

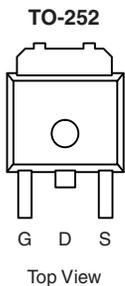
## P-Channel 30-V (D-S), MOSFET

### PRODUCT SUMMARY

$V_{DS}$ (V)	$R_{DS(on)}$ ( $\Omega$ )	$I_D$ (A) <sup>a</sup>
- 30	0.010 at $V_{GS} = - 10$ V	- 15
	0.018 at $V_{GS} = - 4.5$ V	- 12

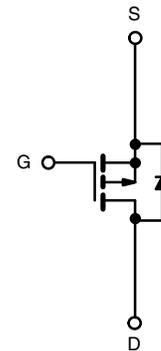
### FEATURES

- TrenchFET<sup>®</sup> Power MOSFETs


**RoHS**  
COMPLIANT


Drain Connected to Tab

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	$V_{GS}$	$\pm 20$		
Continuous Drain Current <sup>b</sup>	$I_D$	$T_A = 25$ °C	- 15	A
		$T_A = 100$ °C	- 8	
Pulsed Drain Current	$I_{DM}$	- 100		
Continuous Source Current (Diode Conduction)	$I_S$	- 15		
Maximum Power Dissipation <sup>b</sup>	$P_D$	$T_C = 25$ °C	70	W
		$T_A = 25$ °C	4 <sup>b</sup>	
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 <sup>b</sup>	$R_{thJA}$		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,  $t \leq 10$  s.

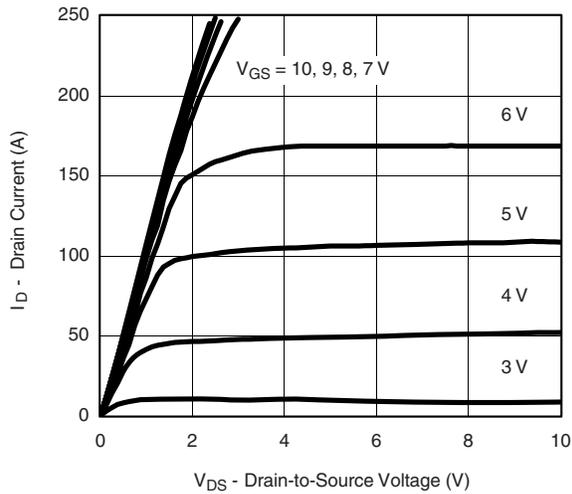
<b>SPECIFICATIONS</b> $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{DS}$	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	- 30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	- 1.0		- 3.0	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}$			- 1	$\mu\text{A}$
		$V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$			- 50	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} = -5\text{ V}, V_{GS} = -10\text{ V}$	- 50			A
		$V_{DS} = -5\text{ V}, V_{GS} = -4.5\text{ V}$	- 20			
Drain-Source On-State Resistance <sup>a</sup>	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -15\text{ A}$			0.010	$\Omega$
		$V_{GS} = -10\text{ V}, I_D = -15\text{ A}, T_J = 125\text{ }^\circ\text{C}$			0.015	
		$V_{GS} = -4.5\text{ V}, I_D = -15\text{ A}$			0.018	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -15\text{ V}, I_D = -15\text{ A}$	20			S
<b>Dynamic<sup>b</sup></b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = -25\text{ V}, f = 1\text{ MHz}$		6000		$\mu\text{F}$
Output Capacitance	$C_{oss}$			1100		
Reverse Transfer Capacitance	$C_{rss}$			700		
Total Gate Charge <sup>c</sup>	$Q_g$	$V_{DS} = -15\text{ V}, V_{GS} = -10\text{ V}, I_D = -45\text{ A}$		90	150	nC
Gate-Source Charge <sup>c</sup>	$Q_{gs}$			20		
Gate-Drain Charge <sup>c</sup>	$Q_{gd}$			16		
Turn-On Delay Time <sup>c</sup>	$t_{d(on)}$	$V_{DD} = -15\text{ V}, R_L = 0.33\text{ }\Omega$ $I_D \cong -45\text{ A}, V_{GEN} = -10\text{ V}, R_G = 2.4\text{ }\Omega$		15	25	ns
Rise Time <sup>c</sup>	$t_r$			375	550	
Turn-Off Delay Time <sup>c</sup>	$t_{d(off)}$			100	200	
Fall Time <sup>c</sup>	$t_f$			140	250	
<b>Source-Drain Diode Ratings and Characteristic</b> $T_C = 25\text{ }^\circ\text{C}$						
Pulsed Current	$I_{SM}$				100	A
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	$I_F = -45\text{ A}, V_{GS} = 0\text{ V}$		1.0	1.5	V
Source-Drain Reverse Recovery Time	$t_{rr}$	$I_F = -45\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		55	100	ns

## Notes:

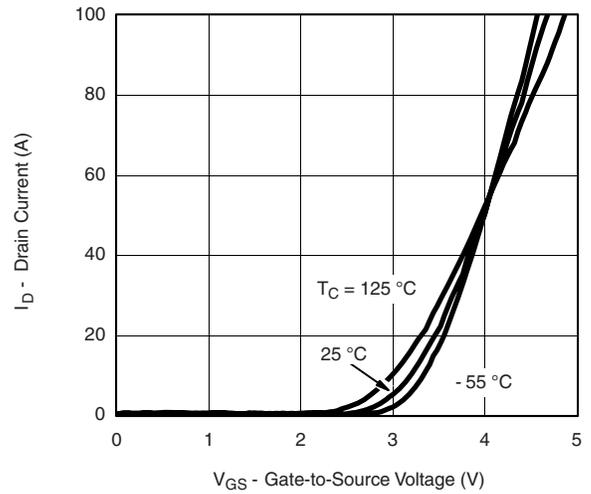
- a. Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .  
b. Guaranteed by design, not subject to production testing.  
c. Independent of operating temperature.

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.

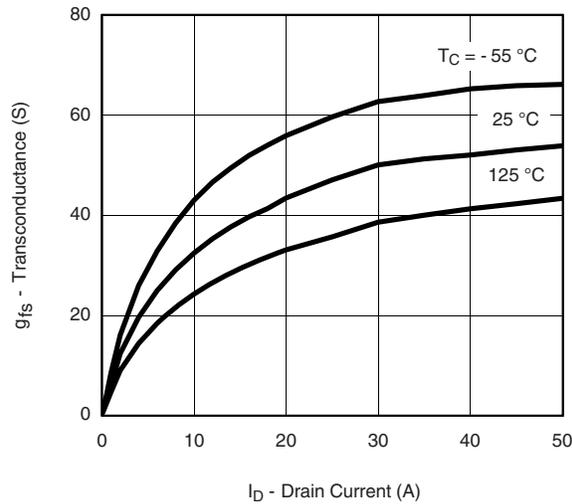
**TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted



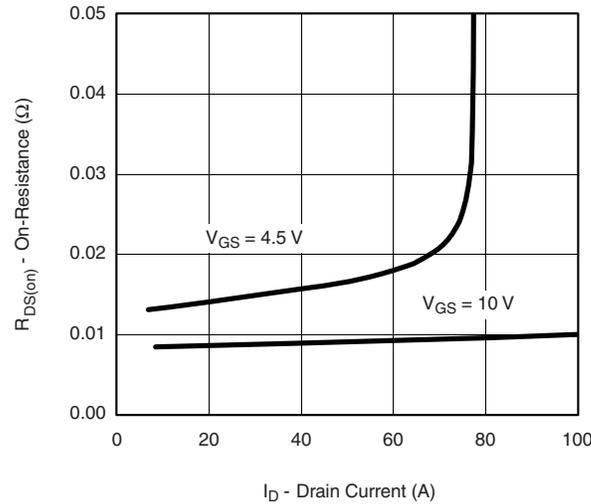
**Output Characteristics**



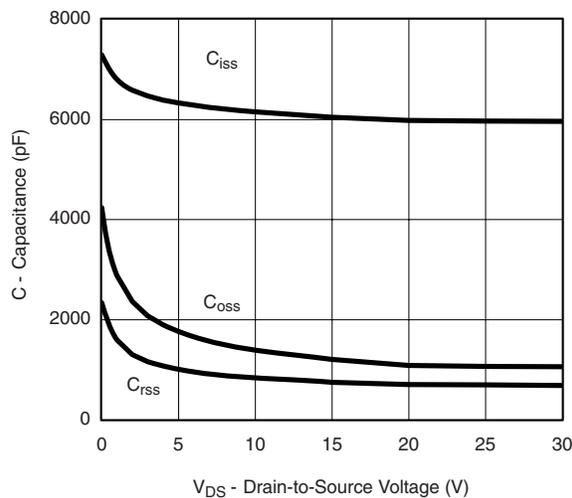
**Transfer Characteristics**



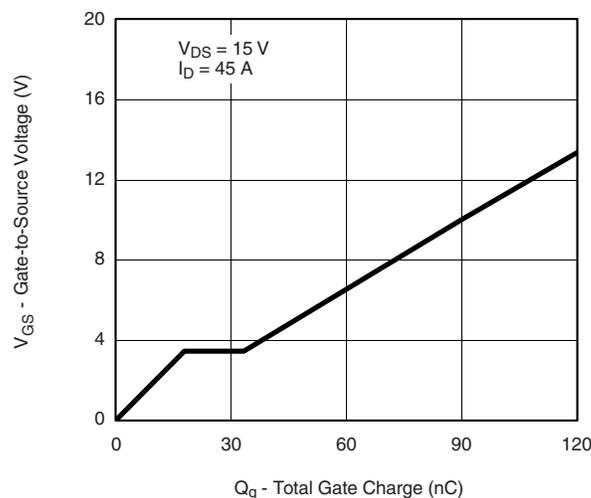
**Transconductance**



**On-Resistance vs. Drain Current**

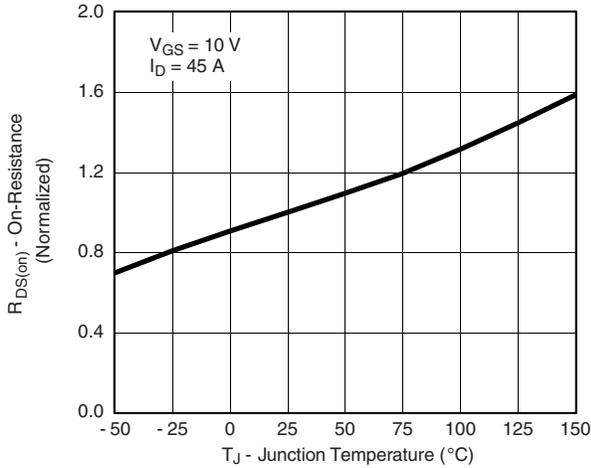


**Capacitance**

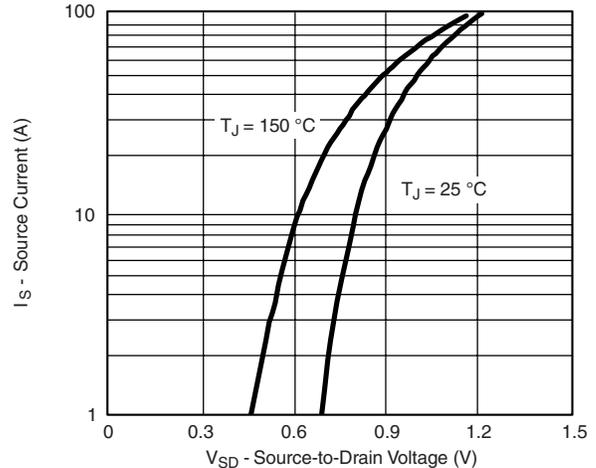


**Gate Charge**

### TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

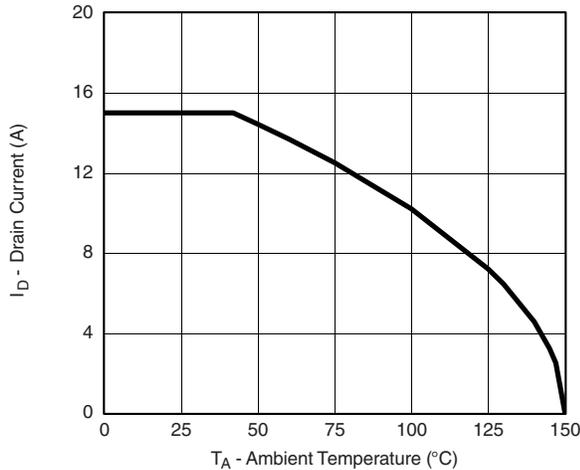


**On-Resistance vs. Junction Temperature**

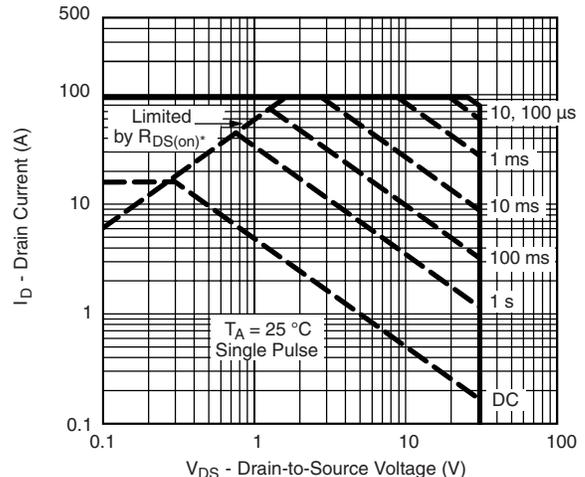


**Source-Drain Diode Forward Voltage**

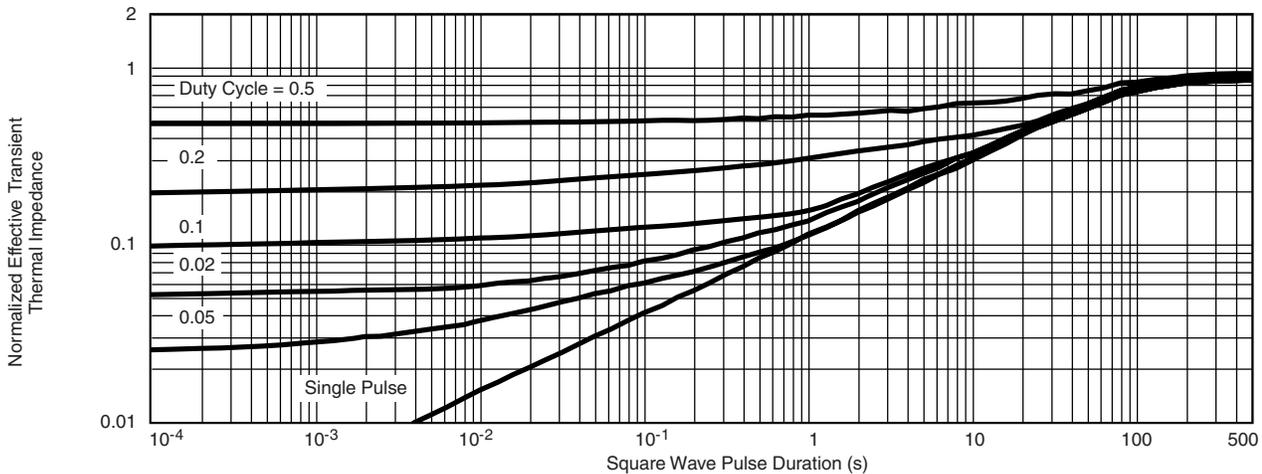
### THERMAL RATINGS



**Maximum Drain Current vs. Ambient Temperature**



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



**Normalized Thermal Transient Impedance, Junction-to-Ambient**

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