• General Description

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

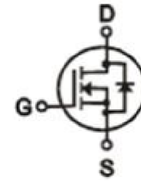
• Features

- 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

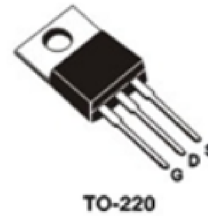
• Product Summary



V_{DS} =120V

$R_{DS(ON)}$ =12mΩ

I_D =80A



•Ordering Information:

Part NO.	ZMS110N12P
Marking	ZMS110N12
Packing Information	Bulk Tube
Basic ordering unit (pcs)	500

•Absolute Maximum Ratings (T_C =25℃)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	120	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	$I_{D@}$TC=25℃	80	A
	$I_{D@}$TC=75℃	60	A
	$I_{D@}$TC=100℃	50	A
Pulsed Drain Current ①	I_{DM}	240	A
Total Power Dissipation(TC=25℃)	P_D@TC=25℃	125	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}	80	mJ
Avalanche Current@L=0.1mH	I_{AS}	40	A

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	1.0	° 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	120			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}=±20V ,V_{DS} =0V			±100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=30A		12	15	mΩ
		V_{GS}=4.5V, I_D=20A		14	18	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	f = 1MHz	-	2420	-	pF
Output capacitance	Coss		-	960	-	
Reverse transfer capacitance	Crss		-	54	-	

•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		56		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

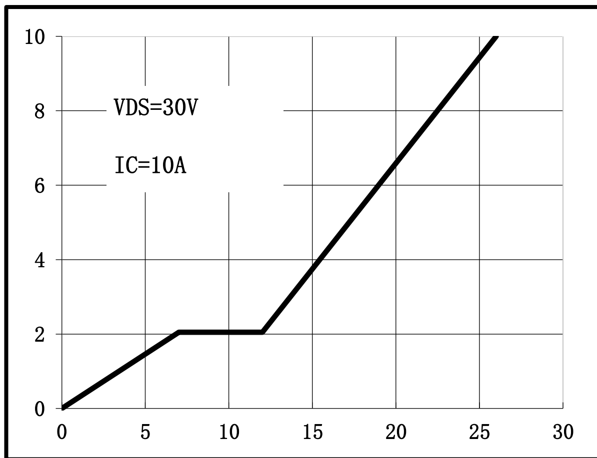


Fig.2 Capacitance Characteristics

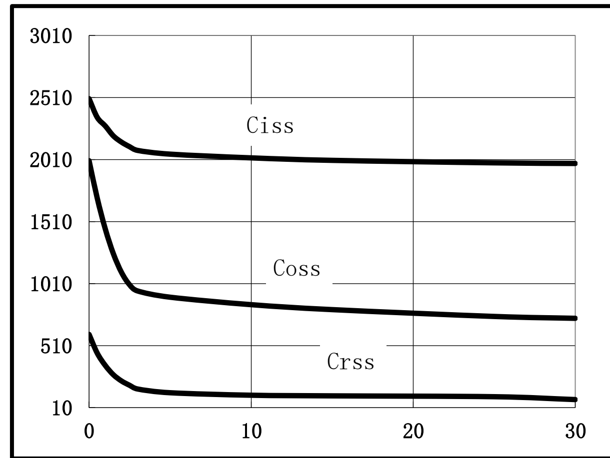


Fig.3 Power Dissipation

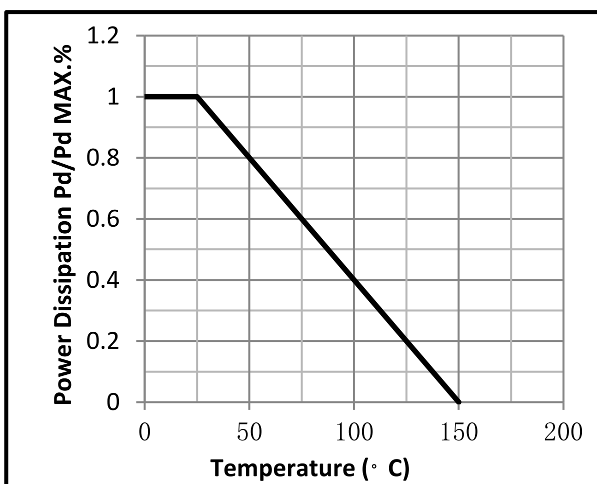


Fig.4 Typical output Characteristics

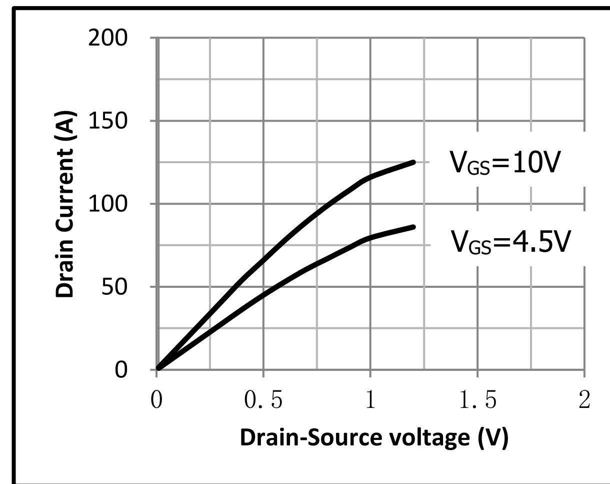


Fig.5 Threshold Voltage V.S Junction Temperature

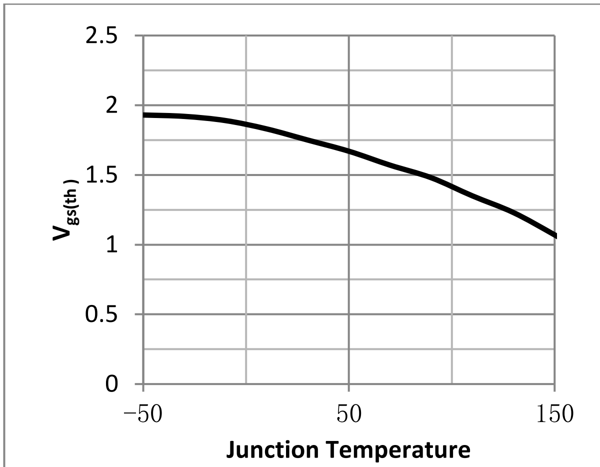


Fig.6 Resistance V.S Drain Current

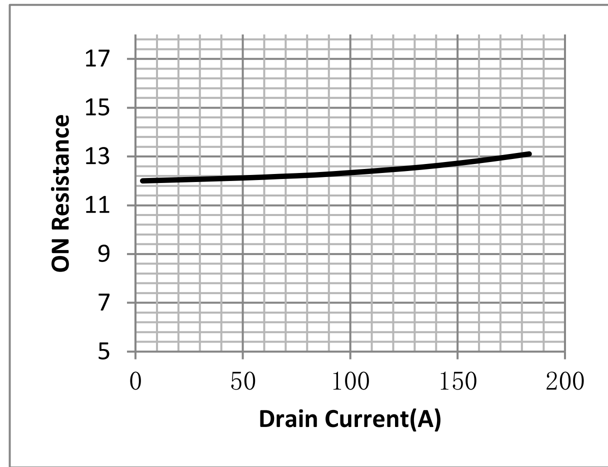


Fig.7 On-Resistance VS Gate Source Voltage

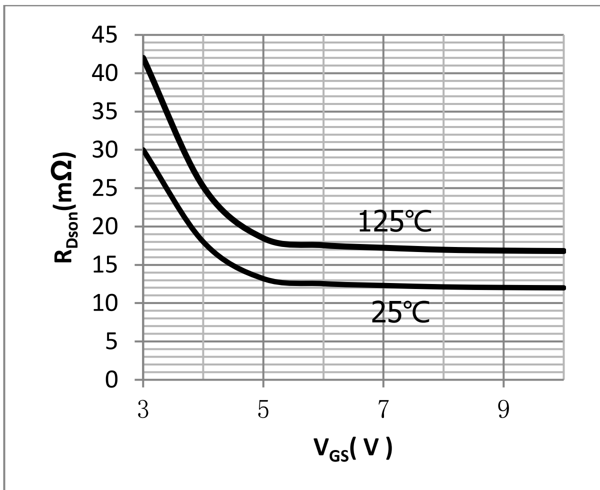


Fig.8 On-Resistance V.S Junction Temperature

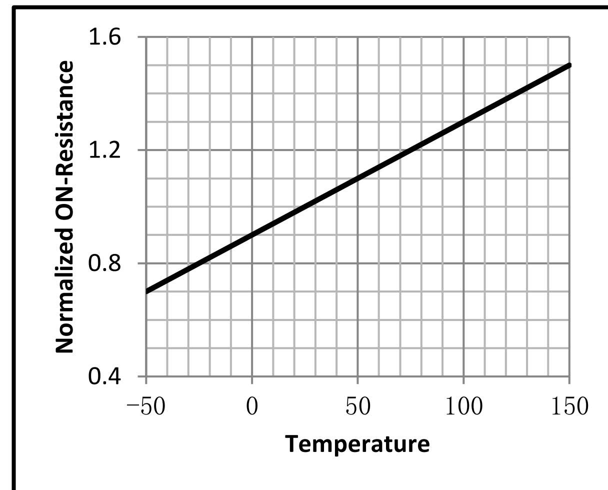


Fig.9 Switching Time Measurement Circuit

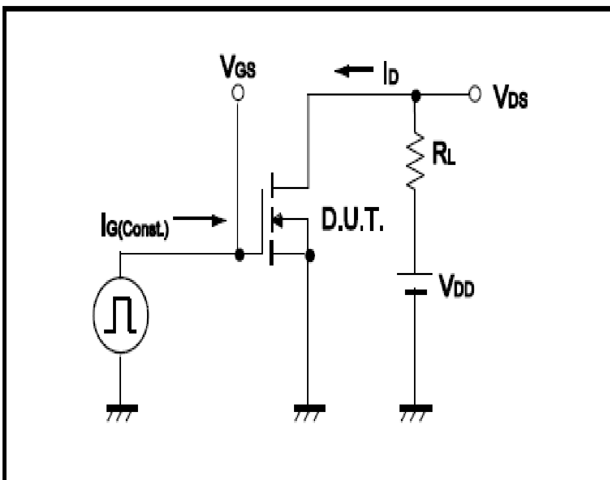


Fig.10 Gate Charge Waveform

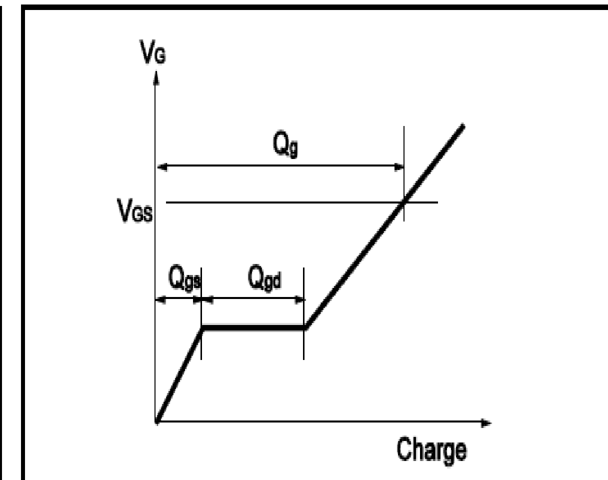


Fig.11 Switching Time Measurement Circuit

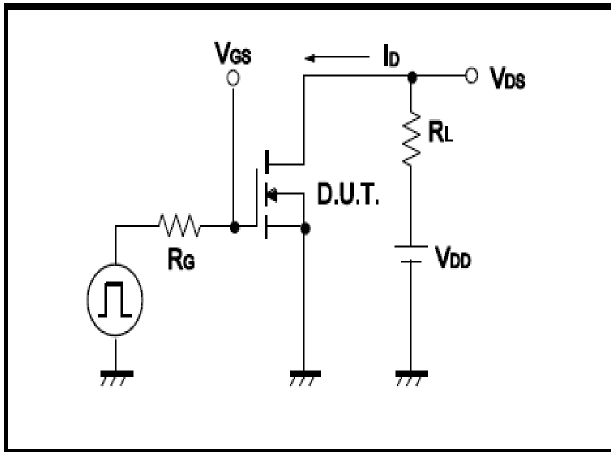
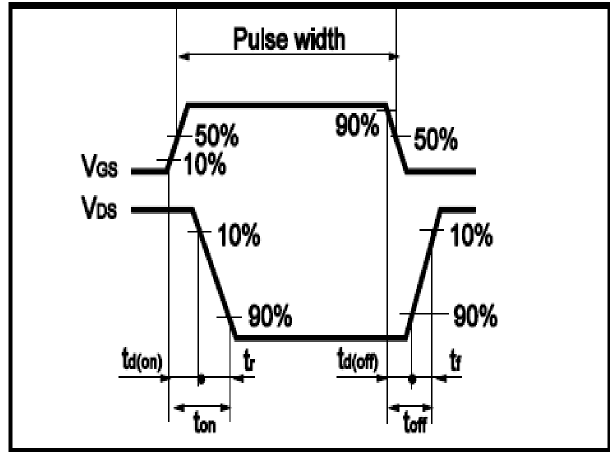


Fig.12 Gate Charge Waveform



• 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