



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

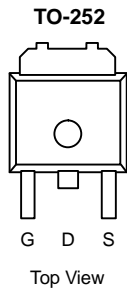
PRODUCT SUMMARY		
V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A) ^a
60	0.031 @ V _{GS} = 10 V	23
	0.045 @ V _{GS} = 4.5 V	19.5

FEATURES

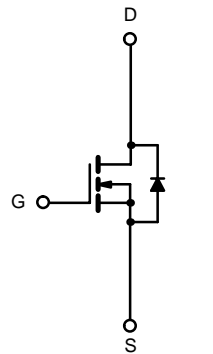
- TrenchFET® Power MOSFET
- 175°C Junction Temperature

APPLICATIONS

- Automotive
 - 12-V Systems



Drain Connected to Tab



Ordering Information: SUD23N06-31L

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) ^b	T _C = 25°C	I _D	23	A
	T _C = 100°C		16.5	
Pulsed Drain Current		I _{DM}	50	
Continuous Source Current (Diode Conduction)		I _S	23	
Avalanche Current		I _{AR}	20	
Repetitive Avalanche Energy (Duty Cycle ≤ 1%)	L = 0.1 mH	E _{AR}	20	mJ
Maximum Power Dissipation	T _C = 25°C	P _D	100	W
	T _A = 25°C		3 ^a	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to 175	°C

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Limit	Unit
Maximum Junction-to-Ambient ^a	t ≤ 10 sec.	R _{thJA}	18	22	°C/W
	Steady State		40	50	
Maximum Junction-to-Case		R _{thJC}	3.2	4	

Notes:

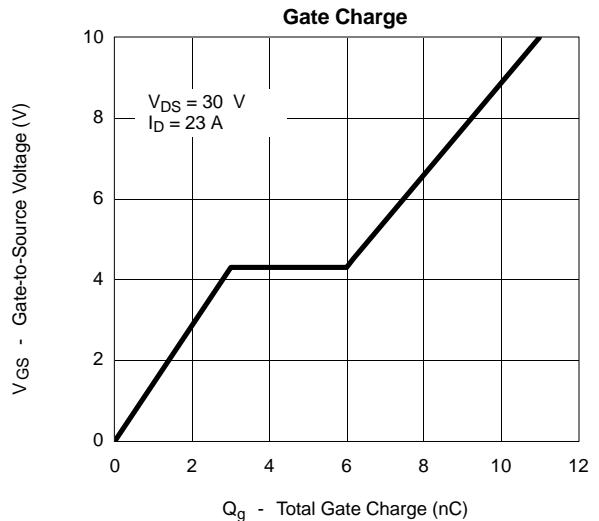
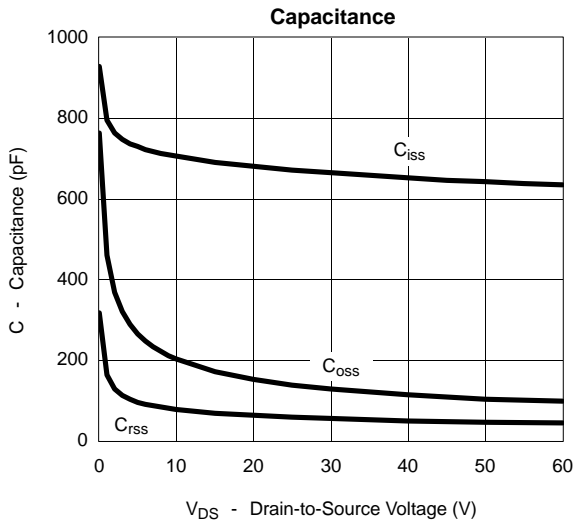
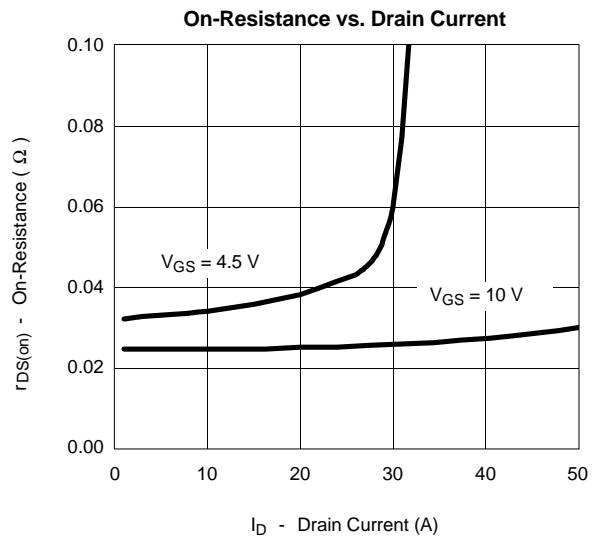
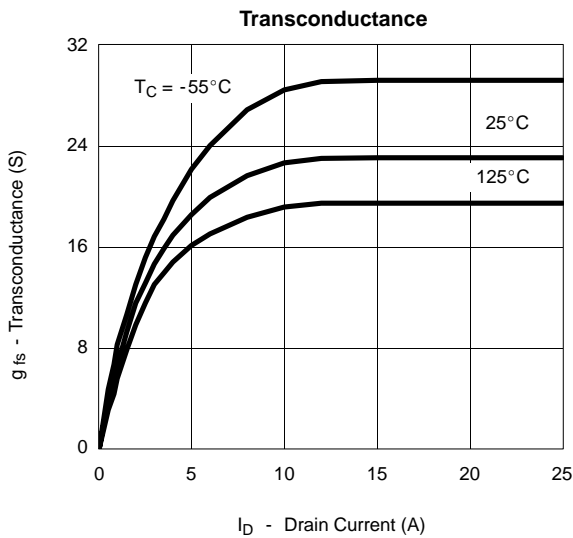
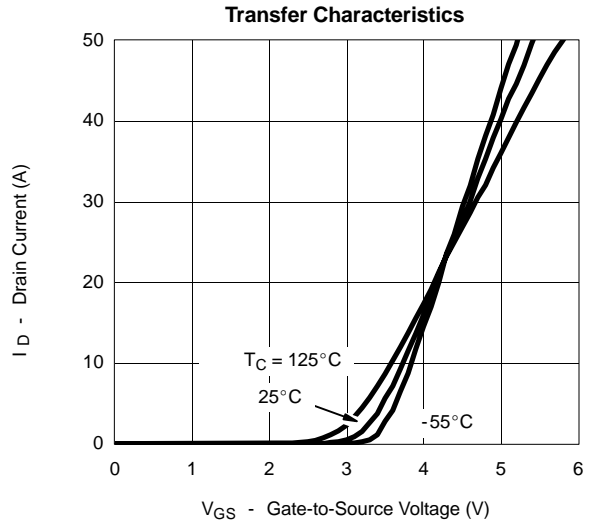
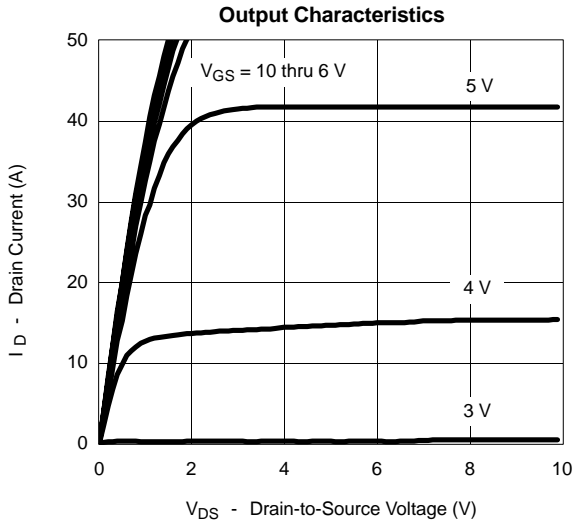
a. Surface mounted on 1" x 1" FR4 Board, t ≤ 10 sec.

SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ ^a	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	1.0	2.0	3.0	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 48\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 48\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			50	
		$V_{DS} = 48\text{ V}, V_{GS} = 0\text{ V}, T_J = 175^\circ\text{C}$			250	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	50			A
Drain-Source On-State Resistance ^b	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 15\text{ A}$		0.025	0.031	Ω
		$V_{GS} = 10\text{ V}, I_D = 15\text{ A}, T_J = 125^\circ\text{C}$			0.055	
		$V_{GS} = 10\text{ V}, I_D = 15\text{ A}, T_J = 175^\circ\text{C}$			0.069	
		$V_{GS} = 4.5\text{ V}, I_D = 10\text{ A}$		0.037	0.045	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 15\text{ A}$		20		S
Dynamic						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		670		pF
Output Capacitance	C_{oss}			140		
Reverse Transfer Capacitance	C_{rss}			60		
Total Gate Charge ^c	Q_g	$V_{DS} = 30\text{ V}, V_{GS} = 10\text{ V}, I_D = 23\text{ A}$		11	17	nC
Gate-Source Charge ^c	Q_{gs}			3		
Gate-Drain Charge ^c	Q_{gd}			3		
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 30\text{ V}, R_L = 1.3\ \Omega$ $I_D \approx 23\text{ A}, V_{GEN} = 10\text{ V}, R_G = 2.5\ \Omega$		8	15	ns
Rise Time ^c	t_r			15	25	
Turn-Off Delay Time ^c	$t_{d(off)}$			30	45	
Fall Time ^c	t_f			25	40	
Source-Drain Diode Ratings and Characteristics ($T_C = 25^\circ\text{C}$)						
Pulsed Current	I_{SM}				50	A
Diode Forward Voltage	V_{SD}	$I_F = 15\text{ A}, V_{GS} = 0\text{ V}$		1.0	1.5	V
Reverse Recovery Time	t_{rr}	$I_F = 15\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		30	60	ns

Notes:

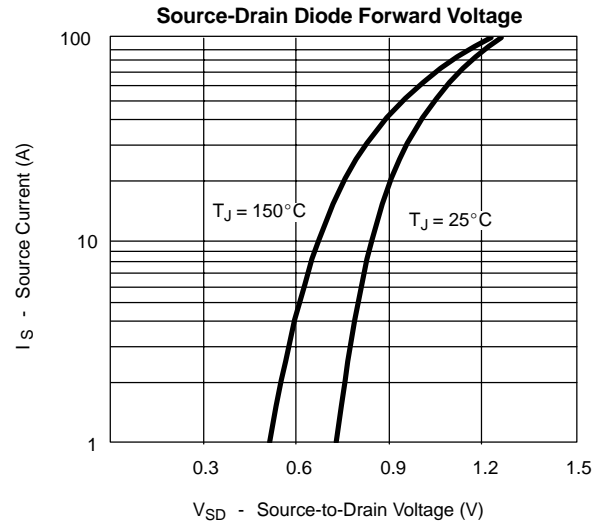
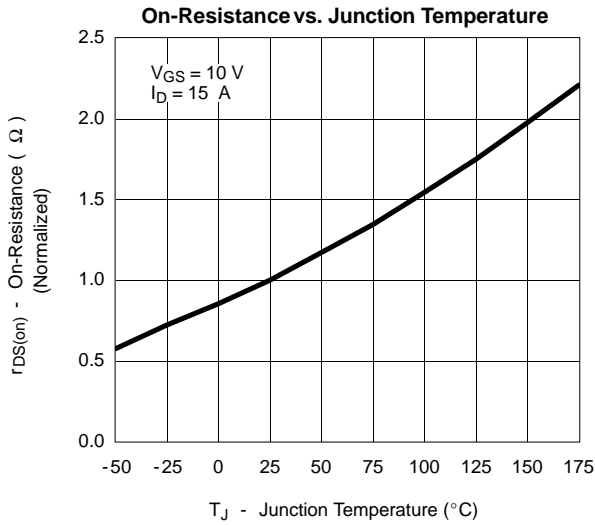
- b. For design aid only; not subject to production testing.
 c. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
 d. Independent of operating temperature.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)





TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



THERMAL RATINGS

