

General Description

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

Features

- AEC-Q101 Qualified
- Low $R_{DS(ON)}$ to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance

Application

- BLDC Motor driver
- DC-DC
- Load Switch

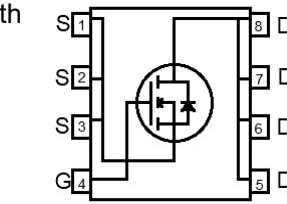
Ordering Information:

Part NO.	ZMSA019N08HNC
Marking	ZMS019N08H
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

Absolute Maximum Ratings (T_C=25°C)

Parameter	Symbol	Conditions	Value	Unit
Drain-Source Voltage	V _{DS}		80	V
Gate-Source Voltage ^①	V _{GS}		±20	V
Continuous Drain Current	I _D	T _C =25°C	176	A
	I _D	T _C =75°C	144	A
	I _D	T _C =100°C	120	A
Pulsed Drain Current	I _{DM}	Pulsed; t _p ≤ 10 μs; T _{mb} = 25 °C;	704	A
Total Power Dissipation	P _D	T _C =25°C	150	W
Total Power Dissipation	P _D	T _A =25°C	3.3	W
Operating Junction Temperature	T _J		-55 to +175	°C
Storage Temperature	T _{STG}		-55 to +175	°C
Single Pulse Avalanche Energy	E _{AS}	L=0.1mH, V _{GS} =10V, R _g =25Ω,	423	mJ
		L=0.5mH, V _{GS} =10V, R _g =25Ω,	698	mJ
ESD Level (HBM)	CLASS 2			

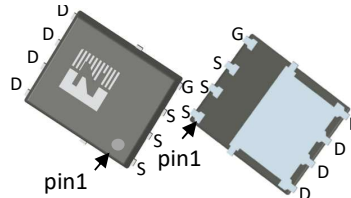
Product Summary



$$V_{DS} = 80V$$

$$R_{DS(ON)} = 1.9m\Omega$$

$$I_D = 176A$$



DFN5*6



•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}		-	1.0	°C/W
Thermal resistance, junction-ambient	$R_{thJA}^{②}$		-	45	°C/W
Soldering temperature	Tsold		-	260	°C

•Electronic Characteristics

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	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2.0	2.7	4.0	V
Drain-Source Leakage Current	I_{DSS}	$V_{GS}=0V, V_{DS}=80V$			1.0	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=30A$		1.9	2.3	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_{SD}=10A$		34		S
Diode Forward Voltage	V_{FSD}	$V_{GS}=0V, I_{SD}=30A$			1.3	V

•Dynamic characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=40V, f=1MHz,$	-	5431	-	pF
Output capacitance	C_{oss}		-	1532	-	
Reverse transfer capacitance	C_{rss}		-	49	-	
Gate Resistance	R_g	$f=1MHz$	-	1.5		Ω
Total gate charge	Q_g	$V_{DD}=15V, I_D=30A, V_{GS}=10V$	-	91	-	nC
Gate - Source charge	Q_{gs}		-	23	-	
Gate - Drain charge	Q_{gd}		-	24	-	
Turn-ON Delay time	$t_{D(on)}$	$V_{GS}=10V, V_{DS}=15V, R_G=3.3\Omega, I_D=20A$	-	17	-	ns
Turn-ON Rise time	t_r		-	12	-	ns
Turn-Off Delay time	$t_{D(off)}$		-	30	-	ns
Turn-Off Fall time	t_f		-	21	-	ns
Reverse Recovery Time	t_{RR}	$V_{DD}=20V, dI_S/dt=100A/\mu s, I_S=50A$	-	87	-	ns
Reverse Recovery Charge	Q_{RR}		-	142	-	nC

Fig.1 Gate-Charge Characteristics

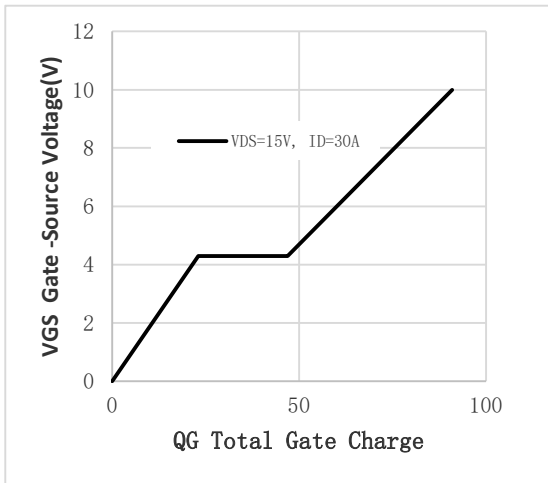


Fig.2 Capacitance Characteristics

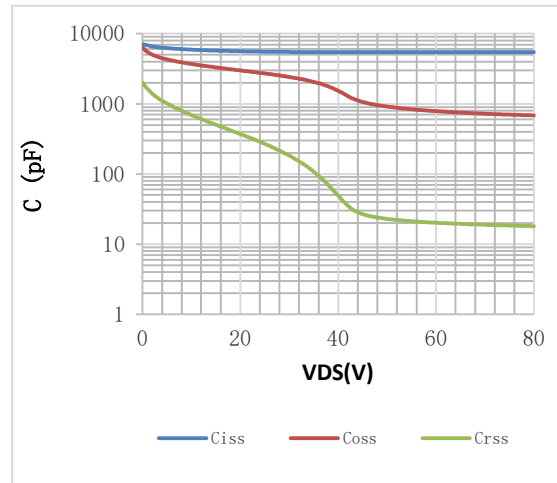


Fig.3 Power Dissipation

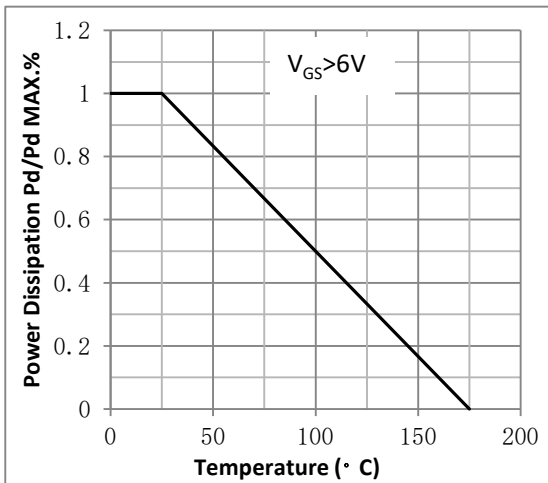


Fig.4 Typical output Characteristics

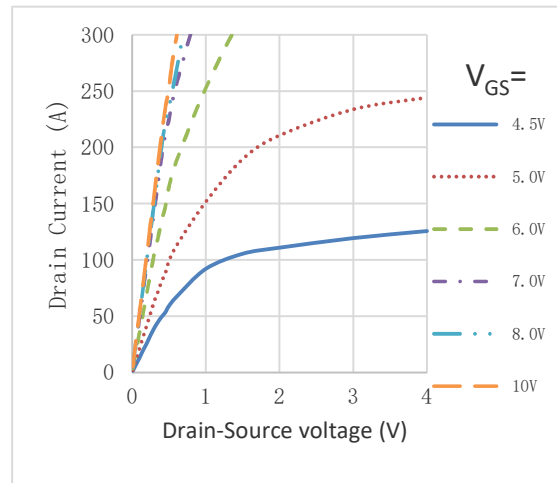


Fig.5 Threshold Voltage V.S Junction Temperature

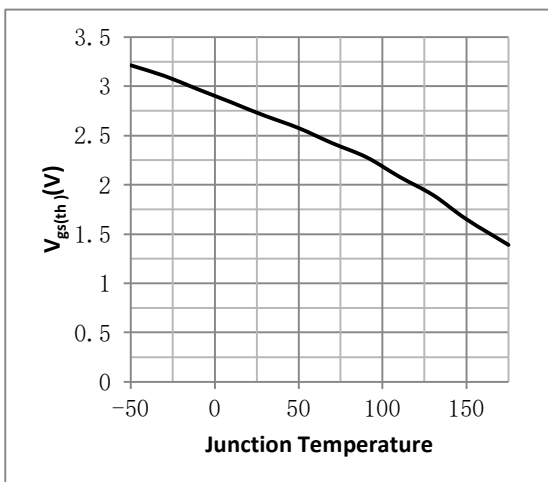


Fig.6 Resistance V.S Drain Current

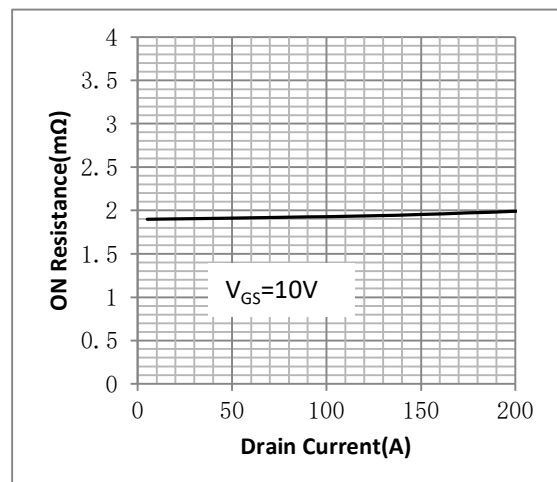


Fig.7 On-Resistance VS Gate Source Voltage

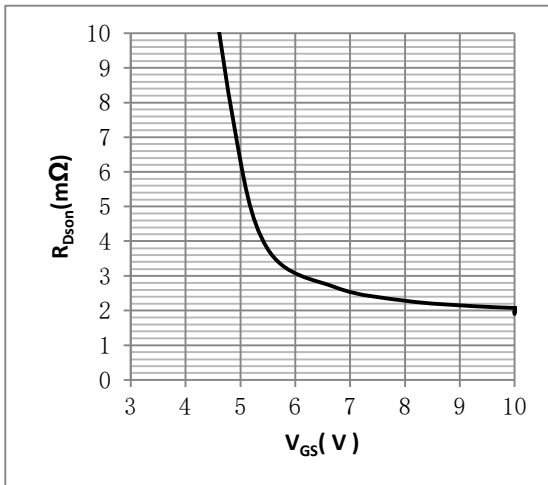


Fig.8 On-Resistance V.S Junction Temperature

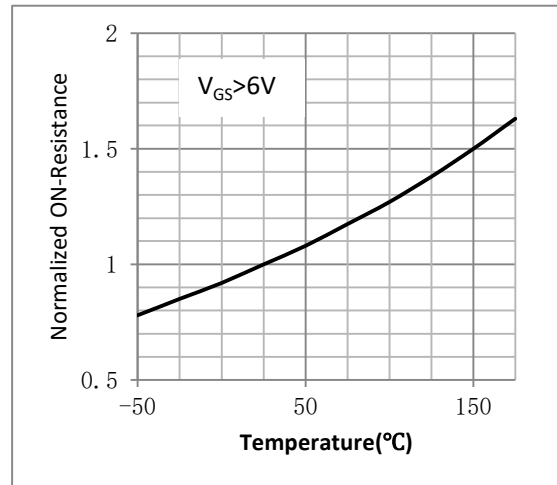


Figure 9. Diode Forward Voltage vs. Current

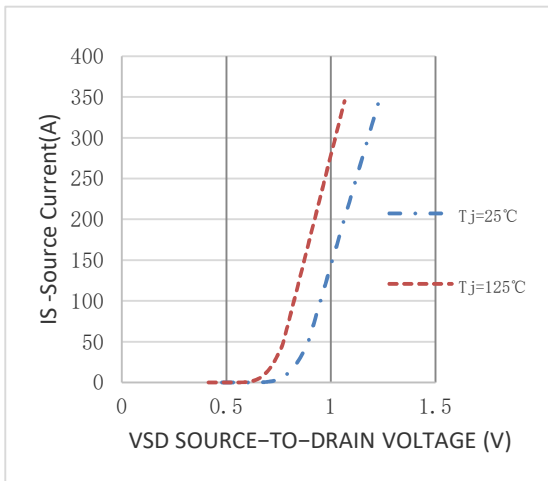


Figure 10. Transfer Characteristics

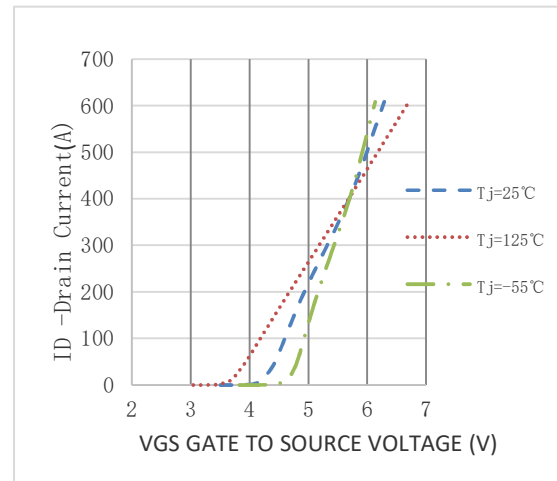


Fig.11 Safe Operating Area

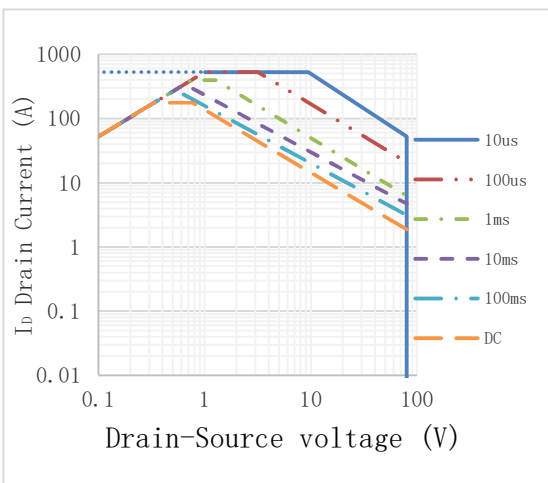
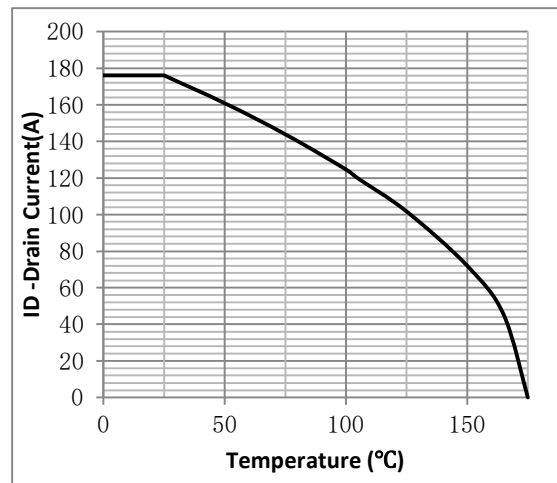
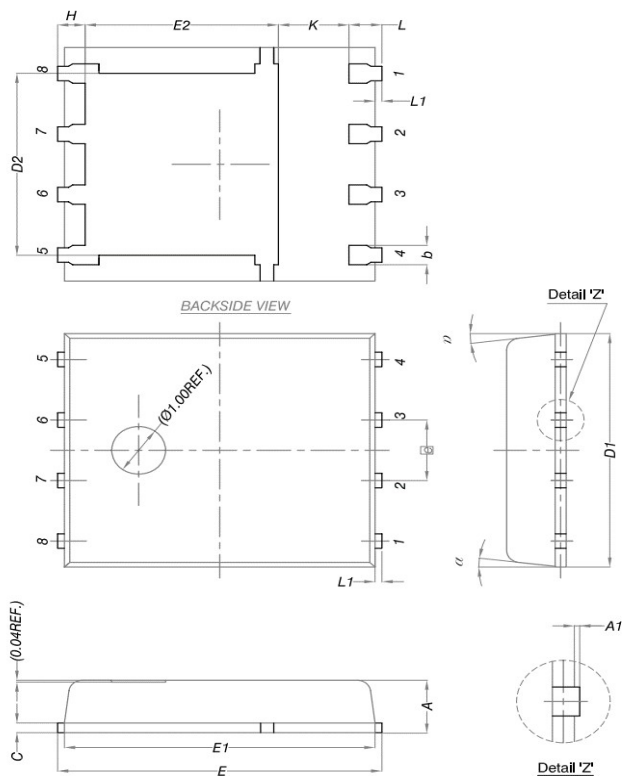


Fig.12 ID vs. Junction Temperature^③



•DFN5*6 Package Outline



DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
A1	0	-	0.05
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.38	3.58	3.78
e	1.27 BSC		
H	0.41	0.51	0.61
K	1.10	-	-
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
α	0°	-	12°

**Note:**

- ① Pulse : $V_{GS}=+20V/-20V$, Duty cycle=50%, $T_j=175^{\circ}C$, $t=1000$ hours; For DC , the following test conditions can be passed: $V_{GS}=+20V/-10V$, $T_j=175^{\circ}C$, $t=1000$ hours;
- ② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate;
- ③ Practically the current will be limited by PCB, thermal design and operating temperature. $V_{GS}=10V$.

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Revision History

Version	Date	Change
A	2024.5.10	New
B	2025.4.2	Update Cxss condition and value.