

**• General Description**

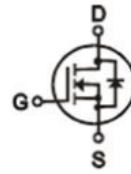
The ZM040N06HB combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ .

**• 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**

- SMPS 2<sup>nd</sup> Synchronous Rectifier
- BLDC Motor driver

**• Product Summary**


$V_{DS} = 60V$

$R_{DS(ON)} = 3.8m\Omega$

$I_D = 120A$


**TO-263**
**• Ordering Information:**

Part NO.	ZM040N06HB
Marking	ZM040N06H
Packing Information	REEL TAPE
Basic ordering unit (pcs)	800

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_{D@TC=25^{\circ}C}$	120	A
	$I_{D@TC=75^{\circ}C}$	91.2	A
	$I_{D@TC=100^{\circ}C}$	75.6	A
Pulsed Drain Current ①	$I_{DM}$	250	A
Total Power Dissipation(TC=25°C)	$P_D@TC=25^{\circ}C$	120	W
Total Power Dissipation(TA=25°C)	$P_D@TA=25^{\circ}C$	5	W
Operating Junction Temperature	$T_J$	-55 to 150	°C
Storage Temperature	$T_{STG}$	-55 to 150	°C

**•Thermal resistance**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	$R_{thJC}$	-	-	1	$^{\circ}C/W$
Thermal resistance, junction - ambient	$R_{thJA}$	-	-	25	$^{\circ}C/W$
Soldering temperature, wavesoldering for 10s	$T_{sold}$	-	-	265	$^{\circ}C$

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2		4	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$			1.0	$\mu A$
Gate- Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$		3.8	5.0	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=25V, I_D=15A$		32		s
Source-drain voltage	$V_{SD}$	$I_S=20A$			1.28	V

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	$C_{iss}$	f = 1MHz	-	6510	-	pF
Output capacitance	$C_{oss}$		-	450	-	
Reverse transfer capacitance	$C_{rss}$		-	200	-	

**•Gate Charge characteristics( $T_a = 25^{\circ}C$ )**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	$Q_g$	$V_{DD} = 25V$	-	54	-	nC
Gate - Source charge	$Q_{gs}$	$I_D = 25A$	-	18	-	
Gate - Drain charge	$Q_{gd}$	$V_{GS} = 10V$	-	21	-	

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

Fig.1 Gate-Charge Characteristics

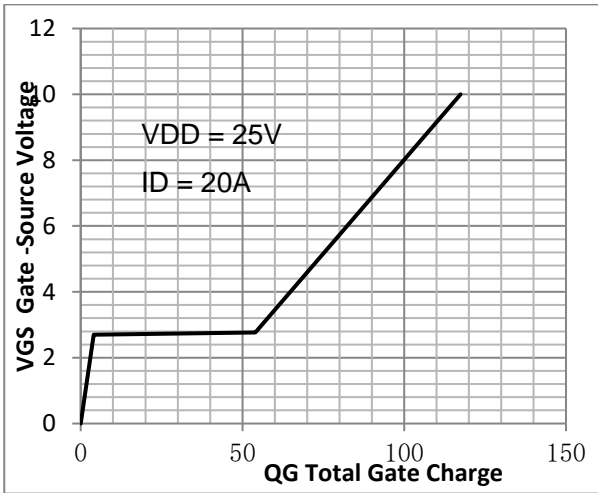


Fig.2 Capacitance Characteristics

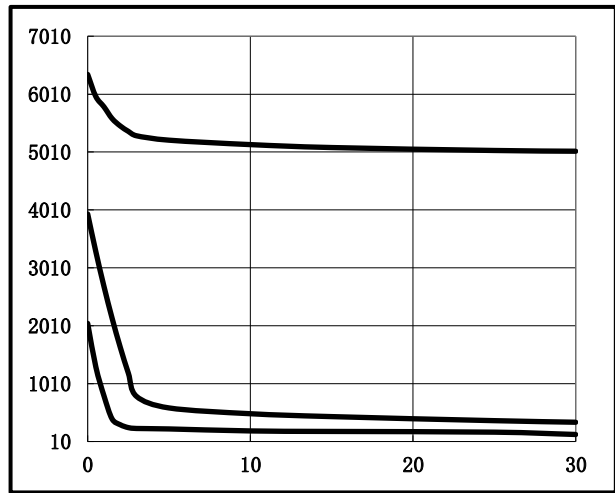


Fig.3 Power Dissipation

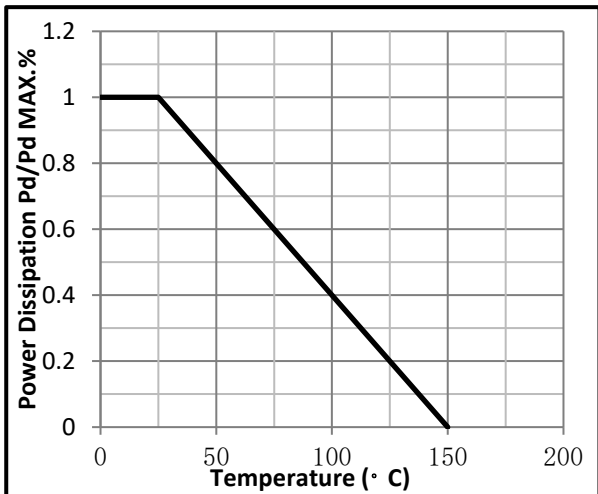


Fig.4 Typical output Characteristics

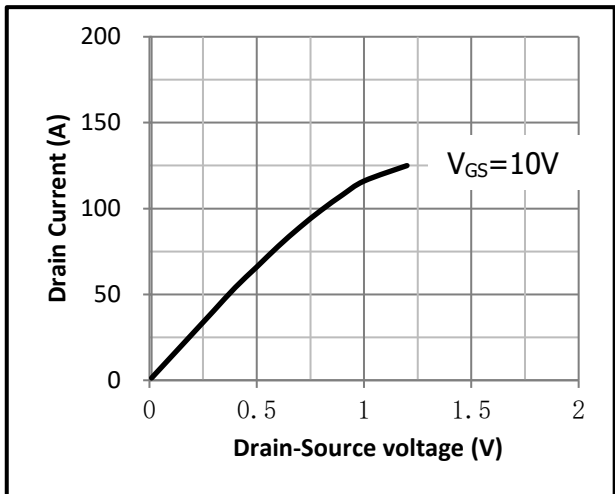


Fig.5 Threshold Voltage V.S Junction Temperature

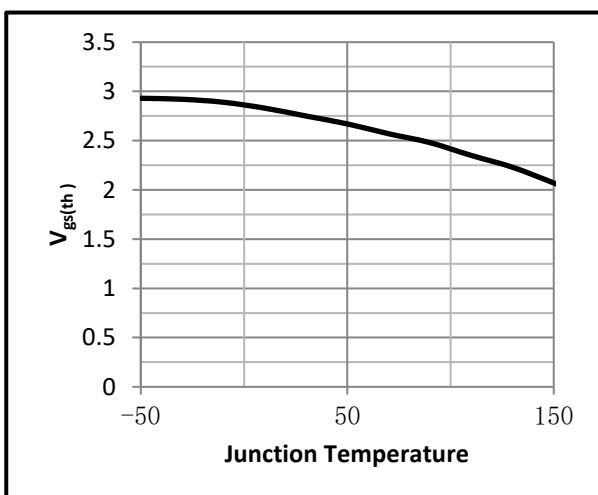


Fig.6 Resistance V.S Drain Current

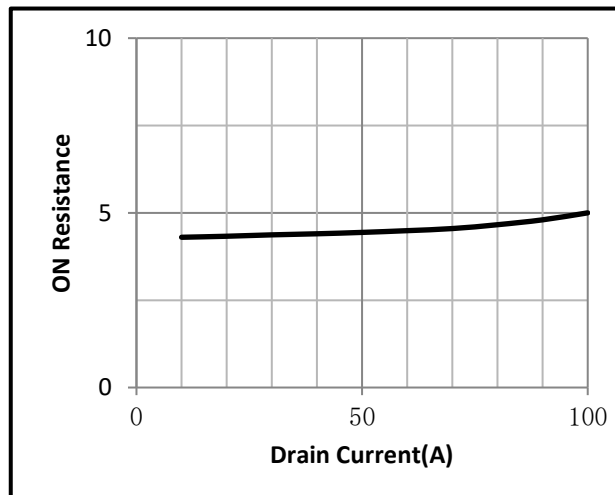


Fig.7 On-Resistance VS Gate Source Voltage

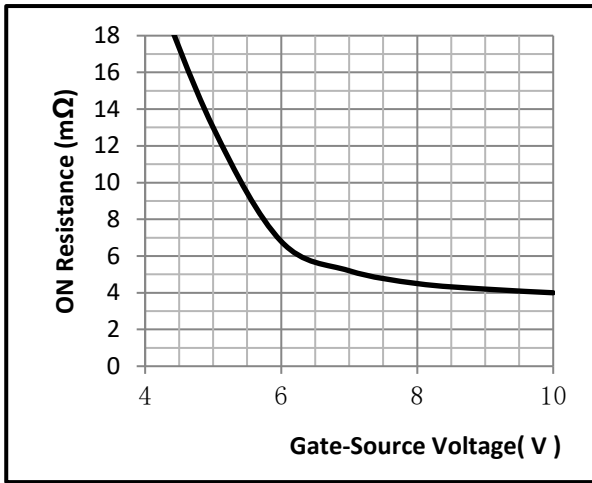


Fig.8 On-Resistance V.S Junction Temperature

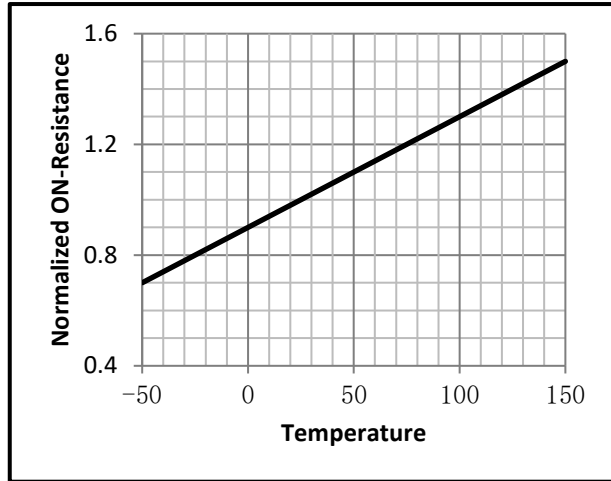


Fig.9 Switching Time Measurement Circuit

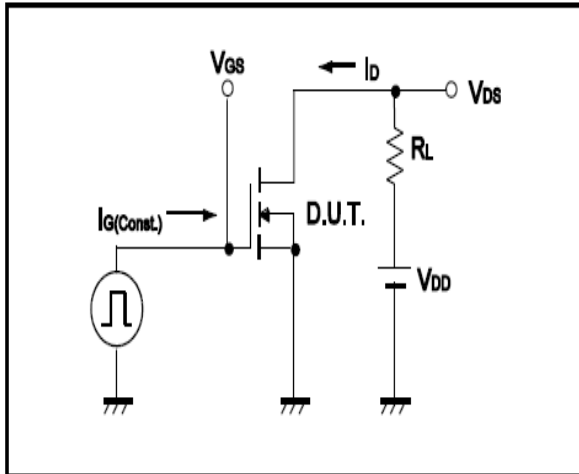


Fig.10 Gate Charge Waveform

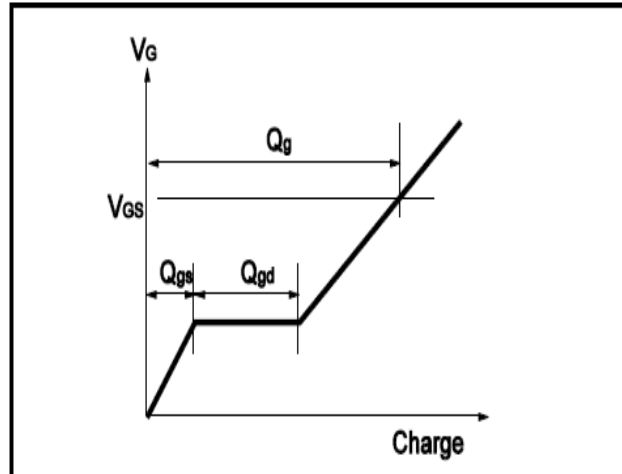


Fig.11 Switching Time Measurement Circuit

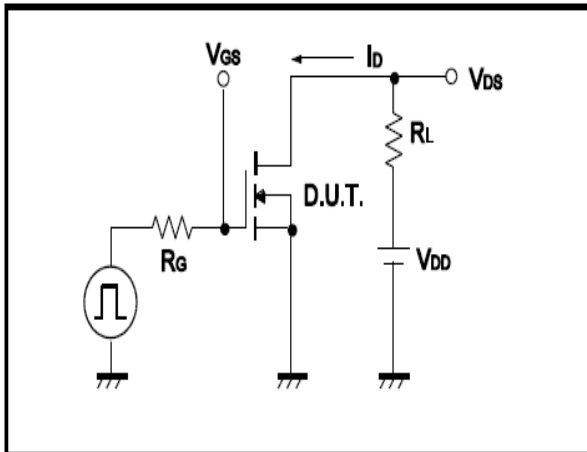
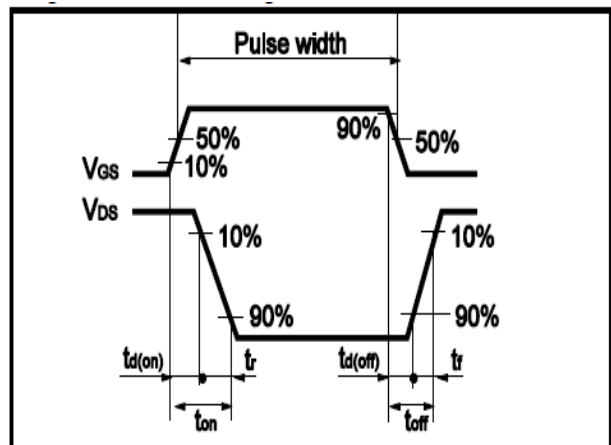


Fig.12 Gate Charge Waveform



• 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				

