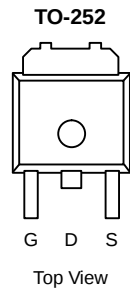




N-Channel 30-V (D-S), 175°C, MOSFET PWM Optimized

PRODUCT SUMMARY

$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A) ^a
30	0.010 @ $V_{GS} = 10$ V	62 ^c
	0.012 @ $V_{GS} = 4.5$ V	55 ^c



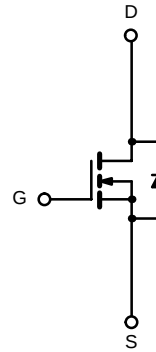
Order Number:
SUD50N03-10CP

FEATURES

- TrenchFET® Power MOSFETS
- PWM Optimized for High Efficiency

APPLICATIONS

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



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	$T_C = 25^\circ\text{C}$	I_D	62 ^c	A
	$T_C = 100^\circ\text{C}$		44 ^c	
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)	Steady State	R_{thJC}	1.75	2.1	

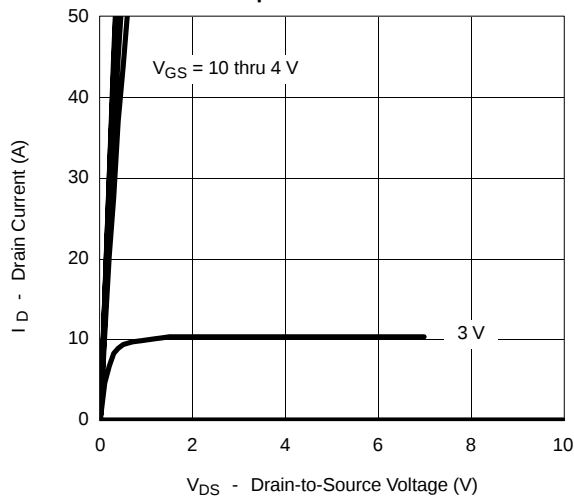
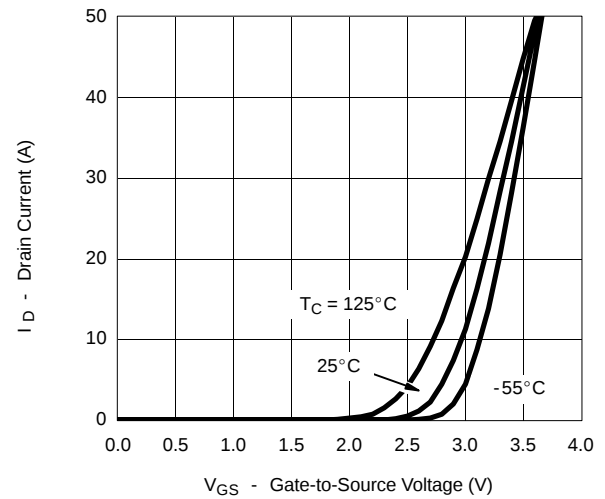
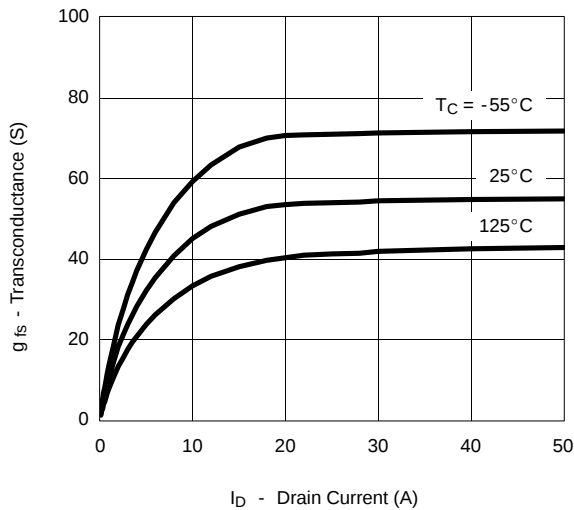
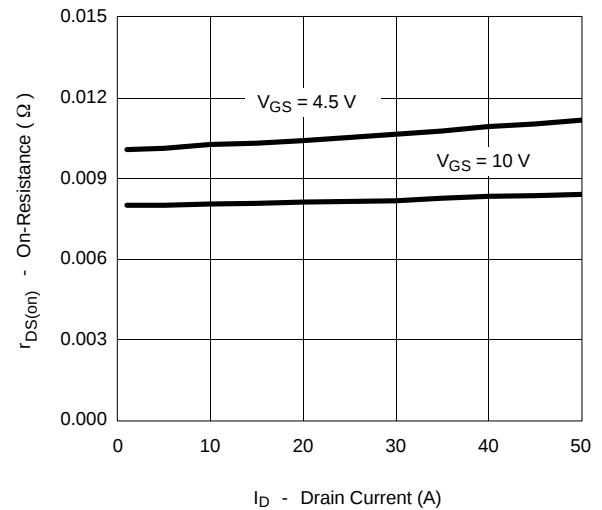
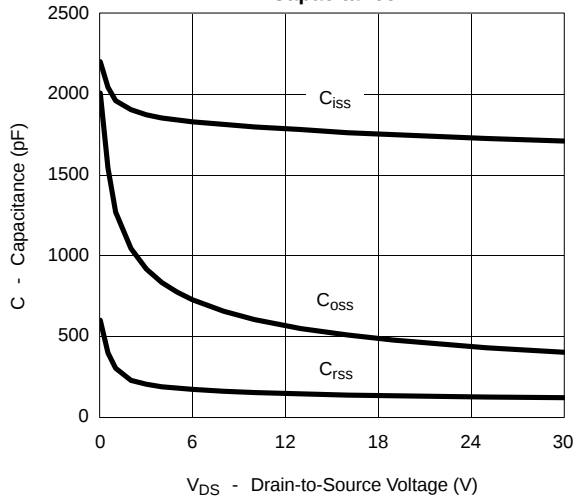
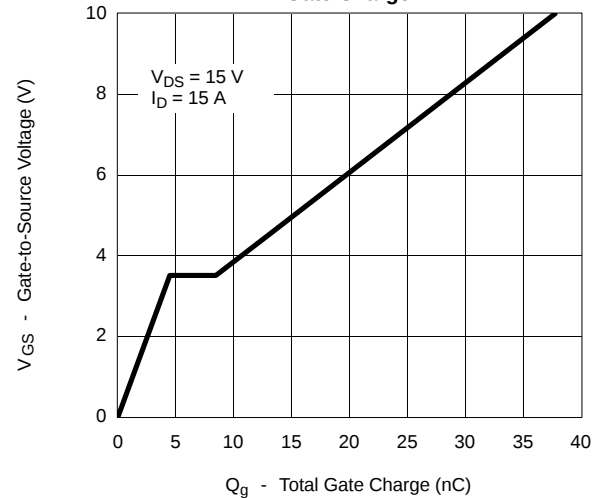
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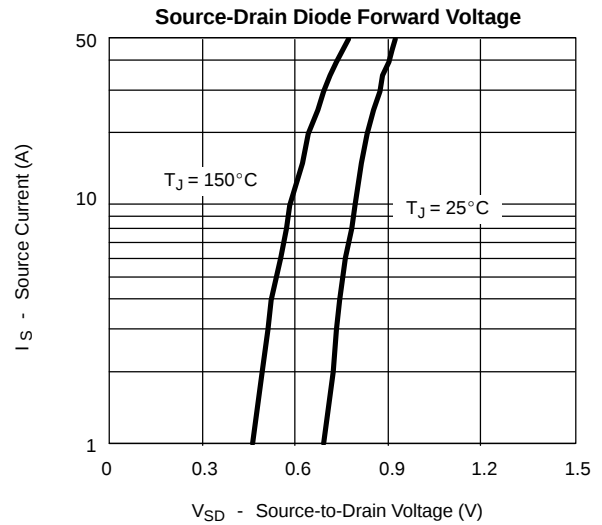
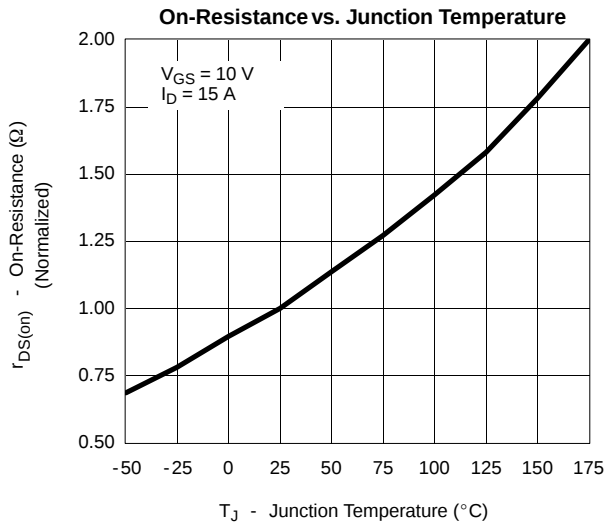
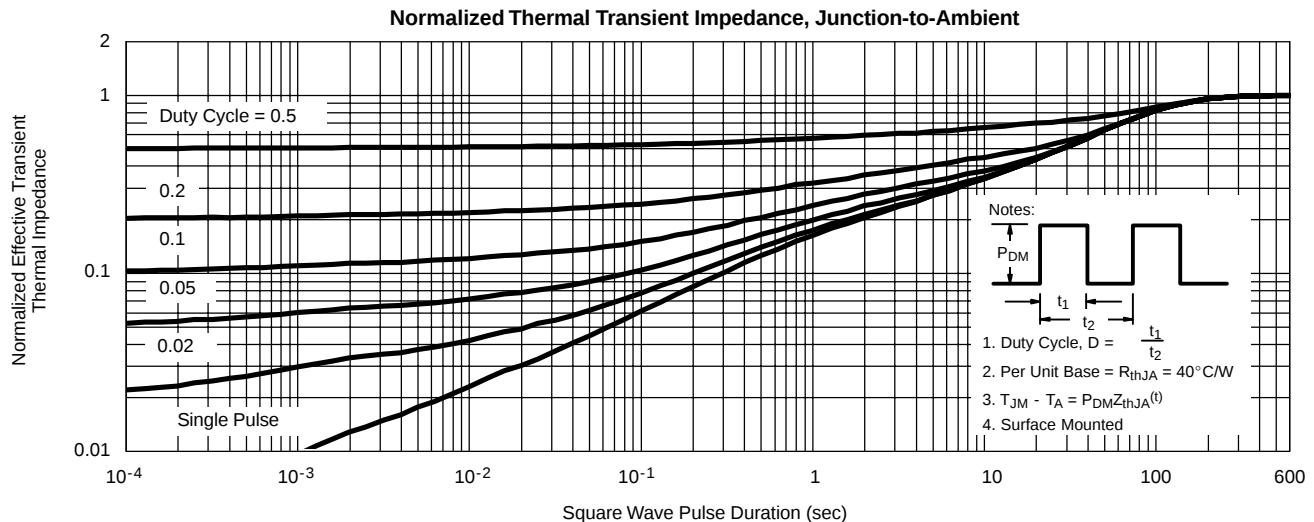
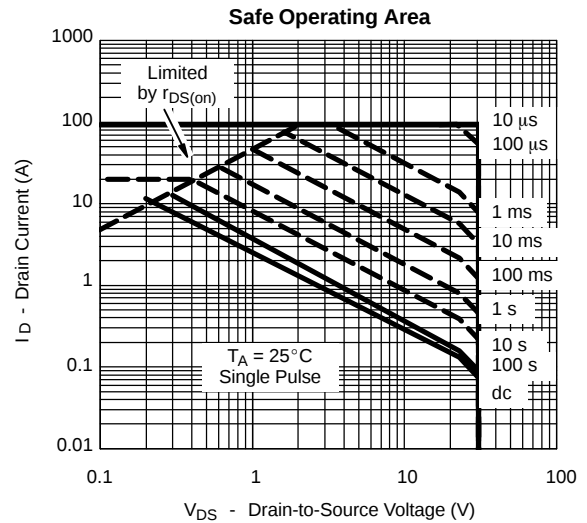
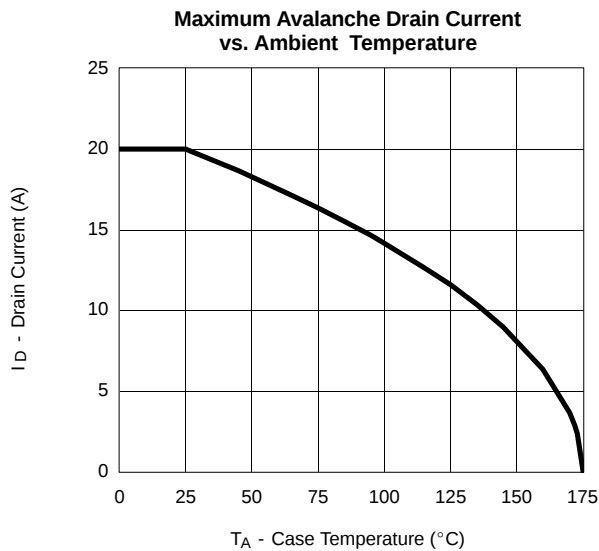
- a Surface mounted on 1" x 1" FR4 Board, $t \leq 10$ sec.
b See SOA curve for voltage derating.
c Based on maximum allowable Junction Temperature. Package limitation current is 50 A.

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		
Reversen Transfer Capacitance	C _{rss}			120		
Total Gate Charge ^c	Q _g	V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = 62 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 = 62 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				62	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 = 62 A, di/dt = 100 A/μs		80	110	ns

Notes:

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

