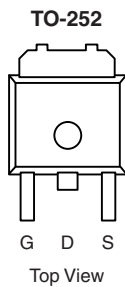


PRODUCT SUMMARY		
V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)
250	0.165 at V <sub>GS</sub> = 10 V	17

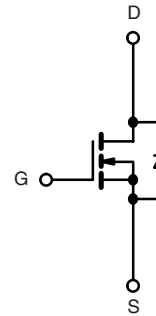
**FEATURES**

- TrenchFET® Power MOSFET
- 175 °C Junction Temperature



Drain Connected to Tab

Ordering Information: SUD17N25-165-E3 (Lead (Pb)-free)



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>	250	V
Gate-Source Voltage	V <sub>GS</sub>	± 20	
Continuous Drain Current (T <sub>J</sub> = 175 °C) <sup>b</sup>	I <sub>D</sub>	T <sub>C</sub> = 25 °C	17
		T <sub>C</sub> = 125 °C	9.8
Pulsed Drain Current	I <sub>DM</sub>	20	A
Continuous Source Current (Diode Conduction)	I <sub>S</sub>	17	
Single Pulse Avalanche Current	I <sub>AS</sub>	5	
Single Pulse Avalanche Energy	E <sub>AS</sub>	L = 0.1 mH 1.25	mJ
Maximum Power Dissipation	P <sub>D</sub>	T <sub>C</sub> = 25 °C	136 <sup>b</sup>
		T <sub>A</sub> = 25 °C	3 <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	
Junction-to-Ambient <sup>a</sup>	R <sub>thJA</sub>	t ≤ 10 sec	15	18	°C/W
		Steady State	40	50	
Junction-to-Case (Drain)	R <sub>thJC</sub>	0.85	1.1		

Notes:

- a. Surface Mounted on 1" x 1" FR4 Board.  
b. See SOA curve for voltage derating.

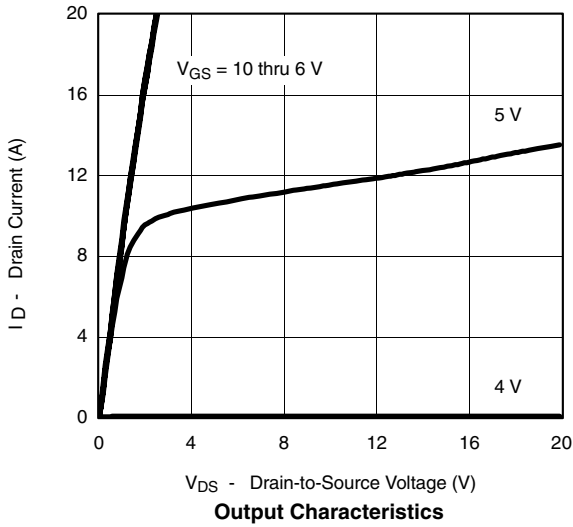
<b>SPECIFICATIONS</b> $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	250			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2.5		4.0	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 250\text{ V}, V_{GS} = 0\text{ V}$			1	$\mu\text{A}$
		$V_{DS} = 250\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$			50	
		$V_{DS} = 250\text{ V}, V_{GS} = 0\text{ V}, T_J = 175\text{ }^\circ\text{C}$			250	
On-State Drain Current <sup>b</sup>	$I_{D(on)}$	$V_{DS} = 15\text{ V}, V_{GS} = 10\text{ V}$	17			A
Drain-Source On-State Resistance <sup>b</sup>	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 14\text{ A}$		0.131	0.165	$\Omega$
		$V_{GS} = 10\text{ V}, I_D = 14\text{ A}, T_J = 125\text{ }^\circ\text{C}$			0.347	
		$V_{GS} = 10\text{ V}, I_D = 14\text{ A}, T_J = 175\text{ }^\circ\text{C}$			0.462	
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = 15\text{ V}, I_D = 17\text{ A}$		36		S
<b>Dynamic<sup>a</sup></b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		1950		$\mu\text{F}$
Output Capacitance	$C_{oss}$			160		
Reverse Transfer Capacitance	$C_{rss}$			70		
Total Gate Charge <sup>c</sup>	$Q_g$	$V_{DS} = 125\text{ V}, V_{GS} = 10\text{ V}, I_D = 17\text{ A}$		30	42	nC
Gate-Source Charge <sup>c</sup>	$Q_{gs}$			10		
Gate-Drain Charge <sup>c</sup>	$Q_{gd}$			10		
Gate Resistance	$R_g$			1.6		$\Omega$
Turn-On Delay Time <sup>c</sup>	$t_{d(on)}$	$V_{DD} = 125\text{ V}, R_L = 7.35\text{ }\Omega$ $I_D \equiv 17\text{ A}, V_{GEN} = 10\text{ V}, R_g = 2.5\text{ }\Omega$		15	25	ns
Rise Time <sup>c</sup>	$t_r$			130	195	
Turn-Off Delay Time <sup>c</sup>	$t_{d(off)}$			30	45	
Fall Time <sup>c</sup>	$t_f$			100	150	
<b>Source-Drain Diode Ratings and Characteristics</b> ( $T_C = 25\text{ }^\circ\text{C}$ )						
Pulsed Current	$I_{SM}$				20	A
Diode Forward Voltage <sup>b</sup>	$V_{SD}$	$I_F = 17\text{ A}, V_{GS} = 0\text{ V}$		0.9	1.5	V
Source-Drain Reverse Recovery Time	$t_{rr}$	$I_F = 17\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		115	175	ns

**Notes:**

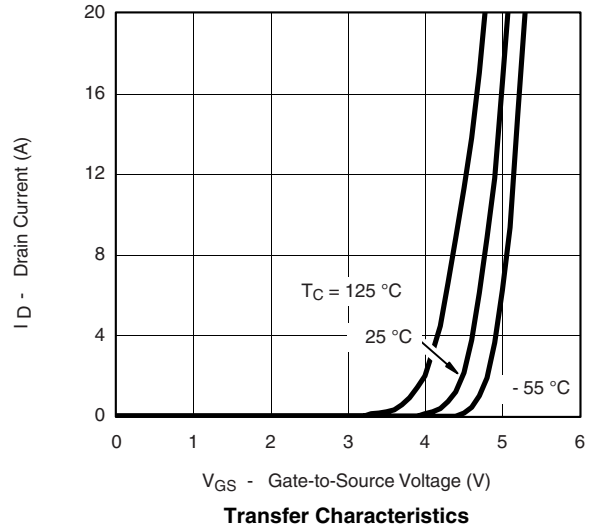
- a. Guaranteed by design, not subject to production testing.  
 b. Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .  
 c. Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

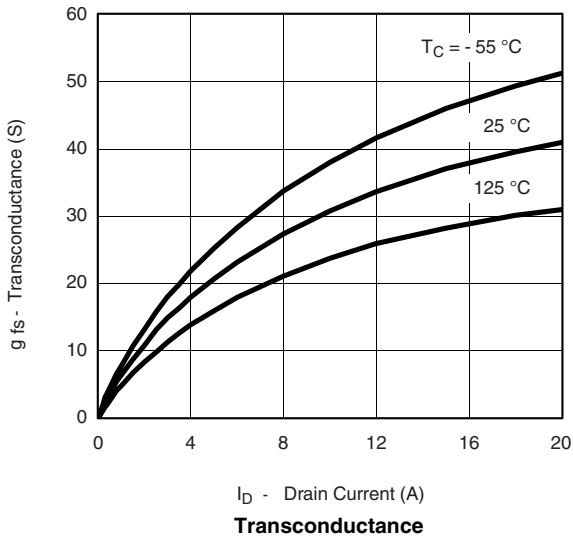
**TYPICAL CHARACTERISTICS** 25 °C unless noted



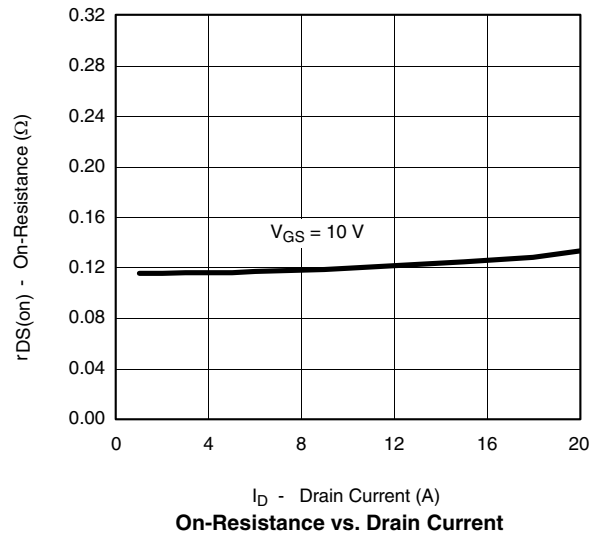
**Output Characteristics**



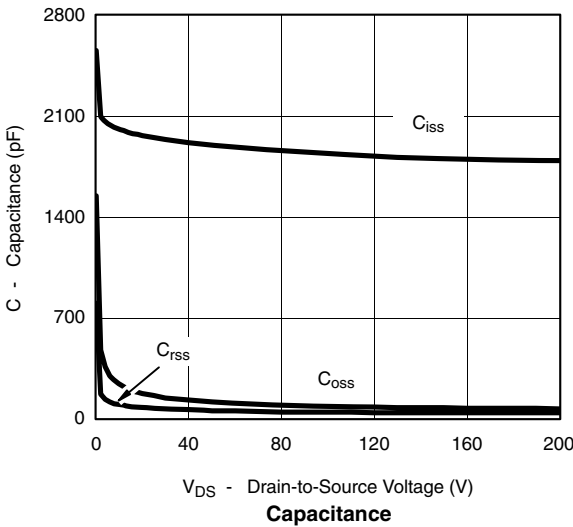
**Transfer Characteristics**



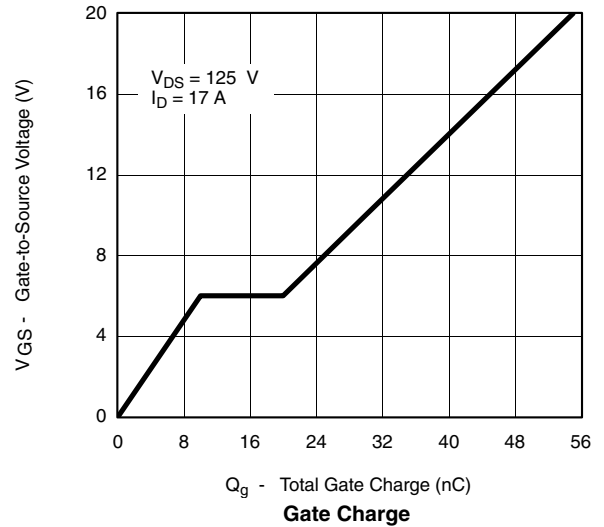
**Transconductance**



**On-Resistance vs. Drain Current**

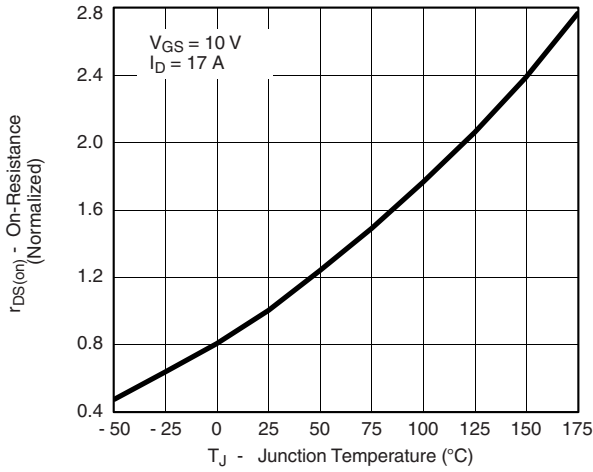


**Capacitance**

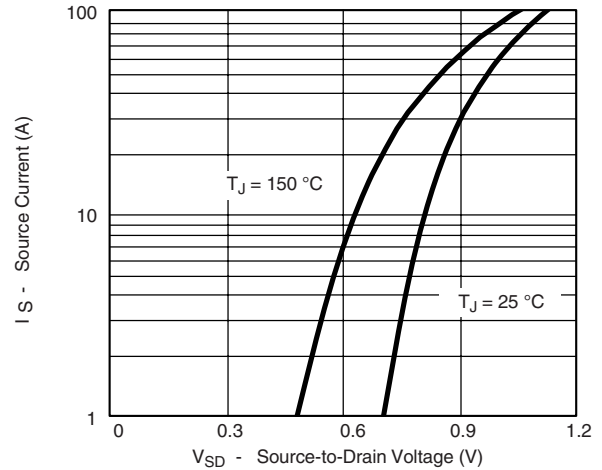


**Gate Charge**

**TYPICAL CHARACTERISTICS** 25 °C unless noted

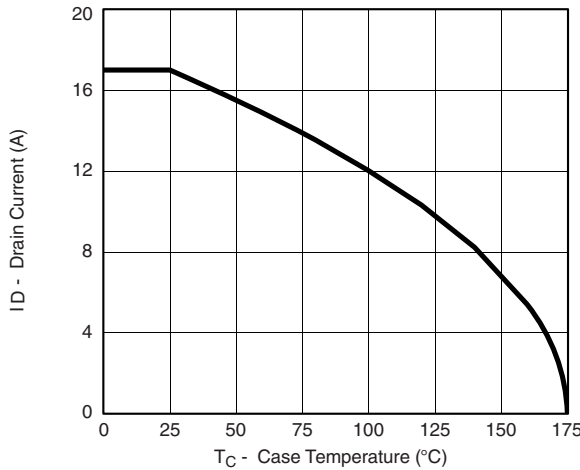


**On-Resistance vs. Junction Temperature**

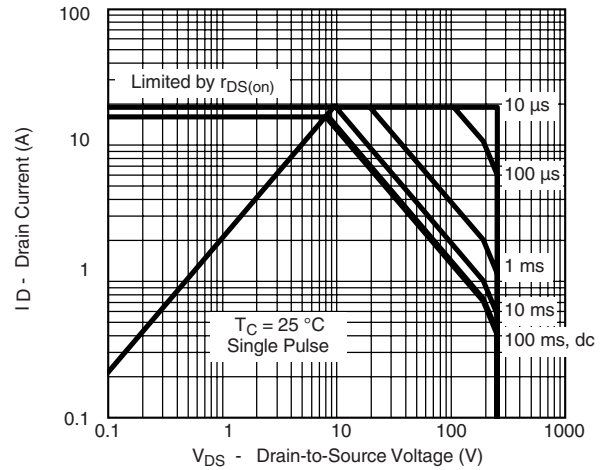


**Source-Drain Diode Forward Voltage**

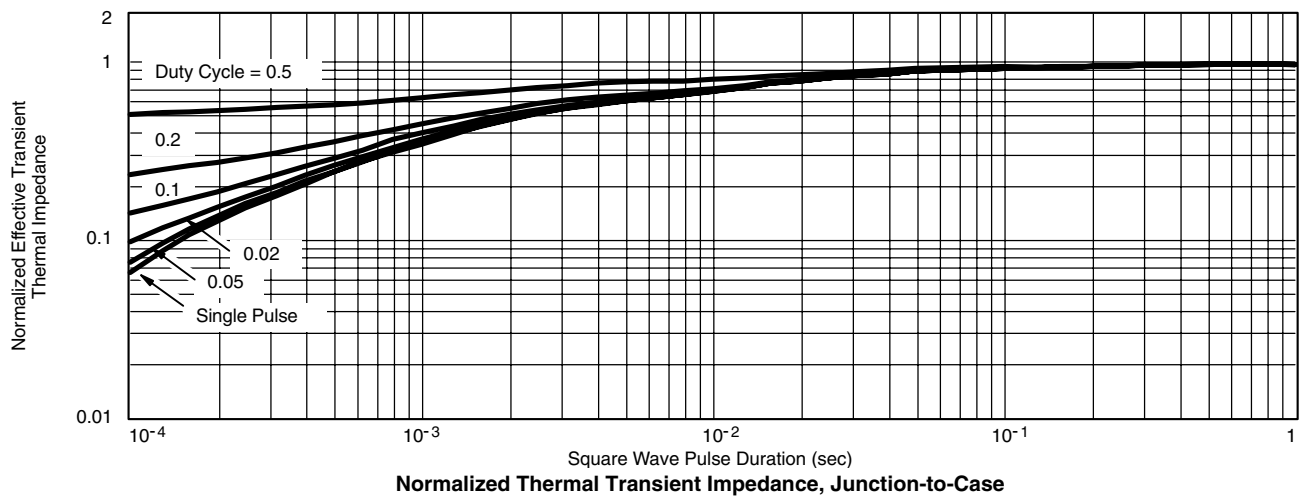
**THERMAL RATINGS**



**Maximum Avalanche Drain Current vs. Case Temperature**



**Safe Operating Area**



**Normalized Thermal Transient Impedance, Junction-to-Case**

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