



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

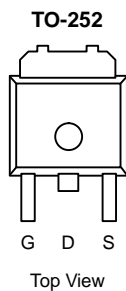
FEATURES

- TrenchFET® Power MOSFETS
- PWM Optimized for High Efficiency

APPLICATIONS

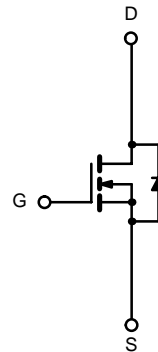
- Buck Converter
 - High Side
 - Low Side
- Synchronous Rectifier
 - Secondary Rectifier

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A) ^a
30	0.010 @ $V_{GS} = 10$ V	15
	0.012 @ $V_{GS} = 4.5$ V	18



Drain Connected to Tab

Order Number:
SUD50N03-10CP



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}	± 20	
Continuous Drain Current ($T_J = 175^\circ\text{C}$) ^a	$T_A = 25^\circ\text{C}$	I_D	15	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	$^\circ\text{C/W}$
	Steady State		40	50	
Maximum Junction-to-Case (Drain)		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 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 250 μA	30			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _{DS} = 250 μA	1			
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 24 V, V _{GS} = 0 V			1	μA
		V _{DS} = 24 V, V _{GS} = 0 V, T _J = 125 °C			50	
		V _{DS} = 24 V, V _{GS} = 0 V, T _J = 175 °C			150	
On-State Drain Current ^a	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	50			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 15 A		0.008	0.010	Ω
		V _{GS} = 10 V, I _D = 15 A, T _J = 125 °C			0.016	
		V _{GS} = 10 V, I _D = 15 A, T _J = 175 °C			0.020	
		V _{GS} = 4.5 V, I _D = 15 A		0.0105	0.012	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 15 A	20	60		S
Dynamic^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		1725		pF
Output Capacitance	C _{oss}			425		
Reverse Transfer Capacitance	C _{rss}			120		
Total Gate Charge ^c	Q _g	V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = 15 A		13	18	nC
Gate-Source Charge ^c	Q _{gs}			4.5		
Gate-Drain Charge ^c	Q _{gd}			4.0		
Gate Resistance	R _G			1.7		Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 15 V, R _L = 1 Ω I _D = 15 A, V _{GEN} = 10 V, R _G = 6 Ω		10	15	ns
Rise Time ^c	t _r			160	240	
Turn-Off Delay Time ^c	t _{d(off)}			30	45	
Fall Time ^c	t _f			55	85	
Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)^b						
Continuous Current	I _S				15	A
Pulsed Current	I _{SM}				100	
Forward Voltage ^a	V _{SD}	I _F = 15 A, V _{GS} = 0 V		0.85	12	V
Reverse Recovery Time	t _{rr}	I _F = 15 A, di/dt = 100 A/μs		80	110	ns

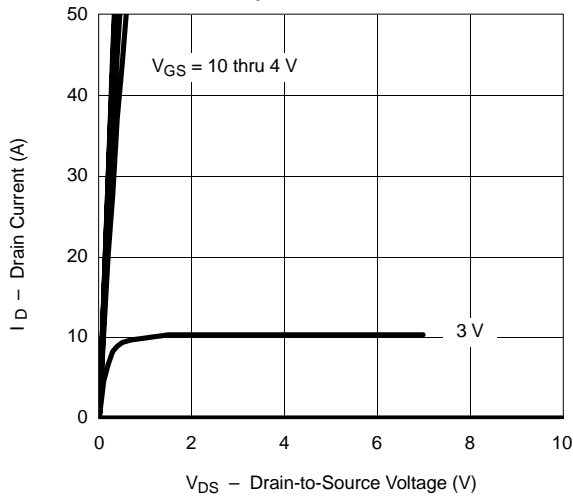
Notes:

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

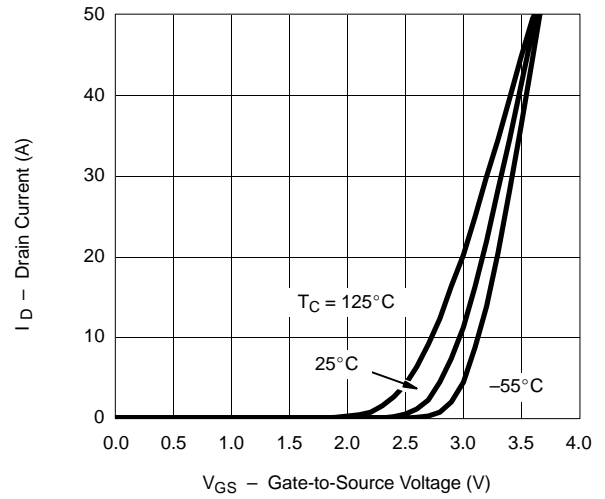


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

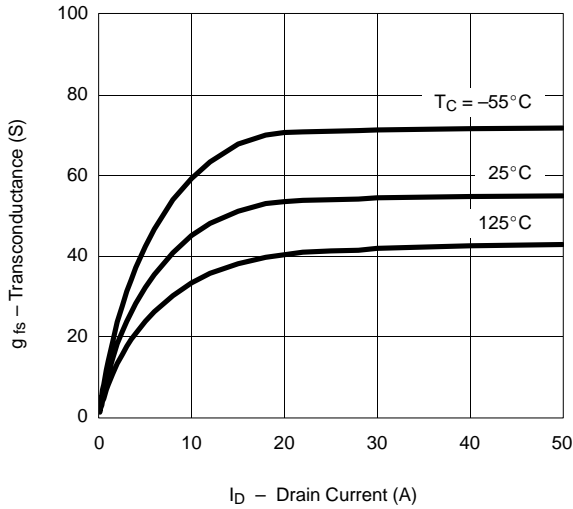
Output Characteristics



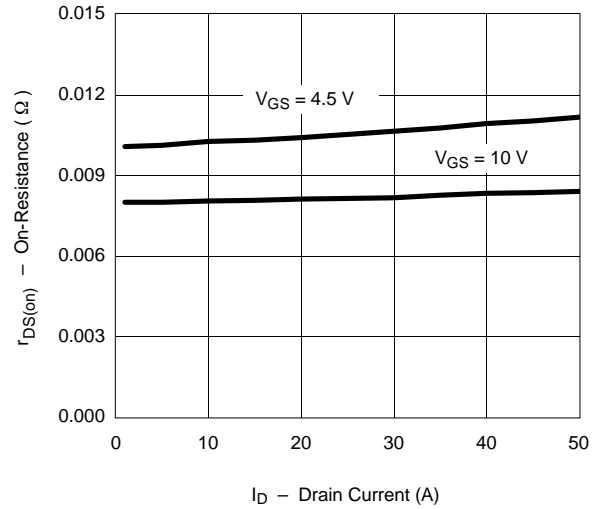
Transfer Characteristics



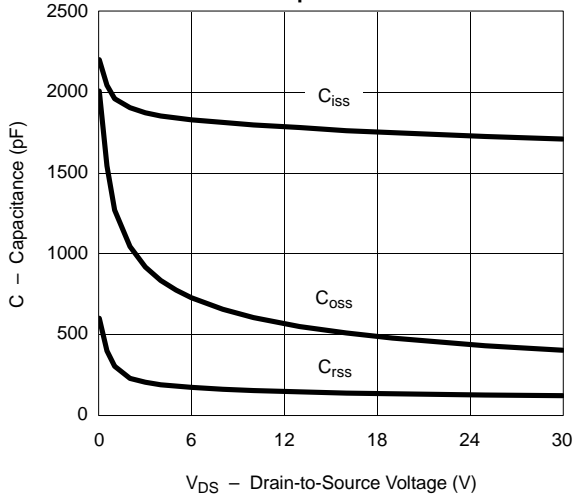
Transconductance



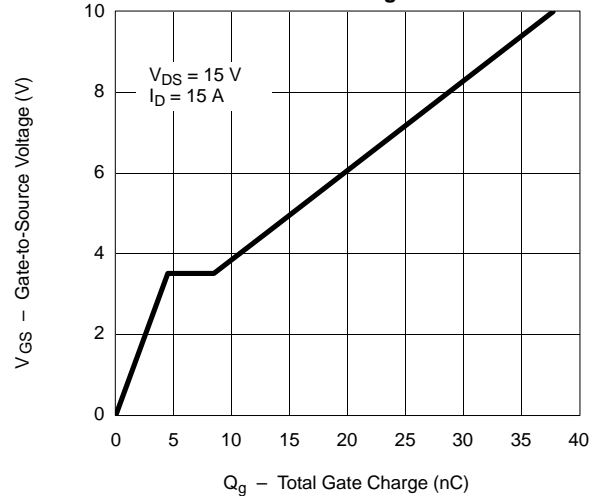
On-Resistance vs. Drain Current



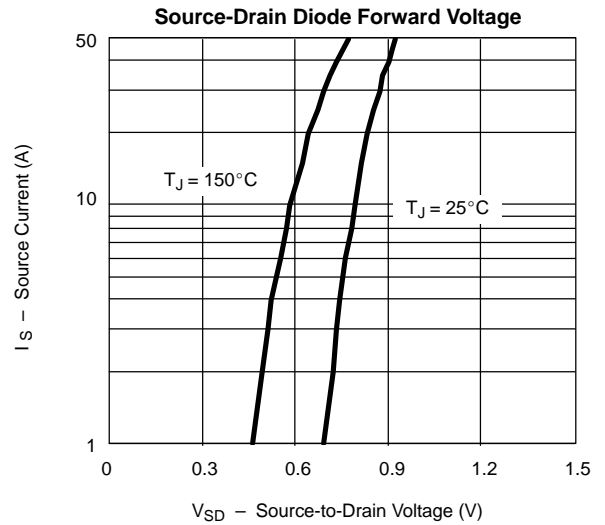
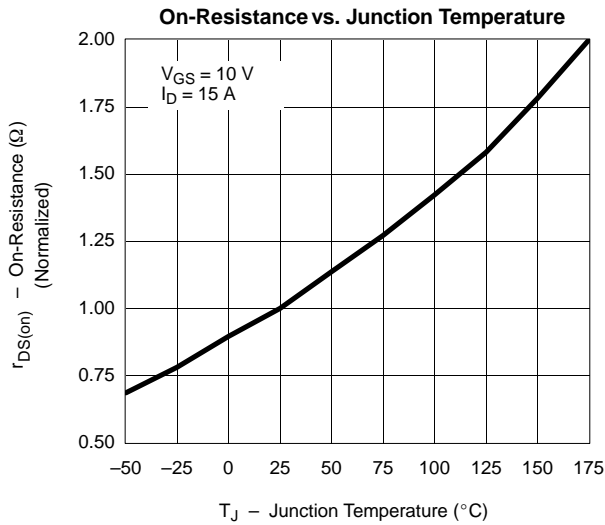
Capacitance



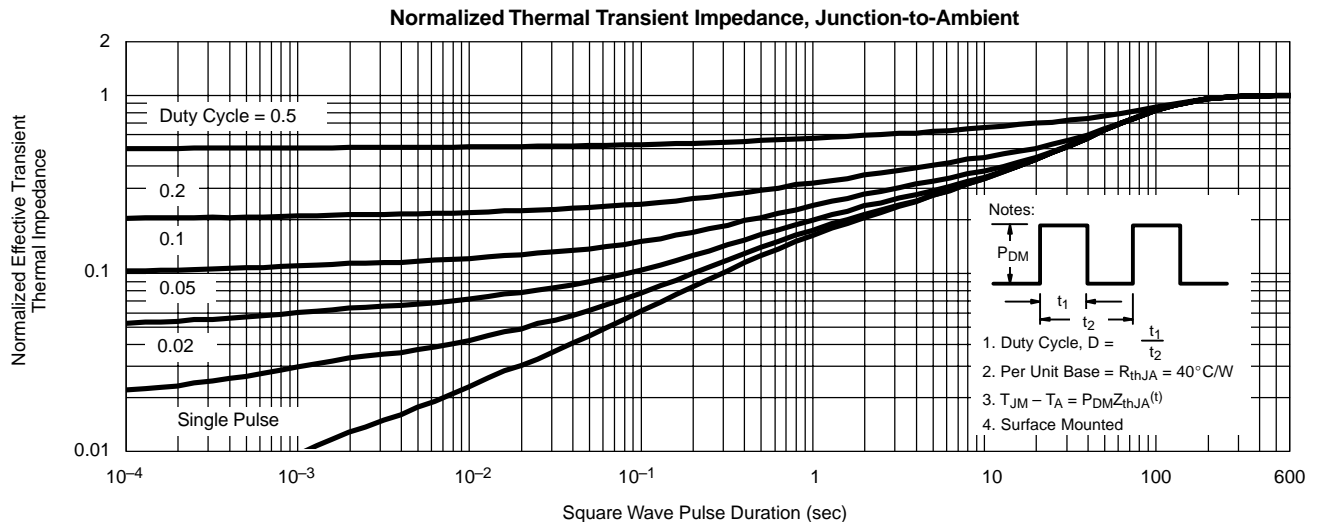
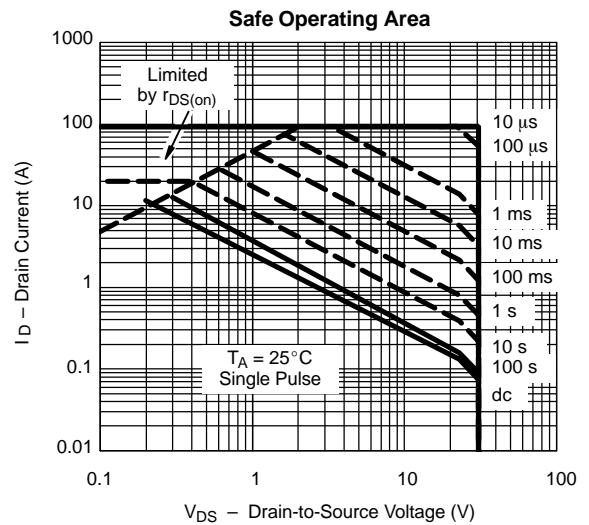
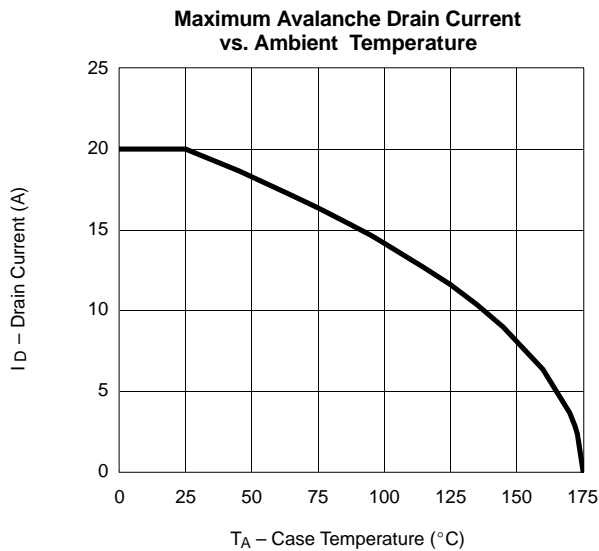
Gate Charge



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



THERMAL RATINGS





THERMAL RATINGS

