● General Description

The ZM094N03D combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

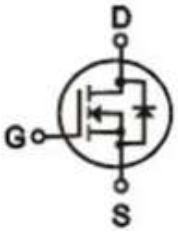
● Features

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

●Application

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

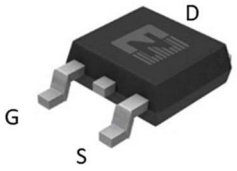
● Product Summary



V_{DS} =30V

$R_{DS(ON)}$ =9.4mΩ

I_D =35A



RoHS

TO-252

●Ordering Information:

Part NO.	ZM094N03D
Marking	ZM094N03
Packing Information	REEL TAPE
Basic ordering unit (pcs)	2500

●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℃	35	A
	$I_{D@}$TC=75℃	26.6	A
	$I_{D@}$TC=100℃	22.05	A
Pulsed Drain Current (Note 1)	I_{DM}	120	A
Total Power Dissipation(TC=25℃)	P_D@TC=25℃	55	W
Total Power Dissipation(TA=25℃)	P_D@TA=25℃	2	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy	E_{AS}	130	mJ

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	2.3	° C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	62.7	° C/W
Soldering temperature, wavesoldering 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=16A		9.4	12	mΩ
		V_{GS}=4.5V, I_D=8A		13	18	mΩ
Forward Transconductance	g_{FS}	V_{DS} =25V, I_D=10A		7		s
Source-drain voltage	V_{SD}	Is=16A			1.28	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	VDS=25V f = 1MHz	-	800	-	pF
Output capacitance	C_{oss}		-	185	-	
Reverse transfer capacitance	C_{rss}		-	110	-	

●Gate Charge characteristics(T_a = 25℃)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q_g	V_{DD} = 15V I_D = 16A V_{GS} = 10V	-	10	-	nC
Gate - Source charge	Q_{gs}		-	4	-	
Gate - Drain charge	Q_{gd}		-	5	-	

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

Fig.1 Power Dissipation

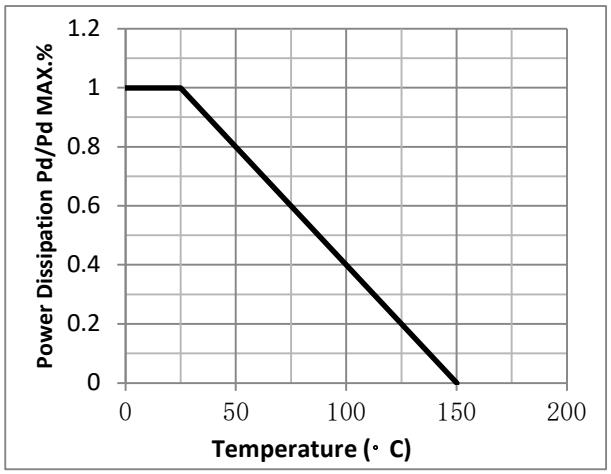


Fig.2 Typical output Characteristics

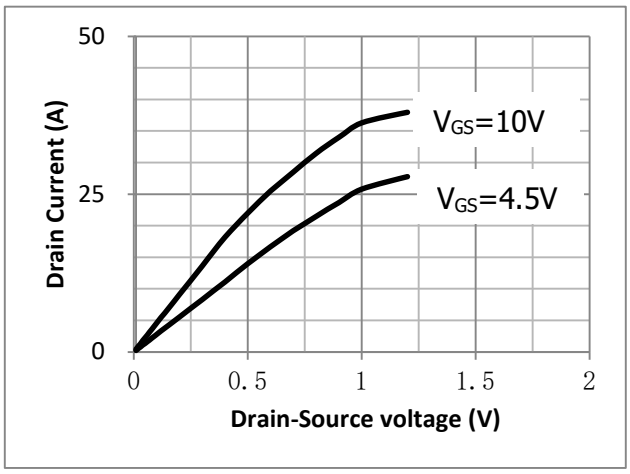


Fig.3 Threshold Voltage V.S Junction Temperature

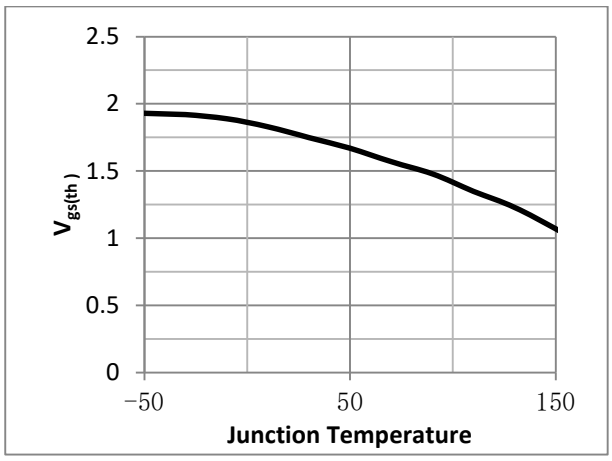


Fig.4 Resistance V.S Drain Current

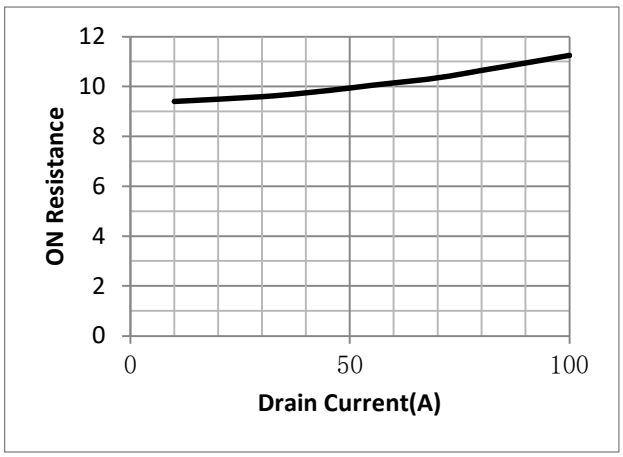


Fig.5 On-Resistance VS Gate Source Voltage

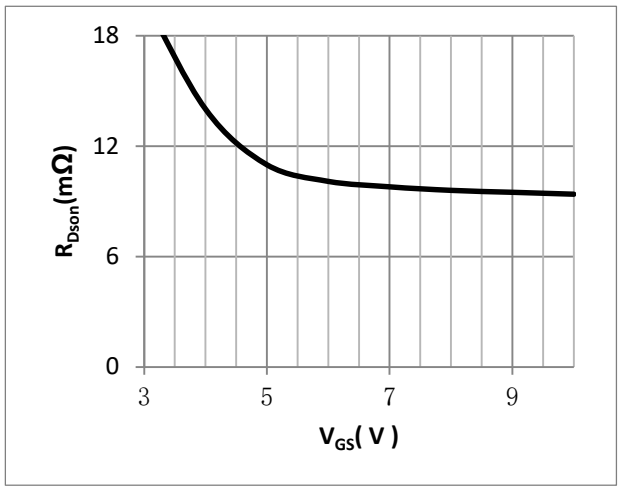


Fig.6 On-Resistance V.S Junction Temperature

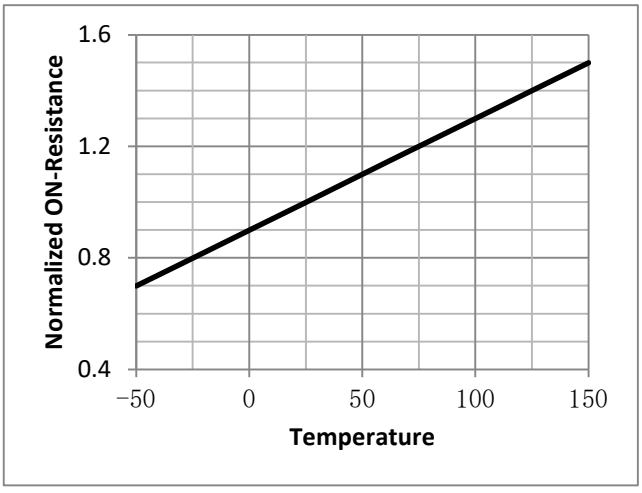


Fig.7 Gate Charge Measurement Circuit

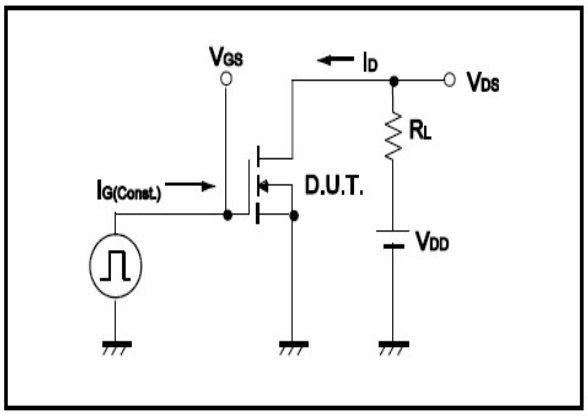


Fig.8 Gate Charge Waveform

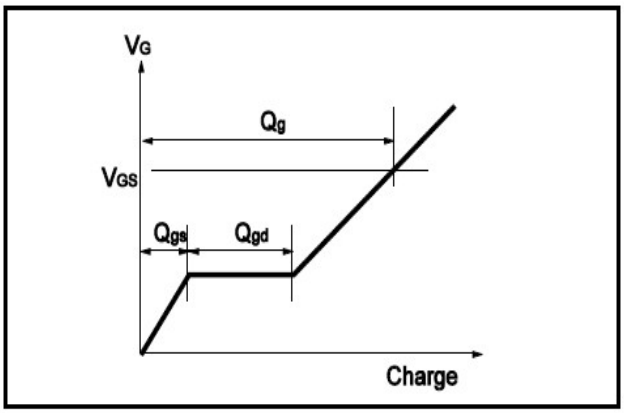


Fig.9 Switching Time Measurement Circuit

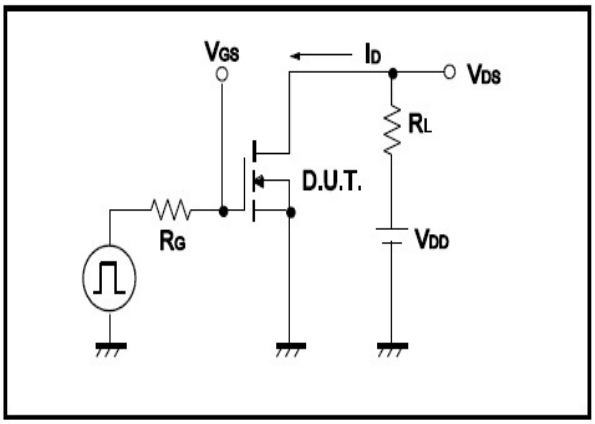


Fig.10 Switching Time Waveform

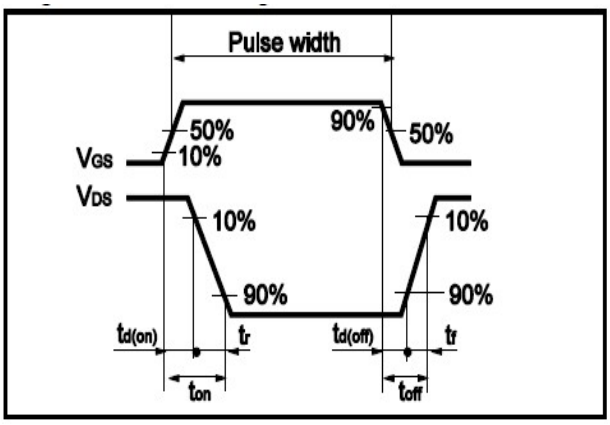


Fig.11 Avalanche Measurement Circuit

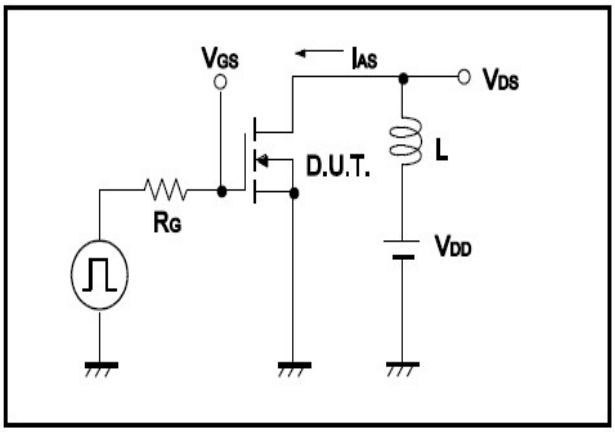
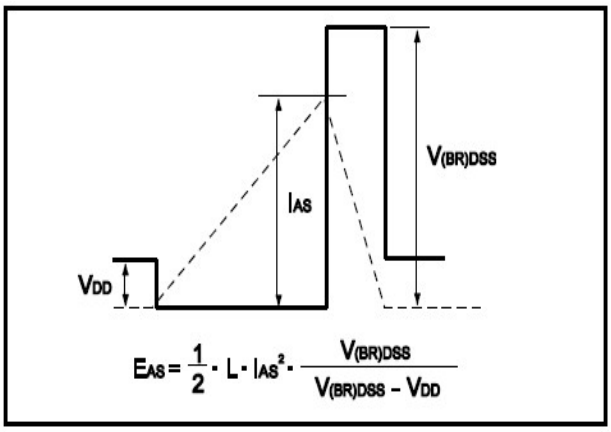
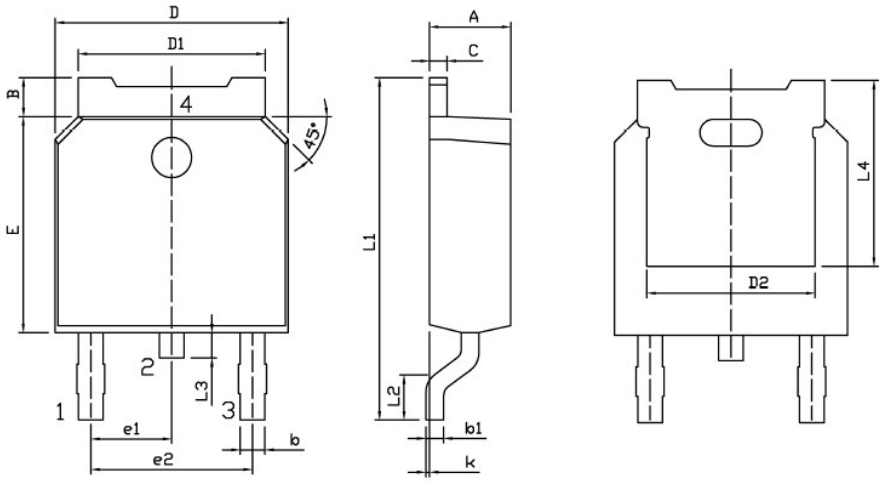


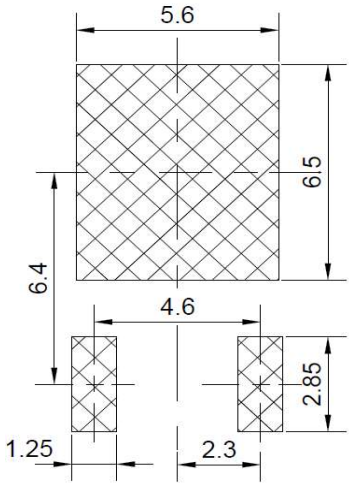
Fig.12 Avalanche Waveform



●Dimensions(TO-252)



Land Pattern
(Only for Reference)



Dimensions In Millimeters					
Symbol	MIN	MAX	Symbol	MIN	MAX
A	2.20	2.40	E	5.95	6.25
B	0.95	1.25	e1	2.24	2.34
b	0.70	0.90	e2	4.43	4.73
b1	0.45	0.55	L1	9.85	10.35
C	0.45	0.55	L2	1.70	2.00
D	6.45	6.75	L3	0.60	0.90
D1	5.10	5.50	L4	5.05	
D2	4.85		k	0.00	0.10