

**• General Description**

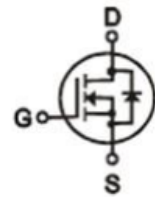
The ZMS100N10F combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ .

**• 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**

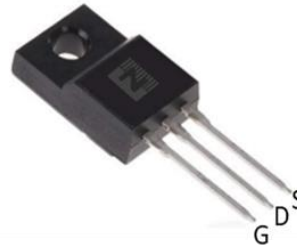
- SMPS 2<sup>nd</sup> Synchronous Rectifier
- BLDC Motor driver

**• Product Summary**


$V_{DS} = 100V$

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

$I_D = 43A$


**TO-220F**
**• Ordering Information:**

Part NO.	ZMS100N10F
Marking	ZMS100N10
Packing Information	TUBE
Basic ordering unit (pcs)	1000

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>②</sup>	$I_D @ T_C = 25^\circ C$	43	A
	$I_D @ T_C = 75^\circ C$	33	A
	$I_D @ T_C = 100^\circ C$	27	A
Pulsed Drain Current <sup>①</sup>	$I_{DM}$	129	A
Total Power Dissipation <sup>②</sup>	$P_D @ T_C = 25^\circ C$	125	W
Total Power Dissipation	$P_D @ T_A = 25^\circ C$	2.5	W
Operating Junction Temperature	$T_J$	-55 to 150	$^\circ C$
Storage Temperature	$T_{STG}$	-55 to 150	$^\circ C$
Single Pulse Avalanche Energy	$E_{AS}$	90	mJ

**•Thermal resistance**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case <sup>②</sup>	R <sub>thJC</sub>	-	-	1.0	° C/W
Thermal resistance, junction - ambient	R <sub>thJA</sub>	-	-	50	° C/W
Soldering temperature, wavesoldering for 10s	T <sub>sold</sub>	-	-	265	° C

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	100			V
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	1.3		2.5	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V			1.0	uA
Gate- Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V			±100	nA
Static Drain-source On Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		9.4	11.5	mΩ
	R <sub>DS(ON)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =16A		12.5	15	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =25V, I <sub>D</sub> =15A		15		s
Diode Forward Voltage	V <sub>FSD</sub>	I <sub>S</sub> =20A			1.28	V

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V f = 1MHz	-	1400	-	pF
Output capacitance	C <sub>oss</sub>		-	630	-	
Reverse transfer capacitance	C <sub>rss</sub>		-	33	-	

**Gate Charge characteristics(T<sub>a</sub>= 25°C)**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q <sub>g</sub>	V <sub>DD</sub> =30V	-	20	-	nC
Gate - Source charge	Q <sub>gs</sub>	I <sub>D</sub> = 8A	-	3.6	-	
Gate - Drain charge	Q <sub>gd</sub>	V <sub>GS</sub> = 10V	-	2.8	-	

Note: ① Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2% ;

② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate;

Fig.1 Gate-Charge Characteristics

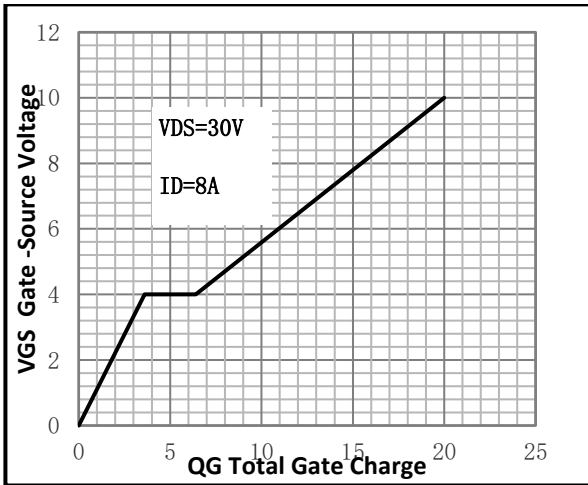


Fig.2 Capacitance Characteristics

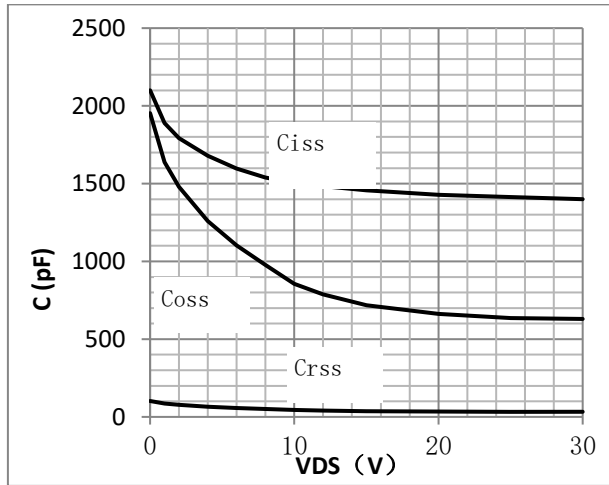


Fig.3 Power Dissipation

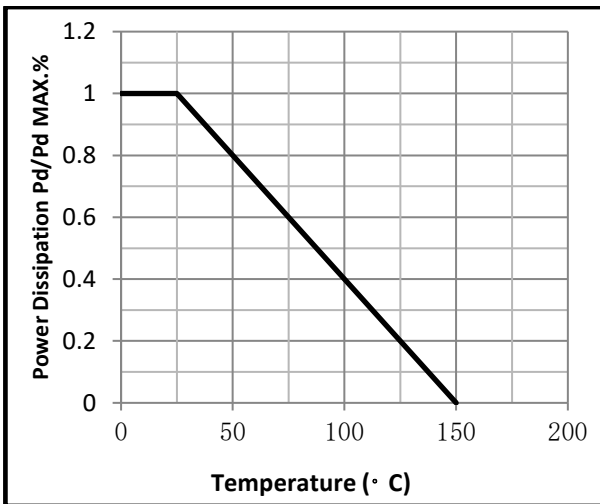


Fig.4 Typical output Characteristics

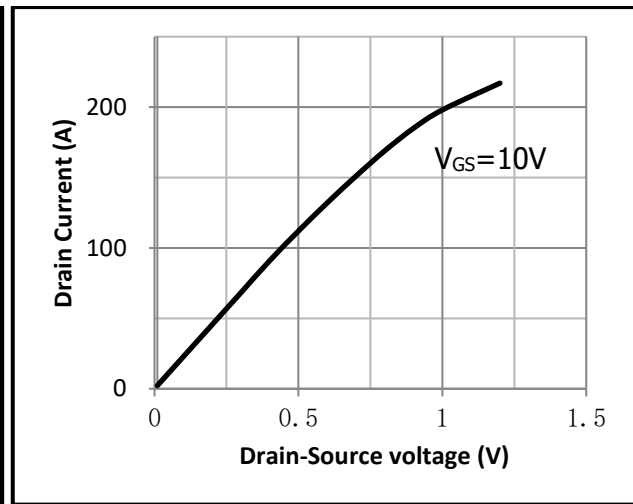


Fig.5 Threshold Voltage V.S Junction Temperature

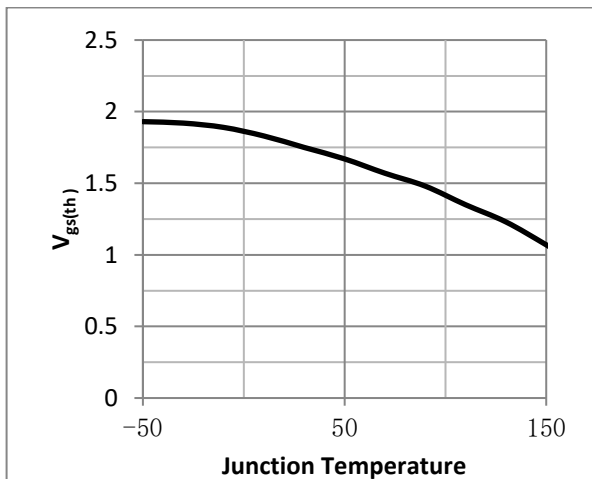


Fig.6 Resistance V.S Drain Current

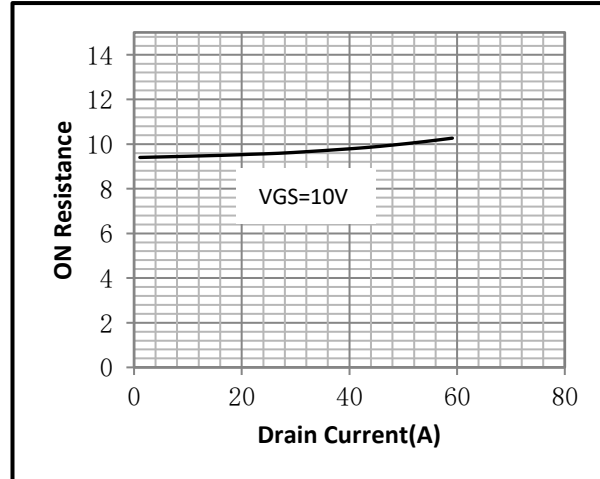


Fig.7 On-Resistance VS Gate Source Voltage

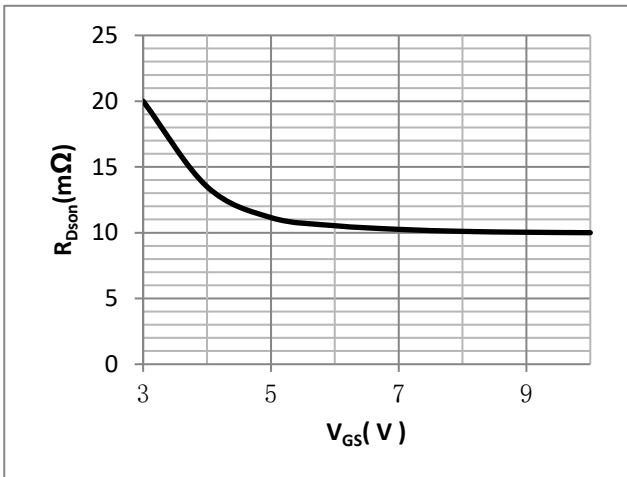


Fig.8 On-Resistance V.S Junction Temperature

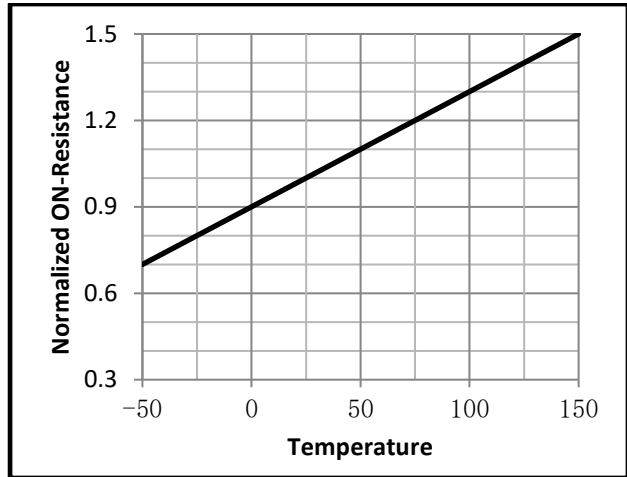


Fig.9 Gate Charge Measurement Circuit

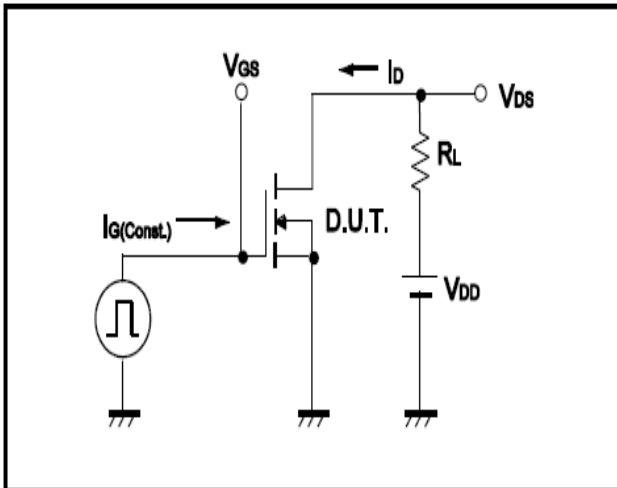


Fig.10 Gate Charge Waveform

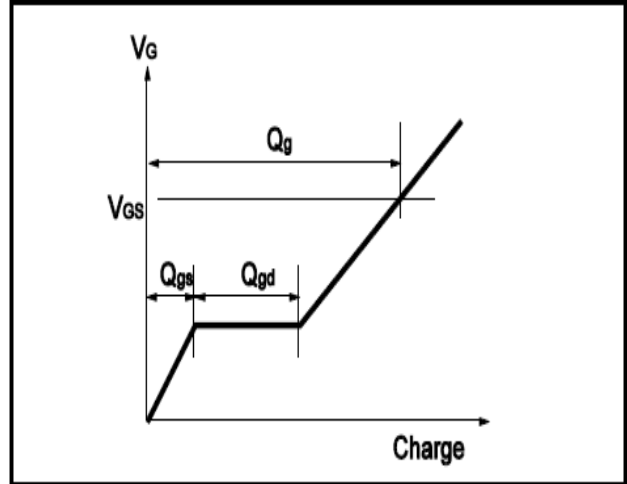


Fig.11 Switching Time Measurement Circuit

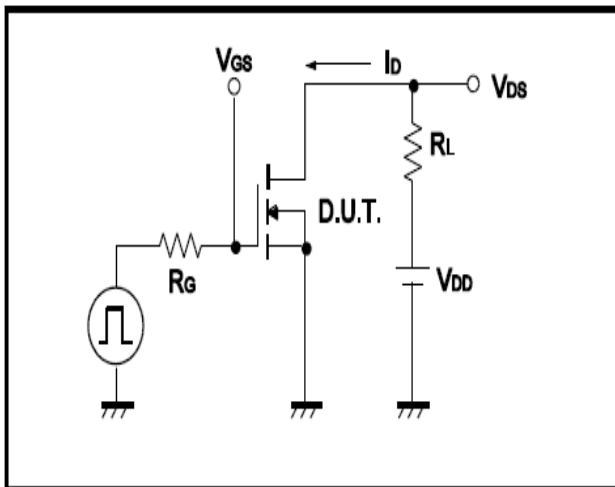
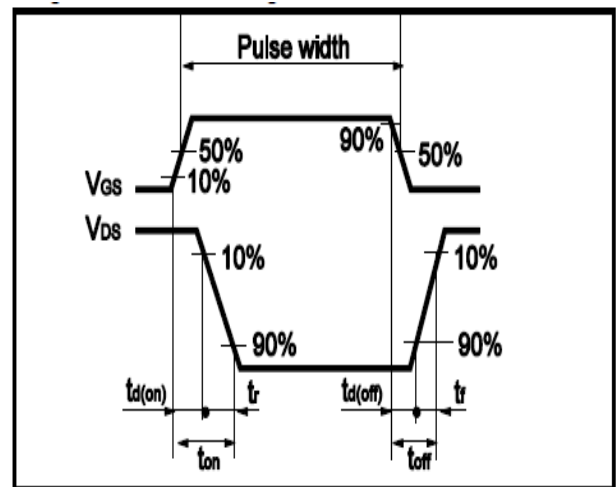


Fig.12 Switching Time Waveform



**Dimensions (TO-220F)**

Unit: mm

SYMBOL	min	nom	max	SYMBOL	min	nom	max
C	4.50	4.70	4.90	b1	2.90	3.40	3.90
c	0.40	0.50	0.6	a	1.08	1.28	1.48
A	9.96	10.16	10.36	a1	0.70	0.80	0.9
B	15.67	15.87	16.07	E	2.34	2.54	2.74
B1	3.30	3.40	3.50	E1	2.34	2.54	2.74
R	3.08	3.18	3.28	C1	2.34	2.54	2.74
b	12.48	12.98	13.48	C2	2.56	2.76	2.96

