

General Description

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

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

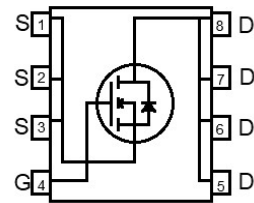
Ordering Information:

Part NO.	ZMSA070N10N
Marking	ZMS070N10
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

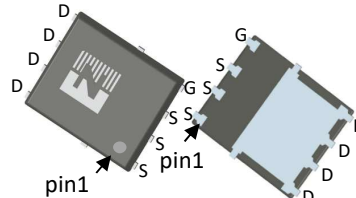
Absolute Maximum Ratings (T_C=25°C)

Parameter	Symbol	Conditions	Value	Unit
Drain-Source Voltage	V _{DS}		100	V
Gate-Source Voltage ^①	V _{GS}		±20	V
Continuous Drain Current	I _D	T _C =25°C	70	A
	I _D	T _C =75°C	58	A
	I _D	T _C =100°C	50	A
Pulsed Drain Current ^①	I _{DM}	Pulsed; t _p ≤ 10 μs; T _{mb} = 25 °C;	280	A
Total Power Dissipation	P _D	T _C =25°C	94	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,	115	mJ
		L=0.5mH, V _{GS} =10V, R _g =25Ω,	207	mJ
ESD Level (HBM)	CLASS 2			

Product Summary



V_{DS} = 100V
 $R_{DS(ON)}$ = 7.5mΩ
 I_D = 70A



DFN5*6



•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}		-	1.6	°C/W
Thermal resistance, junction-ambient ^②	R_{thJA}		-	45	°C/W
Soldering temperature	T _{sold}		-	260	°C

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.4	1.9	2.5	V
Drain-Source Leakage Current	I_{DSS}	$V_{GS}=0V, V_{DS}=100V$			1.0	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=30A$		7.5	9	m Ω
		$V_{GS}=4.5V, I_D=20A$		9.0	11	
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_{SD}=10A$		16		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}	$f=1MHz, V_{DS}=50V$	-	2072	-	pF
Output capacitance	C_{oss}		-	370	-	
Reverse transfer capacitance	C_{rss}		-	6	-	
Gate Resistance	R_g	$f=1MHz$	-	1.6		Ω
Total gate charge	Q_g	$V_{DD}=50V, I_D=30A, V_{GS}=10V$	-	38.4	-	nC
Gate - Source charge	Q_{gs}		-	5.4	-	
Gate - Drain charge	Q_{gd}		-	10.9	-	
Turn-ON Delay time	$t_{D(on)}$	$V_{GS}=10V, V_{DS}=50V, R_G=3.3\Omega, I_D=30A$	-	12	-	ns
Turn-ON Rise time	t_r		-	6	-	ns
Turn-Off Delay time	$t_{D(off)}$		-	21	-	ns
Turn-Off Fall time	t_f		-	5	-	ns
Reverse Recovery Time	t_{RR}	$V_{DD}=50V, dI_S/dt=100A/\mu s, I_S=30A$	-	52	-	ns
Reverse Recovery Charge	Q_{RR}		-	85	-	nC

Fig.1 Gate-Charge Characteristics

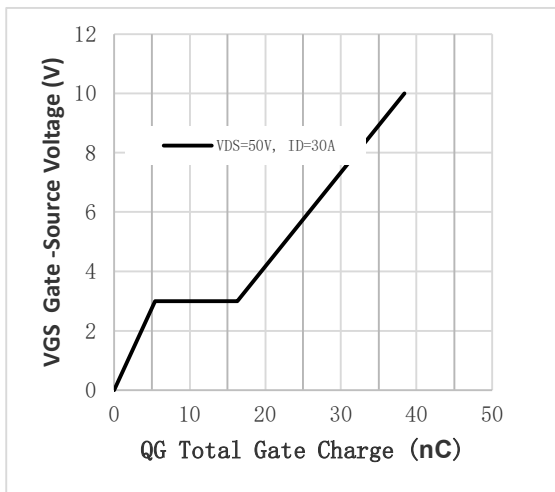


Fig.2 Capacitance Characteristics

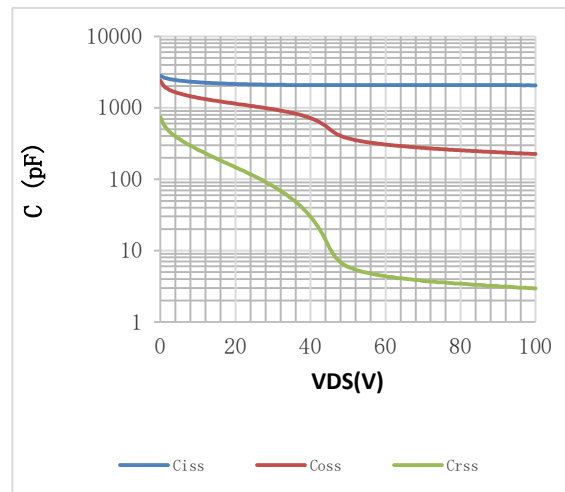


Fig.3 Power Dissipation

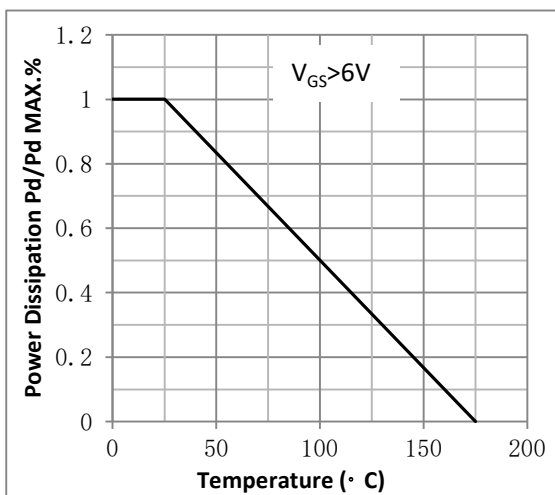


Fig.4 Typical output Characteristics

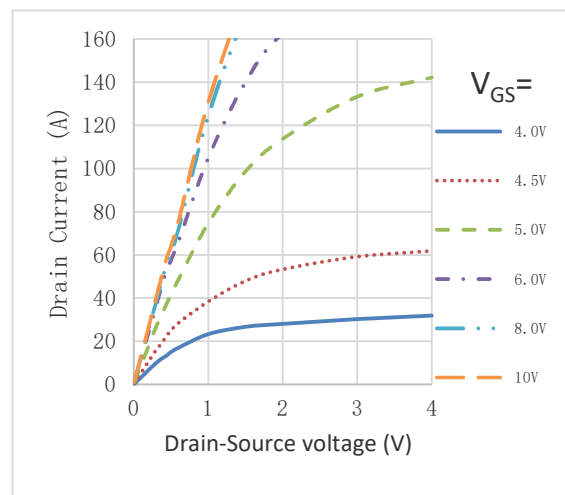


Fig.5 Threshold Voltage V.S Junction Temperature

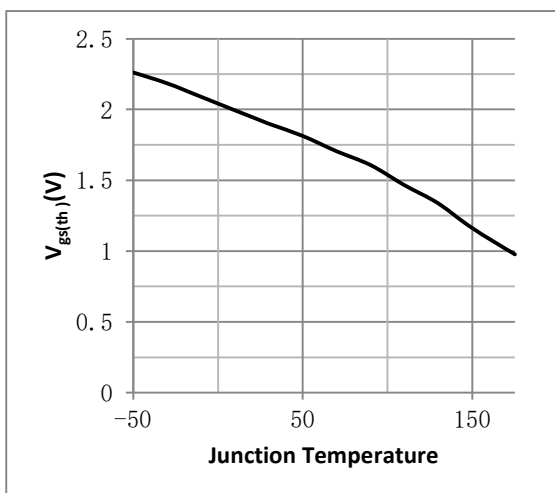


Fig.6 Resistance V.S Drain Current

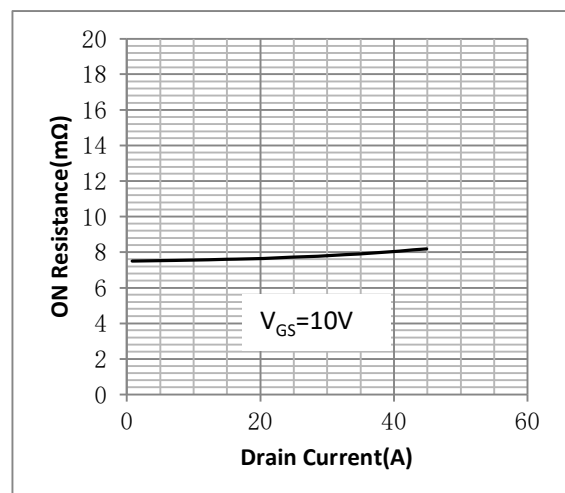


Fig.7 On-Resistance VS Gate Source Voltage

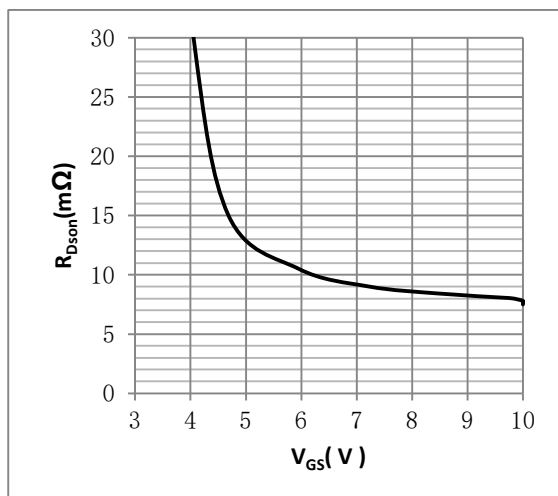


Fig.8 On-Resistance V.S Junction Temperature

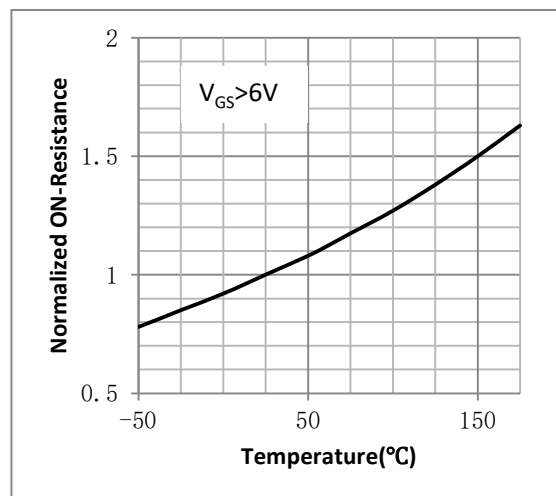


Figure 9. Diode Forward Voltage vs. Current

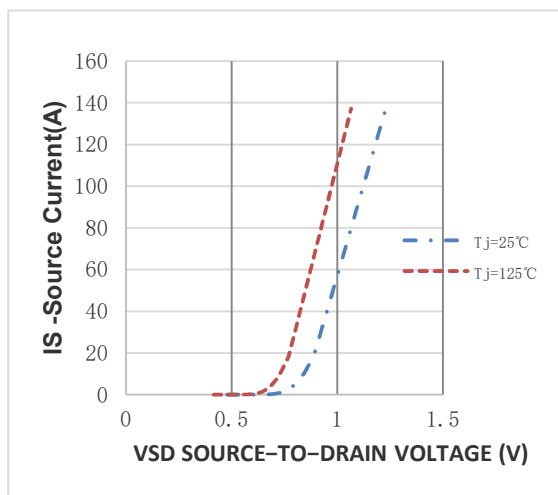


Figure 10. Transfer Characteristics

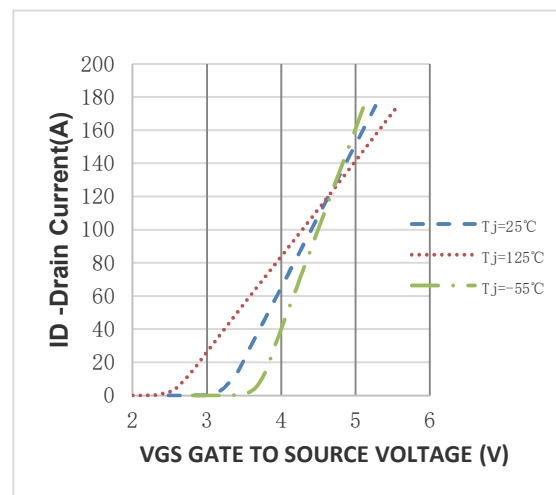


Fig.11 Safe Operating Area

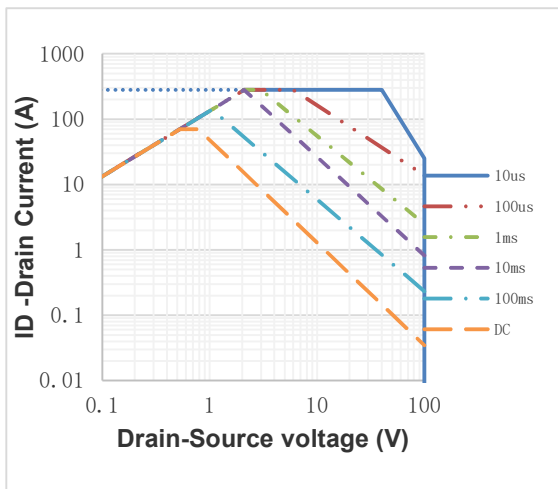
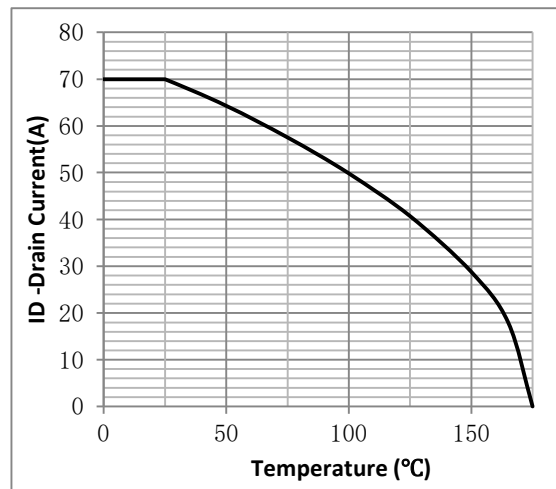
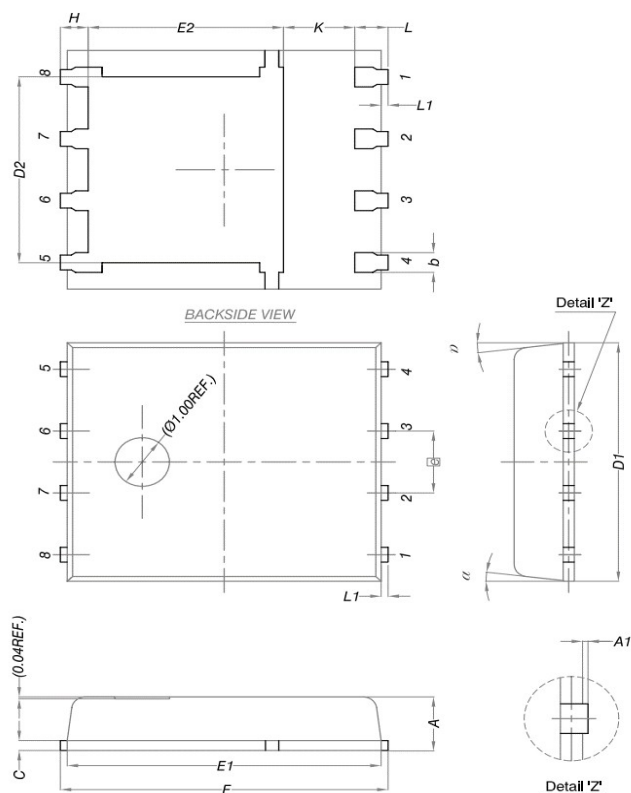


Fig.12 I_D vs. Case Temperature^③



•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 Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$, Accumulation time ≤ 50 hours; For DC , the following test conditions can be passed: $V_{GS}=+20V/-10V$, $T_j=175^\circ\text{C}$, $t=1000$ 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	2022.1.15	
B	2022.2.20	1.Add Dynamic characteristic t_f , t_r etc.
C	2022.9.2	1.Add Reach,HF figure,2.ID modify
D	2023.12.20	1.ID and ID Curve modified
E	2025.10.16	1. Update C_g , Q_g condition,value and curve. 2. Update switching time condition and value.