P-Channel 60-V (D-S), 175°C MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ)
−60	0.155 @ V_{GS} = −10 V	−8.4	12.5
	0.280 @ V_{GS} = −4.5 V	−7.4	

FEATURES

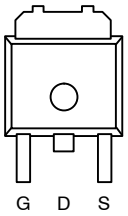
- TrenchFET® Power MOSFET
- 175°C Rated Maximum Junction Temperature

Termination is Pb-free

APPLICATIONS

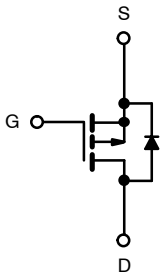
- Automotive Such As:
  - High-Side Switch
  - Motor Drives
  - 12-V Battery

TO-252



Top View

Drain Connected to Tab



P-Channel MOSFET

Ordering Information: SUD08P06-155L—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	−8.4	A
	T_C = 100°C		−6	
Pulsed Drain Current		I_{DM}	−18	
Continuing Source Current (Diode Conduction)		I_S	−8.4	
Avalanche Current		I_{AS}	−12	
Single-Pulse Avalanche Energy	L = 0.1 mH	E_{AS}	7.2	mJ
Maximum Power Dissipation	T_C = 25°C	P_D	25[a]	W
	T_A = 25°C		2[b]	
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[b]	t ≤ 10 sec	R_{thJA}	20	25	°C/W
	Steady State		62	75	
Junction-to-Case		R_{thJC}	5	6	

Notes
a. See SOA Curve for Voltage Derating.
b. Surface Mounted on 1" x 1" FR4 Board.

SPECIFICATIONS (T_J =25°C UNLESS OTHERWISE NOTED)

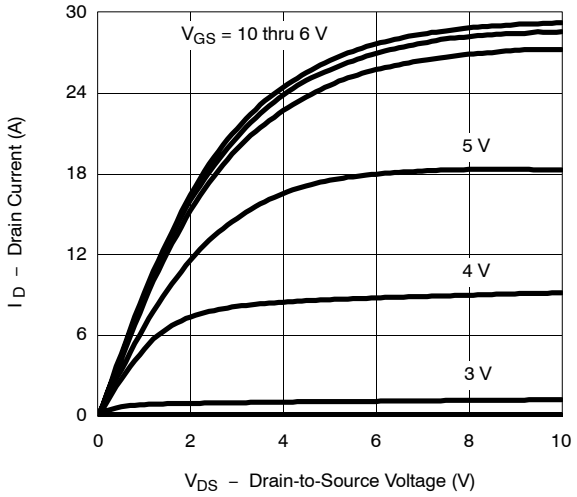
Parameter	Symbol	Test Condition	Min	Typ[a]	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{DS} = 0 V, I_D = −250 μA	−60			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = −250 μA	−1.0	−2.0	−3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero Gate 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	−10			A
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = −10 V, I_D = −5 A		0.125	0.155	Ω
		V_{GS} = −10 V, I_D = −5 A, T_J = 125°C			0.280	
		V_{GS} = −10 V, I_D = −5 A, T_J = 175°C			0.350	
		V_{GS} = −4.5 V, I_D = −2 A		0.158	0.280	
Forward Transconductance[b]	g_{fs}	V_{DS} = −15 V, I_D = −5 A		8		S
Dynamic						
Input Capacitance	C_{iss}	V_{DS} = −25 V, V_{GS} = 0 V, f = 1 MHz		450		pF
Output Capacitance	C_{oss}			65		
Reverse Transfer Capacitance	C_{rss}			40		
Total Gate Charge	Q_g	V_{DS} = −30 V, V_{GS} = −10 V, I_D = −8.4 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 MHz		8.0		Ω
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = −30 V, R_L = 3.57 Ω I_D ≃ 8.4 A, V_{GEN} = −10 V, R_g = 2.5 Ω		5	10	ns
Rise Time[c]	t_r			14	25	
Turn-Off Delay Time[c]	$t_{d(off)}$			15	25	
Fall Time[c]	t_f			7	12	
Source-Drain Diode Ratings and Characteristics (T_C = 25°C)[a]						
Pulsed Current	I_{SM}				−20	A
Forward Voltage[b]	V_{SD}	I_F = −2 A, V_{GS} = 0 V		−0.9	−1.3	V
Reverse Recovery Time	t_{rr}	I_F = −8 A, di/dt = 100 A/μs		50	80	ns
Reverse Recovery Charge	Q_{rr}			80	120	nC

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

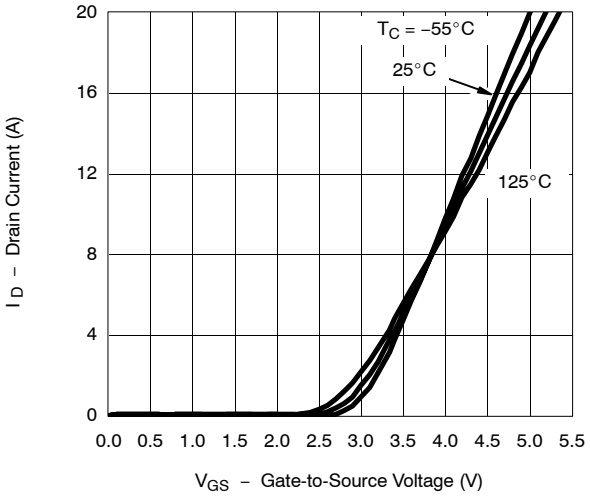
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

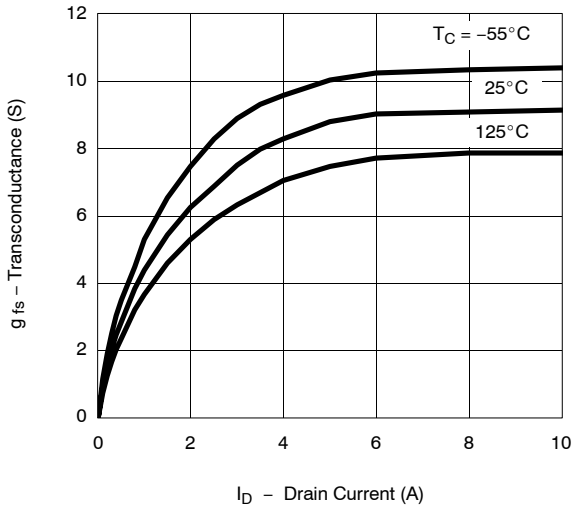
Output Characteristics



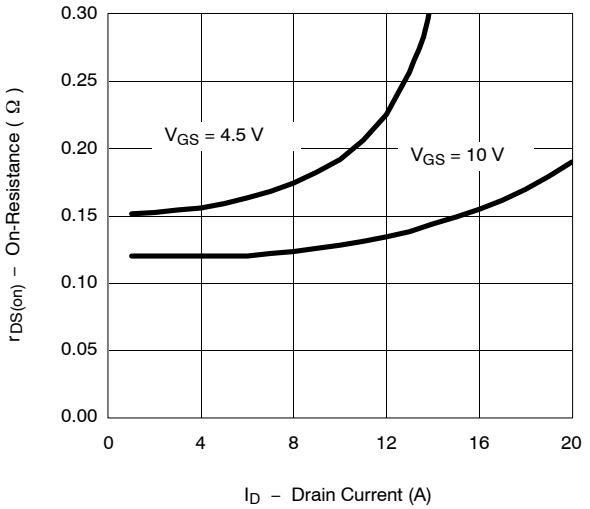
Transfer Characteristics



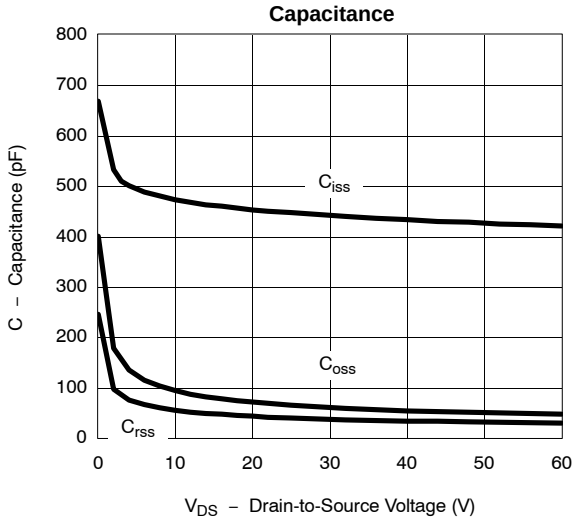
Transconductance



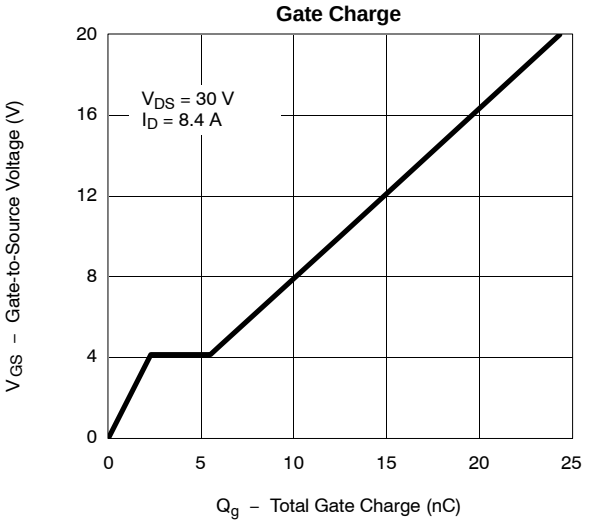
On-Resistance vs. Drain Current



Capacitance

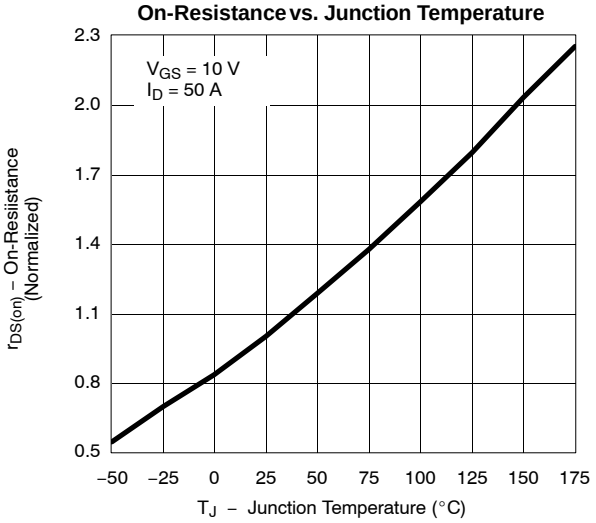


Gate Charge

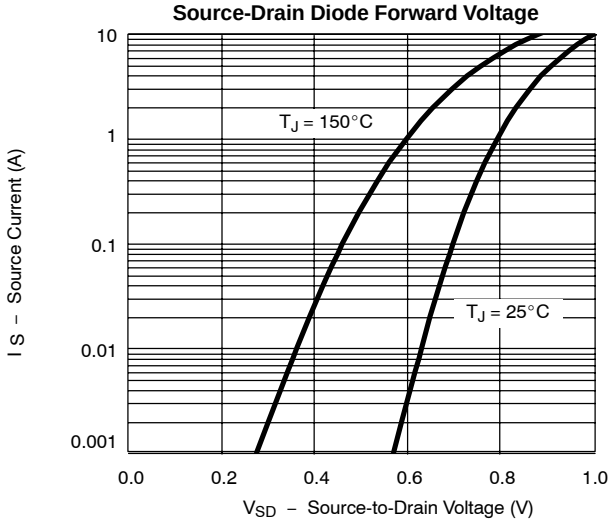


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

On-Resistance vs. Junction Temperature

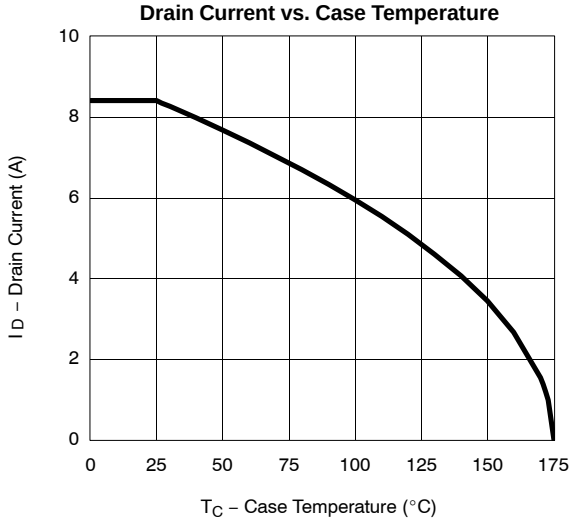


Source-Drain Diode Forward Voltage

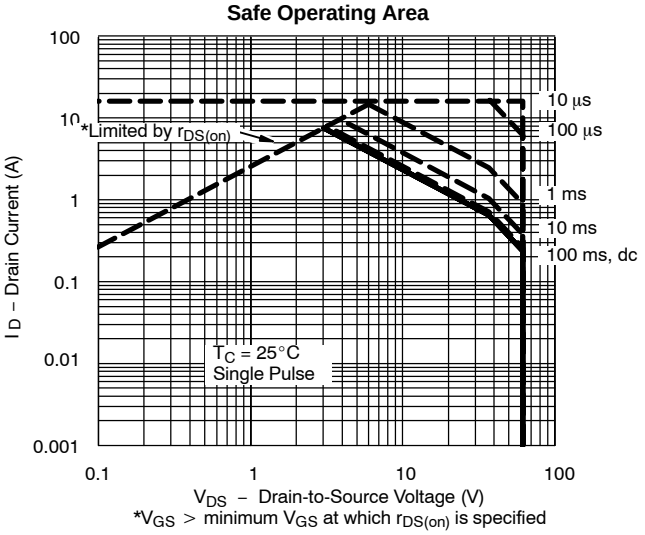


THERMAL RATINGS

Drain Current vs. Case Temperature



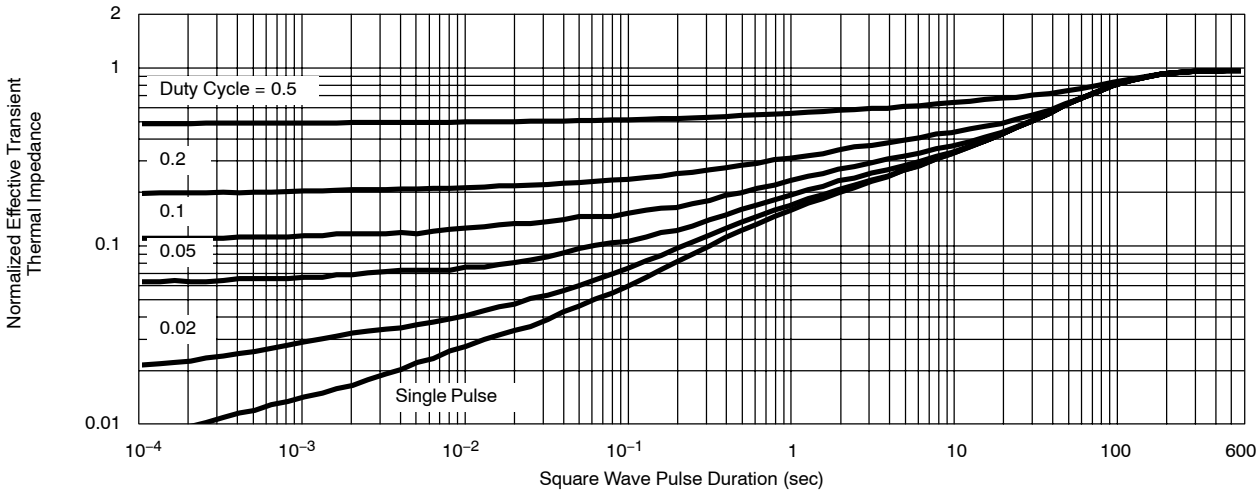
Safe Operating Area



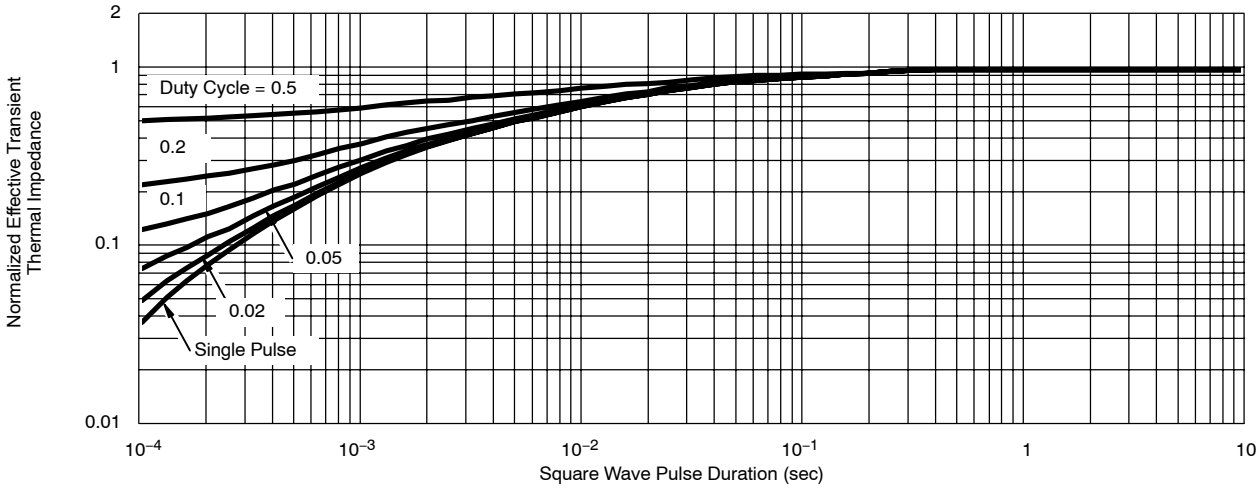
*V_{GS} > minimum V_{GS} at which $r_{DS(on)}$ is specified

THERMAL RATINGS

Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case



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