## ● General Description

The ZMS070N10P combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

● Features

■ Advance device constructure

■ Low $R_{DS(ON)}$ to minimize conduction loss

■ Low Gate Charge for fast switching

■ Low Thermal resistance

● Application

■ Synchronous Rectification for AC-DC/DC-DC converter

■ Power Tools

● Product Summary
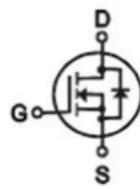
$V_{DS} = 100V$

$R_{DS(ON)} = 7m\Omega$

$I_D = 100A$
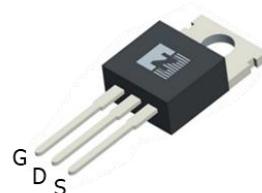
TO-220

● Ordering Information:

Part NO.	ZMS070N10P
Marking	ZMS070N10
Packing Information	Bulk Tube
Basic ordering unit (pcs)	1000

● Absolute Maximum Ratings (T$_C$ =25℃)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D@TC=25℃	100	A
	I_D@TC=75℃	76	A
	I_D@TC=100℃	63	A
Pulsed Drain Current [①]	I_{DM}	300	A
Total Power Dissipation(TC=25℃)	P_D@TC=25℃	150	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy@L=0.1mH	E_{AS}	50	mJ
Avalanche Current@L=0.1mH	I_{AS}	35	A

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	0.75	°C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	50	°C/W
Soldering temperature, wavesoldering for 10s	T_{sold}	-	-	265	°C

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250uA$	100			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250uA$	1.3	1.7	2.5	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$			1.0	uA
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm20V, V_{DS}=0V$			±100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=30A$		7	9	mΩ
		$V_{GS}=4.5V, I_D=20A$		9	11	mΩ
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=40A$		18		s
Diode Forward Voltage	V_{FSD}	$I_S=30A$			1.2	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss	$V_{GS}=0V, V_{DS}=25V$ $f = 1MHz$	-	2120	-	pF
Output capacitance	Coss		-	940	-	
Reverse transfer capacitance	Crss		-	48	-	

●Switching Parameters ($T_a = 25℃$)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Qg	$V_{DD}=30V$ $I_D = 10A$ $V_{GS} = 10V$	-	28	-	nC
Gate - Source charge	Qgs		-	3.8	-	
Gate - Drain charge	Qgd		-	5.9	-	
Turn-ON Delay time	$t_{D(on)}$	$V_{GS}=10V,$ $V_{DS}=50V, R$ $=0.75Ω, R =6Ω$		15		nS
Turn-ON Rise time	t_r			17		
Turn-Off Delay time	$t_{D(off)}$			96		

Turn-Off Fall time	t_f			76		
Body Diode Reverse Recovery Time	t_{rr}	IF=20A, dI/dt=100A/μs		47		nS
Body Diode Reverse Recovery Charge	Q_{rr}	IF=20A, dI/dt=100A/μs		38		nC

Note: ① Pulse Test : Pulse width ≤ 10μs, Duty cycle ≤ 1% ;

Fig.1 Gate-Charge Characteristics
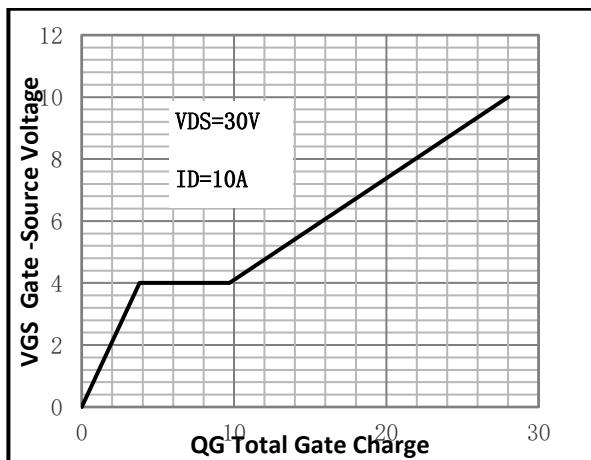
Fig.2 Capacitance Characteristics
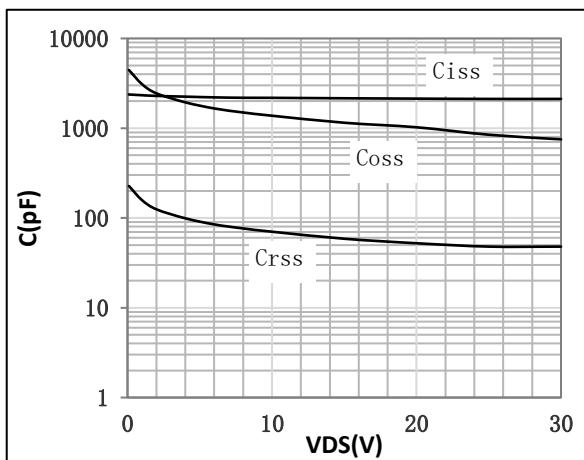
Fig.3 Power Dissipation
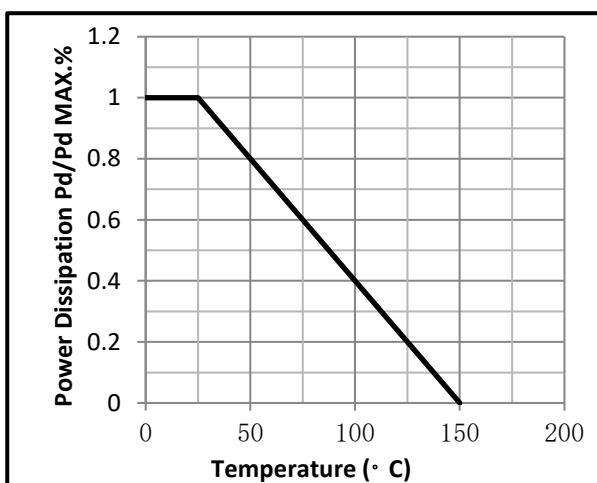
Fig.4 Typical output Characteristics
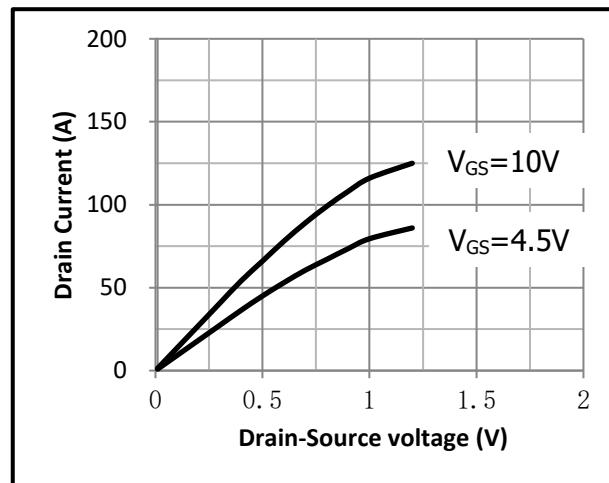
Fig.5 Threshold Voltage V.S Junction Temperature

Fig.6 Resistance V.S Drain Current
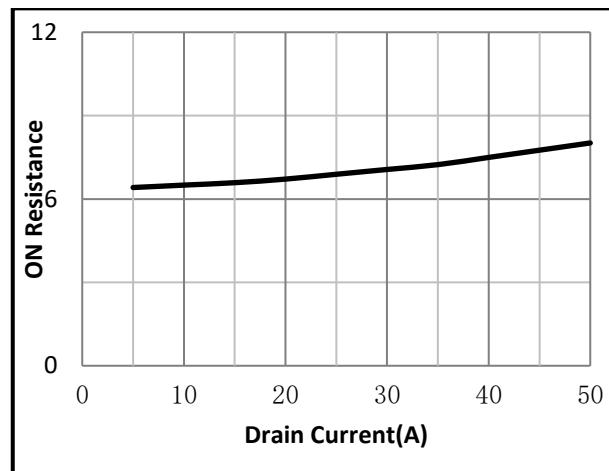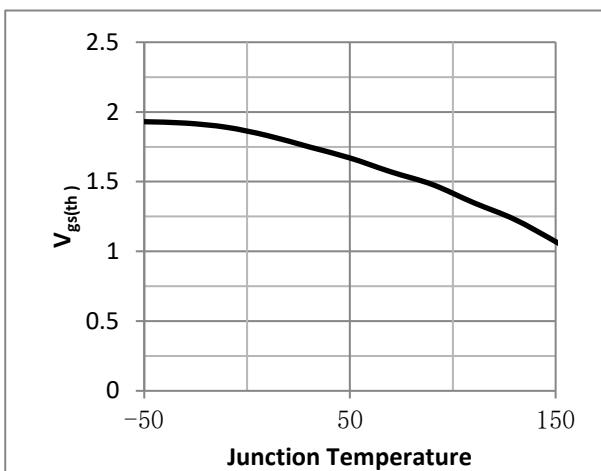

Fig.7 On-Resistance VS Gate Source Voltage
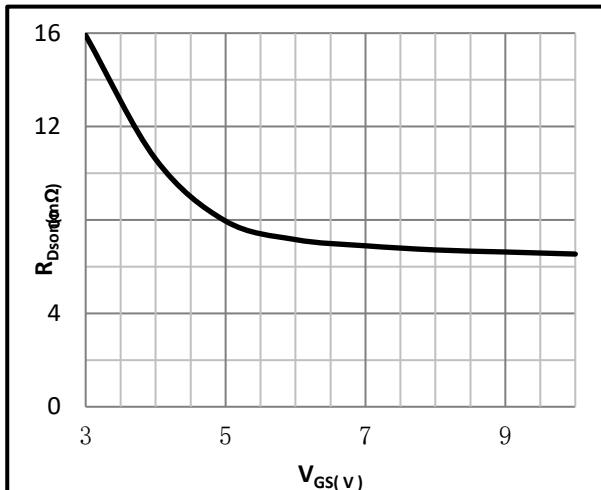
Fig.8 On-Resistance V.S Junction Temperature
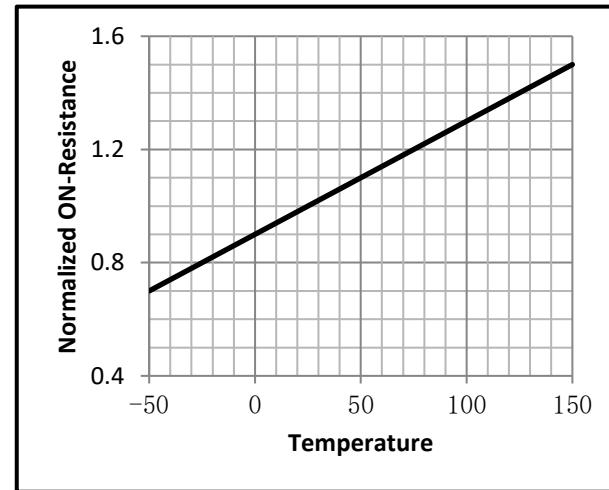
Fig.9 Gate Charge Measurement Circuit
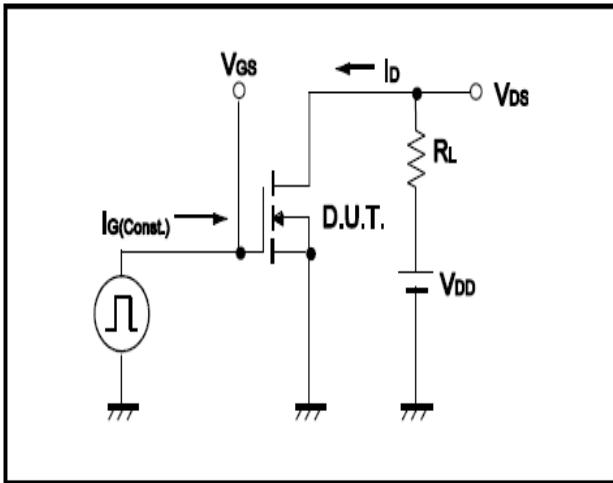
Fig.10 Gate Charge Waveform
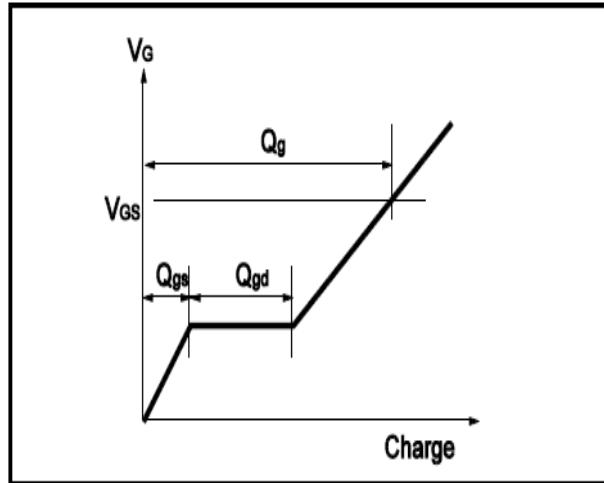
Fig.11 Switching Time Measurement Circuit
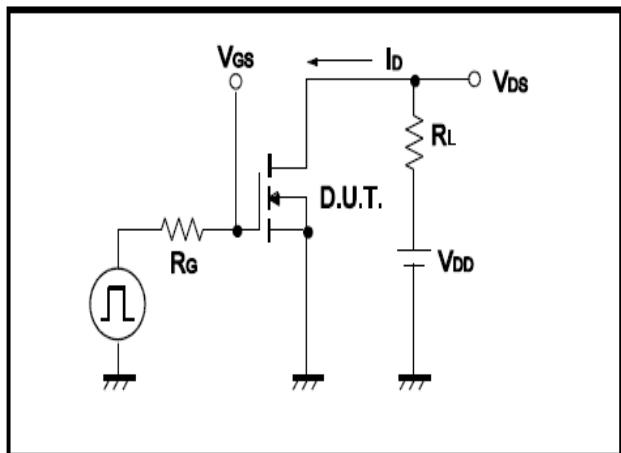
Fig.12 Switching Time Waveform
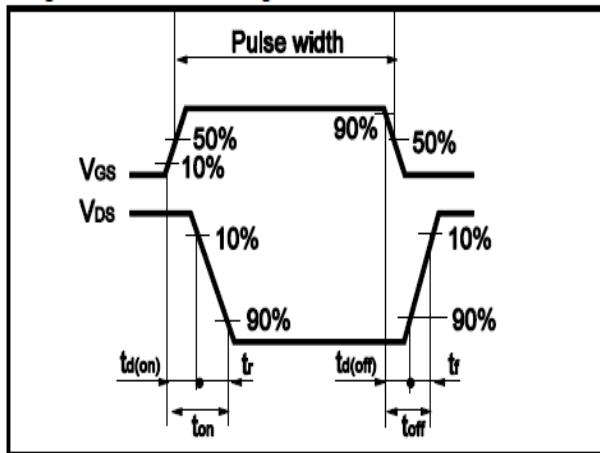
● **Dimensions (TO-220)**

Unit：mm

SYMBOL	min	nom	max	SYMBOL	min	nom	max
A	4.00		4.80	E	9.90		10.70
B	1.20		1.50	e		2.54	
B1	1.00		1.40	F	1.10		1.45
b1	0.65		1.00	L	12.50		14.50
c	0.35		0.75	L1	3.00	3.50	4.00
D	15.00		16.50	Q	2.50		3.00
D1	5.90		6.90	Q1	2.00		3.00
				ΦP	3.60		3.90