

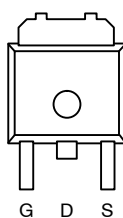


P-Channel 60-V (D-S), 175°C MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ)
-60	0.060 @ $V_{GS} = -10$ V	-19	26
	0.077 @ $V_{GS} = -4.5$ V	-16.8	

TO-252



Top View

Drain Connected to Tab

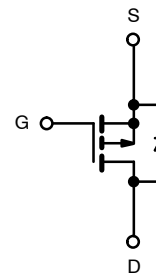
Ordering Information: SUD19P06-60L—E3

FEATURES

- TrenchFET® Power MOSFET
- 175°C Junction Temperature

APPLICATIONS

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



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 175^\circ\text{C}$)	$T_C = 25^\circ\text{C}$	I_D	-19	A
	$T_C = 125^\circ\text{C}$		-11	
Pulsed Drain Current		I_{DM}	-30	
Avalanche Current, Single Pulse		I_{AS}	-22	
Repetitive Avalanche Energy, Single Pulse ^a		E_{AS}	24.2	mJ
Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	46 ^c	W
	$T_A = 25^\circ\text{C}$		2.7 ^{b, c}	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient ^b	$t \leq 10$ sec	R_{thJA}	17	21	$^\circ\text{C/W}$
	Steady State		45	55	
Junction-to-Case		R_{thJC}	2.7	3.25	

Notes:

- Duty cycle $\leq 1\%$.
- When mounted on 1" square PCB (FR-4 material).
- See SOA curve for voltage derating.

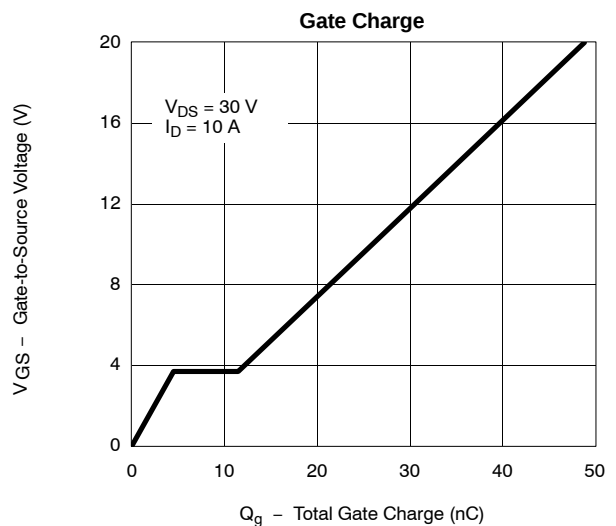
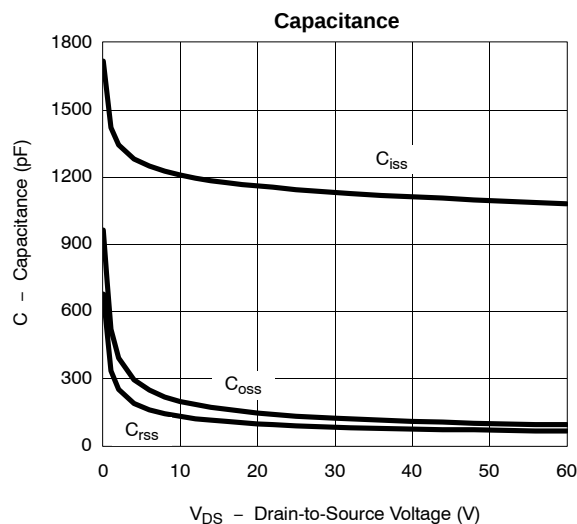
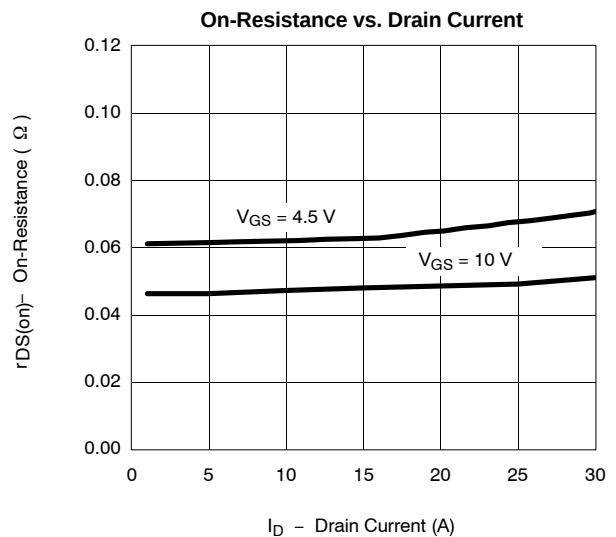
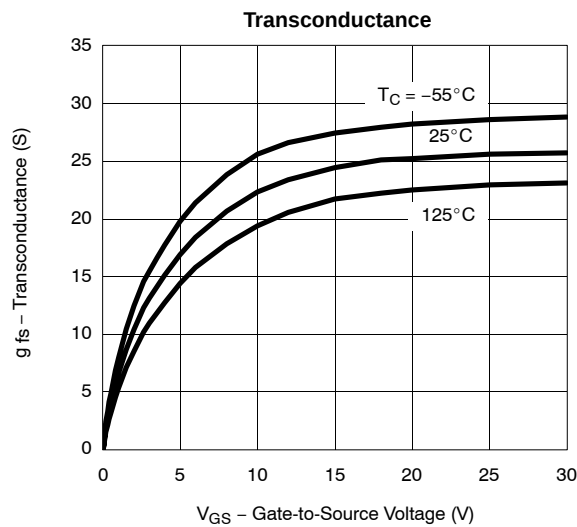
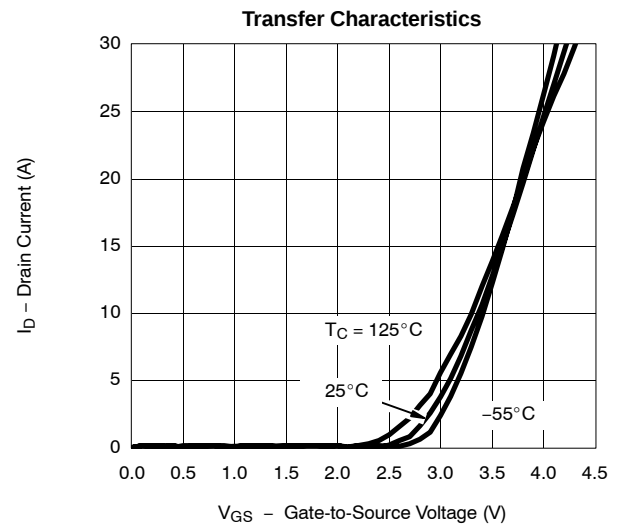
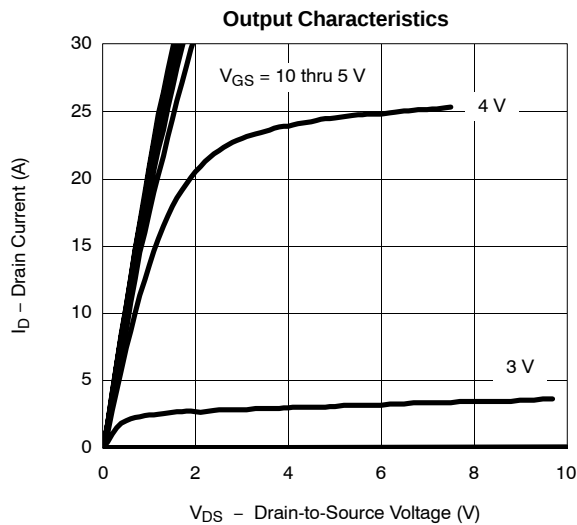
SPECIFICATIONS (T_J = 25 °C UNLESS OTHERWISE NOTED)

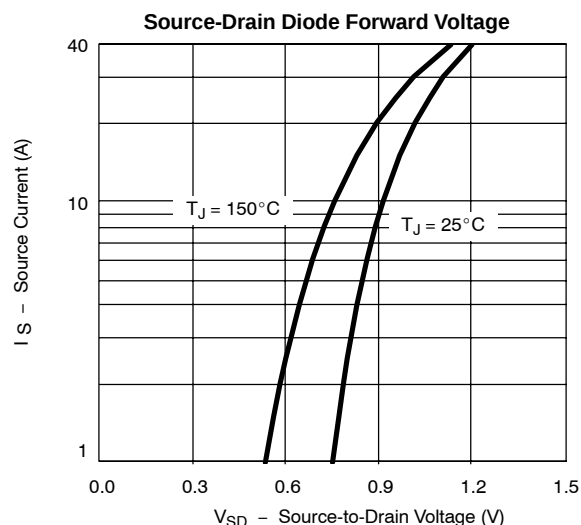
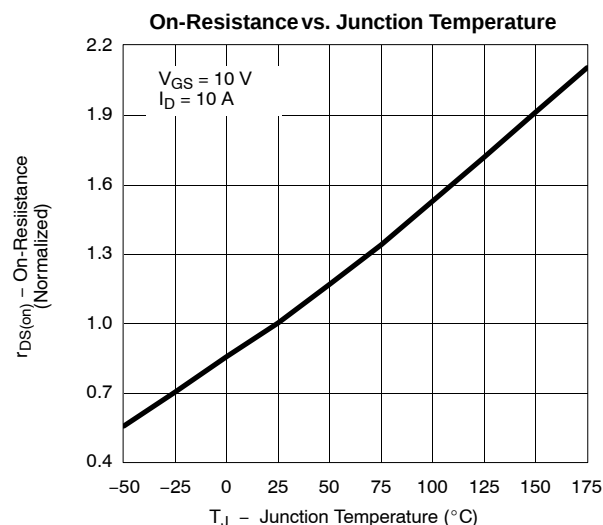
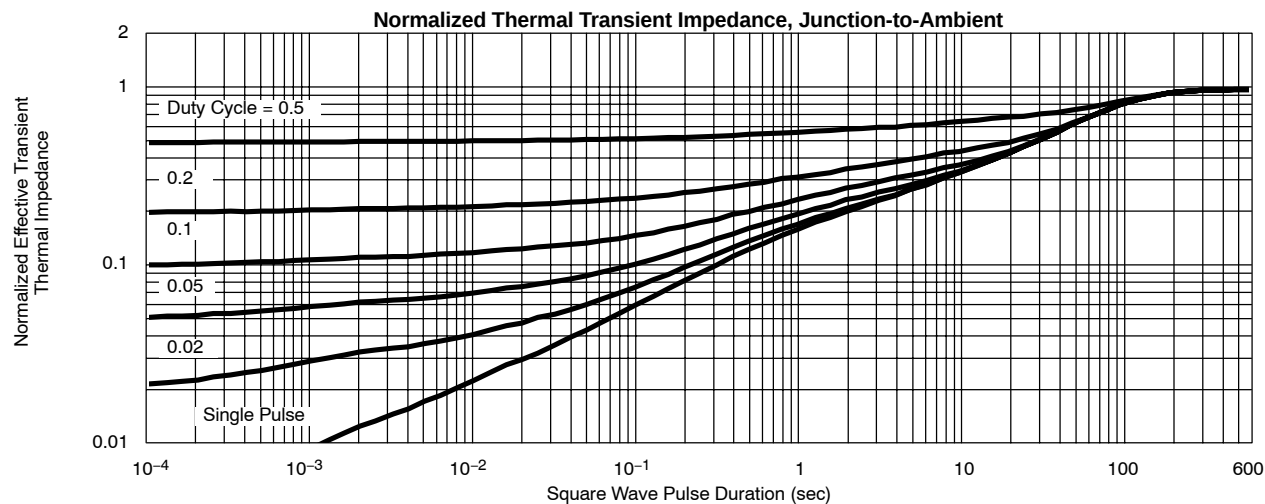
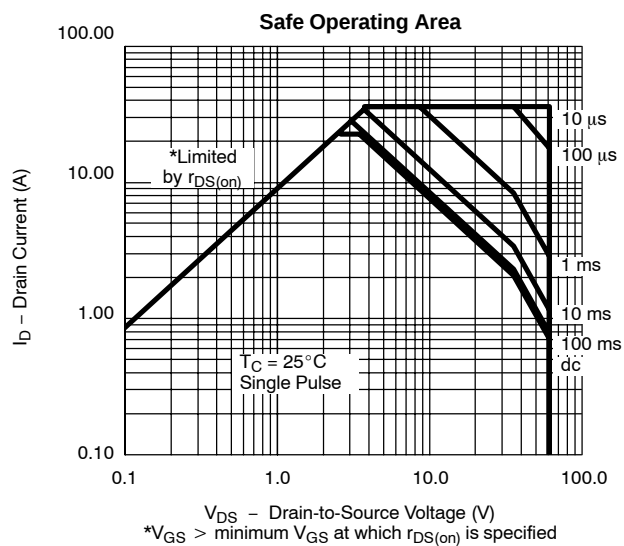
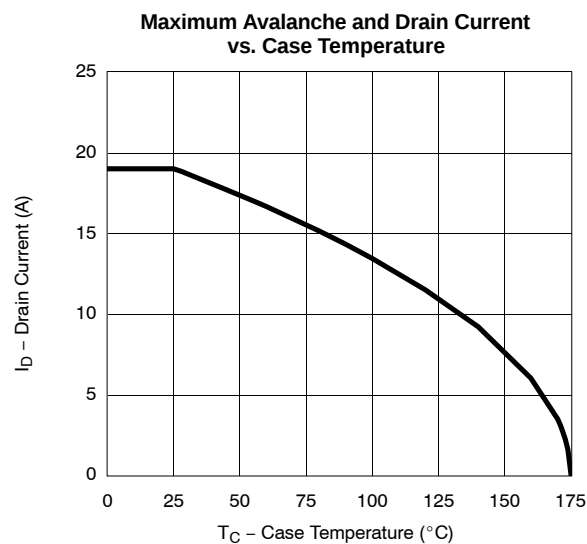
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = -250 μA	-60			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA	-1		-3	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero Gate Voltage 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 ^a	I _{D(on)}	V _{DS} = -5 V, V _{GS} = -10 V	-30			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = -10 V, I _D = -10 A		0.048	0.060	Ω
		V _{GS} = -10 V, I _D = -16.8 A, T _J = 125°C			0.102	
		V _{GS} = -10 V, I _D = -16.8 A, T _J = 175°C			0.129	
		V _{GS} = -4.5 V, I _D = -5 A		0.061	0.077	
Forward Transconductance ^a	g _{fs}	V _{DS} = -15 V, I _D = -10 A		22		S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = -25 V, f = 1 MHz		1140	1710	pF
Output Capacitance	C _{oss}			130		
Reverse Transfer Capacitance	C _{rss}			90		
Total Gate Charge ^c	Q _g	V _{DS} = -30 V, V _{GS} = -10 V, I _D = -10 A		26	40	nC
Gate-Source Charge ^c	Q _{gs}			4.5		
Gate-Drain Charge ^c	Q _{gd}			7.0		
Gate Resistance	R _g	f = 1.0 MHz		7.0		Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = -30 V, R _L = 3 Ω I _D ≈ -19 A, V _{GEN} = -10 V, R _g = 2.5 Ω		8	15	ns
Rise Time ^c	t _r			9	15	
Turn-Off Delay Time ^c	t _{d(off)}			65	100	
Fall Time ^c	t _f			30	45	
Source-Drain Diode Ratings and Characteristics (T _C = 25°C) ^b						
Continuous Current	I _s				-30	A
Pulsed Current	I _{SM}				-30	
Forward Voltage ^a	V _{SD}	I _F = -19 A, V _{GS} = 0 V		-1.0	-1.5	V
Reverse Recovery Time	t _{rr}	I _F = -19 A, di/dt = 100 A/μs		41	61	ns

Notes:

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

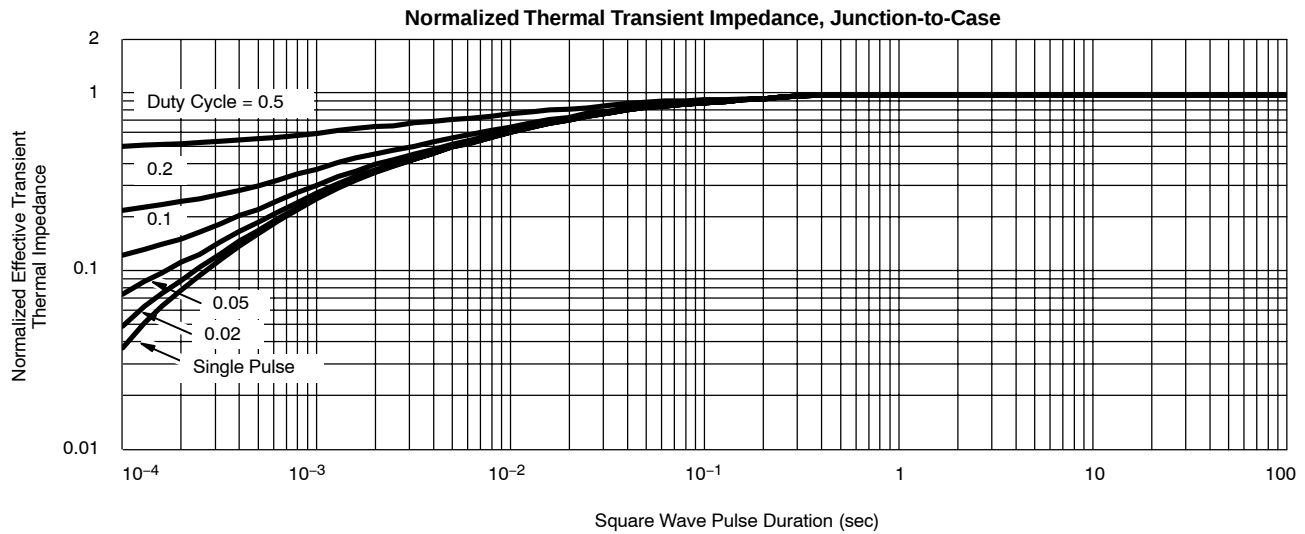
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

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

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



THERMAL RATINGS



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