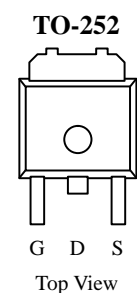


**N-Channel 30-V (D-S), 175°C MOSFET****Product Summary**

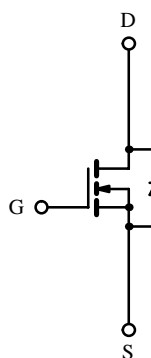
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
30	0.010 @ $V_{GS} = 10$ V	$\pm 15$
	0.019 @ $V_{GS} = 4.5$ V	$\pm 12$

**175°C Rated**  
Maximum Junction Temperature  
**TrenchFET™**  
Power MOSFETs



Order Number:  
SUD50N03-10

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		$V_{GS}$	$\pm 20$	
Continuous Drain Current <sup>a</sup>	$T_A = 25^\circ\text{C}$	$I_D$	$\pm 15$	A
	$T_A = 100^\circ\text{C}$		$\pm 10$	
Pulsed Drain Current		$I_{DM}$	$\pm 100$	
Continuous Source Current (Diode Conduction) <sup>a</sup>		$I_S$	15	
Maximum Power Dissipation	$T_C = 25^\circ\text{C}$	$P_D$	83	W
	$T_A = 25^\circ\text{C}$		4 <sup>a</sup>	
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 <sup>a</sup>	$R_{thJA}$		30	$^\circ\text{C/W}$
Maximum Junction-to-Case	$R_{thJC}$		1.8	

**Notes**

a. Surface Mounted on FR4 Board,  $t \leq 10$  sec.

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70265.

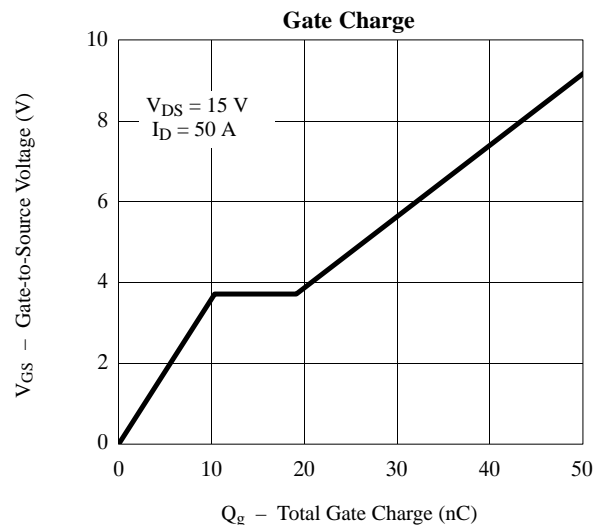
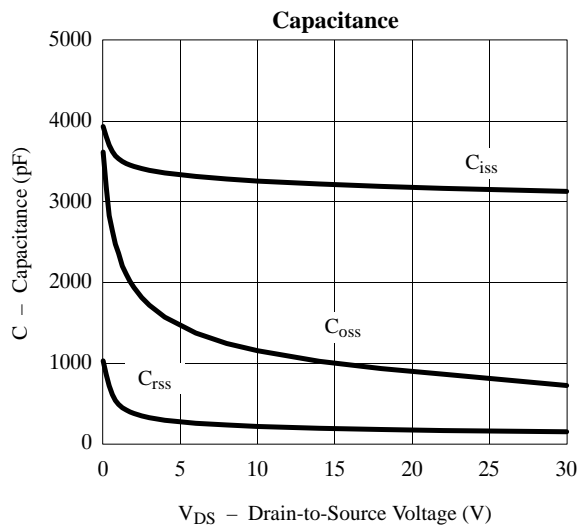
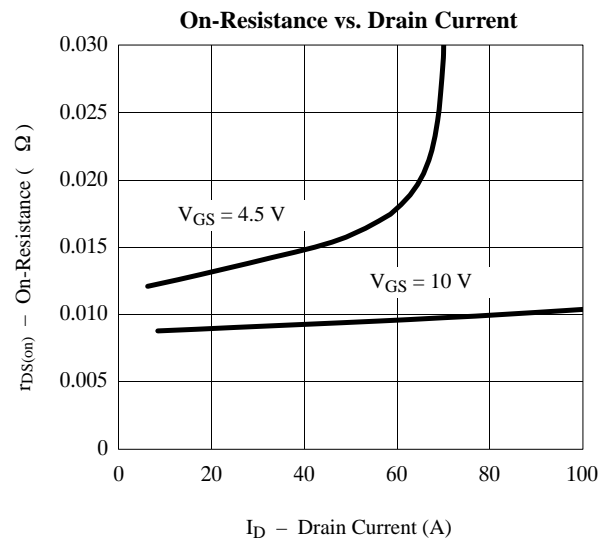
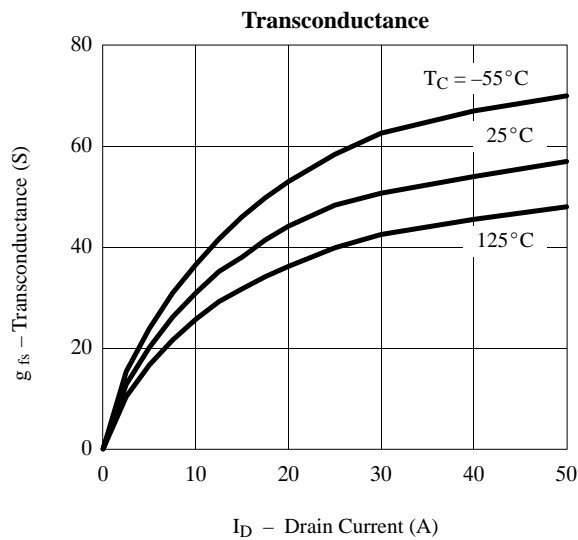
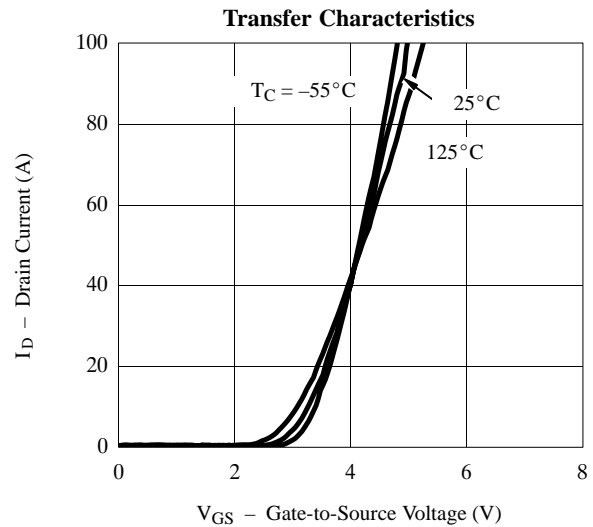
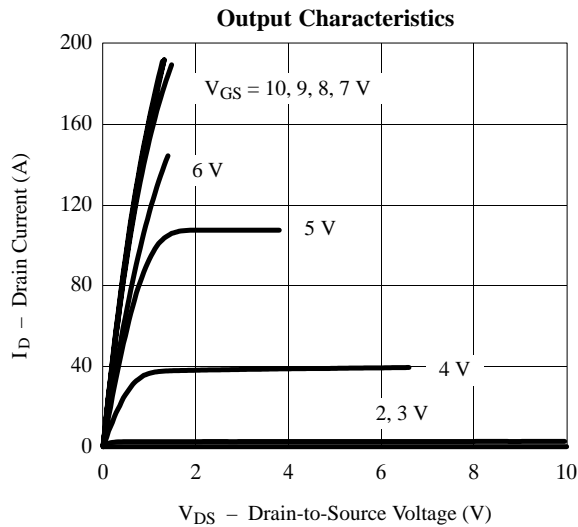
Specifications ( $T_J = 25^\circ\text{C}$  Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit
Static						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	30			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	1.0	2.0		
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125°C			50	
On-State Drain Current <sup>b</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = 5 V, V <sub>GS</sub> = 10 V	50			A
Drain-Source On-State Resistance <sup>b</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 15 A			0.010	Ω
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 15 A, T <sub>J</sub> = 125°C			0.018	
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 15 A			0.019	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 15 A	20			S
Dynamic <sup>a</sup>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, F = 1 MHz		3200	6000	pF
Output Capacitance	C <sub>oss</sub>			800		
Reverse Transfer Capacitance	C <sub>rss</sub>			150		
Total Gate Charge <sup>c</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 50 A		55	100	nC
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>			10		
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>			9		
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>	V <sub>DD</sub> = 15 V, R <sub>L</sub> = 0.3 Ω I <sub>D</sub> ≅ 50 A, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 2.5 Ω		16	30	ns
Rise Time <sup>c</sup>	t <sub>r</sub>			8	20	
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>			33	60	
Fall Time <sup>c</sup>	t <sub>f</sub>			20	40	
Source-Drain Diode Ratings and Characteristic (T <sub>C</sub> = 25°C)						
Pulsed Current	I <sub>SM</sub>				100	A
Diode Forward Voltage <sup>b</sup>	V <sub>SD</sub>	I <sub>F</sub> = 100 A, V <sub>GS</sub> = 0 V		1.2	1.5	V
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 50 A, di/dt = 100 A/μs		55	100	ns

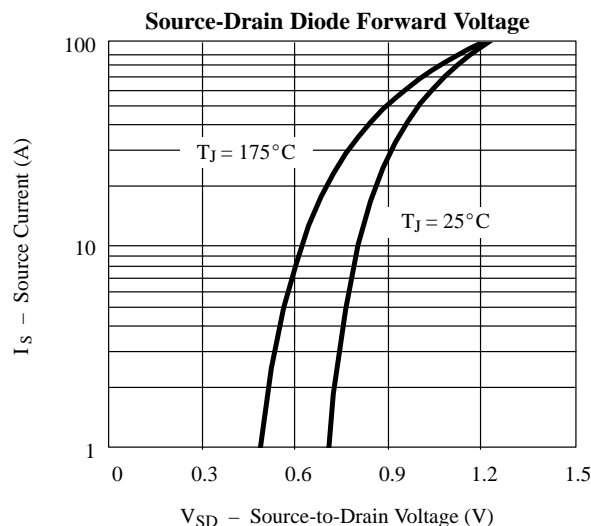
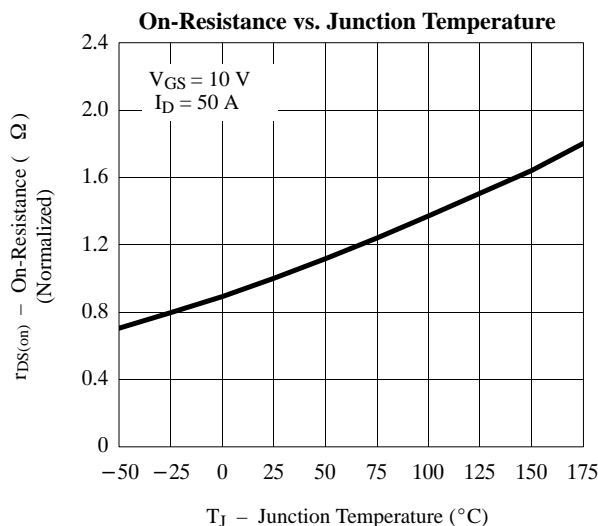
## Notes

- 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.

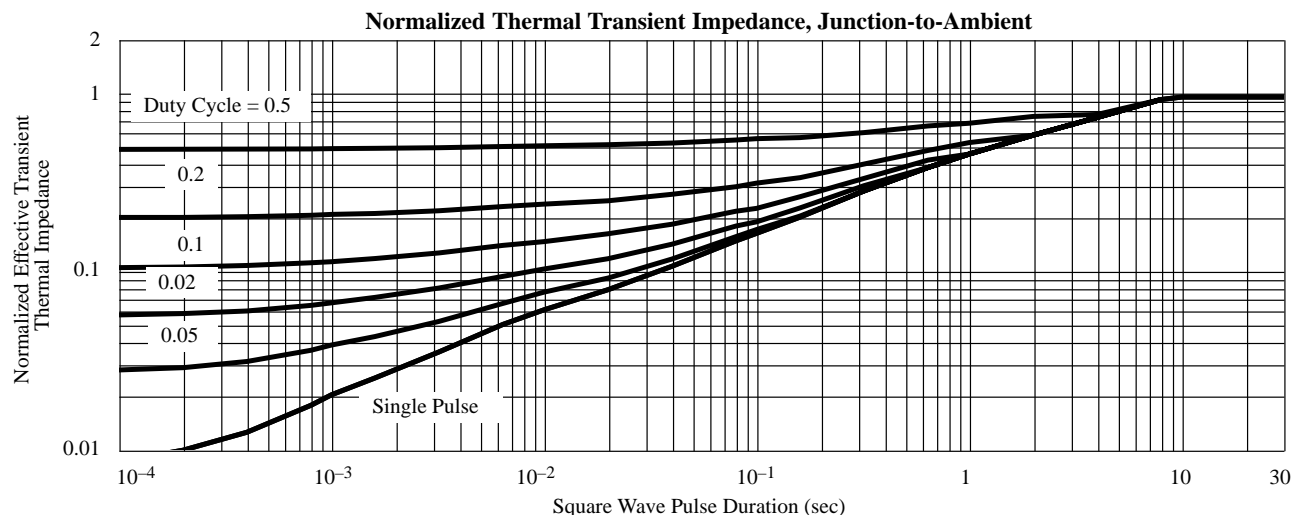
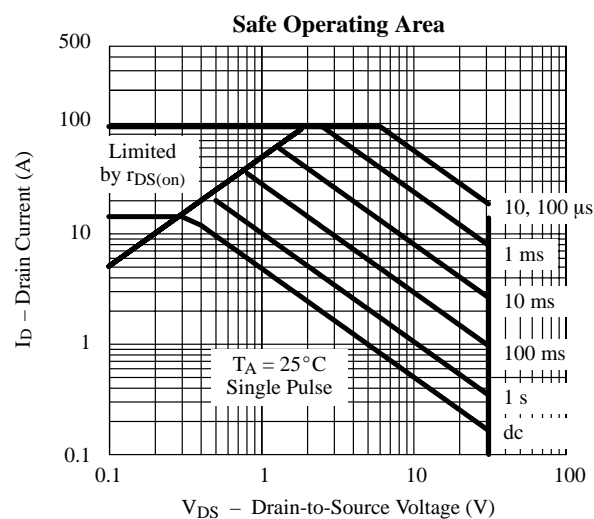
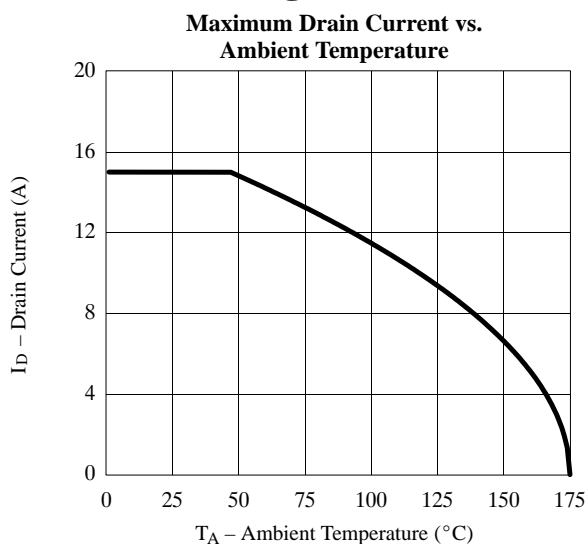
## Typical Characteristics (25°C Unless Otherwise Noted)



## Typical Characteristics (25°C Unless Otherwise Noted)



## Thermal Ratings





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