

• General Description

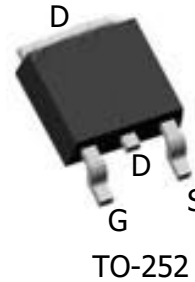
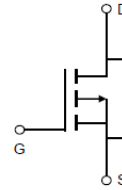
The ZM230P06D combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

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

• Product Summary
 $V_{DS} = -60V$
 $R_{DS(ON)} = 23m\Omega$
 $I_D = -35A$

• Ordering Information:

Part NO.	ZM230P06D
Marking	ZM230P06
Packing Information	REEL TAPE
Basic ordering unit (pcs)	2500

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	± 25	V
Continuous Drain Current	$I_{D@TC=25^\circ C}$	-35	A
	$I_{D@TC=75^\circ C}$	27	A
	$I_{D@TC=100^\circ C}$	22	A
Pulsed Drain Current ^①	I_{DM}	-130	A
Total Power Dissipation	$P_D@TC=25^\circ C$	55	W
Total Power Dissipation	$P_D@TA=25^\circ C$	2.5	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}	45	mJ
Avalanche Current @L=0.1mH	I_{AS}	30	A
ESD Level (HBM)		Class 2	

•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}	-	-	50	$^{\circ}C/W$
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	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-15A$		23	32	m Ω
		$V_{GS}=-4.5V, I_D=-10A$		29	38	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-10V, I_D=-10A$		20		S

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	f = 1MHz	-	3300	-	pF
Output capacitance	C_{oss}		-	148	-	
Reverse transfer capacitance	C_{rss}		-	96	-	

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

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q_g	$V_{DD}=-25V$	-	46	-	nC
Gate - Source charge	Q_{gs}	$I_D=-10A$	-	6.3	-	
Gate - Drain charge	Q_{gd}	$V_{GS}=-10V$	-	8.6	-	

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

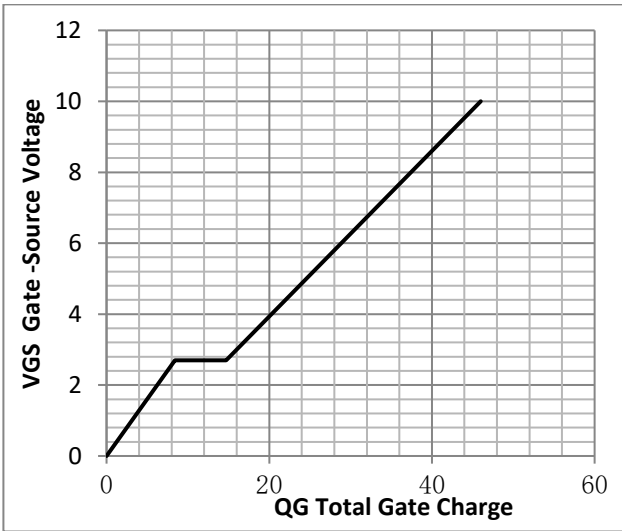


Fig.2 Capacitance Characteristics

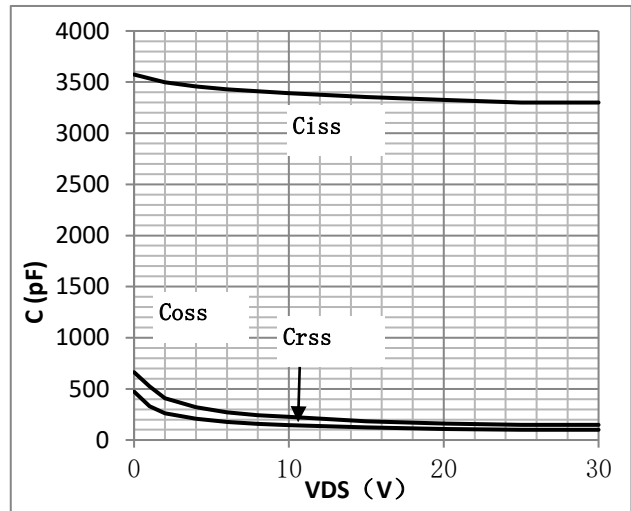


Fig.3 Power Dissipation

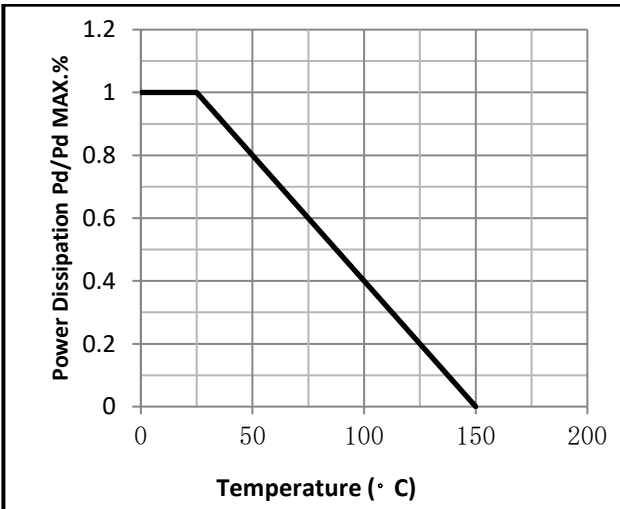


Fig.4 Typical output Characteristics

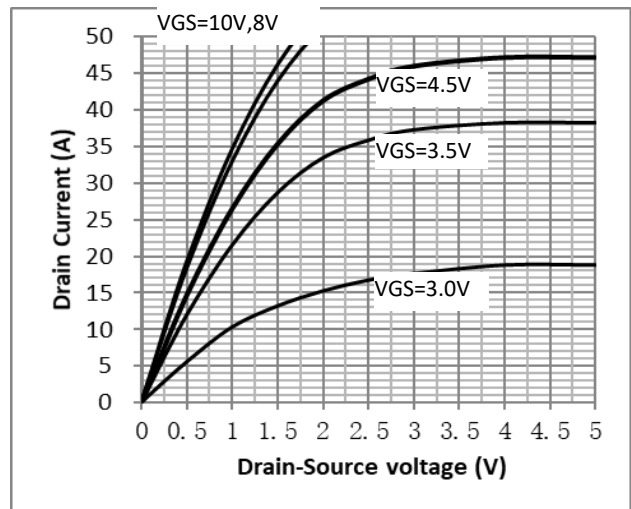


Fig.5 Threshold Voltage V.S Junction Temperature

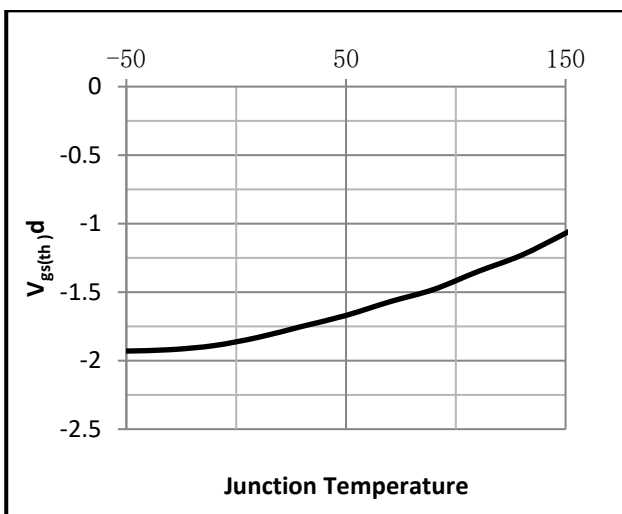


Fig.6 Resistance V.S Drain Current

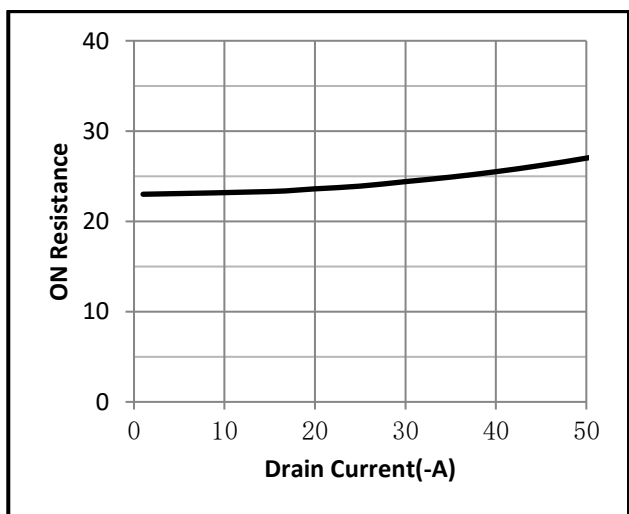


Fig.7 On-Resistance VS Gate Source Voltage

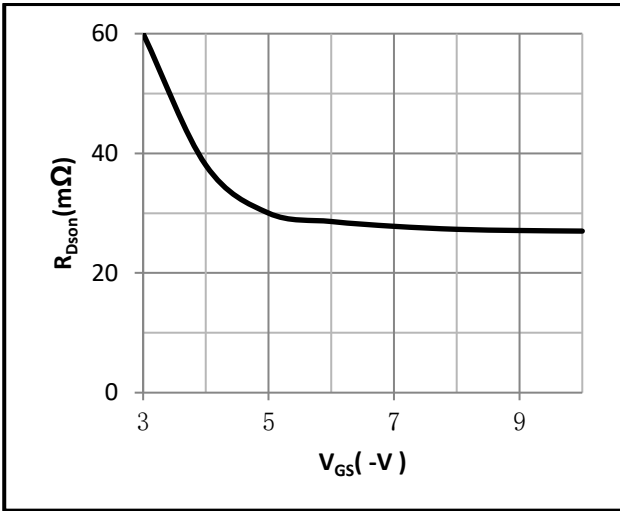


Fig.8 On-Resistance V.S Junction Temperature

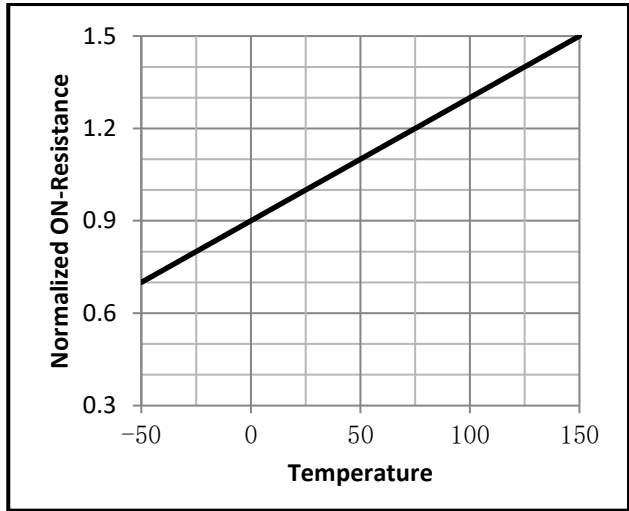


Fig.9 Transfer Characteristics

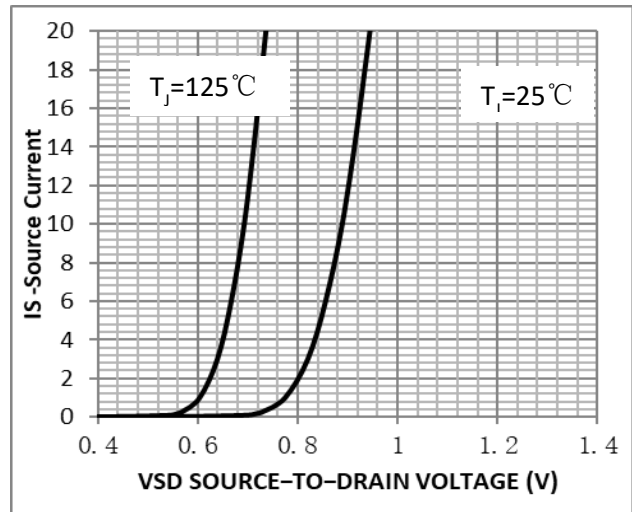
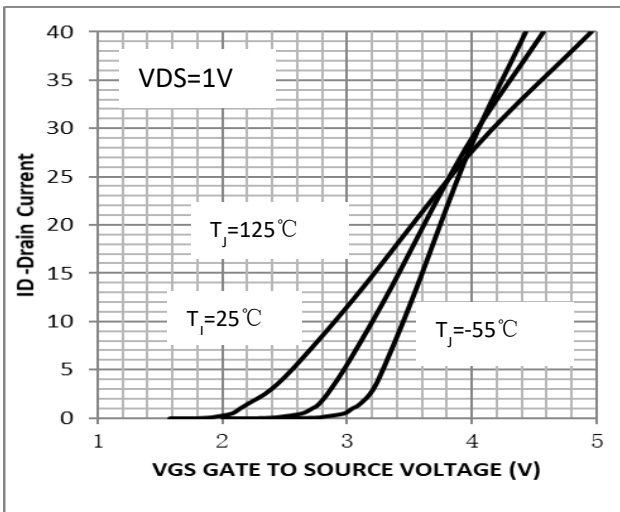


Fig.9 SOA Maximum Safe Operating Area

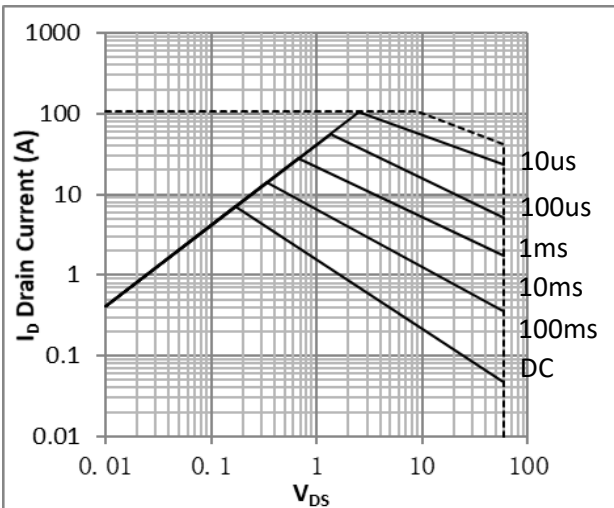


Fig.10 ID-Junction Temperature

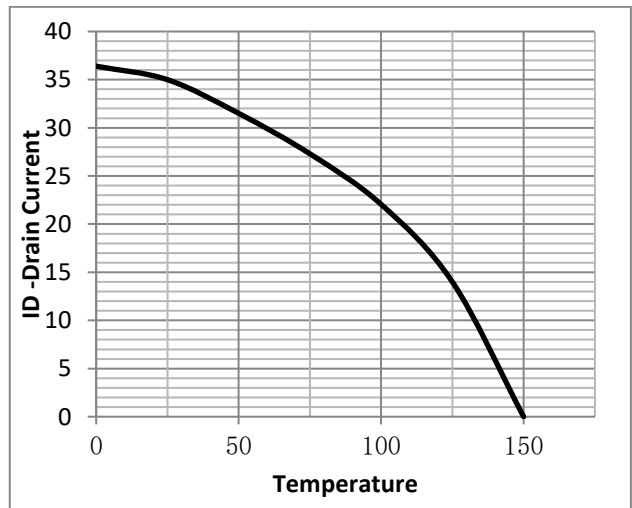


Fig.10 Switching Time Measurement Circuit

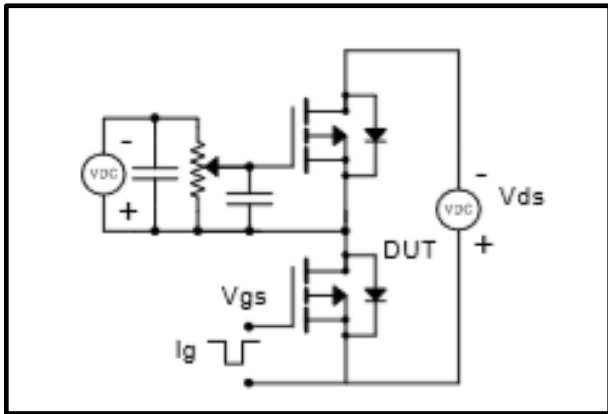


Fig.11 Gate Charge Waveform

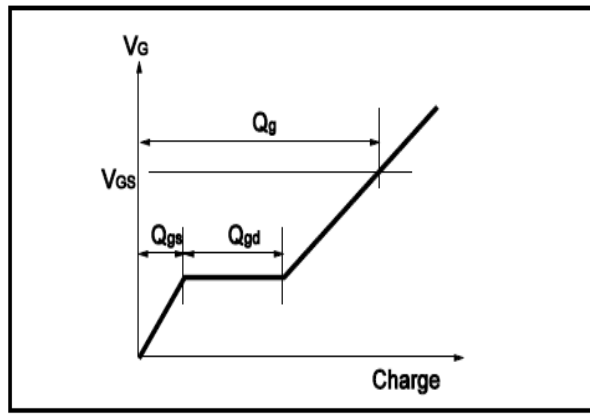


Fig.12 Switching Time Measurement Circuit

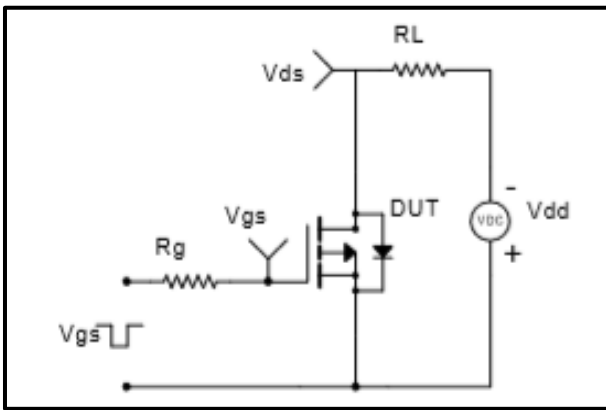
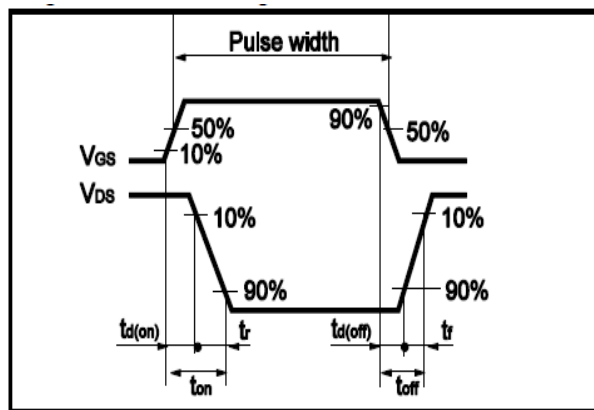


Fig.13 Gate Charge Waveform





• **Dimensions (TO-252)**

Unit: mm

SYMBOL	min	max	SYMBOL	min	max
A	2.10	2.50	B	0.85	1.25
b	0.50	0.80	b1	0.50	0.90
b2	0.45	0.70	C	0.45	0.70
D	6.30	6.75	D1	5.10	5.50
E	5.30	6.30	e1	2.25	2.35
L1	9.20	10.60	e2	4.45	4.75
L2	0.90	1.75	L3	0.60	1.10
K	0.00	0.23			

