



P-Channel 60-V (D-S), 175°C MOSFET

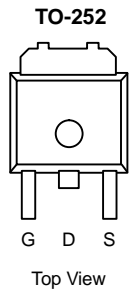
PRODUCT SUMMARY		
V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A)
-60	0.015 @ V _{GS} = -10 V	-50 ^d
	0.020 @ V _{GS} = -4.5 V	-50

FEATURES

- TrenchFET® Power MOSFET
- 175°C Junction Temperature

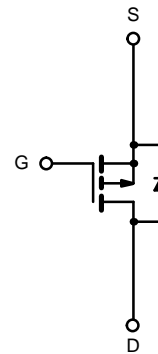
APPLICATIONS

- Automotive 12-V Boardnet



Drain Connected to Tab

Ordering Information: SUD50P06-15L



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _A = 25°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°C)	I _D	T _C = 25°C	-50 ^d
		T _C = 125°C	-39
Pulsed Drain Current	I _{DM}	-80	A
Avalanche Current	I _{AR}	-50	
Repetitive Avalanche Energy ^a	E _{AR}	125	mJ
Power Dissipation	P _D	T _C = 25°C	136 ^c
		T _A = 25°C	3 ^{b, c}
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	R _{thJA}	t ≤ 10 sec	15	18
		Steady State	40	50
Junction-to-Case	R _{thJC}	0.82	1.1	°C/W

Notes:

- Duty cycle ≤ 1%.
- When mounted on 1" square PCB (FR-4 material).
- See SOA curve for voltage derating.
- Package limited.

SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	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		-3	
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	
		$V_{DS} = -48\text{ V}, V_{GS} = 0\text{ V}, T_J = 175^\circ\text{C}$			-150	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = -5\text{ V}, V_{GS} = -10\text{ V}$	-50			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -17\text{ A}$		0.012	0.015	Ω
		$V_{GS} = -10\text{ V}, I_D = -50\text{ A}, T_J = 125^\circ\text{C}$			0.025	
		$V_{GS} = -10\text{ V}, I_D = -50\text{ A}, T_J = 175^\circ\text{C}$			0.030	
		$V_{GS} = -4.5\text{ V}, I_D = -14\text{ A}$			0.020	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\text{ V}, I_D = -17\text{ A}$		61		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = -25\text{ V}, f = 1\text{ MHz}$		4950		pF
Output Capacitance	C_{oss}			480		
Reverse Transfer Capacitance	C_{rss}			405		
Total Gate Charge ^c	Q_g	$V_{DS} = -30\text{ V}, V_{GS} = -10\text{ V}, I_D = -50\text{ A}$		110	165	nC
Gate-Source Charge ^c	Q_{gs}			19		
Gate-Drain Charge ^c	Q_{gd}			28		
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = -30\text{ V}, R_L = 0.6\ \Omega$ $I_D = -50\text{ A}, V_{GEN} = -10\text{ V}, R_G = 6\ \Omega$		15	23	ns
Rise Time ^c	t_r			70	105	
Turn-Off Delay Time ^c	$t_{d(off)}$			175	260	
Fall Time ^c	t_f			175	260	
Source-Drain Diode Ratings and Characteristics ($T_C = 25^\circ\text{C}$)^b						
Continuous Current	I_S				-50	A
Pulsed Current	I_{SM}				-80	
Forward Voltage ^a	V_{SD}	$I_F = -50\text{ A}, V_{GS} = 0\text{ V}$		1.0	1.6	V
Reverse Recovery Time	t_{rr}	$I_F = -50\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		45	70	ns

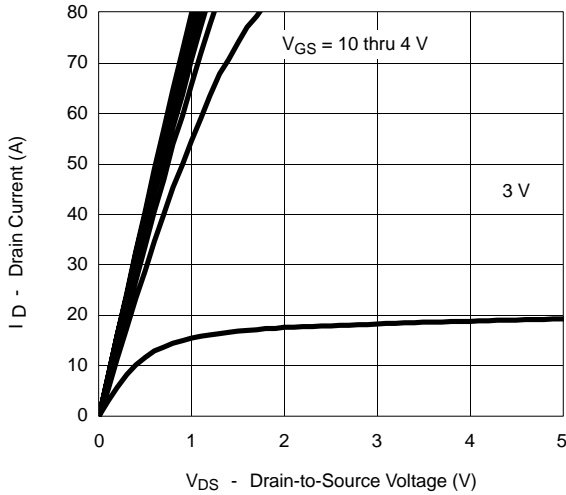
Notes:

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

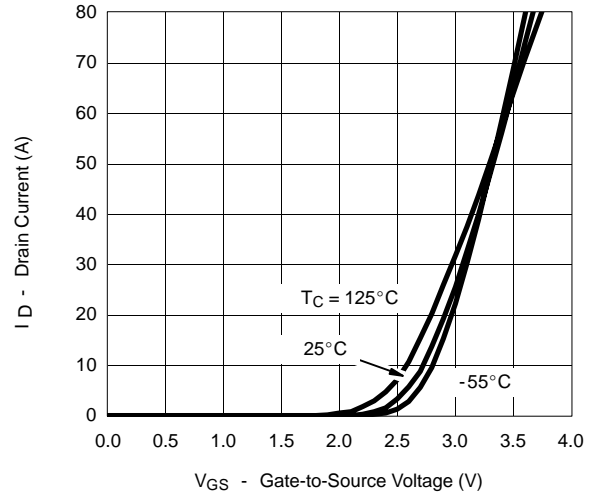


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

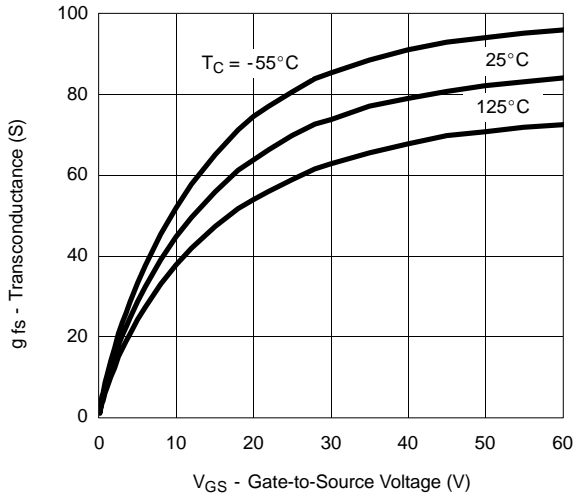
Output Characteristics



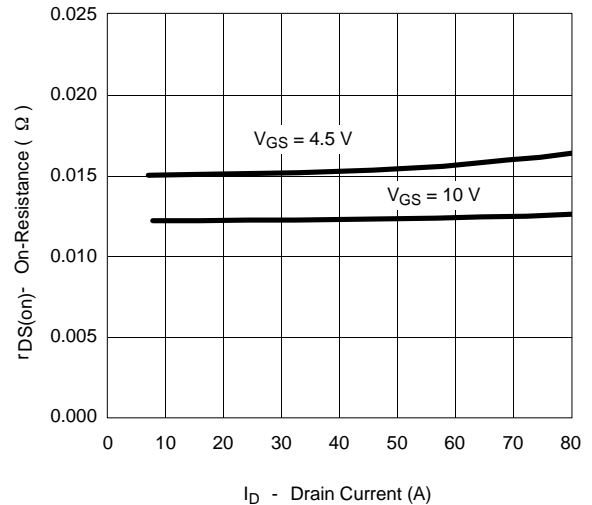
Transfer Characteristics



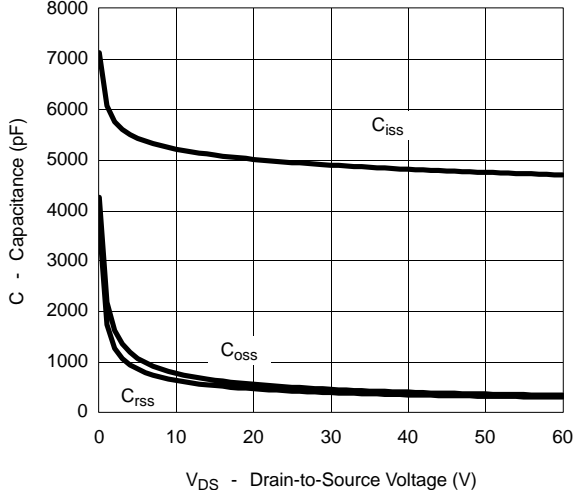
Transconductance



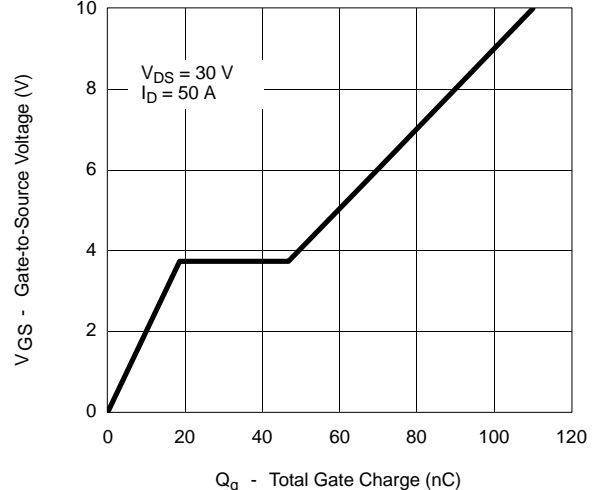
On-Resistance vs. Drain Current



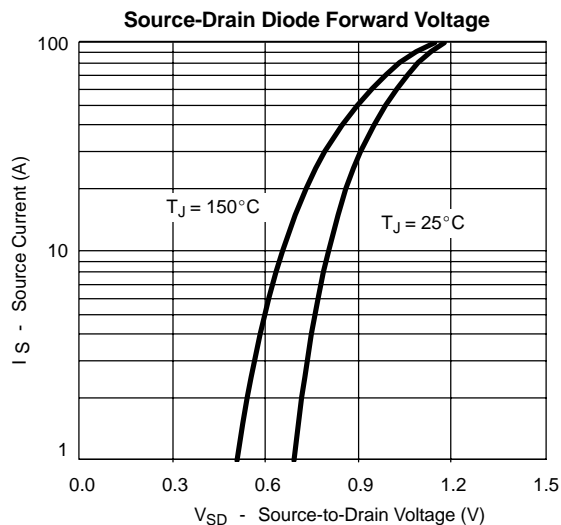
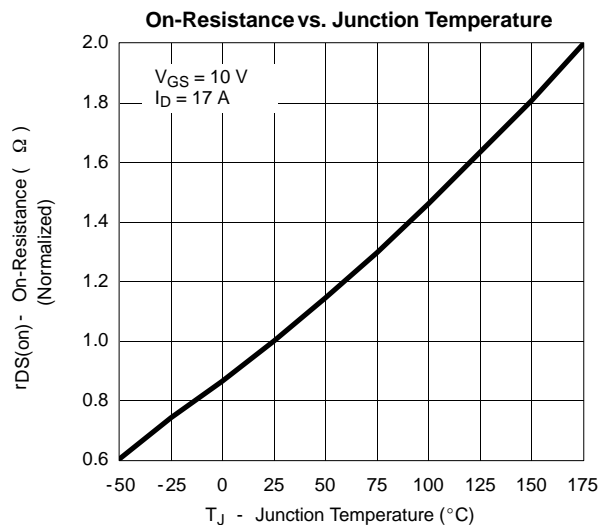
Capacitance



Gate Charge



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



THERMAL RATINGS

