



## N-Channel 60-V (D-S), 175°C MOSFET, Logic Level

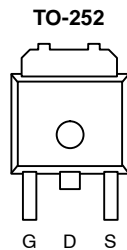


Pb-free Available

PRODUCT SUMMARY		
V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)
60	0.065 @ V <sub>GS</sub> = 10 V	15
	0.090 @ V <sub>GS</sub> = 4.5 V	14

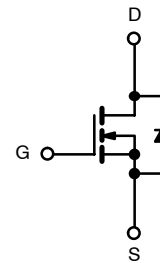
### FEATURES

- TrenchFET® Power MOSFET
- 175°C Maximum Junction Temperature



Top View

Drain Connected to Tab



N-Channel MOSFET

Ordering Information: SUD15N06-90L  
SUD15N06-90L—E3 (Lead (Pb)-Free)

ABSOLUTE MAXIMUM RATINGS (T <sub>C</sub> = 25°C UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Unit
Gate-Source Voltage		V <sub>GS</sub>	±20	V
Continuous Drain Current (T <sub>J</sub> = 175°C)	T <sub>C</sub> = 25°C	I <sub>D</sub>	15	A
	T <sub>C</sub> = 100°C		12	
Pulsed Drain Current		I <sub>DM</sub>	30	
Continuous Source Current (Diode Conduction)		I <sub>S</sub>	15	
Avalanche Current		I <sub>AR</sub>	15	
Repetitive Avalanche Energy (Duty Cycle ≤ 1%)	L = 0.1 mH	E <sub>AR</sub>	11	mJ
Maximum Power Dissipation	T <sub>C</sub> = 25°C	P <sub>D</sub>	37	W
	T <sub>A</sub> = 25°C		2 <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 Free Air, FR4 Board Mount <sup>a</sup>	R <sub>thJA</sub>	60	70	°C/W
Junction-to-Case	R <sub>thJC</sub>	3.3	4.0	

Notes:

a. 1.36 x 2.1 surface mounted on 1" x 1" FR4 Board.



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	60			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	3.0	
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> = 60 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C			50	
		V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 175 °C			150	
On-State Drain Current <sup>b</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = 5 V, V <sub>GS</sub> = 10 V	15			A
Drain-Source On-State Resistance <sup>b</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 10 A		0.050	0.065	Ω
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 10 A, T <sub>J</sub> = 125 °C			0.12	
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 10 A, T <sub>J</sub> = 175 °C			0.15	
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 5 A		0.065	0.090	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 10 A		11		S
<b>Dynamic</b>						
Input Capacitance	C <sub>iSS</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz		524		pF
Output Capacitance	C <sub>oss</sub>			98		
Reverse Transfer Capacitance	C <sub>rSS</sub>			28		
Total Gate Charge <sup>c</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 15 A		12	20	nC
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>			2		
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>			3.5		
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>	V <sub>DD</sub> = 30 V, R <sub>L</sub> = 2 Ω I <sub>D</sub> ≅ 15 A, V <sub>GEN</sub> = 10 V, R <sub>g</sub> = 2.5 Ω		7	20	ns
Rise Time <sup>c</sup>	t <sub>r</sub>			8	25	
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>			15	40	
Fall Time <sup>c</sup>	t <sub>f</sub>			7	20	
<b>Source-Drain Diode Ratings and Characteristics (T<sub>C</sub> = 25 °C)</b>						
Pulsed Current	I <sub>SM</sub>				30	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>F</sub> = 15 A, V <sub>GS</sub> = 0 V		0.9	1.2	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 15 A, di/dt = 100 A/μs		29	60	ns

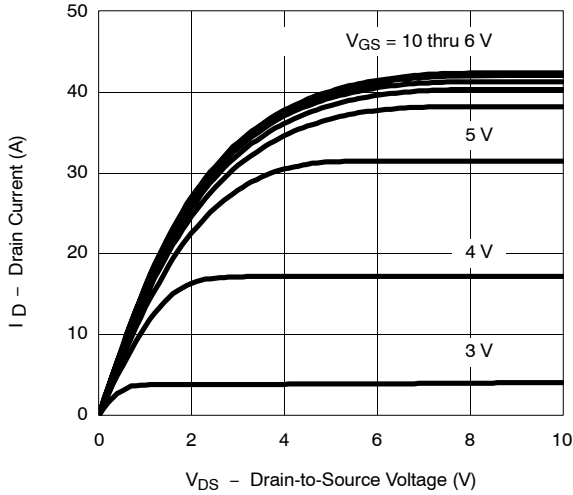
## Notes:

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

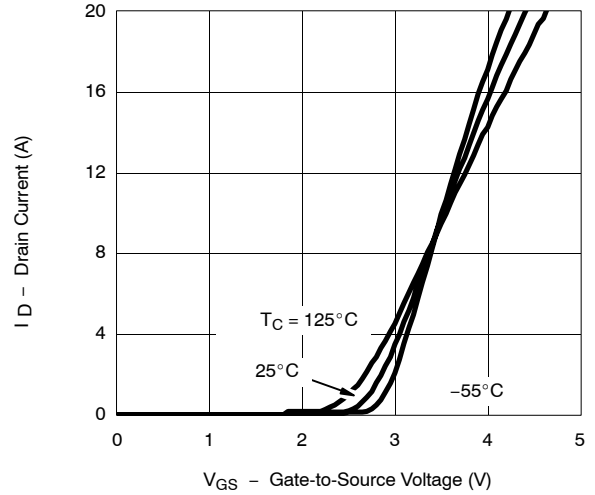
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

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

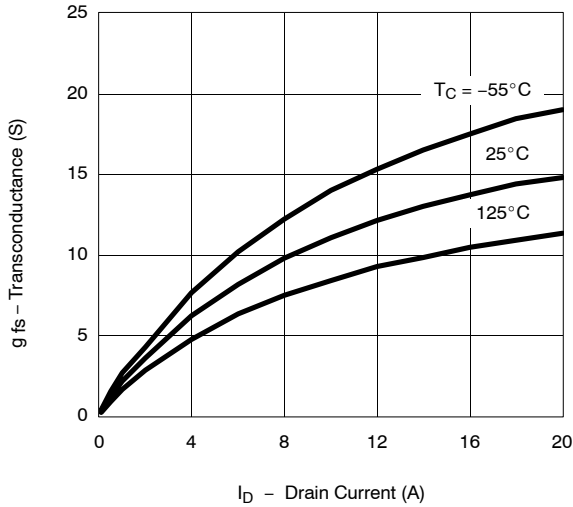
**Output Characteristics**



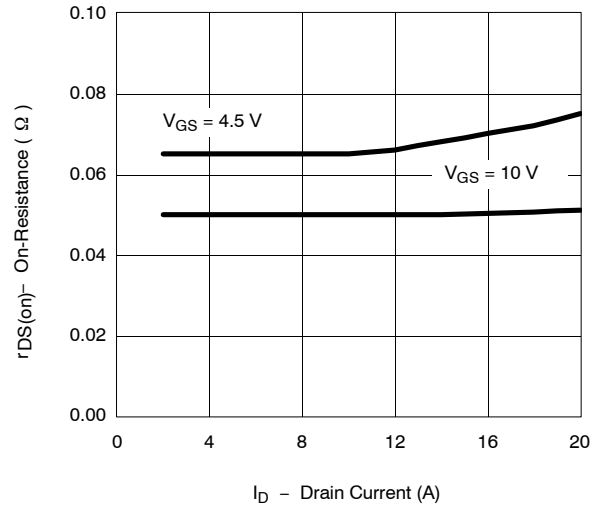
**Transfer Characteristics**



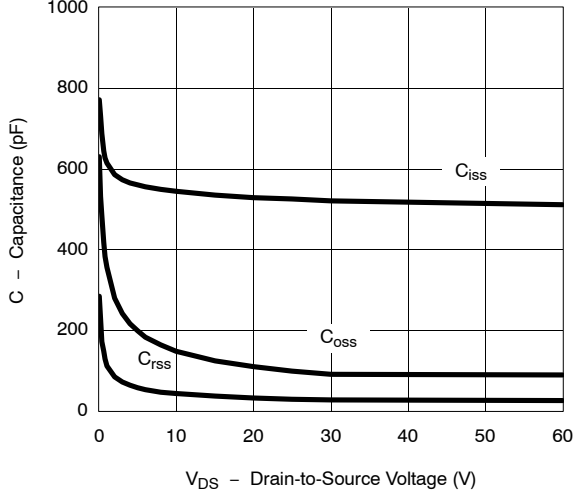
**Transconductance**



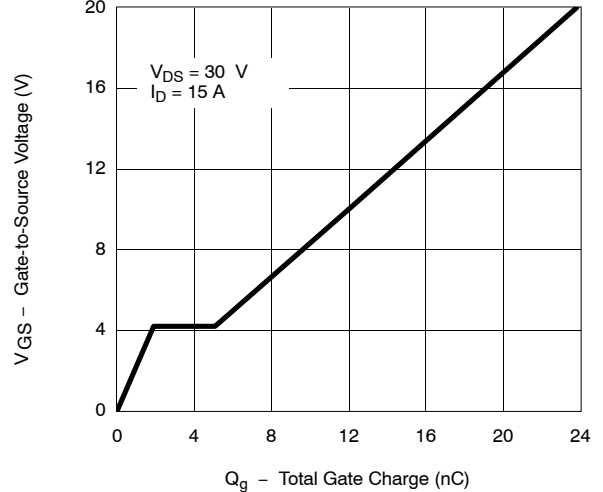
**On-Resistance vs. Drain Current**



**Capacitance**

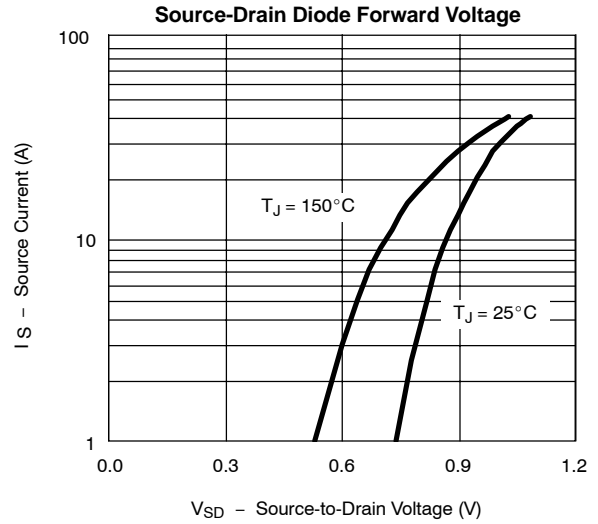
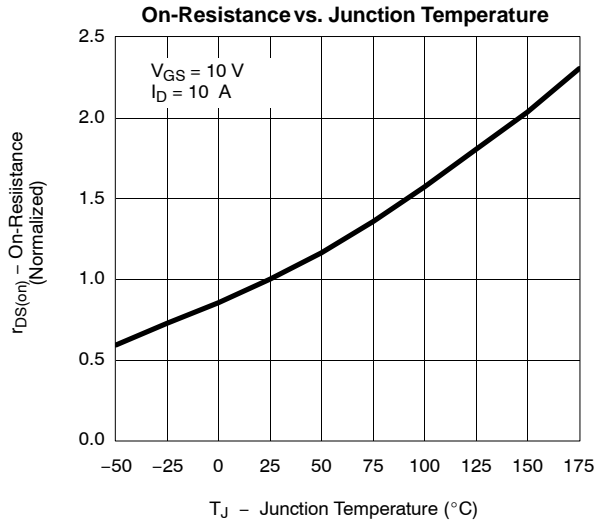


**Gate Charge**

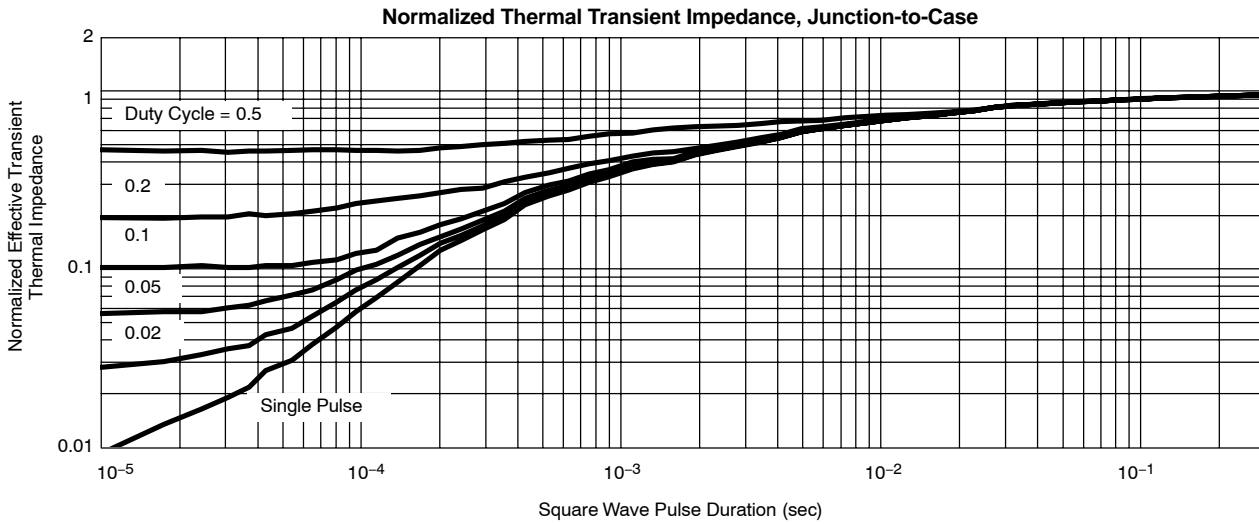
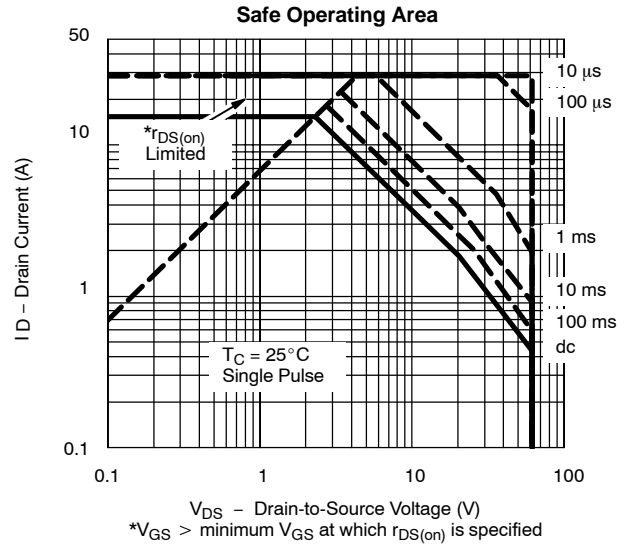
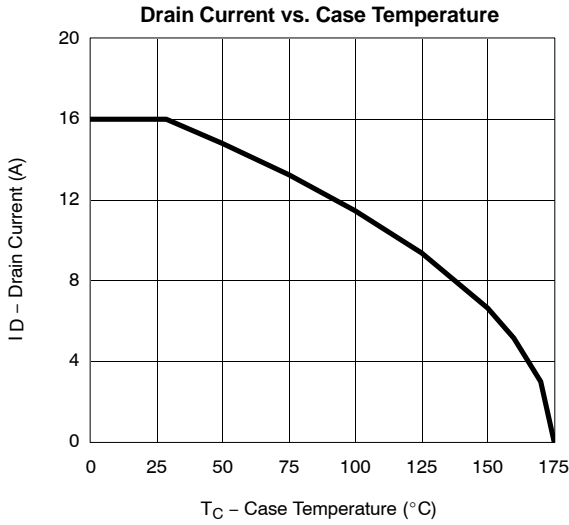




### TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



**THERMAL RATINGS**



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