

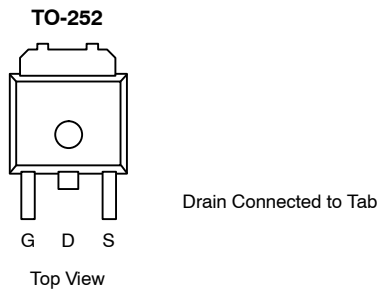


N-Channel 30-V (D-S), 175°C, MOSFET PWM Optimized

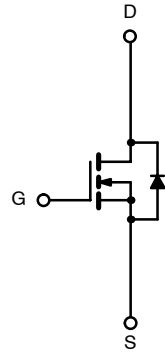
PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A) ^a
30	0.010 @ $V_{GS} = 10$ V	20
	0.014 @ $V_{GS} = 4.5$ V	18

FEATURES

- TrenchFET® Power MOSFET
- 175°C Maximum Junction Temperature
- 100% R_g Tested



Ordering Information: SUD50N03-10BP



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}	± 20	
Continuous Drain Current ($T_J = 175^\circ\text{C}$) ^a	$T_A = 25^\circ\text{C}$	I_D	20	A
	$T_A = 100^\circ\text{C}$		14	
Pulsed Drain Current		I_{DM}	100	
Continuous Source Current (Diode Conduction) ^a		I_S	20	
Maximum Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	71 ^b	W
	$T_A = 25^\circ\text{C}$		8.3 ^a	
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 ^a	$t \leq 10$ sec	R_{thJA}	15	18	$^\circ\text{C}/\text{W}$
	Steady State		40	50	
Maximum Junction-to-Case		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 ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_{DS} = 250\ \mu\text{A}$	0.8	2		
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}	$V_{DS} = 24\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 24\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			50	
		$V_{DS} = 24\text{ V}, V_{GS} = 0\text{ V}, T_J = 175^\circ\text{C}$			150	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	50			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 15\text{ A}$		0.0075	0.010	Ω
		$V_{GS} = 10\text{ V}, I_D = 15\text{ A}, T_J = 125^\circ\text{C}$			0.016	
		$V_{GS} = 10\text{ V}, I_D = 15\text{ A}, T_J = 175^\circ\text{C}$			0.019	
		$V_{GS} = 4.5\text{ V}, I_D = 15\text{ A}$		0.011	0.014	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 15\text{ A}$	20			S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		1500		pF
Output Capacitance	C_{oss}			530		
Reverse Transfer Capacitance	C_{rss}			240		
Total Gate Charge ^c	Q_g	$V_{DS} = 15\text{ V}, V_{GS} = 5\text{ V}, I_D = 20\text{ A}$		15.5	19	nC
Gate-Source Charge ^c	Q_{gs}			5		
Gate-Drain Charge ^c	Q_{gd}			6		
Gate Resistance	R_g		0.5		4.1	Ω
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 15\text{ V}, R_L = 0.3\ \Omega$ $I_D = 20\text{ A}, V_{GEN} = 10\text{ V}, R_G = 2.5\ \Omega$		10	18	ns
Rise Time ^c	t_r			8	15	
Turn-Off Delay Time ^c	$t_{d(off)}$			25	45	
Fall Time ^c	t_f			9	16	
Gate Resistance	R_g				2.3	
Source-Drain Diode Ratings and Characteristics ($T_C = 25^\circ\text{C}$)^b						
Continuous Current	I_S				50	A
Pulsed Current	I_{SM}				100	
Forward Voltage ^a	V_{SD}	$I_F = 100\text{ A}, V_{GS} = 0\text{ V}$		1.2	1.5	V
Reverse Recovery Time	t_{rr}	$I_F = 20\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		30	60	ns

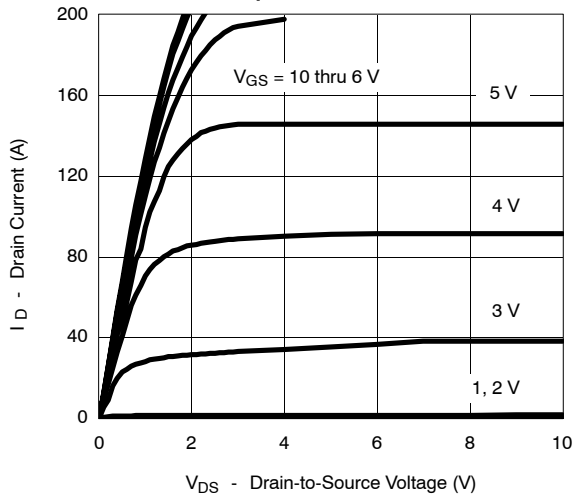
Notes:

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

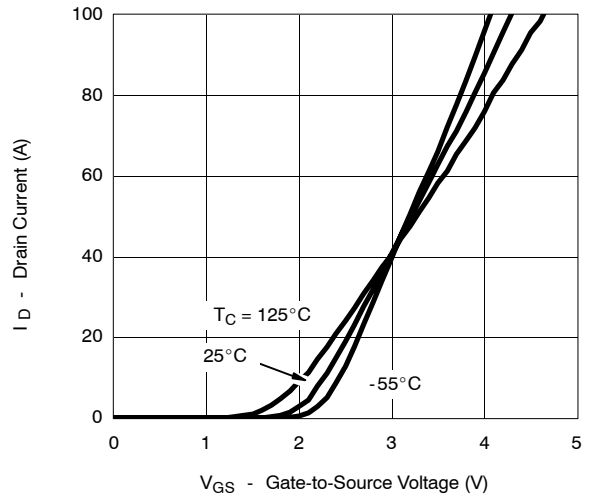


TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

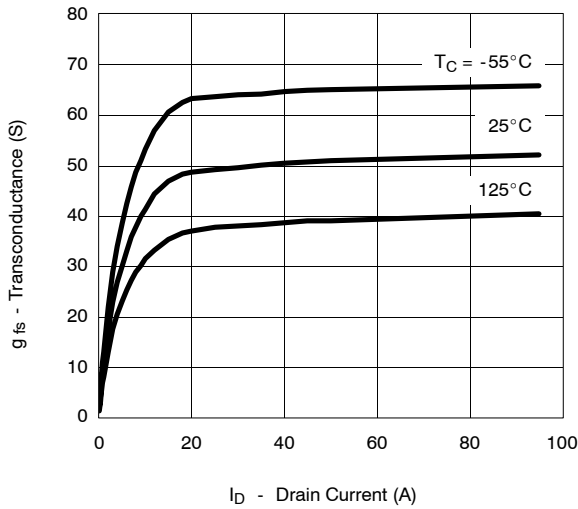
Output Characteristics



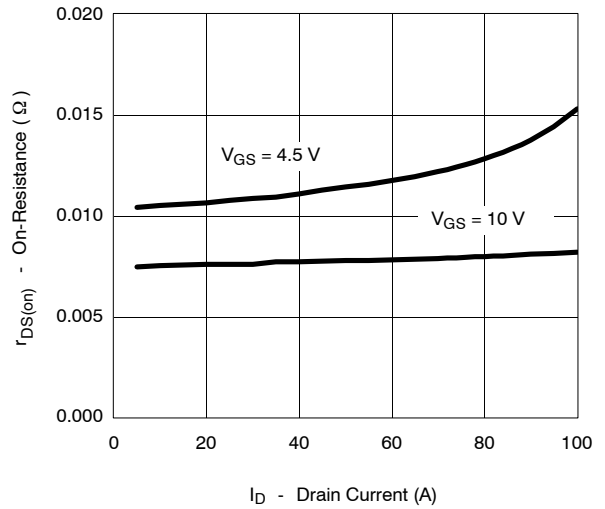
Transfer Characteristics



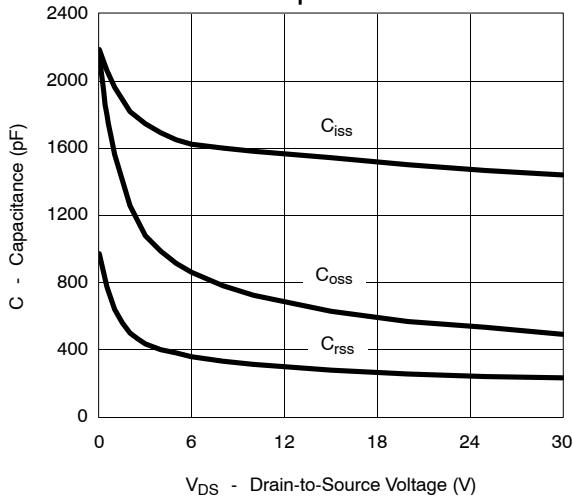
Transconductance



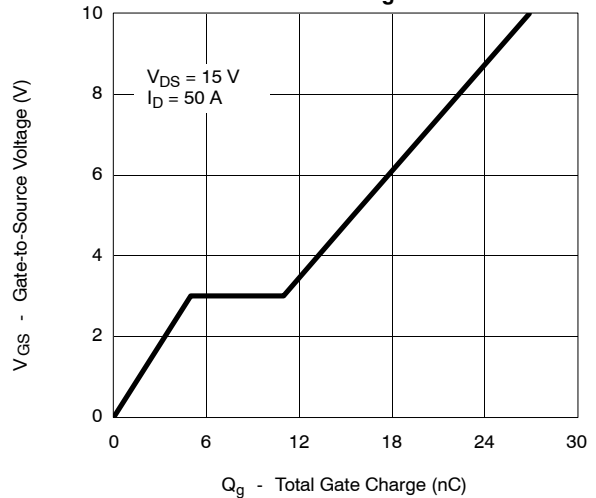
On-Resistance vs. Drain Current



Capacitance

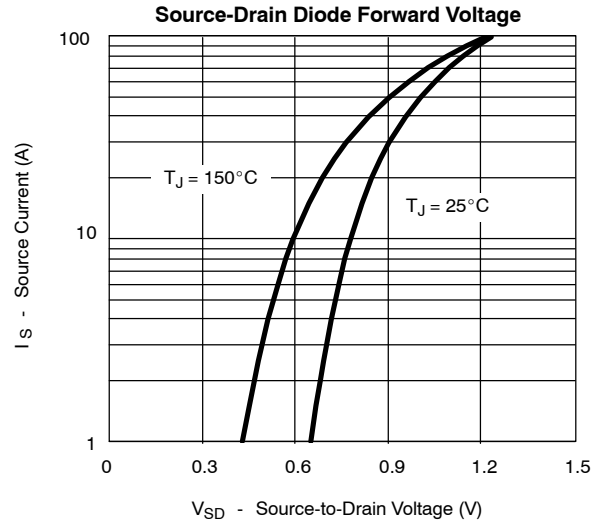
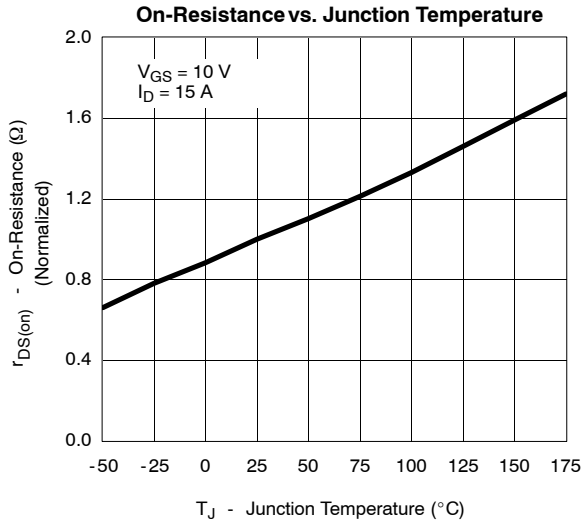


Gate Charge





TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



THERMAL RATINGS

