



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

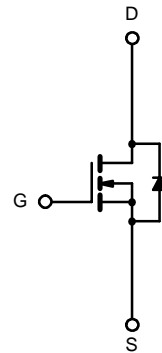
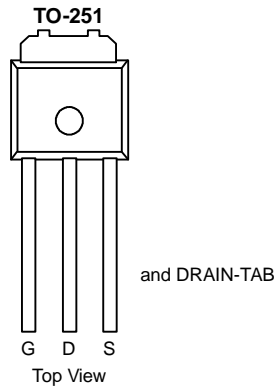
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A) ^b
30	0.0095 @ $V_{GS} = 10$ V	63 ^b
	0.014 @ $V_{GS} = 4.5$ V	52 ^b

FEATURES

- TrenchFET® Power MOSFET
- Optimized for High- or Low-Side

APPLICATIONS

- DC/DC Converters
- Synchronous Rectifiers



Order Number: SUU50N03-09P
SUU50N03-09P—E3 (Lead (Pb)-Free)

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 ^a	$T_C = 25^\circ\text{C}$	I_D	63 ^b	A
	$T_C = 100^\circ\text{C}$		44.5 ^b	
Pulsed Drain Current		I_{DM}	50	
Continuous Source Current (Diode Conduction) ^a		I_S	10	
Avalanche Current	L = 0.1 mH	I_{AS}	35	
Single Pulse Avalanche Energy		E_{AS}	61	mJ
Maximum Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	65.2	W
	$T_A = 25^\circ\text{C}$		7.5 ^a	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	$t \leq 10$ sec	R_{thJA}	16	20	$^\circ\text{C/W}$
	Steady State		40	50	
Maximum Junction-to-Case		R_{thJC}	1.8	2.3	

Notes

- a. Surface Mounted on FR4 Board, $t \leq 10$ sec.
b. Based on maximum allowable Junction Temperature, package limitation current is 50 A.



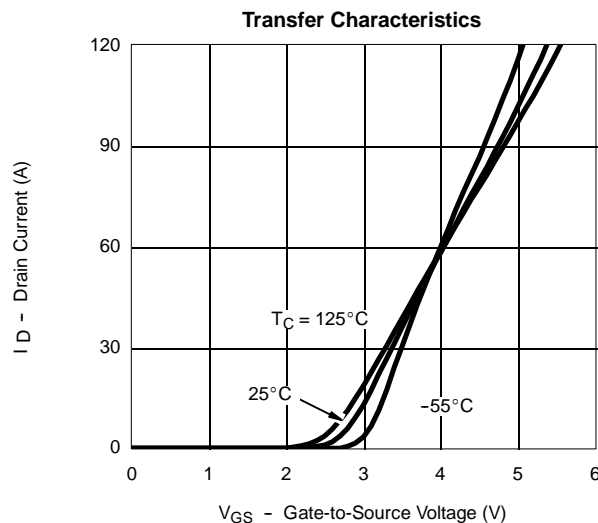
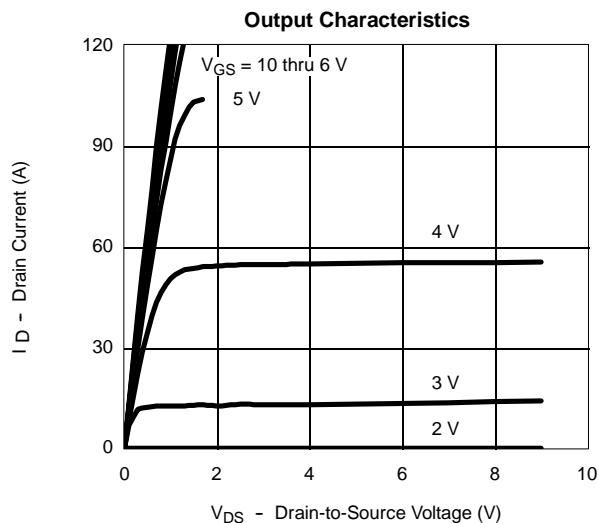
SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ ^a	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	1.0		3.0	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			50	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	50			A
Drain-Source On-State Resistance ^b	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 20\text{ A}$		0.0076	0.0095	Ω
		$V_{GS} = 10\text{ V}, I_D = 20\text{ A}, T_J = 125^\circ\text{C}$			0.015	
		$V_{GS} = 4.5\text{ V}, I_D = 20\text{ A}$		0.0115	0.014	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 20\text{ A}$	20			S
Dynamic^a						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		2200		pF
Output Capacitance	C_{oss}			410		
Reverse Transfer Capacitance	C_{rss}			180		
Gate Resistance	R_g			1.5		Ω
Total Gate Charge ^c	Q_g	$V_{DS} = 15\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 50\text{ A}$		15	23	nC
Gate-Source Charge ^c	Q_{gs}			7.5		
Gate-Drain Charge ^c	Q_{gd}			5.0		
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 15\text{ V}, R_L = 0.3\ \Omega$ $I_D \cong 50\text{ A}, V_{GEN} = 10\text{ V}, R_g = 2.5\ \Omega$		9	15	ns
Rise Time ^c	t_r			80	120	
Turn-Off Delay Time ^c	$t_{d(off)}$			22	35	
Fall Time ^c	t_f			8	12	
Source-Drain Diode Ratings and Characteristic ($T_C = 25^\circ\text{C}$)						
Pulsed Current	I_{SM}				100	A
Diode Forward Voltage ^b	V_{SD}	$I_F = 50\text{ A}, V_{GS} = 0\text{ V}$		1.2	1.5	V
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 50\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		35	70	ns

Notes

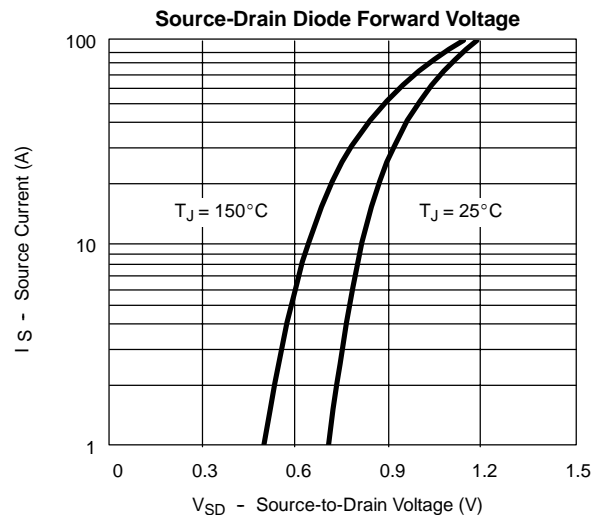
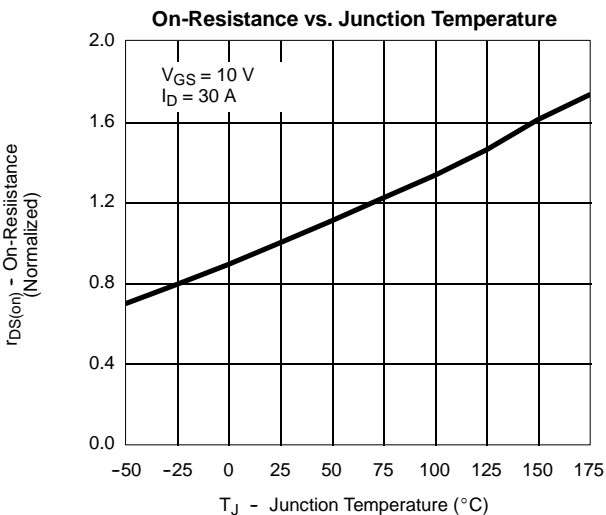
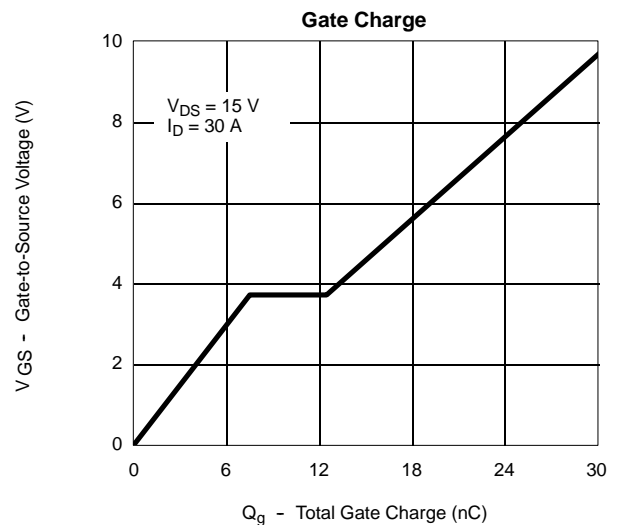
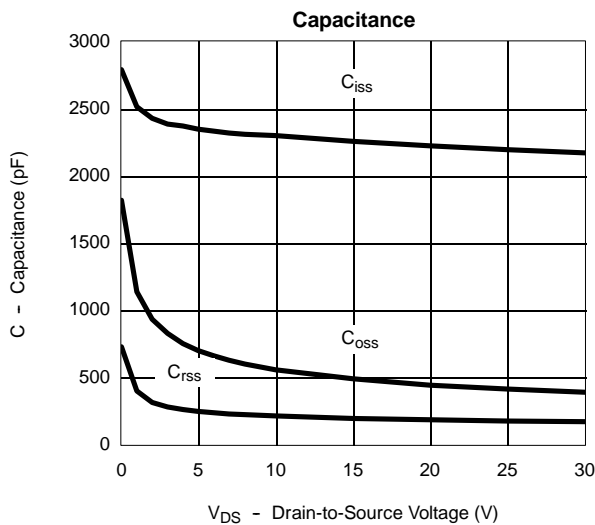
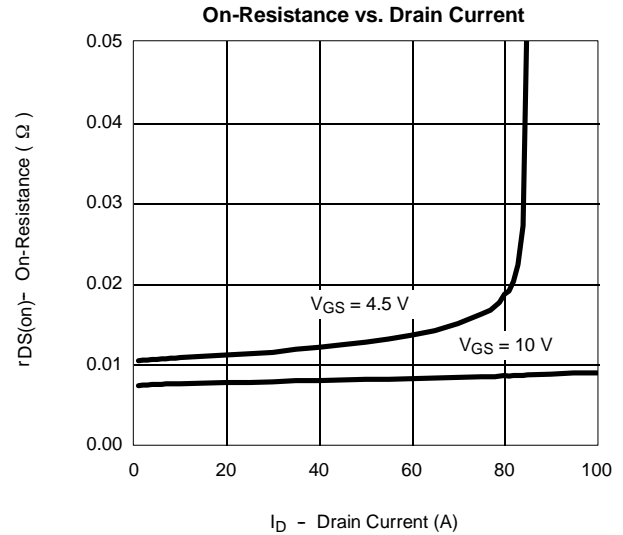
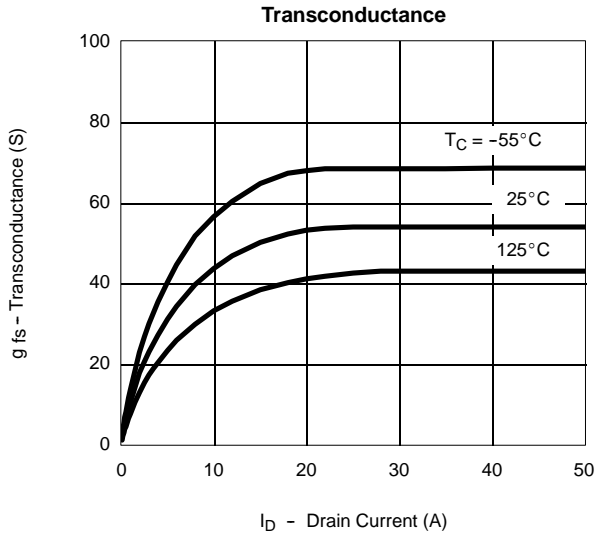
- Guaranteed by design, not subject to production testing.
- Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
- Independent of operating temperature.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



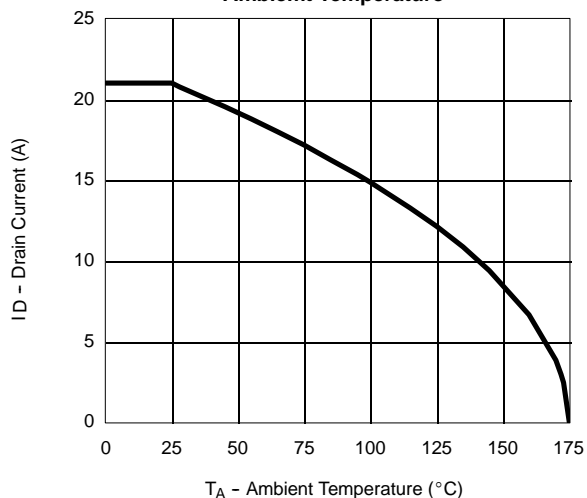


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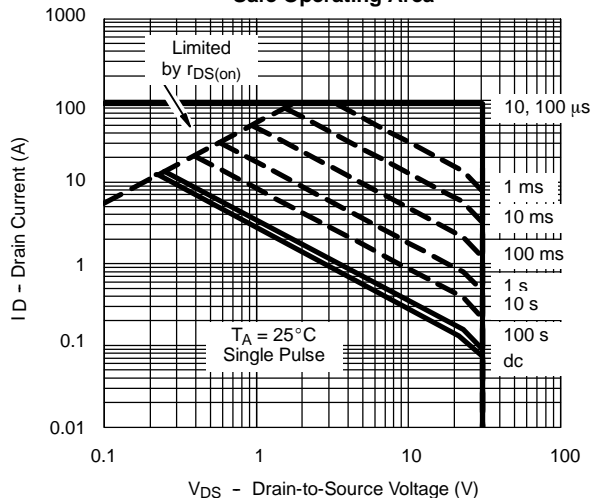


THERMAL RATINGS

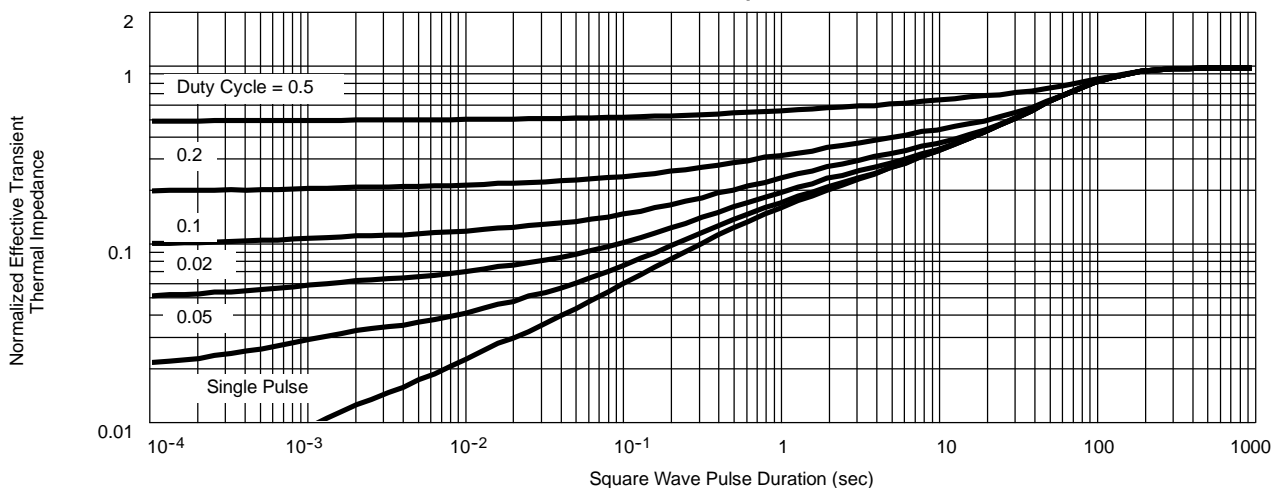
Maximum Drain Current vs. Ambient Temperature



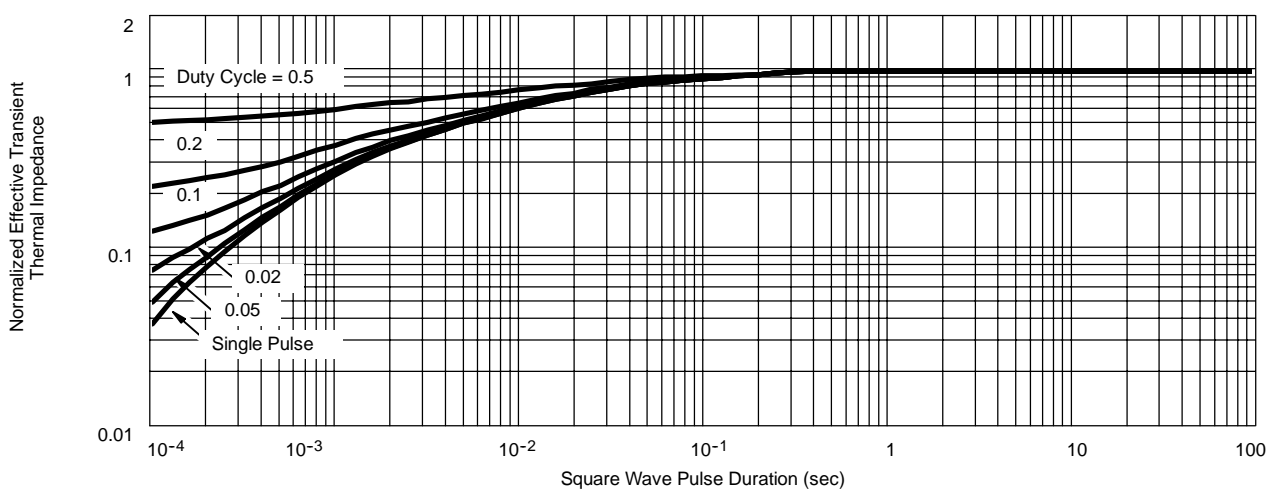
Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case





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