P-Channel 30-V (D-S), MOSFET

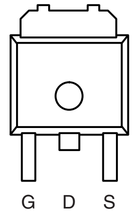
PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)[a]
- 30	0.010 at V_{GS} = - 10 V	- 15
	0.018 at V_{GS} = - 4.5 V	- 12

FEATURES

- TrenchFET® Power MOSFETs

RoHS
COMPLIANT

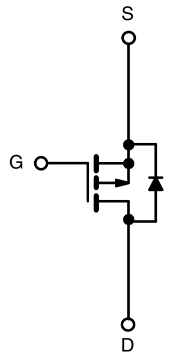
TO-252



Drain Connected to Tab

Top View

Ordering Information: SUD45P03-10-E3 (Lead (Pb)-free)



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	- 15	A
	T_A = 100 °C		- 8	
Pulsed Drain Current		I_{DM}	- 100	
Continuous Source Current (Diode Conduction)		I_S	- 15	
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 s.

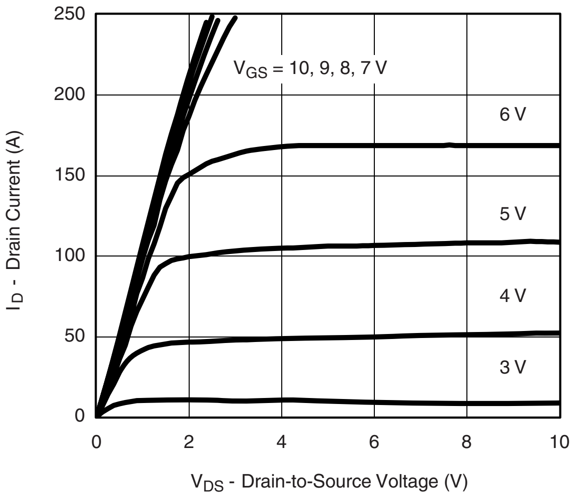
SPECIFICATIONS T_J = 25 °C, unless otherwise noted

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	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		- 3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 30 V, V_{GS} = 0 V			- 1	µA
		V_{DS} = - 30 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	- 50			A
		V_{DS} = - 5 V, V_{GS} = - 4.5 V	- 20			
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 10 V, I_D = - 15 A			0.010	Ω
		V_{GS} = - 10 V, I_D = - 15 A, T_J = 125 °C			0.015	
		V_{GS} = - 4.5 V, I_D = - 15 A			0.018	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 15 V, I_D = - 15 A	20			S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = - 25 V, f = 1 MHz		6000		pF
Output Capacitance	C_{oss}			1100		
Reverse Transfer Capacitance	C_{rss}			700		
Total Gate Charge[c]	Q_g	V_{DS} = - 15 V, V_{GS} = - 10 V, I_D = - 45 A		90	150	nC
Gate-Source Charge[c]	Q_{gs}			20		
Gate-Drain Charge[c]	Q_{gd}			16		
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = - 15 V, R_L = 0.33 Ω I_D ≅ - 45 A, V_{GEN} = - 10 V, R_G = 2.4 Ω		15	25	ns
Rise Time[c]	t_r			375	550	
Turn-Off Delay Time[c]	$t_{d(off)}$			100	200	
Fall Time[c]	t_f			140	250	
Source-Drain Diode Ratings and Characteristic T_C = 25 °C						
Pulsed Current	I_{SM}				100	A
Diode Forward Voltage[a]	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

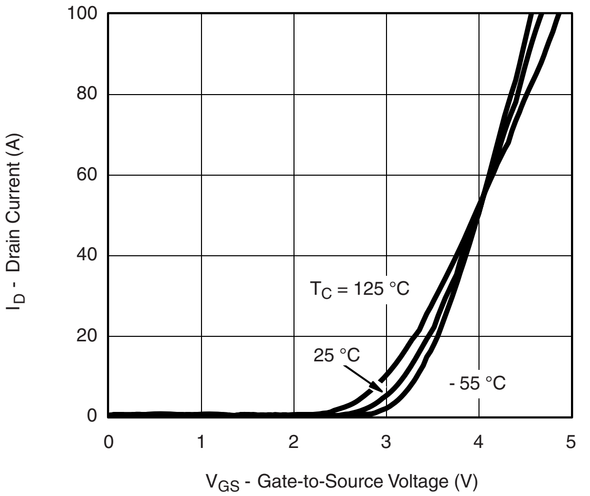
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

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.

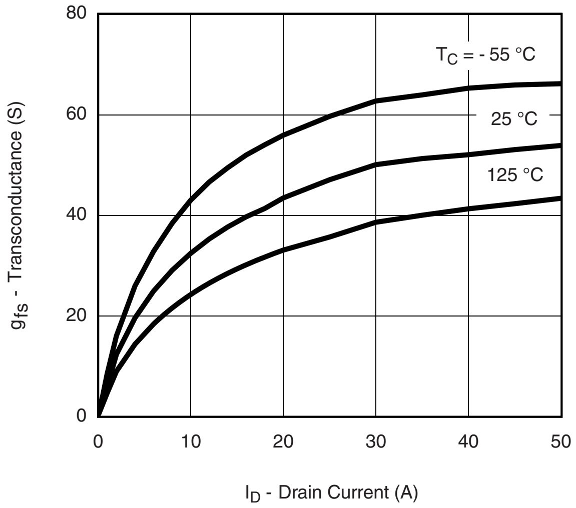
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



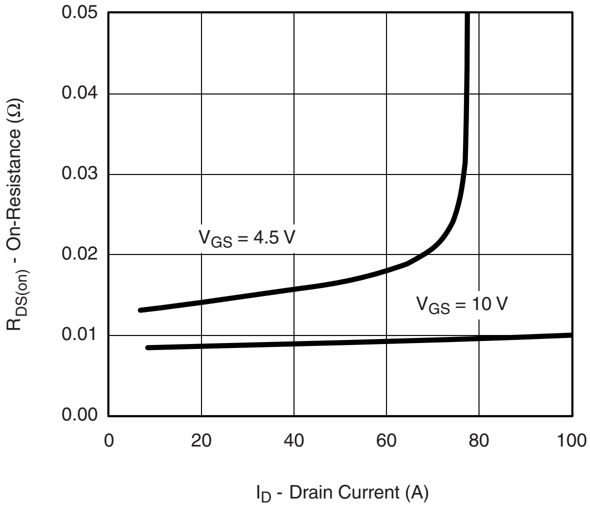
Output Characteristics



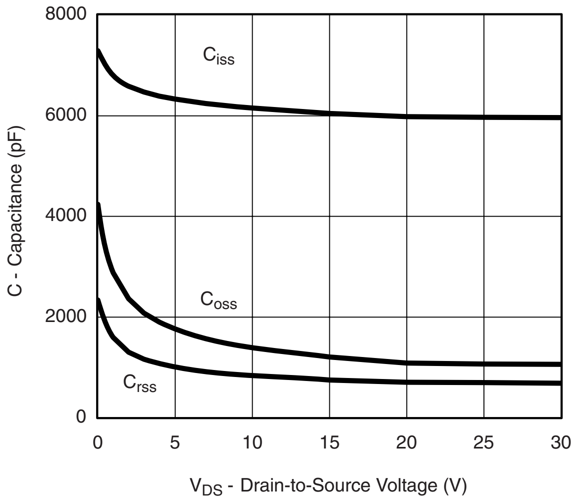
Transfer Characteristics



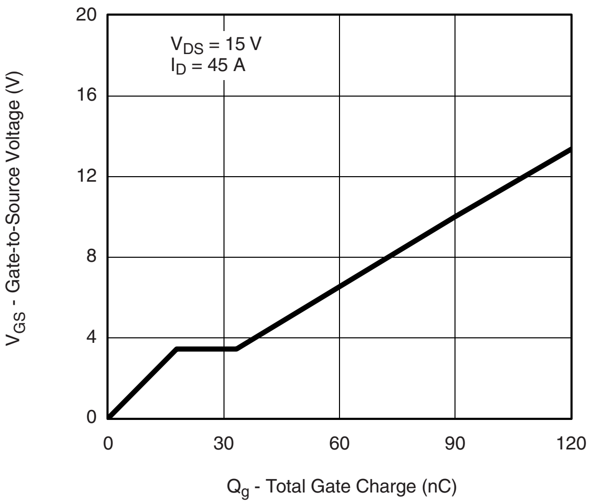
Transconductance



On-Resistance vs. Drain Current

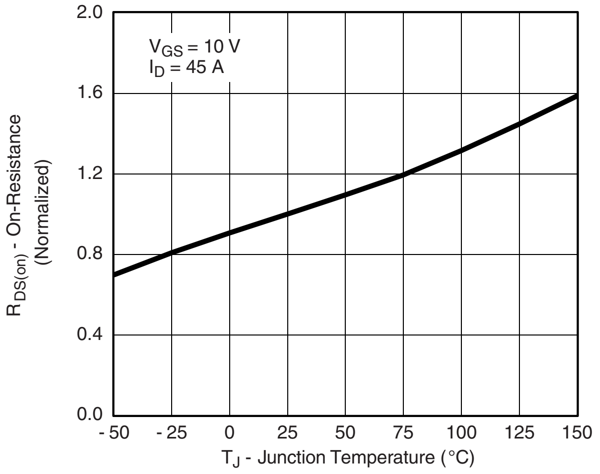


Capacitance

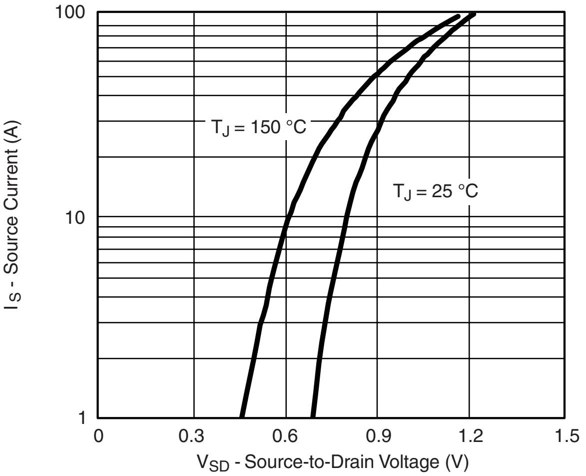


Gate Charge

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

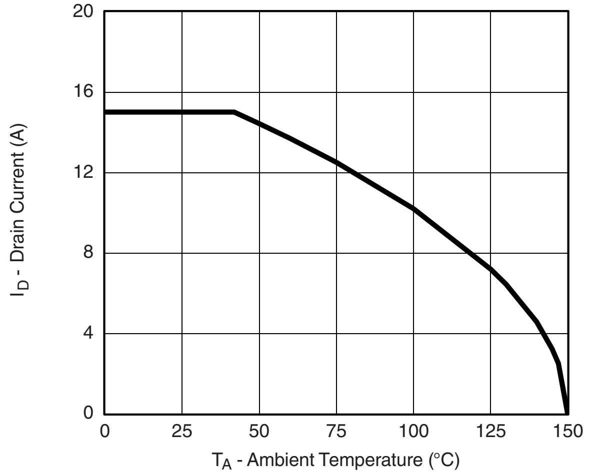


On-Resistance vs. Junction Temperature

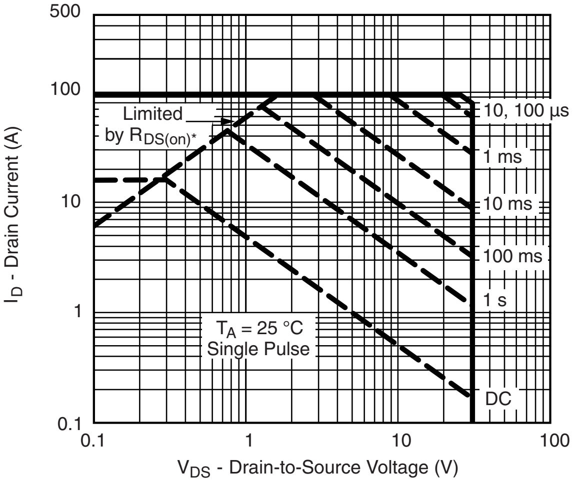


Source-Drain Diode Forward Voltage

THERMAL RATINGS

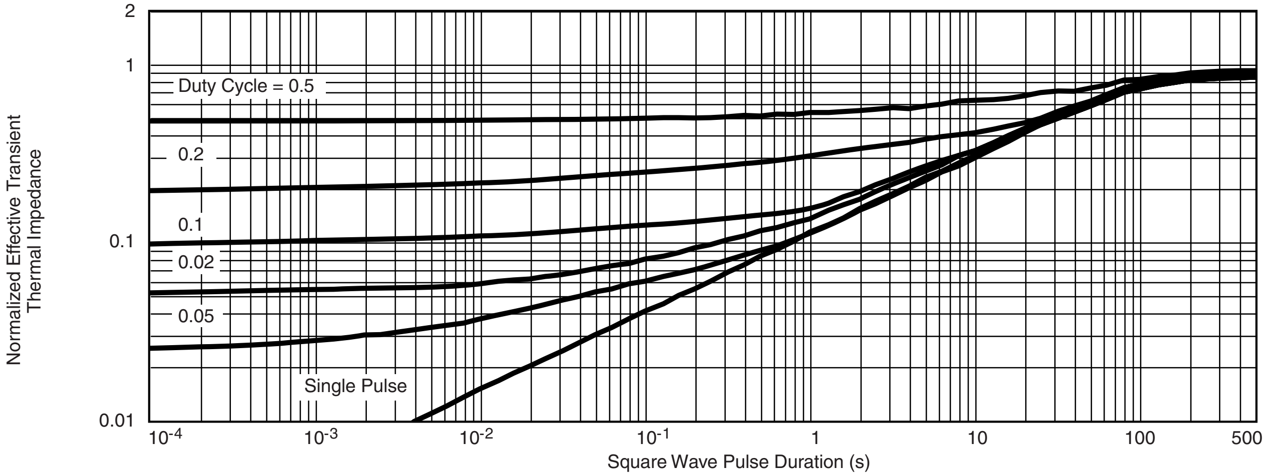


Maximum Drain Current vs. Ambient Temperature



* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient

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