• General Description

The ZM023N04N combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

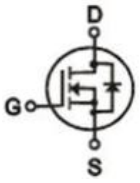
• Features

- ■ Advance high cell density Trench technology
- ■Low $R_{DS(ON)}$ to minimize conductive loss
- ■Low Gate Charge for fast switching
- ■Low Thermal resistance

•Application

- ■ Synchronous Rectification for AC-DC/DC-DC converter
- ■Oring switches
- ■BLDC Motor driver

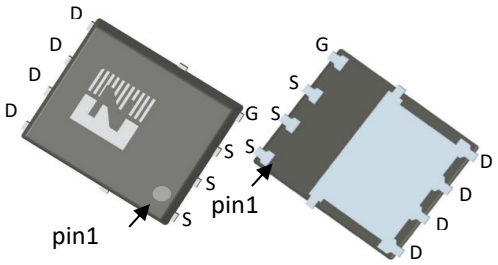
• Product Summary



V_{DS}=40V

$R_{DS(ON)}$ =2.3mΩ

I_D=100A



RoHS

DFN5 x 6

•Ordering Information:

Part NO.	ZM023N04N
Marking	ZM023N04
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

•Absolute Maximum Ratings (T_C =25℃)

Parameter	**Symbol**	Rating	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	$I_{D@}$TC=25℃	100	A
	$I_{D@}$TC=75℃	76	A
	$I_{D@}$TC=100℃	63	A
Pulsed Drain Current ①	I_{DM}	200	A
Total Power Dissipation(TC=25℃)	P_D@TC=25℃	85	W
Total Power Dissipation(TA=25℃)	P_D@TA=25℃	3.4	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy@L=0.1mH	E_{AS}	240	mJ
Avalanche Current@L=0.1mH	I_{AS}	70	A

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	1.5	°C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	37	°C/W
Soldering temperature, wave soldering for 10s	T_{sold}	-	-	265	°C

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V,I_D =250uA	40			V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} =V_{DS}, I_D =250uA	1.2		2.5	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=40V, V_{GS} =0V			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=24A		2.3	3.2	mΩ
		V_{GS}=4.5V, I_D=12A		3.5	4.5	mΩ
Forward Transconductance	g_{FS}	V_{DS} =25V, I_D=10A		20		s
Source-drain voltage	V_{SD}	Is=24A			1.28	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V f = 1MHz	-	4500	-	pF
Output capacitance	C_{oss}		-	398	-	
Reverse transfer capacitance	C_{rss}		-	157	-	

●Gate Charge characteristics(T_a = 25℃)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q_g	V_{DD} = 30V I_D = 20A V_{GS} = 10V	-	84	-	nC
Gate - Source charge	Q_{gs}		-	20	-	
Gate - Drain charge	Q_{gd}		-	9.7	-	

Note: ① Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2% ;

Fig.1 Gate-Charge Characteristics

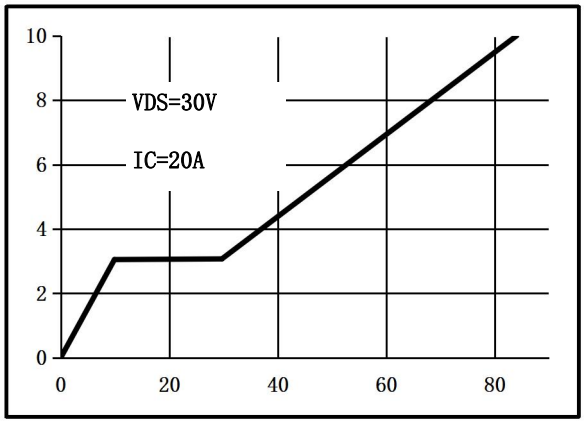


Fig.2 Capacitance Characteristics

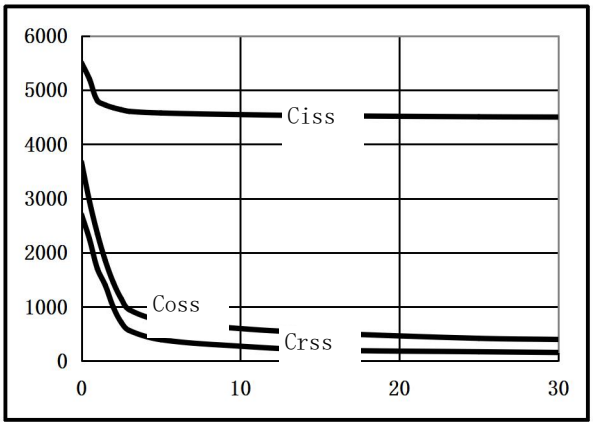


Fig.3 Power Dissipation

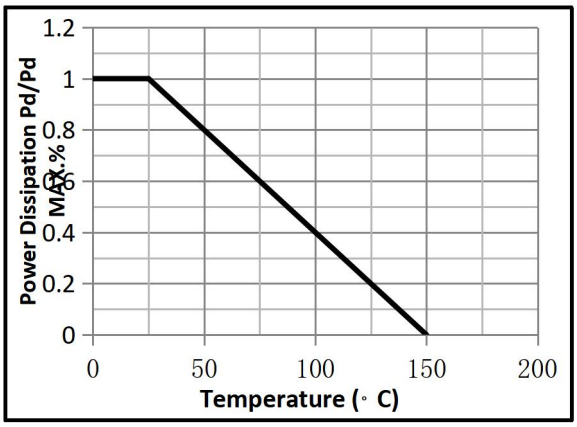


Fig.4 Typical output Characteristics

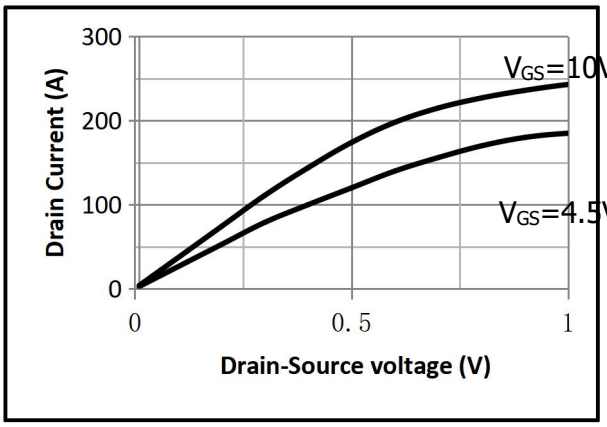


Fig.5 Threshold Voltage V.S Junction Temperature

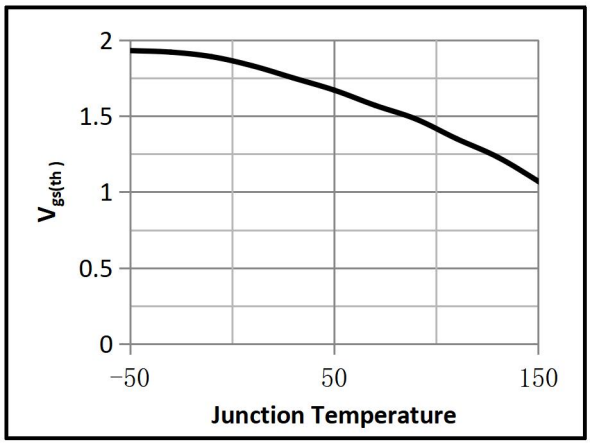


Fig.6 Resistance V.S Drain Current

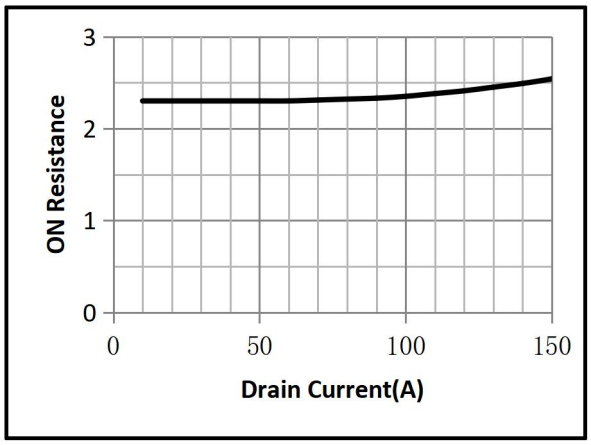


Fig.7 On-Resistance VS Gate Source Voltage

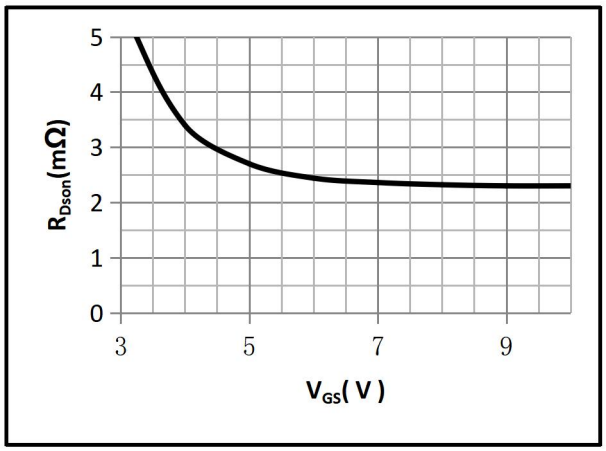


Fig.8 On-Resistance V.S Junction Temperature

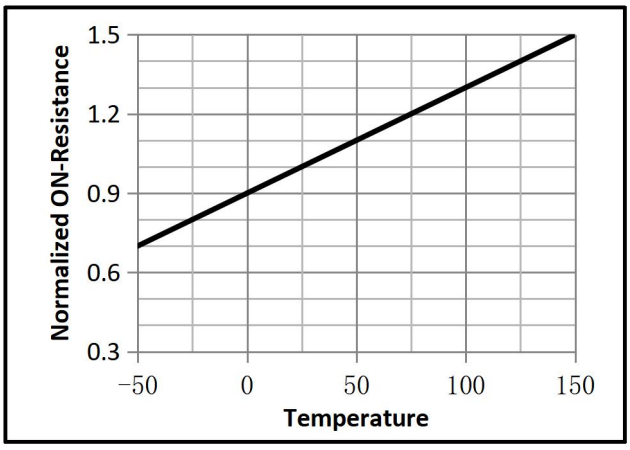


Fig.9 Switching Time Measurement Circuit

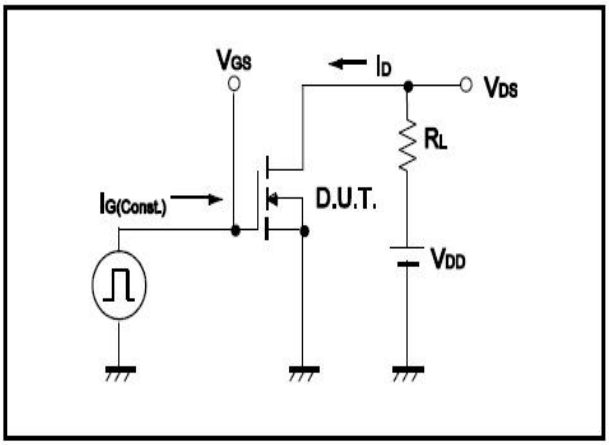


Fig.10 Gate Charge Waveform

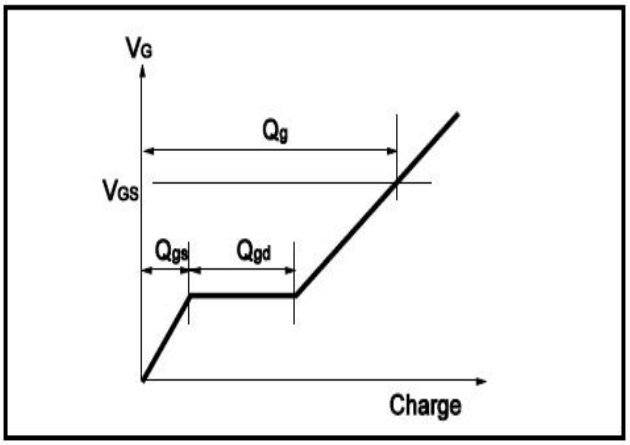


Fig.11Switching Time Measurement Circuit

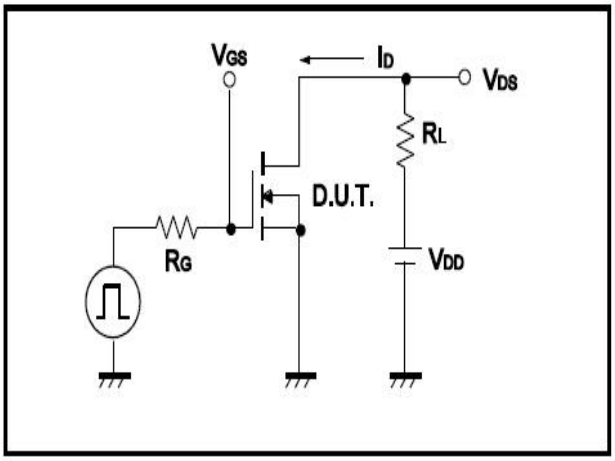
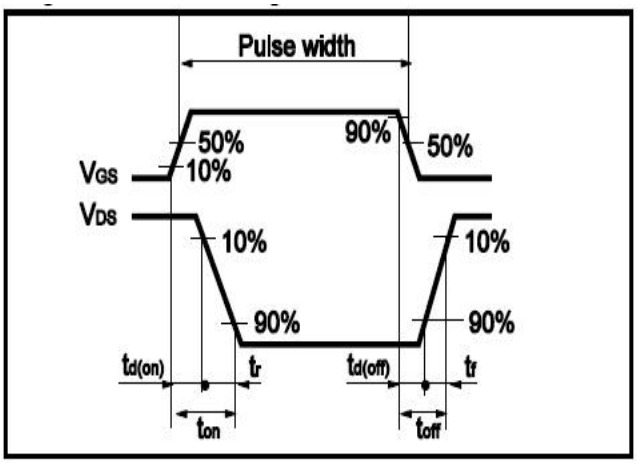
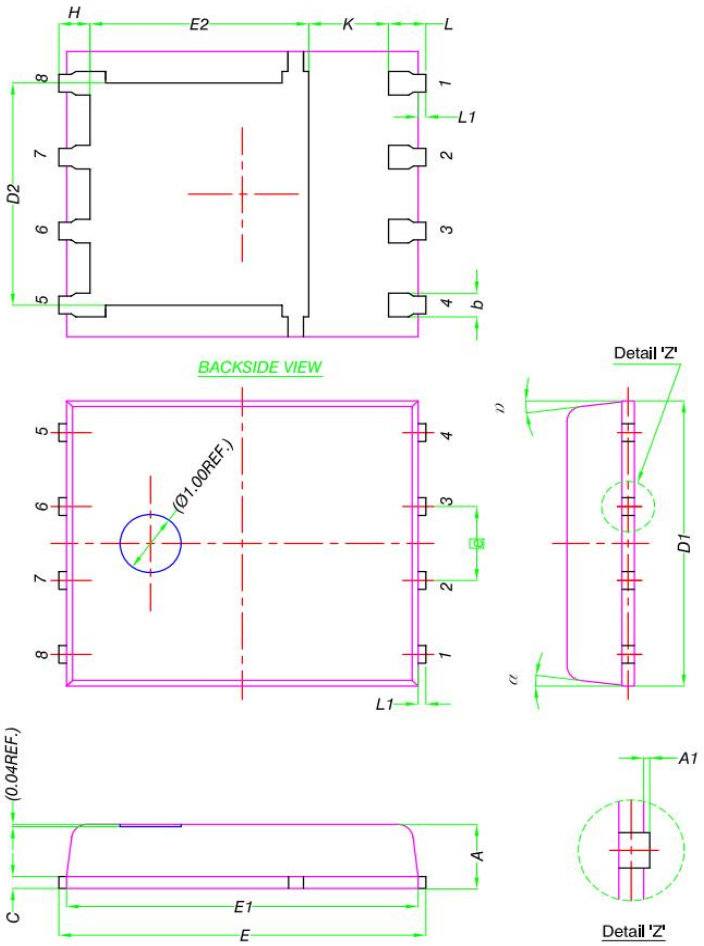


Fig.12 Gate Charge Waveform



●Dimensions（DFN5×6）

Unit：mm



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°