TEMIC
Semiconductors

SUD45P03-15

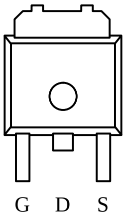
P-Channel Enhancement-Mode Transistor

Product Summary

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)[a]
–30	0.015 @ V_{GS} = –10 V	± 13
	0.024 @ V_{GS} = –4.5 V	± 8

TrenchFET™ Power MOSFETs

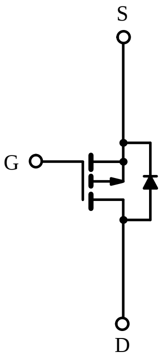
TO-252



Drain Connected to Tab

Top View

Order Number:
SUD45P03-15



P-Channel MOSFET

Absolute Maximum Ratings (T_A = 25°C Unless Otherwise Noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	–30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current[b]	T_A = 25°C	I_D	± 13	A
	T_A = 100°C		± 8	
Pulsed Drain Current		I_{DM}	± 100	
Continuous Source Current (Diode Conduction)		I_S	–13	
Maximum Power Dissipation[b]	T_C = 25°C	P_D	70	W
	T_A = 25°C		4[b]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 150	°C

Thermal Resistance Ratings

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient[b]	R_{thJA}		30	°C/W
Maximum Junction-to-Case	R_{thJC}		1.8	

Notes

a. Calculated Rating for T_A = 25°C, for comparison purposes only. This cannot be used as continuous rating (see Absolute Maximum Ratings and Typical Characteristics).

b. Surface Mounted on FR4 Board, t ≤ 10 sec.

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70267.

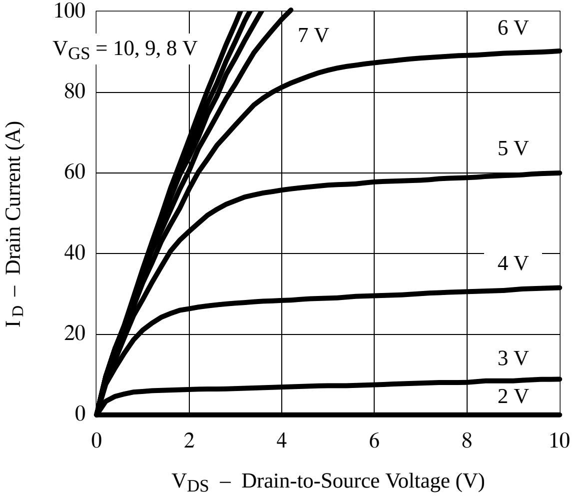
Specifications ($T_J = 25^\circ C$ Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ[NO TAG]	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0$ V, $I_D = -250$ µA	–30			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, $V_{GS} = \pm 20$ V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30$ V, $V_{GS} = 0$ V			–1	µA
		$V_{DS} = -30$ V, $V_{GS} = 0$ V, $T_J = 125^\circ C$			–50	
On-State Drain Current[NO TAG]	$I_{D(on)}$	$V_{DS} = -5$ V, $V_{GS} = -10$ V	–50			A
		$V_{DS} = -5$ V, $V_{GS} = -4.5$ V	–20			
Drain-Source On-State Resistance[NO TAG]	$r_{DS(on)}$	$V_{GS} = -10$ V, $I_D = -13$ A		0.012	0.015	Ω
		$V_{GS} = -10$ V, $I_D = -13$ A, $T_J = 125^\circ C$		0.018	0.026	
		$V_{GS} = -4.5$ V, $I_D = -13$ A		0.020	0.024	
Forward Transconductance[NO TAG]	g_{fs}	$V_{DS} = -15$ V, $I_D = -13$ A	20			S
Dynamic[NO TAG]						
Input Capacitance	C_{iss}	$V_{GS} = 0$ V, $V_{DS} = -25$ V, F = 1 MHz		3200		pF
Output Capacitance	C_{oss}			800		
Reverse Transfer Capacitance	C_{rss}			280		
Total Gate Charge[c]	Q_g	$V_{DS} = -15$ V, $V_{GS} = -10$ V, $I_D = -45$ A		50	125	nC
Gate-Source Charge[c]	Q_{gs}			14		
Gate-Drain Charge[c]	Q_{gd}			6.2		
Turn-On Delay Time[c]	$t_{d(on)}$	$V_{DD} = -15$ V, $R_L = 0.33\ \Omega$ $I_D \cong -45$ A, $V_{GEN} = -10$ V, $R_G = 2.4\ \Omega$		13	20	ns
Rise Time[c]	t_r			10	20	
Turn-Off Delay Time[c]	$t_{d(off)}$			50	100	
Fall Time[c]	t_f			20	40	
Source-Drain Diode Ratings and Characteristic ($T_C = 25^\circ C$)						
Pulsed Current	I_{SM}				100	A
Diode Forward Voltage[b]	V_{SD}	$I_F = -45$ A, $V_{GS} = 0$ V		1.0	1.5	V
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = -45$ A, di/dt = 100 A/µs		55	100	ns

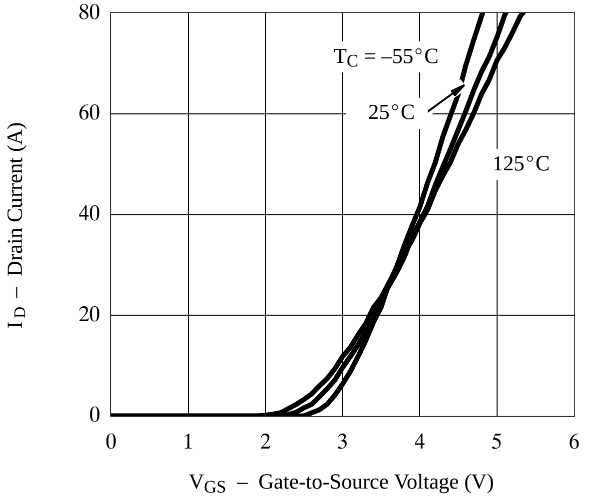
Notes
a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
c. Independent of operating temperature.

Typical Characteristics (25°C Unless Otherwise Noted)

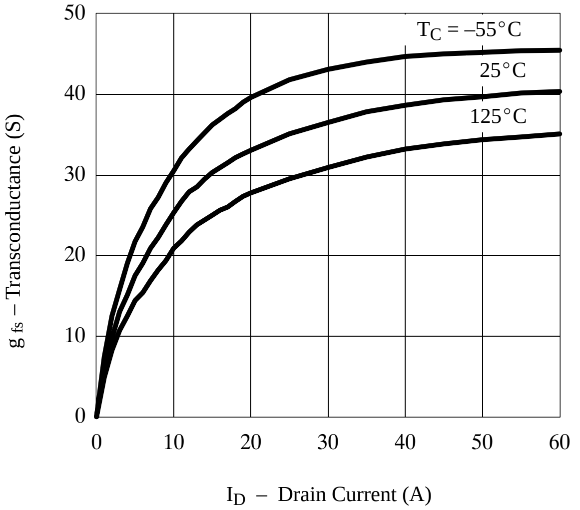
Output Characteristics



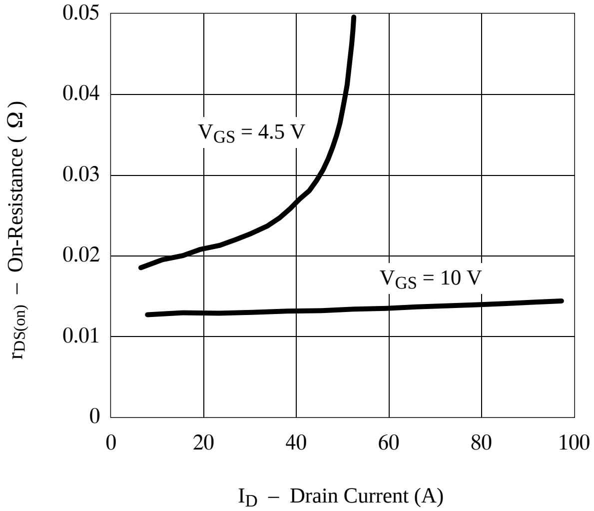
Transfer Characteristics



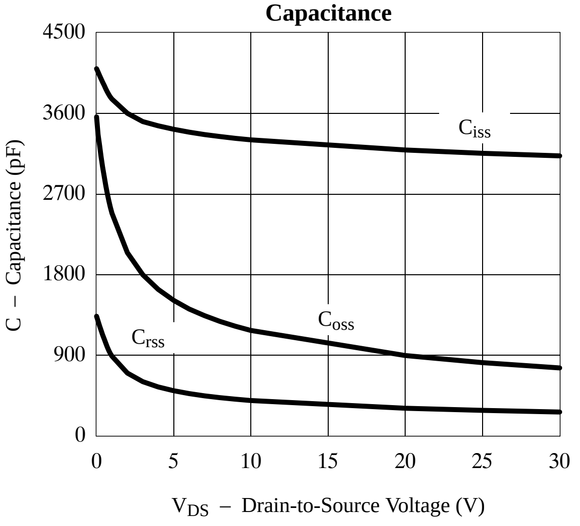
Transconductance



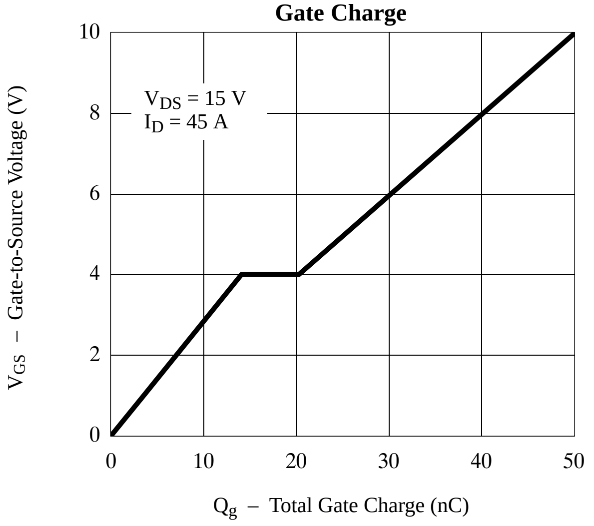
On-Resistance vs. Drain Current



Capacitance

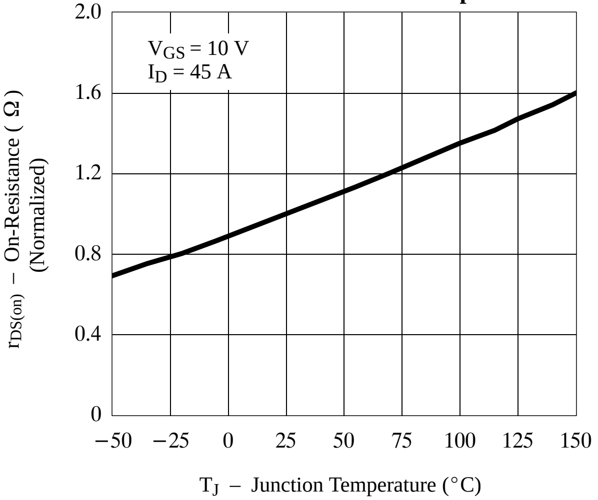


Gate Charge

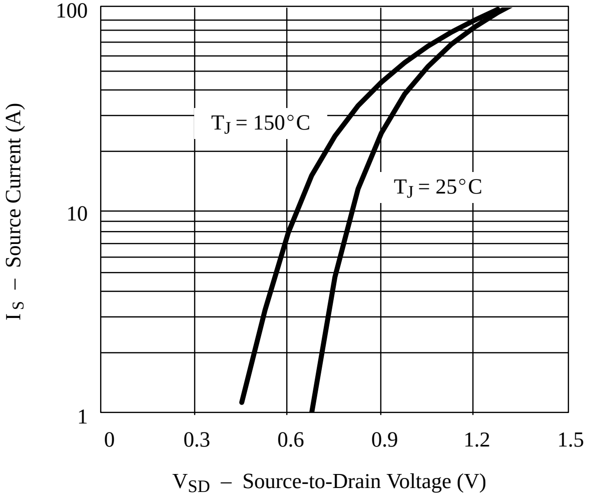


Typical Characteristics (25°C Unless Otherwise Noted)

On-Resistance vs. Junction Temperature

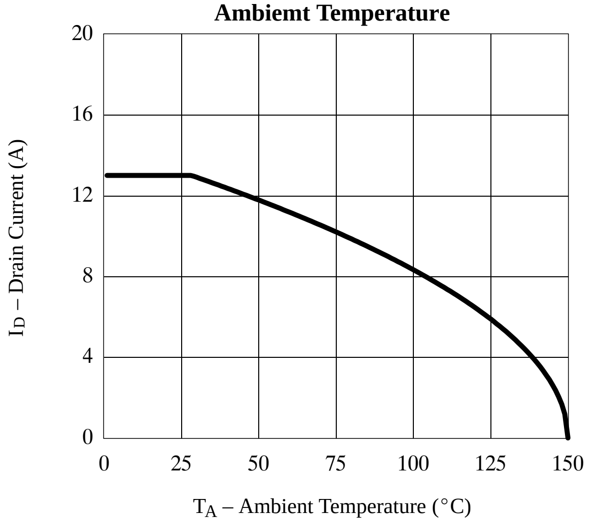


Source-Drain Diode Forward Voltage

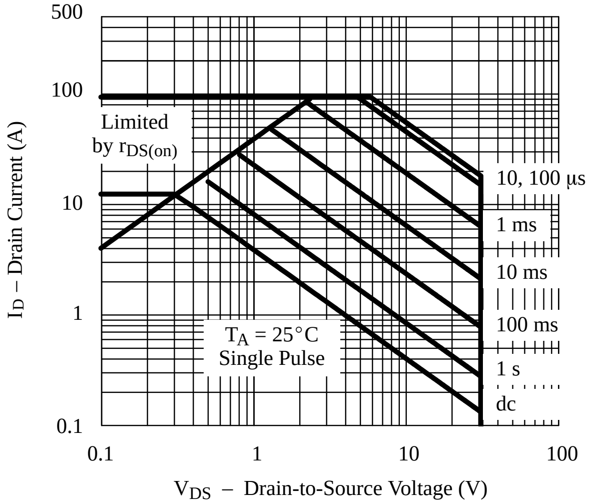


Thermal Ratings

Maximum Drain Current vs. Ambiemt Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient