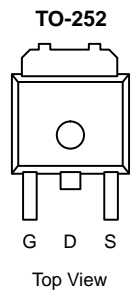




## N-Channel 60-V (D-S), 175 °C MOSFET, Logic Level

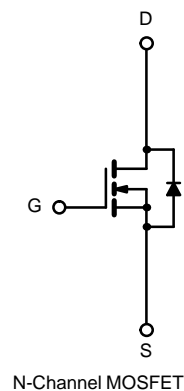
PRODUCT SUMMARY		
V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A) <sup>a</sup>
60	0.022 @ V <sub>GS</sub> = 10 V	30
	0.025 @ V <sub>GS</sub> = 4.5 V	30

**175 °C Rated**  
Maximum Junction Temperature  
**TrenchFET®**  
Power MOSFETs



Drain Connected to Tab

Order Number:  
SUD40N06-25L



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) <sup>b</sup>	T <sub>C</sub> = 25 °C	I <sub>D</sub>	30	A
	T <sub>C</sub> = 100 °C		30	
Pulsed Drain Current		I <sub>DM</sub>	100	
Continuous Source Current (Diode Conduction)		I <sub>S</sub>	34	
Avalanche Current		I <sub>AR</sub>	34	
Repetitive Avalanche Energy (Duty Cycle ≤ 1%)	L = 0.1 mH	E <sub>AR</sub>	58	mJ
Maximum Power Dissipation	T <sub>C</sub> = 25 °C	P <sub>D</sub>	75	W
	T <sub>A</sub> = 25 °C		1.4 <sup>b</sup> , 2.5 <sup>c</sup>	
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>stg</sub>	-55 to 175	°C

THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Limit	Unit
Maximum Junction-to-Ambient	Free Air, FR4 Board Mount	R <sub>thJA</sub>	60	°C/W
	Free Air, Vertical Mount		110	
Maximum Junction-to-Case		R <sub>thJC</sub>	2.0	

Notes:

- a. Package limited.
- b. Free air, vertical mount.
- c. Surface mounted on 1" x 1" FR4 Board, t ≤ 10 sec.

For SPICE model information via the Worldwide Web: <http://www.vishay.com/www/product/spice.htm>



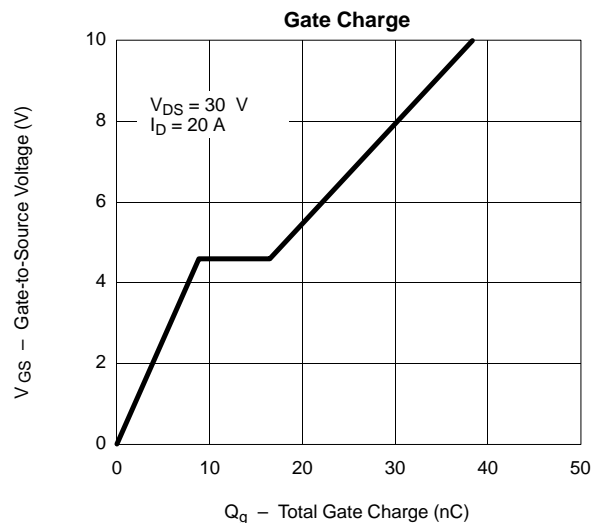
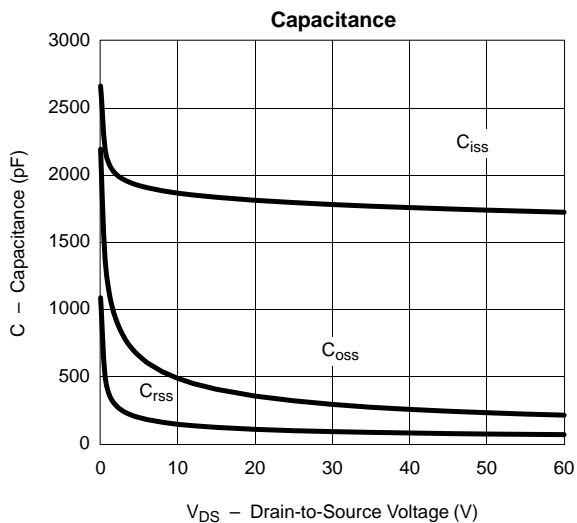
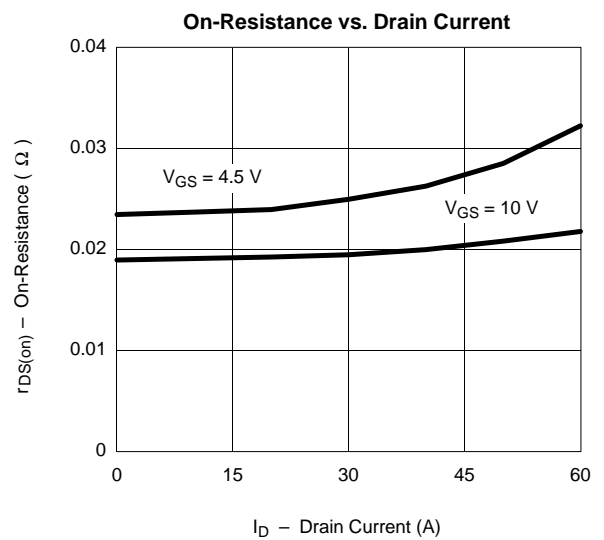
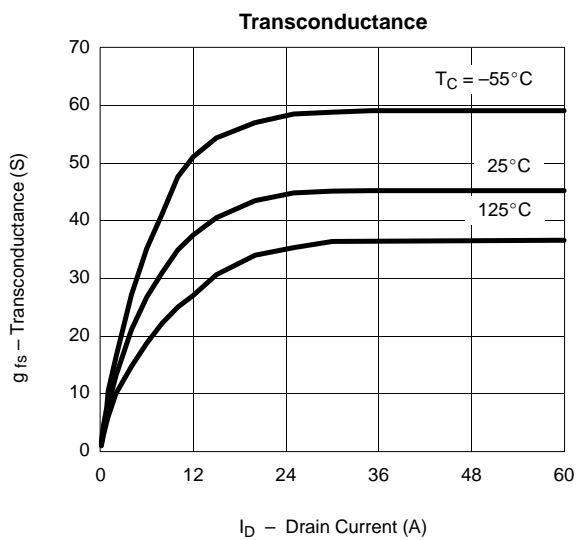
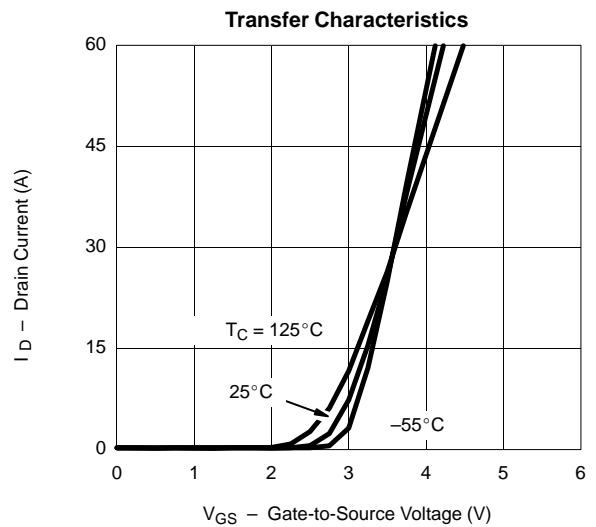
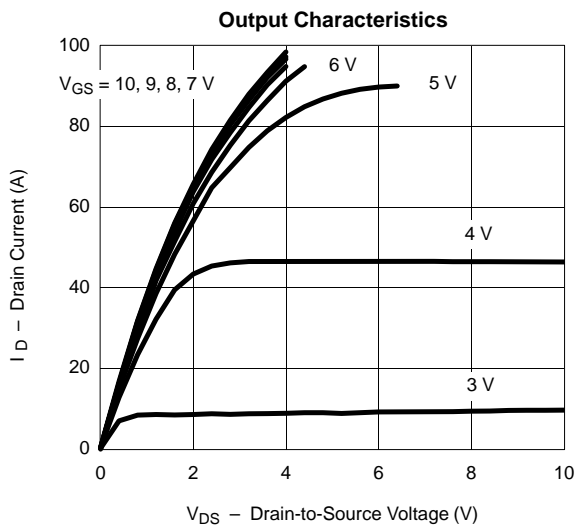
SPECIFICATIONS ( $T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	1.0	2.0	3.0	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}$			1	$\mu\text{A}$
		$V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			50	
		$V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}, T_J = 175^\circ\text{C}$			150	
On-State Drain Current <sup>b</sup>	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	20			A
Drain-Source On-State Resistance <sup>b</sup>	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 20\text{ A}$			0.022	$\Omega$
		$V_{GS} = 10\text{ V}, I_D = 20\text{ A}, T_J = 125^\circ\text{C}$			0.043	
		$V_{GS} = 10\text{ V}, I_D = 20\text{ A}, T_J = 175^\circ\text{C}$			0.053	
		$V_{GS} = 4.5\text{ V}, I_D = 20\text{ A}$			0.025	
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = 15\text{ V}, I_D = 20\text{ A}$				S
<b>Dynamic</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		1800		pF
Output Capacitance	$C_{oss}$			350		
Reverse Transfer Capacitance	$C_{rss}$			100		
Total Gate Charge <sup>c</sup>	$Q_g$	$V_{DS} = 30\text{ V}, V_{GS} = 10\text{ V}, I_D = 40\text{ A}$		40	60	nC
Gate-Source Charge <sup>c</sup>	$Q_{gs}$			9		
Gate-Drain Charge <sup>c</sup>	$Q_{gd}$			10		
Turn-On Delay Time <sup>c</sup>	$t_{d(on)}$	$V_{DD} = 30\text{ V}, R_L = 0.9\ \Omega$ $I_D \cong 20\text{ A}, V_{GEN} = 10\text{ V}, R_G = 2.5\ \Omega$		10	20	ns
Rise Time <sup>c</sup>	$t_r$			9	20	
Turn-Off Delay Time <sup>c</sup>	$t_{d(off)}$			28	50	
Fall Time <sup>c</sup>	$t_f$			7	15	
<b>Source-Drain Diode Ratings and Characteristics (<math>T_C = 25^\circ\text{C}</math>)</b>						
Pulsed Current	$I_{SM}$				20	A
Diode Forward Voltage	$V_{SD}$	$I_F = 20\text{ A}, V_{GS} = 0\text{ V}$		1.0	1.5	V
Reverse Recovery Time	$t_{rr}$	$I_F = 20\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		48	100	ns

## Notes:

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

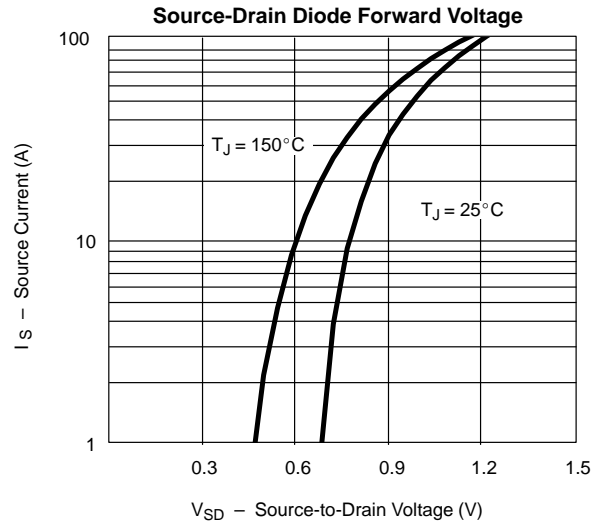
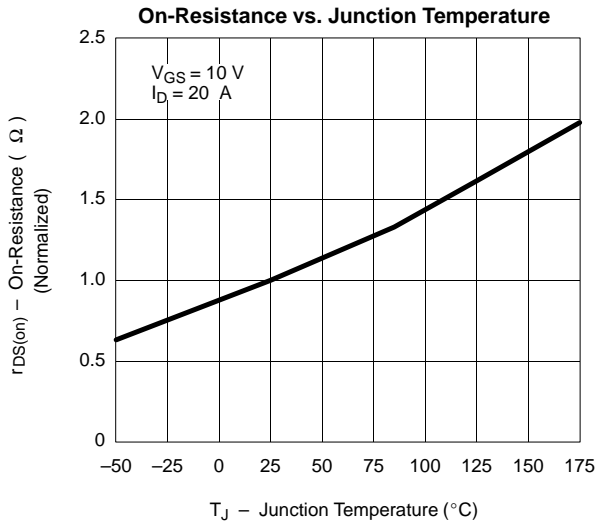


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**





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



### THERMAL RATINGS

