

• **General Description**

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

• **Features**

- 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

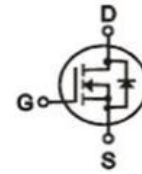
• **Ordering Information:**

Part NO.	ZMS030N10HB6
Marking	ZMS030N10H
Packing Information	REEL TAPE
Basic ordering unit (pcs)	800

• **Absolute Maximum Ratings** ($T_C=25^\circ\text{C}$)

Parameter	Symbol	Conditions	Value	Unit
Drain-Source Voltage	V_{DS}	$25^\circ\text{C} \leq T_j \leq 175^\circ\text{C}$	100	V
Gate-Source Voltage ^①	V_{GS}		± 20	V
Continuous Drain Current	I_D	$T_C=25^\circ\text{C}$	170	A
	I_D	$T_C=75^\circ\text{C}$	139	A
	I_D	$T_C=100^\circ\text{C}$	121	A
Pulsed Drain Current ^①	I_{DM}	Pulsed; $t_p \leq 10 \mu\text{s}$; $T_{mb} = 25^\circ\text{C}$;	680	A
Total Power Dissipation	P_D	$T_C=25^\circ\text{C}$	179	W
Total Power Dissipation	P_D	$T_A=25^\circ\text{C}$	3.1	W
Operating Junction Temperature	T_J		-55 to +175	$^\circ\text{C}$
Storage Temperature	T_{STG}		-55 to +175	$^\circ\text{C}$
Single Pulse Avalanche Energy	E_{AS}	$L=0.1\text{mH}$, $V_{GS}=10\text{V}$, $R_g=25\Omega$,	240	mJ
		$L=0.5\text{mH}$, $V_{GS}=10\text{V}$, $R_g=25\Omega$,	552	mJ
ESD Level (HBM)	CLASS 2			

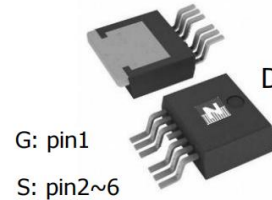
• **Product Summary**



$$V_{DS} = 100\text{V}$$

$$R_{DS(ON)} = 2.6\text{m}\Omega$$

$$I_D = 170\text{A}$$



TO-263-6



•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	RthJC		-	0.7	°C/W
Thermal resistance, junction-ambient	RthJA ^②		-	40	°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	2.0	2.7	4.0	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		2.6	3.4	mΩ
Forward Transconductance	g _{FS}	V _{GS} =5V, I _{SD} = 15A		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	-	5490	-	pF
Output capacitance	Coss		-	3060	-	
Reverse transfer capacitance	Crss		-	309	-	
Gate Resistance	Rg	f = 1MHz	-	1.5		Ω
Total gate charge	Qg	V _{DD} = 15V, I _D = 20A, V _{GS} = 10V	-	97	-	nC
Gate - Source charge	Qgs		-	30	-	
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	-	11	-	ns
Turn-ON Rise time	t _r		-	42	-	ns
Turn-Off Delay time	t _{D(off)}		-	84	-	ns
Turn-Off Fall time	t _f		-	63	-	ns
Reverse Recovery Time	t _{RR}	V _{DD} =20V, dI _S /dt = 100A/us, I _S =50A	-	75	-	ns
Reverse Recovery Charge	Q _{RR}		-	122	-	nC

Fig.1 Gate-Charge Characteristics

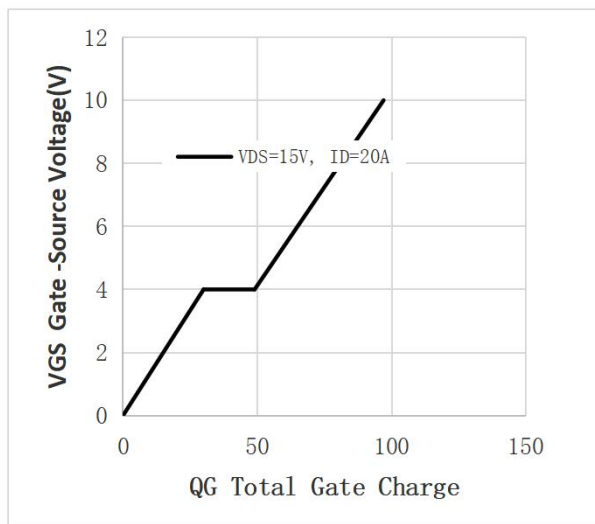


Fig.2 Capacitance Characteristics

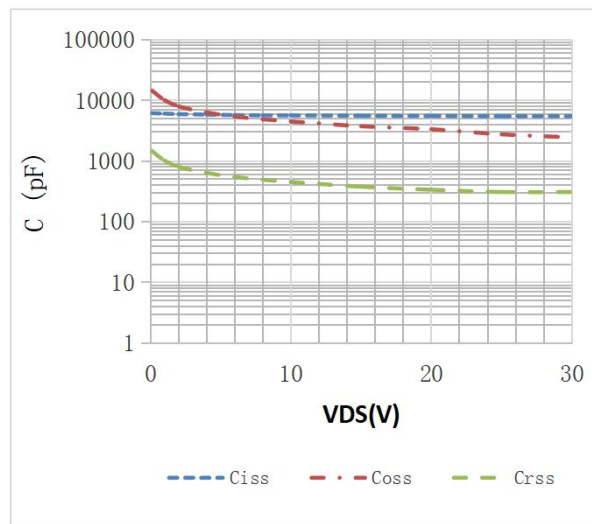


Fig.3 Power Dissipation

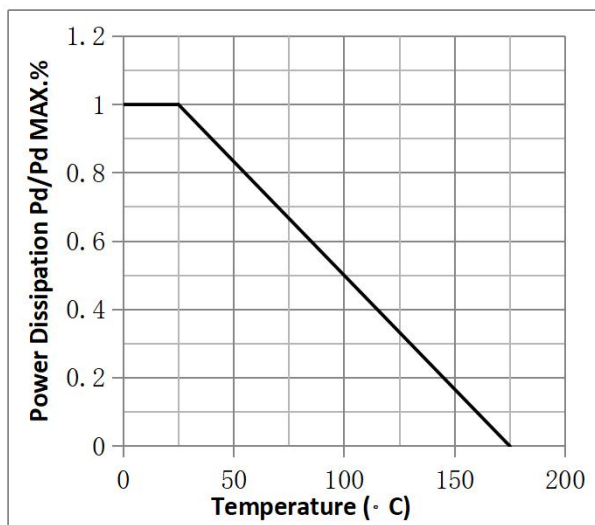


Fig.4 Typical output Characteristics

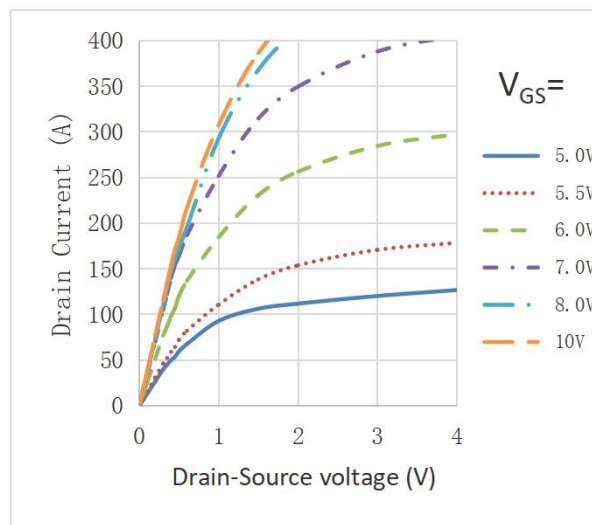


Fig.5 Threshold Voltage V.S Junction Temperature

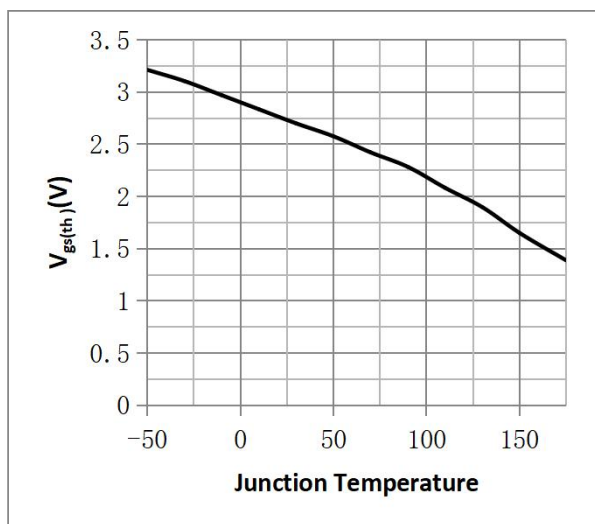


Fig.6 Resistance V.S Drain Current

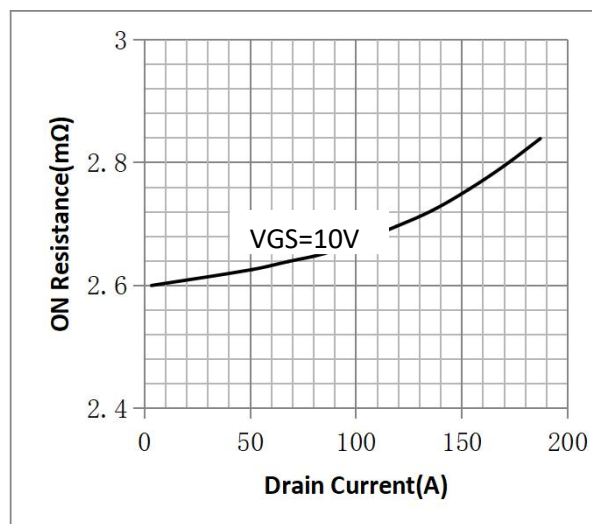


Fig.7 On-Resistance VS Gate Source Voltage

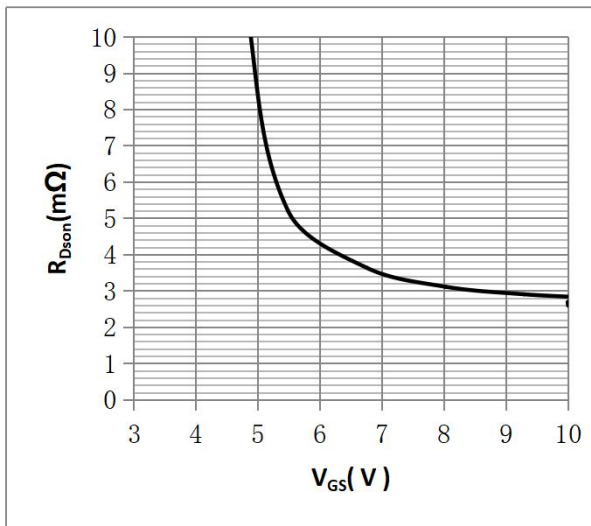


Fig.8 On-Resistance V.S Junction Temperature

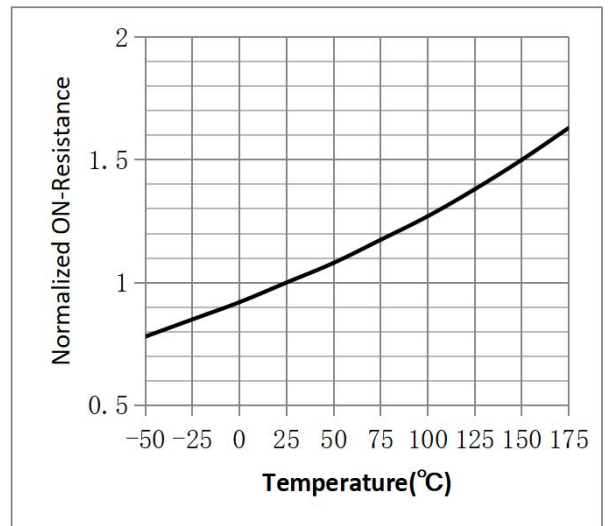


Figure 9. Diode Forward Voltage vs. Current

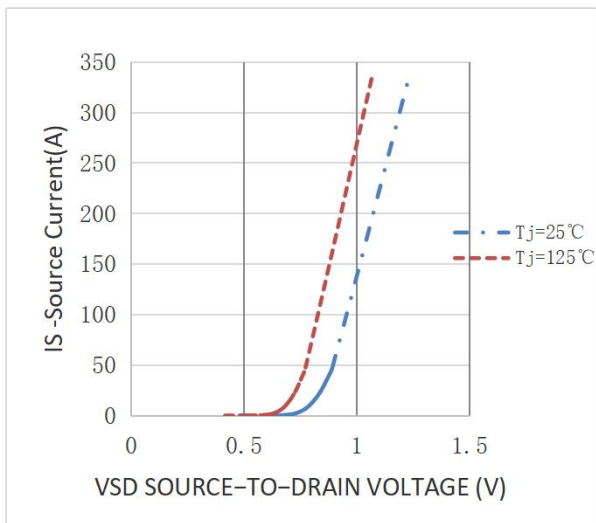


Figure 10. Transfer Characteristics

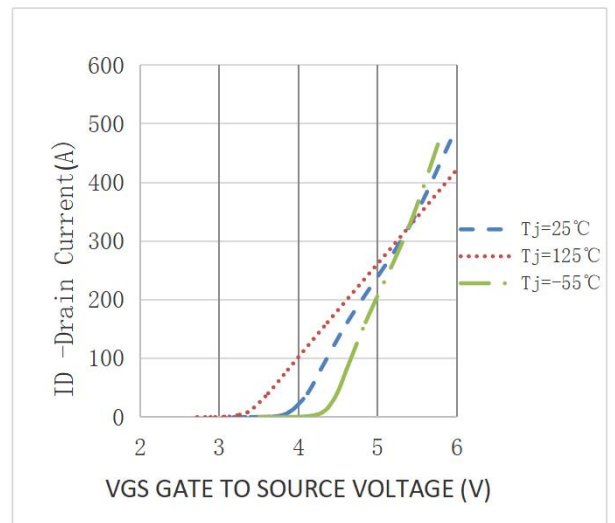


Fig.11 SOA Maximum Safe Operating Area

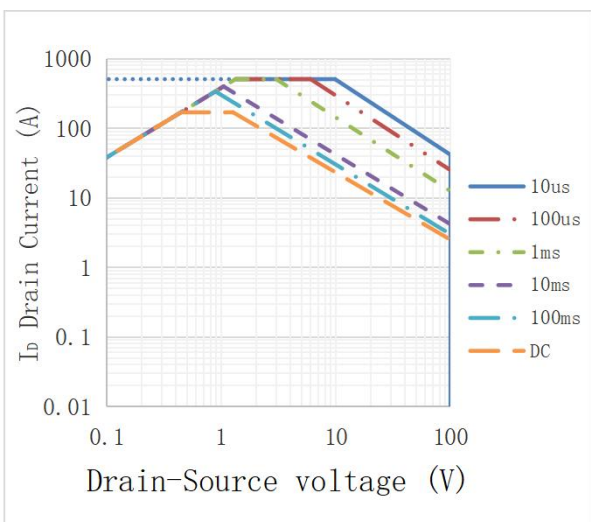
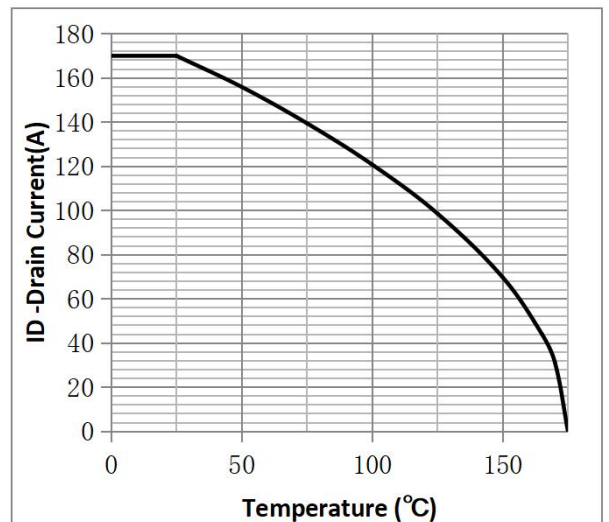
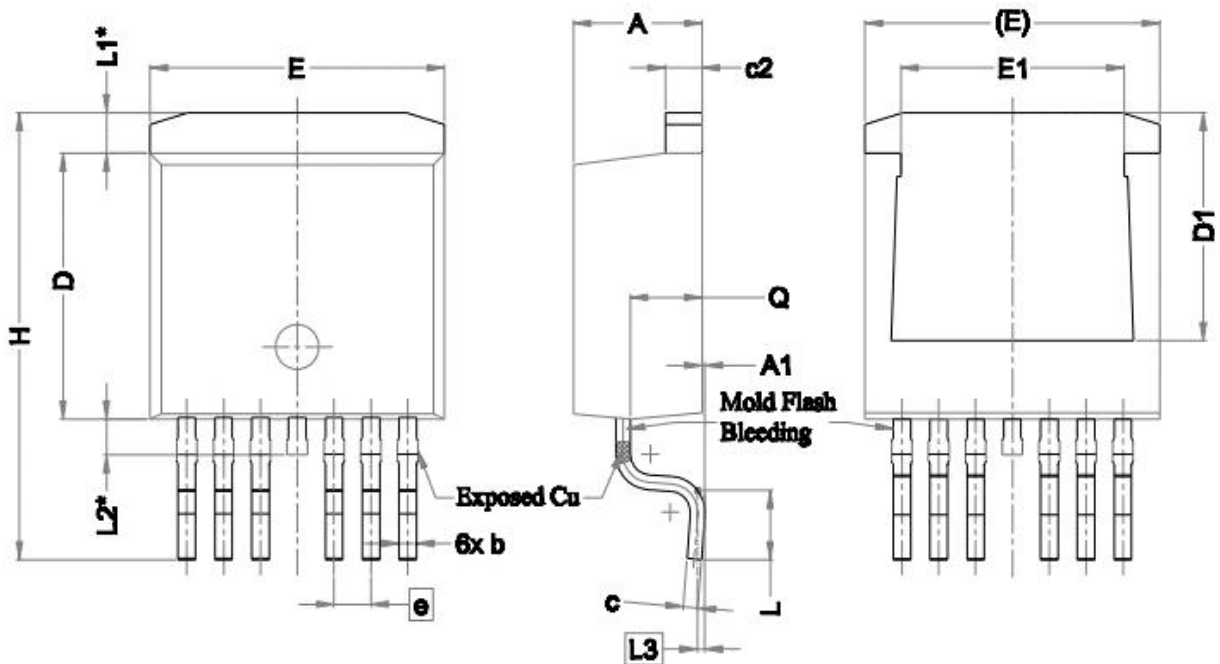


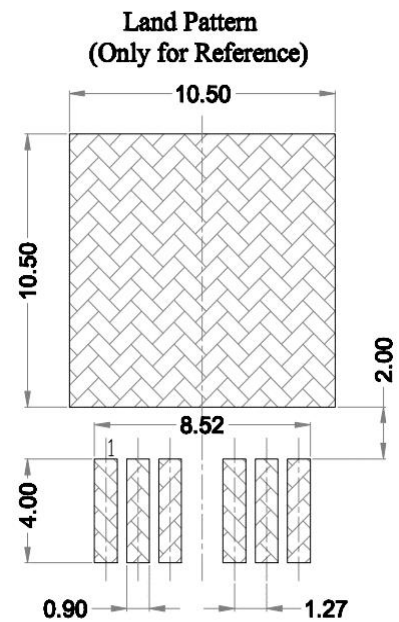
Fig.12 I_D vs. Junction Temperature^③



•TO-263-6 Package Outline



SYMBOL	DIMENSIONS		
	MIN.	NOM.	MAX.
A	4.24	4.44	4.64
A1	0.00	0.10	0.25
b	0.50	0.60	0.70
c	0.40	0.50	0.60
c2	1.15	1.27	1.40
D	8.82	8.92	9.02
D1	6.86	7.65	—
E	9.96	10.16	10.36
E1	6.89	7.77	7.89
e	1.27 BSC		
H	14.61	15.00	15.88
L	1.78	2.32	2.79
L1	1.36 REF.		
L2	1.20 REF.		
L3	0.25 BSC		
Q	2.30	2.48	2.70



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	2022. 1. 6	New
B	2023. 11. 5	Correct SOA