

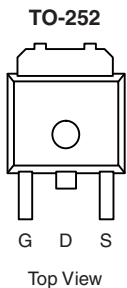
P-Channel 30-V (D-S), MOSFET

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

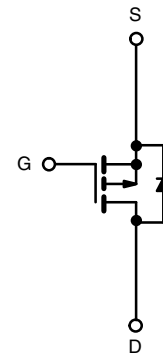
FEATURES

- TrenchFET[®] Power MOSFETs


RoHS
COMPLIANT


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}	± 20	
Continuous Drain Current ^b	I_D	$T_A = 25$ °C	- 15
		$T_A = 100$ °C	- 8
Pulsed Drain Current	I_{DM}	- 100	A
Continuous Source Current (Diode Conduction)	I_S	- 15	
Maximum Power Dissipation ^b	P_D	$T_C = 25$ °C	70
		$T_A = 25$ °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:

- 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).
- Surface Mounted on FR4 board, $t \leq 10$ s.

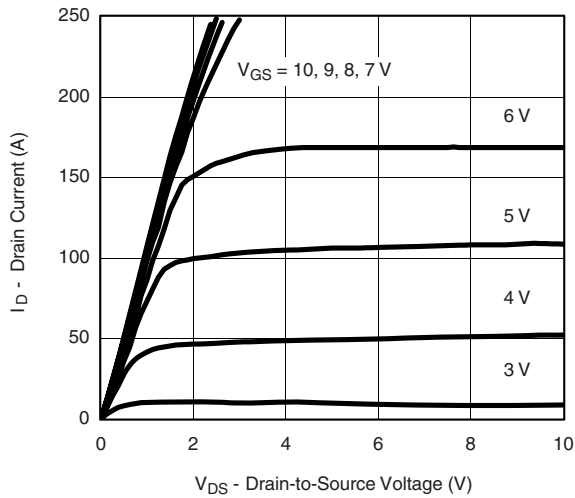
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	- 30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D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

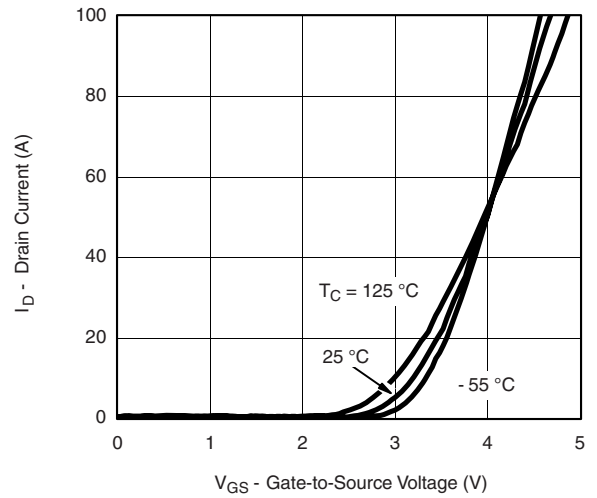
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

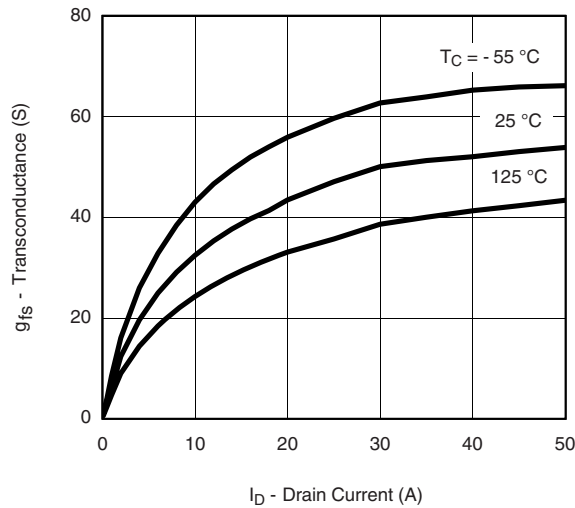
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



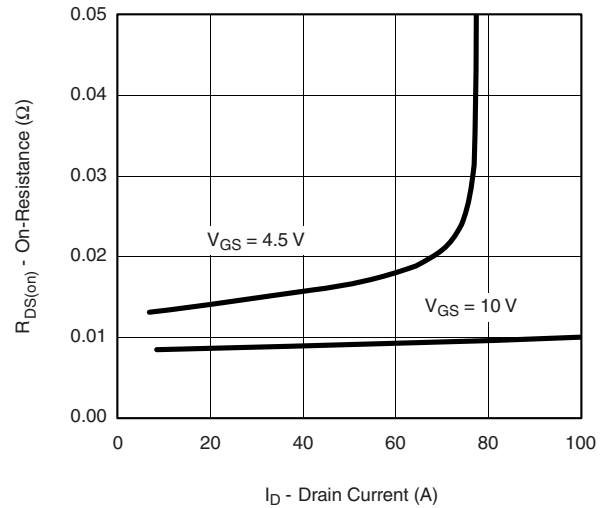
Output Characteristics



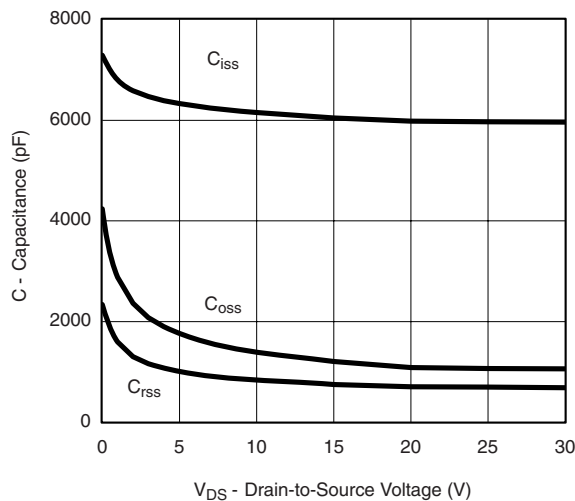
Transfer Characteristics



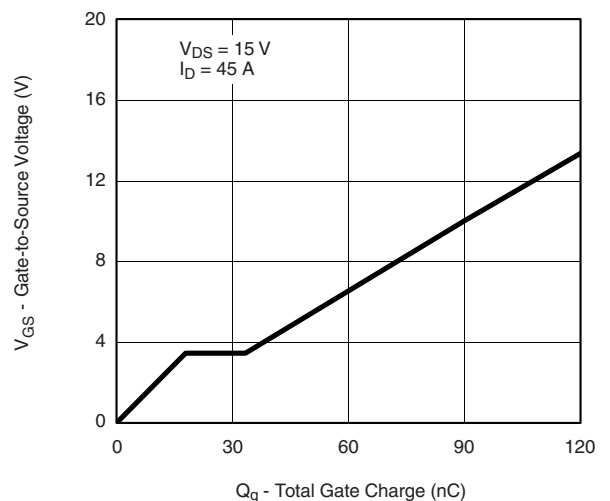
Transconductance



On-Resistance vs. Drain Current

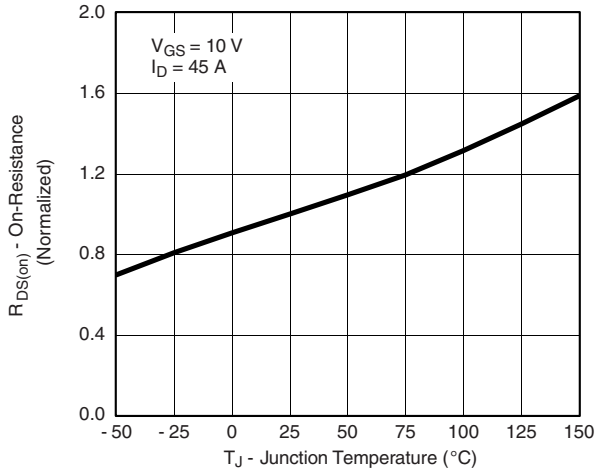


Capacitance

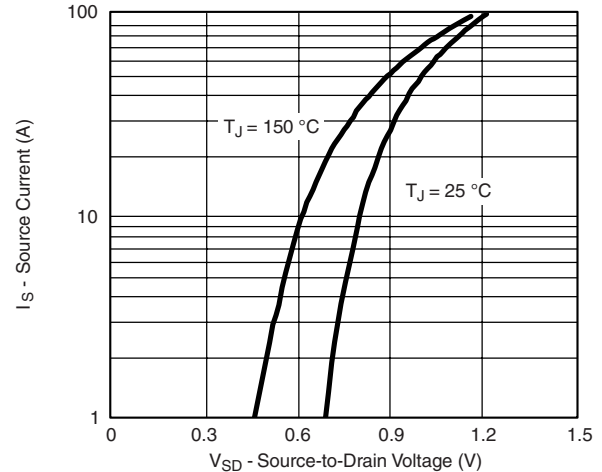


Gate Charge

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

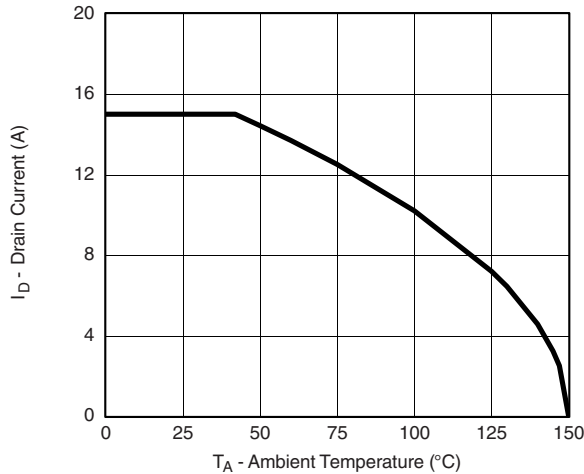


On-Resistance vs. Junction Temperature

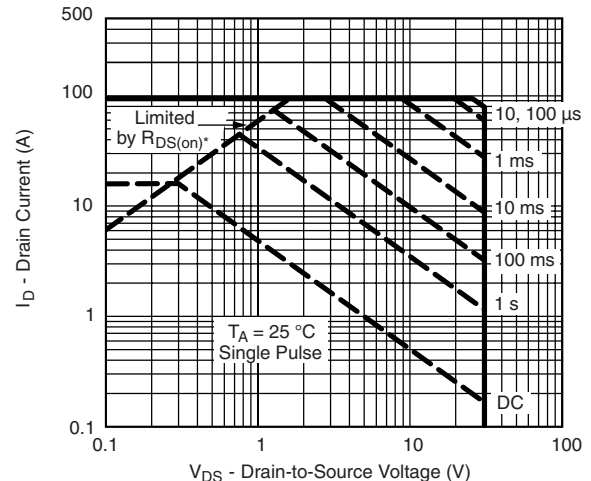


Source-Drain Diode Forward Voltage

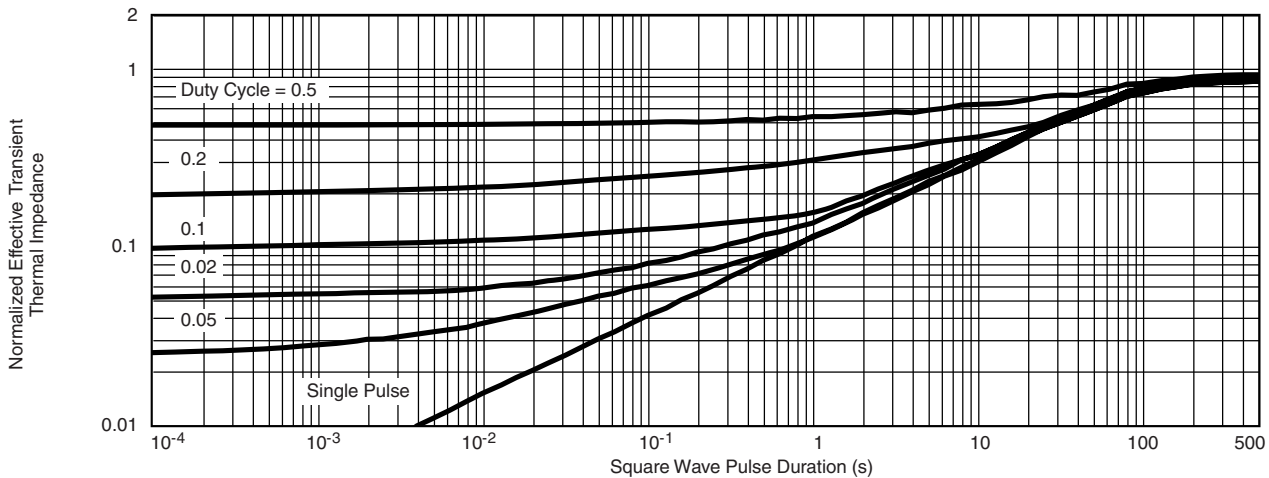
THERMAL RATINGS



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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