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

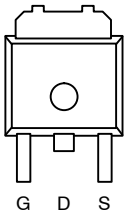
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
60	0.065 @ V_{GS} = 10 V	15
	0.090 @ V_{GS} = 4.5 V	14

FEATURES

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

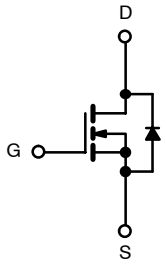
Pb-free Available

TO-252



Drain Connected to Tab

Top View



N-Channel MOSFET

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

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Unit
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current (T_J = 175°C)	T_C = 25°C	I_D	15	A
	T_C = 100°C		12	
Pulsed Drain Current		I_{DM}	30	
Continuous Source Current (Diode Conduction)		I_S	15	
Avalanche Current		I_{AR}	15	
Repetitive Avalanche Energy (Duty Cycle ≤ 1%)	L = 0.1 mH	E_{AR}	11	mJ
Maximum Power Dissipation	T_C = 25°C	P_D	37	W
	T_A = 25°C		2[a]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	−55 to 175	°C

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient Free Air, FR4 Board Mount[a]	R_{thJA}	60	70	°C/W
Junction-to-Case	R_{thJC}	3.3	4.0	

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

SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

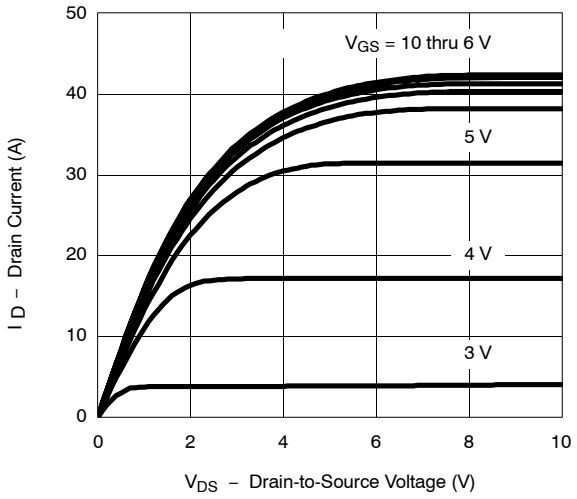
Parameter	Symbol	Test Condition	Min	Typ[a]	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 250 μA	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	1.0	2.0	3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60 V, V_{GS} = 0 V			1	μA
		V_{DS} = 60 V, V_{GS} = 0 V, T_J = 125°C			50	
		V_{DS} = 60 V, V_{GS} = 0 V, T_J = 175°C			150	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 10 V	15			A
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 10 A		0.050	0.065	Ω
		V_{GS} = 10 V, I_D = 10 A, T_J = 125°C			0.12	
		V_{GS} = 10 V, I_D = 10 A, T_J = 175°C			0.15	
		V_{GS} = 4.5 V, I_D = 5 A		0.065	0.090	
Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, I_D = 10 A		11		S
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		524		pF
Output Capacitance	C_{oss}			98		
Reverse Transfer Capacitance	C_{rss}			28		
Total Gate Charge[c]	Q_g	V_{DS} = 30 V, V_{GS} = 10 V, I_D = 15 A		12	20	nC
Gate-Source Charge[c]	Q_{gs}			2		
Gate-Drain Charge[c]	Q_{gd}			3.5		
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = 30 V, R_L = 2 Ω I_D ≅ 15 A, V_{GEN} = 10 V, R_g = 2.5 Ω		7	20	ns
Rise Time[c]	t_r			8	25	
Turn-Off Delay Time[c]	$t_{d(off)}$			15	40	
Fall Time[c]	t_f			7	20	
Source-Drain Diode Ratings and Characteristics (T_C = 25°C)						
Pulsed Current	I_{SM}				30	A
Diode Forward Voltage	V_{SD}	I_F = 15 A, V_{GS} = 0 V		0.9	1.2	V
Reverse Recovery Time	t_{rr}	I_F = 15 A, di/dt = 100 A/μs		29	60	ns

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

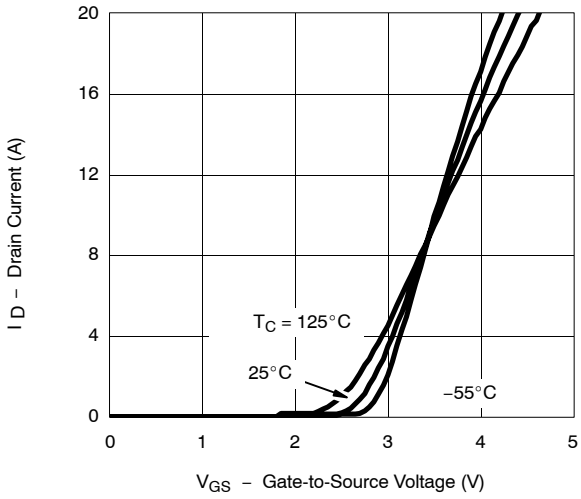
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

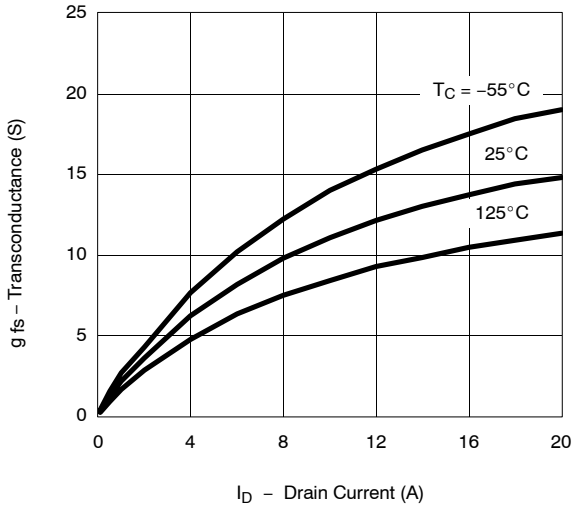
Output Characteristics



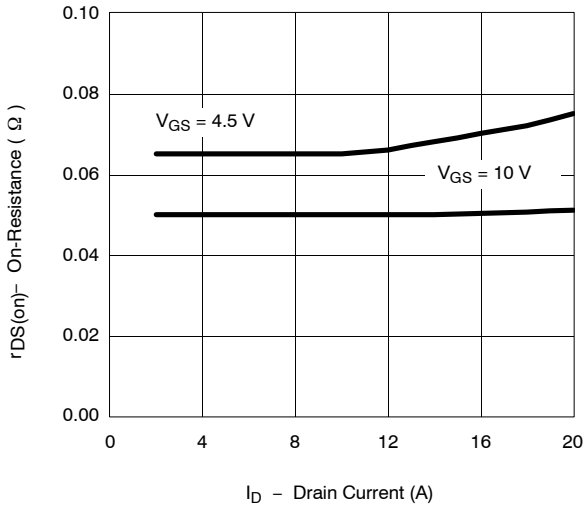
Transfer Characteristics



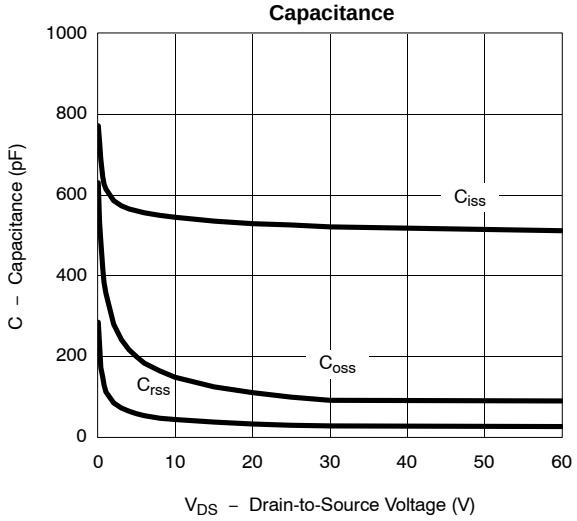
Transconductance



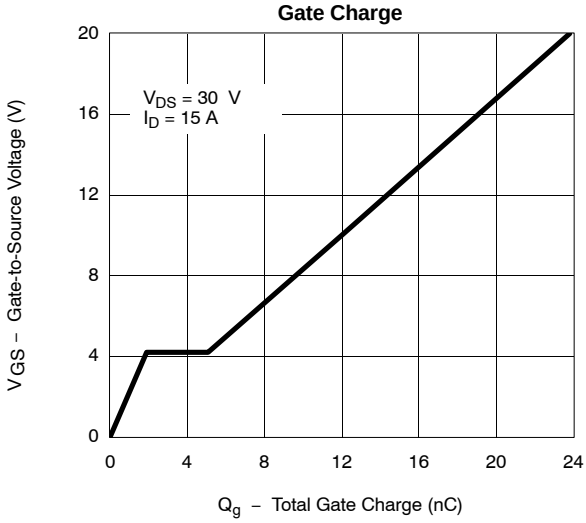
On-Resistance vs. Drain Current



Capacitance

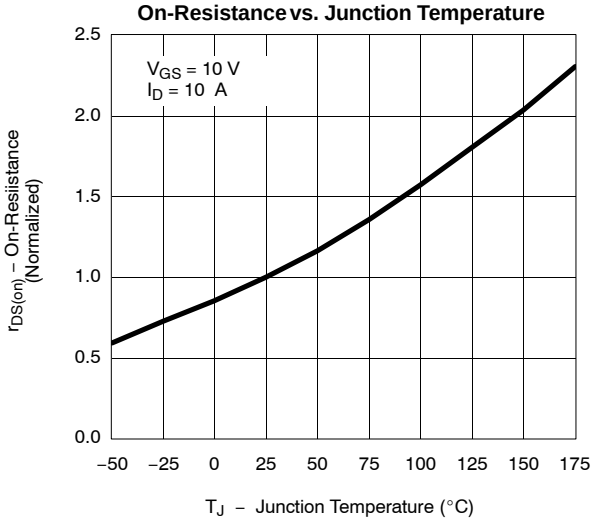


Gate Charge

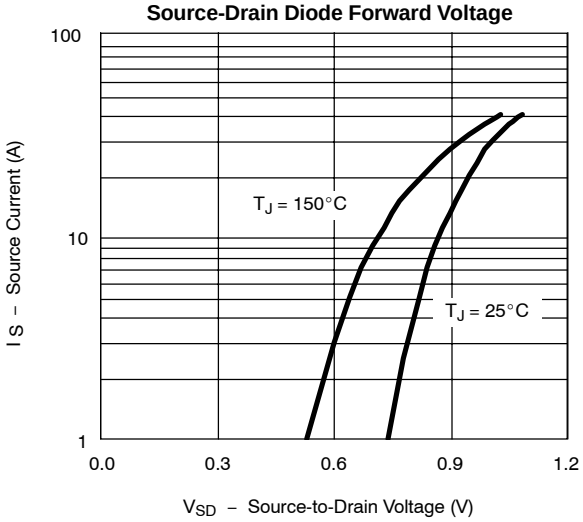


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

On-Resistance vs. Junction Temperature

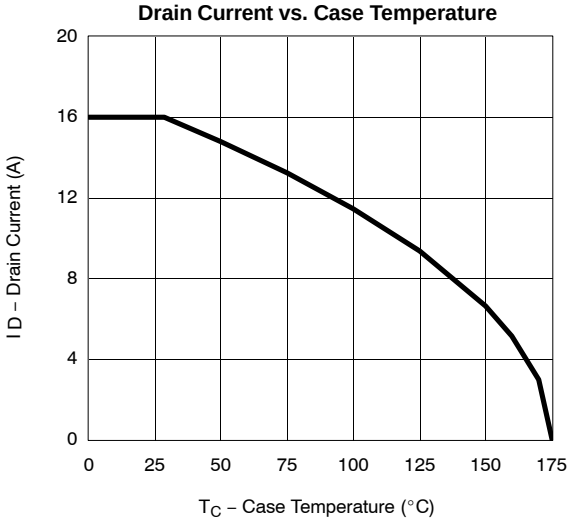


Source-Drain Diode Forward Voltage

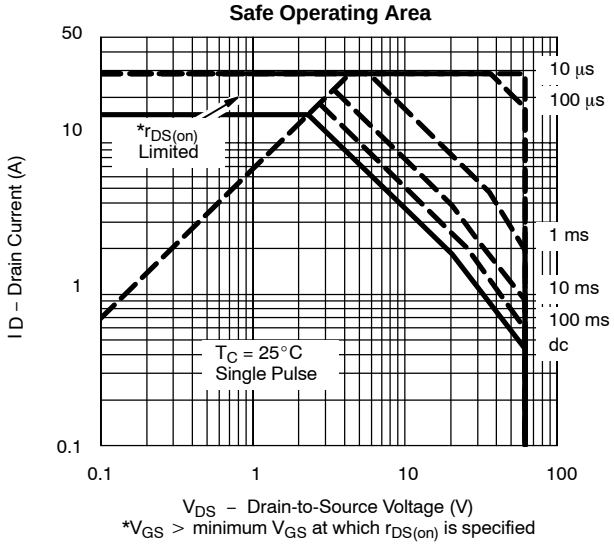


THERMAL RATINGS

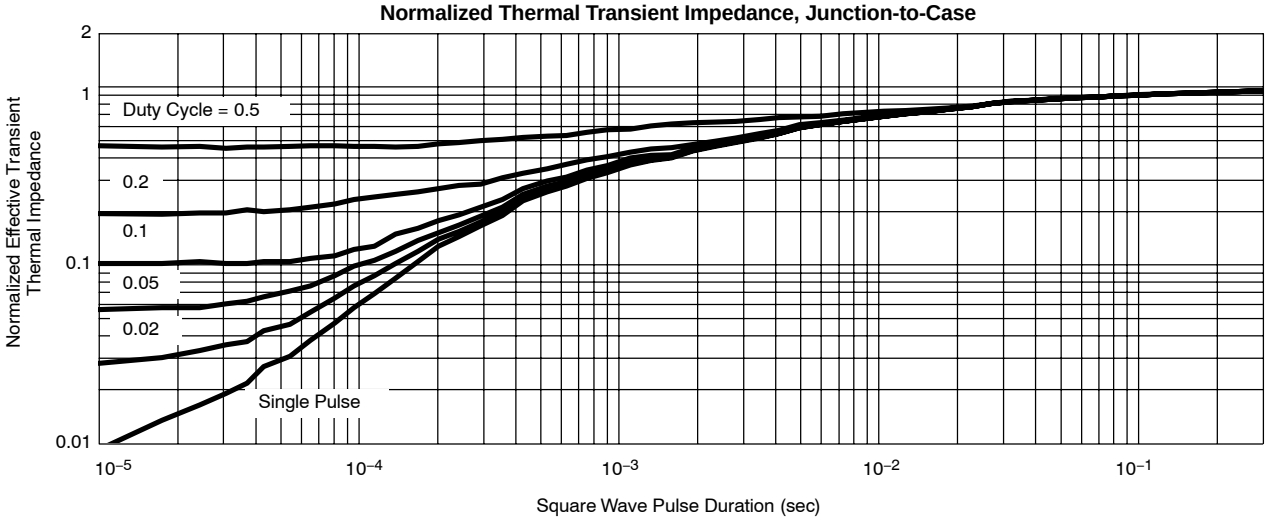
Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case



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