

### General Description

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

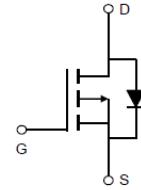
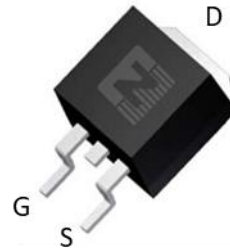
### Features

- 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
- DC/DC

### Product Summary


 $V_{DS} = -60V$ 
 $R_{DS(ON)} = 12m\Omega$ 
 $I_D = -67A$ 


TO-263

### Ordering Information:

Part NO.	ZM120P06B
Marking	ZM120P06
Packing Information	REEL TAPE
Basic ordering unit (pcs)	800

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-60	V
Gate-Source Voltage	$V_{GS}$	$\pm 25$	V
Continuous Drain Current	$I_D @ T_C = 25^\circ C$	-67	A
	$I_D @ T_C = 75^\circ C$	-51	A
	$I_D @ T_C = 100^\circ C$	-42	A
Pulsed Drain Current <sup>①</sup>	$I_{DM}$	-201	A
Total Power Dissipation	$P_D @ T_C = 25^\circ C$	55	W
Total Power Dissipation	$P_D @ T_A = 25^\circ C$	3.5	W
Operating Junction Temperature	$T_J$	-55 to 150	$^\circ C$
Storage Temperature	$T_{STG}$	-55 to 150	$^\circ C$
Single Pulse Avalanche Energy @ $L = 0.1mH$	$E_{AS}$	300	mJ

**●Thermal resistance**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	$R_{thJC}$	-	-	2.1	$^{\circ}C/W$
Thermal resistance, junction - ambient	$R_{thJA}$	-	-	38	$^{\circ}C/W$
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	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = -250\mu A$	-1.2		-2.5	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS} = -60V, V_{GS} = 0V$			-1.0	$\mu A$
Gate- Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 25V, V_{DS} = 0V$			$\pm 100$	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS} = -10V, I_D = -30A$		12	15.6	$m\Omega$
		$V_{GS} = -4.5V, I_D = -20A$		15	20	$m\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS} = -10V, I_D = -30A$		25		S
Source-drain voltage	$V_{SD}$	$I_S = -30A$			1.28	V

**●Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	$C_{iss}$	$f = 1MHz$ $V_{DS} = -25V$	-	10800	-	pF
Output capacitance	$C_{oss}$		-	410	-	
Reverse transfer capacitance	$C_{rss}$		-	298	-	

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

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	$Q_g$	$V_{DD} = -25V$	-	200	-	nC
Gate - Source charge	$Q_{gs}$	$I_D = -10A$	-	32	-	
Gate - Drain charge	$Q_{gd}$	$V_{GS} = -10V$	-	47	-	

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

② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate;

Fig.1 Gate-Charge Characteristics

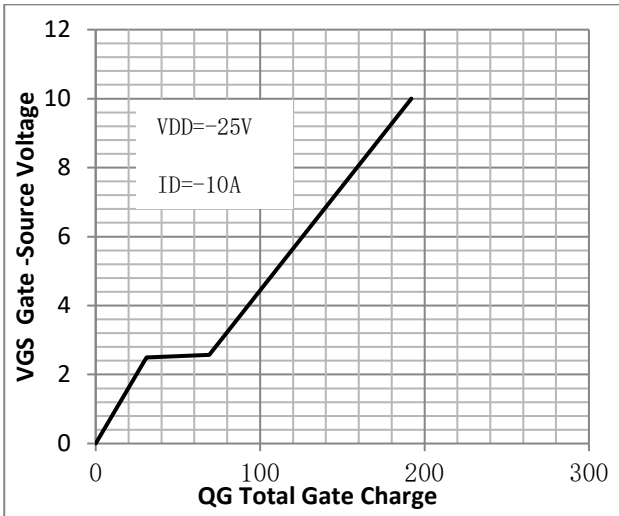


Fig.2 Capacitance Characteristics

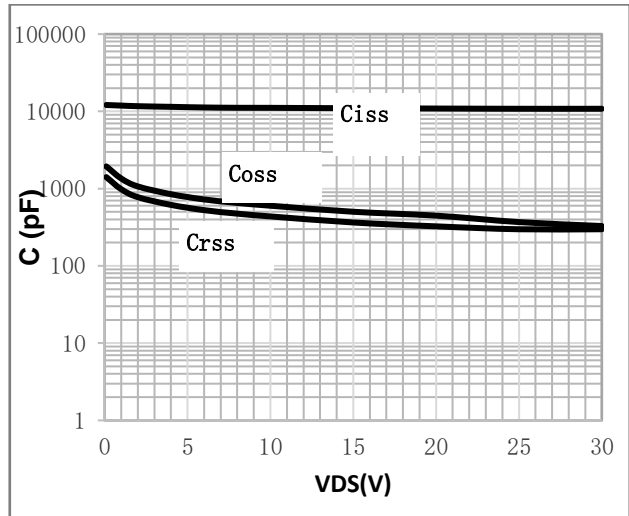


Fig.3 Power Dissipation

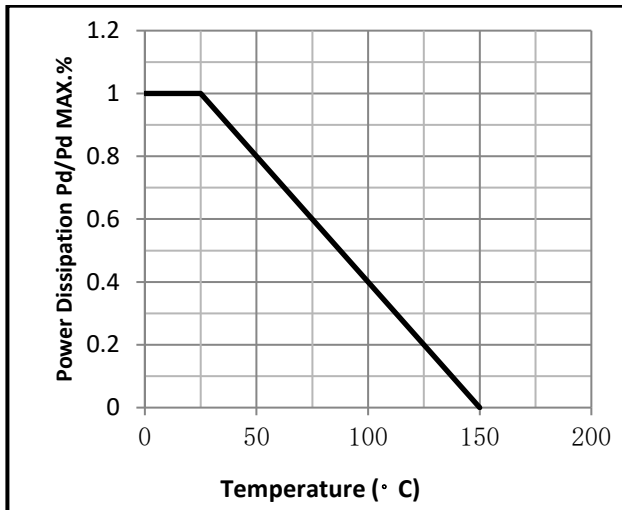


Fig.4 Typical output Characteristics

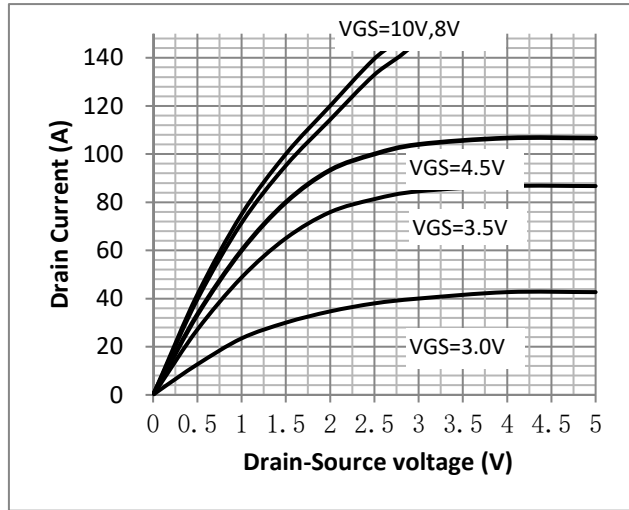


Fig.5 Threshold Voltage V.S Junction Temperature

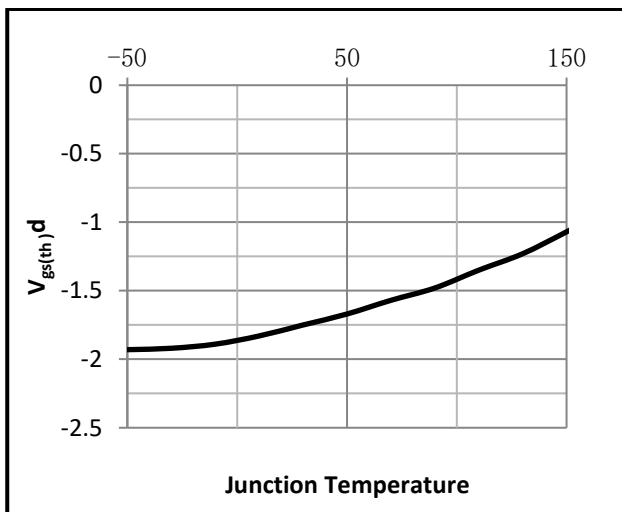


Fig.6 Resistance V.S Drain Current

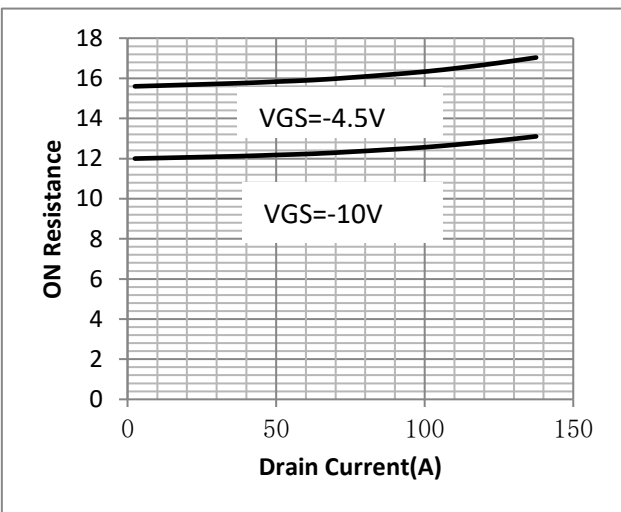


Fig.7 On-Resistance VS Gate Source Voltage

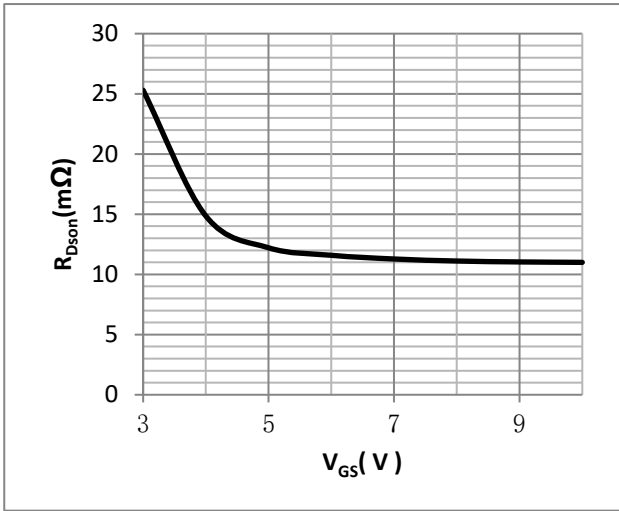


Fig.8 On-Resistance V.S Junction Temperature

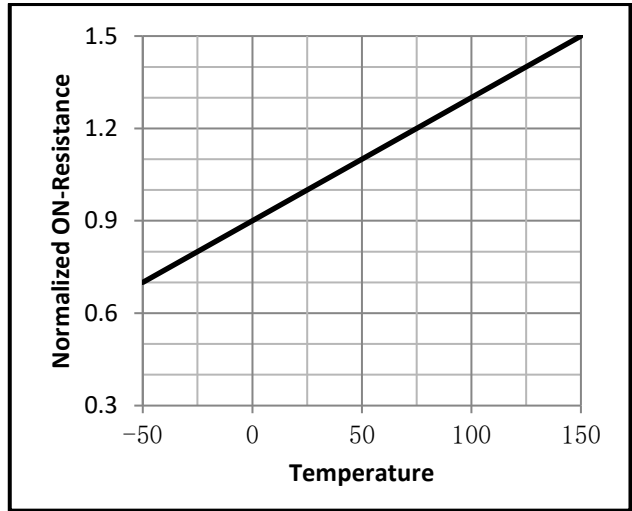


Fig.9 Maximum Forward Biased Safe Operating Area Fig.10 ID-Junction Temperature

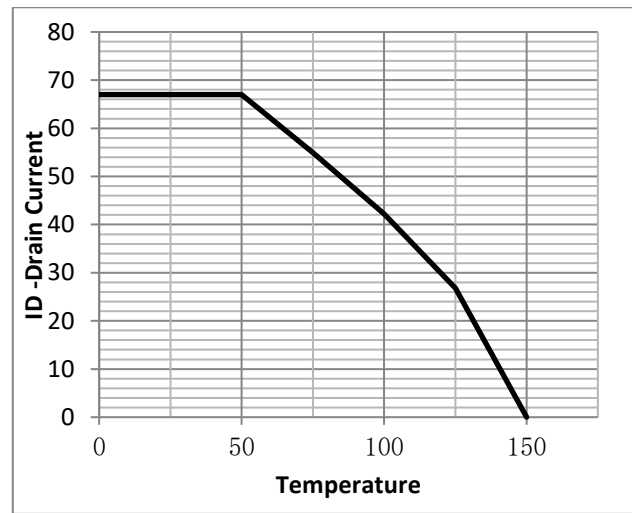
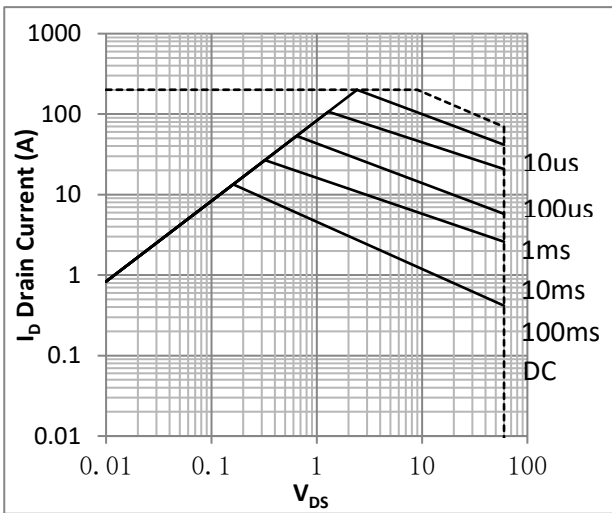


Fig.11 Gate Charge Measurement Circuit

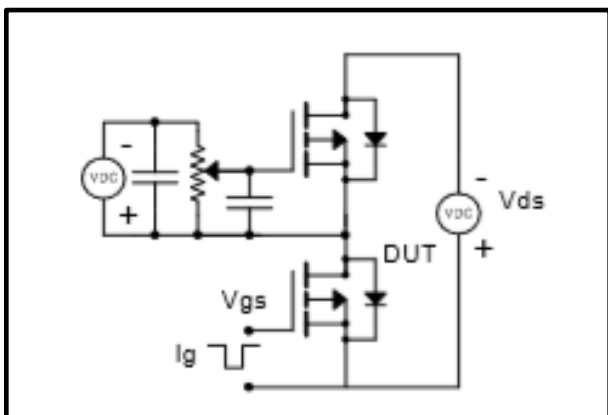


Fig.12 Gate Charge Waveform

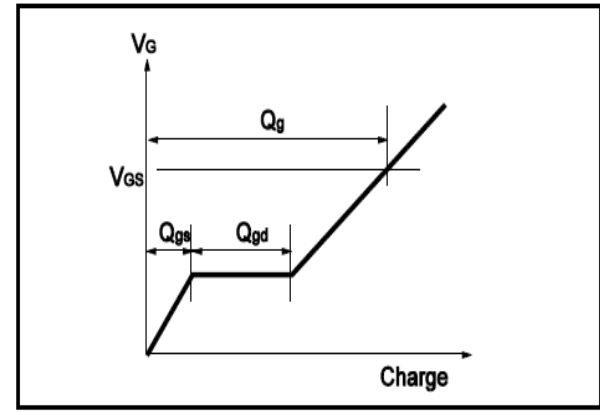


Fig.13 Switching Time Measurement Circuit

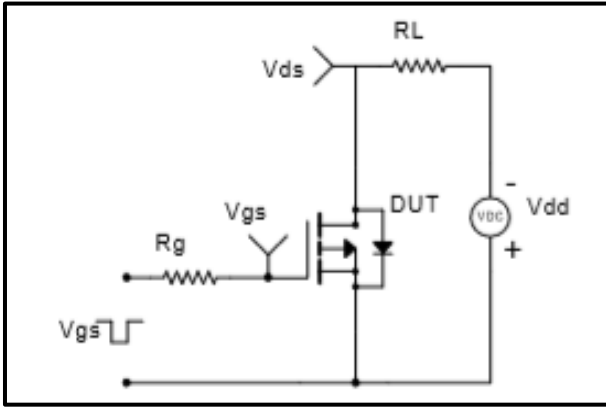
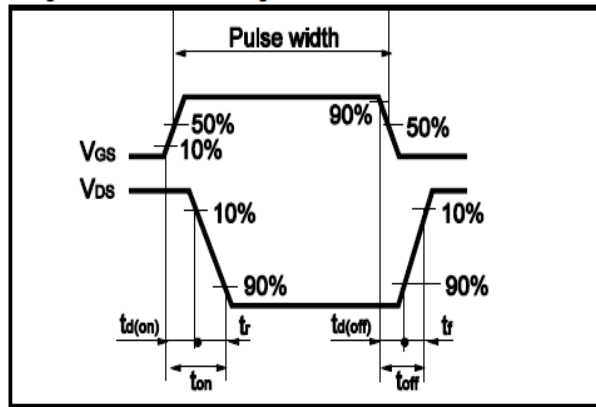


Fig.14 Switching Time Waveform





• 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				

