

**• General Description**

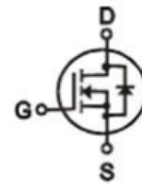
It combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ .

**• Features**

- Advance device constructure
- Low  $R_{DS(ON)}$  to minimize conduction loss
- Low Gate Charge for fast switching
- Low Thermal resistance

**• Application**

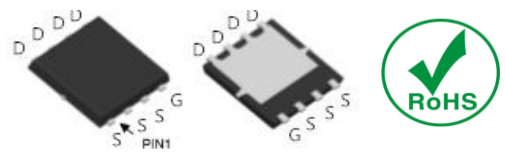
- Synchronous Rectification for AC-DC/DC-DC converter
- Power Tools

**• Product Summary**


$V_{DS} = 120V$

$R_{DS(ON)} = 12m\Omega$

$I_D = 75A$



DFN5 x 6

**• Ordering Information:**

Part NO.	ZMS110N12N
Marking	ZMS110N12
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	120	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D @ TC=25^\circ C$	75	A
	$I_D @ TC=75^\circ C$	57	A
	$I_D @ TC=100^\circ C$	47	A
Pulsed Drain Current ①	$I_{DM}$	225	A
Total Power Dissipation( $TC=25^\circ C$ )	$P_D @ TC=25^\circ C$	85	W
Total Power Dissipation( $TA=25^\circ C$ )	$P_D @ TA=25^\circ C$	3.4	W
Operating Junction Temperature	$T_J$	-55 to 150	$^\circ C$
Storage Temperature	$T_{STG}$	-55 to 150	$^\circ C$
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 <sub>thJC</sub>	-	-	1.5	° C/W
Thermal resistance, junction - ambient	R <sub>thJA</sub>	-	-	37	° 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	120			V
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	1.3	1.7	2.5	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =120V, 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> =30A		12	15	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A		14	18	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =40A		18		s
Diode Forward Voltage	V <sub>FSD</sub>	I <sub>S</sub> =30A			1.2	V

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C <sub>iss</sub>	f = 1MHz	-	2420	-	pF
Output capacitance	C <sub>oss</sub>		-	960	-	
Reverse transfer capacitance	C <sub>rss</sub>		-	54	-	

**•Switching Parameters (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 I <sub>D</sub> = 10A V <sub>GS</sub> = 10V	-	28	-	nC
Gate - Source charge	Q <sub>gs</sub>		-	3.8	-	
Gate - Drain charge	Q <sub>gd</sub>		-	5.9	-	
Turn-ON Delay time	t <sub>D(on)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =50V, R =0.75Ω, R =6Ω		15		nS
Turn-ON Rise time	t <sub>r</sub>			17		
Turn-Off Delay time	t <sub>D(off)</sub>			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

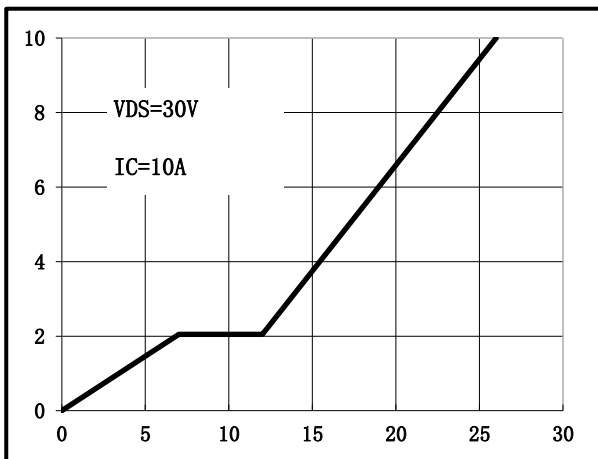


Fig.2 Capacitance Characteristics

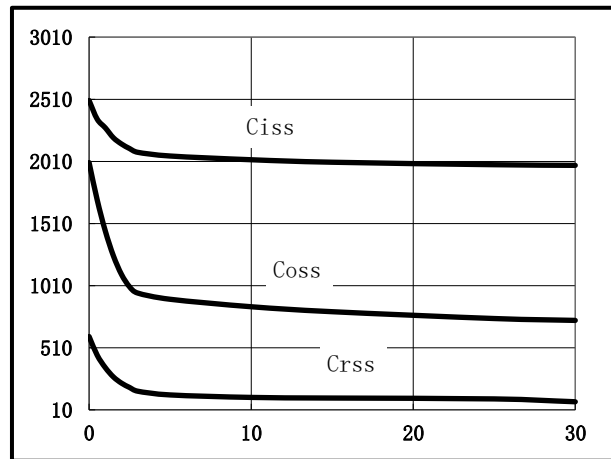


Fig.3 Power Dissipation

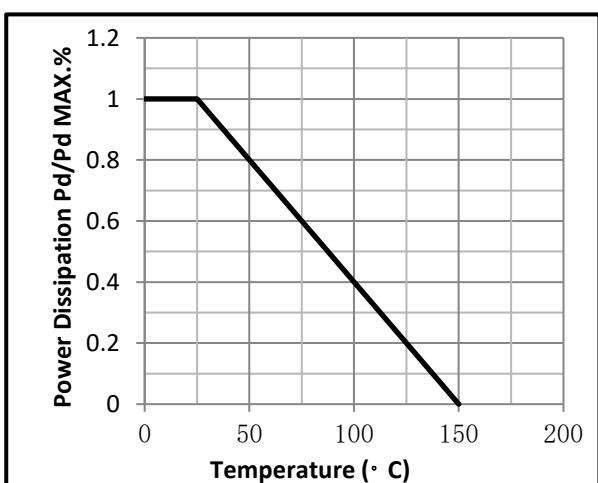


Fig.4 Typical output Characteristics

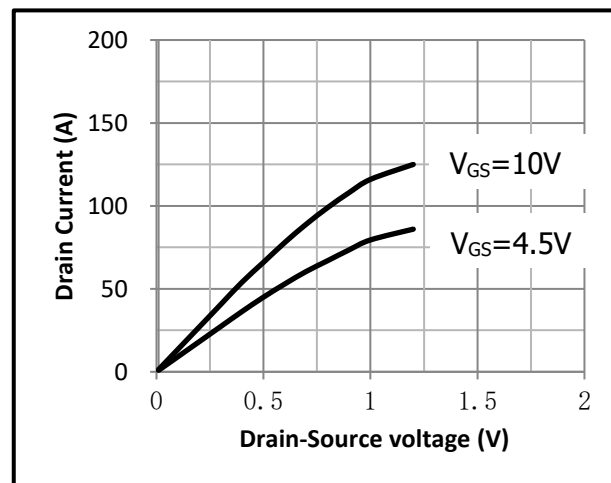


Fig.5 Threshold Voltage V.S Junction Temperature

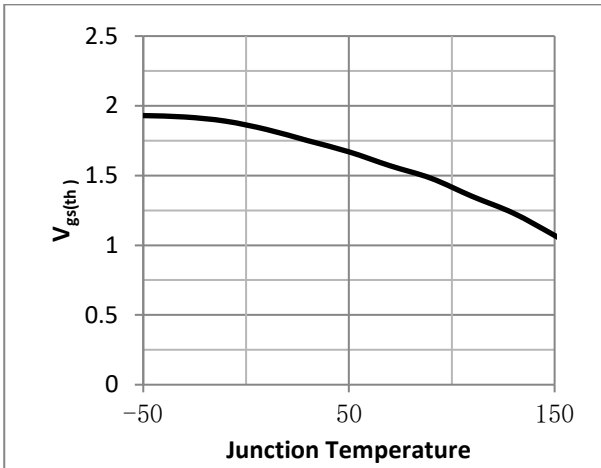


Fig.6 Resistance V.S Drain Current

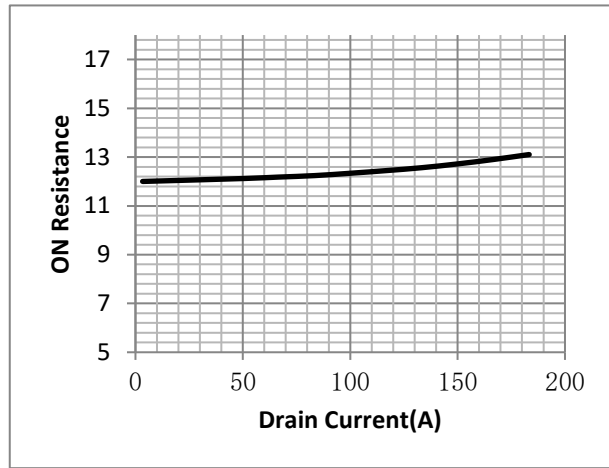


Fig.7 On-Resistance VS Gate Source Voltage

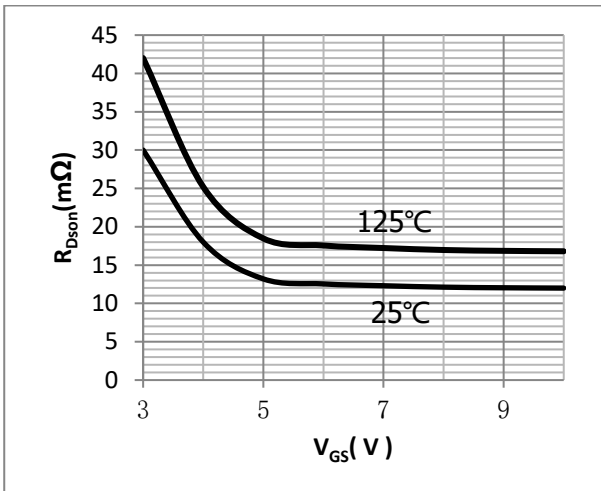


Fig.8 On-Resistance V.S Junction Temperature

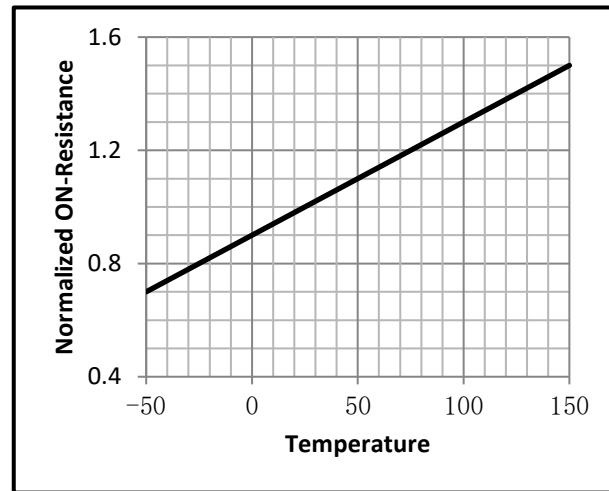


Fig.9 Switching Time Measurement Circuit

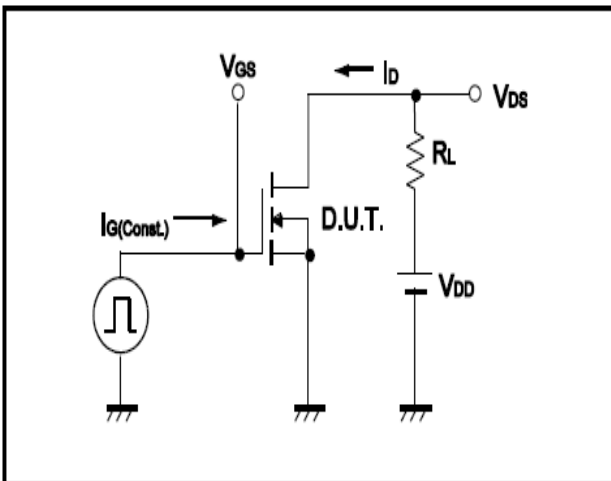


Fig.10 Gate Charge Waveform

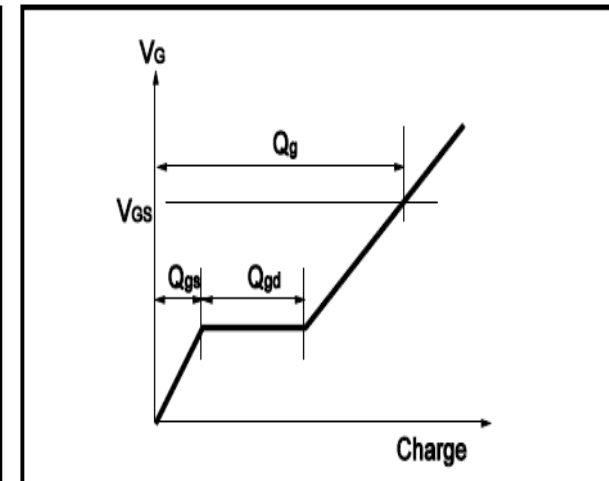


Fig.11 Switching Time Measurement Circuit

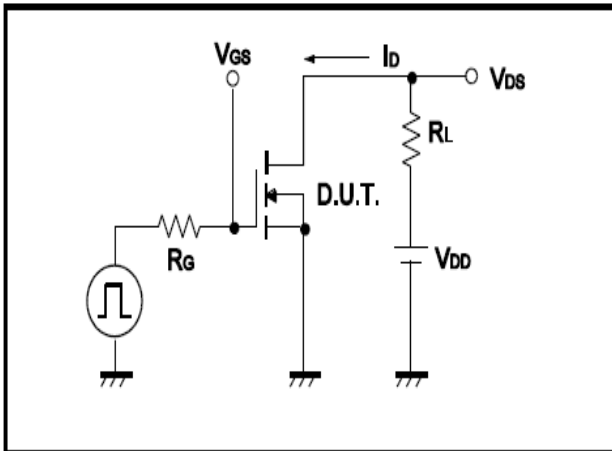
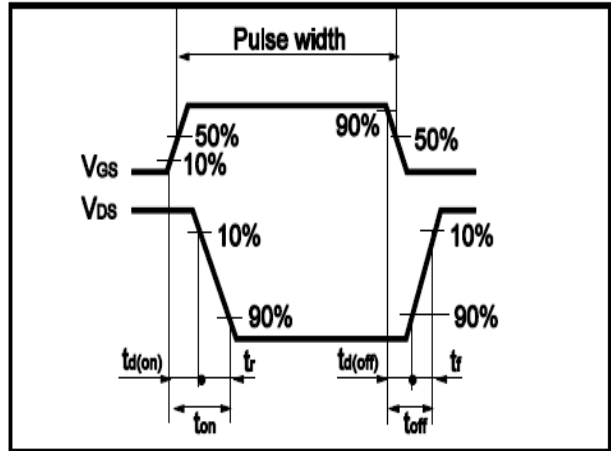


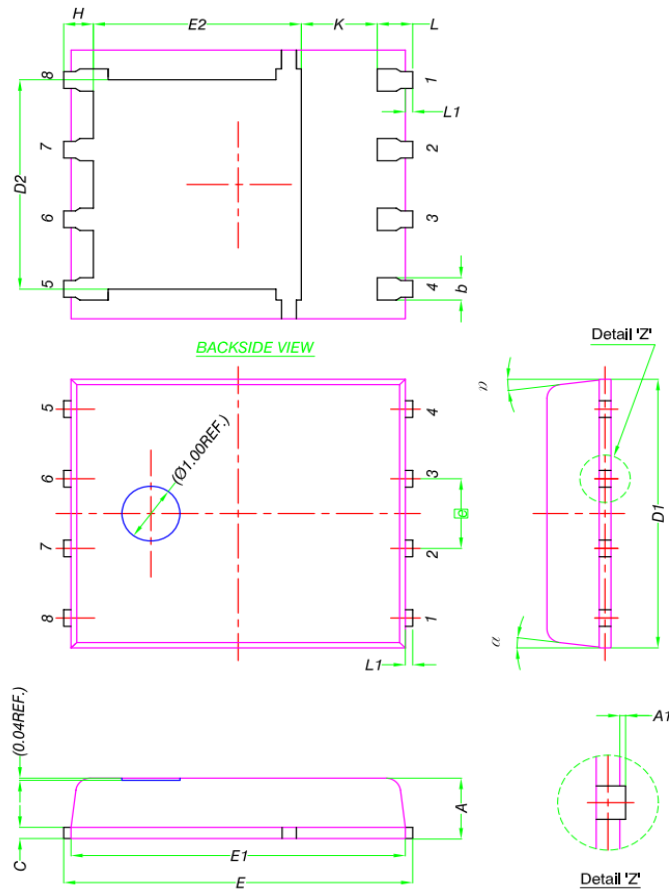
Fig.12 Gate Charge Waveform





•Dimensions (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
<span style="border: 1px solid black; padding: 2px;">e</span>	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°