

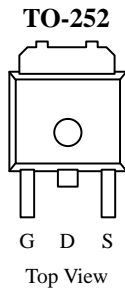


# N-Channel 30-V (D-S), 175°C MOSFET

## Product Summary

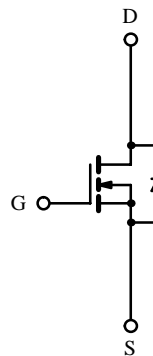
V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)
30	0.010 @ V <sub>GS</sub> = 10 V	± 15
	0.019 @ V <sub>GS</sub> = 4.5 V	± 12

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



Drain Connected to Tab

Order Number:  
SUD50N03-10



N-Channel MOSFET

## Absolute Maximum Ratings (T<sub>A</sub> = 25°C Unless Otherwise Noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V <sub>DS</sub>	30	V
Gate-Source Voltage	V <sub>GS</sub>	± 20	
Continuous Drain Current <sup>a</sup>	I <sub>D</sub>	T <sub>A</sub> = 25°C	± 15
		T <sub>A</sub> = 100°C	± 10
Pulsed Drain Current	I <sub>DM</sub>	± 100	A
Continuous Source Current (Diode Conduction) <sup>a</sup>	I <sub>S</sub>	15	
Maximum Power Dissipation	P <sub>D</sub>	T <sub>C</sub> = 25°C	83
		T <sub>A</sub> = 25°C	4 <sup>a</sup>
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 175	°C

## Thermal Resistance Ratings

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>a</sup>	R <sub>thJA</sub>		30	°C/W
Maximum Junction-to-Case	R <sub>thJC</sub>		1.8	

### Notes

a. Surface Mounted on FR4 Board, t ≤ 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.



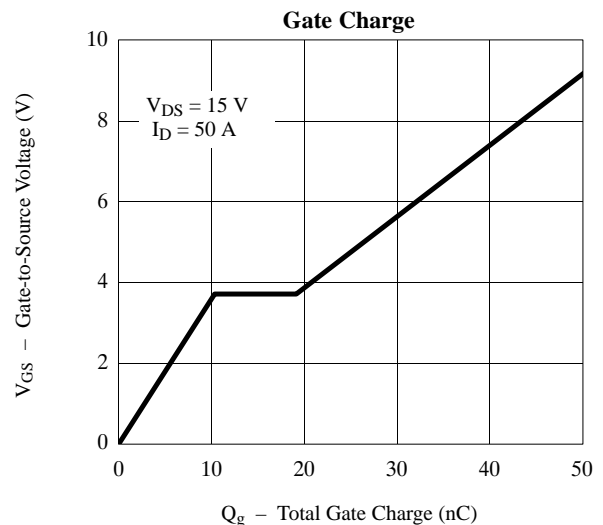
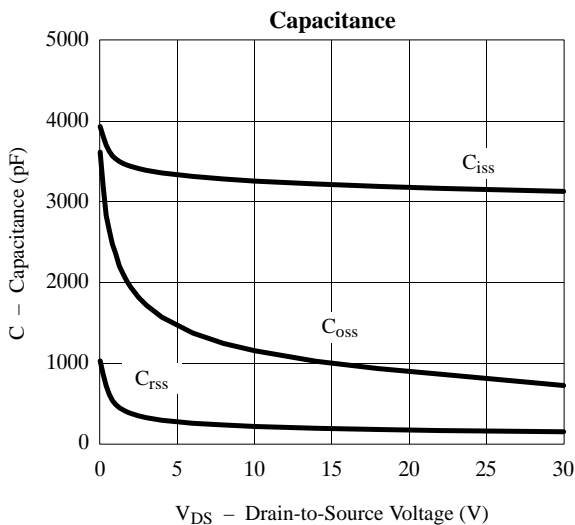
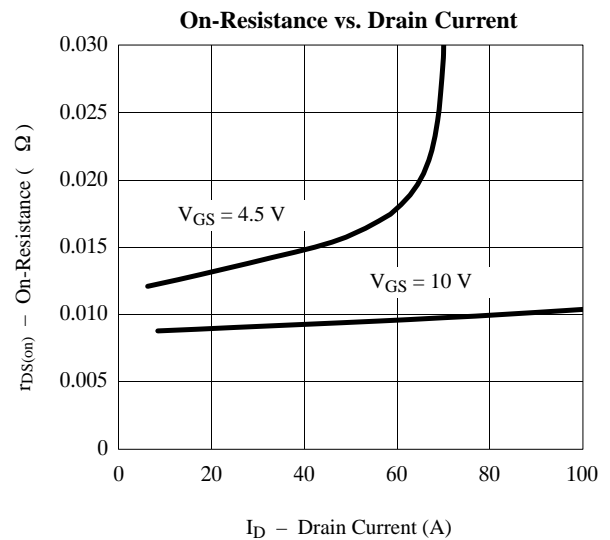
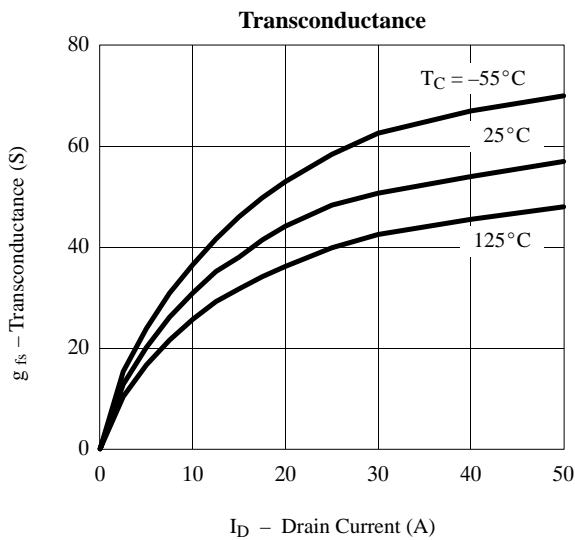
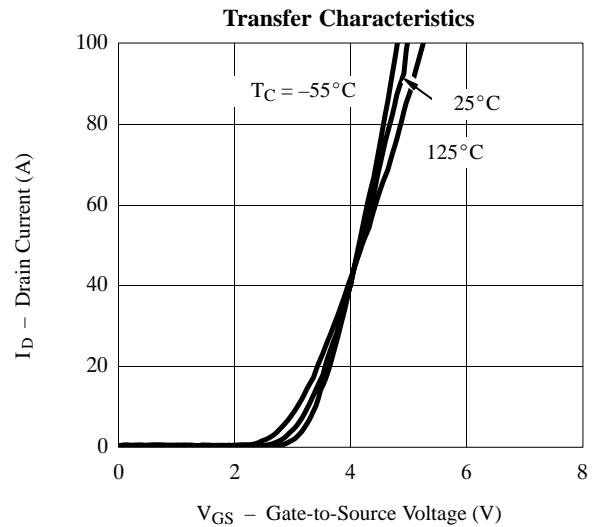
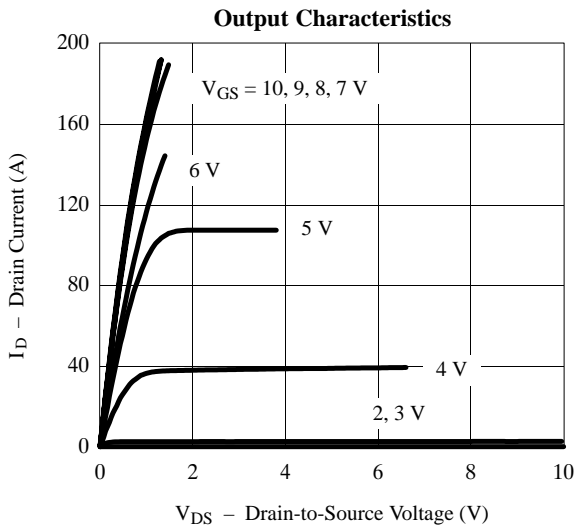
### Specifications ( $T_J = 25^\circ\text{C}$ Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
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	2.0		
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$			1	$\mu\text{A}$
		$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			50	
On-State Drain Current <sup>b</sup>	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	50			A
Drain-Source On-State Resistance <sup>b</sup>	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 15\text{ A}$			0.010	$\Omega$
		$V_{GS} = 10\text{ V}, I_D = 15\text{ A}, T_J = 125^\circ\text{C}$			0.018	
		$V_{GS} = 4.5\text{ V}, I_D = 15\text{ A}$			0.019	
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = 15\text{ V}, I_D = 15\text{ A}$	20			S
<b>Dynamic<sup>a</sup></b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, F = 1\text{ MHz}$		3200	6000	pF
Output Capacitance	$C_{oss}$			800		
Reverse Transfer Capacitance	$C_{rss}$			150		
Total Gate Charge <sup>c</sup>	$Q_g$	$V_{DS} = 15\text{ V}, V_{GS} = 10\text{ V}, I_D = 50\text{ A}$		55	100	nC
Gate-Source Charge <sup>c</sup>	$Q_{gs}$			10		
Gate-Drain Charge <sup>c</sup>	$Q_{gd}$			9		
Turn-On Delay Time <sup>c</sup>	$t_{d(on)}$	$V_{DD} = 15\text{ V}, R_L = 0.3\ \Omega$ $I_D \cong 50\text{ A}, V_{GEN} = 10\text{ V}, R_G = 2.5\ \Omega$		16	30	ns
Rise Time <sup>c</sup>	$t_r$			8	20	
Turn-Off Delay Time <sup>c</sup>	$t_{d(off)}$			33	60	
Fall Time <sup>c</sup>	$t_f$			20	40	
<b>Source-Drain Diode Ratings and Characteristic (<math>T_C = 25^\circ\text{C}</math>)</b>						
Pulsed Current	$I_{SM}$				100	A
Diode Forward Voltage <sup>b</sup>	$V_{SD}$	$I_F = 100\text{ A}, V_{GS} = 0\text{ V}$		1.2	1.5	V
Source-Drain Reverse Recovery Time	$t_{rr}$	$I_F = 50\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		55	100	ns

**Notes**

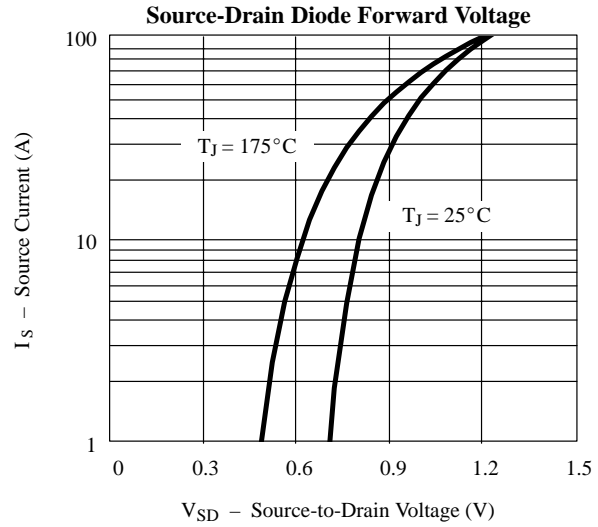
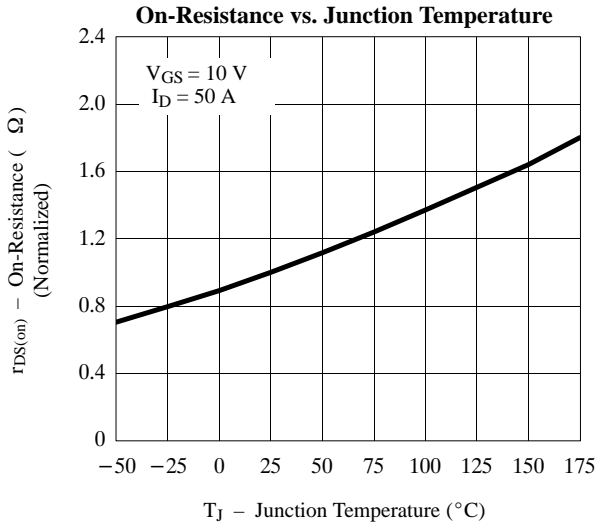
- a. Guaranteed by design, not subject to production testing.
- b. Pulse test; pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .
- c. Independent of operating temperature.

Typical Characteristics (25°C Unless Otherwise Noted)





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



### Thermal Ratings

