



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

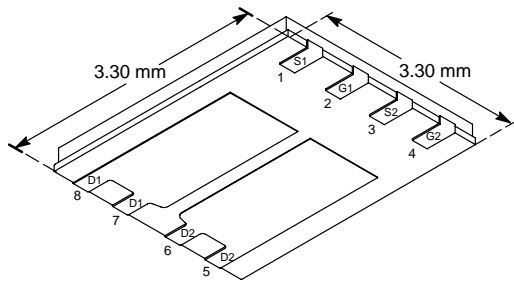
FEATURES

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

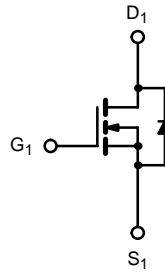
APPLICATIONS

- HDD Spindle Drive

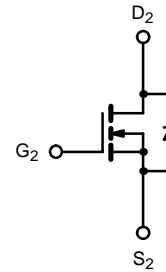
PowerPAK™ 1212-8



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 ($T_J = 150^\circ\text{C}$) ^a	$T_A = 25^\circ\text{C}$	I_D	7.7	5.3	A
	$T_A = 85^\circ\text{C}$		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	$T_A = 25^\circ\text{C}$	P_D	2.8	1.3	W
	$T_A = 85^\circ\text{C}$		1.5	0.85	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150		$^\circ\text{C}$

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)		R_{thJC}	4	5	

Notes

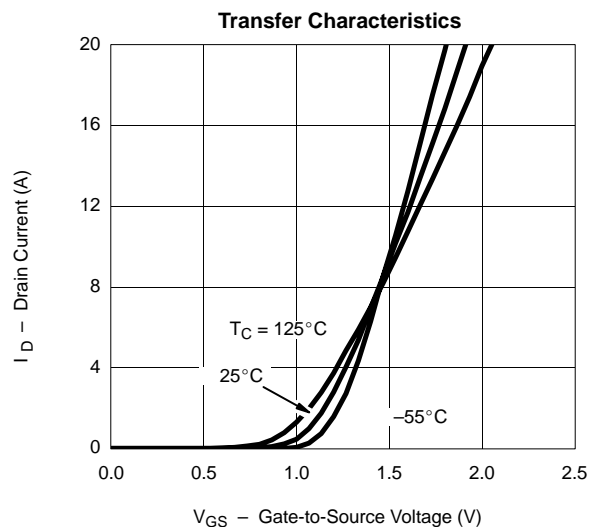
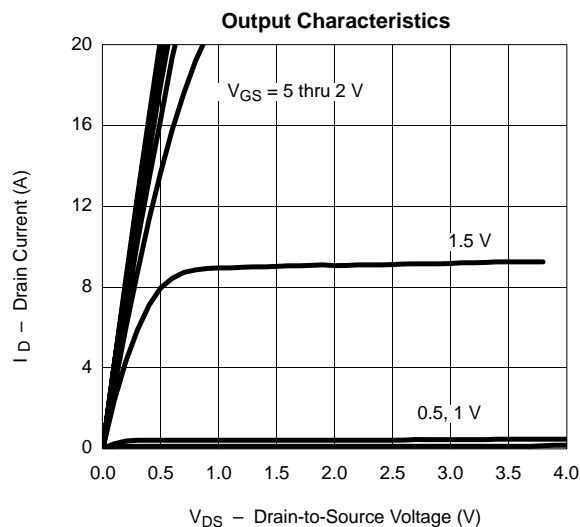
a. Surface Mounted on 1" x 1" FR4 Board.

SPECIFICATIONS (T_J = 25 °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 μA	0.45			V
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 16 V, V _{GS} = 0 V			1	μA
		V _{DS} = 16 V, V _{GS} = 0 V, T _J = 85 °C			5	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 4.5 V	20			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 4.5 V, I _D = 7.7 A		0.025	0.030	Ω
		V _{GS} = 2.5 V, I _D = 7.0 A		0.030	0.036	
		V _{GS} = 1.8 V, I _D = 1 A		0.037	0.045	Ω
Forward Transconductance ^a	g _{fs}	V _{DS} = 10 V, I _D = 7.7 A		23		S
Diode Forward Voltage ^a	V _{SD}	I _S = 2.3 A, V _{GS} = 0 V		0.70	1.2	V
Dynamic^b						
Total Gate Charge	Q _g	V _{DS} = 10 V, V _{GS} = 4.5 V, I _D = 7.7 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 V, R _L = 10 Ω I _D ≅ 1 A, V _{GEN} = 4.5 V, R _G = 6 Ω		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 A, di/dt = 100 A/μs		40	80	

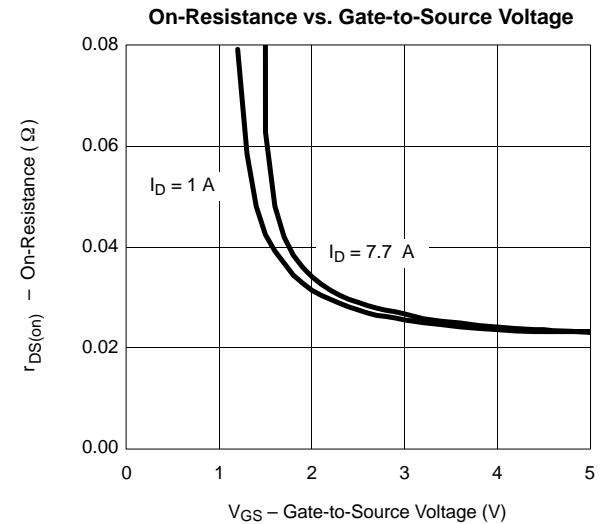
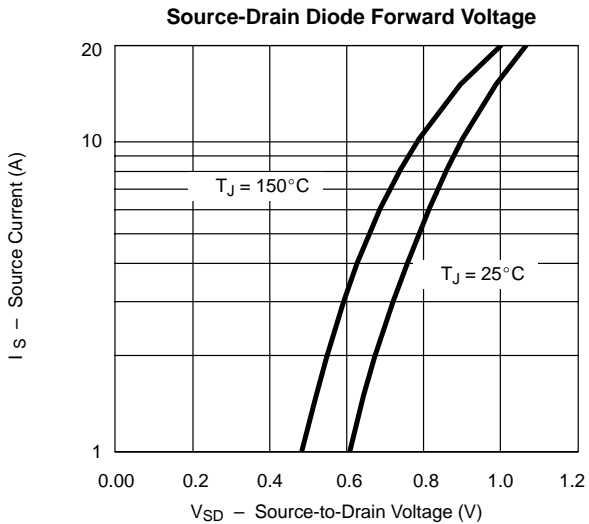
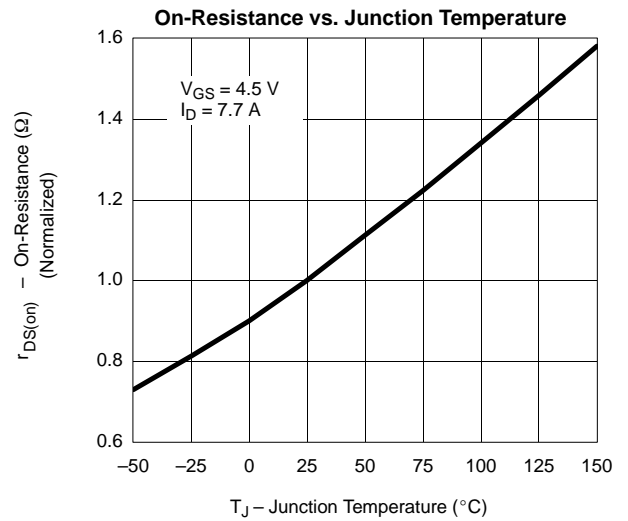
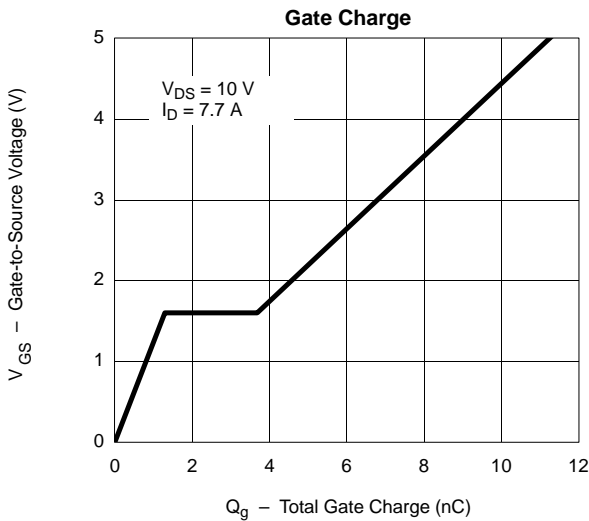
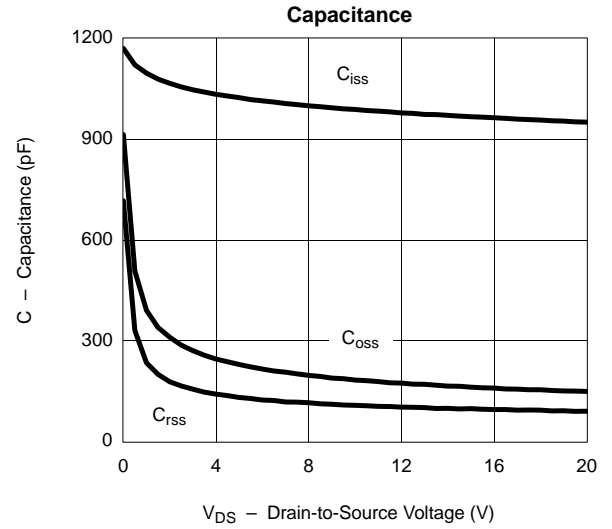
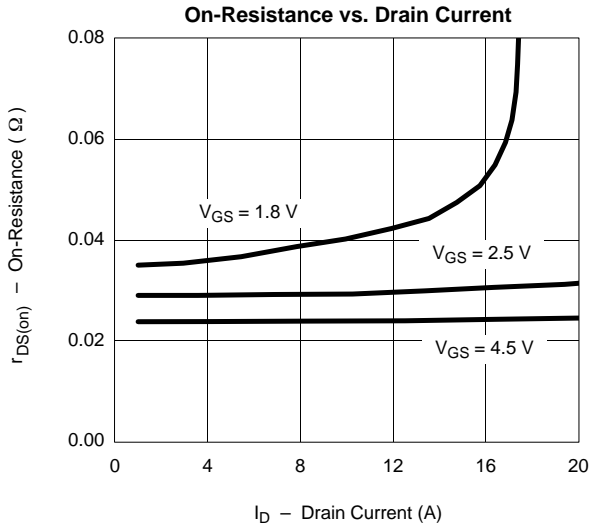
Notes

- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



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