

**• General Description**

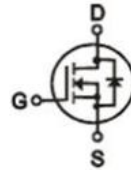
The ZM060N06HP combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ .

**• 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**

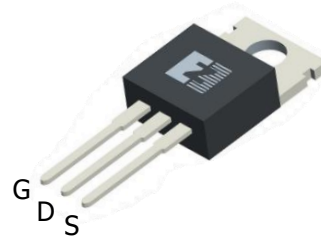
- MB/VGA Vcore
- SMPS 2<sup>nd</sup> Synchronous Rectifier
- POL application
- BLDC Motor driver

**• Product Summary**


$V_{DS} = 60V$

$R_{DS(ON)} = 6m\Omega$

$I_D = 80A$



TO-220

**• Ordering Information:**

Part NO.	ZM060N06HP
Marking	ZM060N06H
Packing Information	Bulk Tube
Basic ordering unit (pcs)	1000

**• 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	$I_{D@TC=25^{\circ}C}$	80	A
	$I_{D@TC=75^{\circ}C}$	60.8	A
	$I_{D@TC=100^{\circ}C}$	50.4	A
Pulsed Drain Current <sup>①</sup>	$I_{DM}$	190	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	°C/W
Thermal resistance, junction - ambient	$R_{thJA}$	-	-	25	°C/W
Soldering temperature, wavesoldering for 10s	$T_{sold}$	-	-	265	°C

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	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	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 16A$		6	8	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS} = 25V, I_D = 8A$		28		s
Source-drain voltage	$V_{SD}$	$I_S = 16A$			1.28	V

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	$C_{iss}$	f = 1MHz VDS=25V	-	4200	-	pF
Output capacitance	$C_{oss}$		-	290	-	
Reverse transfer capacitance	$C_{rss}$		-	130	-	

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

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	$Q_g$	$V_{DD} = 25V$	-	56	-	nC
Gate - Source charge	$Q_{gs}$	$I_D = 15A$	-	16	-	
Gate - Drain charge	$Q_{gd}$	$V_{GS} = 10V$	-	26	-	

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

Fig.1 Gate-Charge Characteristics

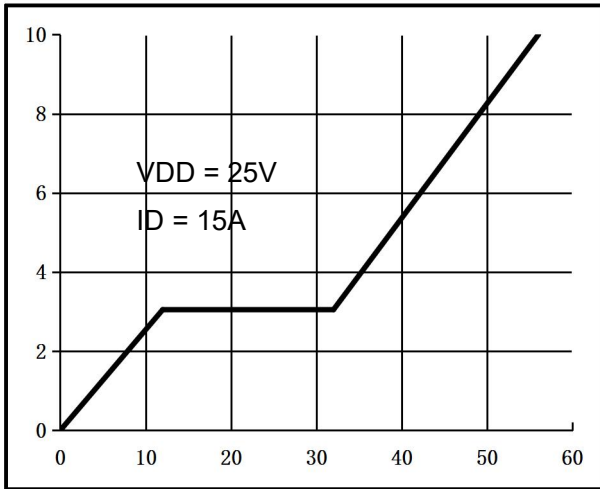


Fig.2 Capacitance Characteristics

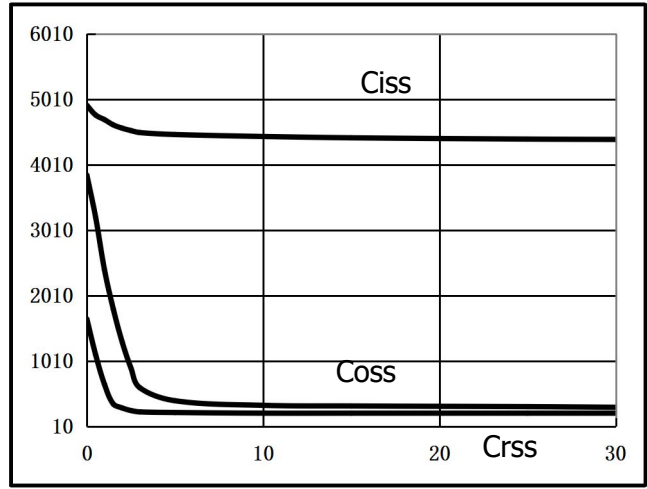


Fig.3 Power Dissipation

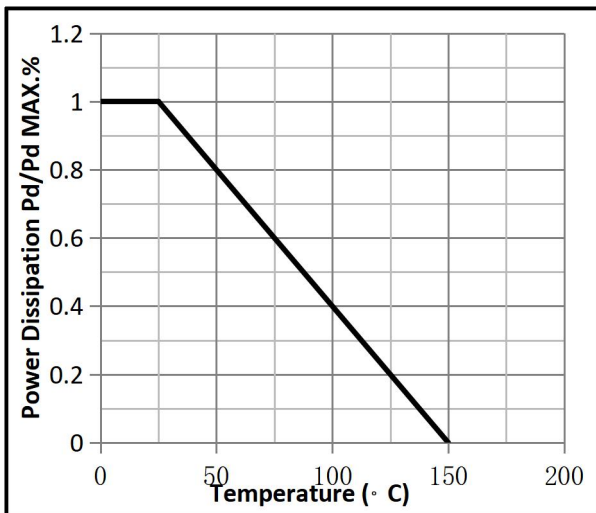


Fig.4 Typical output Characteristics

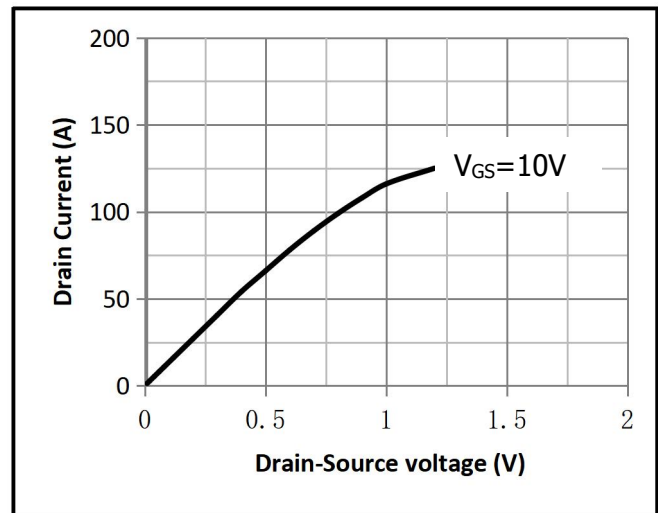


Fig.5 Threshold Voltage V.S Junction Temperature

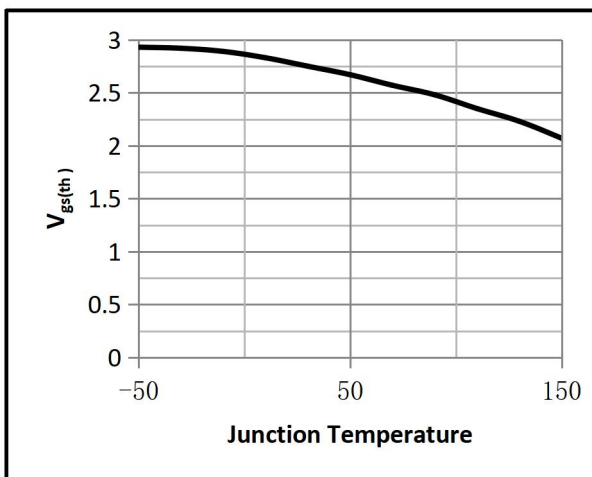


Fig.6 Resistance V.S Drain Current

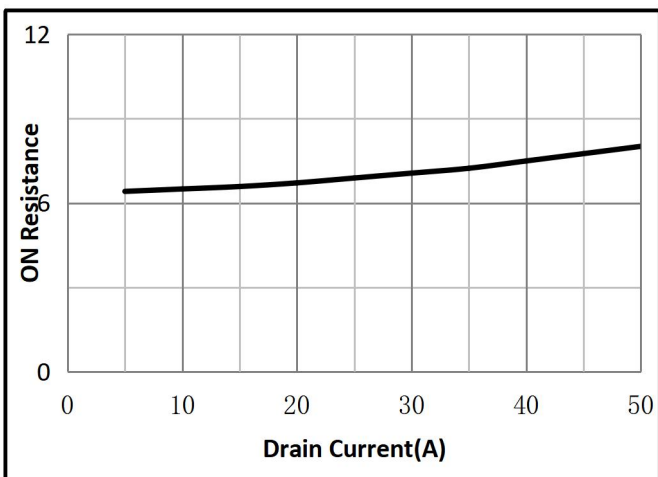


Fig.7 On-Resistance VS Gate Source Voltage

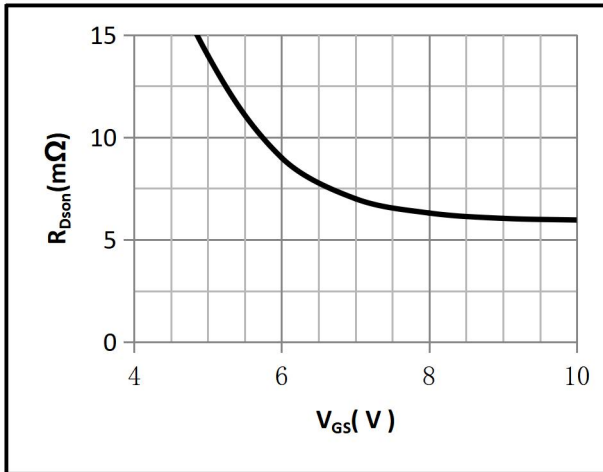


Fig.8 On-Resistance V.S Junction Temperature

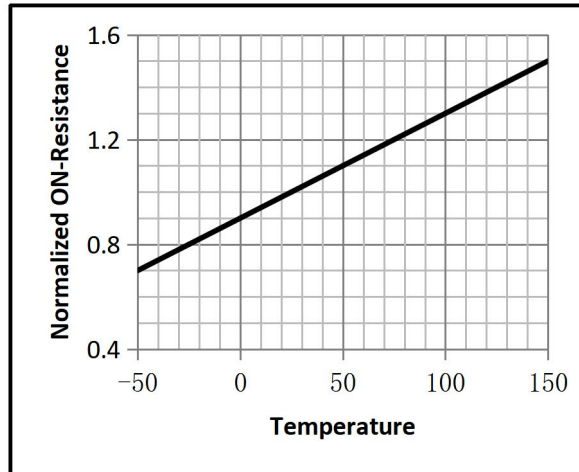


Fig.9 Switching Time Measurement Circuit

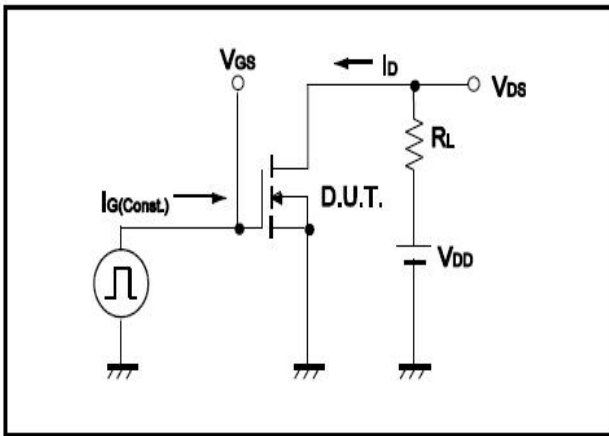


Fig.10 Gate Charge Waveform

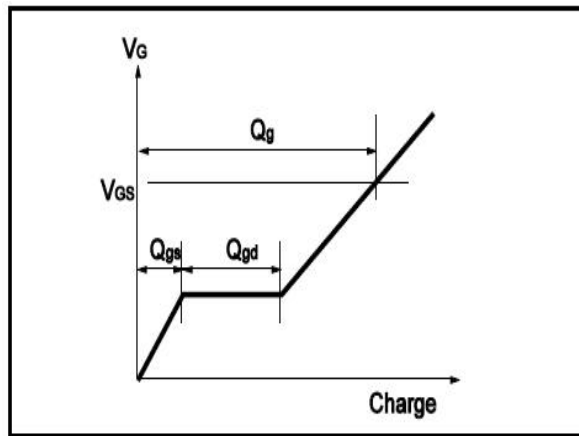


Fig.11 Switching Time Measurement Circuit

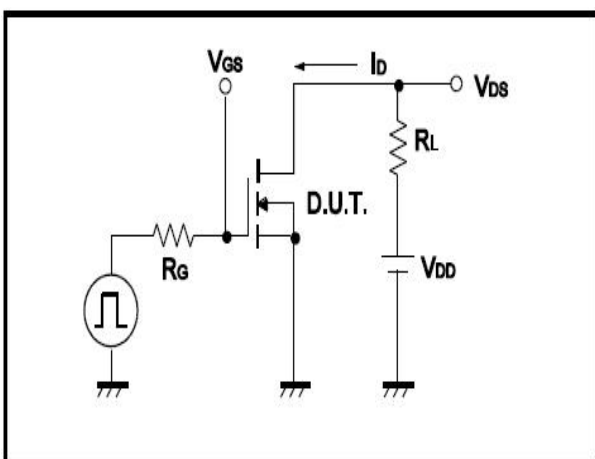
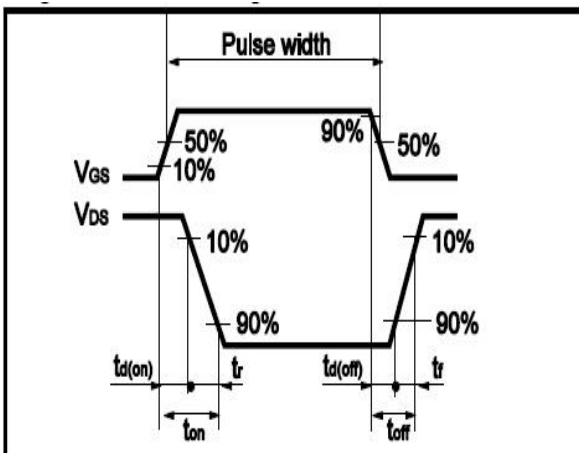


Fig.12 Gate Charge Waveform





●Dimensions (TO-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	<b>3.50</b>	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

