



N-Channel 30-V (D-S) 175°C MOSFET

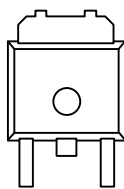
PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A) ^a
30	0.011 @ $V_{GS} = 10$ V	50
	0.017 @ $V_{GS} = 4.5$ V	43

FEATURES

- TrenchFET® Power MOSFET
- 175°C Maximum Junction Temperature
- 100% R_g Tested

TO-252

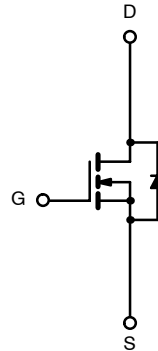


G D S

Top View

Order Number:
SUD50N03-11

Drain Connected to Tab



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 ($T_J = 175^\circ\text{C}$) ^b	$T_C = 25^\circ\text{C}$	I_D	50	A
	$T_C = 100^\circ\text{C}$		37	
Pulsed Drain Current		I_{DM}	100	
Continuous Source Current (Diode Conduction) ^a		I_S	50	
Maximum Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	62.5 ^c	W
	$T_A = 25^\circ\text{C}$		7.5 ^b	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient ^b	$t \leq 10$ sec	R_{thJA}	17	20	$^\circ\text{C/W}$
	Steady State		50	60	
Junction-to-Case		R_{thJC}	2	2.4	$^\circ\text{C/W}$
Junction-to-Lead		R_{thJL}	4	4.8	

Notes

- Package Limited.
- Surface Mounted on 1" x 1" FR4 Board, $t \leq 10$ sec.
- See SOA curve for voltage derating.

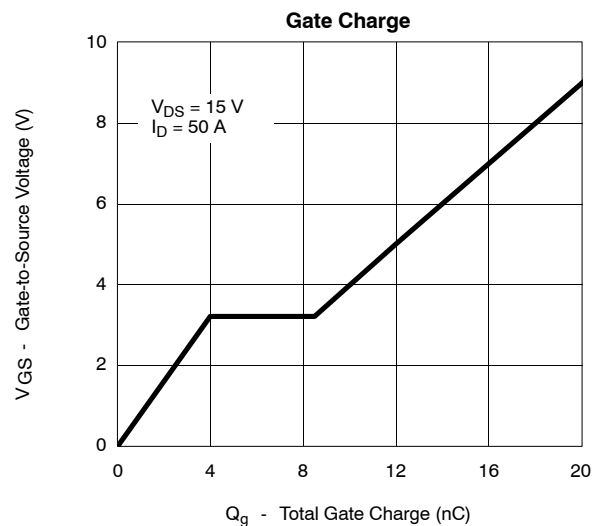
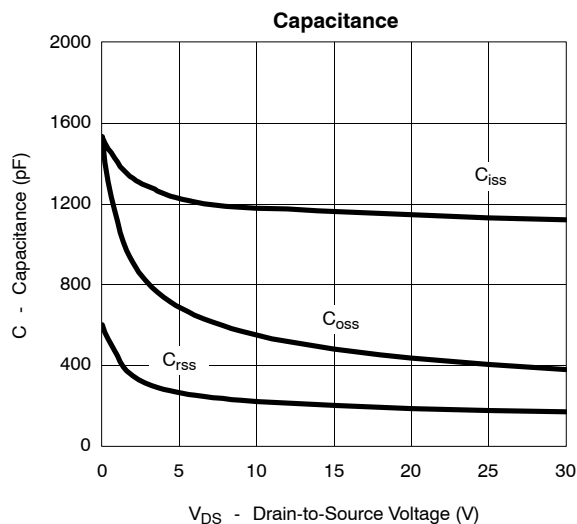
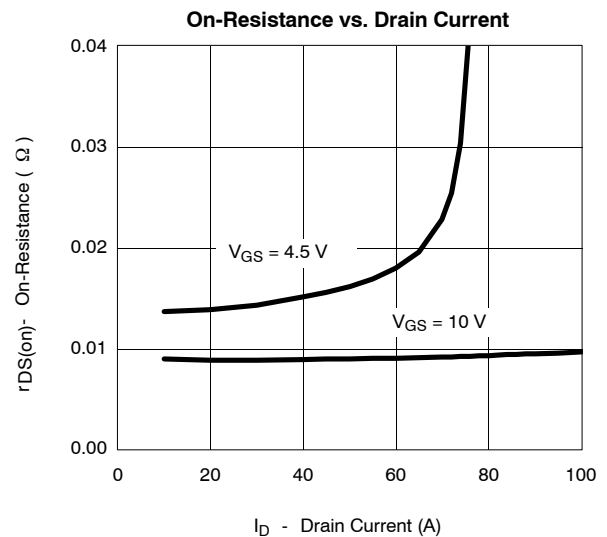
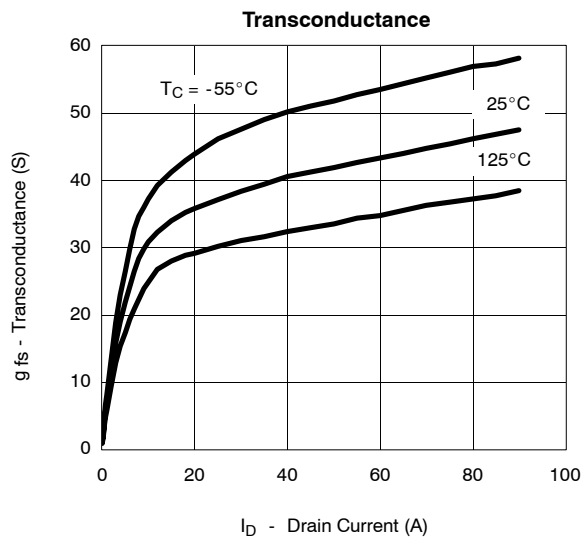
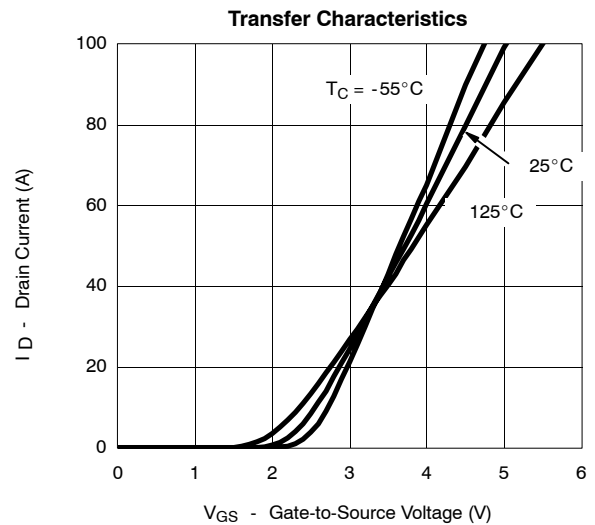
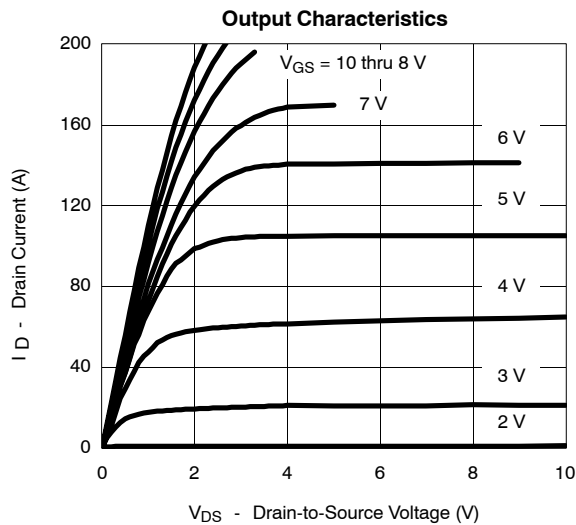
SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ ^a	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 250 μA	30			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	0.8			
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 24 V, V _{GS} = 0 V			1	μA
		V _{DS} = 24 V, V _{GS} = 0 V, T _J = 125 °C			50	
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 5 V	50			A
Drain-Source On-State Resistance ^b	r _{DS(on)}	V _{GS} = 10 V, I _D = 25 A		0.009	0.011	Ω
		V _{GS} = 5 V, I _D = 20 A, T _J = 125 °C			0.018	
		V _{GS} = 4.5 V, I _D = 15 A		0.014	0.017	
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 20 A	10			S
Dynamic ^a						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, F = 1 MHz		1130		pF
Output Capacitance	C _{oss}			400		
Reverse Transfer Capacitance	C _{rss}			175		
Total Gate Charge ^c	Q _g	V _{DS} = 15 V, V _{GS} = 5 V, I _D = 50 A		12	20	nC
Gate-Source Charge ^c	Q _{gs}			4		
Gate-Drain Charge ^c	Q _{gd}			4.5		
Gate Resistance	R _g		0.5		3.4	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 15 V, R _L = 0.3 Ω I _D ≅ 50 A, V _{GEN} = 10 V, R _G = 2.5 Ω		8	12	ns
Rise Time ^c	t _r			10	15	
Turn-Off Delay Time ^c	t _{d(off)}			18	30	
Fall Time ^c	t _f			6	9	
Source-Drain Diode Ratings and Characteristic (T _C = 25 °C)						
Continuous Current	I _S				50	A
Pulsed Current	I _{SM}				80	
Diode Forward Voltage ^b	V _{SD}	I _F = 100 A, V _{GS} = 0 V			1.5	V
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 50 A, di/dt = 100 A/μs		30	50	ns

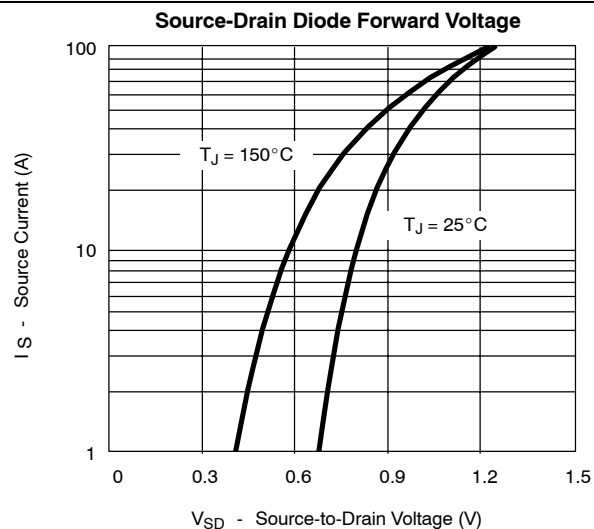
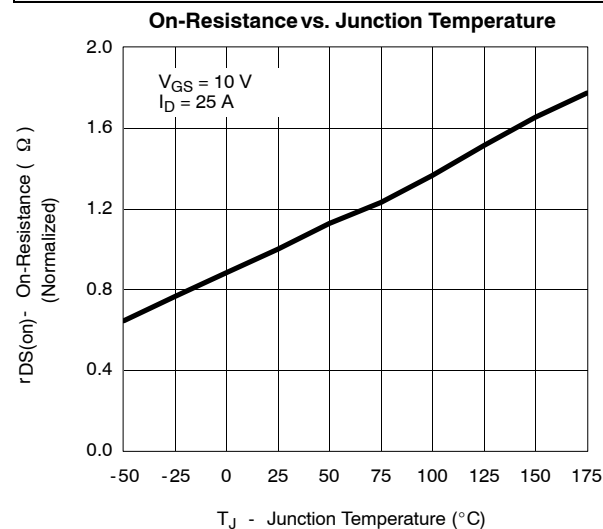
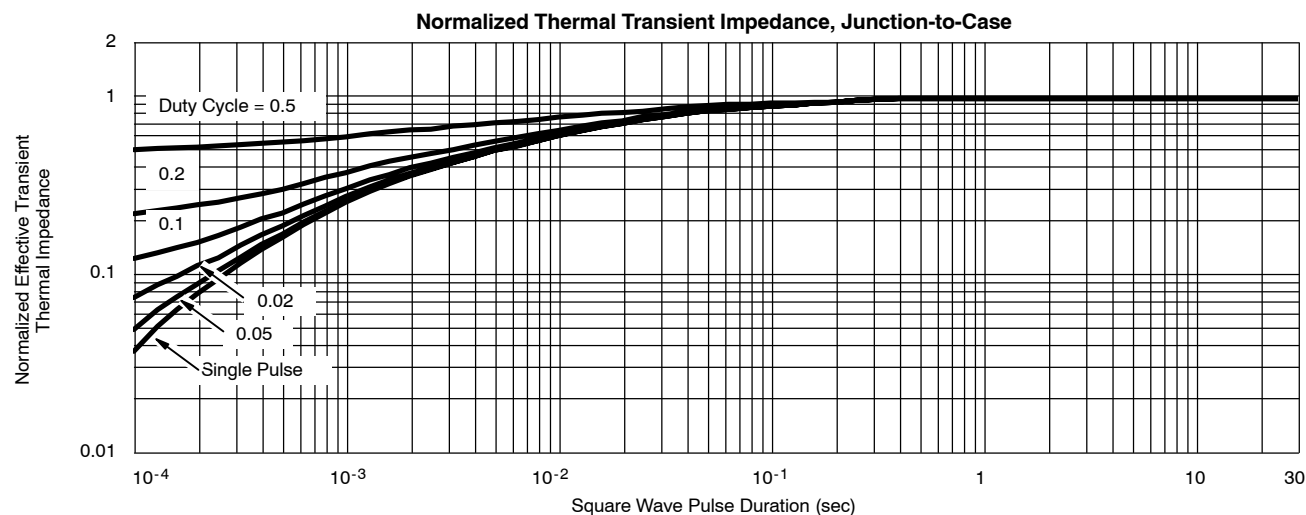
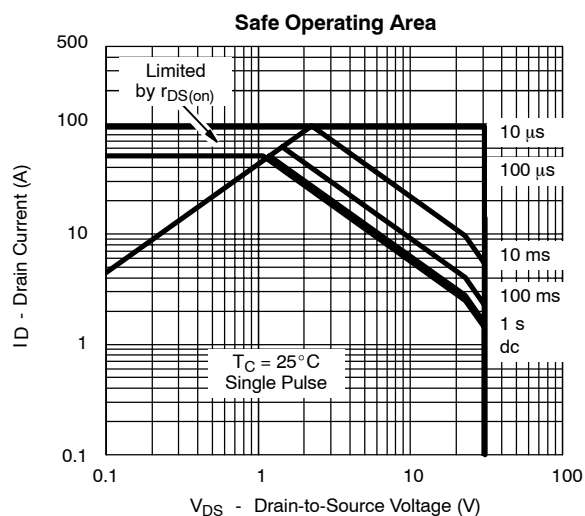
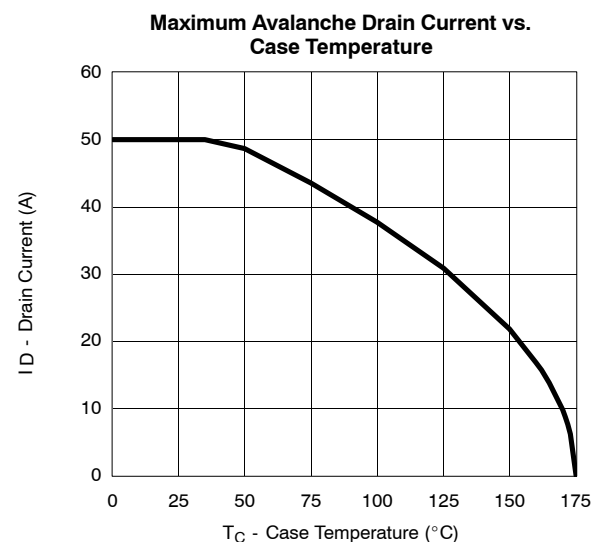
Notes

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



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**THERMAL RATINGS**



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