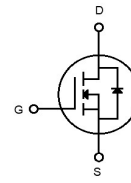


• General Description

It combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

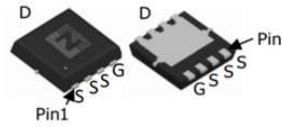
• Product Summary



$V_{DS} = 80V$
 $R_{DS(ON)} = 12m\Omega$
 $I_D = 51A$

• Features

- Low $R_{DS(ON)}$ to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance



DFN3*3



• Application

- BLDC Motor driver
- DC-DC
- Load Switch

• Ordering Information:

Part NO.	ZMS120N08HM
Marking	120N08H
Packing Information	REEL TAPE
Basic ordering unit (pcs)	5000

• Absolute Maximum Ratings ($T_A=25^\circ C$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Max.	Unit
Drain-Source Voltage	V_{DS}		-	80	V
Gate-Source Voltage	V_{GS}		-20	20	V
Continuous Drain Current	I_D	$V_{GS}=10V, T_C=25^\circ C$	-	51	A
	I_D	$V_{GS}=10V, T_C=75^\circ C$	-	42	A
	I_D	$V_{GS}=10V, T_C=100^\circ C$	-	36	A
Pulsed Drain Current	I_{DM}	Pulsed; $t_p \leq 10 \mu s; T_C = 25^\circ C$;	-	204	A
Total Power Dissipation	P_D	$T_C=25^\circ C$	-	75	W
Total Power Dissipation	P_D	$T_A=25^\circ C$	-	2.5	W
Operating Junction Temperature	T_J		-55	175	$^\circ C$
Storage Temperature	T_{STG}		-55	175	$^\circ C$
Single Pulse Avalanche Energy	E_{AS}	$L=0.1mH, V_{GS}=10V, R_g=25\Omega,$	-	39	mJ
		$L=0.3mH, V_{GS}=10V, R_g=25\Omega,$	-	63	mJ
ESD Level (HBM)	CLASS 2				

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	2	°C/W
Thermal resistance, junction-ambient	R_{thJA}°	-	-	60	°C/W
Soldering temperature	T_{sold}	-	-	260	°C

•Electronic Characteristics (Tj=25°C,unless otherwise specified)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	80	-	-	V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2	2.8	4	V
Drain-Source Leakage Current	I_{DSS}	$V_{GS}=0V, V_{DS}=80V$	-	-	1	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=16A, T_j=25^{\circ}C$	-	12	14	m Ω
		$V_{GS}=10V, I_D=16A, T_j=175^{\circ}C$	-	20.3	-	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_{SD}=10A$	-	9	-	S
Diode Forward Voltage	V_{FSD}	$V_{GS}=0V, I_{SD}=16A$	-	-	1.3	V

•Dynamic characteristics (Tj=25°C,unless otherwise specified)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	$f = 1MHz, V_{DS}=40V, V_{GS}=0V$	-	908	-	pF
Output capacitance	C_{oss}		-	166	-	
Reverse transfer capacitance	C_{rss}		-	4	-	
Gate Resistance	R_g	$f = 1MHz$	-	2.3	-	Ω
Total gate charge	Q_g	$V_{DD}=40V, I_D=16A, V_{GS}=10V$	-	18.6	-	nC
Gate - Source charge	Q_{gs}		-	4.1	-	
Gate - Drain charge	Q_{gd}		-	7	-	
Turn-ON Delay time	$t_{D(on)}$	$V_{GS}=10V, V_{DS}=40V, R_G=3.3\Omega, I_D=16A$	-	9	-	ns
Turn-ON Rise time	t_r		-	47	-	ns
Turn-Off Delay time	$t_{D(off)}$		-	17	-	ns
Turn-Off Fall time	t_f		-	14	-	ns
Reverse Recovery Time	t_{rr}	$V_{DD}=40V, di_S/dt = 100A/\mu s, I_S=16A$	-	31	-	ns
Reverse Recovery Charge	Q_{rr}		-	32	-	nC

Fig.1 Gate-source voltage as a function of gate charge; Typical values; $T_j=25^\circ\text{C}$

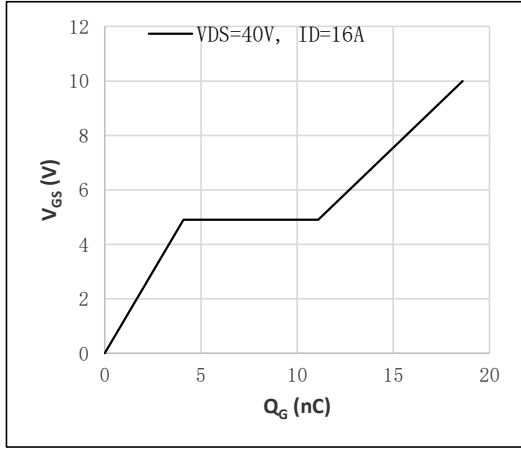


Fig.2 Input, output and reverse transfer capacitances as a function of drain-source voltage; Typical values; $T_j=25^\circ\text{C}$

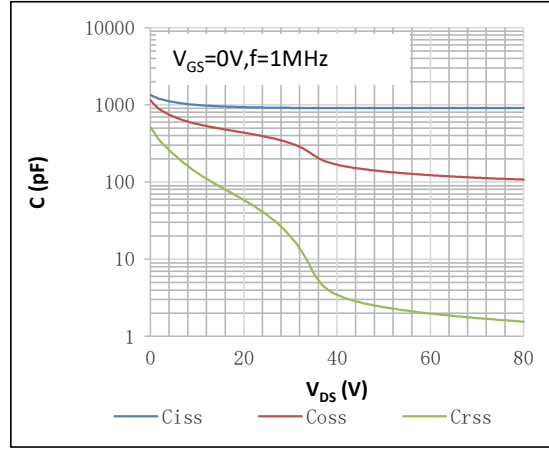


Fig.3 Output characteristics: drain current as a function of drain-source voltage; Typical values; $T_j=25^\circ\text{C}$

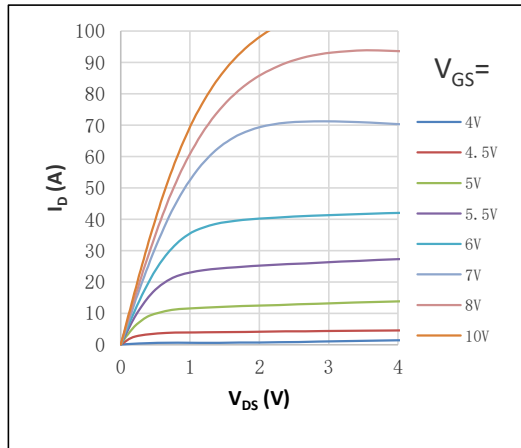


Fig.4 Output characteristics: drain current as a function of drain-source voltage; Typical values: Expanded curve; $T_j=25^\circ\text{C}$

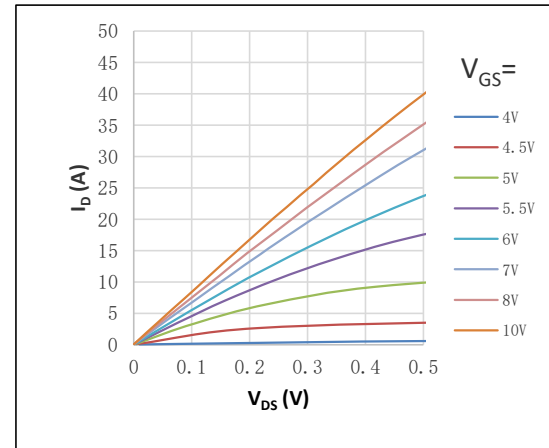


Fig.5 Gate-source threshold voltage as a function of junction temperature; Typical values

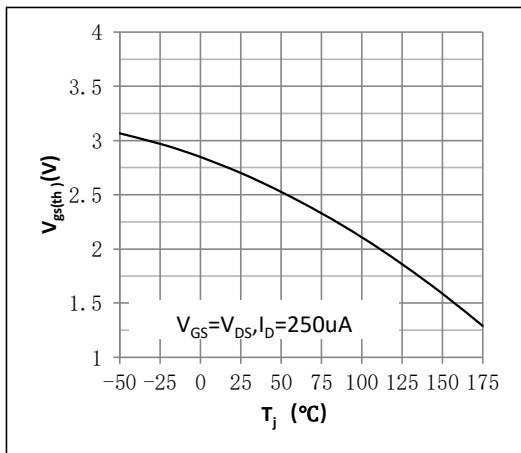


Fig.6 Drain-source on-state resistance as a function of drain current; Typical values; $T_j=25^\circ\text{C}$

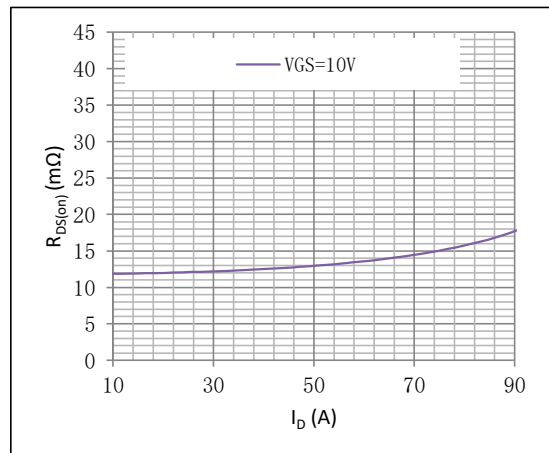


Fig.7 Drain-source on-state resistance as a function of gate-source voltage;Typical values

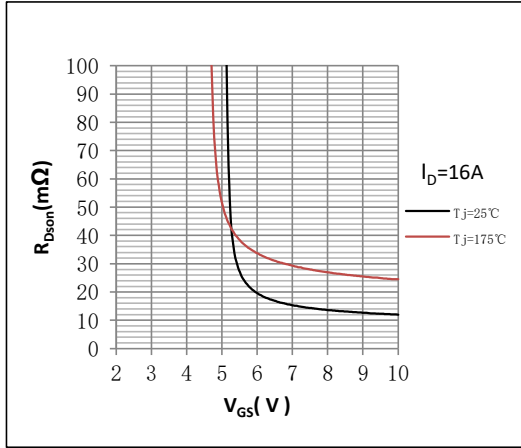


Figure 9. Source (diode forward) current as a function of source-drain (diode forward) voltage ;Typical values

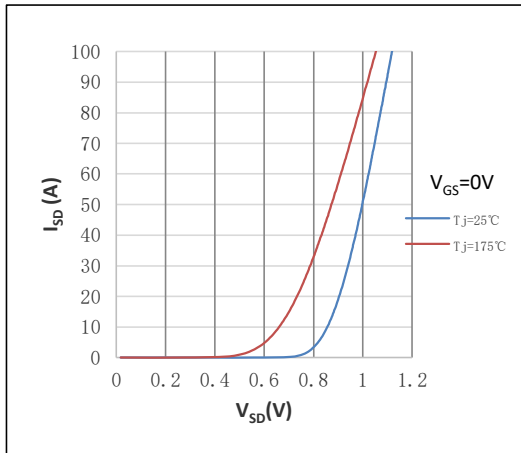


Fig.11 Safe operating area: continuous and peak drain currents as a function of drain-source voltage;Calculative values

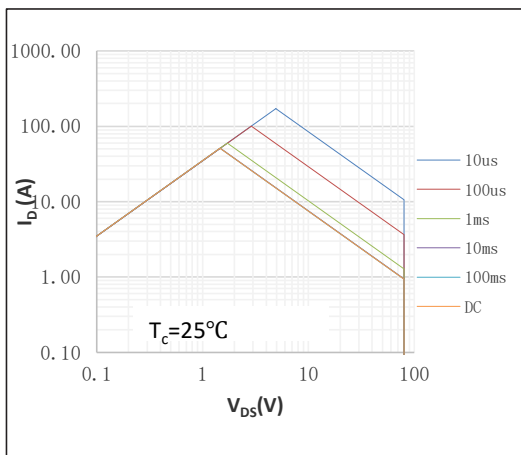


Fig.8 Normalized drain-source on-state resistance factor as a function of junction temperature;Typical values
Normalized On-Resistance= $R_{DS(on)}/R_{DS(on)}(25^\circ C)$

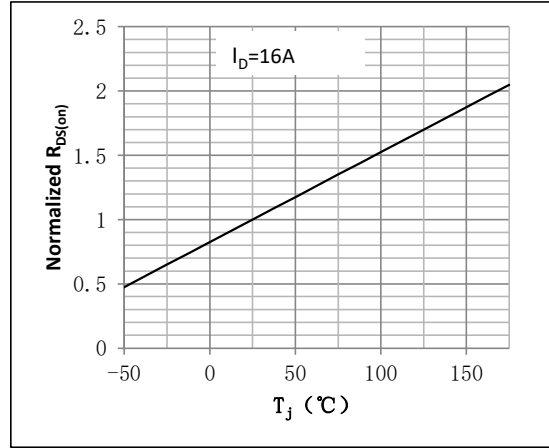


Figure 10. Transfer characteristics: drain current as a function of gate-source voltage;Typical values

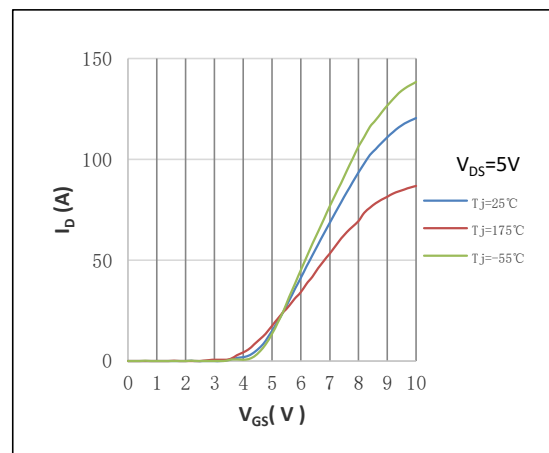


Fig.12 Continuous drain current as a function of case temperature;Calculative values

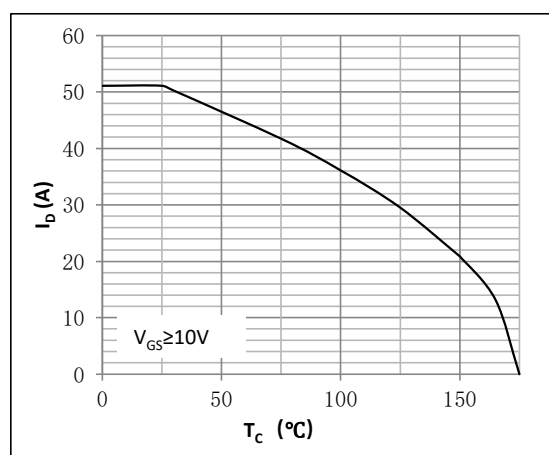


Fig.13 Drain-source breakdown voltage as a function of junction temperature; Typical values
Normalized BVDSS = $BVDSS / BVDSS(25^{\circ}C)$

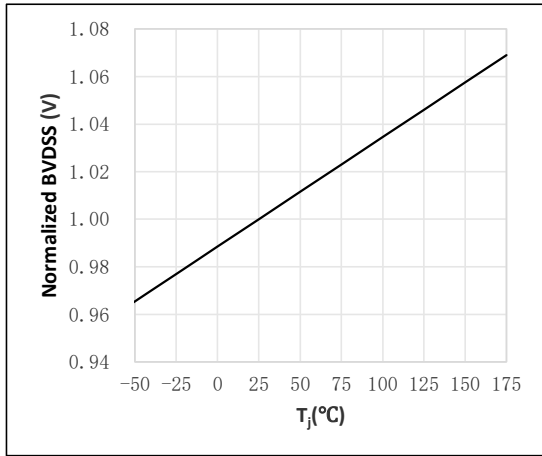


Fig.14 Normalized total power dissipation as a function of case temperature; Calculative values
Normalized Power Dissipation = $P_d / P_d(25^{\circ}C)$

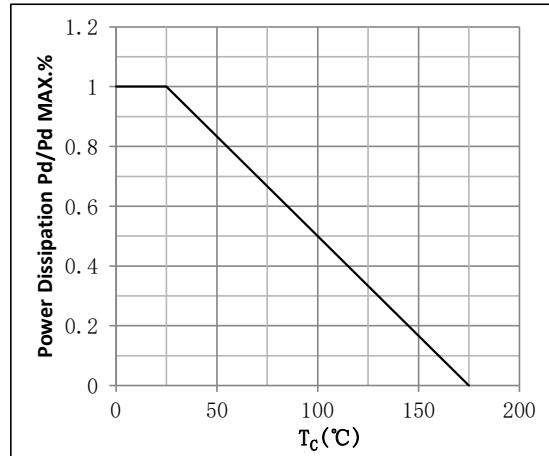
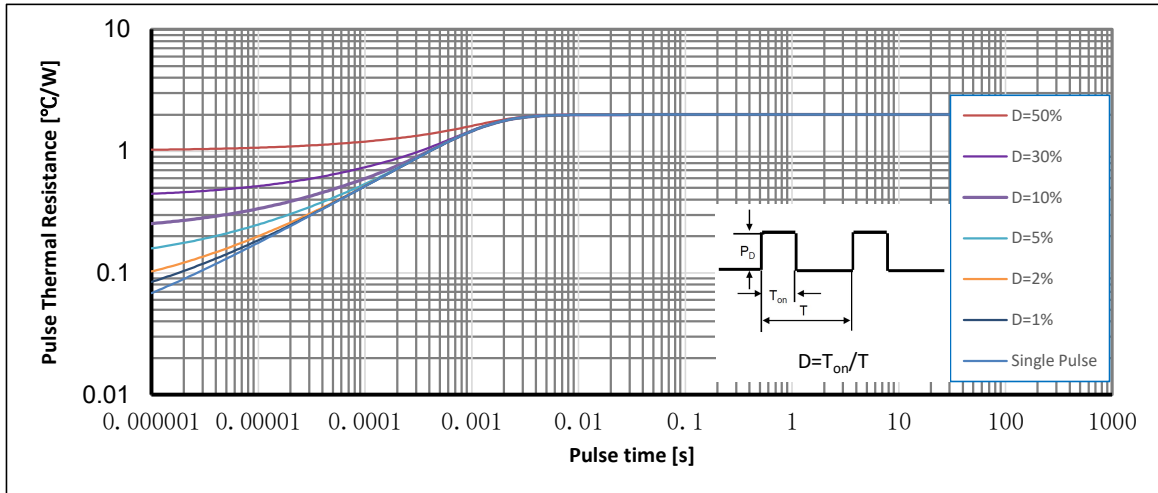
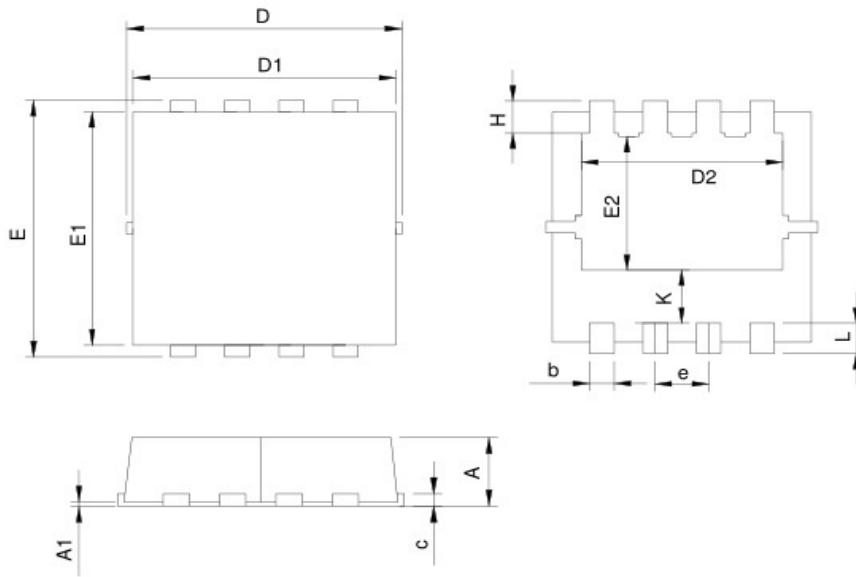


Fig.15 Transient thermal impedance from junction to case as a function of pulse duration; max values

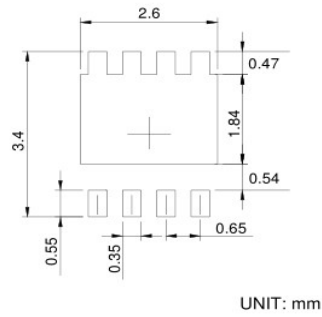


•DFN3*3 Package Outline



L O O B M < S	DFN3.3x3.3-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	1.00	0.028	0.039
A1	0.00	0.05	0.000	0.002
b	0.25	0.35	0.010	0.014
c	0.14	0.20	0.006	0.008
D	3.10	3.50	0.122	0.138
D1	3.05	3.25	0.120	0.128
D2	2.35	2.55	0.093	0.100
E	3.10	3.50	0.122	0.138
E1	2.90	3.10	0.114	0.122
E2	1.64	1.84	0.065	0.072
e	0.65 BSC		0.026 BSC	
H	0.32	0.52	0.013	0.020
K	0.59	0.79	0.023	0.031
L	0.25	0.55	0.010	0.022

RECOMMENDED LAND PATTERN



UNIT: mm

Note:

① Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate;

② Practically the current will be limited by PCB, thermal design and operating temperature. VGS=10V.

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A	2025/4/16	New