

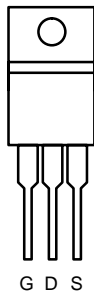


N-Channel 30-V (D-S) 175°C MOSFET

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

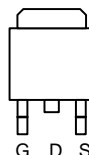
TO-220AB



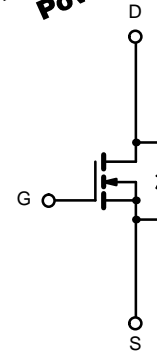
Top View
SUP85N03-07P

DRAIN connected to TAB

TO-263



Top View
SUB85N03-07P



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _A = 25°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°C)	I _D	T _C = 25°C	85 ^a
		T _C = 100°C	64
Pulsed Drain Current	I _{DM}	240	A
Avalanche Current	I _{AR}	75	
Repetitive Avalanche Energy ^b	E _{AR}	280	
Maximum Power Dissipation ^b	P _D	T _C = 25°C (TO-220AB and TO-263)	107 ^c
		T _A = 25°C (TO-263) ^d	3.75
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to 175	°C

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Limit	Unit
Junction-to-Ambient	R _{thJA}	PCB Mount (TO-263) ^d	40
		Free Air (TO-220AB)	62.5
Junction-to-Case	R _{thJC}	1.4	°C/W

Notes

- a. Package limited.
- b. Duty cycle ≤ 1%.
- c. See SOA curve for voltage derating.
- d. 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

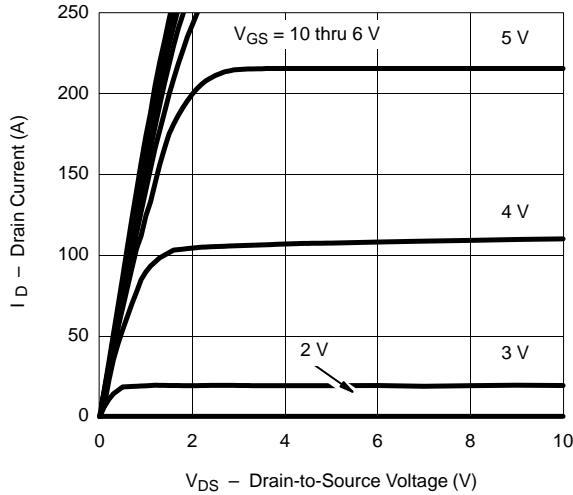
Notes

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

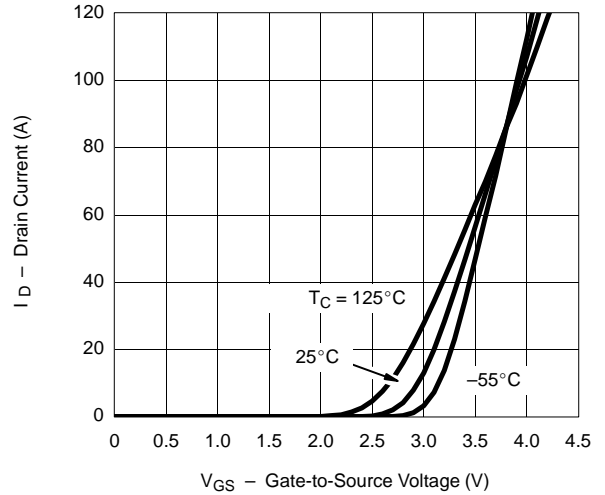


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

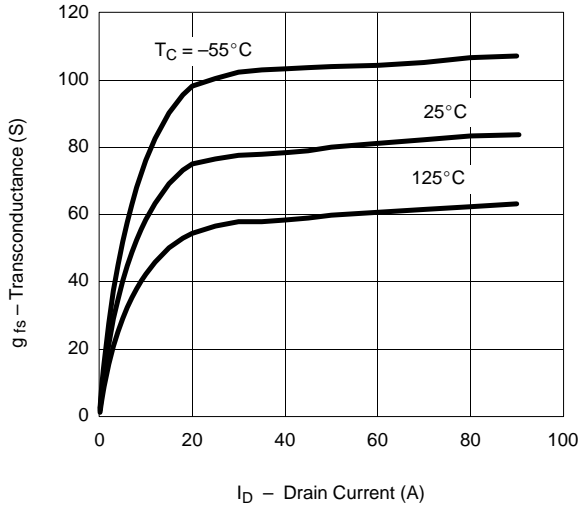
Output Characteristics



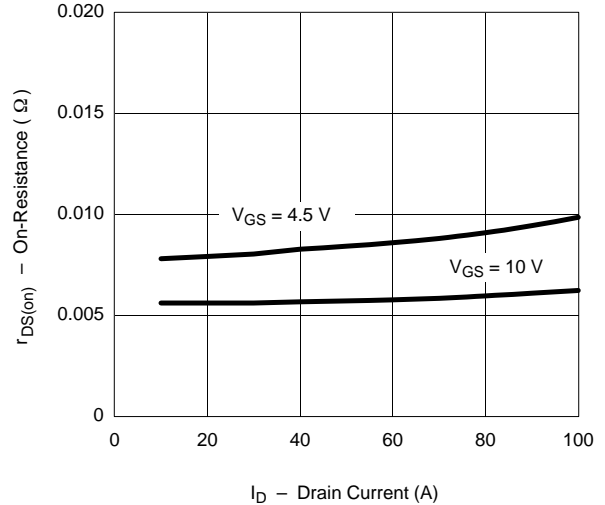
Transfer Characteristics



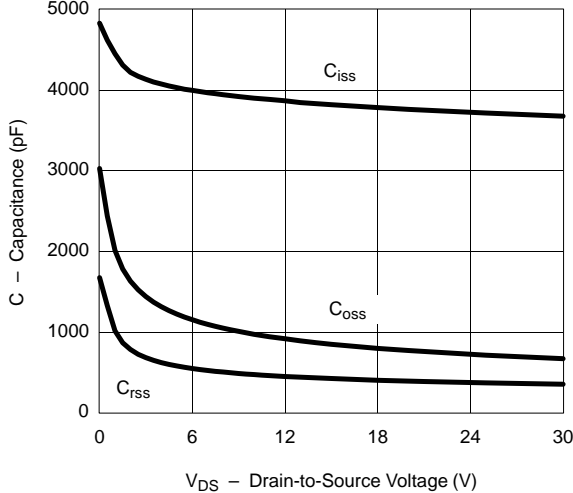
Transconductance



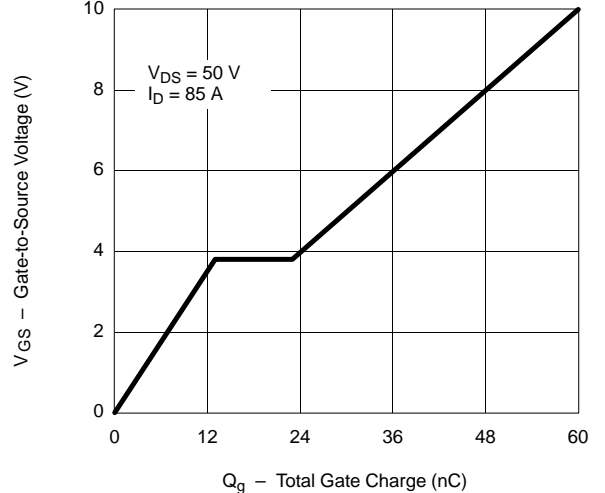
On-Resistance vs. Drain Current



Capacitance

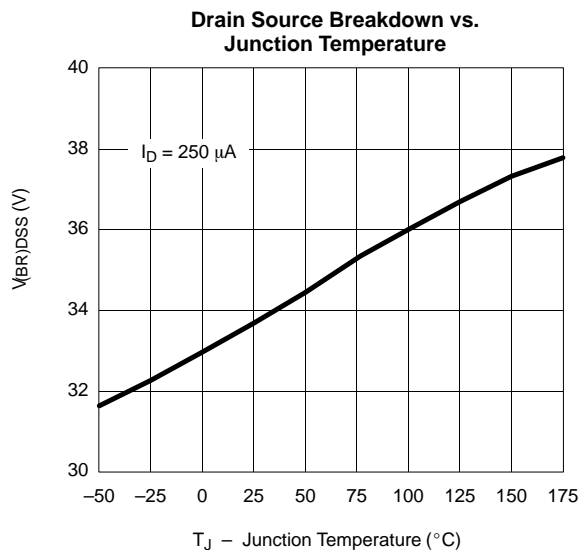
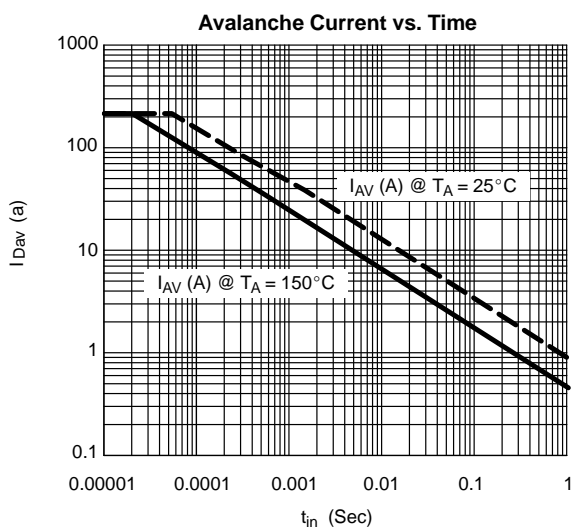
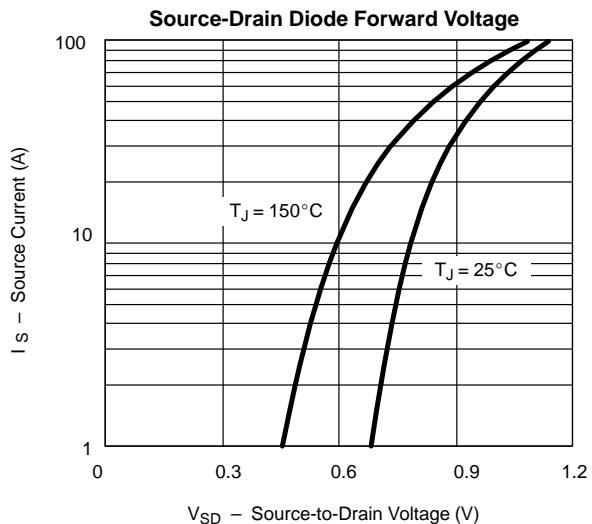
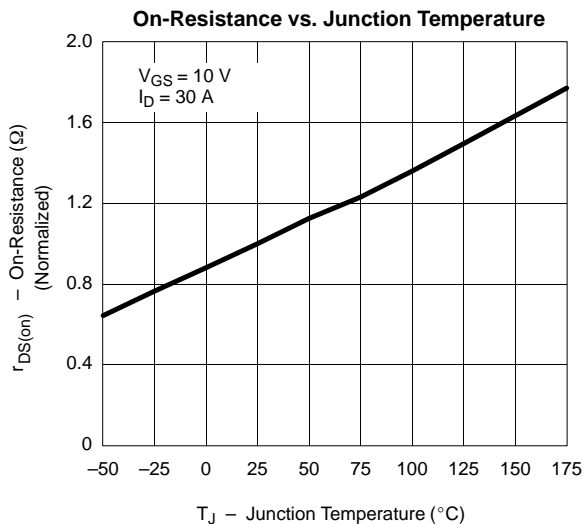


Gate Charge





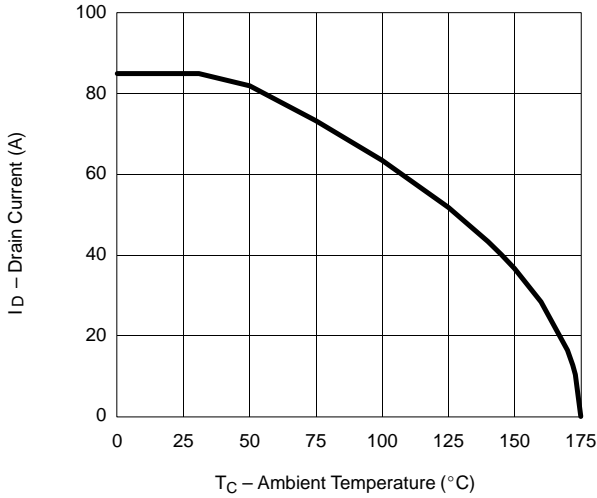
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



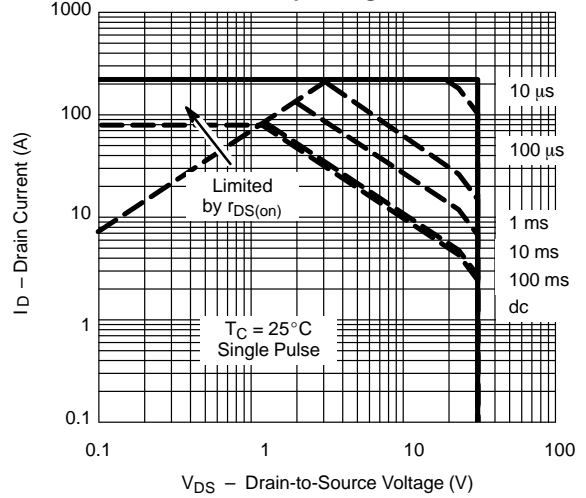


THERMAL RATINGS

Maximum Avalanche and Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

