



## N-Channel 150-V (D-S) 175°C MOSFET

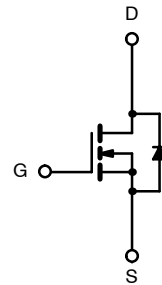
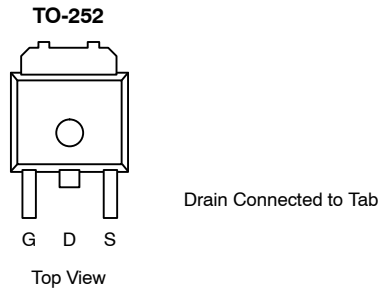
PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
150	0.052 @ $V_{GS} = 10$ V	25
	0.060 @ $V_{GS} = 6$ V	23

### FEATURES

- TrenchFET® Power MOSFET
- 175°C Junction Temperature
- PWM Optimized
- 100%  $R_g$  Tested

### APPLICATIONS

- Primary Side Switch



Ordering Information:

SUD25N15-52  
SUD25N15-52—E3 (Lead Free)

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		$V_{DS}$	150	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	
Continuous Drain Current ( $T_J = 175^\circ\text{C}$ ) <sup>b</sup>	$T_C = 25^\circ\text{C}$	$I_D$	25	A
	$T_C = 125^\circ\text{C}$		14.5	
Pulsed Drain Current		$I_{DM}$	50	
Continuous Source Current (Diode Conduction)		$I_S$	25	
Avalanche Current		$I_{AR}$	25	
Repetitive Avalanche Energy (Duty Cycle $\leq 1\%$ )	$L = 0.1$ mH	$E_{AR}$	31	mJ
Maximum Power Dissipation	$T_C = 25^\circ\text{C}$	$P_D$	136 <sup>b</sup>	W
	$T_A = 25^\circ\text{C}$		3 <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
Junction-to-Ambient <sup>a</sup>	$t \leq 10$ sec	$R_{thJA}$	15	18	$^\circ\text{C/W}$
	Steady State		40	50	
Junction-to-Case (Drain)		$R_{thJC}$	0.85	1.1	

Notes

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

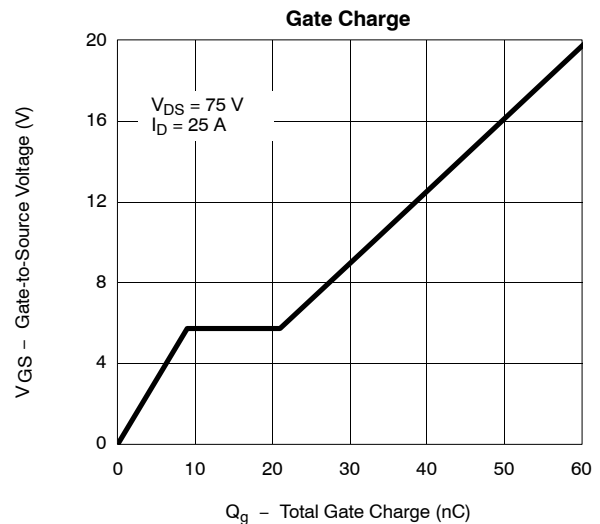
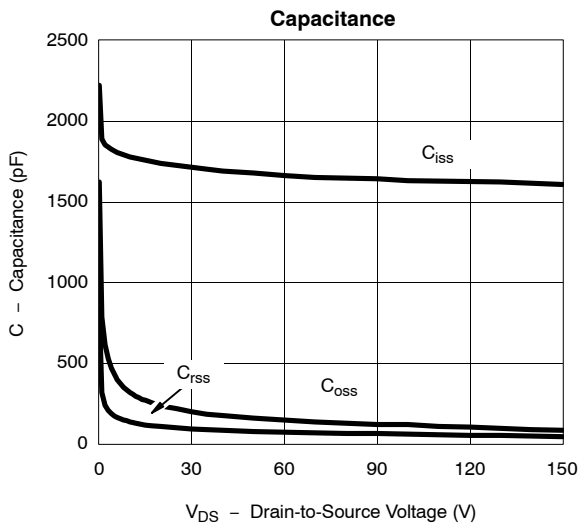
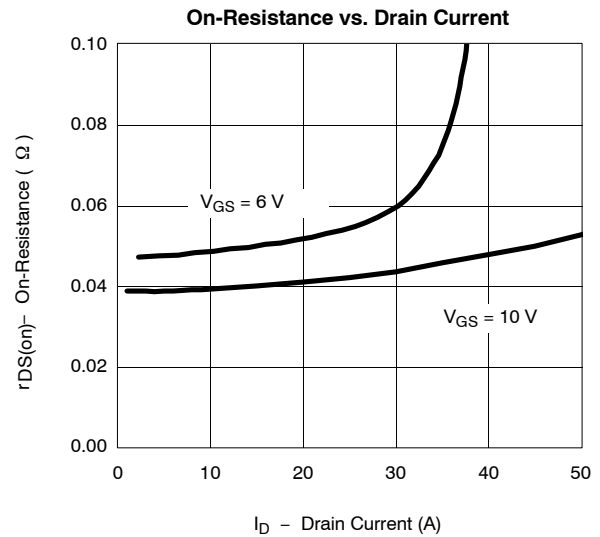
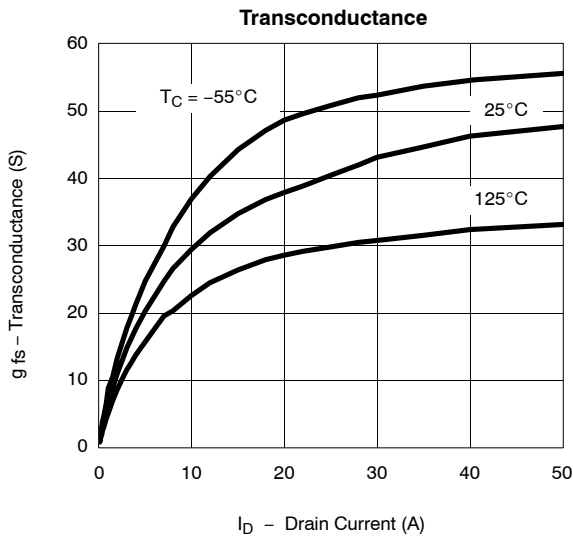
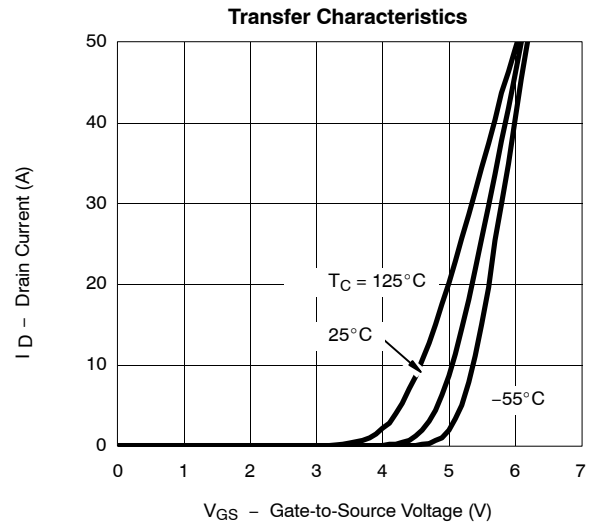
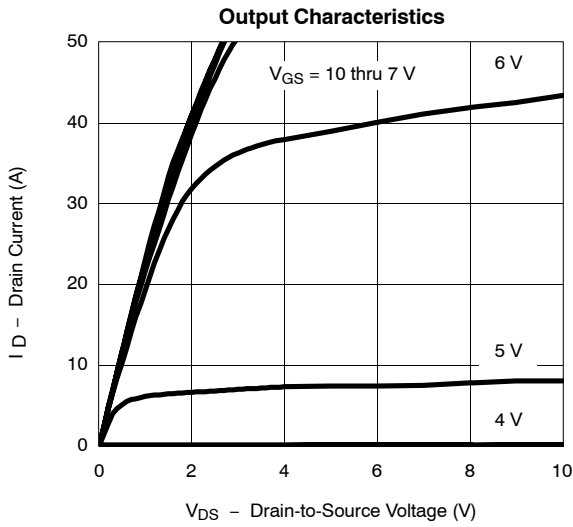
SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	150			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	2		4	
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> = 150 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 150 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C			50	
		V <sub>DS</sub> = 150 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 175 °C			250	
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> = 5 A		0.042	0.052	Ω
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 5 A, T <sub>J</sub> = 125 °C			0.109	
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 5 A, T <sub>J</sub> = 175 °C			0.145	
		V <sub>GS</sub> = 6 V, I <sub>D</sub> = 5 A		0.047	0.060	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 25 A		40		S
<b>Dynamic<sup>a</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, F = 1 MHz		1725		pF
Output Capacitance	C <sub>oss</sub>			216		
Reverse Transfer Capacitance	C <sub>rss</sub>			100		
Total Gate Charge <sup>c</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 75 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 25 A		33	40	nC
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>			9		
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>			12		
Gate Resistance	R <sub>g</sub>		1		3	Ω
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>	V <sub>DD</sub> = 50 V, R <sub>L</sub> = 3 Ω I <sub>D</sub> ≅ 25 A, V <sub>GEN</sub> = 10 V, R <sub>g</sub> = 2.5 Ω		15	25	ns
Rise Time <sup>c</sup>	t <sub>r</sub>			70	100	
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>			25	40	
Fall Time <sup>c</sup>	t <sub>f</sub>			60	40	
<b>Source-Drain Diode Ratings and Characteristic (T<sub>C</sub> = 25 °C)</b>						
Pulsed Current	I <sub>SM</sub>				50	A
Diode Forward Voltage <sup>b</sup>	V <sub>SD</sub>	I <sub>F</sub> = 25 A, V <sub>GS</sub> = 0 V		0.9	1.5	V
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 25 A, di/dt = 100 A/μs		95	140	ns

## Notes

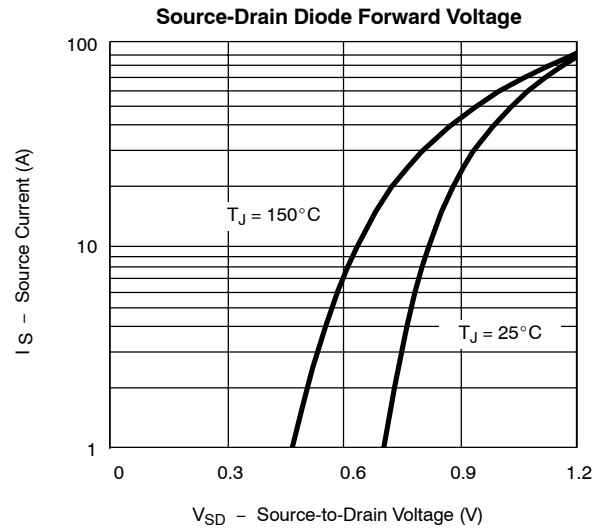
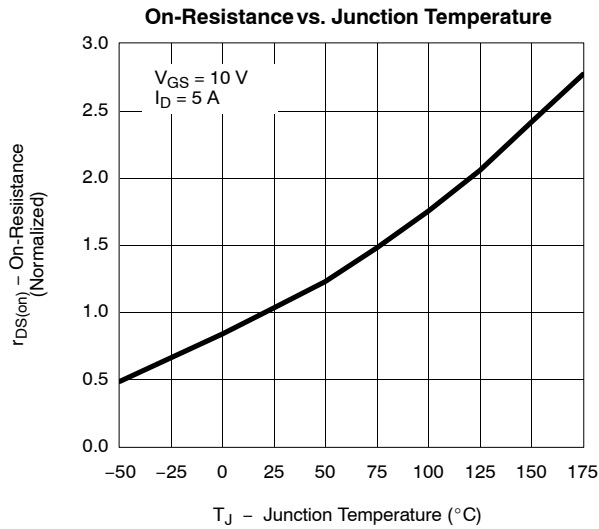
- Guaranteed by design, not subject to production testing.
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- Independent of operating temperature.



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



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**THERMAL RATINGS**

