● General Description

The ZMS040N10P combines advanced SGT 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

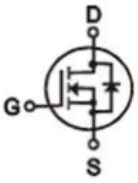
●Application

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

■Oring switches

■Power Tools

● Product Summary

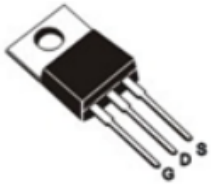


V_{DS}=100V

$R_{DS(ON)}$ =4.2mΩ

I_D=160A

RoHS



TO-220

●Ordering Information:

Part NO.	ZMS040N10P
Marking	ZMS040N10
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@T_C=25℃	160	A
	I_D@T_C=75℃	121	A
	I_D @T_C=100℃	100	A
Pulsed Drain Current ①	I_{DM}	480	A
Total Power Dissipation	P_D@T_C=25℃	85	W
Total Power Dissipation	P_D@T_A=25℃	3.4	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}	200	mJ

Avalanche Current@L=0.1mH	I_{AS}	35	A

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	1.5	° C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	37	° C/W
Soldering temperature, wave soldering 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		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=25A		4.2	5.2	mΩ
		V_{GS}=4.5V, I_D=15A		5.0	6.5	mΩ
Forward Transconductance	g_{FS}	V_{DS} =25V, I_D=10A		28		s
Source-drain voltage	V_{SD}	Is=25A			1.28	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss	V_{GS}=0V, V_{DS}=25V f = 1MHz	-	4028	-	pF
Output capacitance	Coss		-	1960	-	
Reverse transfer capacitance	Crss		-	44	-	

●Gate Charge characteristics(T_a = 25℃)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Qg	V_{DD} = 25V	-	48	-	nC
Gate - Source charge	Qgs	I_D = 8A	-	16	-	
Gate - Drain charge	Qgd	V_{GS} = 10V	-	4.9	-	
Body Diode Reverse Recovery Time	trr	I_F=20A, di/dt=100A/μs		33		nS

Body Diode Reverse Recovery Charge	Qrr	I_F=20A, di/dt=100A/μs		170		nC

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

Fig.1 Gate-Charge Characteristics

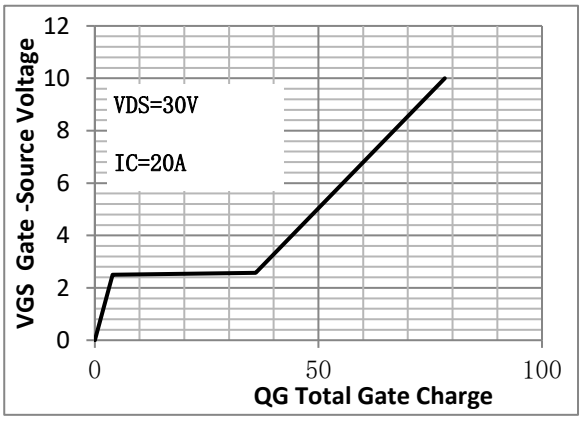


Fig.2 Capacitance Characteristics

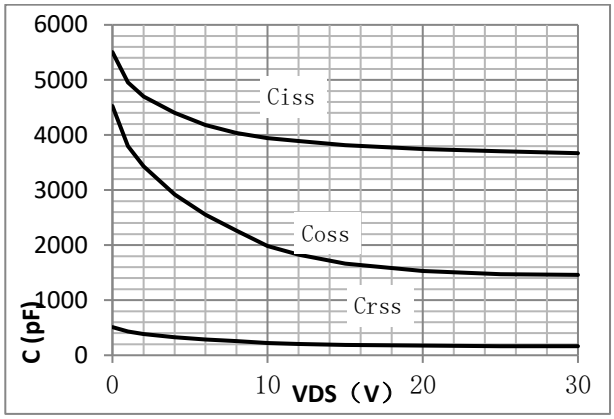


Fig.3 Power Dissipation

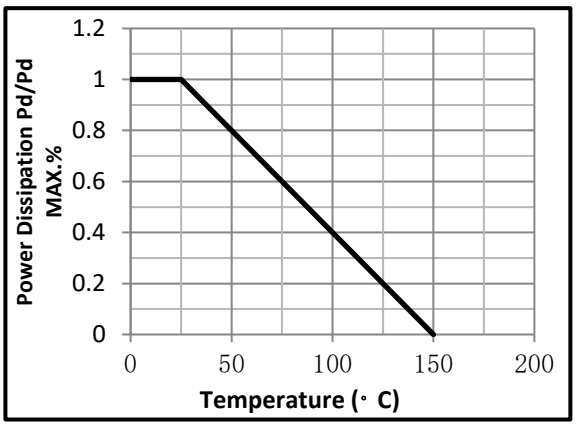


Fig.4 Typical output Characteristics

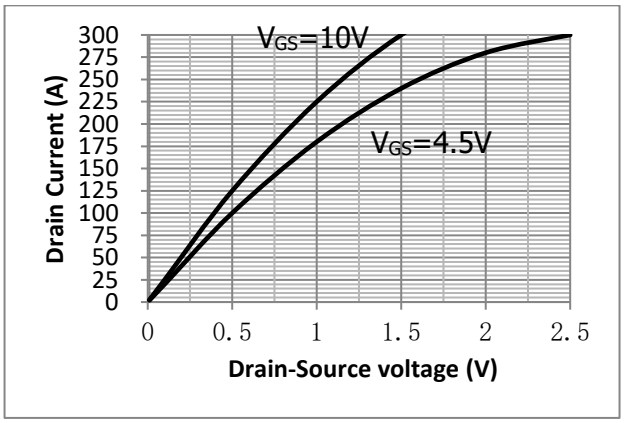


Fig.5 Threshold Voltage V.S Junction Temperature

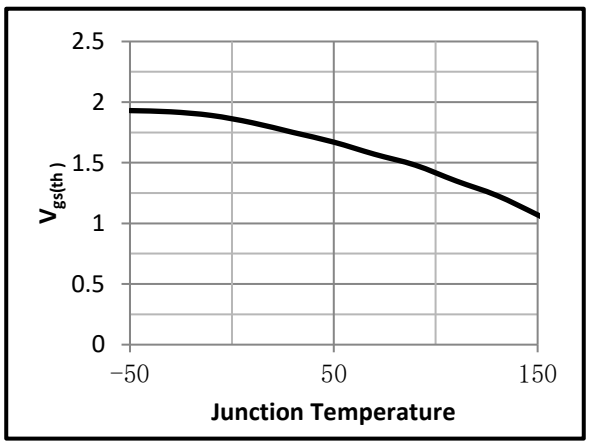


Fig.6 Resistance V.S Drain Current

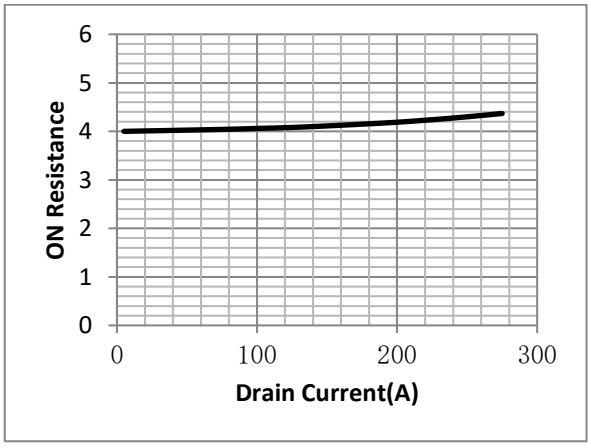


Fig.7 On-Resistance VS Gate Source Voltage

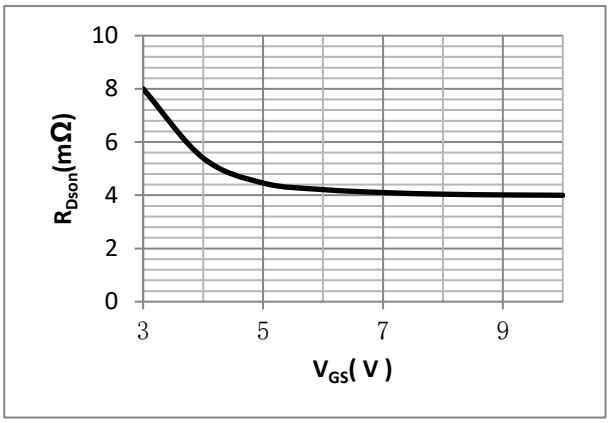


Fig.8 On-Resistance V.S Junction Temperature

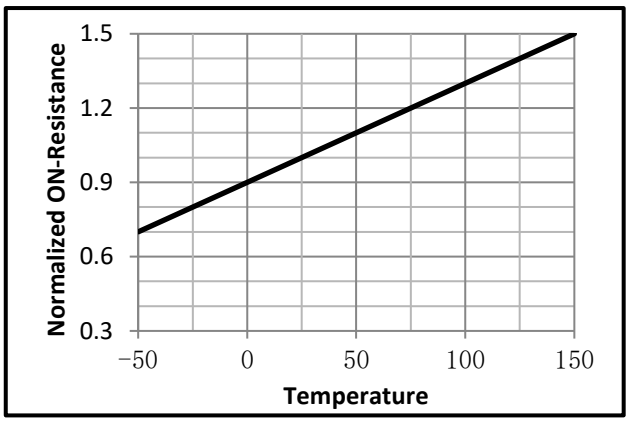


Fig.9 SOA Maximum Safe Operating Area

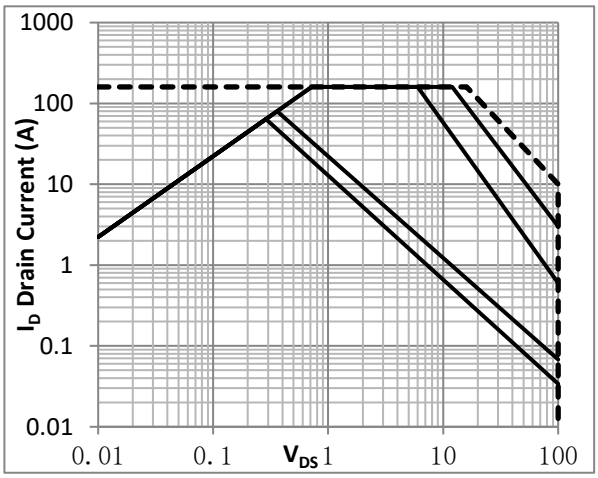


Fig.10 ID-Junction Temperature

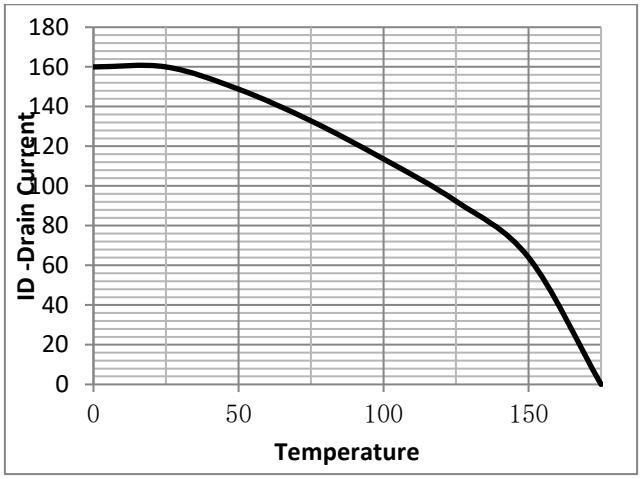


Fig.11 Switching Time Measurement Circuit

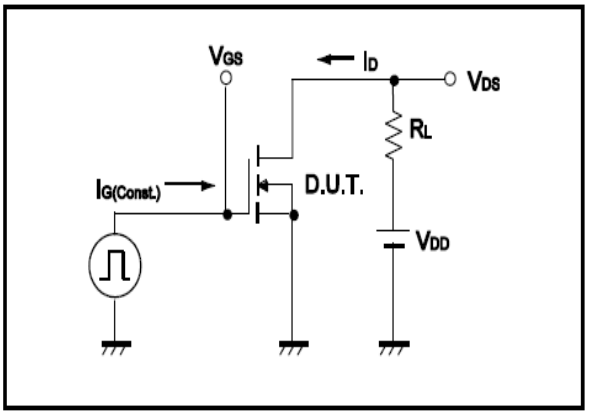


Fig.12 Gate Charge Waveform

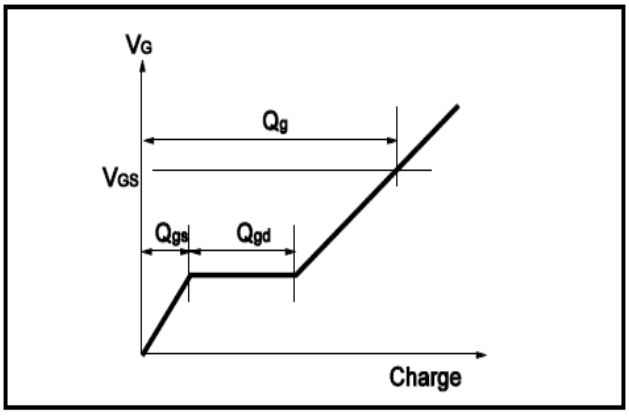


Fig.13 Switching Time Measurement Circuit

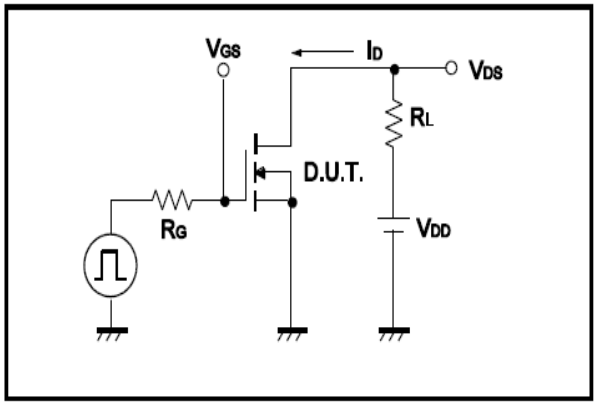


Fig.14 Gate Charge Waveform

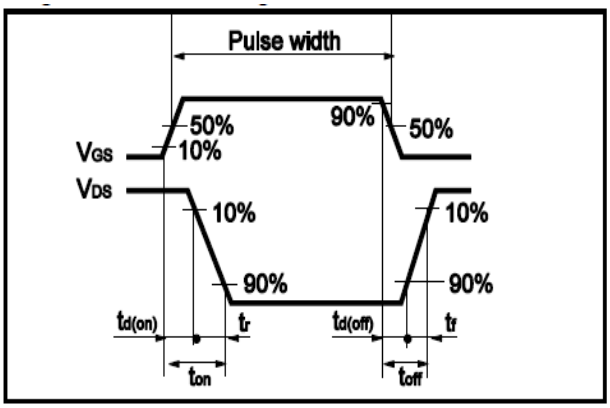


Fig.15 Avalanche Measurement Circuit

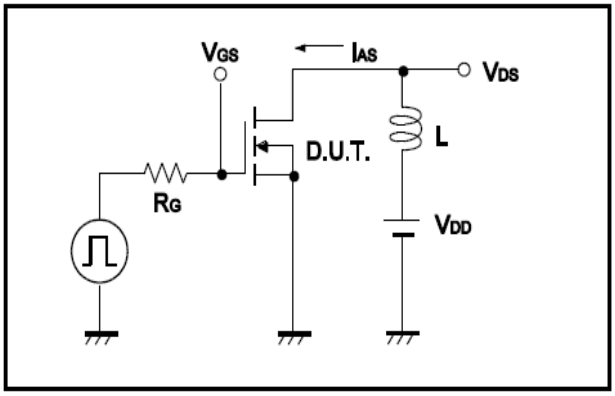
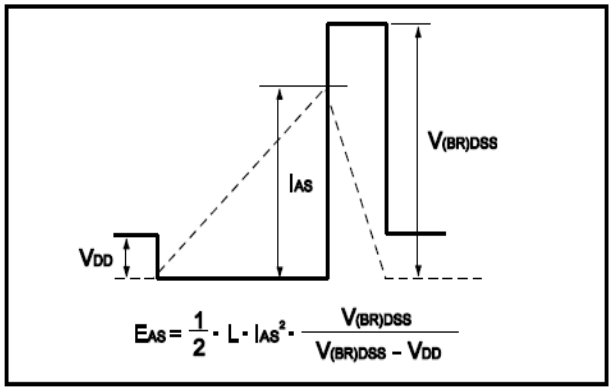


Fig.16 Avalanche Waveform



•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