

• General Description

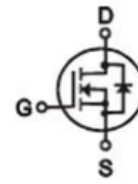
The ZMS040N10HB combines advanced SGT MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

• 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

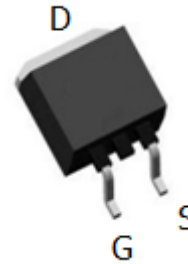
- Synchronous Rectification for AC-DC/DC-DC converter
- Oring switches
- Power Tools

• Product Summary


$V_{DS} = 100V$

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

$I_D = 160A$


TO-263
• Ordering Information:

Part NO.	ZMS040N10HB
Marking	ZMS040N10H
Packing Information	REEL TAPE
Basic ordering unit (pcs)	800

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$I_D @ T_C = 25^\circ C$	160	A
	$I_D @ T_C = 75^\circ C$	121	A
	$I_D @ T_C = 100^\circ C$	100	A
Pulsed Drain Current ①	I_{DM}	480	A
Total Power Dissipation	$P_D @ T_C = 25^\circ C$	96	W
Total Power Dissipation	$P_D @ T_A = 25^\circ C$	3.1	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}	200	mJ

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	1.3	° C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	40	° 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}	$V_{GS} = 0V, I_D = 250\mu A$	100			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = 250\mu A$	2.0		4.0	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = 100V, V_{GS} = 0V$			1.0	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 25A$		4.2	5.2	m Ω
Forward Transconductance	g_{FS}	$V_{DS} = 25V, I_D = 10A$		28		s
Source-drain voltage	V_{SD}	$I_S = 25A$			1.28	V

•Dynamic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 25V$ $f = 1MHz$	-	4028	-	pF
Output capacitance	C_{oss}		-	1787	-	
Reverse transfer capacitance	C_{rss}		-	91	-	
Total gate charge	Q_g	$V_{DD} = 25V$	-	48	-	nC
Gate - Source charge	Q_{gs}	$I_D = 8A$	-	16	-	
Gate - Drain charge	Q_{gd}	$V_{GS} = 10V$	-	4.9	-	
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 20A,$ $di/dt = 100A/\mu s$		TBD		nS
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F = 20A,$ $di/dt = 100A/\mu s$		TBD		nC

Note: ① Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$;

Fig.1 Gate-Charge Characteristics

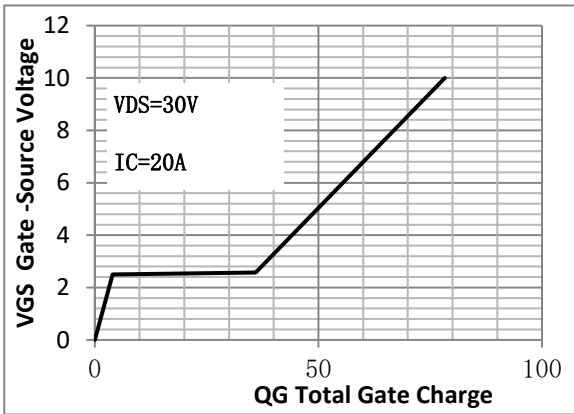


Fig.2 Capacitance Characteristics

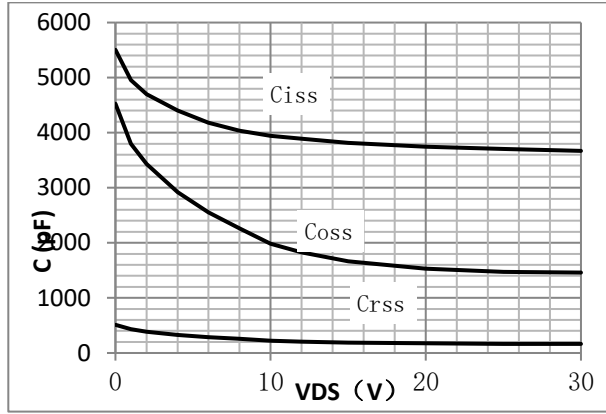


Fig.3 Power Dissipation

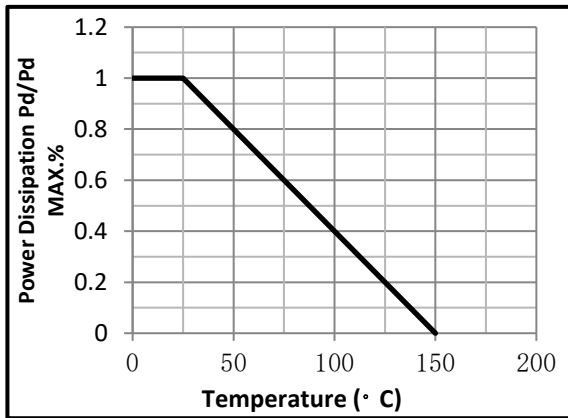


Fig.4 Typical output Characteristics

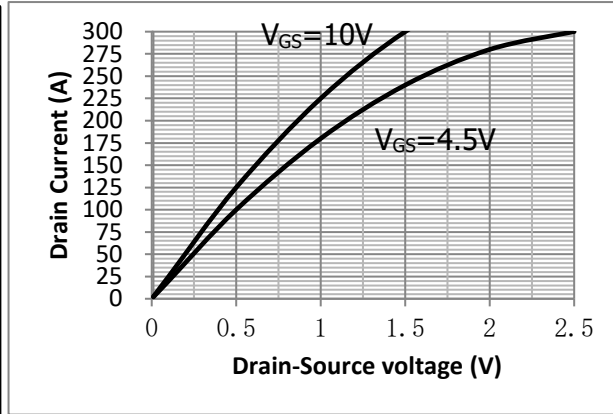


Fig.5 Threshold Voltage V.S Junction Temperature

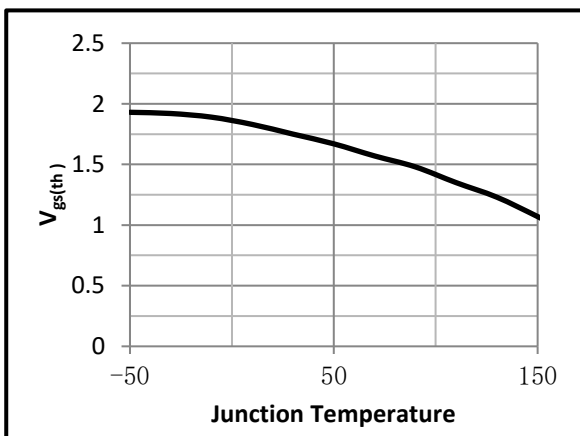


Fig.6 Resistance V.S Drain Current

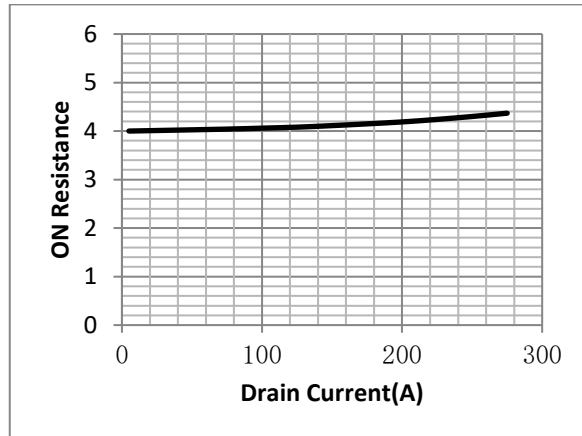


Fig.7 On-Resistance VS Gate Source Voltage

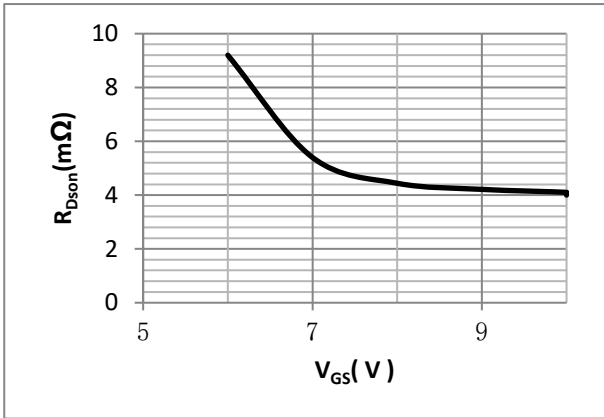


Fig.8 On-Resistance V.S Junction Temperature

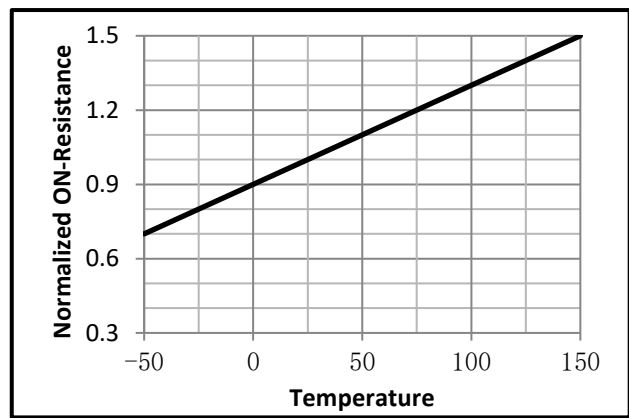


Fig.9 SOA Maximum Safe Operating Area

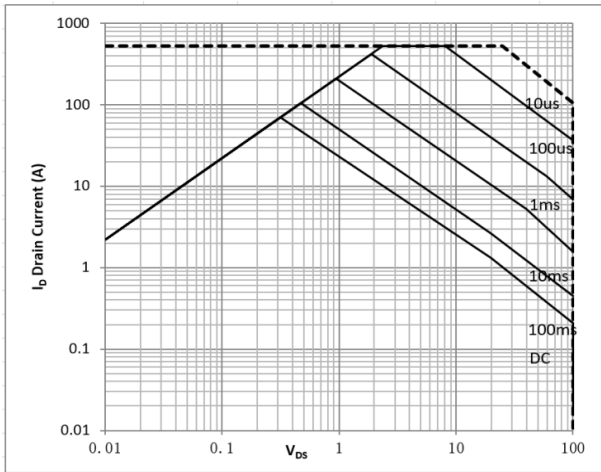


Fig.10 I_D -Junction Temperature

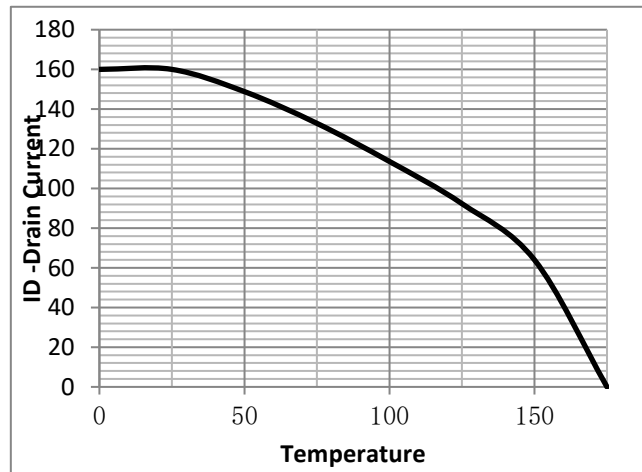


Fig.11 Switching Time Measurement Circuit

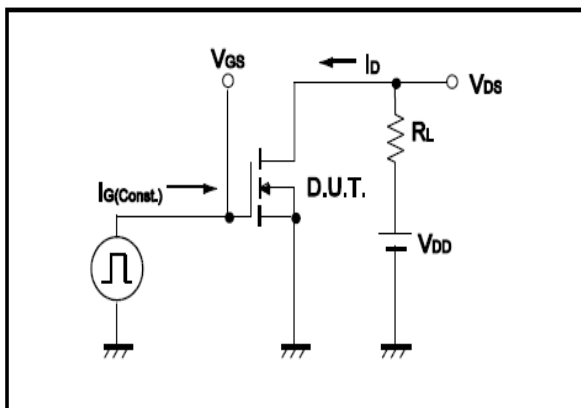


Fig.12 Gate Charge Waveform

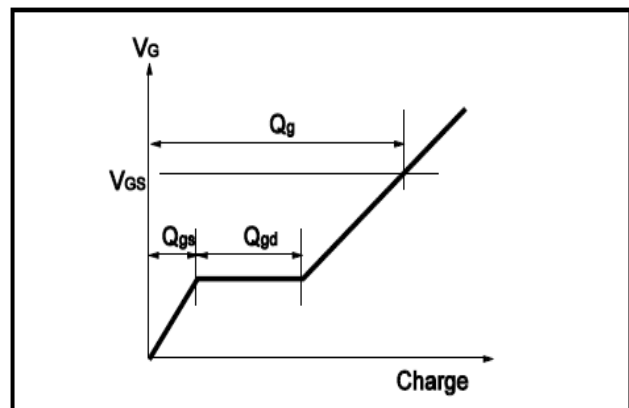


Fig.13 Switching Time Measurement Circuit

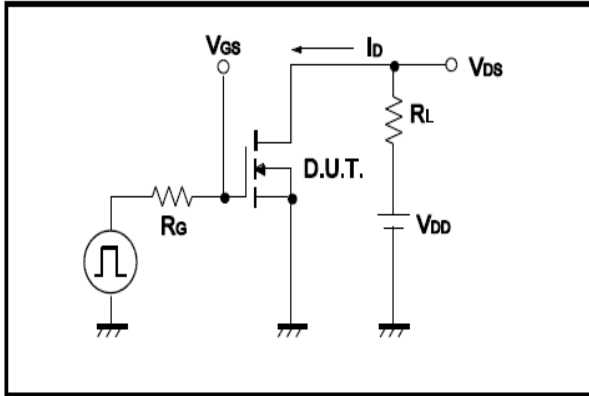


Fig.14 Gate Charge Waveform

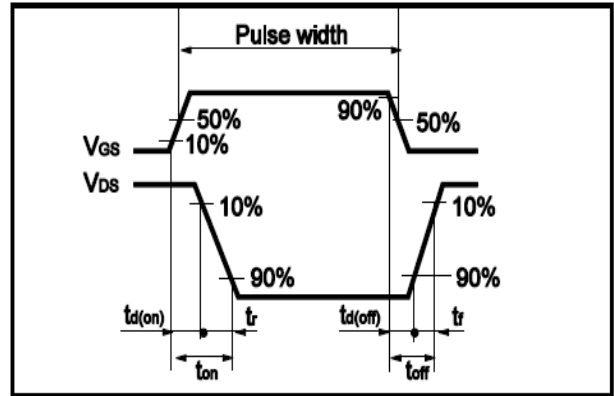


Fig.15 Avalanche Measurement Circuit

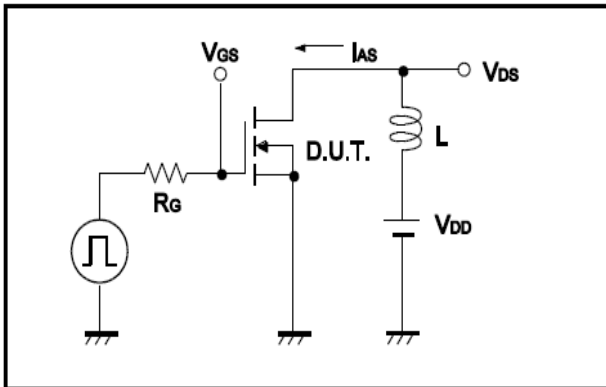
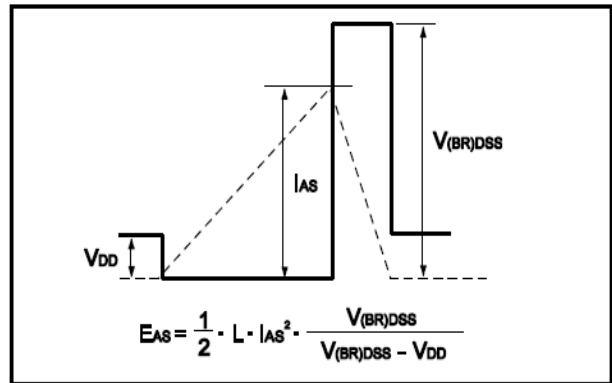


Fig.16 Avalanche Waveform





•Dimensions (TO-263)

Unit: mm

SYMBOL	MIN	TYP	MAX	SYMBOL	MIN	TYP	MAX
A	4.42		4.72	E	8.99		9.29
B	1.22		1.32	e1	2.44		2.64
b	0.76		0.86	e2	4.98		5.18
b1	1.22		1.32	L1	15.19		15.79
b2	0.33		0.43	L2	2.29		2.79
C	1.22		1.32	L3	1.3		1.75
D	9.95		10.25				

