

**• General Description**

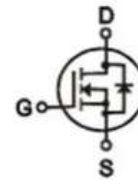
The ZM012N03N combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ .

**• 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**

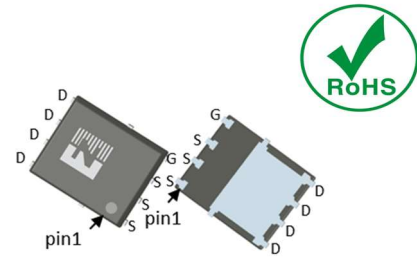
- MB/VGA Vcore
- SMPS 2<sup>nd</sup> Synchronous Rectifier
- POL application
- BLDC Motor driver

**• Product Summary**


$V_{DS} = 30V$

$R_{DS(ON)} = 1.2m\Omega$

$I_D = 140A$


**DFN5 x 6**
**• Ordering Information:**

Part NO.	ZM012N03N
Marking	ZM012N03
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

**• Absolute Maximum Ratings (TC=25°C)**

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_{D@TC=25^{\circ}C}$	140	A
	$I_{D@TC=75^{\circ}C}$	106	A
	$I_{D@TC=100^{\circ}C}$	88	A
Pulsed Drain Current ①	$I_{DM}$	320	A
Total Power Dissipation(TC=25°C)	$P_D@TC=25^{\circ}C$	80	W
Total Power Dissipation(TA=25°C)	$P_D@TA=25^{\circ}C$	3.2	W
Operating Junction Temperature	$T_J$	-55 to 150	°C
Storage Temperature	$T_{STG}$	-55 to 150	°C
Single Pulse Avalanche Energy	$E_{AS}$	460	mJ

**•Thermal resistance**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	$R_{thJC}$	-	-	1.5	$^{\circ}C/W$
Thermal resistance, junction - ambient	$R_{thJA}$	-	-	40	$^{\circ}C/W$
Soldering temperature, wave soldering 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	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 24A$		1.2	1.5	m $\Omega$
		$V_{GS} = 4.5V, I_D = 12A$		1.8	2.4	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS} = 25V, I_D = 10A$		40		s
Source-drain voltage	$V_{SD}$	$I_S = 24A$		0.8	1.28	V

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	$C_{iss}$	$V_{DS} = 25V$ $f = 1MHz$	-	5700	-	pF
Output capacitance	$C_{oss}$		-	680	-	
Reverse transfer capacitance	$C_{rss}$		-	530	-	

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

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	$Q_g$	$V_{DD} = 15V$	-	125	-	nC
Gate - Source charge	$Q_{gs}$	$I_D = 20A$	-	16	-	
Gate - Drain charge	$Q_{gd}$	$V_{GS} = 10V$	-	25	-	

Note: ① Pulse Test : Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$  ;

Fig.1 Power Dissipation

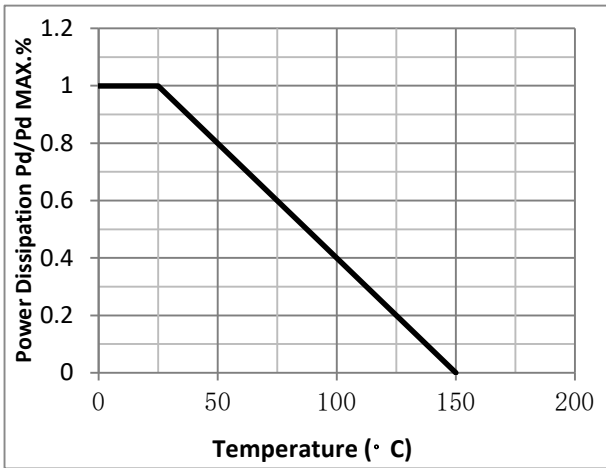


Fig.2 Typical output Characteristics

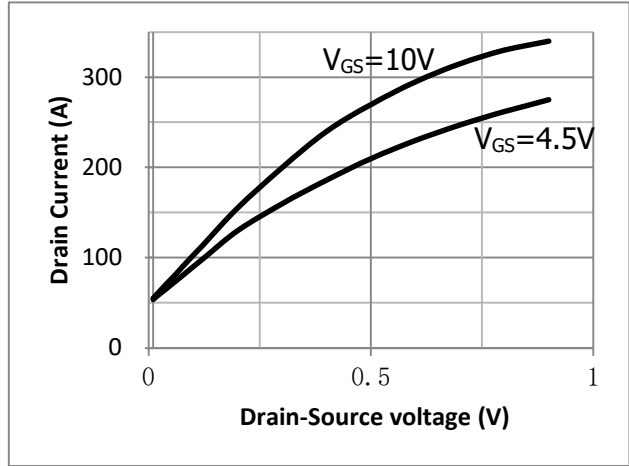


Fig.3 Threshold Voltage V.S Junction Temperature

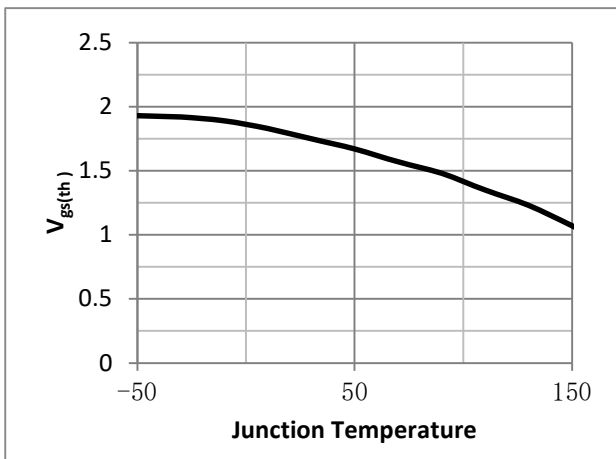


Fig.4 Resistance V.S Drain Current

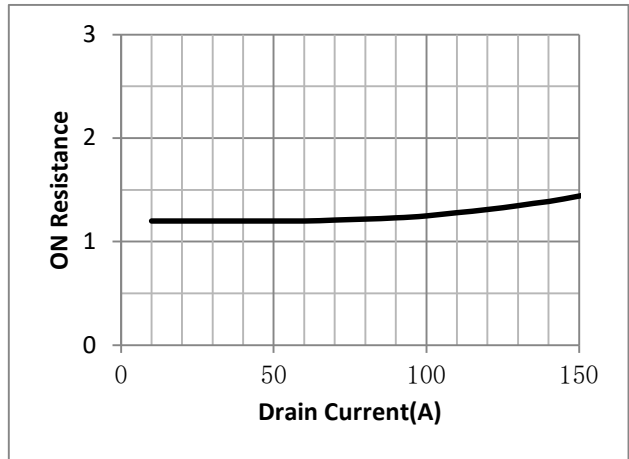


Fig.5 On-Resistance VS Gate Source Voltage

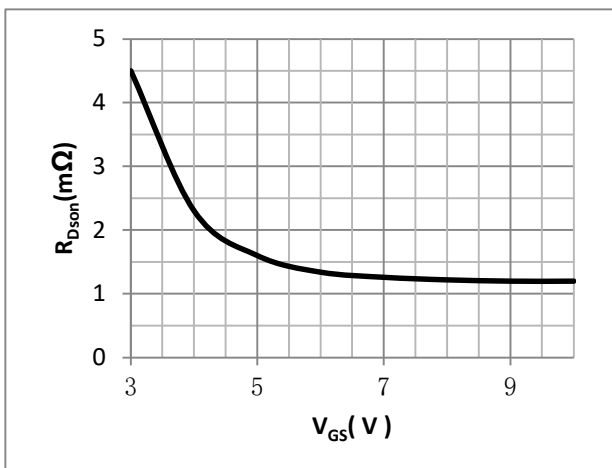


Fig.6 On-Resistance V.S Junction Temperature

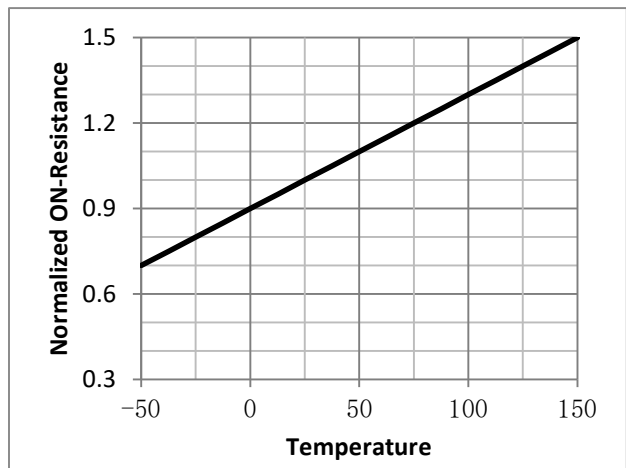


Fig.7 Gate Charge Characteristics

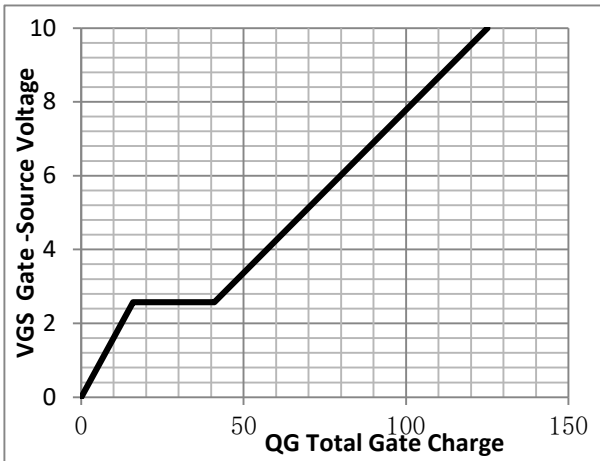


Fig.8 Capacitance vs Vds

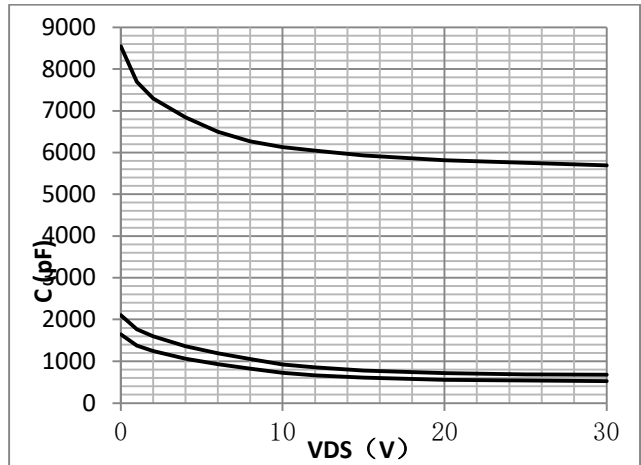


Fig.9 SOA Maximum Safe Operating Area

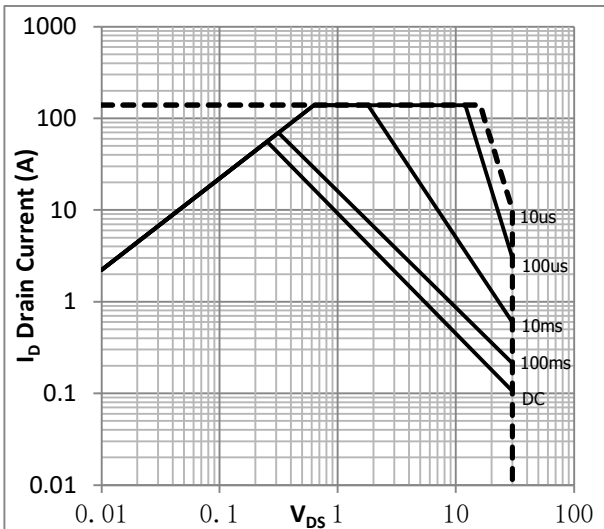


Fig.10 ID-Junction Temperature

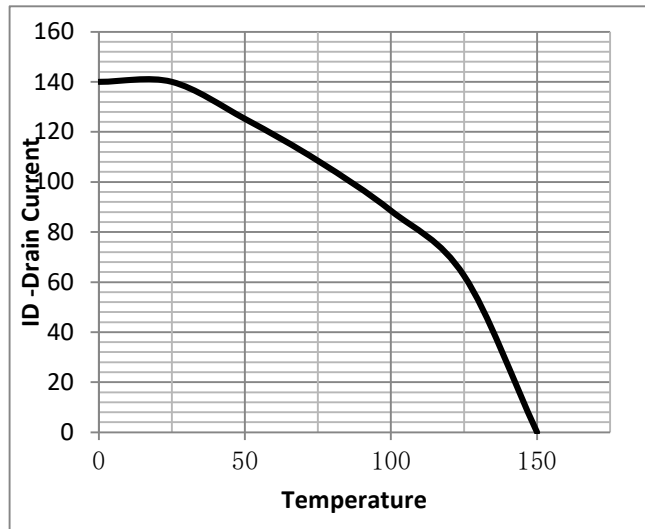


Fig.11 Gate Charge Measurement Circuit

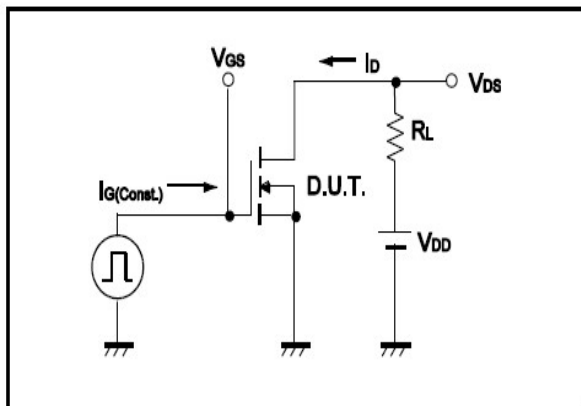


Fig.12 Gate Charge Waveform

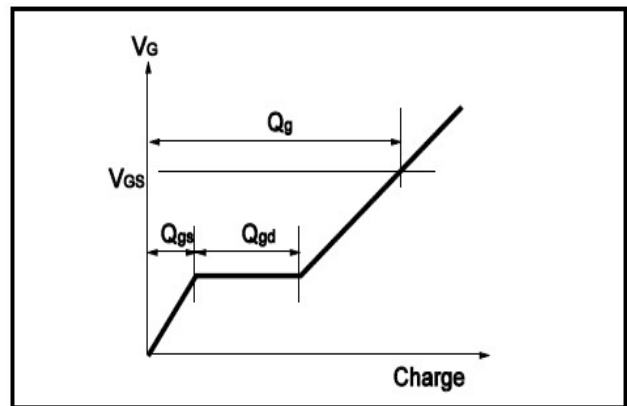


Fig.13 Resistive Switching Test Circuit

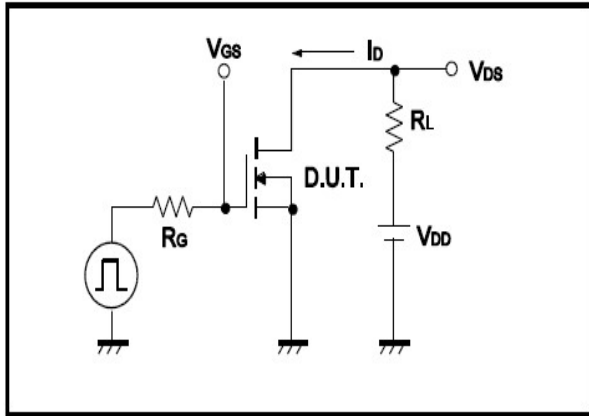


Fig.14 Resistive Switching Test Waveform

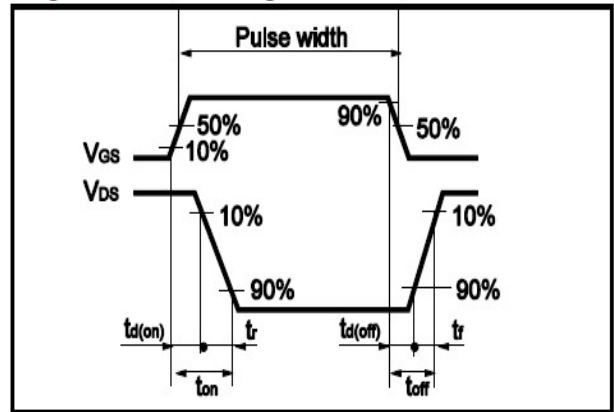


Fig.15 Avalanche Measurement Circuit

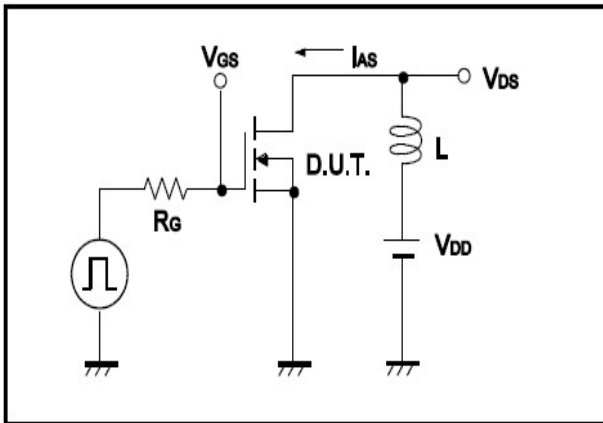
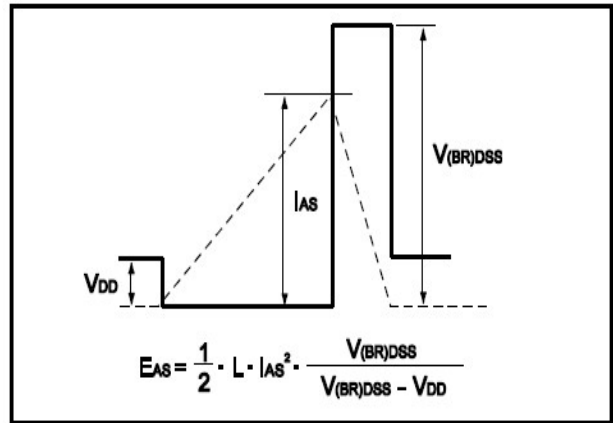


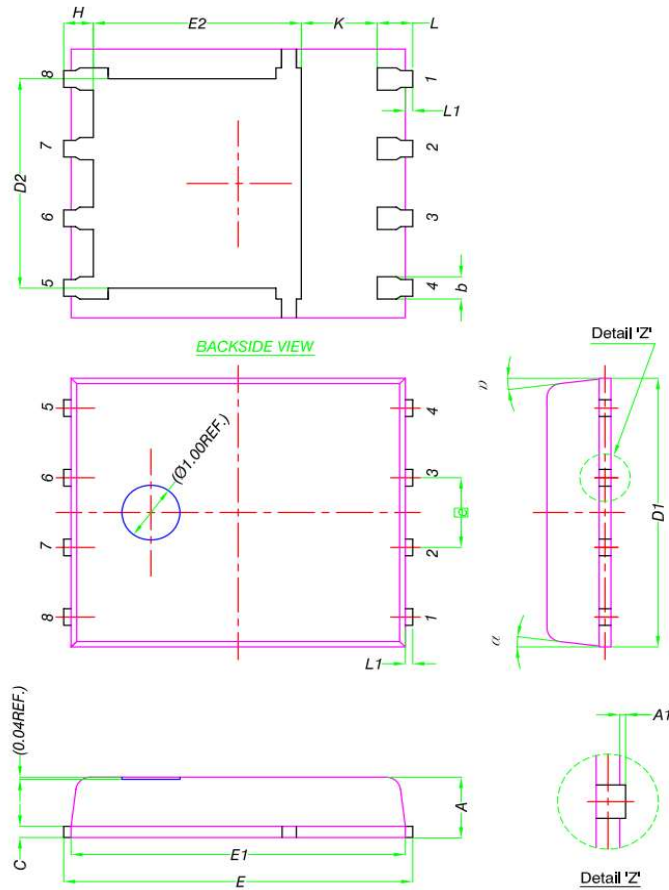
Fig.16 Avalanche Waveform





•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°