● General Description

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

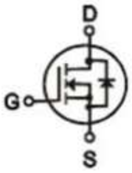
● Features

- ■ 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
- ■Oring switches
- ■Power Tools

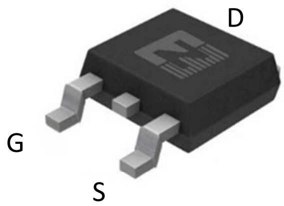
● Product Summary



V_{DS}=60V

$R_{DS(ON)}$ =9mΩ

I_D =50A



TO-252

●Ordering Information:

Part NO.	ZMS090N06D
Marking	ZMS090N06
Packing Information	REEL TAPE
Basic ordering unit (pcs)	2500

●Absolute Maximum Ratings (Tc =25℃)

Parameter	**Symbol**	Rating	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	$I_{D@}$TC=25℃	50	A
	$I_{D@}$TC=75℃	38	A
	$I_{D@}$TC=100℃	31.5	A
Pulsed Drain Current ①	I_{DM}	150	A
Total Power Dissipation	P_D@TC=25℃	54	W
Total Power Dissipation	P_D@TA=25℃	2	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy	E_{AS}	47	mJ

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	2.3	°C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	63	°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	60			V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} =V_{DS}, I_D =250uA	1.2		2.5	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=60V, 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=10A		9	11	mΩ
		V_{GS}=4.5V, I_D=5A		12	14	mΩ
Forward Transconductance	g_{FS}	V_{DS} =25V, I_D=10A		14		s
Source-drain voltage	V_{SD}	Is=10A			1.28	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Gate Risistance	Rg	f = 1MHz		1.5		Ω
Input capacitance	C_{iss}	f = 1MHz VDS=25V	-	960	-	pF
Output capacitance	C_{oss}		-	460	-	
Reverse transfer capacitance	C_{rss}		-	35	-	

●Gate Charge characteristics(T_a = 25℃)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q_g	V_{DD} = 25V	-	14	-	nC
Gate - Source charge	Q_{gs}	I_D = 8A	-	2.8	-	
Gate - Drain charge	Q_{gd}	V_{GS} = 10V	-	2.2	-	

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

Fig.1 Gate-Charge Characteristics

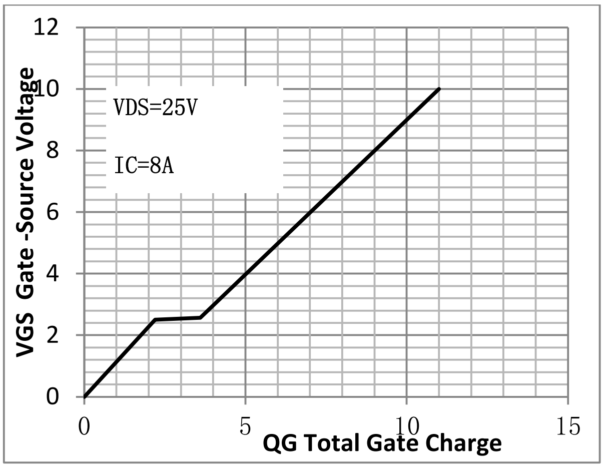


Fig.2 Capacitance Characteristics

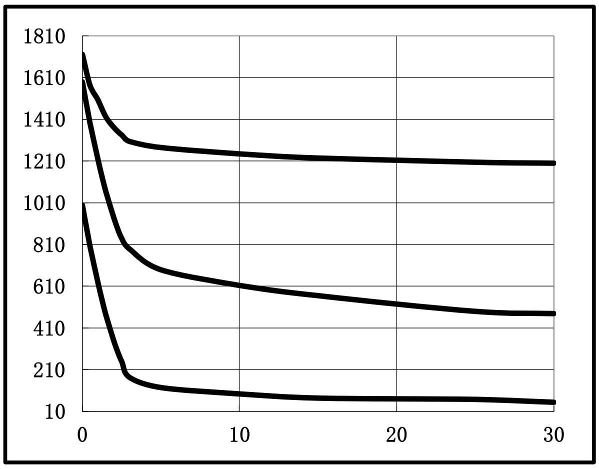


Fig.3 Power Dissipation

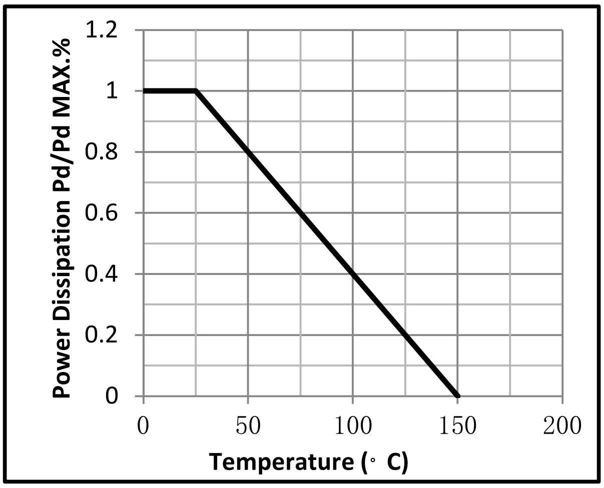


Fig.4 Typical output Characteristics

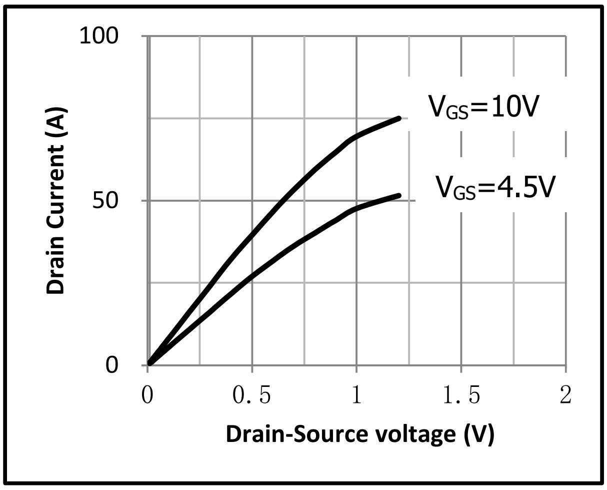


Fig.5 Threshold Voltage V.S Junction Temperature

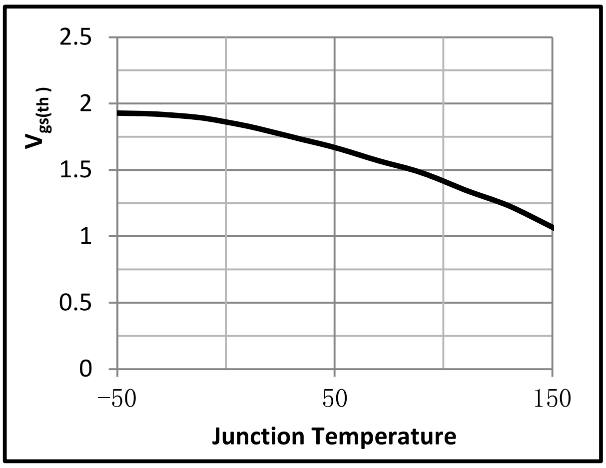


Fig.6 Resistance V.S Drain Current

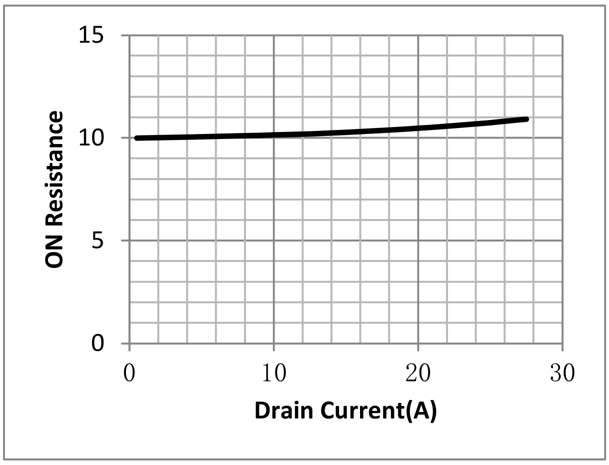
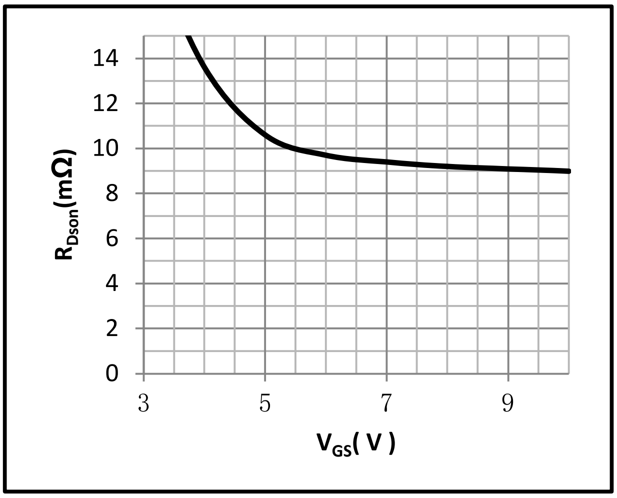


Fig.7 On-Resistance VS Gate Source Voltage

Fig.8 On-Resistance V.S Junction Temperature



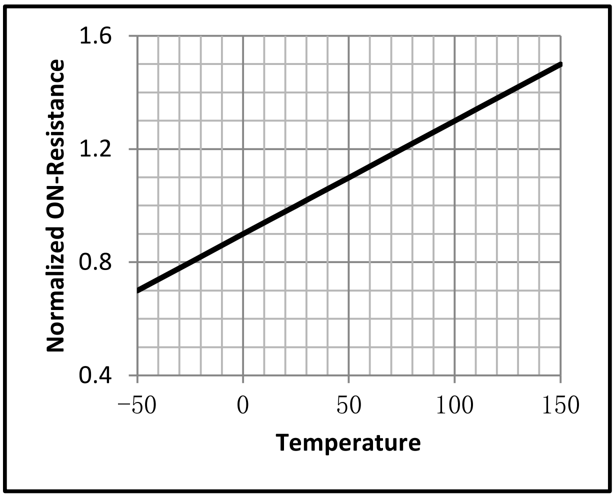


Fig.9 Switching Time Measurement Circuit

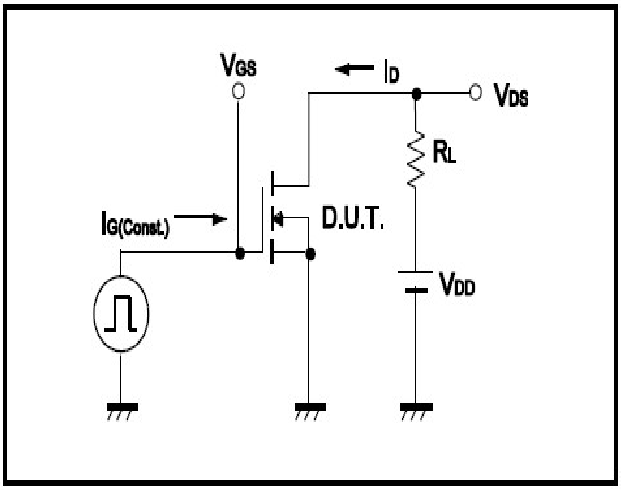


Fig.10 Gate Charge Waveform

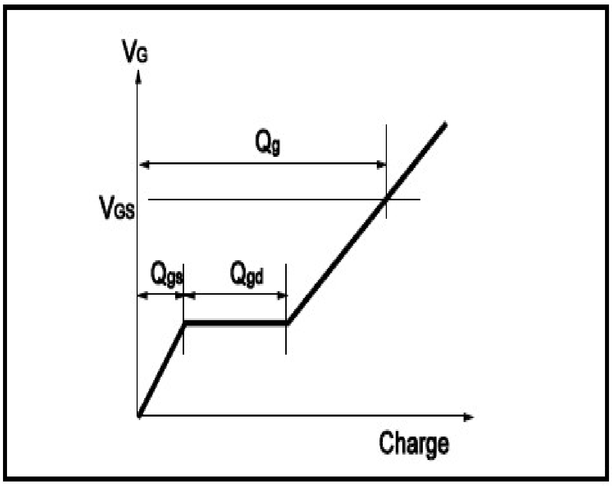


Fig.11 Switching Time Measurement Circuit

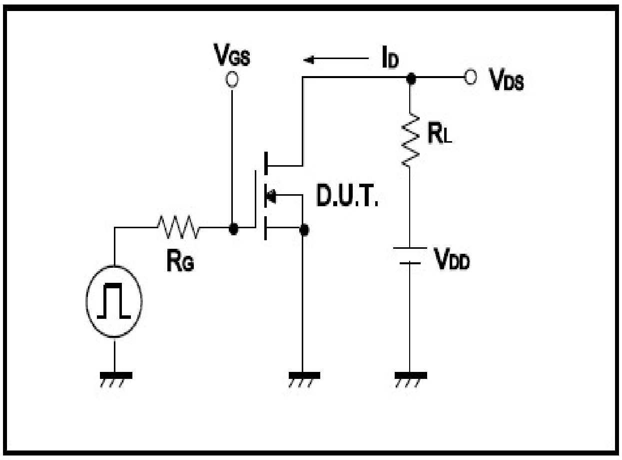
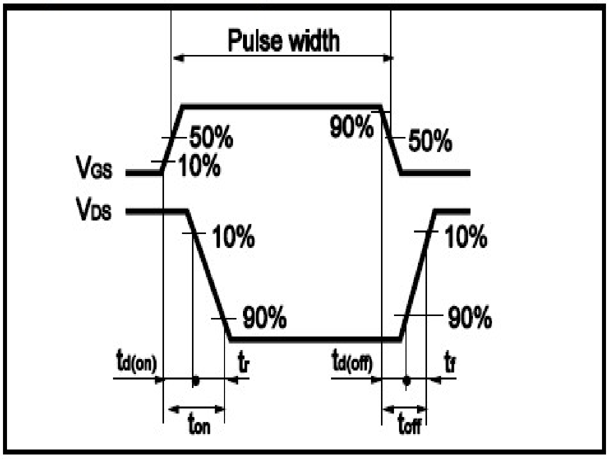
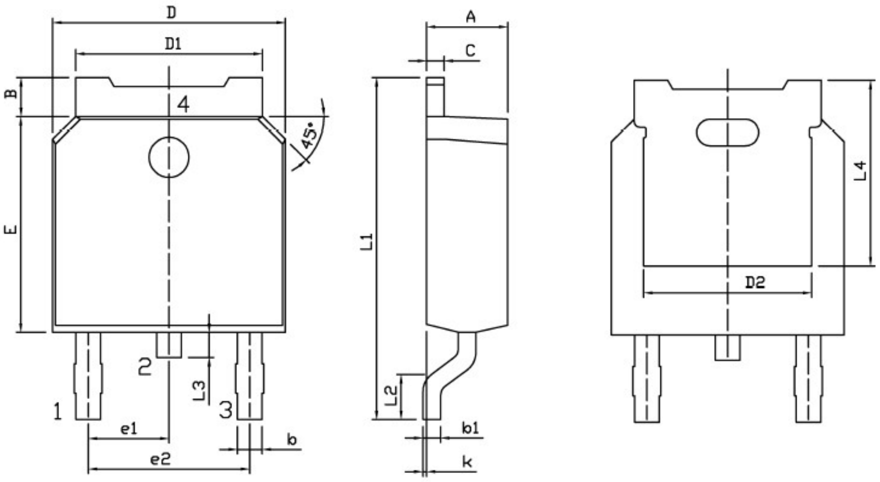


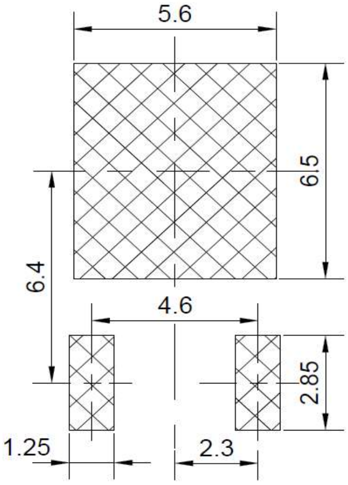
Fig.12 Gate Charge Waveform



●Dimensions(TO-252)



Land Pattern
(Only for Reference)



Dimensions In Millimeters					
Symbol	MIN	MAX	Symbol	MIN	MAX
A	2.20	2.40	E	5.95	6.25
B	0.95	1.25	e1	2.24	2.34
b	0.70	0.90	e2	4.43	4.73
b1	0.45	0.55	L1	9.85	10.35
C	0.45	0.55	L2	1.70	2.00
D	6.45	6.75	L3	0.60	0.90
D1	5.10	5.50	L4	5.05	
D2	4.85		k	0.00	0.10