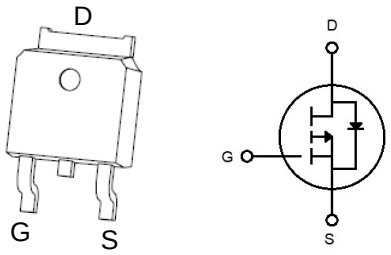
-60V/-50A P-Channel MOSFET

BVDSS	-60	V
ID	-50	A
RDSON@VGS=10V	12.0	mΩ
RDSON@VGS=4.5V	16.0	mΩ

TO-252



General Description

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

Features

■Low $R_{DS(ON)}$ to minimize conductive loss

■High GOX reliability

■Low Thermal resistance

Application

■BLDC Motor driver

■DC-DC

■Load Switch

Ordering Information:

Product	Package	Marking	Packing
M120P06L	TO-252	ZM120P06	2500PCS/Reel

Absolute Maximum Ratings (T_C=25℃)

Parameter	Symbol	Conditions	Value	Unit
Drain-Source Voltage	V_{DS}		-60	V
Gate-Source Voltage	V_{GS}		±20	V
Continuous Drain Current	I_D	T_C=25℃	-50	A
	I_D	T_C=75℃	-39	A
	I_D	T_C=100℃	-32	A
Pulsed Drain Current	I_{DM}	Pulsed; t_p ≤ 10 μs; T_{mb} = 25 °C;	-200	A
Total Power Dissipation	P_D	T_C=25℃	89	W
Total Power Dissipation	P_D	T_A=25℃	2.0	W
Operating Junction Temperature	T_J		-55 to +150	℃
Storage Temperature	T_{STG}		-55 to +150	℃
Single Pulse Avalanche Energy	E_{AS}	L=0.1mH, V_{GS}=-10V, Rg=25Ω,	120	mJ
		L=0.5mH, V_{GS}=-10V, Rg=25Ω,	252	mJ
ESD Level (HBM)	CLASS 2			

Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}		-	1.4	°C/W
Thermal resistance, junction-ambient①	R_{thJA}		-	62	°C/W
Soldering temperature(total time<10s)	Tsold		-	260	°C

-60V/-50A P-Channel MOSFET

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	-1.3	-1.8	-2.5	V
Drain-Source Leakage Current	I_{DSS}	V_{GS}=0V, V_{DS}= -60V			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		12	17	mΩ
		V_{GS}=-4.5V, I_D= -12A		16	23	mΩ
Forward Transconductance	g_{FS}	V_{DS} =-5V, I_{SD} = -10A		25		s
Diode Forward Voltage	V_{FSD}	V_{GS} =0V, I_{SD} = -16A			1.3	V

Dynamic characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input capacitance	Ciss	f = 1MHz, V_{DS}=-25V	-	7300	-	pF
Output capacitance	Coss		-	355	-	
Reverse transfer capacitance	Crss		-	272	-	
Gate Risistance	Rg	f = 1MHz	-	4		Ω
Total gate charge	Qg	V_{DD} = -15V, I_D = -16A, V_{GS} = -10V	-	103	-	nC
	Qg(-4.5V)		-	41	-	
Gate - Source charge	Qgs		-	14	-	
Gate - Drain charge	Qgd		-	15	-	
Turn-ON Delay time	$t_{D(on)}$	V_{GS}=-10V,V_{DS}=-15V, R_G =3.3Ω, I_D =-20A	-	16	-	ns
Turn-ON Rise time	t_r		-	25	-	ns
Turn-Off Delay time	$t_{D(off)}$		-	112	-	ns
Turn-Off Fall time	t_f		-	50	-	ns
Reverse Recovery Time	t_{RR}	V_{DD}=-20V, dI_S/dt = 100A/us, I_S=-20A	-	74	-	ns
Reverse Recovery Charge	Q_{RR}		-	287	-	nC

Note:

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

-60V/-50A P-Channel MOSFET

Fig.1 Gate-Charge Characteristics

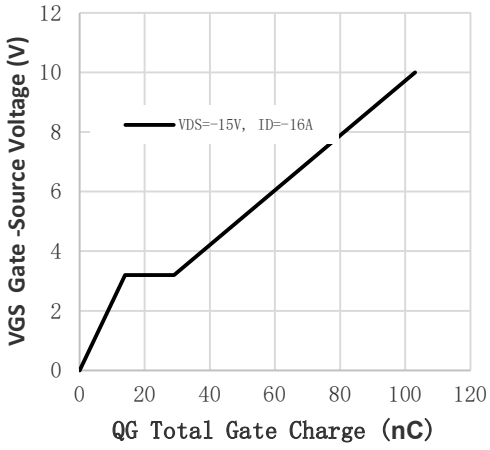


Fig.2 Capacitance Characteristics

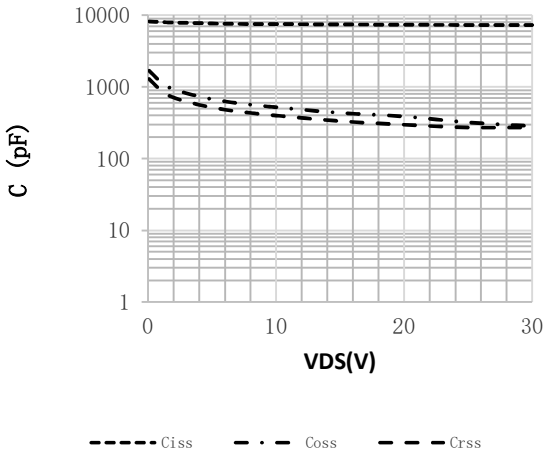


Fig.3 Power Dissipation

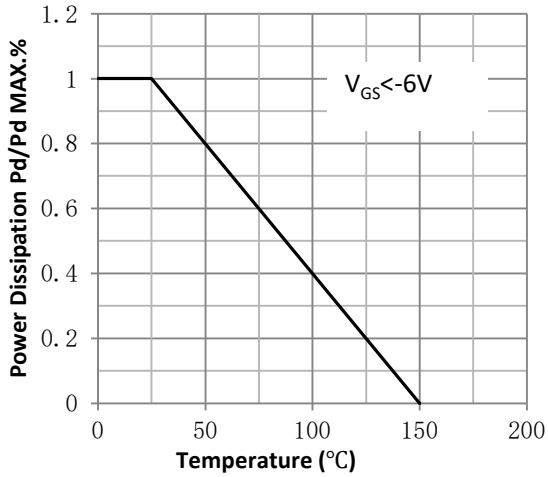


Fig.4 Typical output Characteristics

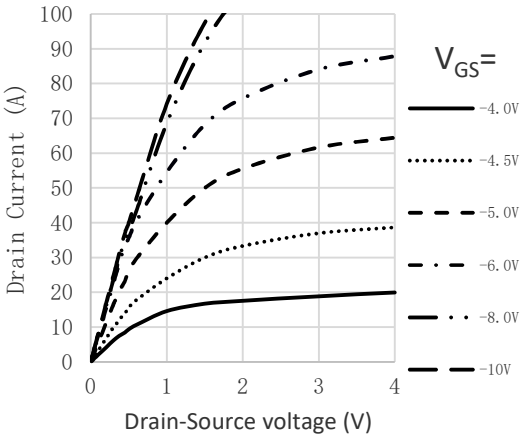


Fig.5 Threshold Voltage V.S Junction Temperature

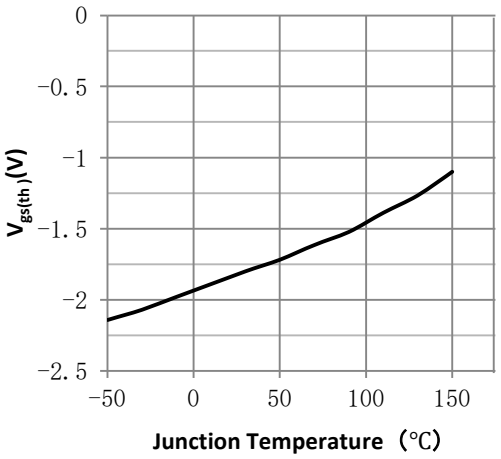


Fig.6 Resistance V.S Drain Current

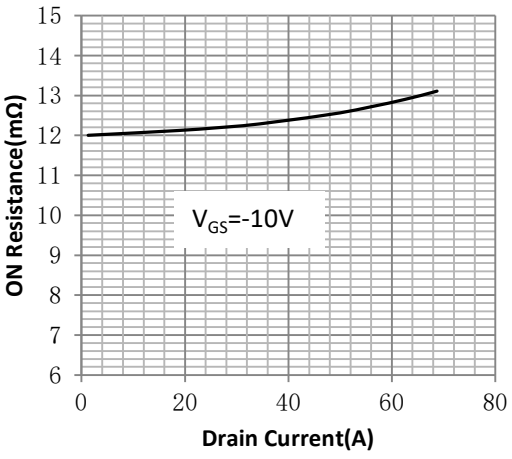


Fig.7 On-Resistance VS Gate Source Voltage

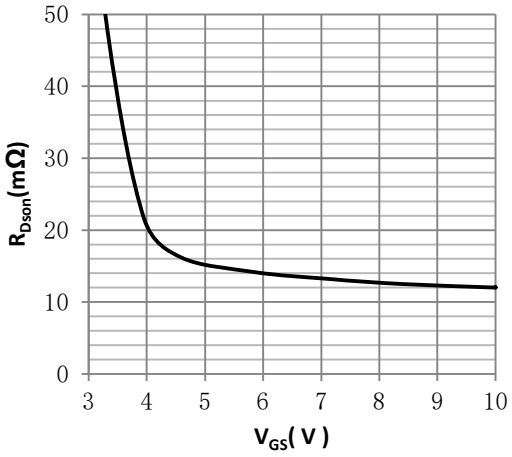


Fig.8 On-Resistance V.S Junction Temperature

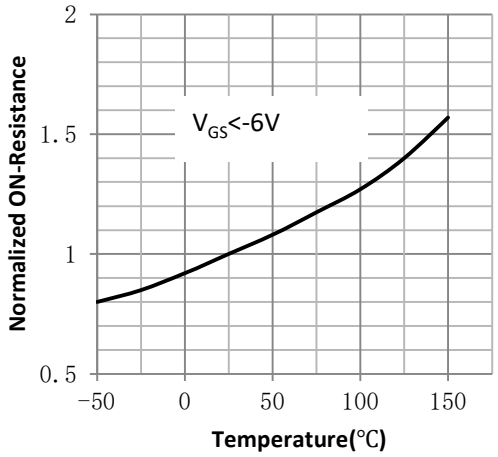


Figure 9. Diode Forward Voltage vs. Current

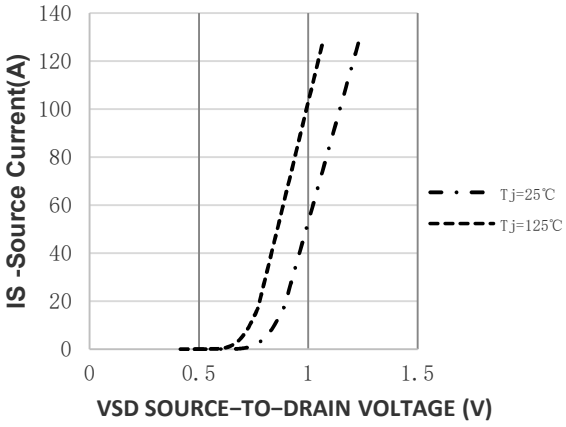


Figure 10. Transfer Characteristics

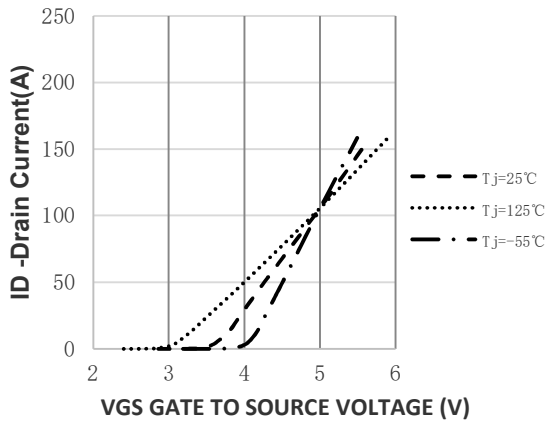


Fig.11 Safe Operating Area

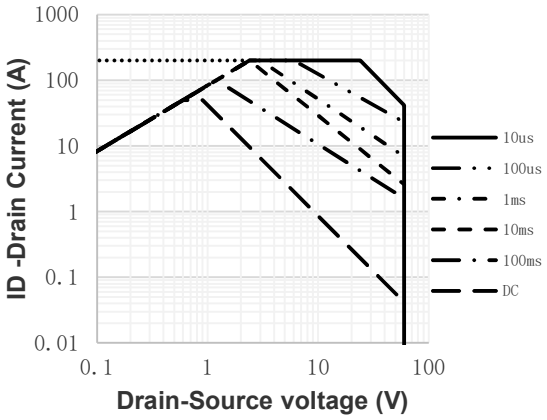
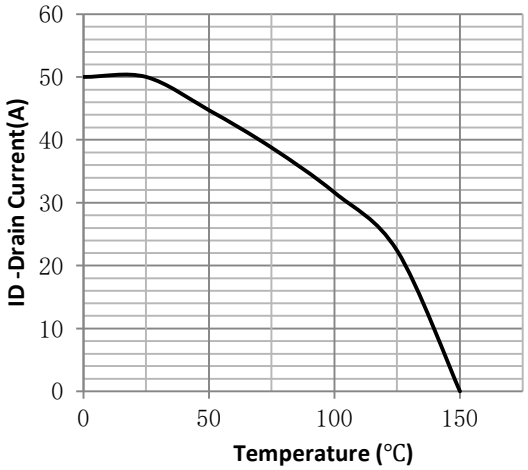
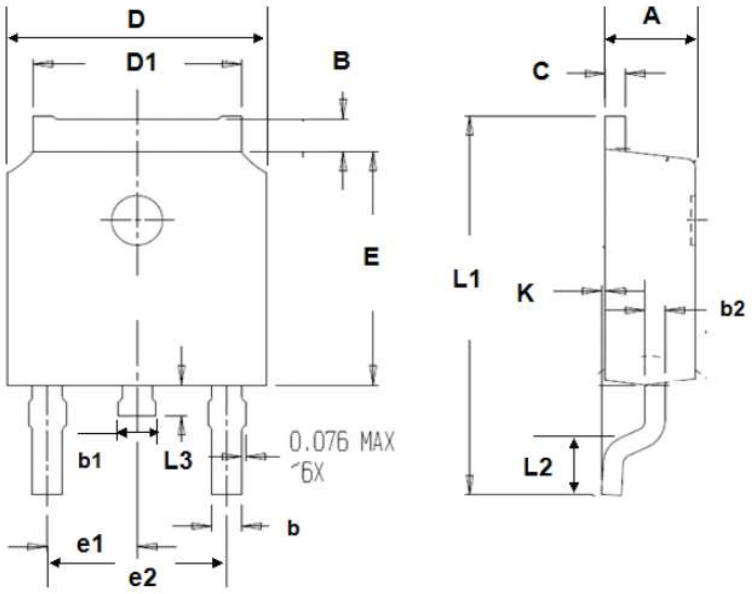


Fig.12 ID vs. Case Temperature



Dimensions (TO-252)



Unit：mm

SYMBOL	min	max	SYMBOL	min	max
A	2.10	2.50	B	0.85	1.25
b	0.50	0.90	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	2.24	2.35
L1	9.20	10.60	e2	4.43	4.75
L2	0.90	1.75	L3	0.60	1.10
K	0.00	0.23			