



Dual N-Channel 20-V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
20	0.030 @ $V_{GS} = 4.5$ V	7.7
	0.036 @ $V_{GS} = 2.5$ V	7.0
	0.045 @ $V_{GS} = 1.8$ V	6.3

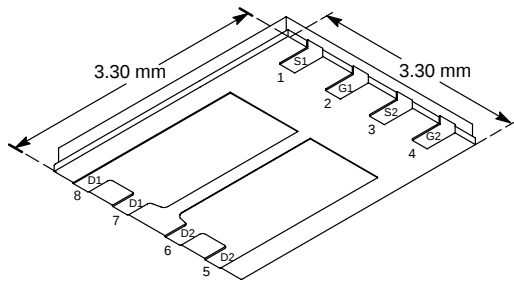
FEATURES

- TrenchFET® Power MOSFETs: 1.8-V Rated
- New Low Thermal Resistance PowerPAK™ Package with Low 1.07-mm Profile

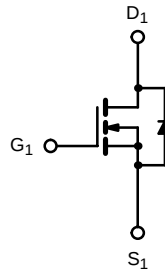
APPLICATIONS

- HDD Spindle Drive

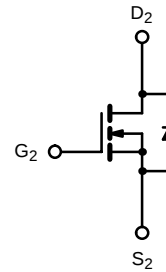
PowerPAK™ 1212-8



Bottom View



N-Channel MOSFET



N-Channel MOSFET

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

Parameter		Symbol	10 secs	Steady State	Unit
Drain-Source Voltage		V _{DS}	20		V
Gate-Source Voltage		V _{GS}	± 8		
Continuous Drain Current (T _J = 150°C) ^a	T _A = 25°C	I _D	7.7	5.3	A
	T _A = 85°C		5.5	3.8	
Pulsed Drain Current		I _{DM}	20		
Continuous Source Current (Diode Conduction) ^a		I _S	2.3	1.1	
Maximum Power Dissipation ^a	T _A = 25°C	P _D	2.8	1.3	W
	T _A = 85°C		1.5	0.85	
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 ^a	$t \leq 10$ sec	R_{thJA}	35	44	$^\circ\text{C/W}$
	Steady State		75	94	
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	4	5	

Notes

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

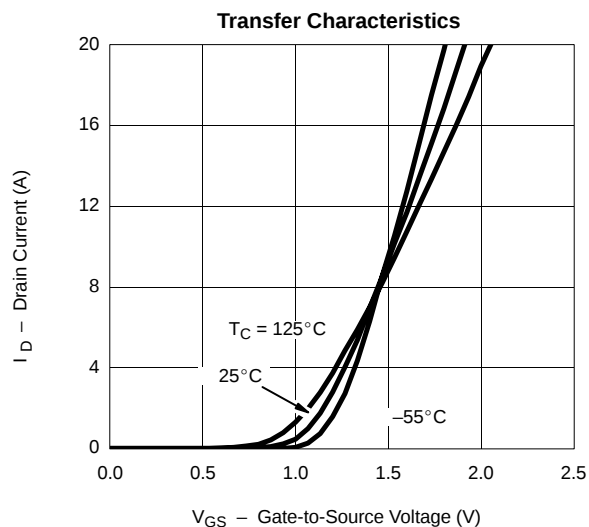
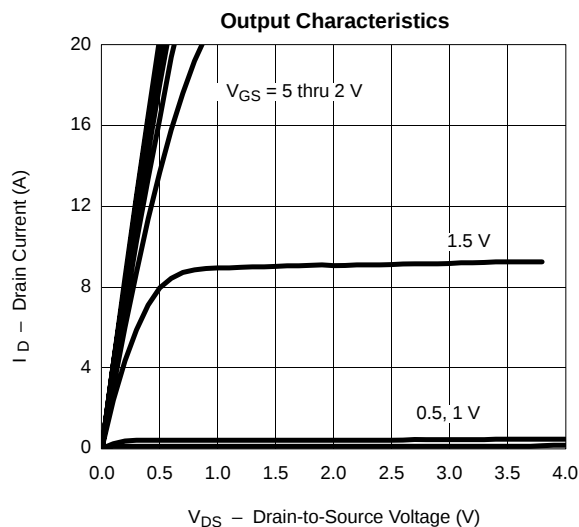
SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

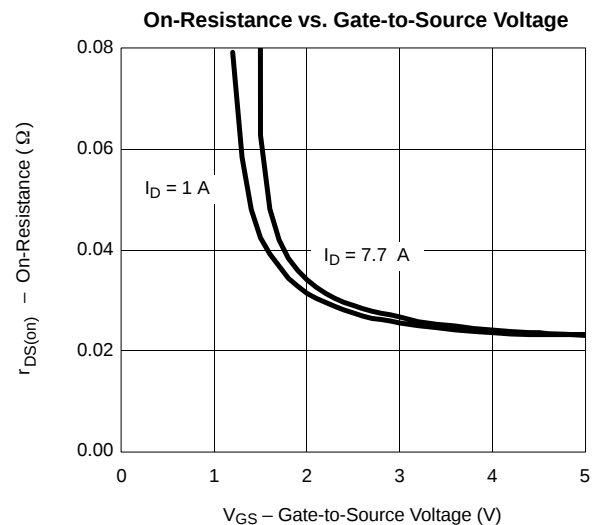
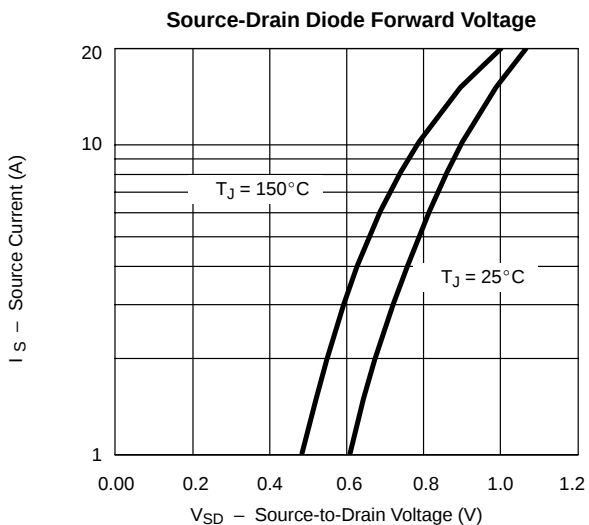
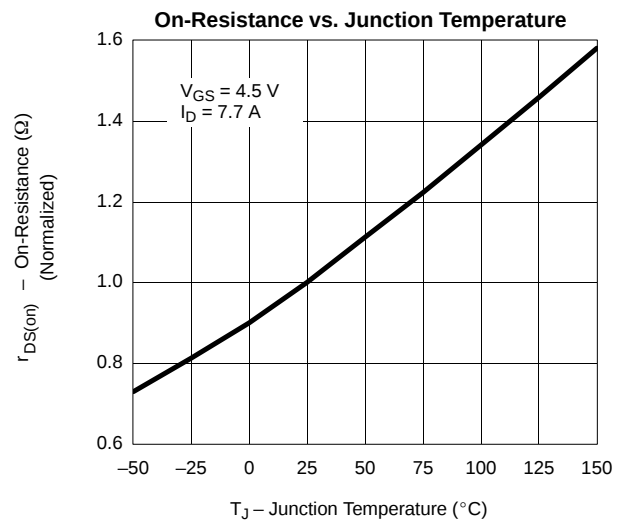
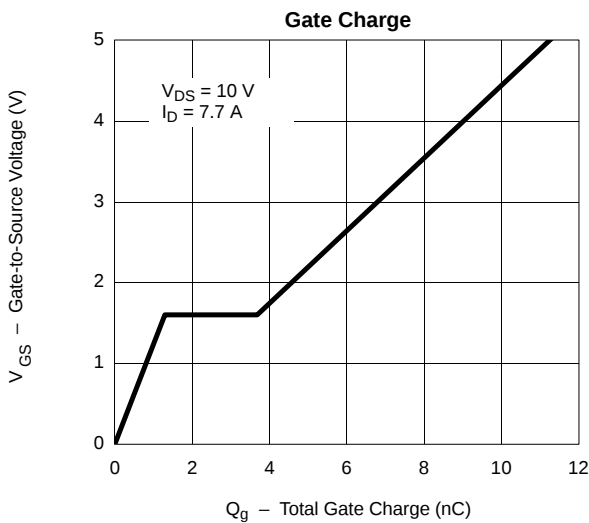
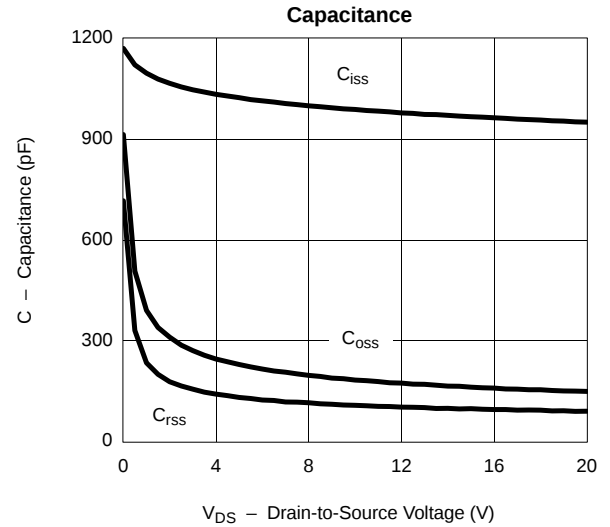
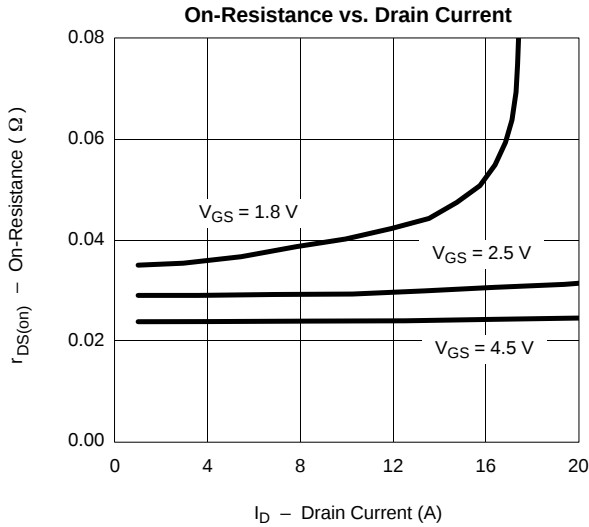
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 935\ \mu\text{A}$	0.45			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}$, $V_{GS} = \pm 8\ \text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 16\ \text{V}$, $V_{GS} = 0\ \text{V}$			1	μA
		$V_{DS} = 16\ \text{V}$, $V_{GS} = 0\ \text{V}$, $T_J = 85^\circ\text{C}$			5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\ \text{V}$, $V_{GS} = 4.5\ \text{V}$	20			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 4.5\ \text{V}$, $I_D = 7.7\ \text{A}$		0.025	0.030	Ω
		$V_{GS} = 2.5\ \text{V}$, $I_D = 7.0\ \text{A}$		0.030	0.036	
		$V_{GS} = 1.8\ \text{V}$, $I_D = 1\ \text{A}$		0.037	0.045	Ω
Forward Transconductance ^a	g_{fs}	$V_{DS} = 10\ \text{V}$, $I_D = 7.7\ \text{A}$		23		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 2.3\ \text{A}$, $V_{GS} = 0\ \text{V}$		0.70	1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 10\ \text{V}$, $V_{GS} = 4.5\ \text{V}$, $I_D = 7.7\ \text{A}$		10.2	15	nC
Gate-Source Charge	Q_{gs}			1.3		
Gate-Drain Charge	Q_{gd}			2.4		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10\ \text{V}$, $R_L = 10\ \Omega$ $I_D \cong 1\ \text{A}$, $V_{GEN} = 4.5\ \text{V}$, $R_G = 6\ \Omega$		15	23	ns
Rise Time	t_r			50	75	
Turn-Off Delay Time	$t_{d(off)}$			60	90	
Fall Time	t_f			45	68	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 2.3\ \text{A}$, $di/dt = 100\ \text{A}/\mu\text{s}$		40	80	

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)

**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)
