• General Description

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

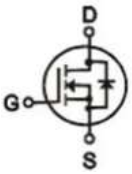
• Features

- ■ 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 2nd Synchronous Rectifier
- ■POL application
- ■BLDC Motor driver

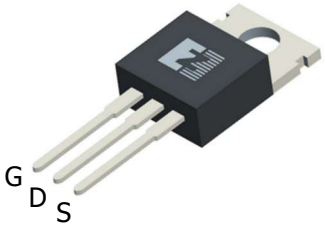
• Product Summary



V_{DS} =60V

$R_{DS(ON)}$ =6mΩ

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_C =25℃)

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℃	80	A
	$I_{D@}$TC=75℃	60.8	A
	$I_{D@}$TC=100℃	50.4	A
Pulsed Drain Current ①	I_{DM}	190	A
Total Power Dissipation(TC=25℃)	P_D@TC=25℃	120	W
Total Power Dissipation(TA=25℃)	P_D@TA=25℃	5	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃

●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 =250uA	60			V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} =V_{DS}, I_D =250uA	2		4	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=60V, 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=16A		6	8	mΩ
Forward Transconductance	g_{FS}	V_{DS} =25V, I_D=8A		28		s
Source-drain voltage	V_{SD}	Is=16A			1.28	V

●Dynamic characteristics(T_a = 25℃)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	f = 1MHz V_{DS}=25V	-	4200	-	pF
Output capacitance	C_{oss}		-	290	-	
Reverse transfer capacitance	C_{rss}		-	130	-	
Total gate charge	Q_g	V_{DD} = 25V I_D = 15A V_{GS} = 10V	-	56	-	nC
Gate - Source charge	Q_{gs}		-	16	-	
Gate - Drain charge	Q_{gd}		-	26	-	
Turn-ON Delay time	$t_{D(on)}$	V_{GS}=10V, V_{DS}=15V, R_G =3.3Ω, I_D =20A	-	11	-	ns
Turn-ON Rise time	t_r		-	66	-	ns
Turn-Off Delay time	$t_{D(off)}$		-	41	-	ns
Turn-Off Delay time	t_f		-	44	-	ns
Reverse Recovery Time	T_{rr}	V_{DD}=20V, dI_S/dt = 100A/us, I_S=50A	-	37	-	ns
Reverse Recovery Charge	Q_{rr}		-	43	-	nC

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

Fig.1 Gate-Charge Characteristics

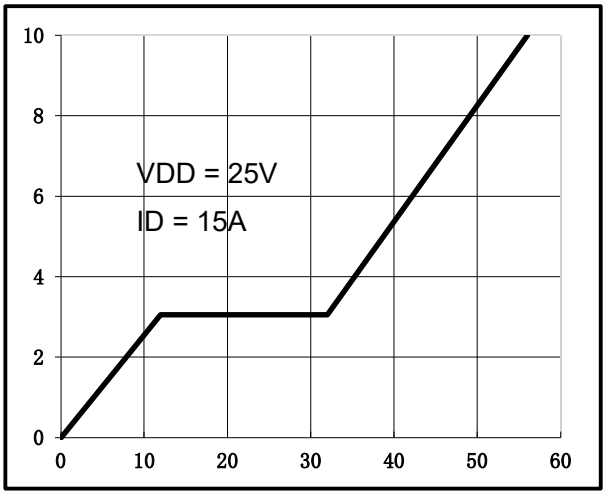


Fig.2 Capacitance Characteristics

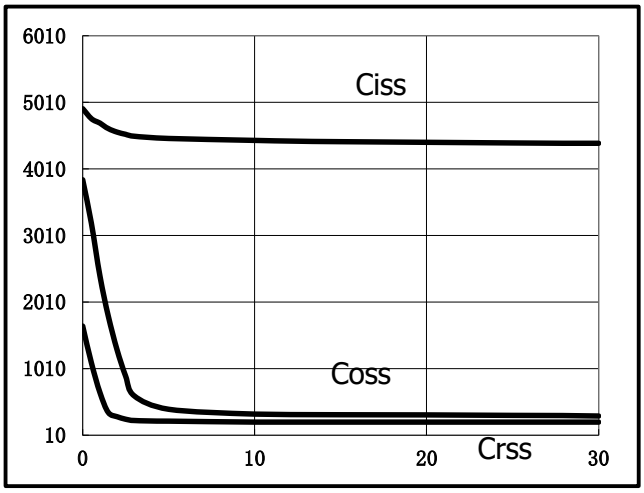


Fig.3 Power Dissipation

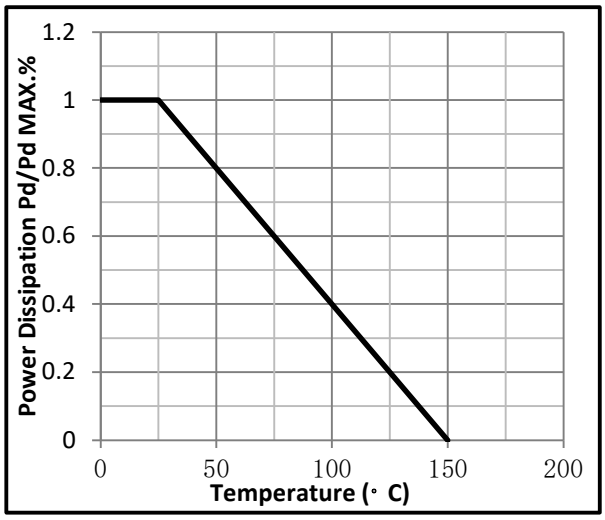


Fig.4 Typical output Characteristics

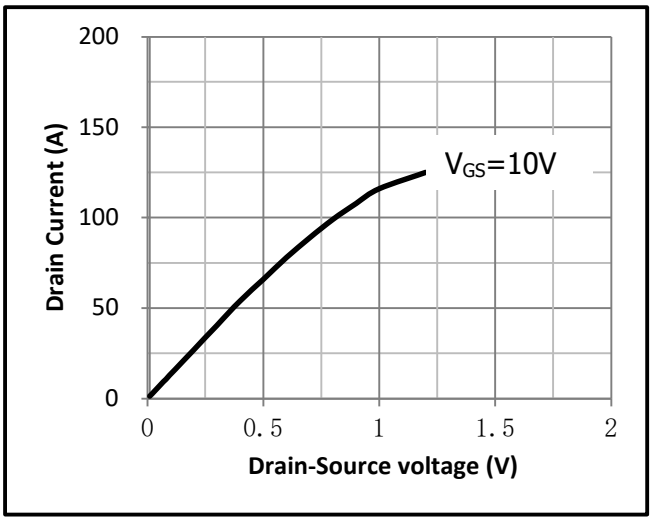


Fig.5 Threshold Voltage V.S Junction Temperature

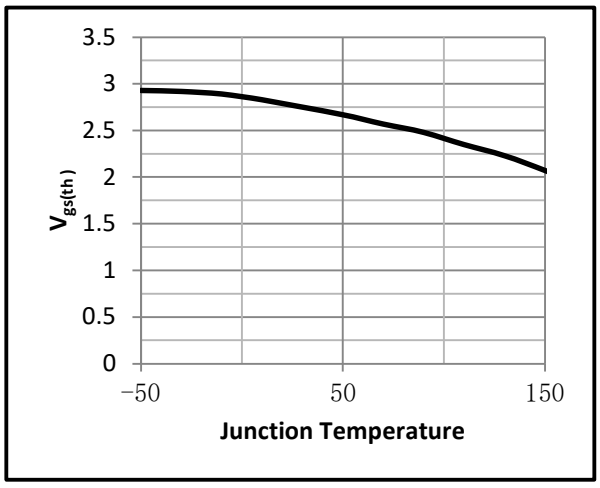


Fig.6 Resistance V.S Drain Current

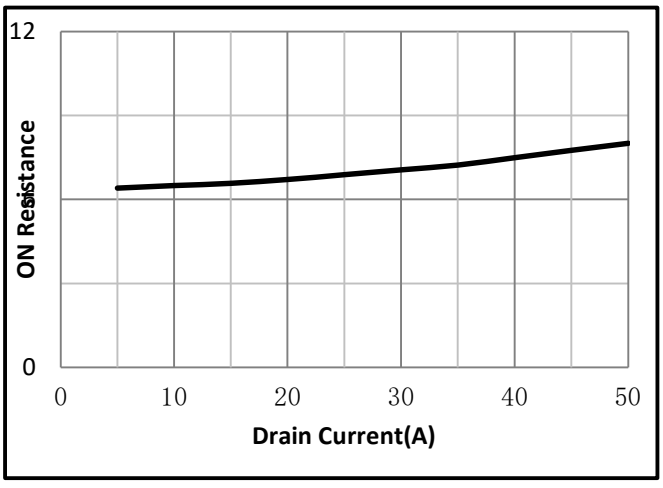


Fig.7 On-Resistance VS Gate Source Voltage

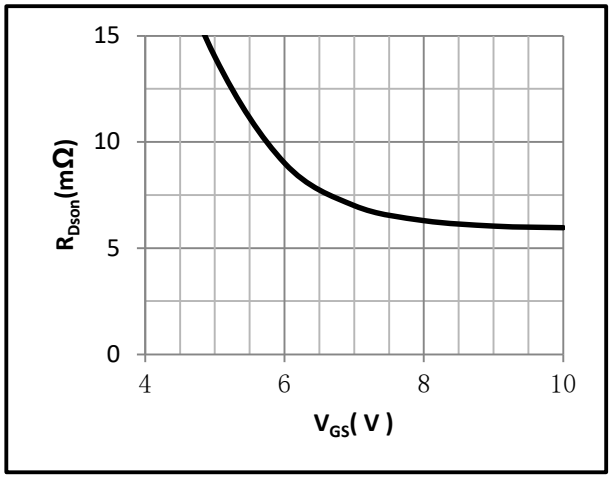


Fig.8 On-Resistance V.S Junction Temperature

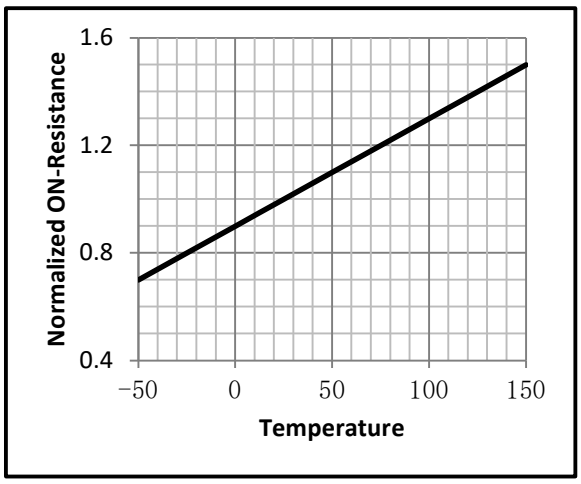


Fig.9 Switching Time Measurement Circuit

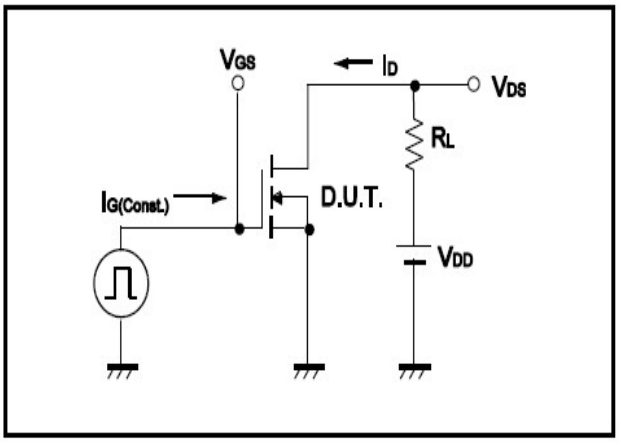


Fig.10 Gate Charge Waveform

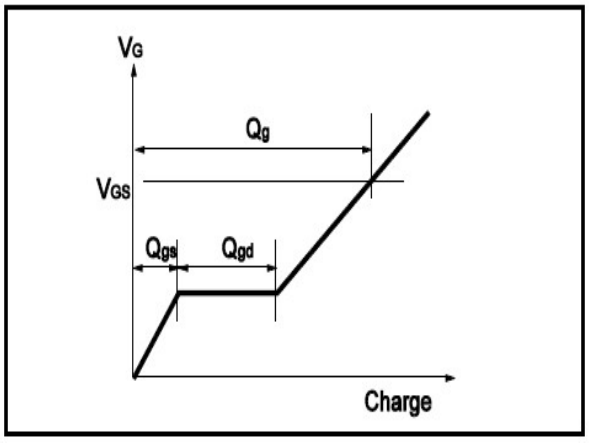


Fig.11 Switching Time Measurement Circuit

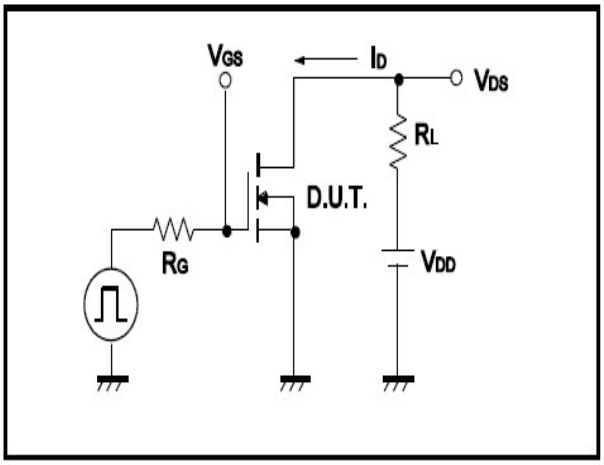
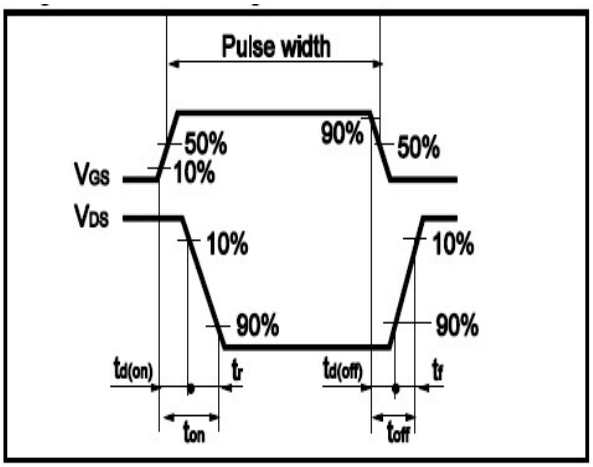


Fig.12 Gate Charge Waveform



●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	**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