

N-Channel Reduced Q_g , Fast Switching MOSFET

PRODUCT SUMMARY

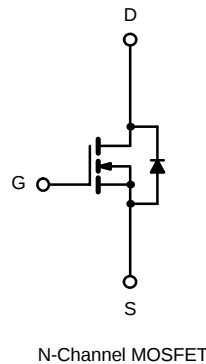
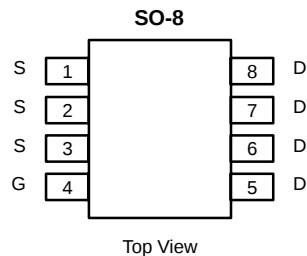
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
12	0.0055 @ $V_{GS} = 4.5$ V	17
	0.008 @ $V_{GS} = 2.5$ V	14

FEATURES

- TrenchFET® Power MOSFETS
- PWM Optimized for High Efficiency
- Low Output Voltage

APPLICATIONS

- Synchronous Rectifier
- Point-of-Load Synchronous Buck Converter

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter		Symbol	10 secs	Steady State	Unit
Drain-Source Voltage		V _{DS}	12		V
Gate-Source Voltage		V _{GS}	± 8		
Continuous Drain Current (T _J = 150°C) ^a	T _A = 25°C	I _D	17	11	A
	T _A = 70°C		14	8	
Pulsed Drain Current		I _{DM}	± 50		
Continuous Source Current (Diode Conduction) ^a		I _S	2.7	1.40	
Maximum Power Dissipation ^a	T _A = 25°C	P _D	3.0	1.6	W
	T _A = 70°C		2.0	1.0	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to 150		°C

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient (MOSFET) ^a	$t \leq 10$ sec	R_{thJA}	34	41	$^\circ\text{C/W}$
	Steady State		67	80	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	15	19	

Notes

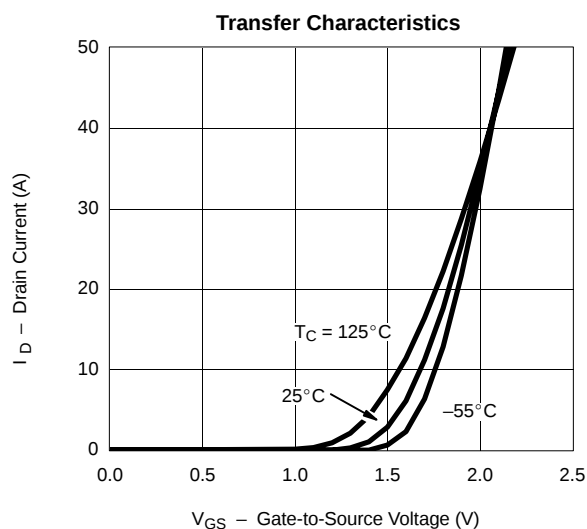
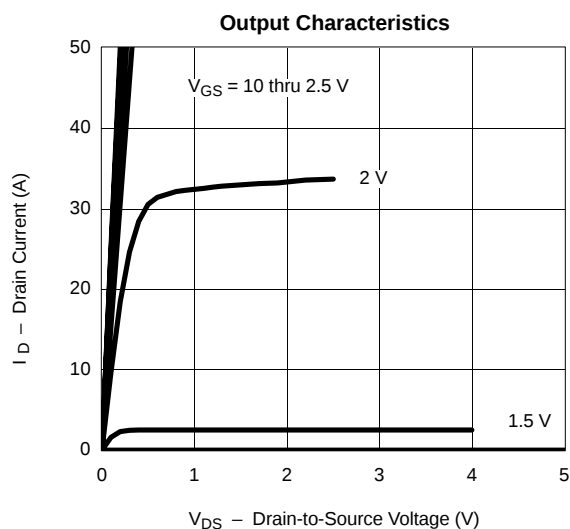
a. Surface Mounted on 1" x 1" FR4 Board.

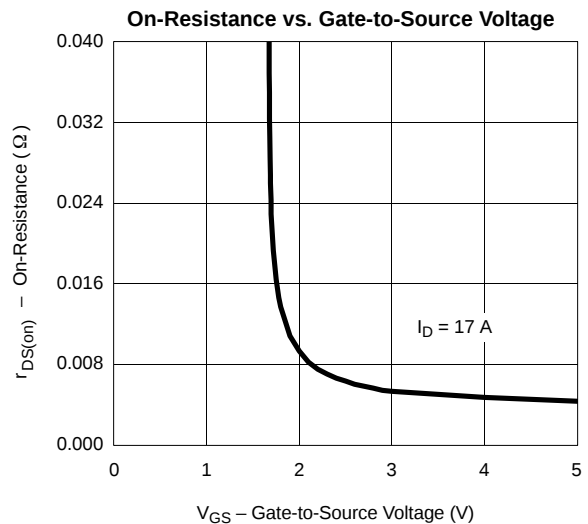
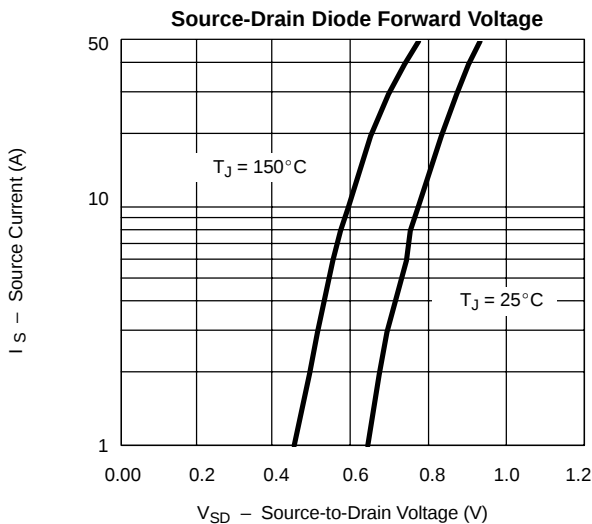
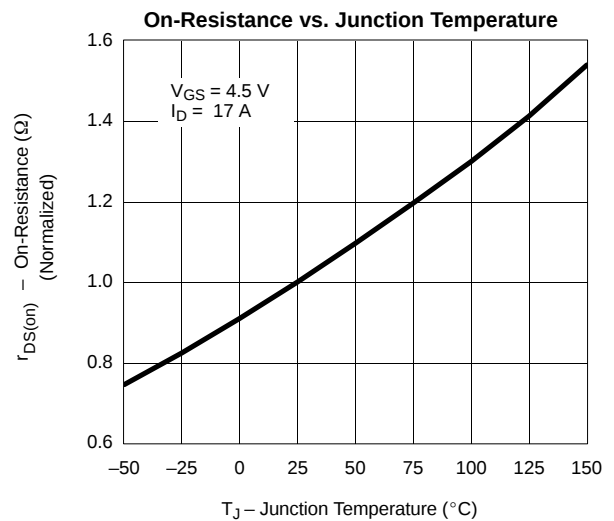
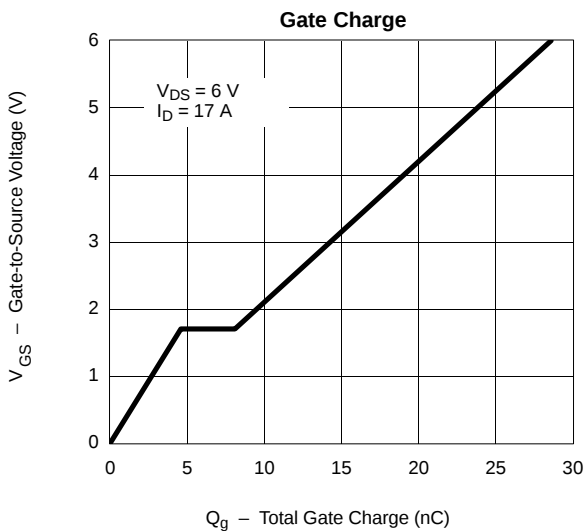
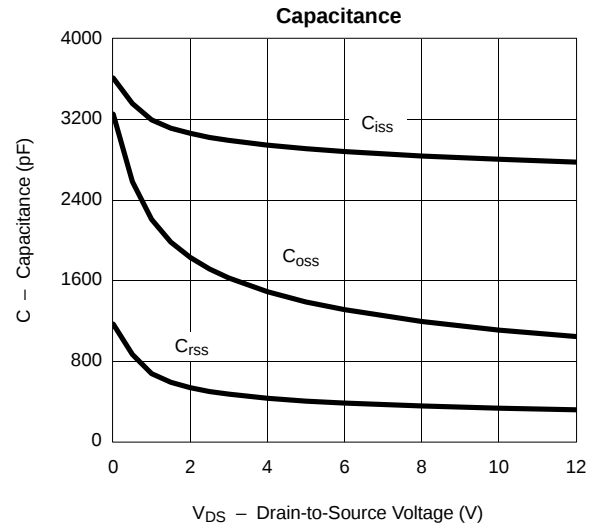
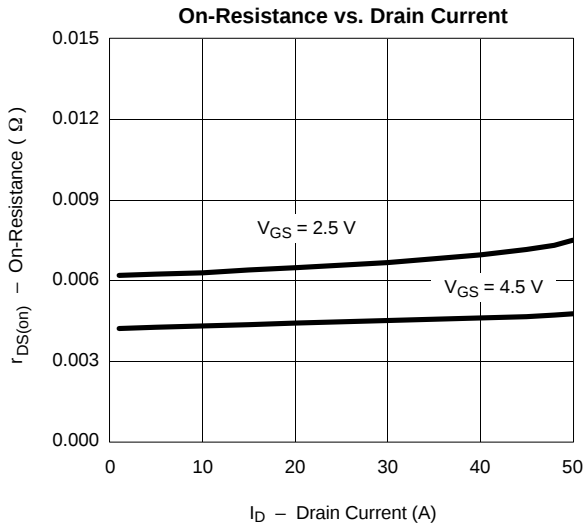
MOSFET SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$	0.6			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}$, $V_{GS} = \pm 8\ \text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 9.6\ \text{V}$, $V_{GS} = 0\ \text{V}$			1	μA
		$V_{DS} = 9.6\ \text{V}$, $V_{GS} = 0\ \text{V}$, $T_J = 70^\circ\text{C}$			5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\ \text{V}$, $V_{GS} = 4.5\ \text{V}$	40			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 4.5\ \text{V}$, $I_D = 17$		0.0045	0.0055	Ω
		$V_{GS} = 2.5\ \text{V}$, $I_D = 14$		0.0065	0.008	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 6\ \text{V}$, $I_D = 17$		80		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 2.7\ \text{A}$, $V_{GS} = 0\ \text{V}$		0.70	1.1	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 6\ \text{V}$, $V_{GS} = 4.5\ \text{V}$, $I_D = 17\ \text{A}$		21	30	nC
Gate-Source Charge	Q_{gs}			4.6		
Gate-Drain Charge	Q_{gd}			3.5		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 6\ \text{V}$, $R_L = 6\ \Omega$ $I_D \cong 1\ \text{A}$, $V_{GEN} = 4.5\ \text{V}$, $R_G = 6\ \Omega$		28	42	ns
Rise Time	t_r			32	48	
Turn-Off Delay Time	$t_{d(off)}$			82	123	
Fall Time	t_f			35	53	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 2.7\ \text{A}$, $di/dt = 100\ \text{A}/\mu\text{s}$		60	90	

Notes

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

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

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