



# P-Channel 60-V (D-S), 175 °C MOSFET

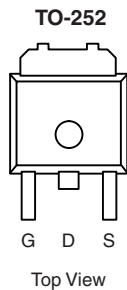
PRODUCT SUMMARY			
V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)	Q <sub>g</sub> (Typ)
- 60	0.155 at V <sub>GS</sub> = - 10 V	- 8.4	12.5
	0.280 at V <sub>GS</sub> = - 4.5 V	- 7.4	

## FEATURES

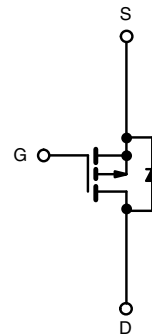
- TrenchFET® Power MOSFETS
- 175 °C Rated Maximum Junction Temperature



RoHS COMPLIANT



Ordering Information: SUD08P06-155L-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)	I <sub>D</sub>	T <sub>C</sub> = 25 °C	- 8.4
		T <sub>C</sub> = 100 °C	- 6
Pulsed Drain Current	I <sub>DM</sub>	- 18	A
Continuing Source Current (Diode Conduction)	I <sub>S</sub>	- 8.4	
Avalanche Current	I <sub>AS</sub>	- 12	
Single Pulse Avalanche Energy	L = 0.1 mH E <sub>AS</sub>	7.2	mJ
Maximum Power Dissipation	P <sub>D</sub>	T <sub>C</sub> = 25 °C	25 <sup>a</sup>
		T <sub>A</sub> = 25 °C	2 <sup>b</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 <sup>b</sup>	R <sub>thJA</sub>	t ≤ 10 sec	20	25	°C/W
		Steady State	62	75	
Junction-to-Case	R <sub>thJC</sub>	5	6		

Notes:

- a. See SOA curve for voltage derating.
- b. Surface Mounted on 1" x 1" FR-4 board.

<b>SPECIFICATIONS</b> $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	- 60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	- 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	$\mu\text{A}$
		$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$			- 50	
		$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}, T_J = 175\text{ }^\circ\text{C}$			- 150	
On-State Drain Current <sup>b</sup>	$I_{D(on)}$	$V_{DS} = -5\text{ V}, V_{GS} = -10\text{ V}$	- 10			A
Drain-Source On-State Resistance <sup>b</sup>	$r_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -5\text{ A}$		0.125	0.155	$\Omega$
		$V_{GS} = -10\text{ V}, I_D = -5\text{ A}, T_J = 125\text{ }^\circ\text{C}$			0.280	
		$V_{GS} = -10\text{ V}, I_D = -5\text{ A}, T_J = 175\text{ }^\circ\text{C}$			0.350	
		$V_{GS} = -4.5\text{ V}, I_D = -2\text{ A}$		0.158	0.280	
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = -15\text{ V}, I_D = -5\text{ A}$		8		S
<b>Dynamic</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = -25\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		450		$\text{pF}$
Output Capacitance	$C_{oss}$			65		
Reverse Transfer Capacitance	$C_{rss}$			40		
Total Gate Charge	$Q_g$	$V_{DS} = -30\text{ V}, V_{GS} = -10\text{ V}, I_D = -8.4\text{ A}$		12.5	19	nC
Gate-Source Charge	$Q_{gs}$			2.3		
Gate-Drain Charge	$Q_{gd}$			3.2		
Gate Resistance	$R_g$	$f = 1\text{ MHz}$		8.0		$\Omega$
Turn-On Delay Time <sup>c</sup>	$t_{d(on)}$	$V_{DD} = -30\text{ V}, R_L = 3.57\text{ }\Omega$ $I_D \cong -8.4\text{ A}, V_{GEN} = -10\text{ V}, R_G = 2.5\text{ }\Omega$		5	10	ns
Rise Time <sup>c</sup>	$t_r$			14	25	
Turn-Off Delay Time <sup>c</sup>	$t_{d(off)}$			15	25	
Fall Time <sup>c</sup>	$t_f$			7	12	
<b>Source-Drain Diode Ratings and Characteristics</b> ( $T_C = 25\text{ }^\circ\text{C}$ ) <sup>b</sup>						
Pulsed Current	$I_{SM}$				- 20	A
Forward Voltage <sup>b</sup>	$V_{SD}$	$I_F = -2\text{ A}, V_{GS} = 0\text{ V}$		- 0.9	- 1.3	V
Reverse Recovery Time	$t_{rr}$	$I_F = -8\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		50	80	ns
Reverse Recovery Time	$Q_{rr}$			80	120	nC

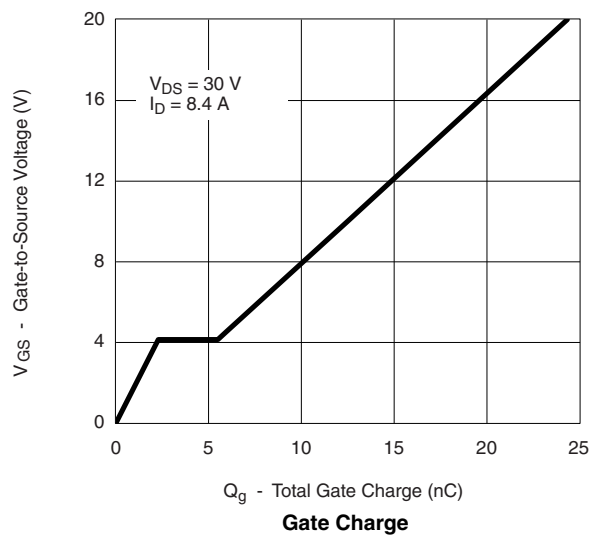
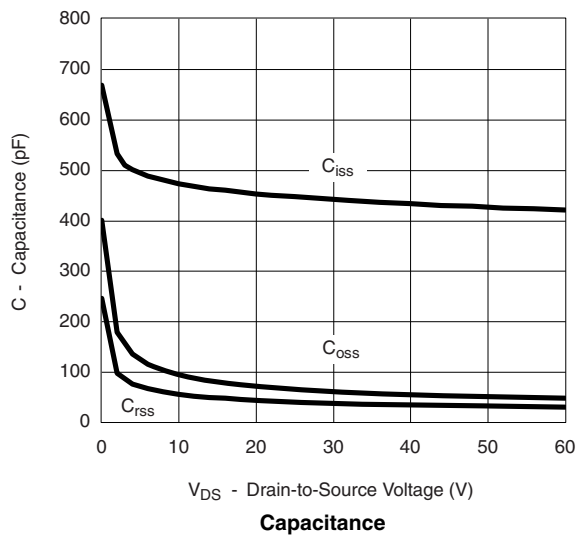
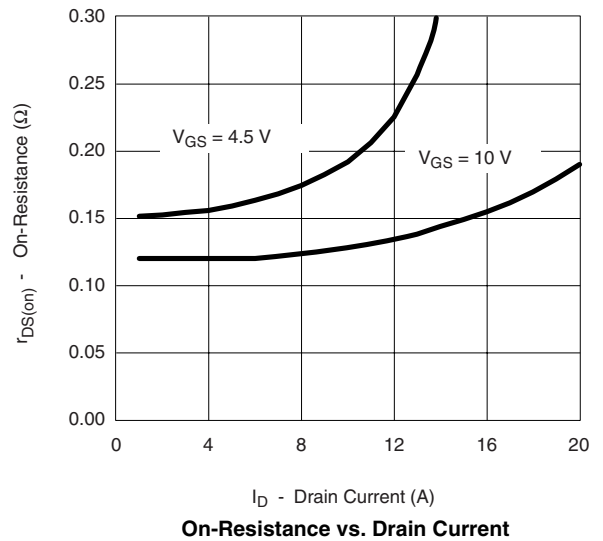
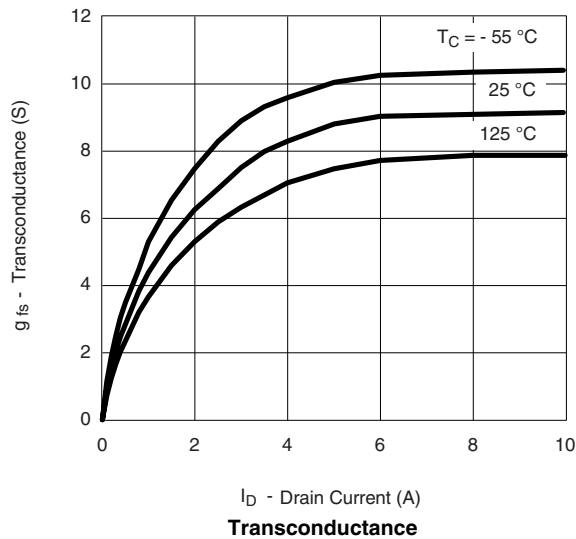
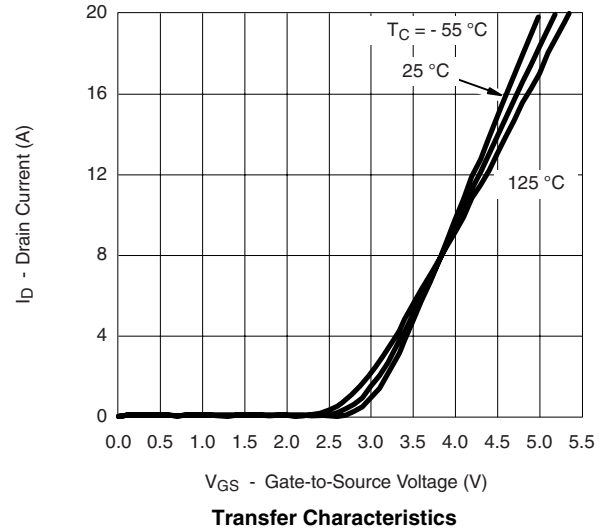
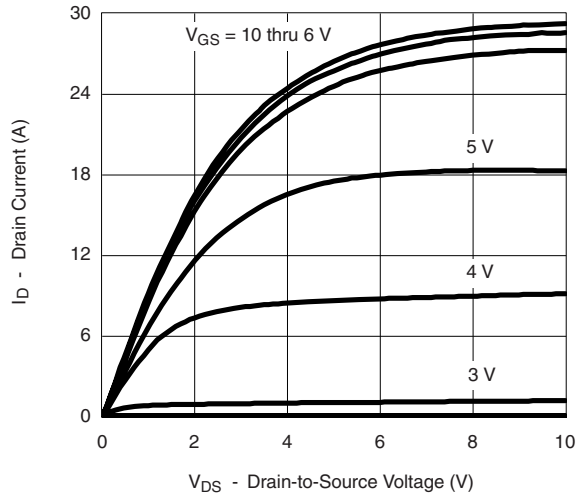
## Notes:

- Guaranteed by design, not subject to production testing.
- Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .
- 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

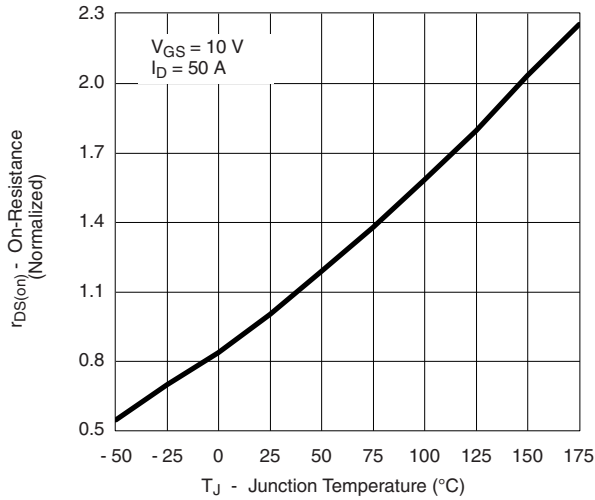


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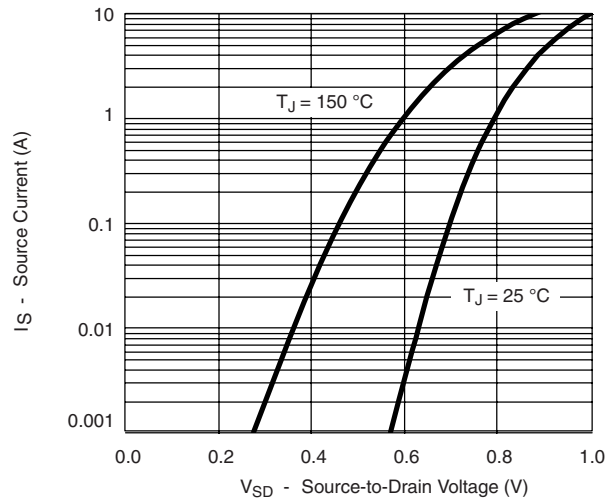


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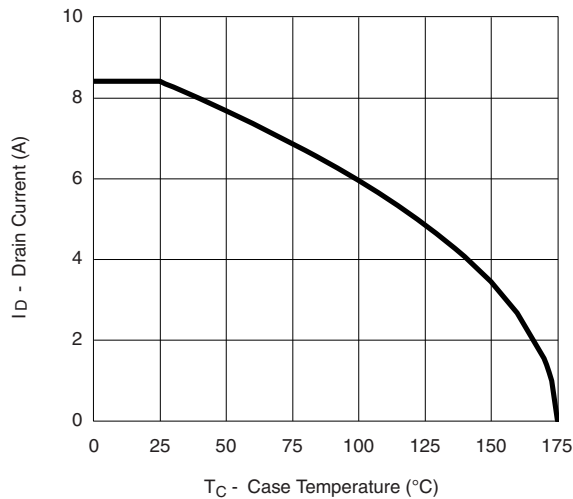


On-Resistance vs. Junction Temperature

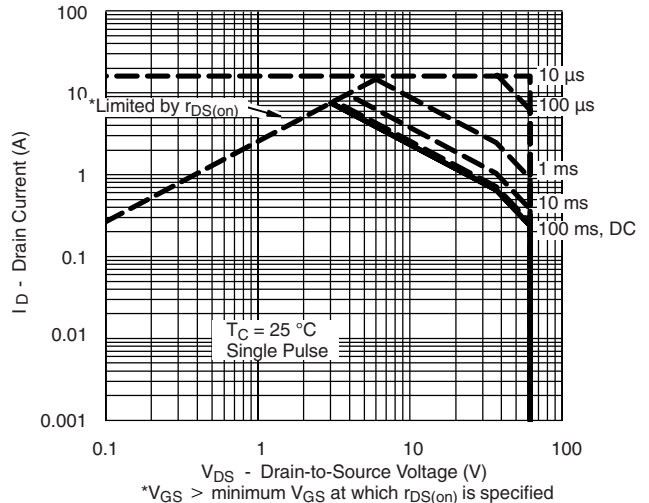


Source-Drain Diode Forward Voltage

## THERMAL RATINGS



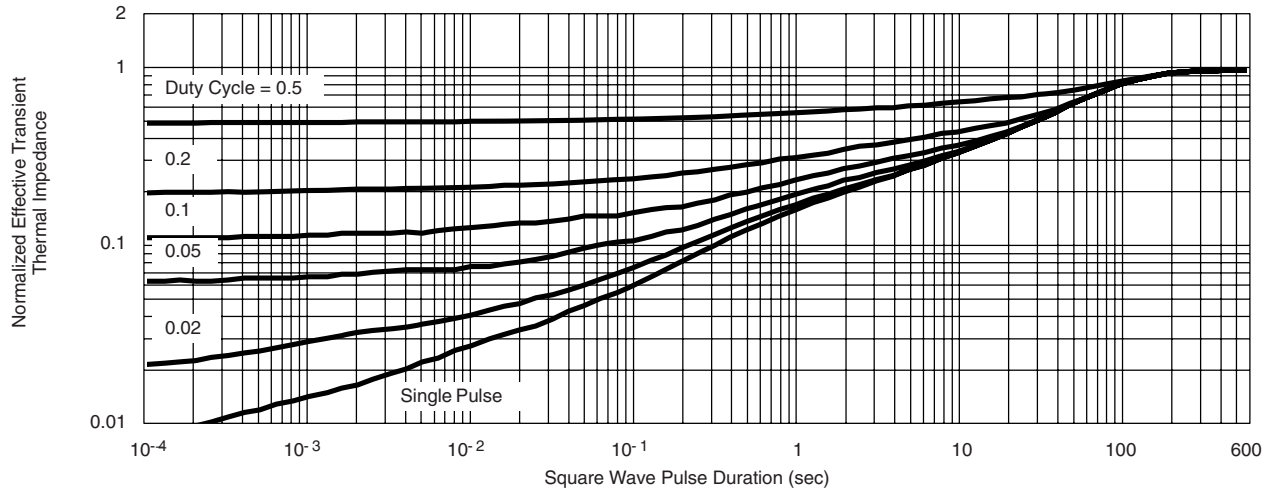
Drain Current vs. Case Temperature



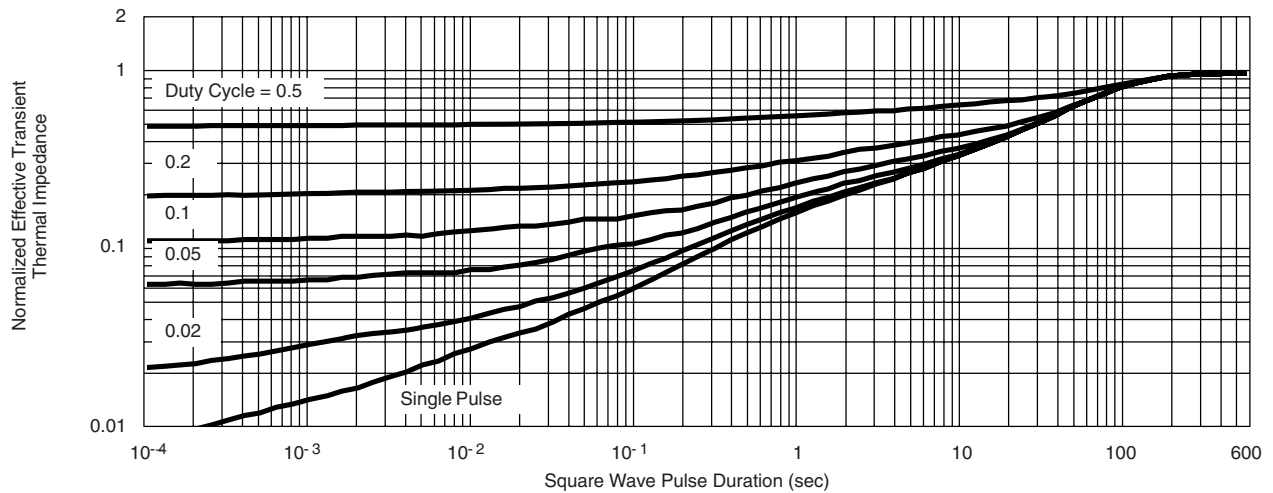
Safe Operating Area



**THERMAL RATINGS**



**Normalized Thermal Transient Impedance, Junction-to-Ambient**



**Normalized Thermal Transient Impedance, Junction-to-Case**

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