

**• General Description**

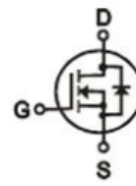
The ZMS040N10HF combines advanced SGT MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ .

**• 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**

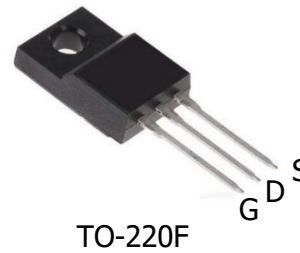
- Synchronous Rectification for AC-DC/DC-DC converter
- Oring switches
- Power Tools

**• Product Summary**


$V_{DS} = 100V$

$R_{DS(ON)} = 4.2m\Omega$

$I_D = 100A$


**• Ordering Information:**

Part NO.	ZMS040N10HF
Marking	ZMS040N10H
Packing Information	Bulk Tube
Basic ordering unit (pcs)	800

**• Absolute Maximum Ratings (T<sub>C</sub> = 25°C)**

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D @ T_C = 25^\circ C$	100	A
	$I_D @ T_C = 75^\circ C$	76	A
	$I_D @ T_C = 100^\circ C$	63	A
Pulsed Drain Current ①	$I_{DM}$	400	A
Total Power Dissipation(TC=25°C)	$P_D @ T_C = 25^\circ C$	85	W
Total Power Dissipation(TA=25°C)	$P_D @ T_A = 25^\circ C$	3.4	W
Operating Junction Temperature	$T_J$	-55 to 150	°C
Storage Temperature	$T_{STG}$	-55 to 150	°C
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 <sub>thJC</sub>	-	-	2.8	° C/W
Thermal resistance, junction - ambient	R <sub>thJA</sub>	-	-	62	° C/W
Soldering temperature, wave soldering 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	100			V
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	2.0		4.0	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =100V, 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> =25A		4.2	5.2	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =25V, I <sub>D</sub> =10A		28		s
Source-drain voltage	V <sub>SD</sub>	I <sub>S</sub> =25A			1.28	V

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V f = 1MHz	-	4028	-	pF
Output capacitance	C <sub>oss</sub>		-	1960	-	
Reverse transfer capacitance	C <sub>rss</sub>		-	44	-	

**•Gate Charge characteristics(T<sub>a</sub> = 25°C)**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q <sub>g</sub>	V <sub>DD</sub> = 25V	-	48	-	nC
Gate - Source charge	Q <sub>gs</sub>	I <sub>D</sub> = 8A	-	16	-	
Gate - Drain charge	Q <sub>gd</sub>	V <sub>GS</sub> = 10V	-	4.9	-	
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =20A, di/dt=100A/μs		TBD		nS
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =20A, di/dt=100A/μs		TBD		nC

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

Fig.1 Gate-Charge Characteristics

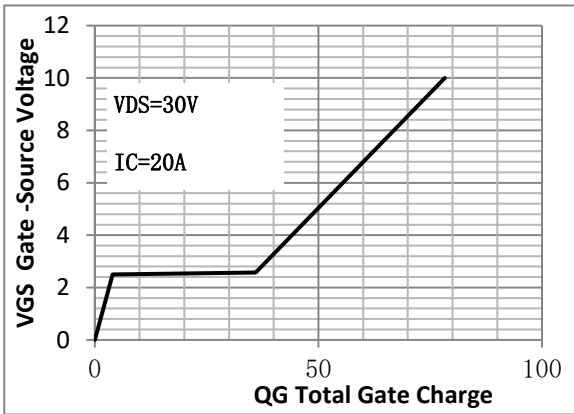


Fig.2 Capacitance Characteristics

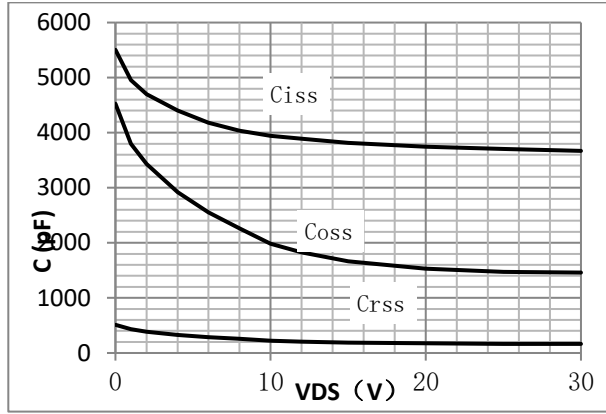


Fig.3 Power Dissipation

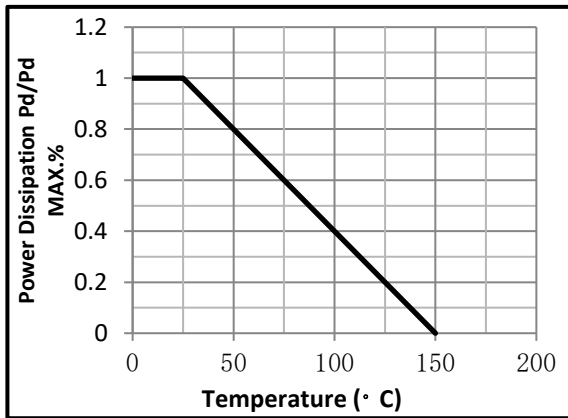


Fig.4 Typical output Characteristics

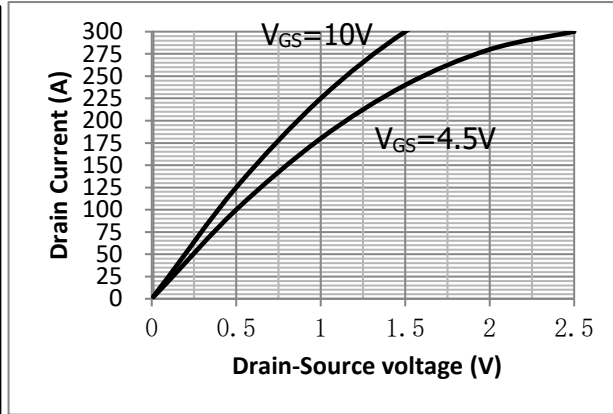


Fig.5 Threshold Voltage V.S Junction Temperature

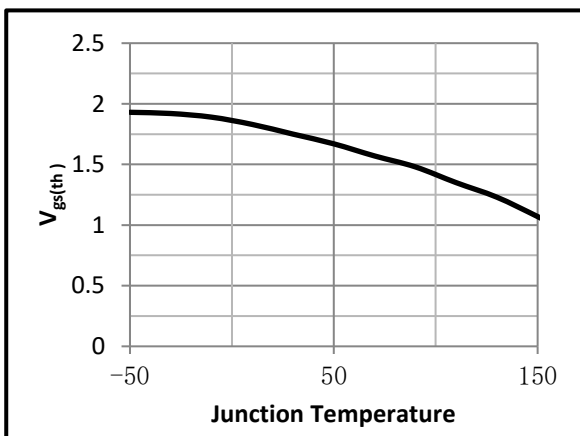


Fig.6 Resistance V.S Drain Current

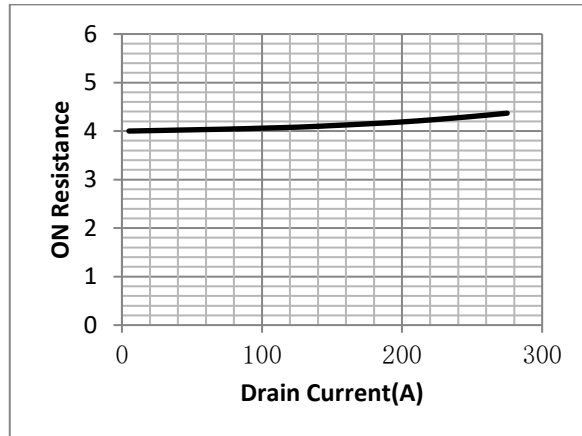


Fig.7 On-Resistance VS Gate Source Voltage

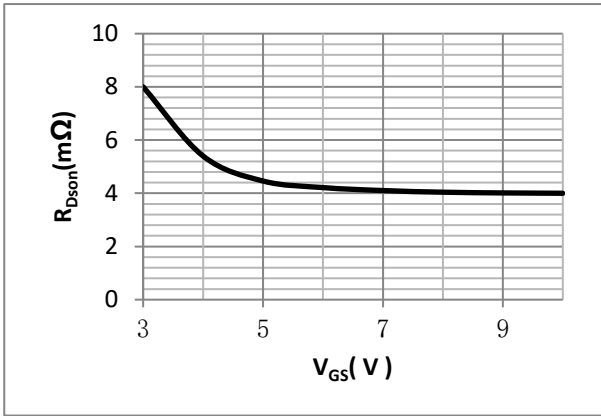


Fig.8 On-Resistance V.S Junction Temperature

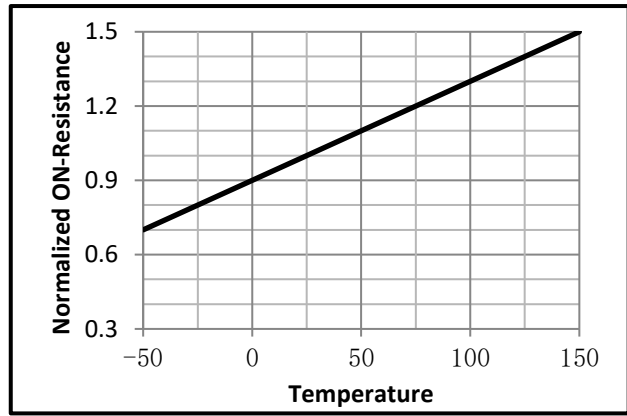


Fig.9 SOA Maximum Safe Operating Area

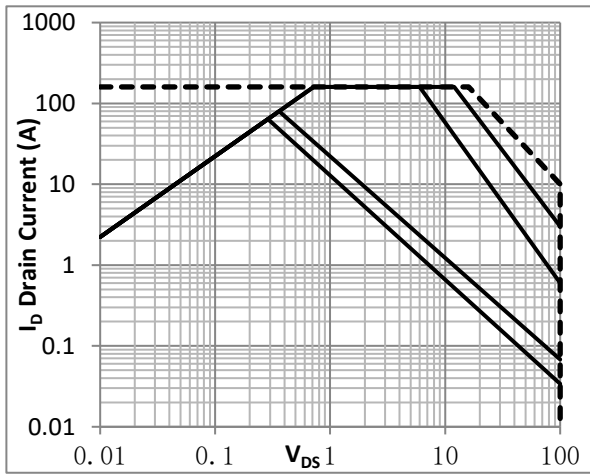


Fig.10 ID-Junction Temperature

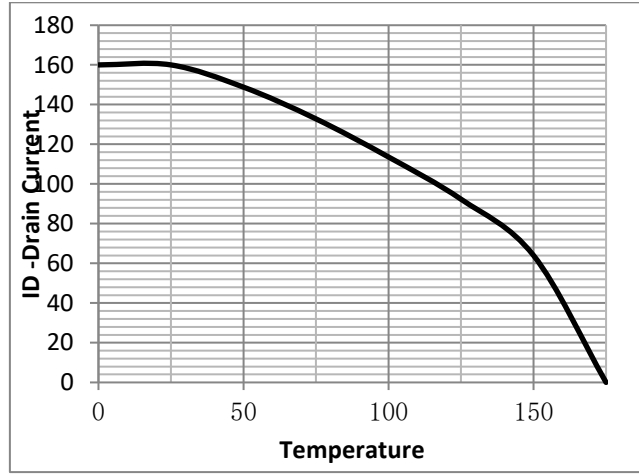


Fig.11 Switching Time Measurement Circuit

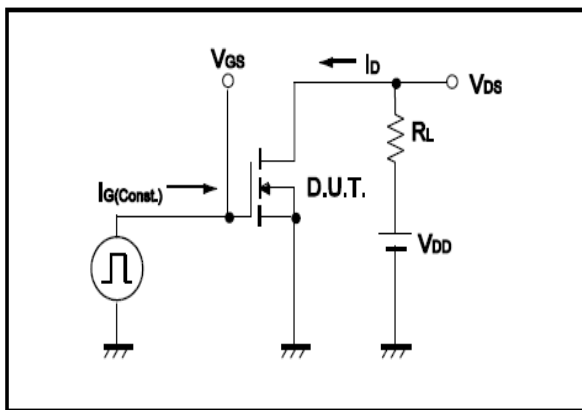


Fig.12 Gate Charge Waveform

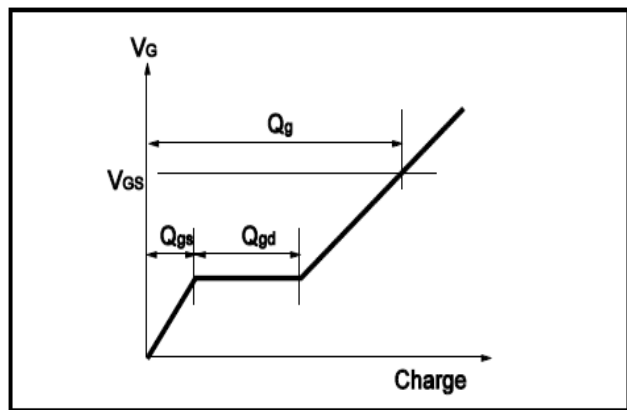


Fig.13 Switching Time Measurement Circuit

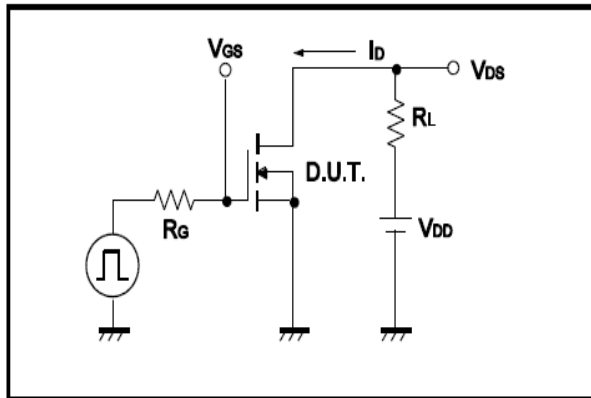


Fig.14 Gate Charge Waveform

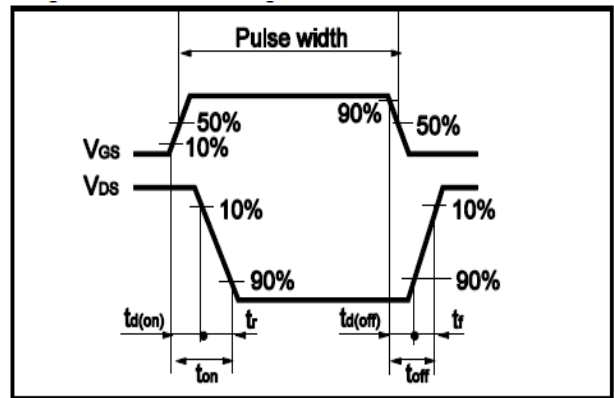


Fig.15 Avalanche Measurement Circuit

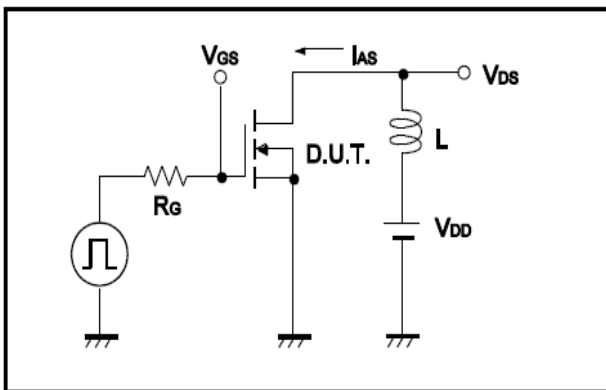
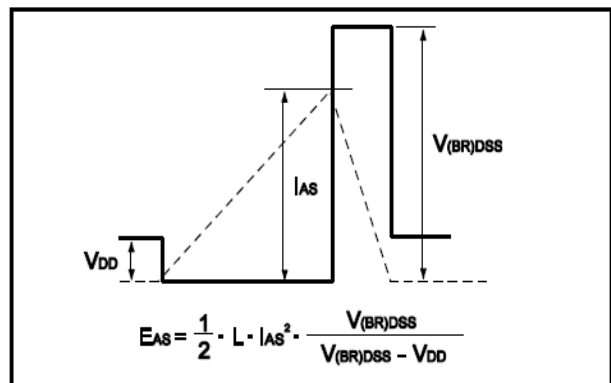


Fig.16 Avalanche Waveform





• Dimensions (TO-220F)

Unit: mm

SYMBOL	min	nom	max	SYMBOL	min	nom	max
A	4.40		4.95	e		2.54	
A <sub>1</sub>	2.30		2.90	L	12.50		14.30
b	0.45		0.90	L <sub>1</sub>	9.10		10.05
b <sub>1</sub>	1.10		1.70	L <sub>2</sub>	15.00		16.00
c	0.35		0.90	L <sub>3</sub>	3.00		4.00
D	14.50		17.00	øp	3.00		3.50
D1	6.10		9.00	Q	2.30		2.80
E	9.60		10.30				

