



• 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.

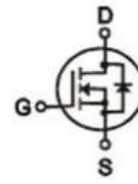
• Features

- 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 2nd Synchronous Rectifier
- POL application
- BLDC Motor driver

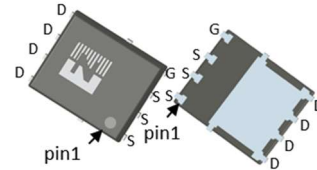
• Product Summary



$V_{DS} = 30V$

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

$I_D = 110A$



DFN5 x 6

• Ordering Information:

Part NO.	ZMS016N03NC
Marking	ZMS016N03
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

• Absolute Maximum Ratings (T_C=25°C)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	$I_D @TC=25^\circ C$	110	A
	$I_D @TC=75^\circ C$	84	A
	$I_D @TC=100^\circ C$	69	A
Pulsed Drain Current ^①	I_{DM}	330	A
Total Power Dissipation	$P_D @TC=25^\circ C$	96	W
Total Power Dissipation	$P_D @TA=25^\circ C$	3.1	W
Operating Junction Temperature	T_J	-55 to 150	°C
Storage Temperature	T_{STG}	-55 to 150	°C
Single Pulse Avalanche Energy	E_{AS}	110	mJ



• Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	1.3	$^{\circ}C/W$
Thermal resistance, junction - ambient	R_{thJA}	-	-	40	$^{\circ}C/W$
Soldering temperature, wave soldering for 10s	T_{sold}	-	-	260	$^{\circ}C$

• 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	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 24A$		1.3	1.5	m Ω
		$V_{GS} = 4.5V, I_D = 12A$		2.2	2.8	m Ω
Forward Transconductance	g_{FS}	$V_{DS} = 5V, I_D = 5A$		32		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}	$V_{DS} = 25V$ $f = 1MHz$	-	2250	-	pF
Output capacitance	C_{oss}		-	620	-	
Reverse transfer capacitance	C_{rss}		-	53	-	

• Dynamic characteristics ($T_a = 25^{\circ}C$)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q_g	$V_{DD} = 25V$ $I_D = 8A$ $V_{GS} = 10V$	-	41	-	nC
Gate - Source charge	Q_{gs}		-	8.6	-	
Gate - Drain charge	Q_{gd}		-	4.5	-	
Turn-on delay time	$t_{D(on)}$	$V_{GS} = 10V, V_{DS} = 15V,$ $R_G = 3.3\Omega, I_D = 20A$	-	12	-	ns
Turn-on rise time	t_r		-	28	-	ns
Turn-off delay time	$t_{D(off)}$		-	24	-	ns



Turn-off fall time	t_f	$V_{DD}=20V, di_s/dt = 100A/us, I_s=30A$	-	13	-	ns
Reverse recovery time	t_{rr}		-	22	-	ns
Reverse recovery charge	Q_{rr}		-	23	-	nC

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

Fig.1 Power Dissipation

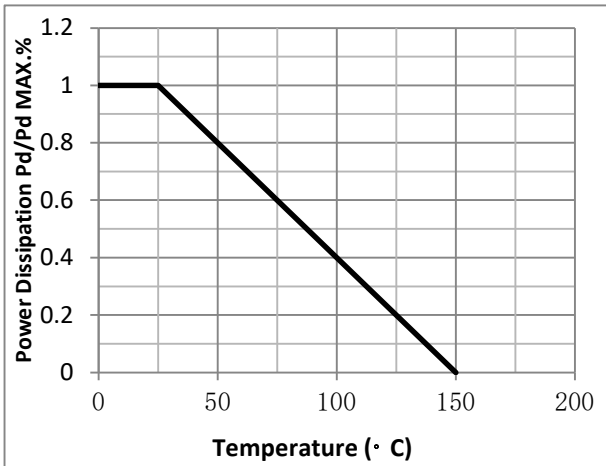


Fig.2 Typical output Characteristics

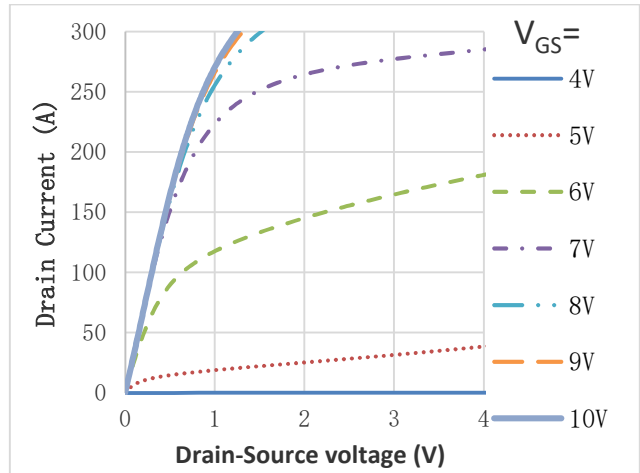


Fig.3 Threshold Voltage V.S Junction Temperature

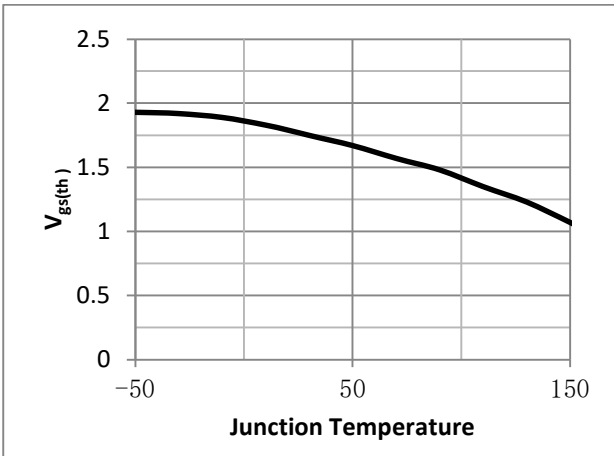


Fig.4 Resistance V.S Drain Current

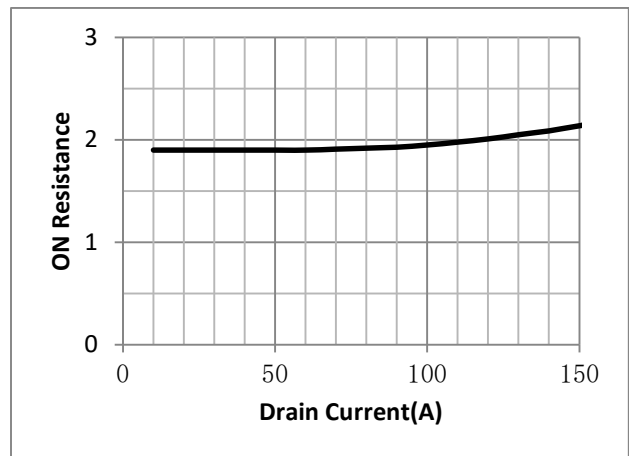




Fig.5 On-Resistance VS Gate Source Voltage

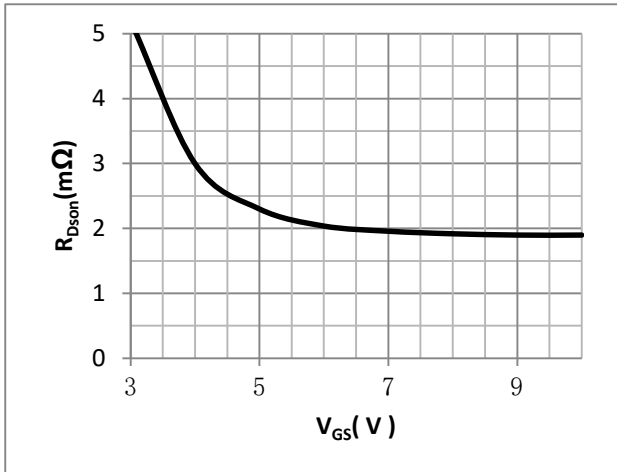


Fig.6 On-Resistance V.S Junction Temperature

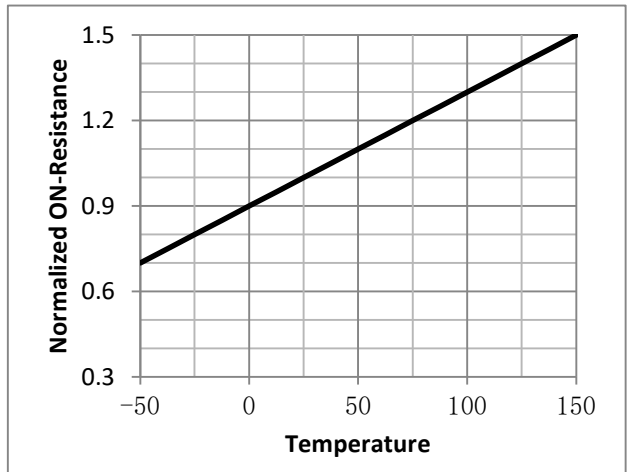


Fig.7 Gate Charge Characteristics

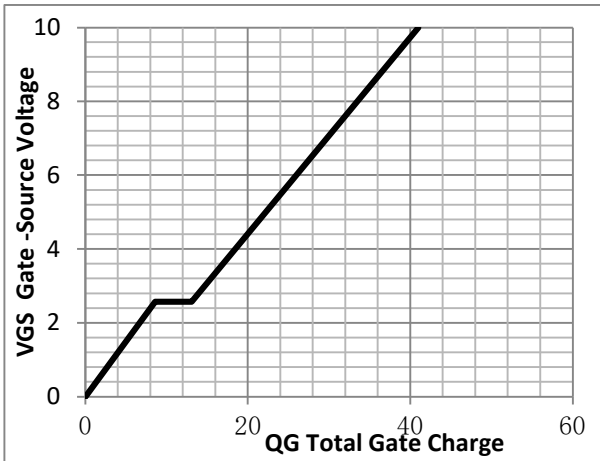


Fig.8 Capacitance vs Vds

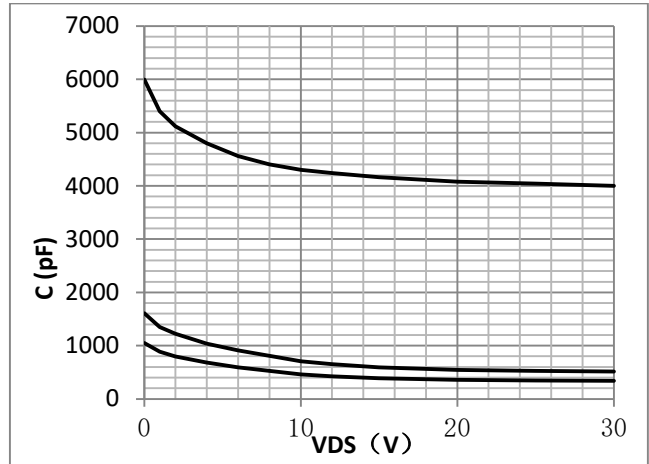


Fig.9 SOA Maximum Safe Operating Area

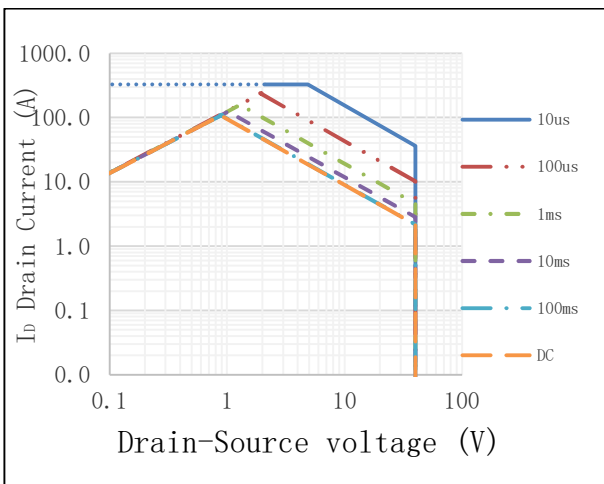


Fig.10 I_D -Junction Temperature

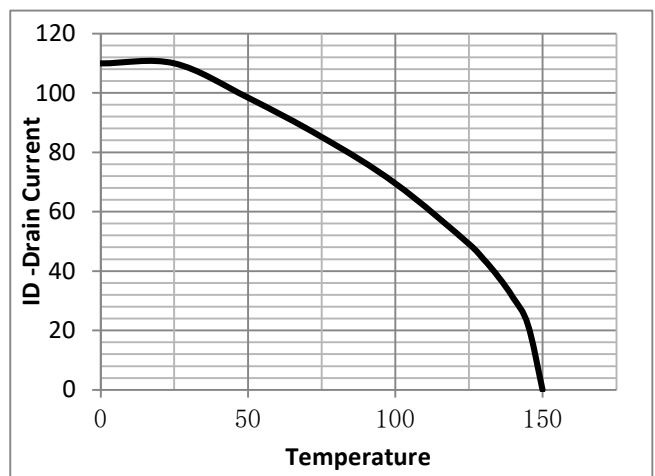


Fig.11 Gate Charge Measurement Circuit

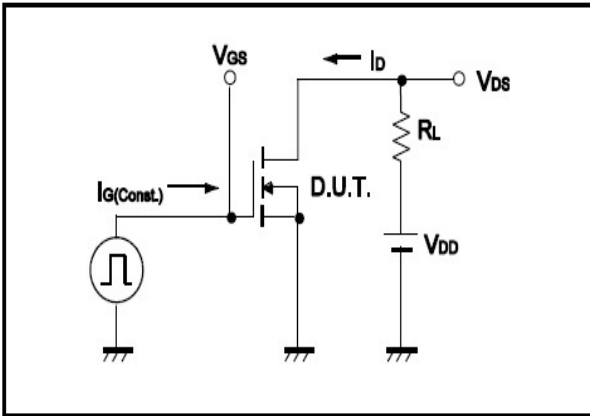


Fig.12 Gate Charge Waveform

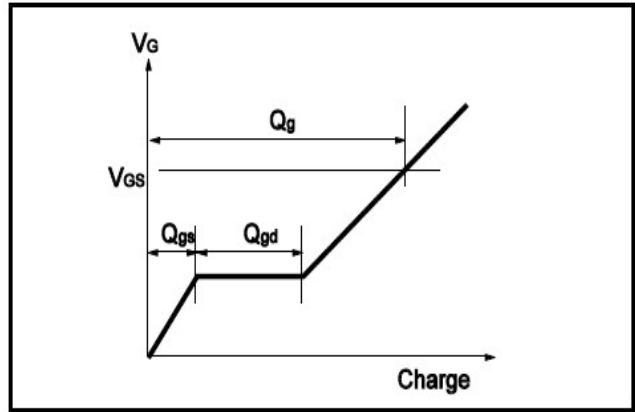


Fig.13 Resistive Switching Test Circuit

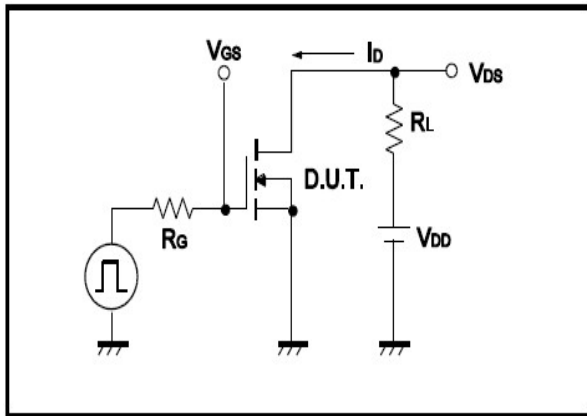


Fig.14 Resistive Switching Test Waveform

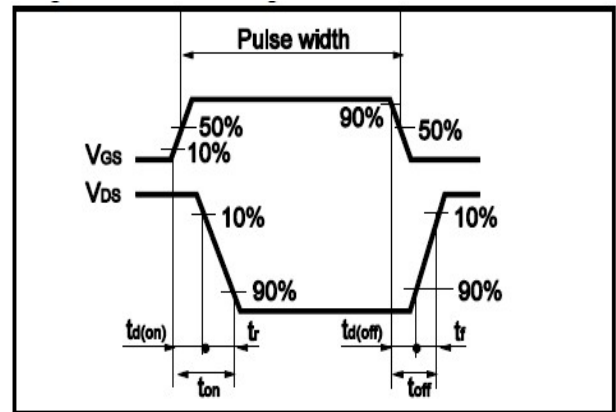


Fig.15 Avalanche Measurement Circuit

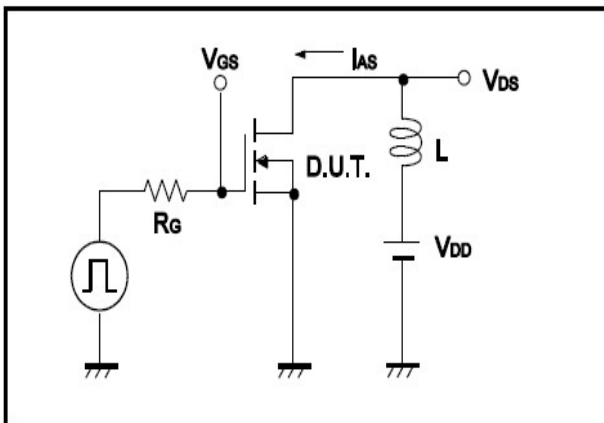
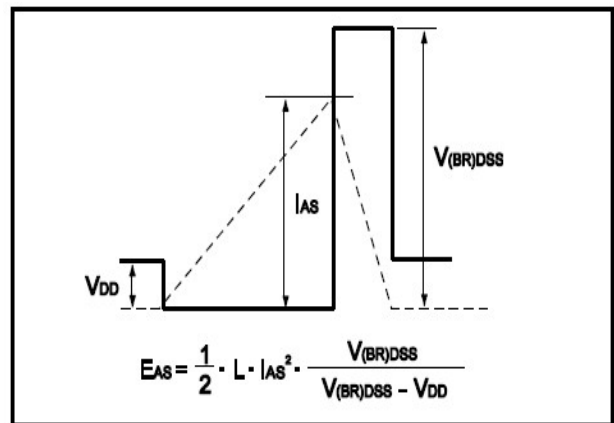


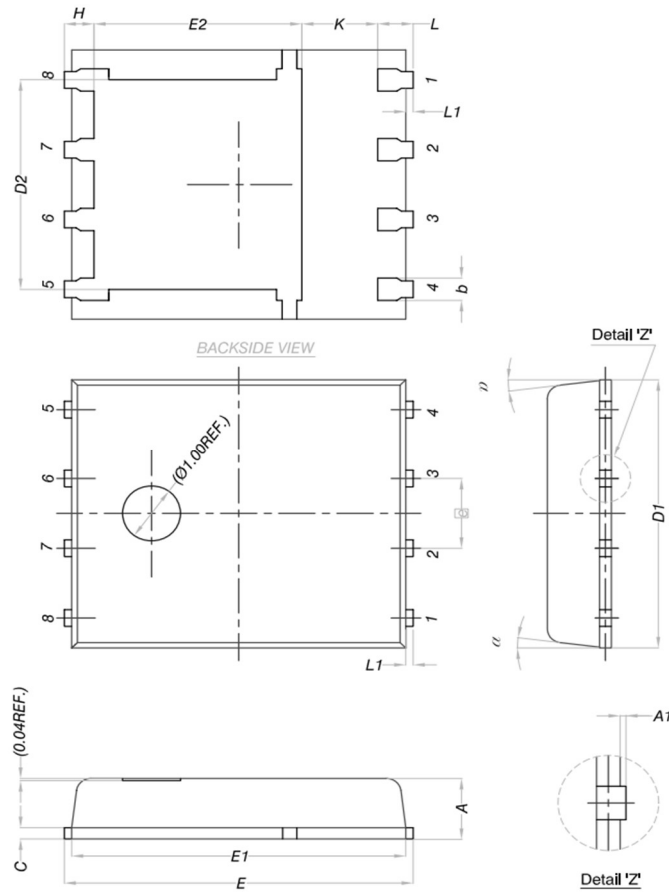
Fig.16 Avalanche Waveform





•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°



Version	Date	Change
A	2021.8.12	NEW
B	2024.5.7	Add ESD LEVEL
C	2024.6.4	Modified Rdson up limit, EAS, SOA curve
D	2025.9.22	Add switching time and reverse recovery parameter.