

**General Description**

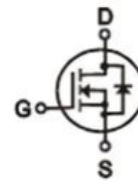
It combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ . This device is ideal for load switch and battery protection applications.

**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**

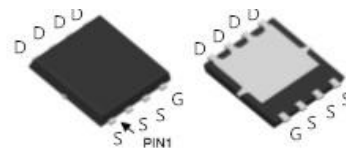
- MB/VGA Vcore
- SMPS 2<sup>nd</sup> Synchronous Rectifier
- POL application
- BLDC Motor driver

**Product Summary**

$V_{DS} = 40V$

$R_{DS(ON)} = 3.6m\Omega$

$I_D = 55A$



DFN3 x 3

**Ordering Information:**

Part NO.	ZMS032N04M
Marking	032N04
Packing Information	REEL TAPE
Basic ordering unit (pcs)	5000

**Absolute Maximum Ratings (T<sub>C</sub>=25°C)**

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	40	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D @ T_C=25^\circ C$	55	A
	$I_D @ T_C=75^\circ C$	42	A
	$I_D @ T_C=100^\circ C$	34	A
Pulsed Drain Current ①	$I_{DM}$	165	A
Total Power Dissipation	$P_D @ T_C=25^\circ C$	46	W
Total Power Dissipation	$P_D @ T_A=25^\circ C$	2.3	W
Operating Junction Temperature	$T_J$	-55 to 150	°C
Storage Temperature	$T_{STG}$	-55 to 150	°C
Single Pulse Avalanche Energy	$E_{AS}$	80	mJ



### •Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	$R_{thJC}$	-	-	2.7	$^{\circ}C/W$
Thermal resistance, junction - ambient	$R_{thJA}$	-	-	53	$^{\circ}C/W$
Soldering temperature, wave soldering for 10s	$T_{sold}$	-	-	265	$^{\circ}C$

### •Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40			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	$I_{DSS}$	$V_{DS} = 40V, V_{GS} = 0V$			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	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 24A$		3.6	4.7	$m\Omega$
		$V_{GS} = 4.5V, I_D = 12A$		5.4	7.0	$m\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS} = 25V, I_D = 10A$		11		s
Source-drain voltage	$V_{SD}$	$I_S = 24A$			1.28	V

### •Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	$C_{iss}$	$f = 1MHz$	-	1300	-	pF
Output capacitance	$C_{oss}$		-	395	-	
Reverse transfer capacitance	$C_{rss}$		-	22	-	

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

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	$Q_g$	$V_{DD} = 25V$	-	27	-	nC
Gate - Source charge	$Q_{gs}$	$I_D = 8A$	-	2.9	-	
Gate - Drain charge	$Q_{gd}$	$V_{GS} = 10V$	-	7.6	-	

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



Fig.1 Power Dissipation

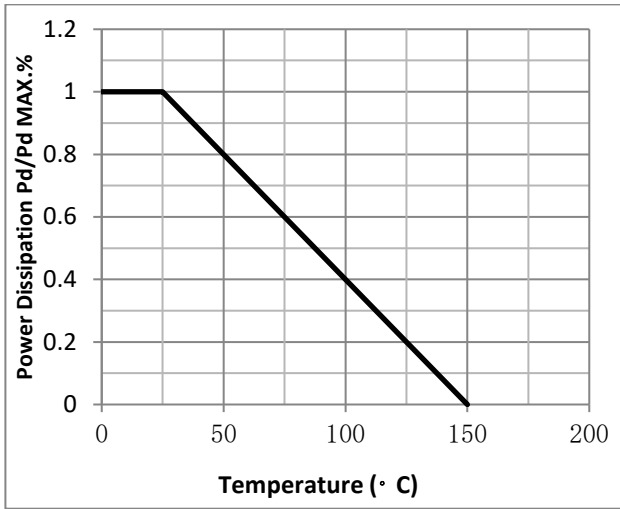


Fig.2 Typical output Characteristics

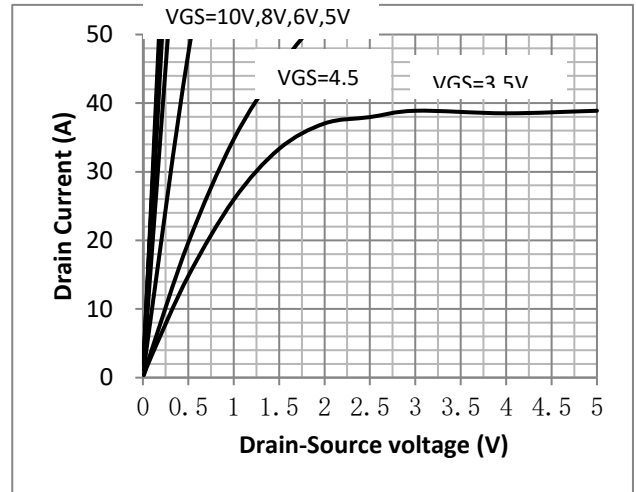


Fig.3 Threshold Voltage V.S Junction Temperature

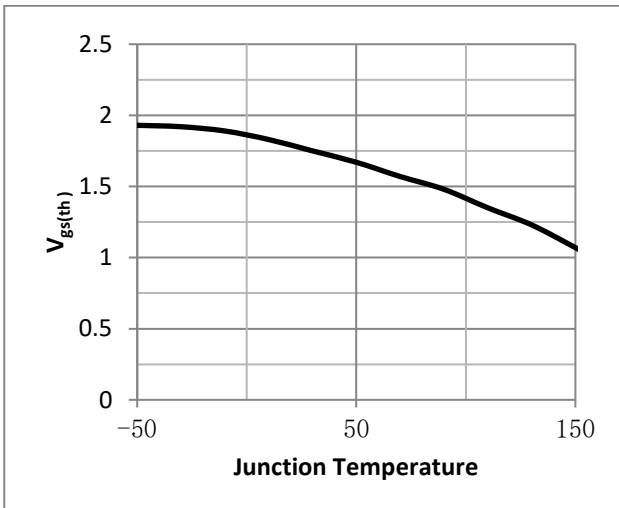


Fig.4 Resistance V.S Drain Current

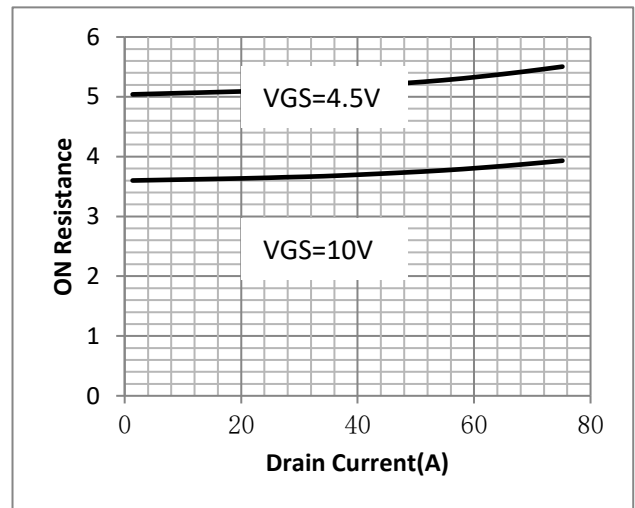


Fig.5 On-Resistance VS Gate Source Voltage

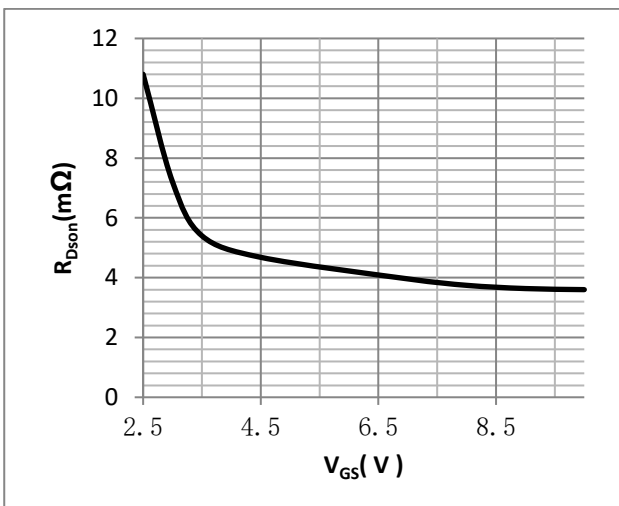


Fig.6 On-Resistance V.S Junction Temperature

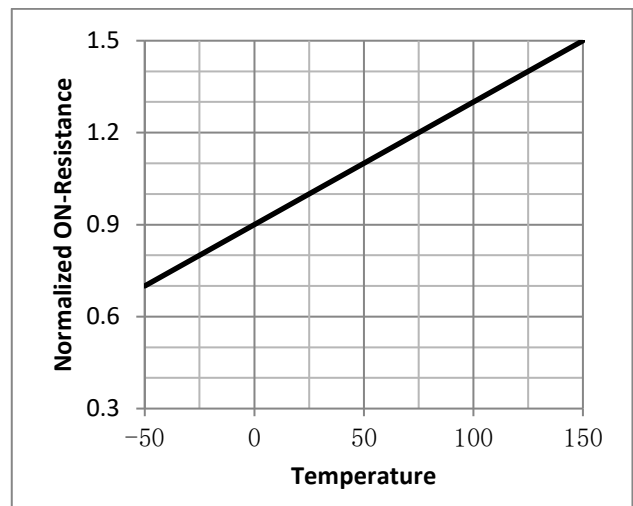


Fig.7 Gate Charge Characteristics

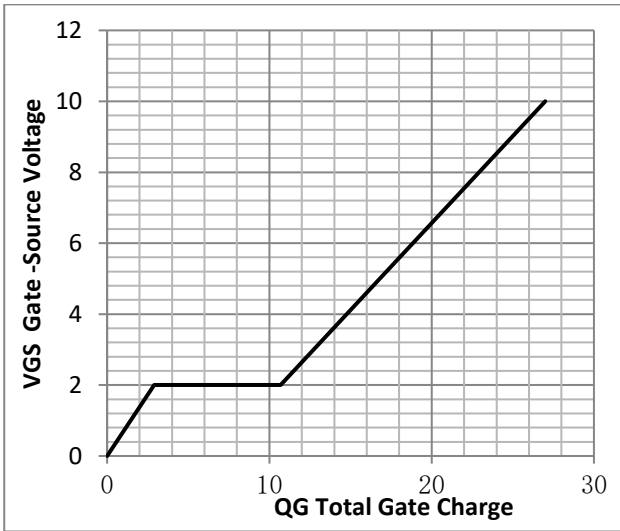


Fig.8 Capacitance vs Vds

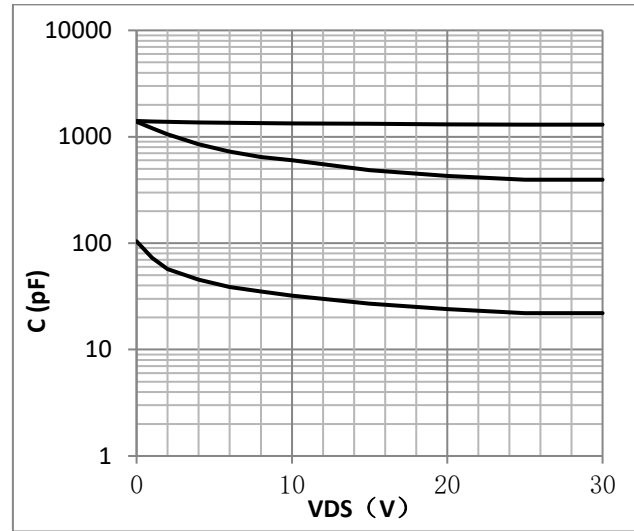


Fig.9 SOA Maximum Safe Operating Area

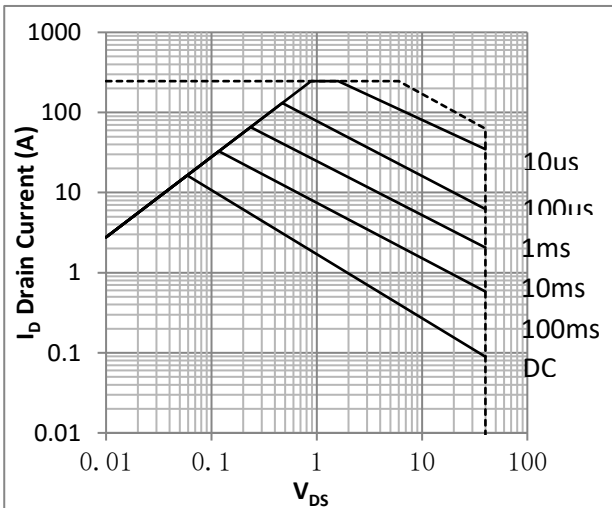


Fig.10 ID-Junction Temperature

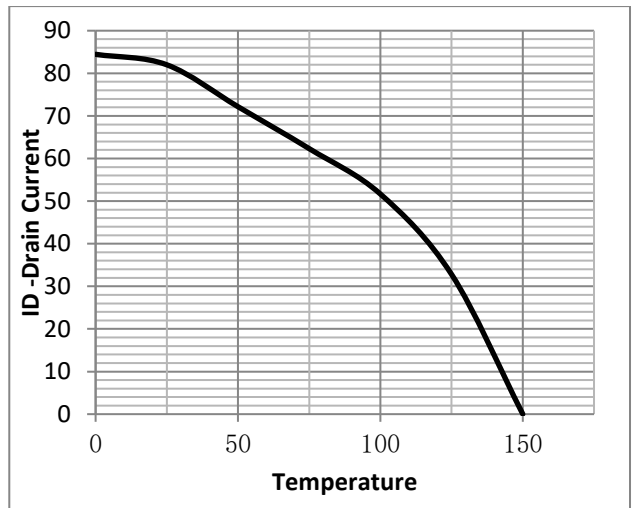


Fig.11 Switching Time Measurement Circuit

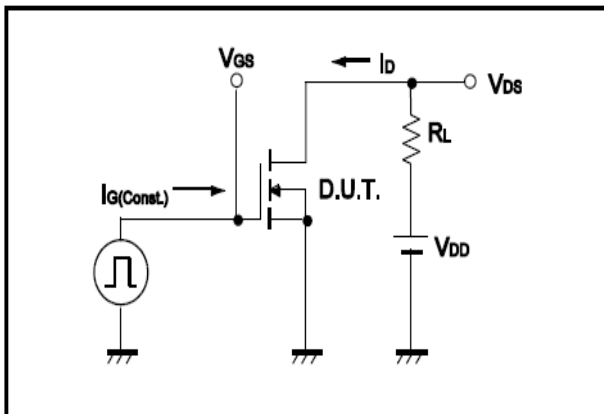


Fig.12 Gate Charge Waveform

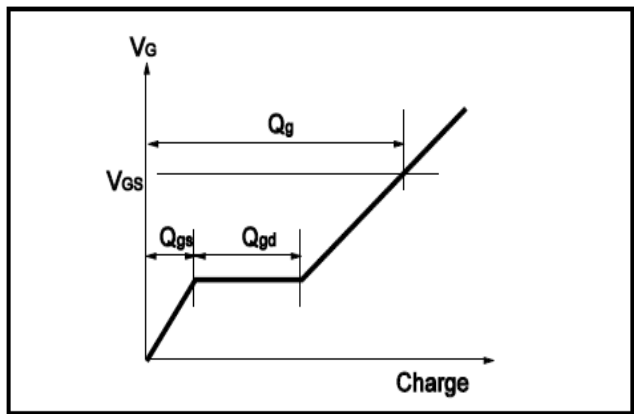




Fig.13 Resistive Switching Test Circuit

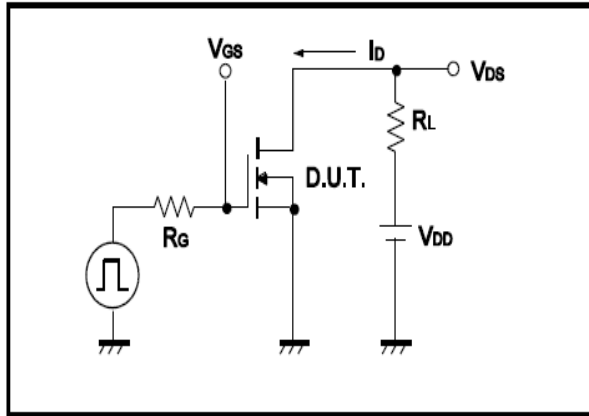


Fig.14 Resistive Switching Test Waveform

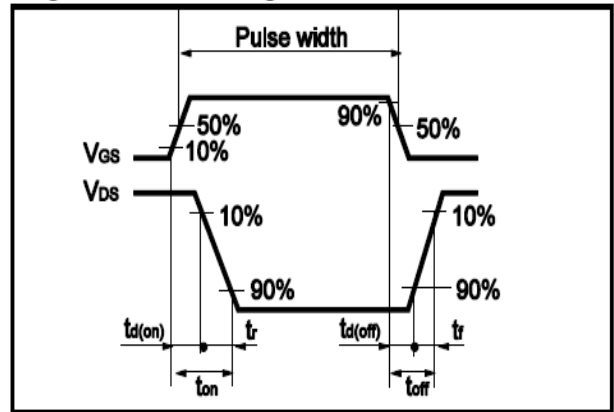


Fig.15 Avalanche Measurement Circuit

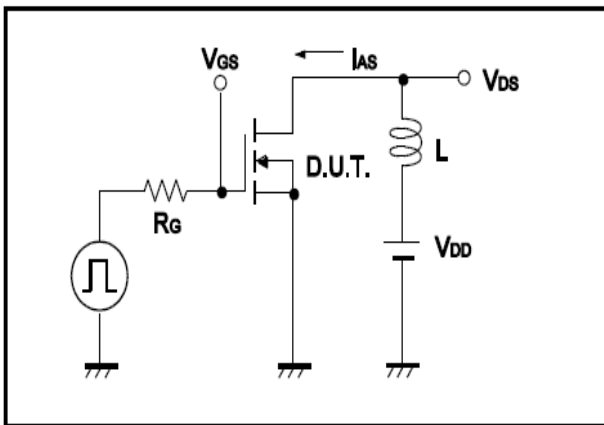
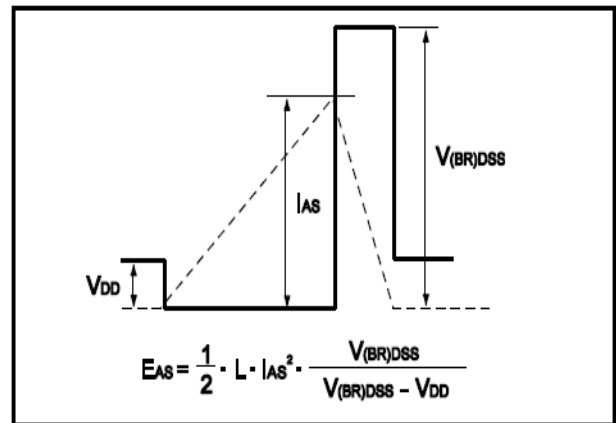


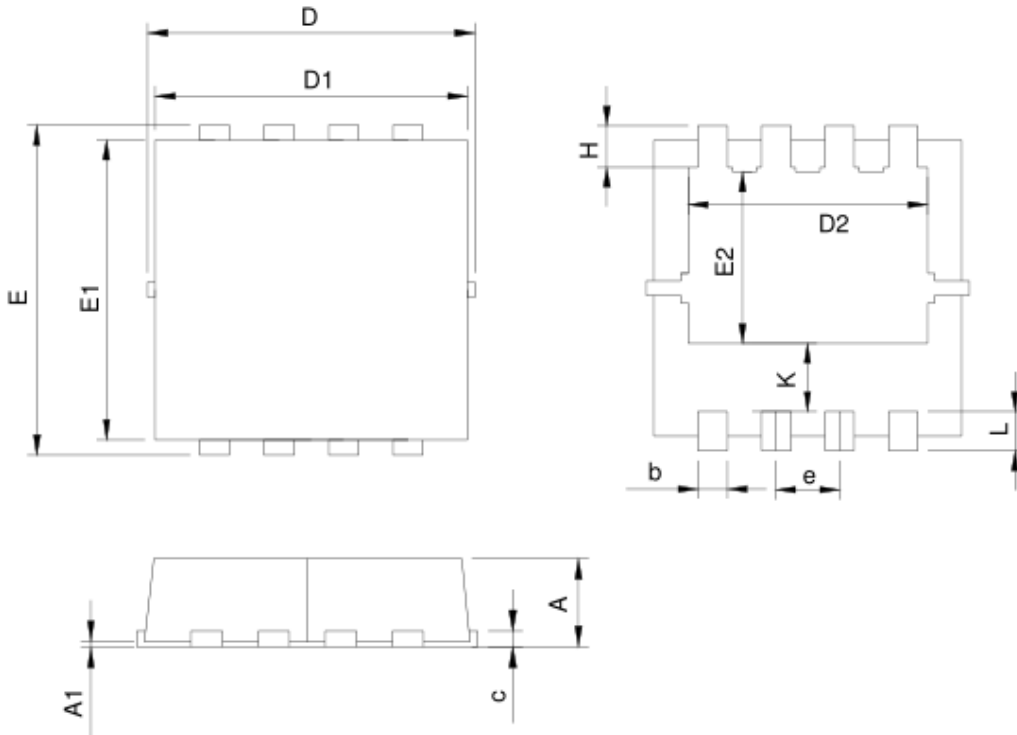
Fig.16 Avalanche Waveform





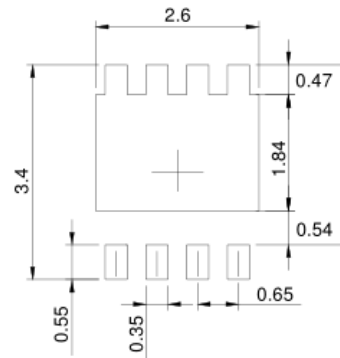
•Dimensions(DFN3×3)

Unit: mm



SYMBOL	DFN3.3x3.3-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	1.00	0.028	0.039
A1	0.00	0.05	0.000	0.002
b	0.25	0.35	0.010	0.014
c	0.14	0.20	0.006	0.008
D	3.10	3.50	0.122	0.138
D1	3.05	3.25	0.120	0.128
D2	2.35	2.55	0.093	0.100
E	3.10	3.50	0.122	0.138
E1	2.90	3.10	0.114	0.122
E2	1.64	1.84	0.065	0.072
e	0.65 BSC		0.026 BSC	
H	0.32	0.52	0.013	0.020
K	0.59	0.79	0.023	0.031
L	0.25	0.55	0.010	0.022

RECOMMENDED LAND PATTERN



UNIT: mm