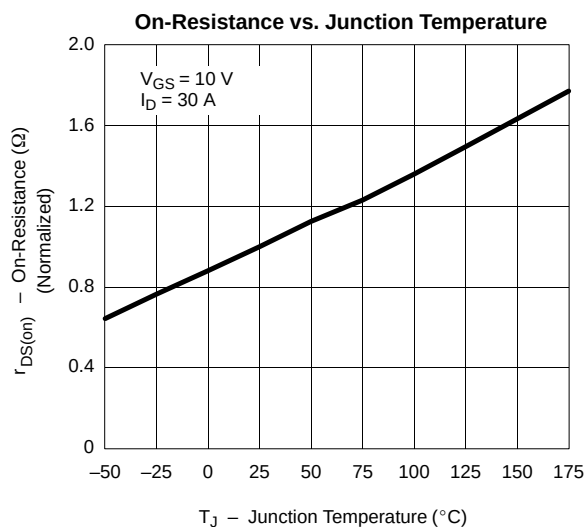


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TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**Output Characteristics****Transfer Characteristics****Transconductance****On-Resistance vs. Drain Current****Capacitance****Gate Charge**

SUP/SUB85N03-07P**Vishay Siliconix****New Product****TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**



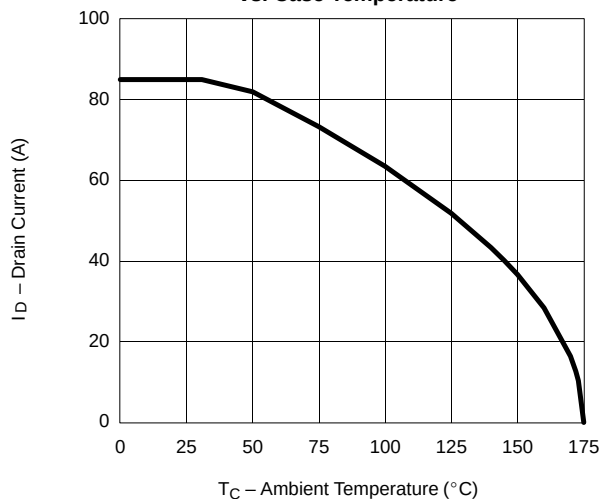
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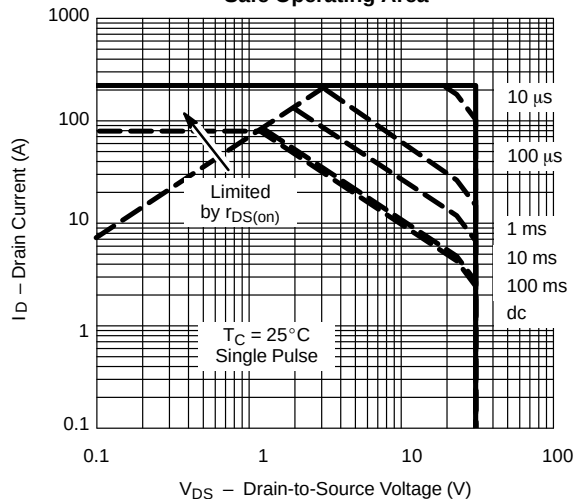
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THERMAL RATINGS

Maximum Avalanche and Drain Current
vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

