

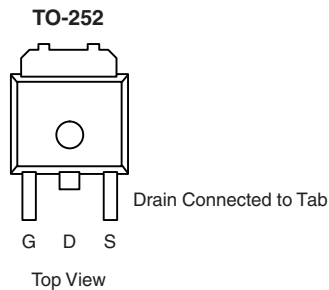
P-Channel 60-V (D-S), 175 °C MOSFET, Logic Level

PRODUCT SUMMARY

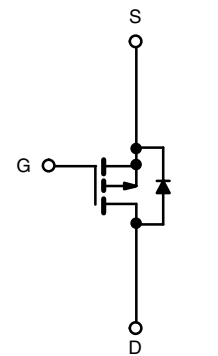
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
- 60	0.170 at $V_{GS} = - 10$ V	- 10
	0.280 at $V_{GS} = - 4.5$ V	- 8

FEATURES

- TrenchFET® Power MOSFETs
- 175 °C Rated Maximum Junction Temperature


RoHS
COMPLIANT


Ordering Information: SUD10P06-280L-E3 (Lead (Pb)-free)



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS $T_C = 25$ °C, unless otherwise noted

Parameter	Symbol	Limit	Unit
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_J = 150$ °C)	I_D	$T_C = 25$ °C	- 10
		$T_C = 100$ °C	- 7
Pulsed Drain Current	I_{DM}	- 20	A
Continuous Source Current (Diode Conduction)	I_S	- 10	
Avalanche Current	I_{AS}	- 10	
Single Pulse Avalanche Energy	E_{AS}	5	mJ
Maximum Power Dissipation	P_D	$T_C = 25$ °C	37
		$T_A = 25$ °C	2 ^a
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient ^a	R_{thJA}	FR4 Board Mount	60	°C/W
		Free Air	120	
Junction-to-Case	R_{thJC}	3.7	4.0	

Notes:

a. Surface Mounted on FR4 board.

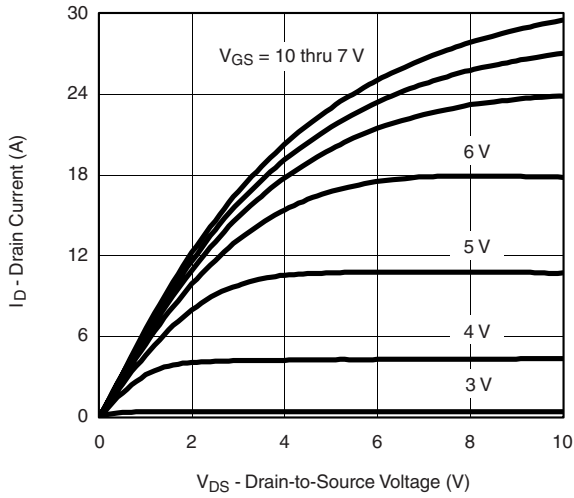
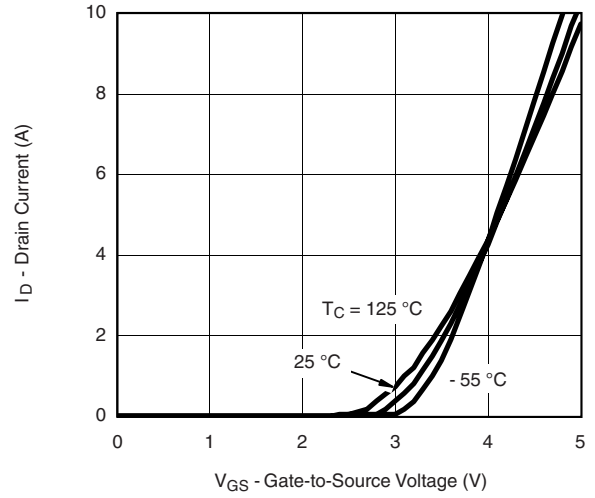
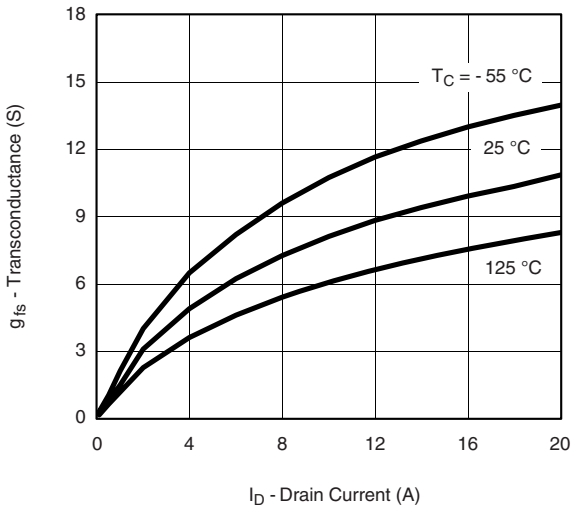
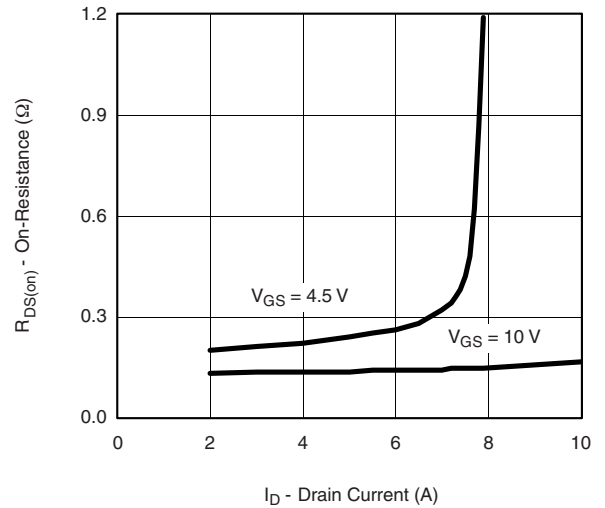
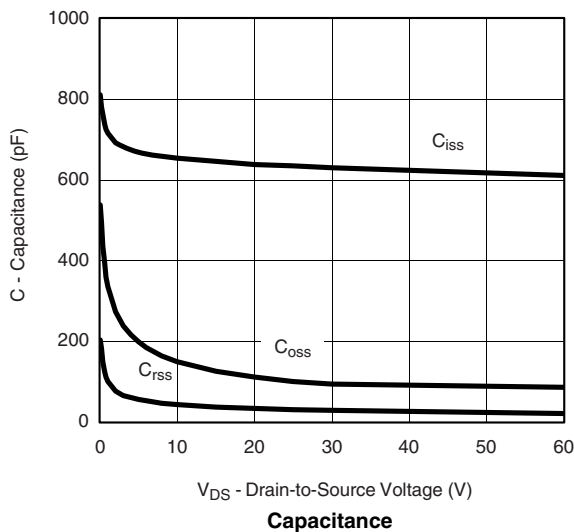
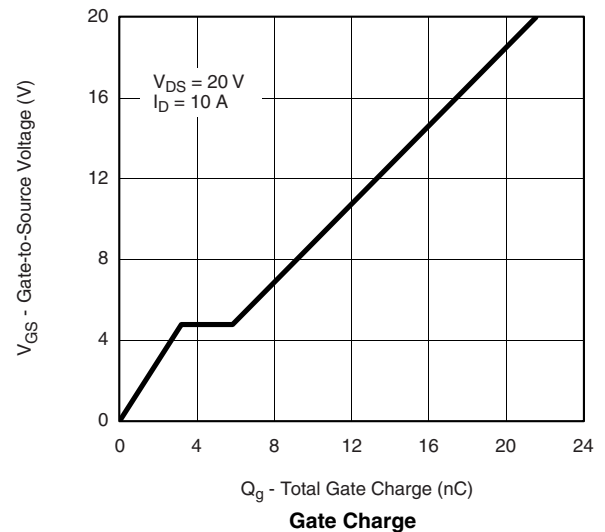
 For SPICE model information via the Worldwide Web: <http://www.vishay.com/www/product/spice.htm>.

SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ. ^a	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{DS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	- 60			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	- 1.0	- 2.0	- 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}	$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}$			- 1	μA
		$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$			- 50	
		$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}, T_J = 175\text{ }^\circ\text{C}$			- 150	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} = -5\text{ V}, V_{GS} = -10\text{ V}$	- 10			A
Drain-Source On-State Resistance ^b	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -5\text{ A}$		0.130	0.170	Ω
		$V_{GS} = -10\text{ V}, I_D = -5\text{ A}, T_J = 125\text{ }^\circ\text{C}$			0.31	
		$V_{GS} = -10\text{ V}, I_D = -5\text{ A}, T_J = 175\text{ }^\circ\text{C}$			0.375	
		$V_{GS} = -4.5\text{ V}, I_D = -2\text{ A}$		0.210	0.280	
Forward Transconductance ^b	g_{fs}	$V_{DS} = -15\text{ V}, I_D = -5\text{ A}$		6		S
Dynamic						
Input Capacitance	C_{iss}	$V_{DS} = -25\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		635		μF
Output Capacitance	C_{oss}			100		
Reverse Transfer Capacitance	C_{rss}			30		
Total Gate Charge	Q_g	$V_{DS} = -30\text{ V}, V_{GS} = -10\text{ V}, I_D = -10\text{ A}$		11.5	25	nC
Gate-Source Charge	Q_{gs}			3.5		
Gate-Drain Charge	Q_{gd}			2		
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = -30\text{ V}, R_L = 3\text{ }\Omega$ $I_D \equiv 10\text{ A}, V_{GEN} = -10\text{ V}, R_G = 2.5\text{ }\Omega$		9	20	ns
Rise Time ^c	t_r			16	20	
Turn-Off Delay Time ^c	$t_{d(off)}$			17	30	
Fall Time ^c	t_f			19	35	
Source-Drain Diode Ratings and Characteristics $T_C = 25\text{ }^\circ\text{C}^a$						
Pulsed Current	I_{SM}				- 20	A
Forward Voltage ^b	V_{SD}	$I_F = 10\text{ A}, V_{GS} = 0\text{ V}$			- 1.3	V
Reverse Recovery Time	t_{rr}	$I_F = 10\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		50	80	ns

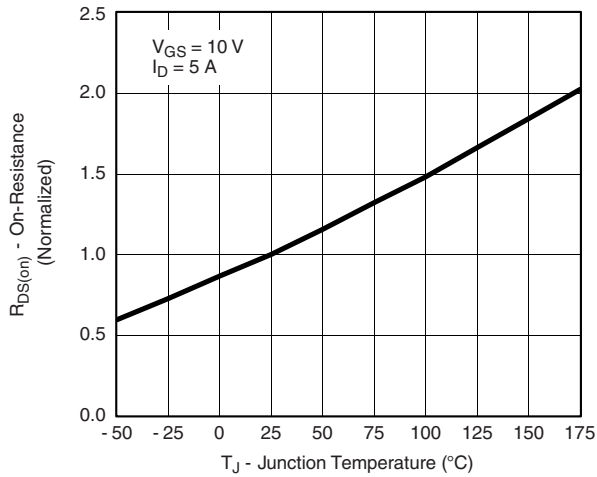
Notes:

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

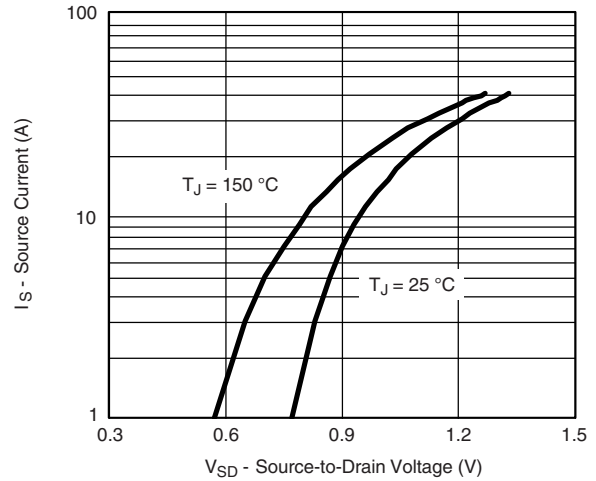
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure 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

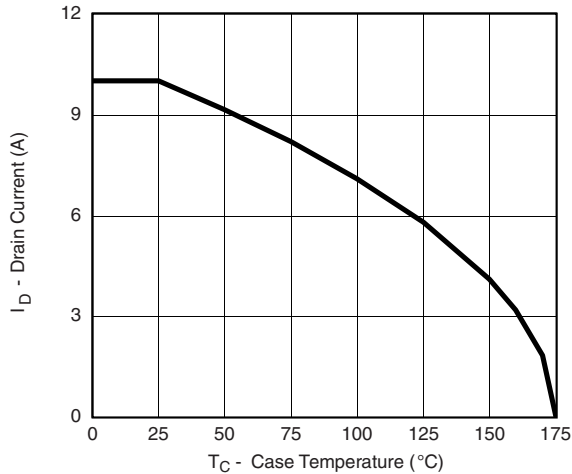


On-Resistance vs. Junction Temperature

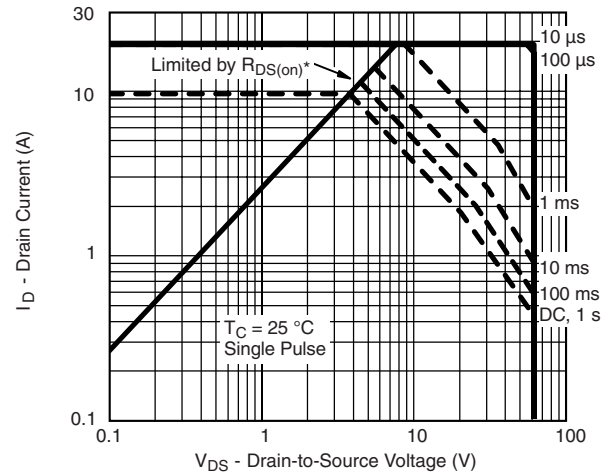


Source-Drain Diode Forward Voltage

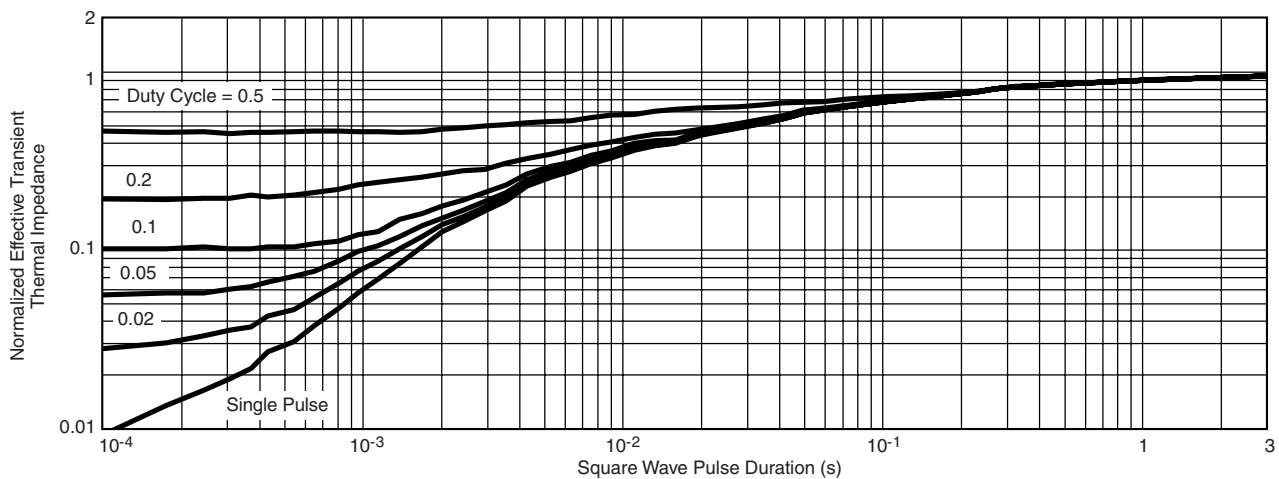
THERMAL RATINGS



Drain Current vs. Case Temperature



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



Normalized Thermal Transient Impedance, Junction-to-Case

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