



N-Channel 20-V (D-S) 175°C MOSFET

PRODUCT SUMMARY

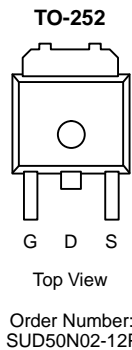
V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A) ^a
20	0.012 @ V _{GS} = 10 V	40 ^c
	0.026 @ V _{GS} = 4.5 V	27 ^c

FEATURES

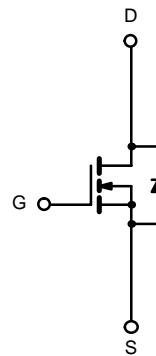
- TrenchFET® Power MOSFET
- 175°C Junction Temperature
- PWM Optimized for High Efficiency

APPLICATIONS

- High-Side Synchronous Buck DC/DC Conversion
 - Desktop
 - Server



Drain Connected to Tab



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	20	V	
Gate-Source Voltage	V _{GS}	±20		
Continuous Drain Current ^a	I _D	T _C = 25°C	40 ^c	A
		T _C = 100°C	28 ^c	
Pulsed Drain Current	I _{DM}	90		
Continuous Source Current (Diode Conduction) ^a	I _S	4		
Maximum Power Dissipation	T _C = 25°C	P _D	33.3	W
	T _A = 25°C	P _D	6 ^a	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to 175	°C	

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^a	R _{thJA}	t ≤ 10 sec	20	25	°C/W
		Steady State	40	50	
Maximum Junction-to-Case	R _{thJC}	3.7	4.5		

Notes

- Surface Mounted on FR4 Board, t ≤ 10 sec.
- Limited by package
- Based on maximum allowable Junction Temperature. Package limitation current is 30 A.

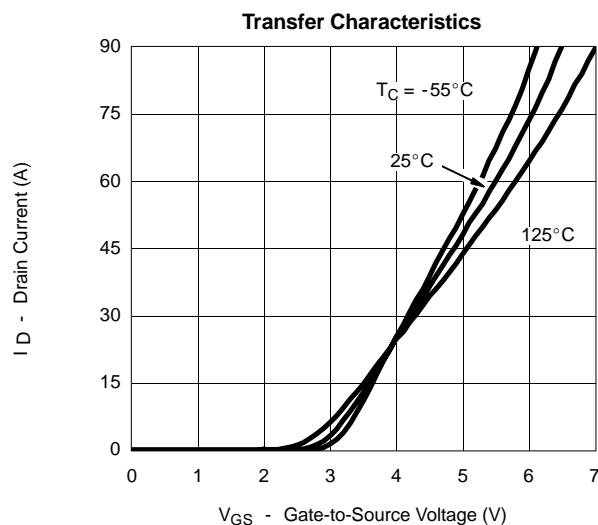
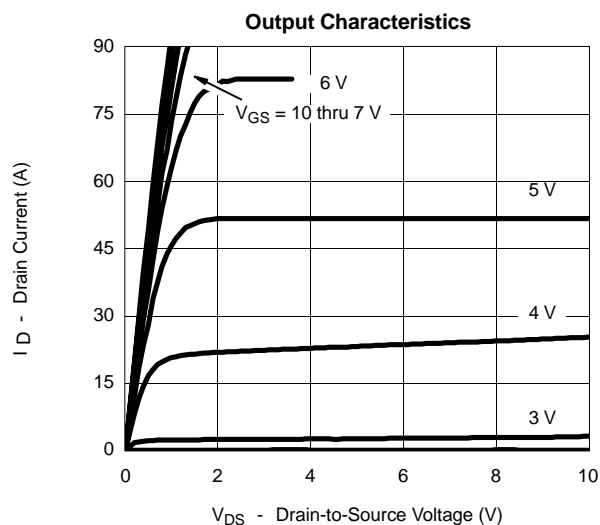
SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ ^a	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	20			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	0.8		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}	$V_{DS} = 16\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 16\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			50	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	50			A
Drain-Source On-State Resistance ^b	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 20\text{ A}$		0.0095	0.012	Ω
		$V_{GS} = 10\text{ V}, I_D = 20\text{ A}, T_J = 125^\circ\text{C}$			0.0143	
Forward Transconductance ^b	g_{fs}	$V_{GS} = 4.5\text{ V}, I_D = 15\text{ A}$		0.021	0.026	S
		$V_{DS} = 15\text{ V}, I_D = 20\text{ A}$	10			
Dynamic^a						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 10\text{ V}, f = 1\text{ MHz}$		1000		pF
Output Capacitance	C_{oss}			370		
Reverse Transfer Capacitance	C_{rss}			180		
Gate Resistance	R_G			3.0		Ω
Total Gate Charge ^c	Q_g	$V_{DS} = 10\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 50\text{ A}$		7.5	12	nC
Gate-Source Charge ^c	Q_{gs}			3.5		
Gate-Drain Charge ^c	Q_{gd}			2.6		
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 10\text{ V}, R_L = 0.2\ \Omega$ $I_D \cong 50\text{ A}, V_{GEN} = 10\text{ V}, R_G = 2.5\ \Omega$		11	20	ns
Rise Time ^c	t_r			10	15	
Turn-Off Delay Time ^c	$t_{d(off)}$			24	35	
Fall Time ^c	t_f			9	15	
Source-Drain Diode Ratings and Characteristic ($T_C = 25^\circ\text{C}$)						
Pulsed Current	I_{SM}				100	A
Diode Forward Voltage ^b	V_{SD}	$I_F = 50\text{ A}, V_{GS} = 0\text{ V}$		1.1	1.5	V
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 50\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		20	40	ns

Notes

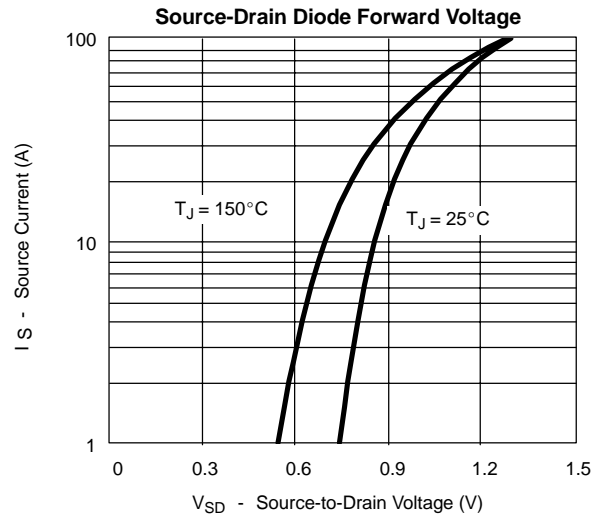
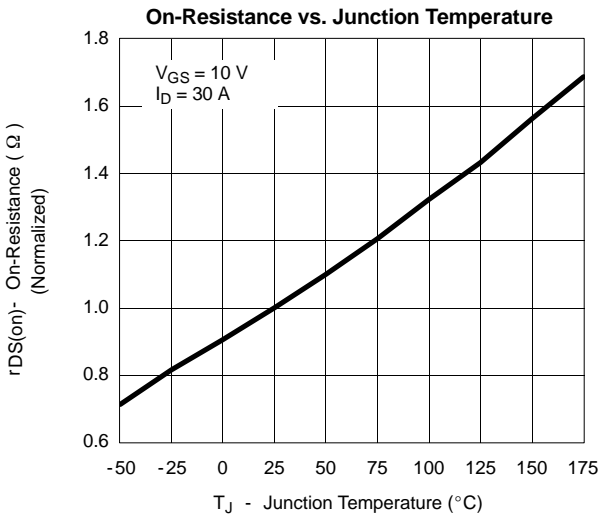
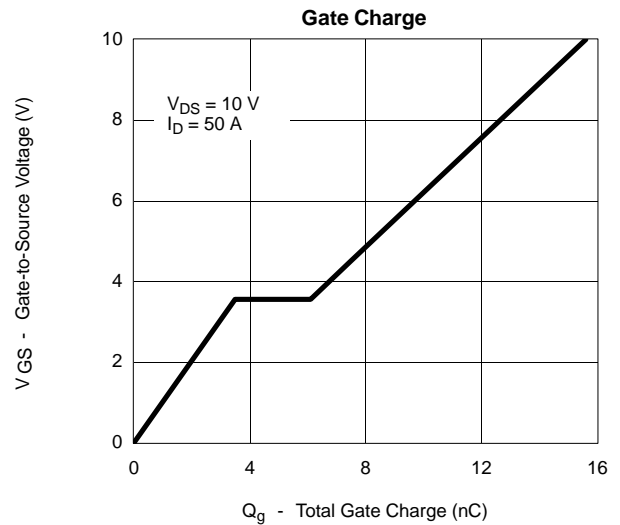
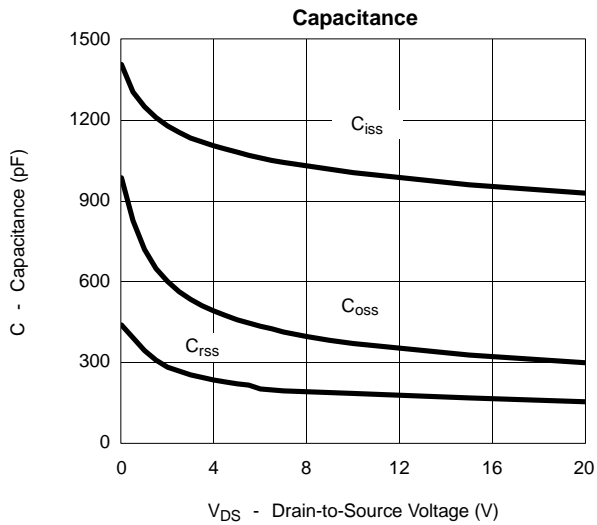
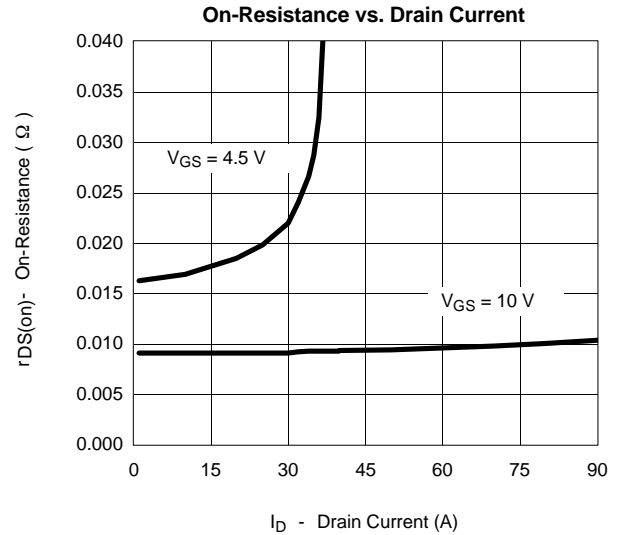
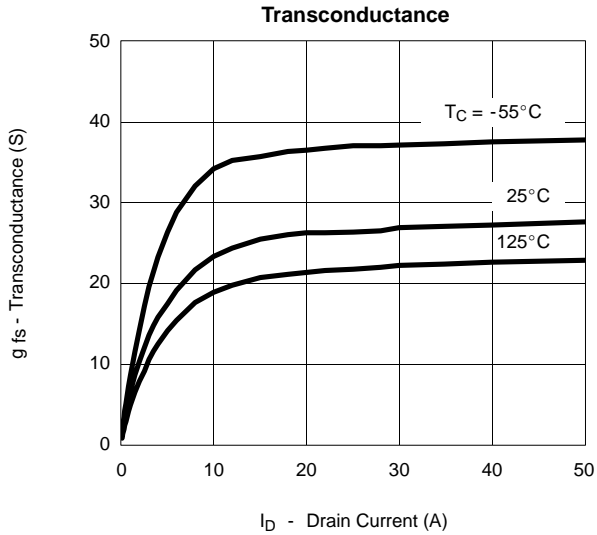
- Guaranteed by design, not subject to production testing.
- Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
- Independent of operating temperature.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)





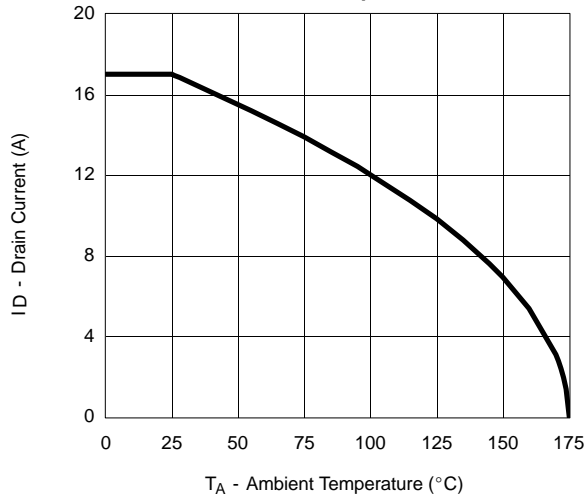
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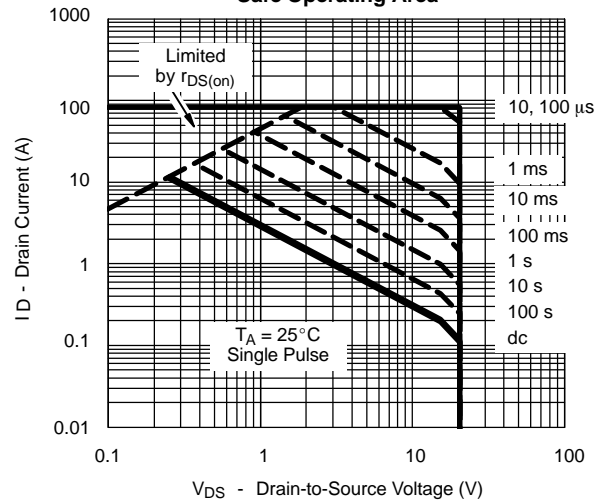


THERMAL RATINGS

Maximum Drain Current vs. Ambient Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient

