● General Description

The ZM027N03I combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for load switch and battery protection applications.

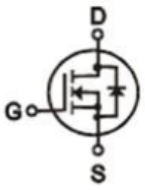
● Features

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

●Application

- ■MB/VGA Vcore
- ■SMPS 2nd Synchronous Rectifier
- ■POL application
- ■BLDC Motor driver

● Product Summary



V_{DS} =30V

$R_{DS(ON)}$ =2.7mΩ

I_D =95A

TO-251

RoHS

●Ordering Information:

Part NO.	ZM027N03I
Marking	ZM027N03
Packing Information	REEL TAPE
Basic ordering unit (pcs)	900

●Absolute Maximum Ratings (T_C =25℃)

Parameter	**Symbol**	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	$I_{D@}$TC=25℃	95	A
	$I_{D@}$TC=75℃	72	A
	I_{D} @TC=100℃	60	A
Pulsed Drain Current①	I_{DM}	220	A
Total Power Dissipation	P_D@TC=25℃	70	W
Total Power Dissipation	P_D@TA=25℃	2.8	W
Operating Junction Temperature	T_J	-55 to 175	℃
Storage Temperature	T_{STG}	-55 to 175	℃
Single Pulse Avalanche Energy (L=0.5mH,VGS=10V,Rg=25Ω,TJ=25 ℃)	E_{AS}	350	mJ

Single Pulse Avalanche Energy (L=0.1mH,VGS=10V,Rg=25Ω,TJ=25 ℃)	E_{AS}	180	mJ

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	1.8	° C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	45	° 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	30			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}=30V, 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		2.7	3.6	mΩ
		V_{GS}=4.5V, I_D=12A		4.6	5.5	mΩ
Forward Transconductance	g_{FS}	V_{DS} =25V, I_D=10A		30		s
Source-drain voltage	V_{SD}	Is=24A			1.28	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss	f = 1MHz, V_{DS}=25V	-	2800	-	pF
Output capacitance	Coss		-	420	-	
Reverse transfer capacitance	Crss		-	280	-	

●Gate Charge characteristics(T_a = 25℃)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Gate Risistance	Rg	f = 1MHz		2.5		Ω
Total gate charge	Qg	V_{DD} = 25V	-	27	-	nC
Gate - Source charge	Qgs	I_D = 8A	-	8.6	-	
Gate - Drain charge	Qgd	V_{GS} = 10V	-	13.8	-	

Turn-ON Delay time	$t_{D(on)}$	V_{GS}=10V ,V_{DS}=15V R_G =3.3Ω, I_D =15A		12		ns
Turn-ON Rise time	t_r			44		ns
Turn-Off Delay time	$t_{D(off)}$			50		ns
Turn-Off Fall time	t_f			15		ns
Reverse Recovery Time	t_{RR}	VDD = 20 V, dIS/dt = 100 A/s, IS = 30 A		5.8		ns
Charge Time	t_a			3.4		ns
Discharge Time	t_b			2.4		ns
Reverse Recovery Charge	Q_{RR}			1.6		nC

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

Fig.1 Power Dissipation

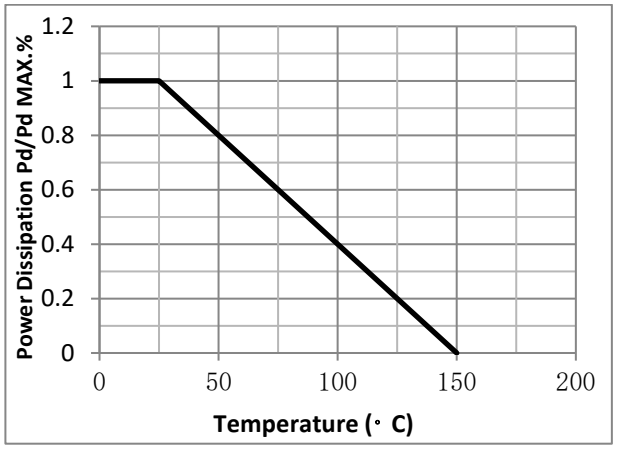


Fig.2 Typical output Characteristics

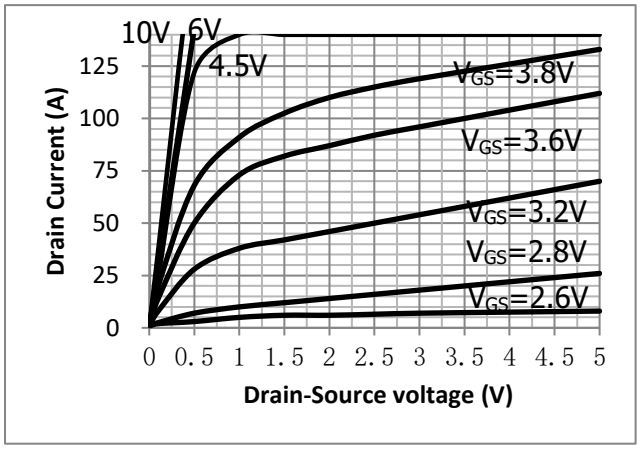


Fig.3 Threshold Voltage V.S Junction Temperature

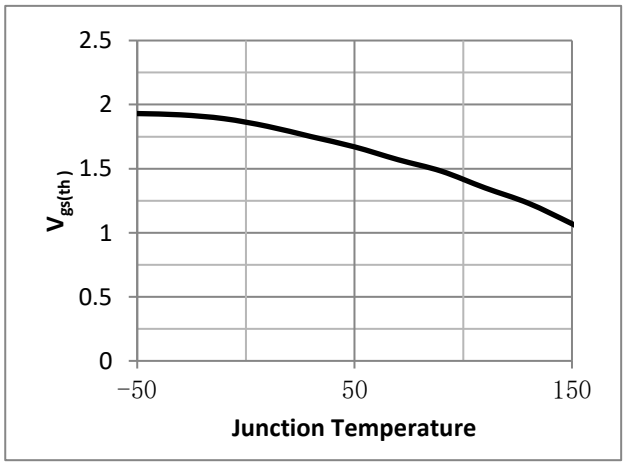


Fig.4 Resistance V.S Drain Current

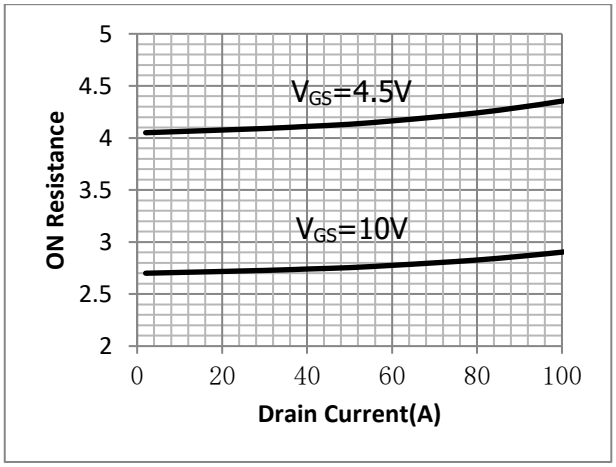


Fig.5 On-Resistance VS Gate Source Voltage

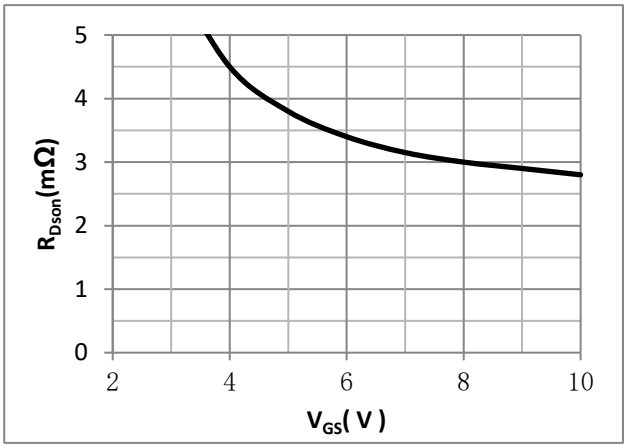


Fig.6 On-Resistance V.S Junction Temperature

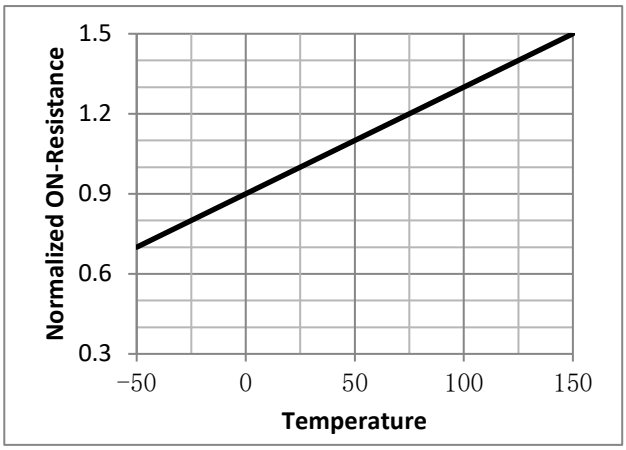


Fig.7 SOA Maximum Safe Operating Area

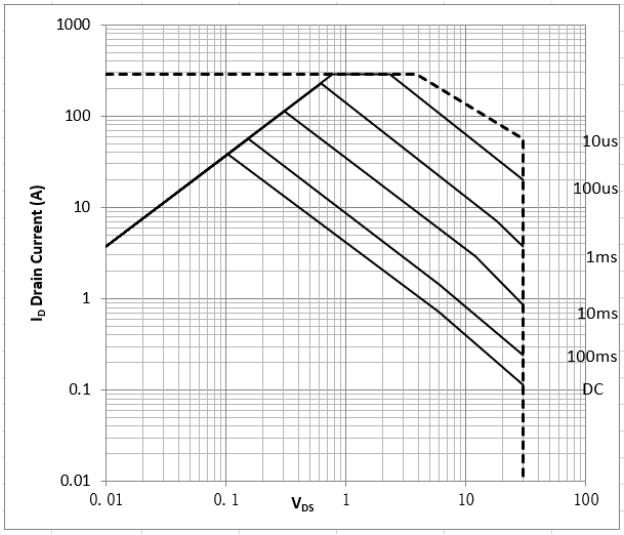


Fig.8 ID-Junction Temperature

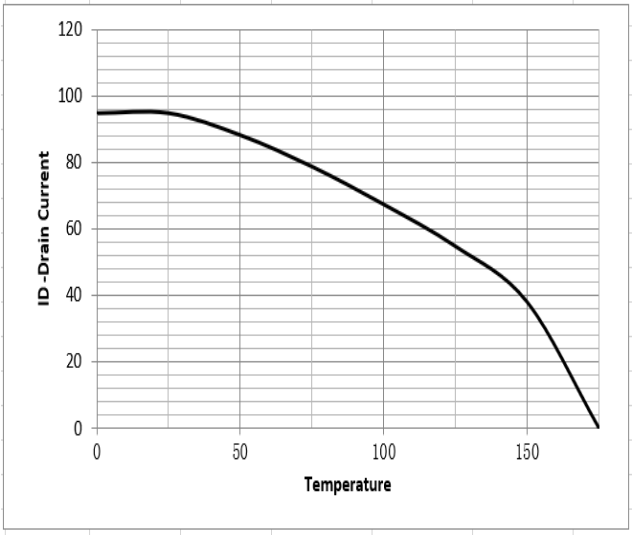


Figure 9. Diode Forward Voltage vs. Current

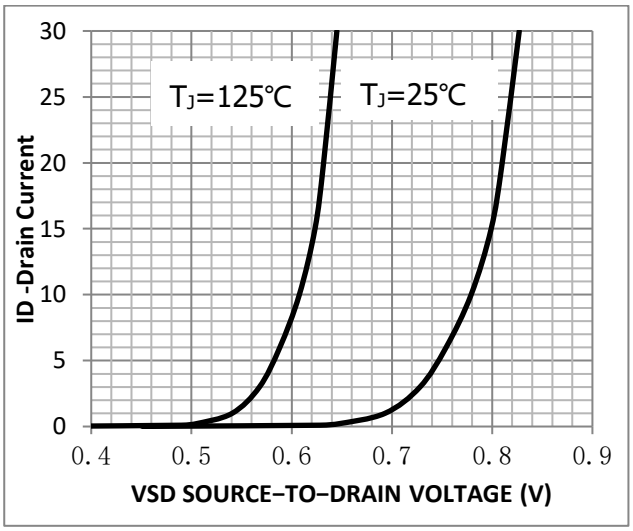


Figure 10. Transfer Characteristics

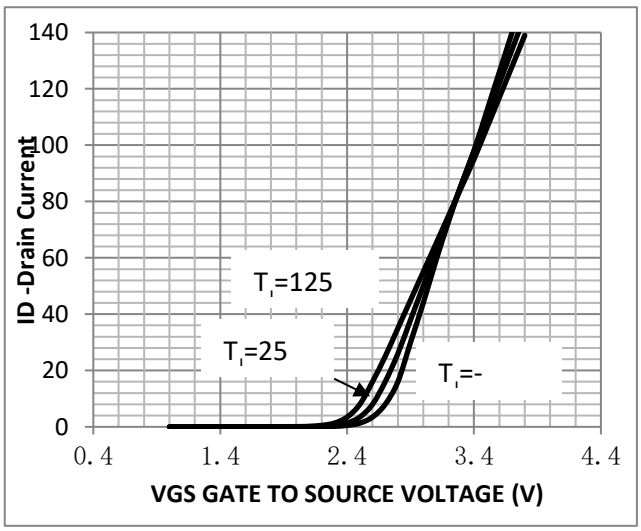


Figure 11. Gate−to−Source and Drain−to−Source Voltage vs. Total Charge

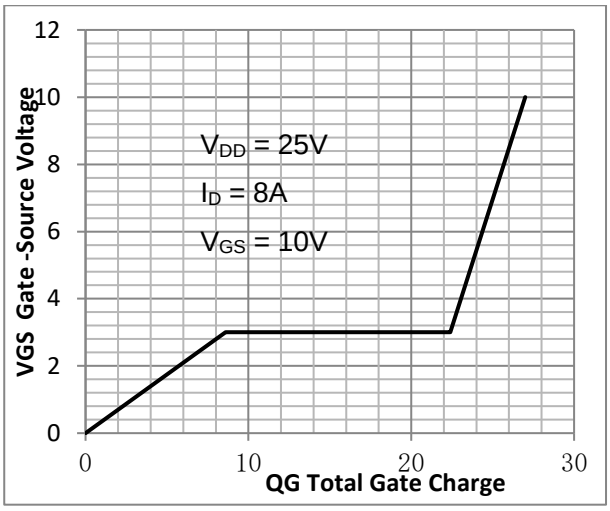


Fig.12 Capacitance Variation

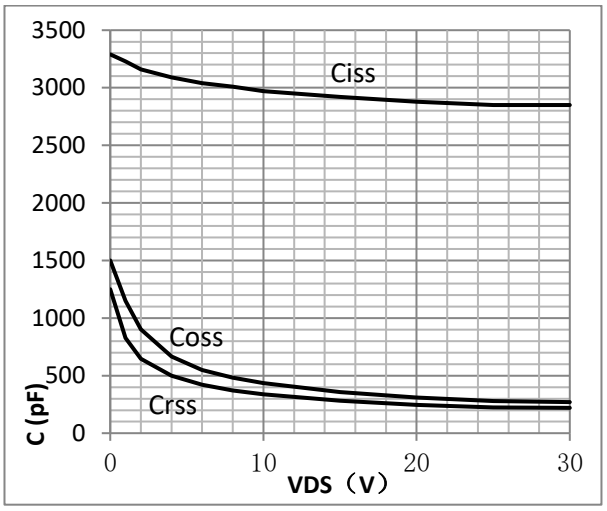


Fig.13 Switching Time Measurement Circuit

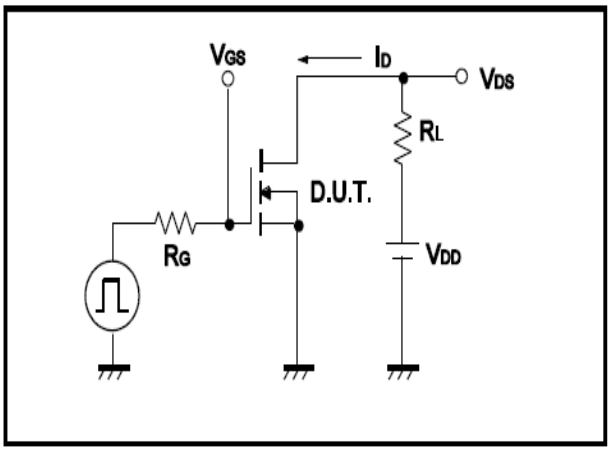


Fig.14 Gate Charge Waveform

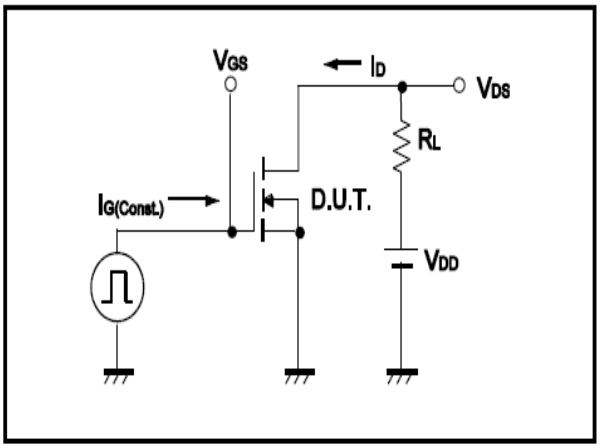


Fig.15 Avalanche Measurement Circuit

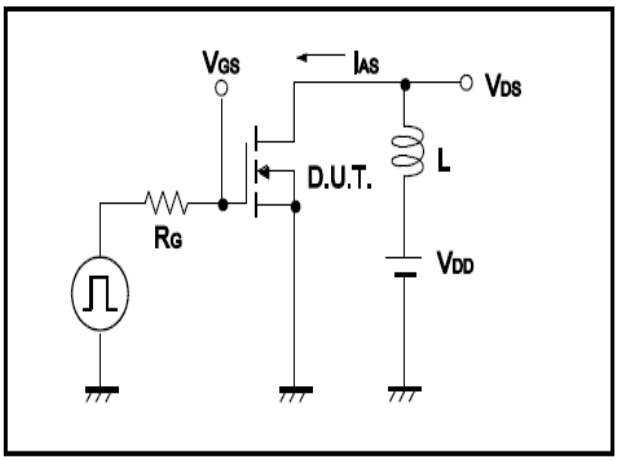


Fig.16 Avalanche Waveform

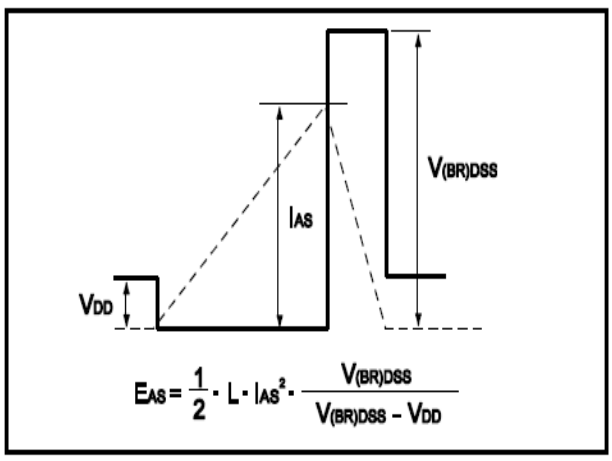
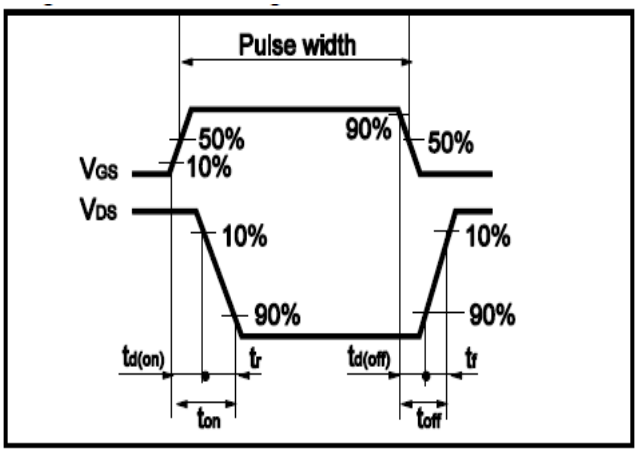


Fig.17 Gate Charge Waveform



●Dimensions(TO-251)

Unit：mm

SYMBOL	min	max	SYMBOL	min	max
A	2.10	2.50	D	6.35	6.80
A1	0.95	1.30	D1	5.10	5.50
B	0.80	1.25	E	5.30	6.30
b	0.50	0.80	e	2.24	2.35
b1	0.70	0.90	E1	4.43	4.73
c	0.45	0.60	L	7.00	9.40
c1	0.45	0.60