

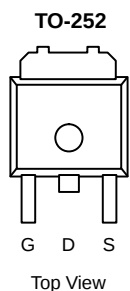


P-Channel 40-V (D-S), 175°C MOSFET

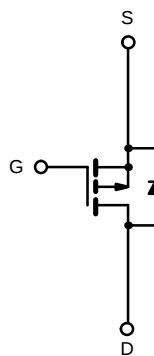
PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-40	0.015 @ $V_{GS} = -10$ V	-50
	0.023 @ $V_{GS} = -4.5$ V	-45

175°C Rated
Maximum Junction Temperature
TrenchFET®
Power MOSFETs



Order Number:
SUD50P04-15



P-Channel MOSFET

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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	-40	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ^b	$T_C = 25^\circ\text{C}$	I_D	-50	A
	$T_C = 100^\circ\text{C}$		-40	
Pulsed Drain Current		I_{DM}	-150	
Continuous Source Current (Diode Conduction)		I_S	-50	W
Maximum Power Dissipation ^b	$T_C = 25^\circ\text{C}$	P_D	100 ^b	
	$T_A = 25^\circ\text{C}$		3 ^a	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	$t \leq 10$ sec.	R_{thJA}	15	18	$^\circ\text{C/W}$
	Steady State		40	50	
Maximum Junction-to-Case		R_{thJC}	1.2	1.5	

Notes

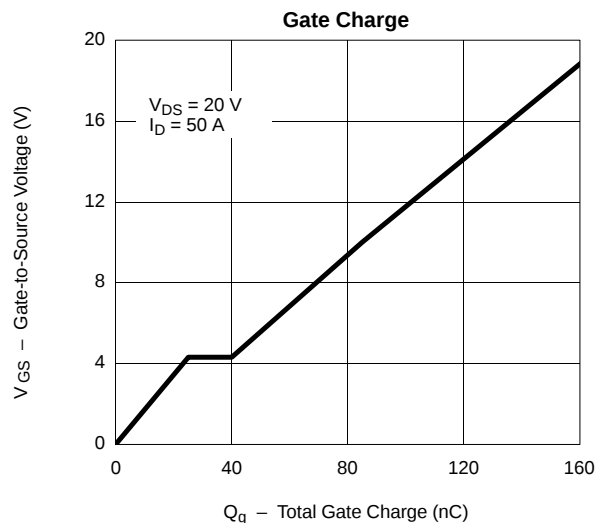
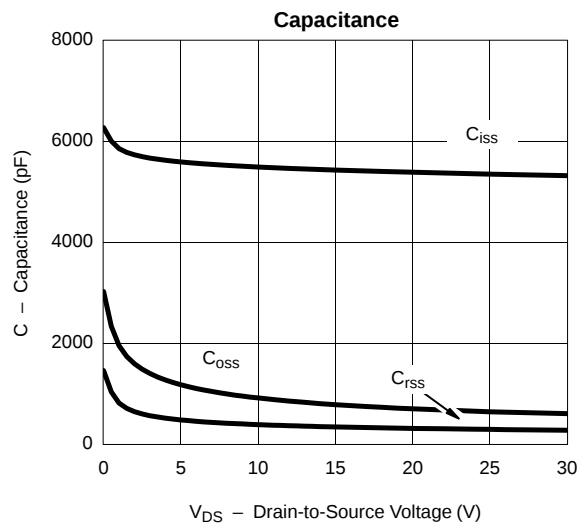
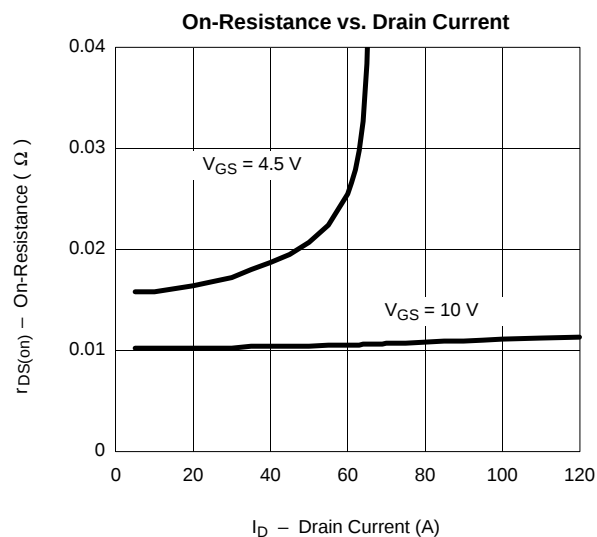
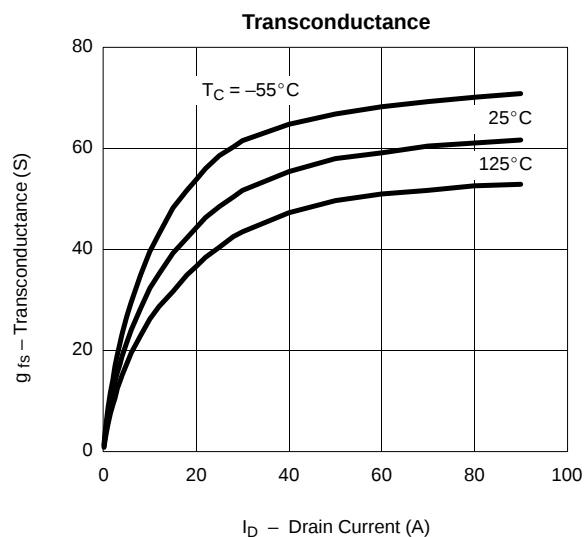
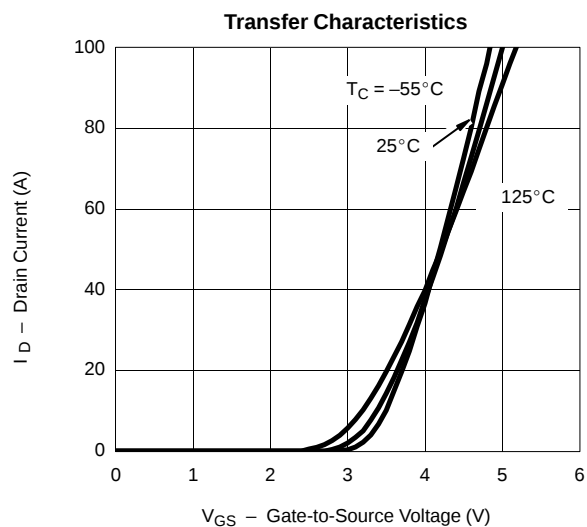
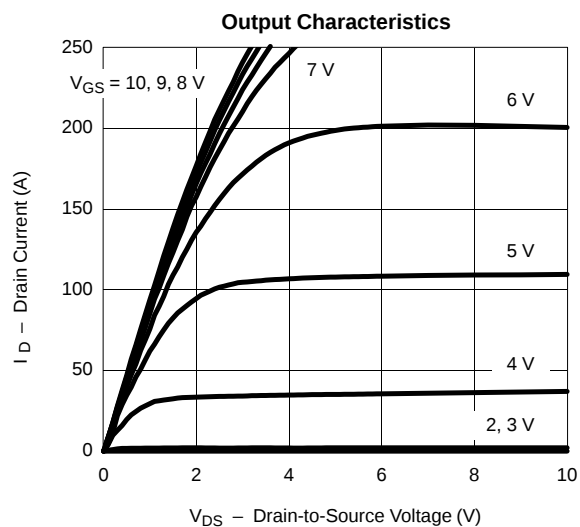
- a. Surface Mounted on 1" x 1" FR4 Board.
b. See SOA curve for voltage derating.

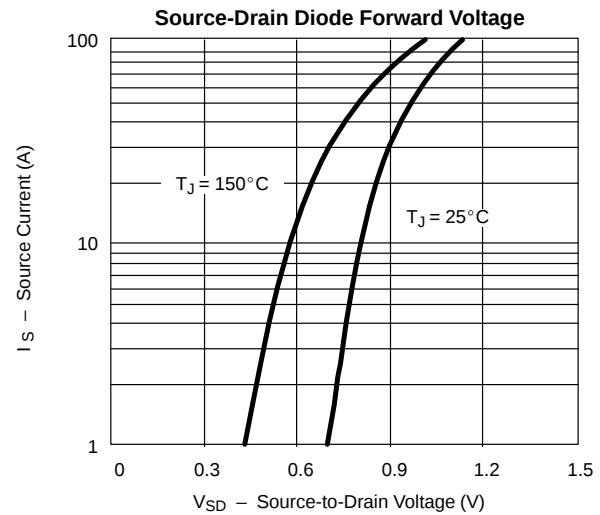
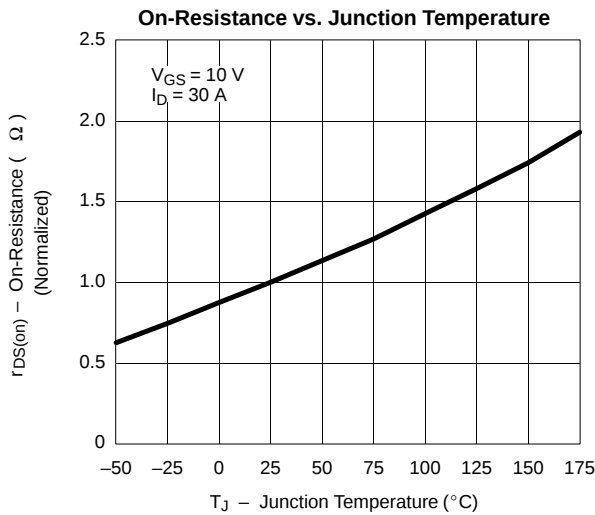
**SPECIFICATIONS (T_J = 25 °C UNLESS OTHERWISE NOTED)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = −250 μA	−40			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = −250 μA	−1.0			
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = −40 V, V _{GS} = 0 V			−1	μA
		V _{DS} = −40 V, V _{GS} = 0 V, T _J = 125°C			−50	
On-State Drain Current ^a	I _{D(on)}	V _{DS} = −5 V, V _{GS} = −10 V	−120			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = −10 V, I _D = −30 A		0.012	0.015	Ω
		V _{GS} = −10 V, I _D = −30 A, T _J = 125°C			0.024	
		V _{GS} = −4.5 V, I _D = −20 A		0.018	0.023	
Forward Transconductance ^a	g _{fs}	V _{DS} = −15 V, I _D = −30 A	20			S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = −25 V, f = 1 MHz		5400		pF
Output Capacitance	C _{oss}			640		
Reverse Transfer Capacitance	C _{rss}			300		
Total Gate Charge ^c	Q _g	V _{DS} = −20 V, V _{GS} = −10 V, I _D = −50 A		85	130	nC
Gate-Source Charge ^c	Q _{gs}			25		
Gate-Drain Charge ^c	Q _{gd}			15		
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = −20 V, R _L = 0.4 Ω I _D ≅ −50 A, V _{GEN} = −10 V, R _G = 2.5 Ω		15	25	ns
Rise Time ^c	t _r			380	580	
Turn-Off Delay Time ^c	t _{d(off)}			75	115	
Fall Time ^c	t _f			140	210	
Source-Drain Diode Ratings and Characteristic (T _C = 25°C)						
Pulsed Current	I _{SM}				−150	A
Diode Forward Voltage ^a	V _{SD}	I _F = −50 A, V _{GS} = 0 V		−1.2	−1.5	V
Source-Drain Reverse Recovery Time	t _{rr}	I _F = −50 A, di/dt = 100 A/μs		40	80	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.

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

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

THERMAL RATINGS
