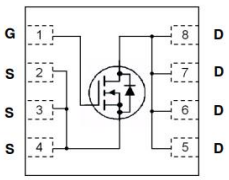
• General Description

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

• Product Summary



V_{DS}= 100V
$R_{DS(ON)}$ = 2mΩ
I_D= 206A

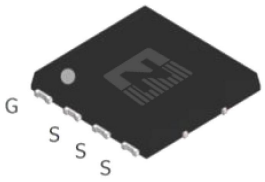
• Features

■AEC-Q101 Qualified

■Low $R_{DS(ON)}$ to minimize conductive loss

■Low Gate Charge for fast switching

■Low Thermal resistance



DFN8*8

•Application

■BLDC Motor driver

■DC-DC

■Load Switch

•Ordering Information:

Part NO.	ZMSA020N10HG
Marking	ZMS020N10H
Packing Information	REEL TAPE
Basic ordering unit (pcs)	2500

•Absolute Maximum Ratings (T_C=25℃)

Parameter	Symbol	Conditions	Value	Unit
Drain-Source Voltage	V_{DS}		100	V
Gate-Source Voltage	V_{GS}		±20	V
Continuous Drain Current	I_D	T_C=25℃	206	A
	I_D	T_C=75℃	169	A
	I_D	T_C=100℃	146	A
Pulsed Drain Current ①	I_{DM}	Pulsed; t_p ≤ 10 μs; T_{mb} = 25 °C;	824	A
Total Power Dissipation	P_D	T_C=25℃	214	W
Total Power Dissipation	P_D	T_A=25℃	4.3	W
Operating Junction Temperature	T_J		-55 to +175	℃
Storage Temperature	T_{STG}		-55 to +175	℃
Single Pulse Avalanche Energy	E_{AS}	L=0.1mH, VGS=10V, Rg=25Ω,	423	mJ
		L=0.5mH, VGS=10V, Rg=25Ω,	762	mJ
ESD Level (HBM)	CLASS 2			

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}		-	0.7	°C/W
Thermal resistance, junction-ambient	$R_{thJA①}$		-	35	°C/W
Soldering temperature（total time<10s)	Tsold		-	260	°C

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V, I_D =250uA	100			V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} =V_{DS}, I_D =250uA	2	2.7	4	V
Drain-Source Leakage Current	I_{DSS}	V_{GS}=0V, V_{DS}= 100V			1.0	uA
Gate- Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS} = 0V			100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D= 40A		2	2.5	mΩ
Forward Transconductance	g_{FS}	V_{GS} =5V, I_{SD} = 5A		30		S
Diode Forward Voltage	V_{FSD}	V_{GS} =0V, I_{SD} = 40A			1.3	V

●Dynamic characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input capacitance	Ciss	f = 1MHz, V_{DS}=25V	-	6012	-	pF
Output capacitance	Coss		-	3235	-	
Reverse transfer capacitance	Crss		-	312	-	
Gate Risistance	Rg	f = 1MHz	-	1.6		Ω
Total gate charge	Qg	V_{DD} = 15V, I_D = 40A, V_{GS} = 10V	-	93	-	nC
Gate - Source charge	Qgs		-	22	-	
Gate - Drain charge	Qgd		-	19	-	
Turn-ON Delay time	$t_{D(on)}$	V_{GS}=10V,V_{DS}=15V, R_G =3.3Ω, I_D =20A	-	31	-	ns
Turn-ON Rise time	t_r		-	20	-	ns
Turn-Off Delay time	$t_{D(off)}$		-	60	-	ns
Turn-Off Fall time	t_f		-	25	-	ns
Reverse Recovery Time	t_{rr}	V_{DD}=20V, dI_S/dt = 100A/us, I_S=20A	-	46	-	ns
Reverse Recovery Charge	Q_{rr}		-	42	-	nC

Fig.1 Gate-Charge Characteristics

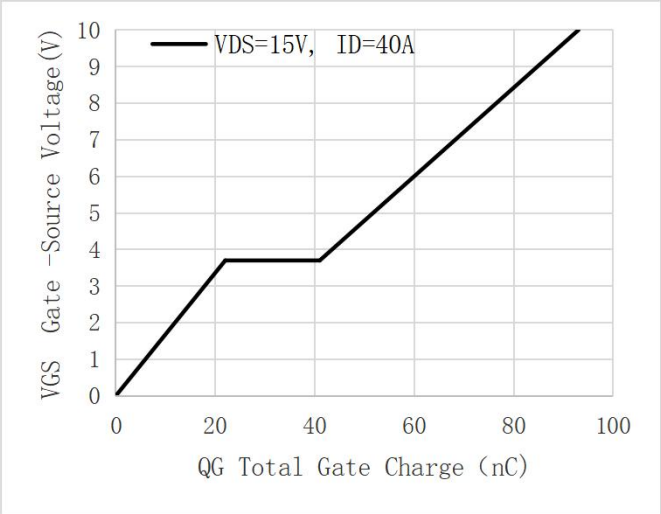


Fig.2 Capacitance Characteristics

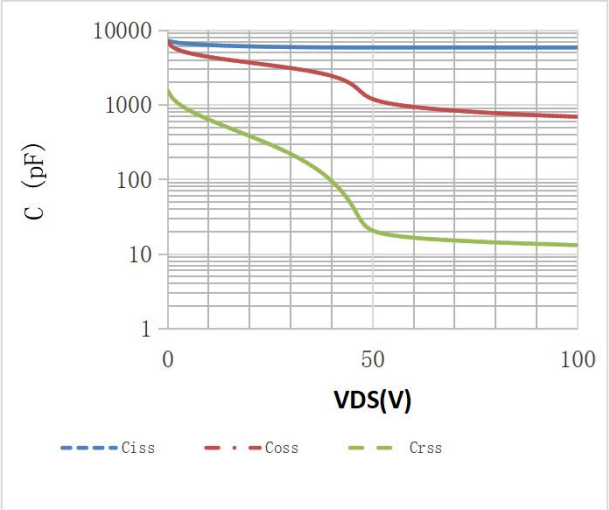


Fig.3 Power Dissipation

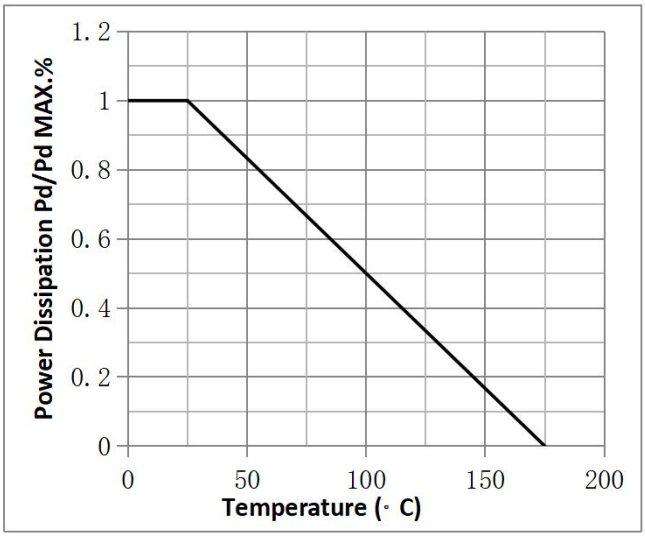


Fig.4 Typical output Characteristics

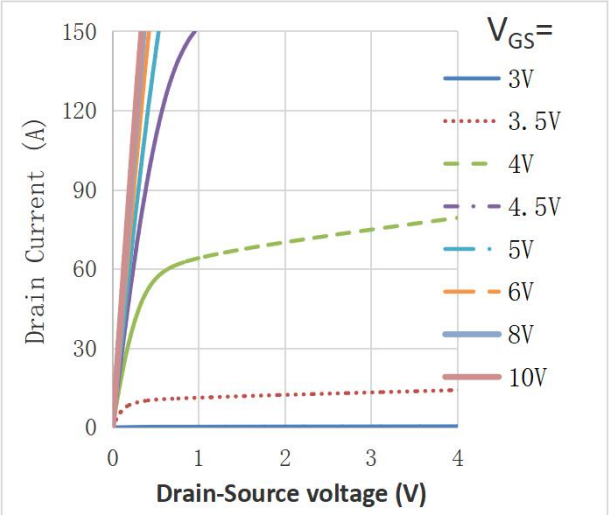


Fig.5 Threshold Voltage V.S Junction Temperature

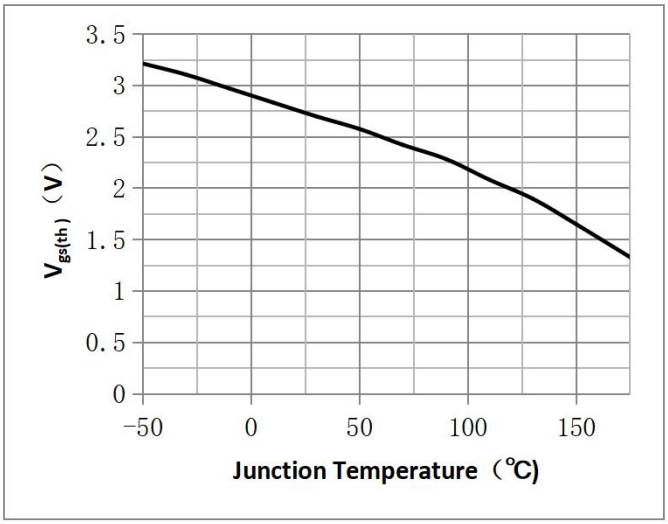


Fig.6 Resistance V.S Drain Current

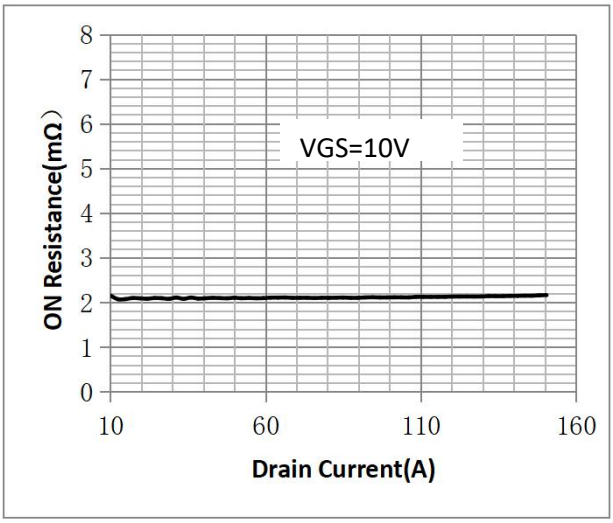


Fig.7 On-Resistance VS Gate Source Voltage

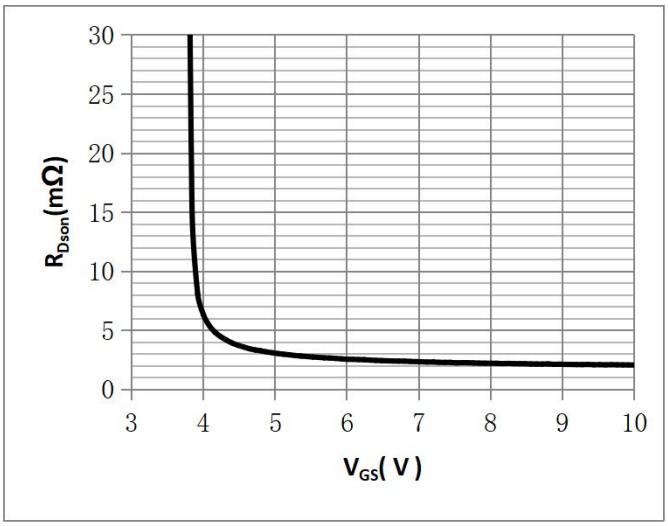


Fig.8 On-Resistance V.S Junction Temperature

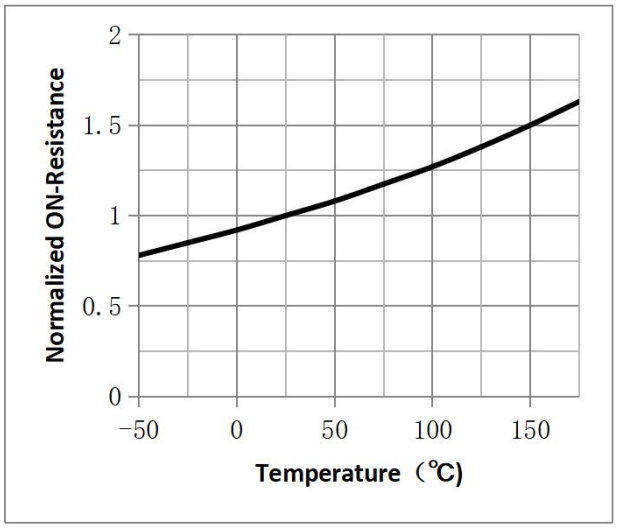


Figure 9. Diode Forward Voltage vs. Current

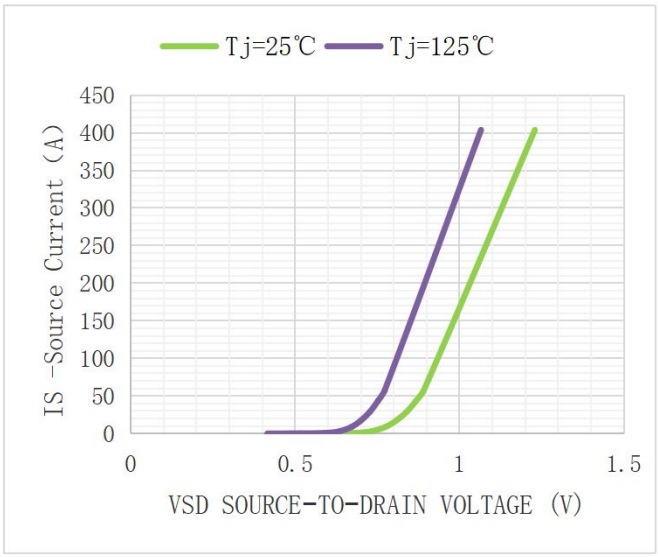


Figure 10. Transfer Characteristics

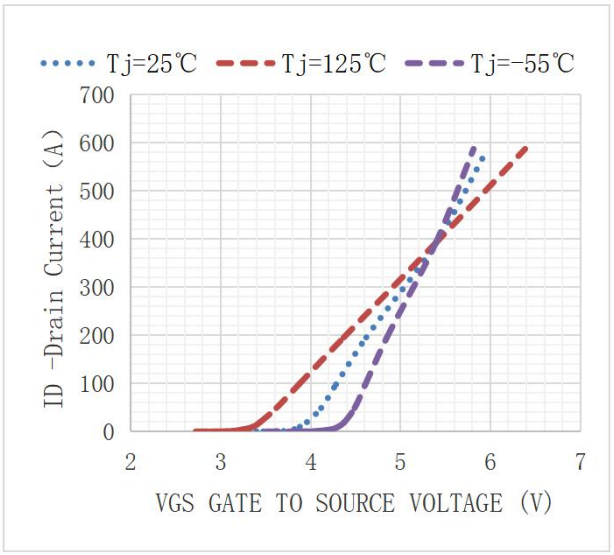


Fig.11 SOA Maximum Safe Operating Area

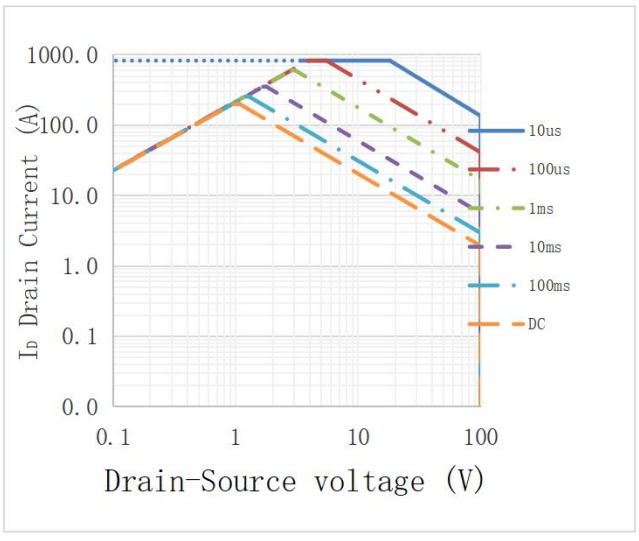
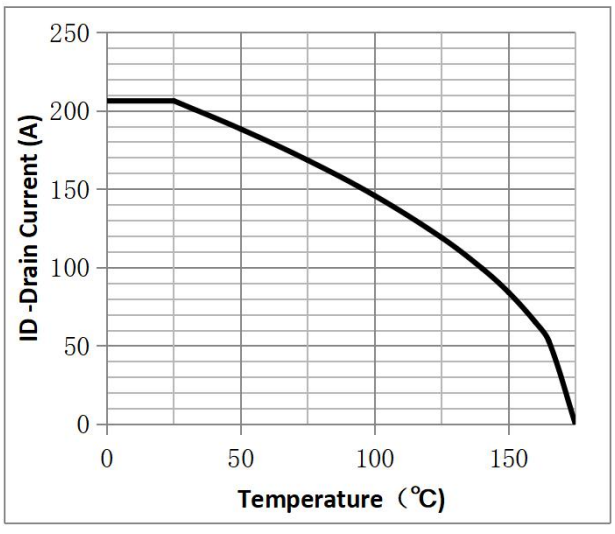
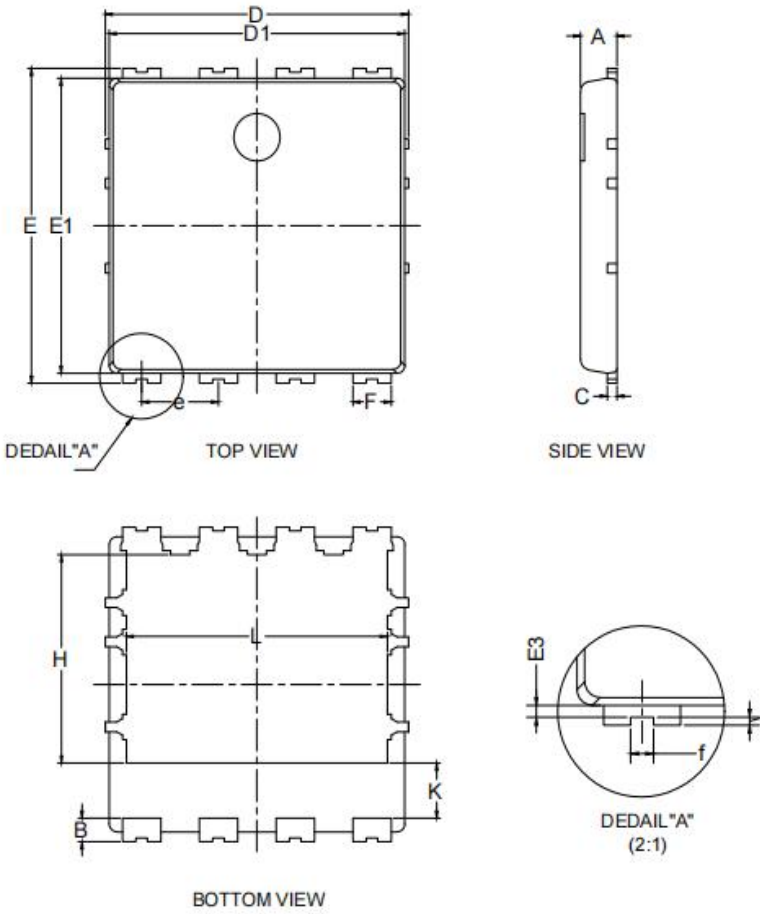


Fig.12 ID vs. Junction Temperature②



●DFN8*8 Package Outline



MILLIMETERS			
DIM	MIN	TYP	MAX
A	0.90	0.95	1.00
B	0.50	0.60	0.70
C		0.254TYP	
D	7.80	7.90	8.00
D1	7.60	7.70	7.80
E	7.90	8.00	8.10
E1	7.40	7.50	7.60
e		2.00TYP	
F		1.00TYP	
H	5.15	5.30	5.40
L	6.60	6.80	6.90
K	1.20	—	—
E2	0.04	0.10	0.16
E3	0.10	0.15	0.20
f	0.25	0.30	0.35

Note:

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

②Practically 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	2024-9-23	New