

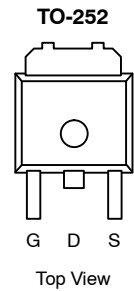


N-Channel 50-V (D-S), 175°C MOSFET, Logic Level

PRODUCT SUMMARY		
V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A) ^a
50	0.018 @ V _{GS} = 10 V	30
	0.020 @ V _{GS} = 4.5 V	30

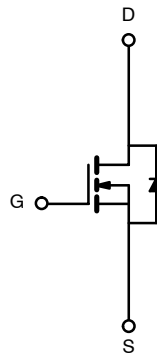
FEATURES

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



Order Number:
SUD45N05-20L

Drain Connected to Tab



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _C = 25°C UNLESS OTHERWISE NOTED)			
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	50	V
Gate-Source Voltage	V _{GS}	± 20	
Continuous Drain Current ^a	I _D	T _C = 25°C	A
		T _C = 100°C	
Pulsed Drain Current	I _{DM}	100	
Continuous Source Current (Diode Conduction) ^a	I _S	43	
Avalanche Current	I _{AR}	37	
Repetitive Avalanche Energy (Duty Cycle ≤ 1%)	L = 0.1 mH E _{AR}	93	
Maximum Power Dissipation	P _D	T _C = 25°C	W
		T _A = 25°C	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to 175	°C

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Limit	Unit
Maximum Junction-to-Ambient	R _{thJA}	Free Air, FR4 Board Mount	°C/W
		Free Air, Vertical Mount	
Maximum Junction-to-Case	R _{thJC}	2.0	

Notes

- a. Package limited.
- b. Surface Mounted on FR4 Board, t ≤ 10 sec.

For SPICE model information via the Worldwide Web: <http://www.vishay.com/www/product/spice.htm>

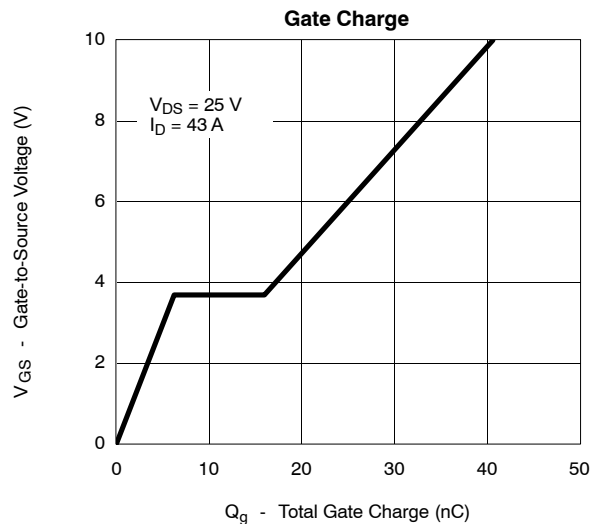
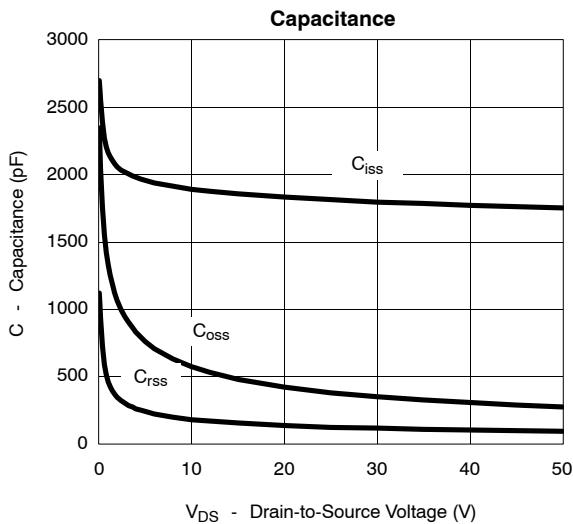
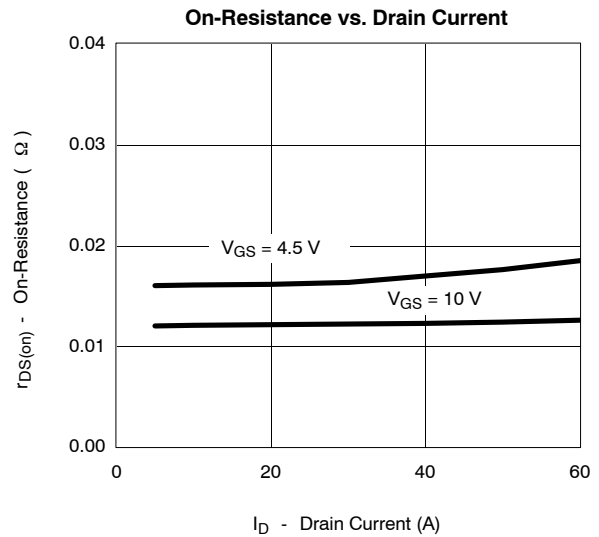
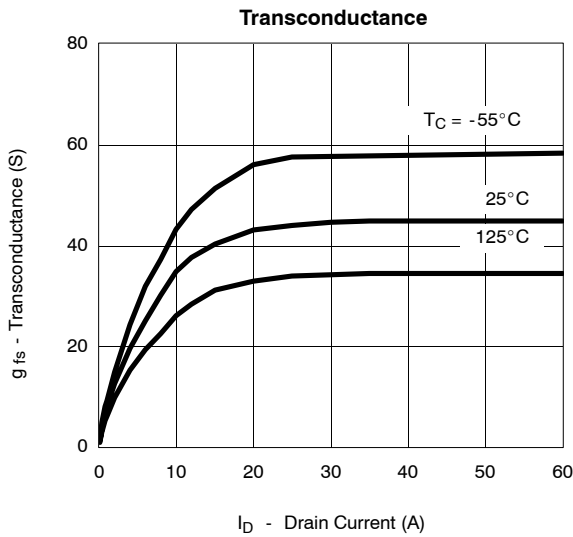
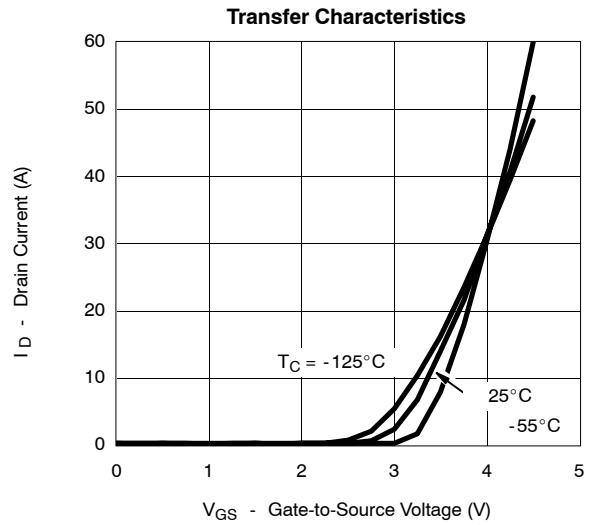
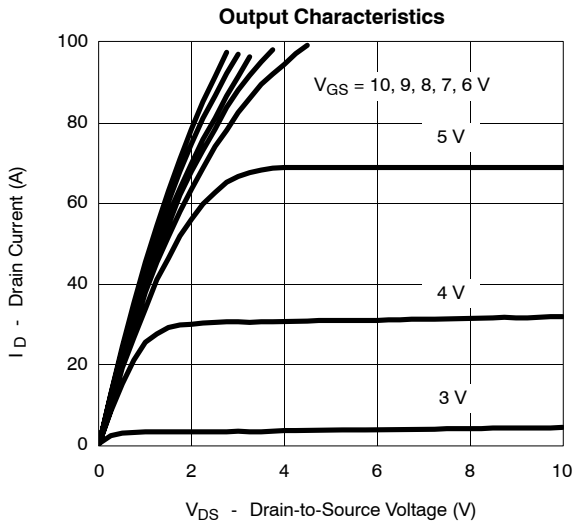
SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ ^a	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 250 μA	50			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1.0	2.0		
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 50 V, V _{GS} = 0 V			1	μA
		V _{DS} = 50 V, V _{GS} = 0 V, T _J = 125 °C			50	
		V _{DS} = 50 V, V _{GS} = 0 V, T _J = 175 °C			150	
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	43			A
Drain-Source On-State Resistance ^b	r _{DS(on)}	V _{GS} = 10 V, I _D = 20 A			0.018	Ω
		V _{GS} = 10 V, I _D = 20 A, T _J = 125 °C			0.036	
		V _{GS} = 10 V, I _D = 43 A, T _J = 125 °C			0.040	
		V _{GS} = 4.5 V, I _D = 43 A			0.020	
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 43 A	20			S
Dynamic^a						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		1800	3600	pF
Output Capacitance	C _{oss}			370		
Reverse Transfer Capacitance	C _{rss}			130		
Total Gate Charge ^c	Q _g	V _{DS} = 25 V, V _{GS} = 10 V, I _D = 43 A		43	60	nC
Gate-Source Charge ^c	Q _{gs}			7		
Gate-Drain Charge ^c	Q _{gd}			10		
Gate Resistance	R _g		0.5		3.6	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 25 V, R _L = 0.6 Ω I _D = 43 A, V _{GEN} = 10 V, R _G = 2.5 Ω		10	20	ns
Rise Time ^c	t _r			10	20	
Turn-Off Delay Time ^c	t _{d(off)}			32	60	
Fall Time ^c	t _f			7	15	
Source-Drain Diode Ratings and Characteristic (T_C = 25 °C)						
Pulsed Current	I _{SM}				43	A
Diode Forward Voltage ^b	V _{SD}	I _F = 43 A, V _{GS} = 0 V			1.5	V
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 43 A, di/dt = 100 A/μs		49	100	ns

Notes

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

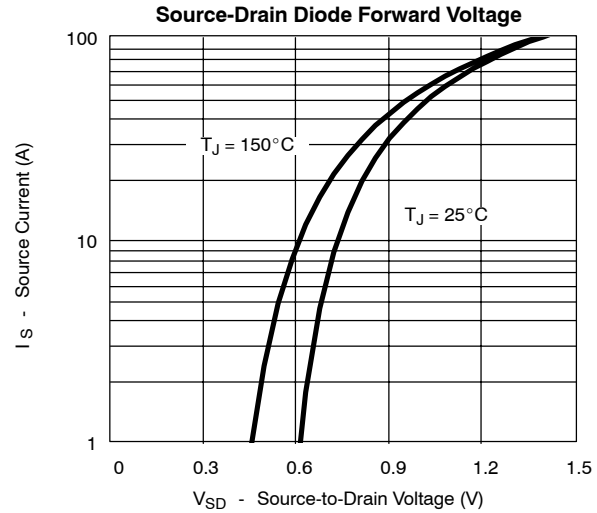
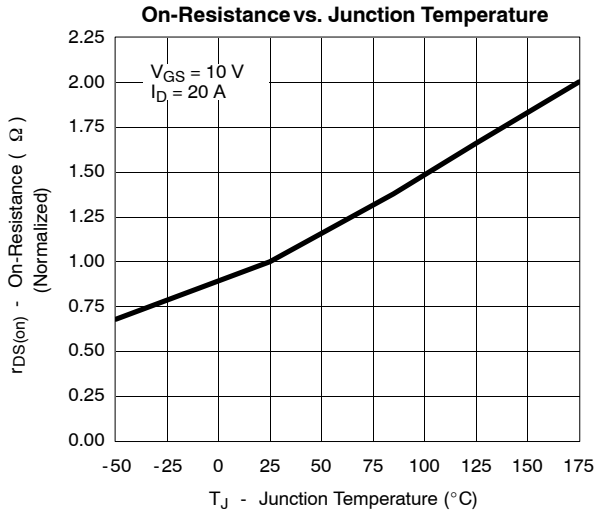


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

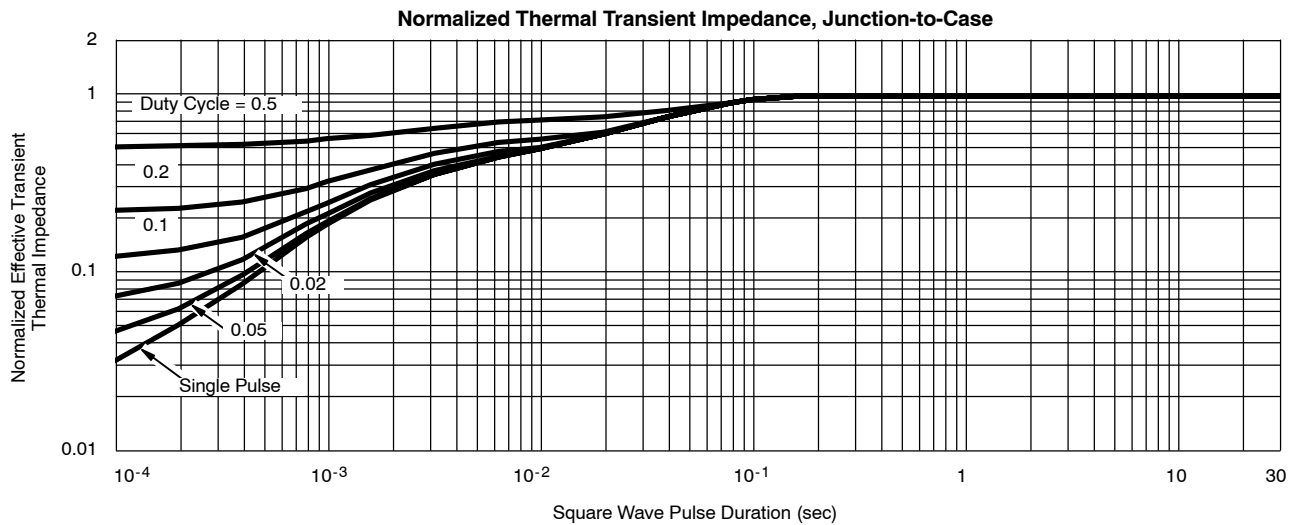
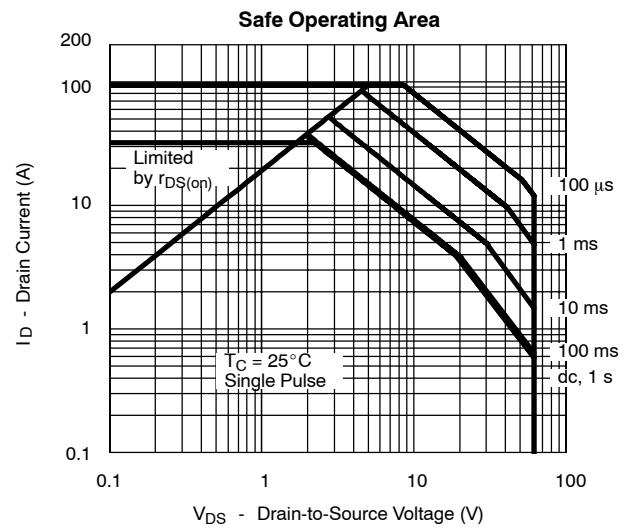
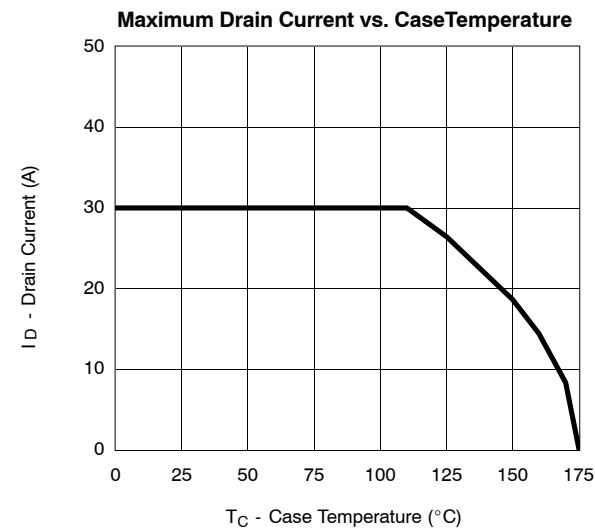




TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



THERMAL RATINGS





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