



N-Channel 30-V (D-S) MOSFET

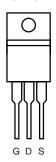
PRODUCT SUMMARY				
V _{DS} (V)	$R_{DS(on)}(\Omega)$ $I_D(A)$		Q _g (Typ.)	
30	$0.0036 \text{ at V}_{GS} = 10 \text{ V}$	85 ^d	67	
30	0.0044 at $V_{GS} = 4.5 \text{ V}$	85 ^d	07	

FEATURES

- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET[®] Power MOSFET
- 100 % R_q and UIS Tested
- Compliant to RoHS Directive 2002/95/EC



TO-220AB

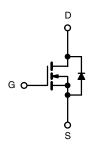


Top View

Ordering Information: SUP85N03-3m6P-GE3 (Lead (Pb)-free and Halogen-free)

APPLICATIONS

- Power Supply
 - Secondary Synchronous Rectification
- DC/DC Converter



N-Channel MOSFET

ABSOLUTE MAXIMUM RATING	$T_C = 25 ^{\circ}C$, unless other	erwise noted			
Parameter	Symbol	Limit	Unit		
Drain-Source Voltage	V _{DS}	30	V		
Gate-Source Voltage		V _{GS}	± 20	V	
Continuous Drain Current (T _{.I} = 150 °C)	T _C = 25 °C	1-	85 ^d	۸	
Continuous Diairi Current (1) = 130 °C)	T _C = 70 °C	I _D	85 ^d		
Pulsed Drain Current		I _{DM}	120	A	
Avalanche Current		I _{AS}	45		
Single Avalanche Energy ^a	L = 0.1 mH	E _{AS}	101	mJ	
Maximum Power Dissipation ^a	T _C = 25 °C	В	78.1 ^b	W	
	T _A = 25 °C ^c	$ P_D$ $-$	3.1		
Operating Junction and Storage Temperature Range		T _J , T _{stg}	- 55 to 150	°C	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Limit	Unit		
Junction-to-Ambient (PCB Mount) ^c	R _{thJA}	40	°C/W		
Junction-to-Case (Drain)	R _{thJC}	1.6			

Notes:

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

SUP85N03-3m6P

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Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	$V_{DS} = 0 \text{ V}, I_D = 250 \mu\text{A}$	30			V
Gate Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_D = 250 \mu A$	1		2.5	
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 250	nA
Zero Gate Voltage Drain Current		V _{DS} = 30 V, V _{GS} = 0 V			1	μΑ
	I _{DSS}	$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 125 ^{\circ}\text{C}$			50	
		$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 150 ^{\circ}\text{C}$			250	
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \ge 10 \text{ V}, V_{GS} = 10 \text{ V}$	50			Α
Drain-Source On-State Resistance ^a		V _{GS} = 10 V, I _D = 22 A		0.0030	0.0036	Ω
	R _{DS(on)}	$V_{GS} = 4.5 \text{ V}, I_D = 20 \text{ A}$		0.0036	0.0044	
Forward Transconductance ^a	9 _{fs}	V _{DS} = 15 V, I _D = 20 A		110		S
Dynamic ^b	•			•		
Input Capacitance	C _{iss}			3535		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V, V _{DS} = 15 V, f = 1 MHz		680		
Reverse Transfer Capacitance	C _{rss}			400		
Total Gate Charge ^c	Q_g			67	100	nC
Gate-Source Charge ^c	Q_{gs}	$V_{DS} = 15 \text{ V}, V_{GS} = 10 \text{ V}, I_{D} = 20 \text{ A}$		10.5		
Gate-Drain Charge ^c	Q_{gd}			12.2		
Gate Resistance	R_{g}	f = 1 MHz	0.3	1.4	2.8	Ω
Turn-On Delay Time ^c	t _{d(on)}			11	20	
Rise Time ^c	t _r	V_{DD} = 15 V, R_L = 1.5 Ω		10	20	ns
Turn-Off Delay Time ^c	t _{d(off)}	$I_D \cong 10 \text{ A}, V_{GEN} = 10 \text{ V}, R_g = 1 \Omega$		35	53	
Fall Time ^c	t _f			10	20	
Drain-Source Body Diode Ratings ar	nd Characteris	stics T _C = 25 °C ^b		•		
Continuous Current	Is				85	
Pulsed Current	I _{SM}				120	Α
Forward Voltage ^a	V _{SD}	I _F = 10 A, V _{GS} = 0 V		0.83	1.5	V
Reverse Recovery Time	t _{rr}	I _F = 10 A, dl/dt = 100 A/μs		41	62	ns
Peak Reverse Recovery Current	I _{RM(REC)}			2	3	Α
Reverse Recovery Charge	Q _{rr}	-		40	60	nC

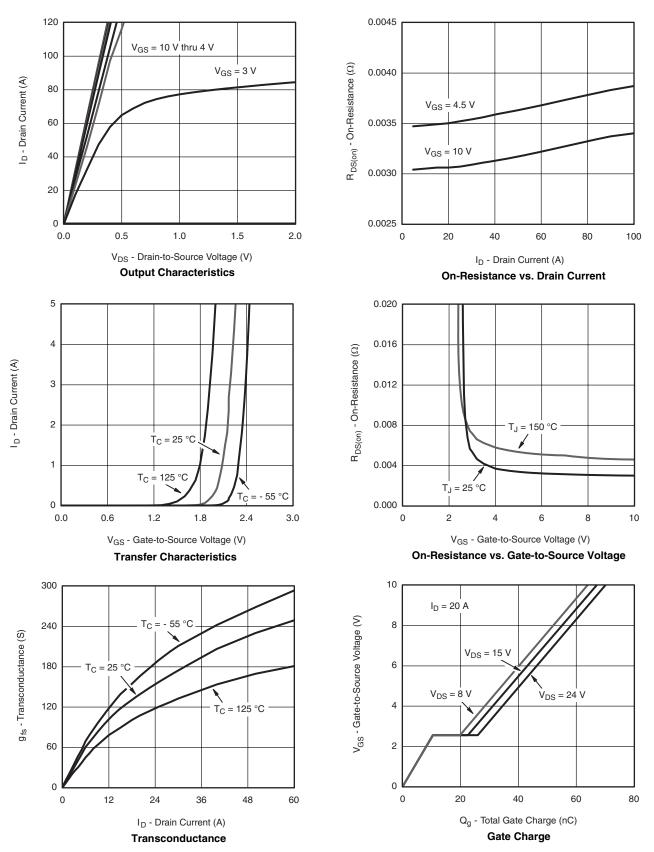
Notes:

- a. Pulse test; pulse width $\leq 300~\mu s,$ duty cycle $\leq 2~\%.$
- b. Guaranteed by design, not subject to production testing.
- c. 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.



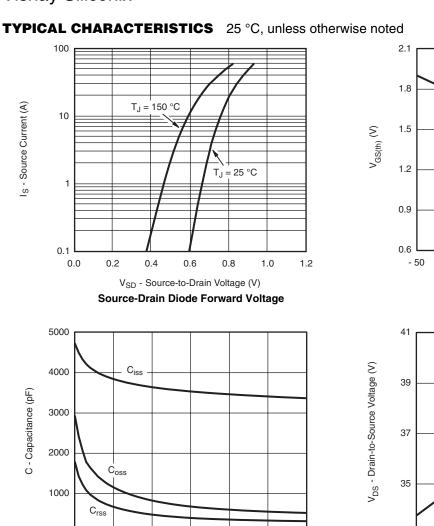
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

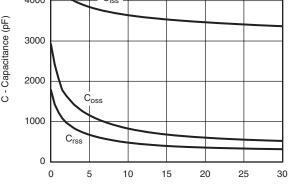


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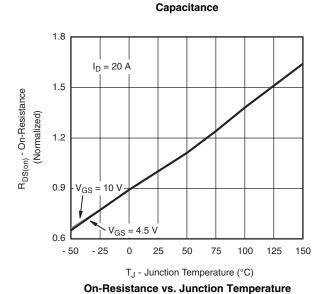
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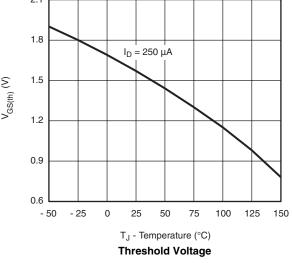


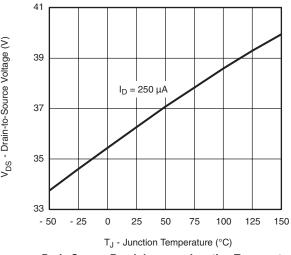




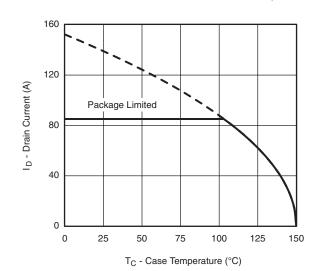
 V_{DS} - Drain-to-Source Voltage (V)









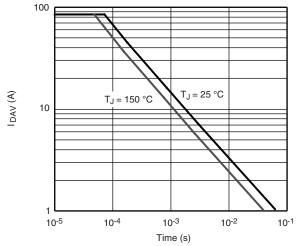


Current Derating

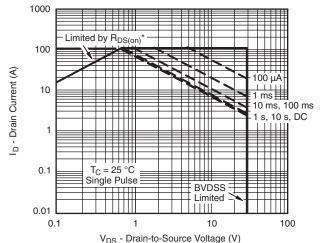


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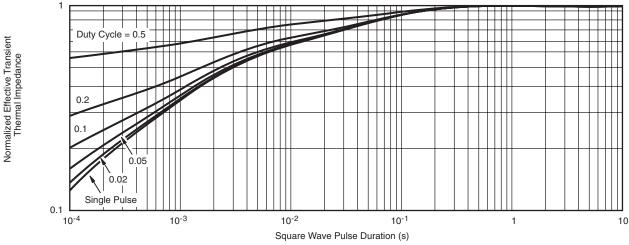


Single Pulse Avalanche Current Capability vs. Time



* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified





Normalized Thermal Transient Impedance, Junction-to-Case

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