

• General Description

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

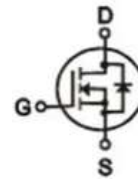
• Features

- 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

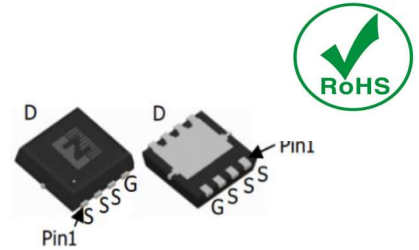
• Product Summary



$$V_{DS} = 30V$$

$$R_{DS(ON)} = 2.8m\Omega$$

$$I_D = 50A$$



DFN3 x 3

• Ordering Information:

Part NO.	ZMS028N03M
Marking	028N03
Packing Information	REEL TAPE
Basic ordering unit (pcs)	5000

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$I_D @ T_C=25^\circ C$	50	A
	$I_D @ T_C=75^\circ C$	38	A
	$I_D @ T_C=100^\circ C$	31	A
Pulsed Drain Current ^①	I_{DM}	150	A
Total Power Dissipation($T_C=25^\circ C$)	$P_D @ T_C=25^\circ C$	21	W
Total Power Dissipation($T_A=25^\circ C$)	$P_D @ T_A=25^\circ C$	1.8	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}	40	mJ

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	6.0	° C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	70	° C/W
Soldering temperature, wave soldering for 10s	T_{sold}	-	-	265	° C

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	30			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = 250\mu A$	1.2	1.7	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	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 20A$		2.8	3.7	m Ω
		$V_{GS} = 4.5V, I_D = 10A$		3.5	4.5	m Ω
Forward Transconductance	g_{FS}	$V_{DS} = 25V, I_D = 4A$		8		s
Source-drain voltage	V_{SD}	$I_S = 20A$			1.28	V

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	$V_{DS} = 25V$ $f = 1MHz$	-	1350	-	pF
Output capacitance	C_{oss}		-	372	-	
Reverse transfer capacitance	C_{rss}		-	32	-	

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

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q_g	$V_{DD} = 15V$ $I_D = 20A$ $V_{GS} = 10V$	-	24	-	nC
Gate - Source charge	Q_{gs}		-	5.2	-	
Gate - Drain charge	Q_{gd}		-	2.8	-	
Turn-ON Delay time	$t_{D(on)}$	$V_{DD} = 15V$ $I_D = 20A$ $V_{GS} = 4.5V$ $R_{G,ext} = 2\Omega$		8.9		ns
Turn-ON Rise time	t_r			7.5		
Turn-Off Delay time	$t_{D(off)}$			13.4		
Turn-Off Fall time	t_f			6.7		



Body Diode Reverse Recovery Time	t_{rr}	$I_F=20A$, $dI/dt=100A/\mu s$		14		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=20A$, $dI/dt=100A/\mu s$		25		nC

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

Fig.1 Power Dissipation

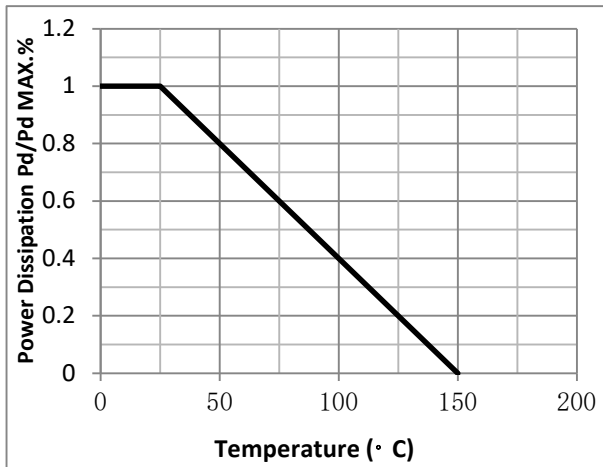


Fig.2 Typical output Characteristics

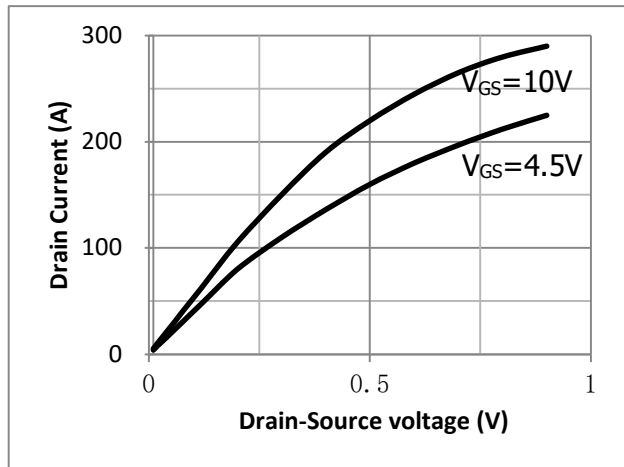


Fig.3 Threshold Voltage V.S Junction Temperature

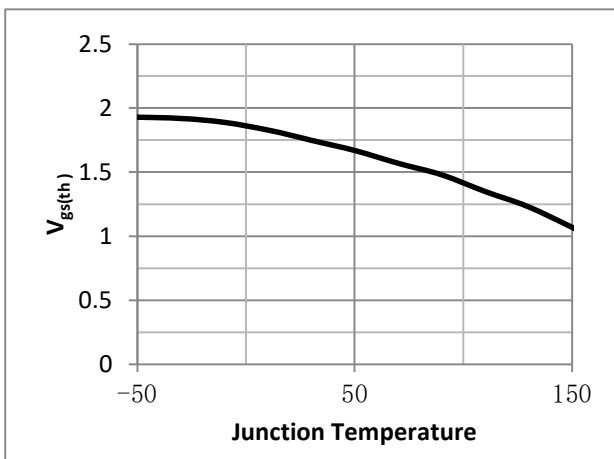


Fig.4 Resistance V.S Drain Current

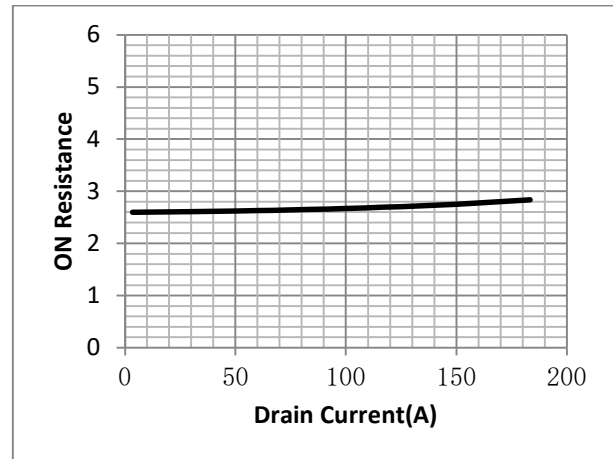


Fig.5 On-Resistance VS Gate Source Voltage

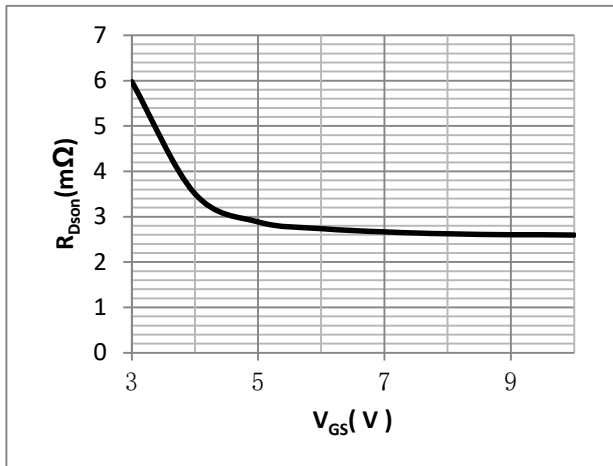


Fig.6 On-Resistance V.S Junction Temperature

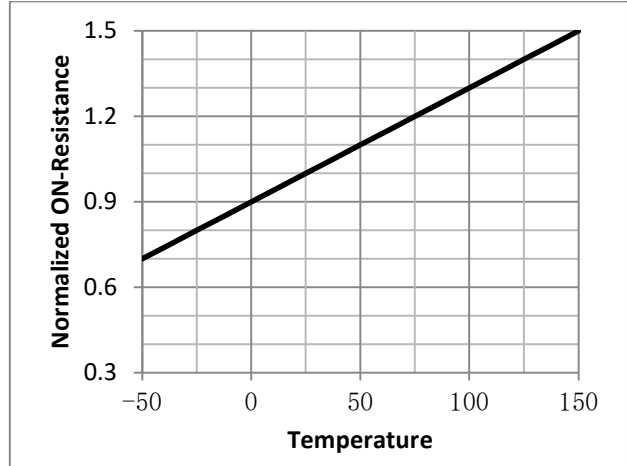


Fig.7 Gate Charge Characteristics

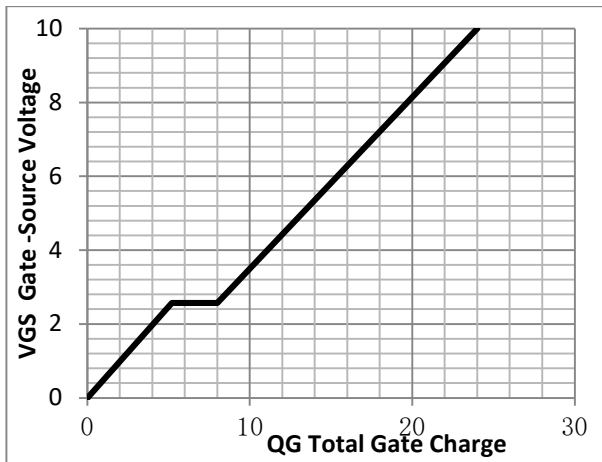


Fig.8 Capacitance vs V_DS

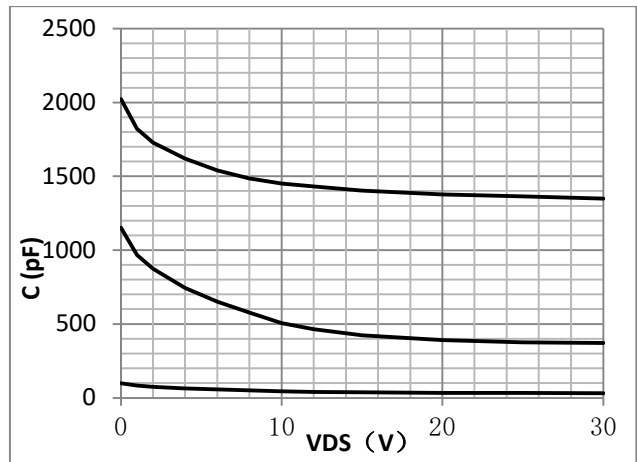


Fig.9 SOA Maximum Safe Operating Area

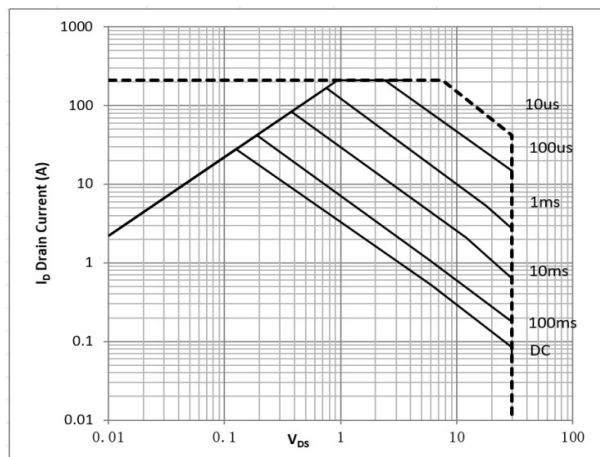


Fig.10 ID-Junction Temperature

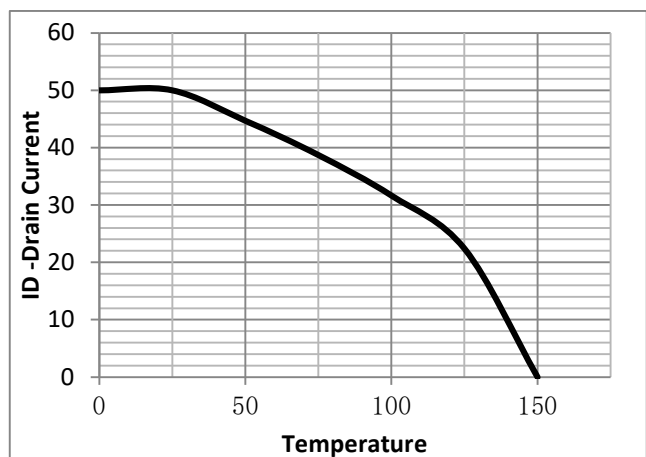


Fig.11 Gate Charge Measurement Circuit

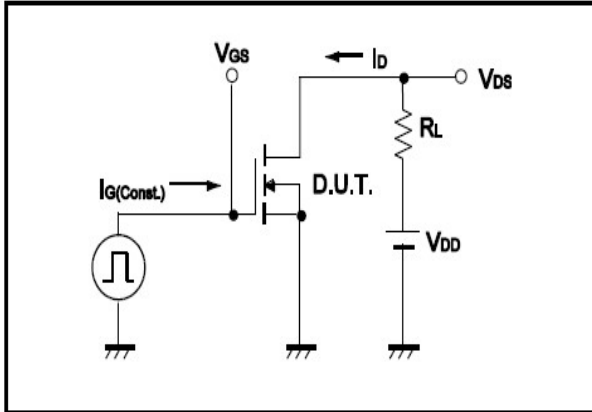


Fig.12 Gate Charge Waveform

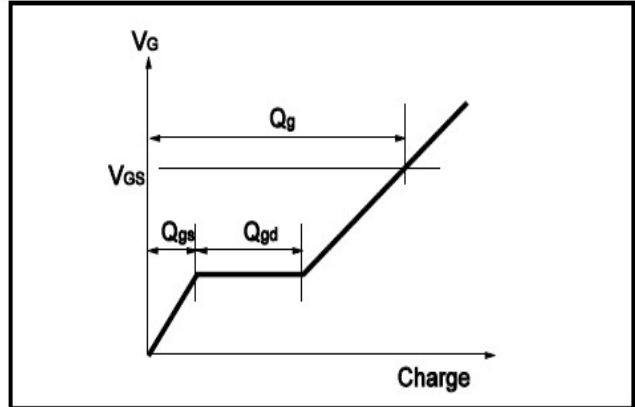


Fig.13 Resistive Switching Test Circuit

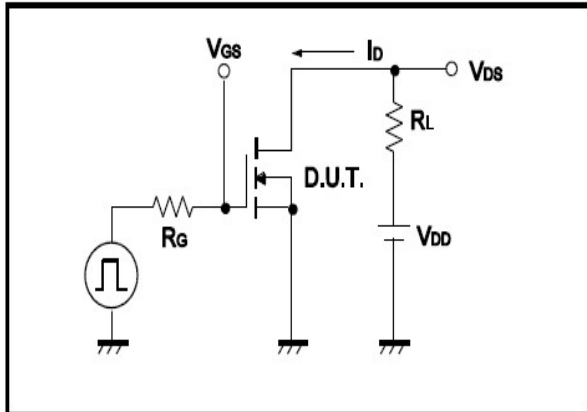


Fig.14 Resistive Switching Test Waveform

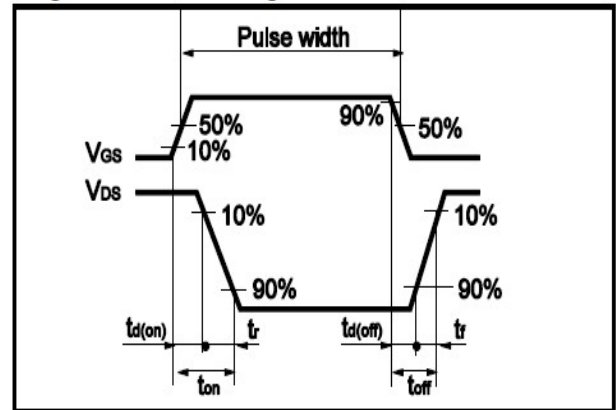


Fig.15 Avalanche Measurement Circuit

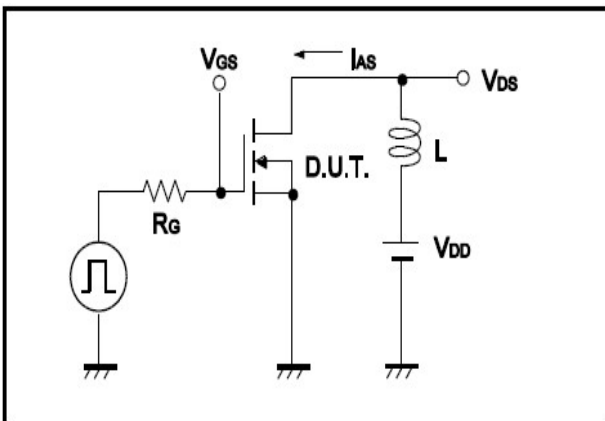
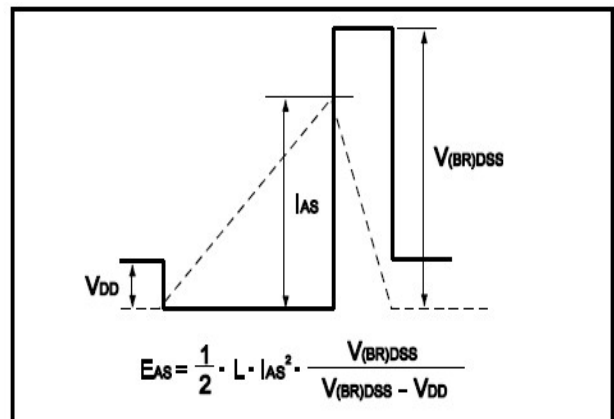


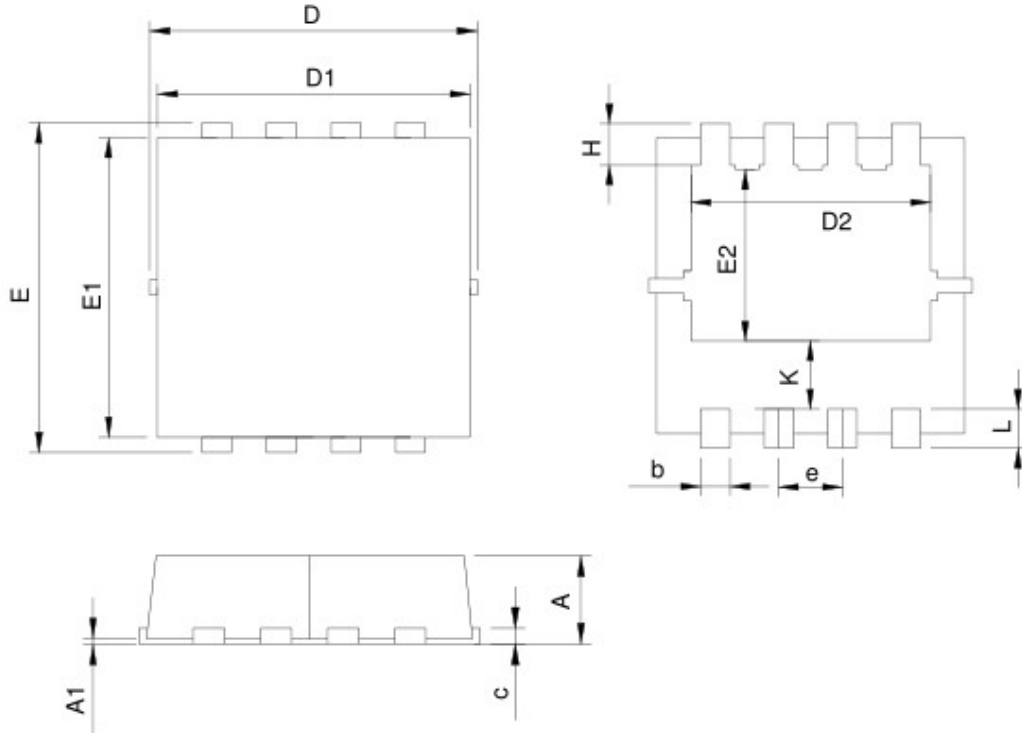
Fig.16 Avalanche Waveform





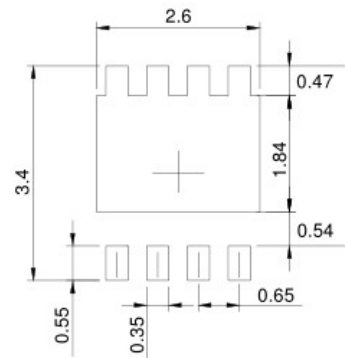
●Dimensions(DFN3×3)

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