

**• General Description**

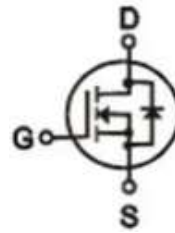
The ZM094N03D combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ .

**• 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**

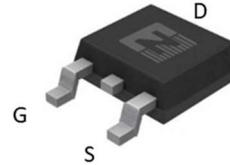
- MB/VGA Vcore
- SMPS 2<sup>nd</sup> Synchronous Rectifier
- POL application
- BLDC Motor driver

**• Product Summary**


$V_{DS} = 30V$

$R_{DS(ON)} = 9.4m\Omega$

$I_D = 35A$



TO-252

**• Ordering Information:**

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

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_{D@TC=25^\circ C}$	35	A
	$I_{D@TC=75^\circ C}$	26.6	A
	$I_{D@TC=100^\circ C}$	22.05	A
Pulsed Drain Current (Note 1)	$I_{DM}$	120	A
Total Power Dissipation( $TC=25^\circ C$ )	$P_{D@TC=25^\circ C}$	55	W
Total Power Dissipation( $TA=25^\circ C$ )	$P_{D@TA=25^\circ C}$	2	W
Operating Junction Temperature	$T_J$	-55 to 150	$^\circ C$
Storage Temperature	$T_{STG}$	-55 to 150	$^\circ C$
Single Pulse Avalanche Energy	$E_{AS}$	130	mJ

**• Thermal resistance**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	$R_{thJC}$	-	-	2.3	$^{\circ}C/W$
Thermal resistance, junction - ambient	$R_{thJA}$	-	-	62.7	$^{\circ}C/W$
Soldering temperature, wavesoldering for 10s	$T_{sold}$	-	-	265	$^{\circ}C$

### •Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	30			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = 250\mu A$	1.2		2.5	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS} = 30V, V_{GS} = 0V$			1.0	$\mu A$
Gate- Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 16A$		9.4	12	$m\Omega$
		$V_{GS} = 4.5V, I_D = 8A$		13	18	$m\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS} = 25V, I_D = 10A$		7		S
Source-drain voltage	$V_{SD}$	$I_S = 16A$			1.28	V

### •Electronic Characteristics

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

### •Gate Charge characteristics( $T_a = 25^{\circ}C$ )

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  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$  ;

Fig.1 Power Dissipation

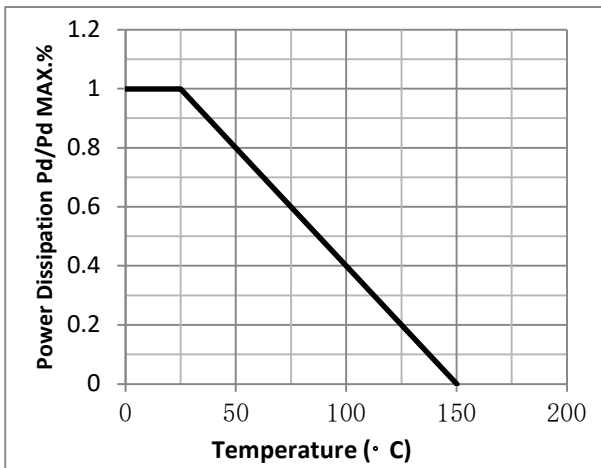


Fig.2 Typical output Characteristics

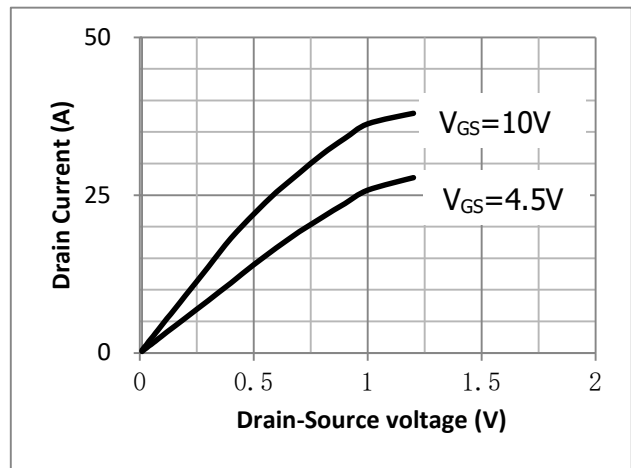


Fig.3 Threshold Voltage V.S Junction Temperature

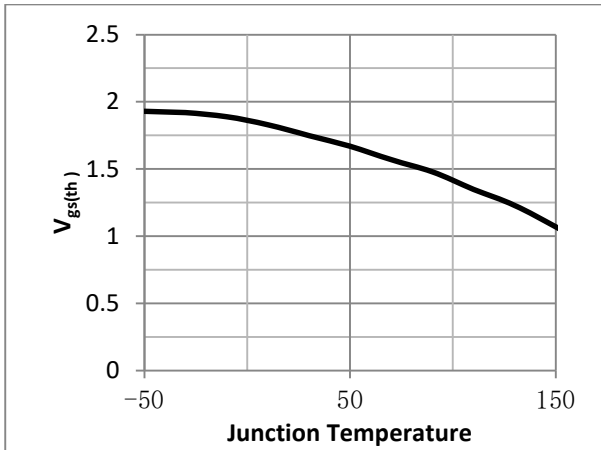


Fig.4 Resistance V.S Drain Current

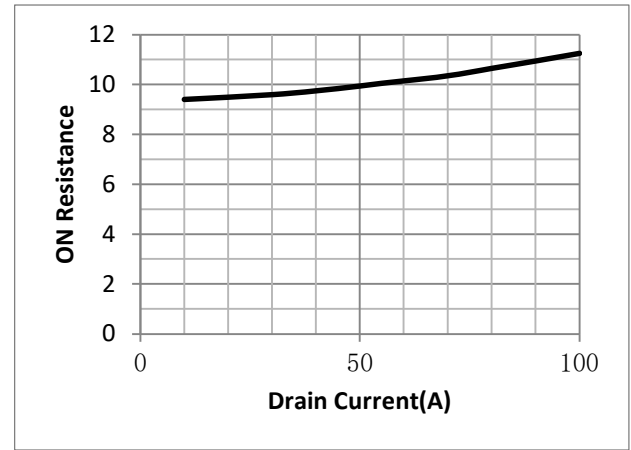


Fig.5 On-Resistance VS Gate Source Voltage

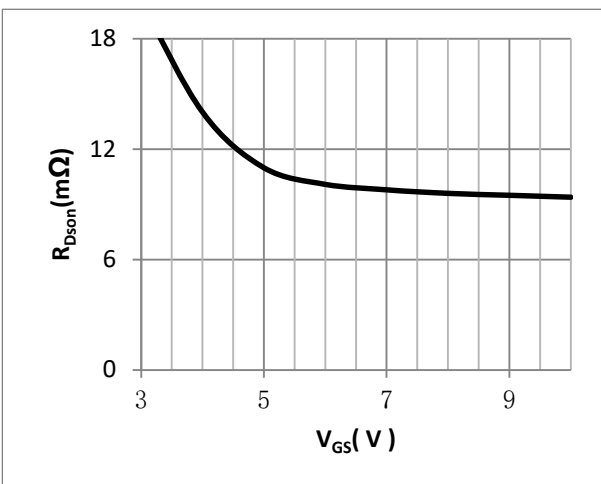


Fig.6 On-Resistance V.S Junction Temperature

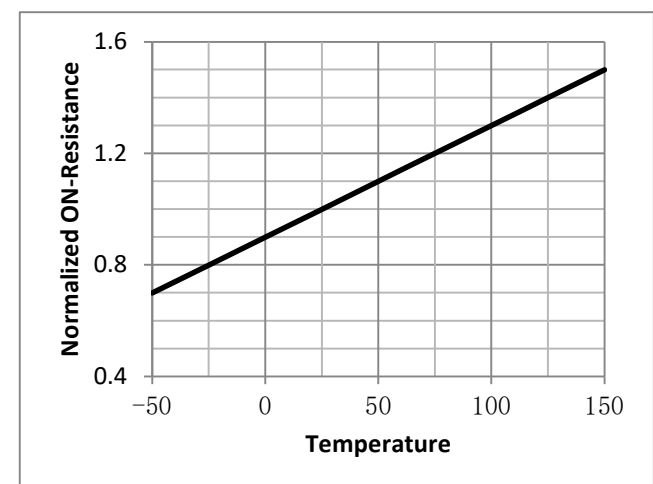


Fig.7 Gate Charge Measurement Circuit

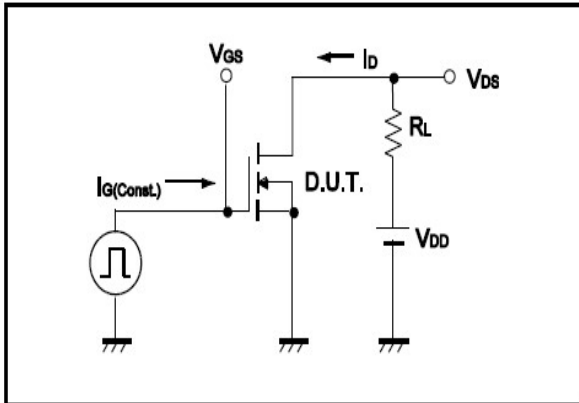


Fig.8 Gate Charge Waveform

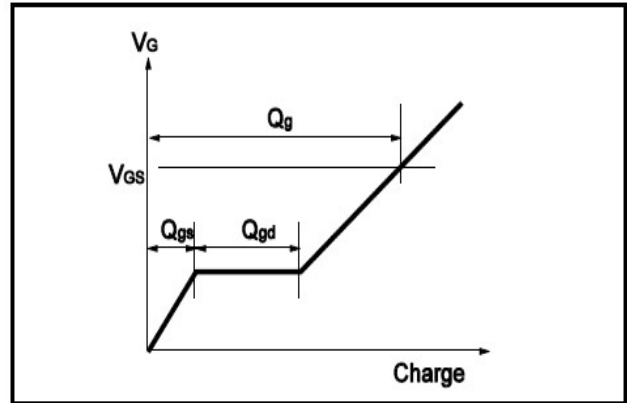


Fig.9 Switching Time Measurement Circuit

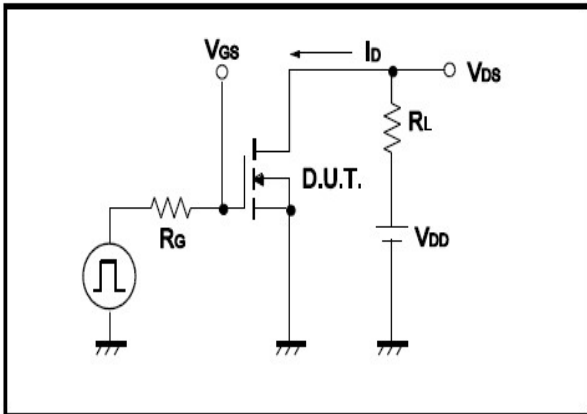


Fig.10 Switching Time Waveform

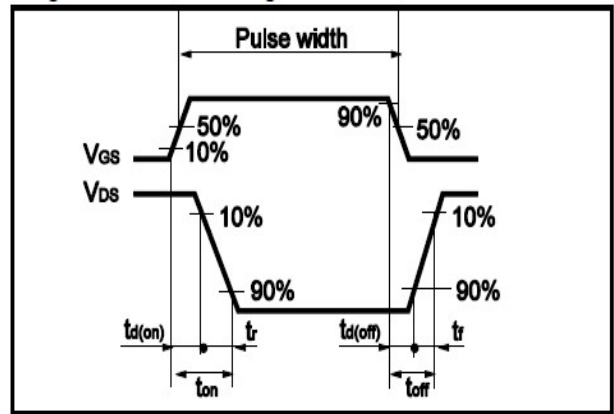


Fig.11 Avalanche Measurement Circuit

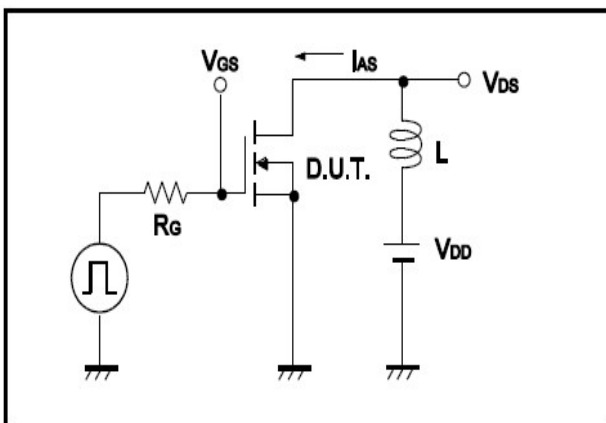
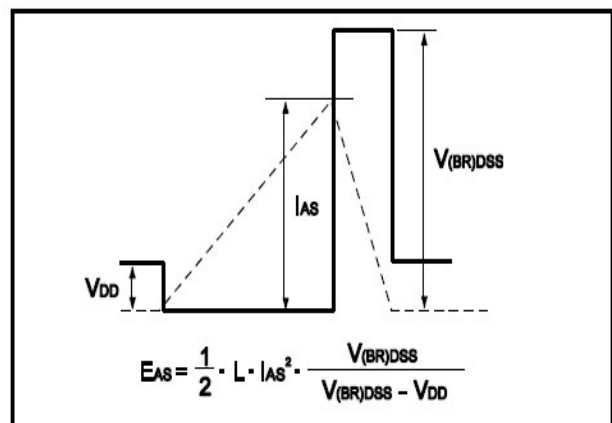


Fig.12 Avalanche Waveform



**•Dimensions(TO-252)**

Unit: mm

SYMBOL	min	max	SYMBOL	min	max
A	2.10	2.50	B	0.85	1.25
b	0.50	0.80	b1	0.50	0.90
b2	0.45	0.70	C	0.45	0.70
D	6.30	6.75	D1	5.10	5.50
E	5.30	6.30	e1	2.25	2.35
L1	9.20	10.60	e2	4.45	4.75
L2	0.90	1.75	L3	0.60	1.10
K	0.00	0.23			

