



P-Channel 60-V (D-S), 175°C MOSFET

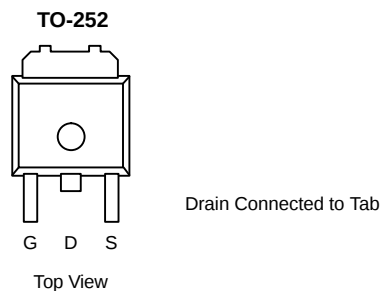
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-60	0.015 @ $V_{GS} = -10$ V	-50 ^d
	0.020 @ $V_{GS} = -4.5$ V	-50

FEATURES

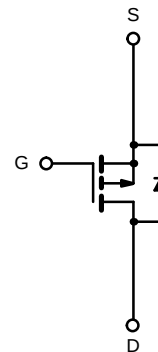
- TrenchFET® Power MOSFET
- 175°C Junction Temperature

APPLICATIONS

- Automotive 12-V Boardnet



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)	T _C = 25°C	I _D	-50 ^d	A
	T _C = 125°C		-39	
Pulsed Drain Current		I _{DM}	-80	
Avalanche Current		I _{AR}	-50	
Repetitive Avalanche Energy ^a	L = 0.1 mH	E _{AR}	125	mJ
Power Dissipation	T _C = 25°C	P _D	136 ^c	W
	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	$t \leq 10$ sec	R_{thJA}	15	18	$^\circ\text{C/W}$
	Steady State		40	50	
Junction-to-Case		R_{thJC}	0.82	1.1	

Notes:

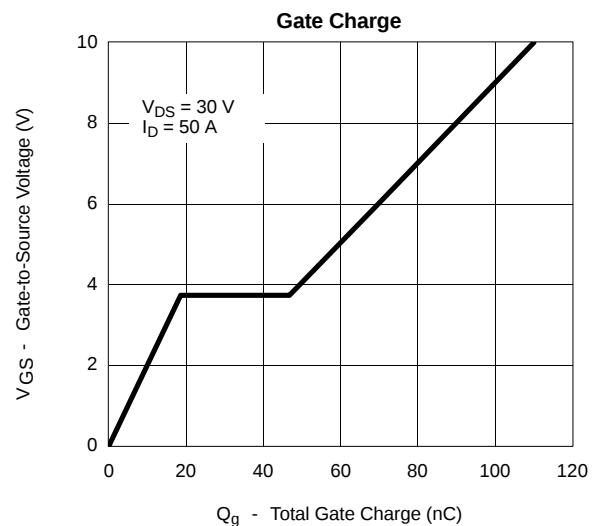
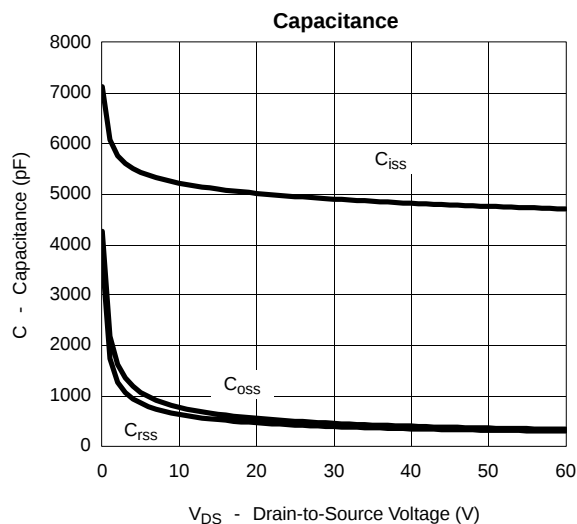
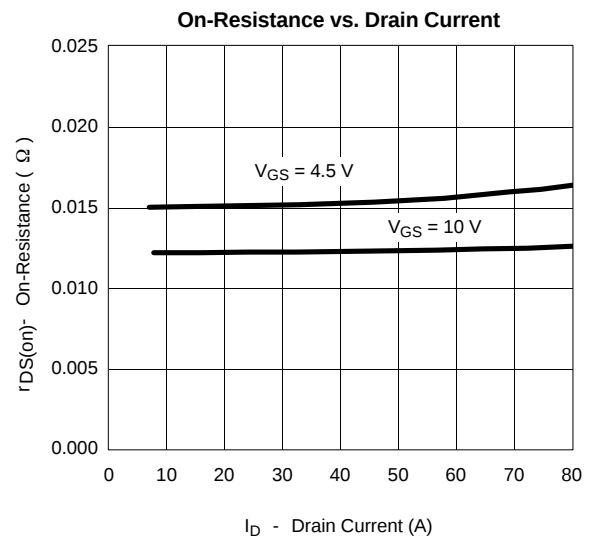
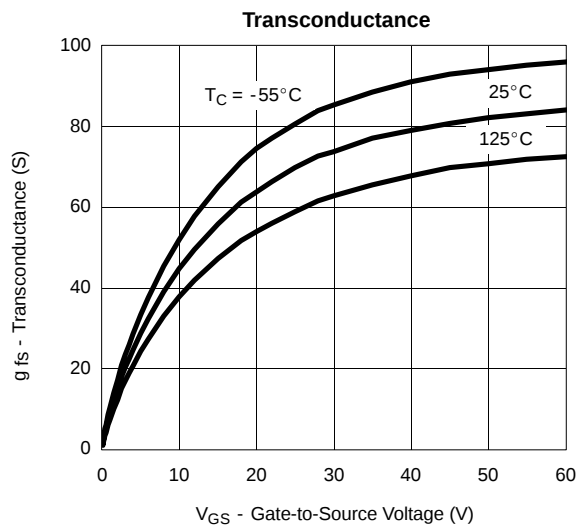
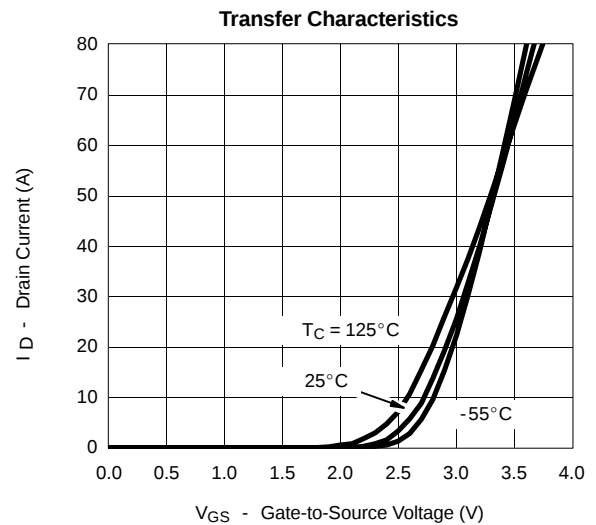
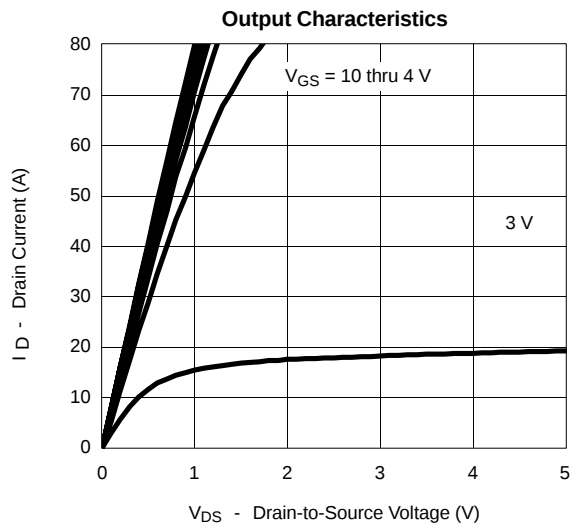
- Duty cycle $\leq 1\%$.
- When mounted on 1" square PCB (FR-4 material).
- See SOA curve for voltage derating.
- Package limited.

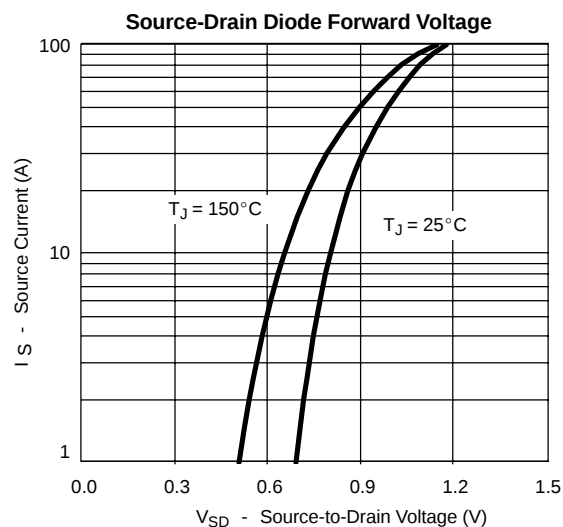
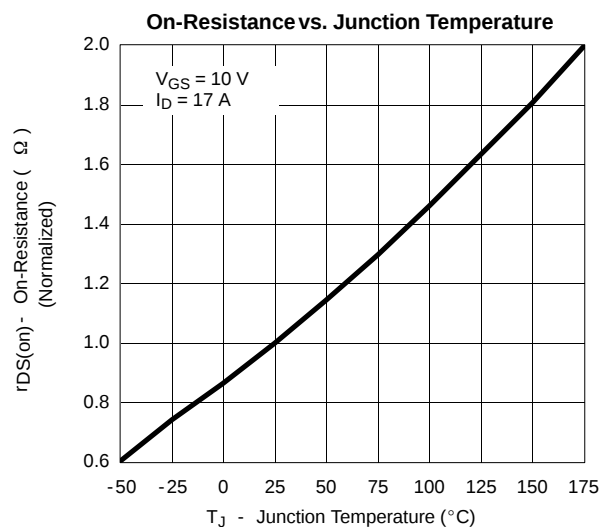
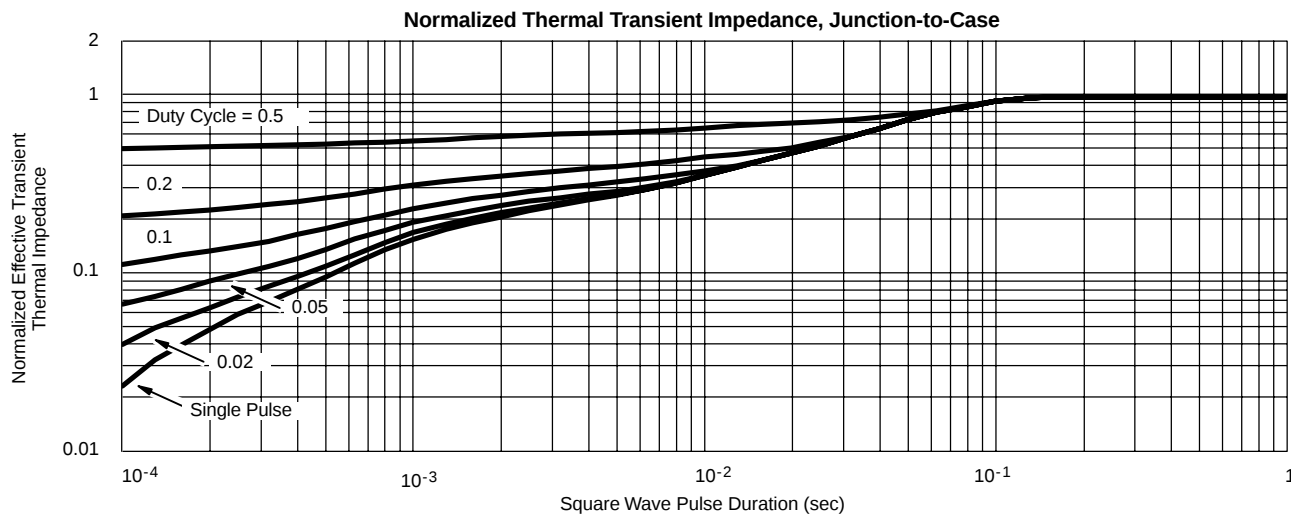
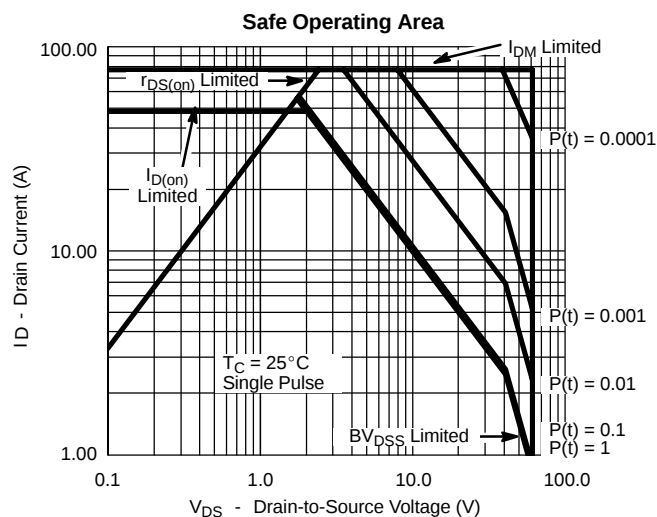
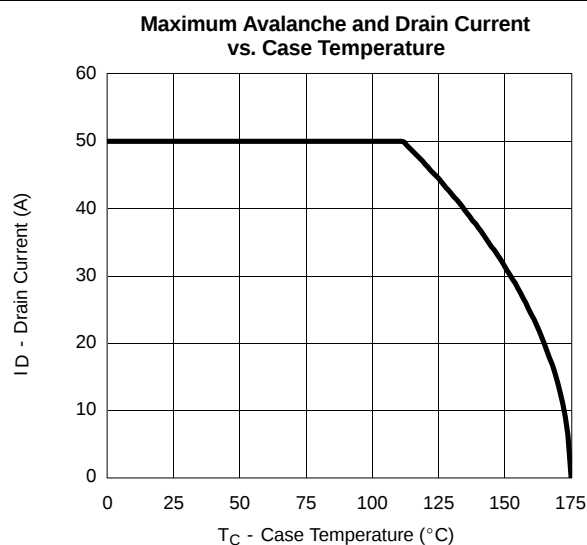
SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 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} = -48 V, V _{GS} = 0 V			-1	μA
		V _{DS} = -48 V, V _{GS} = 0 V, T _J = 125°C			-50	
		V _{DS} = -48 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	-50			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = -10 V, I _D = -17 A		0.012	0.015	Ω
		V _{GS} = -10 V, I _D = -50 A, T _J = 125°C			0.025	
		V _{GS} = -10 V, I _D = -50 A, T _J = 175°C			0.030	
		V _{GS} = -4.5 V, I _D = -14 A			0.020	
Forward Transconductance ^a	g _{fs}	V _{DS} = -15 V, I _D = -17 A		61		S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = -25 V, f = 1 MHz		4950		pF
Output Capacitance	C _{oss}			480		
Reverse Transfer Capacitance	C _{rss}			405		
Total Gate Charge ^c	Q _g	V _{DS} = -30 V, V _{GS} = -10 V, I _D = -50 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 V, R _L = 0.6 Ω I _D ≈ -50 A, V _{GEN} = -10 V, R _G = 6 Ω		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°C) ^b						
Continuous Current	I _S				-50	A
Pulsed Current	I _{SM}				-80	
Forward Voltage ^a	V _{SD}	I _F = -50 A, V _{GS} = 0 V		1.0	1.6	V
Reverse Recovery Time	t _{rr}	I _F = -50 A, di/dt = 100 A/μs		45	70	ns

Notes:

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

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

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



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