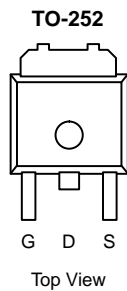




N-Channel 30-V (D-S), 175°C, MOSFET PWM Optimized

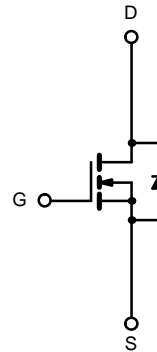
**175°C Rated**  
Maximum Junction Temperature  
**TrenchFET®**  
Power MOSFETs

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A) <sup>a</sup>
30	0.010 @ $V_{GS} = 10$ V	20
	0.014 @ $V_{GS} = 4.5$ V	18



Drain Connected to Tab

Order Number:  
SUD50N03-10AP



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		$V_{DS}$	30	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	
Continuous Drain Current ( $T_J = 175^\circ\text{C}$ ) <sup>a</sup>	$T_A = 25^\circ\text{C}$	$I_D$	20	A
	$T_A = 100^\circ\text{C}$		14	
Pulsed Drain Current		$I_{DM}$	100	
Continuous Source Current (Diode Conduction) <sup>a</sup>		$I_S$	20	
Maximum Power Dissipation	$T_C = 25^\circ\text{C}$	$P_D$	71 <sup>b</sup>	W
	$T_A = 25^\circ\text{C}$		8.3 <sup>a</sup>	
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	-55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>a</sup>	$t \leq 10$ sec	$R_{thJA}$	15	18	$^\circ\text{C/W}$
	Steady State		40	50	
Maximum Junction-to-Case	Steady State	$R_{thJC}$	1.75	2.1	

Notes:

- a. Surface mounted on 1" x 1" FR4 Board,  $t \leq 10$  sec.
- b. See SOA curve for voltage derating.



MOSFET SPECIFICATIONS (T <sub>J</sub> = 25°C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	30			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>DS</sub> = 250 μA	1	2		
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125°C			50	
		V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 175°C			150	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = 5 V, V <sub>GS</sub> = 10 V	50			A
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 15 A		0.0075	0.010	Ω
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 15 A, T <sub>J</sub> = 125°C			0.016	
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 15 A, T <sub>J</sub> = 175°C			0.019	
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 15 A		0.011	0.014	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 15 A	20			S
<b>Dynamic<sup>b</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz		2710	6000	pF
Output Capacitance	C <sub>oss</sub>			500		
Reverse Transfer Capacitance	C <sub>rss</sub>			250		
Total Gate Charge <sup>c</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 20 A		55	100	nC
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>			10		
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>			9		
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>	V <sub>DD</sub> = 15 V, R <sub>L</sub> = 0.3 Ω I <sub>D</sub> = 20 A, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 2.5 Ω		16	30	ns
Rise Time <sup>c</sup>	t <sub>r</sub>			90	135	
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>			33	60	
Fall Time <sup>c</sup>	t <sub>f</sub>			20	40	
<b>Source-Drain Diode Ratings and Characteristics (T<sub>C</sub> = 25°C)<sup>b</sup></b>						
Continuous Current	I <sub>S</sub>				20	A
Pulsed Current	I <sub>SM</sub>				100	
Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>F</sub> = 100 A, V <sub>GS</sub> = 0 V		1.2	1.5	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 20 A, di/dt = 100 A/μs		55	100	ns

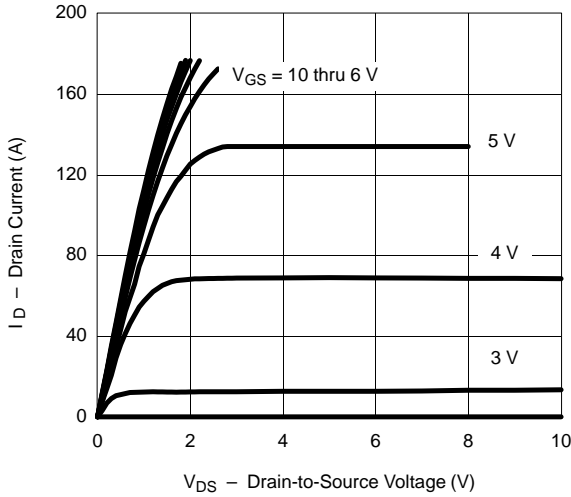
## Notes:

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

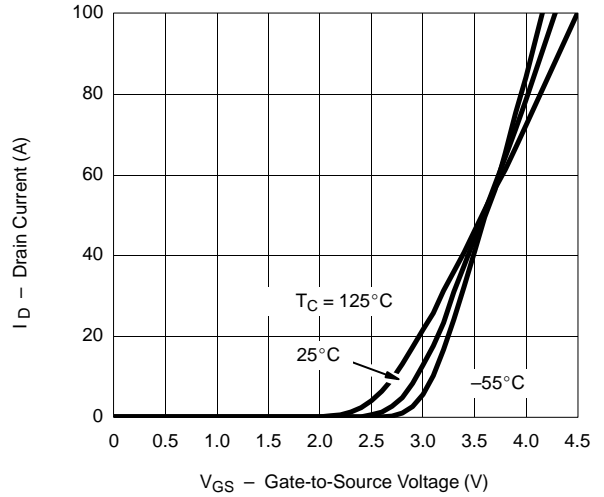


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

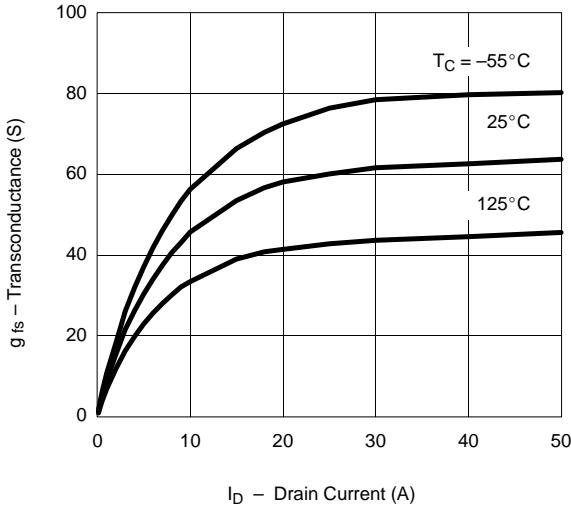
Output Characteristics



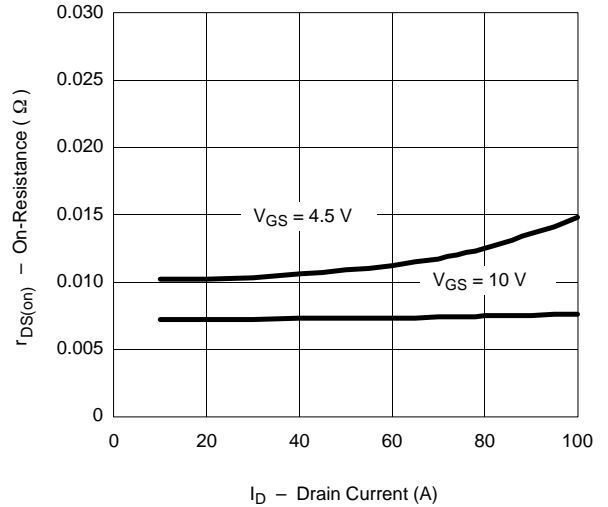
Transfer Characteristics



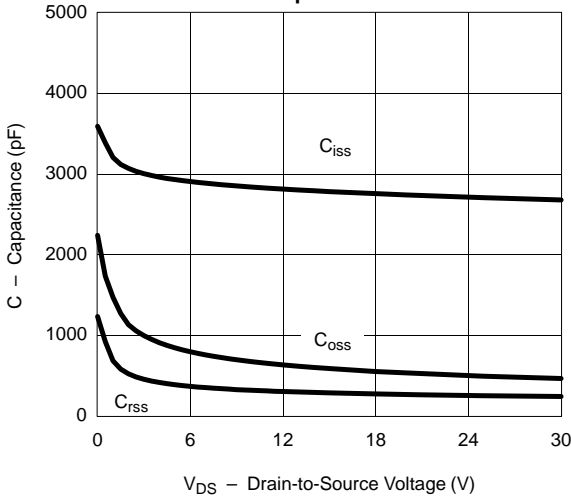
Transconductance



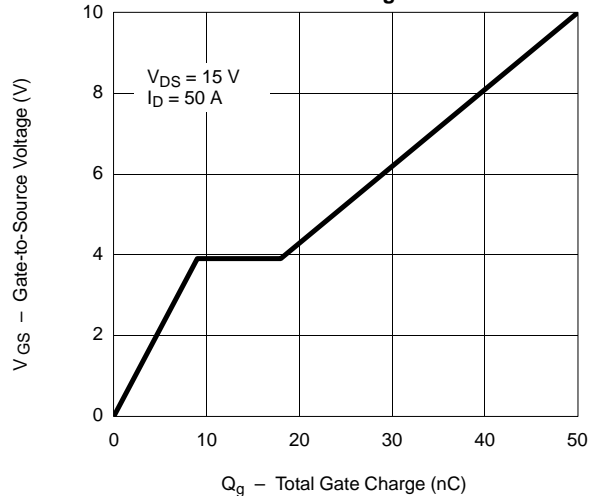
On-Resistance vs. Drain Current



Capacitance

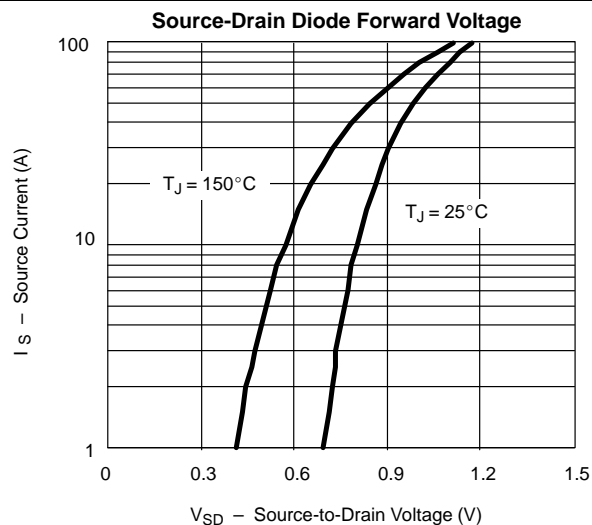
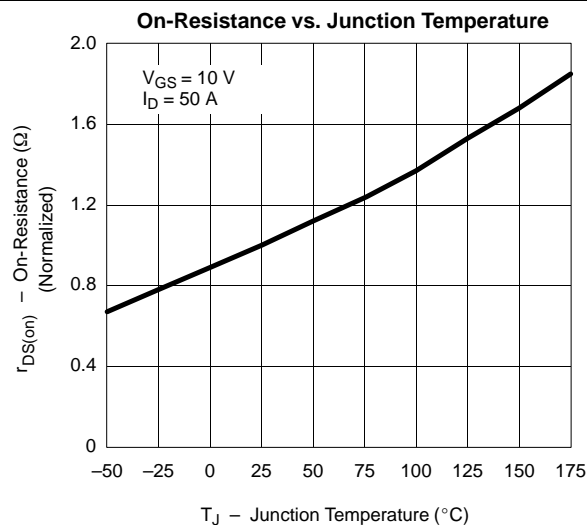


Gate Charge





### TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



### THERMAL RATINGS

