

• General Description

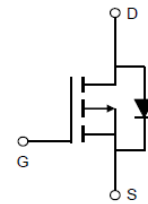
The ZM130P03M combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

• 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

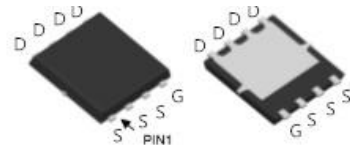
- Load Switch
- PWM Application
- BLDC Motor driver

• Product Summary


$$V_{DS} = -30V$$

$$R_{DS(ON)} = 13m\Omega$$

$$I_D = -27A$$



DFN3 x 3

• Ordering Information:

Part NO.	ZM130P03M
Marking	130P03
Packing Information	REEL TAPE
Basic ordering unit (pcs)	5000

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 25	V
Continuous Drain Current	$I_D @ TC=25^\circ C$	-27	A
	$I_D @ TC=75^\circ C$	-20	A
	$I_D @ TC=100^\circ C$	-17	A
Pulsed Drain Current ^①	I_{DM}	-81	A
Total Power Dissipation ^②	$P_D @ TC=25^\circ C$	42	W
Total Power Dissipation	$P_D @ TA=25^\circ C$	2.3	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}	80	mJ
Avalanche Current @ L=0.1mH	I_{AS}	-30	A

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case ^②	R _{thJC}	-	-	3.0	° C/W
Thermal resistance, junction - ambient	R _{thJA}	-	-	55	° 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	-30			V
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = -250uA	-1.2		-2.5	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} = -30V, V _{GS} = 0V			-1.0	uA
Gate- Source Leakage Current	I _{GSS}	V _{GS} = ±12V, V _{DS} = 0V			±100	nA
Static Drain-source On Resistance	R _{DS(ON)}	V _{GS} = -10V, I _D = -9A		13	15	mΩ
		V _{GS} = -4.5V, I _D = -8A		22	25	mΩ
Forward Transconductance	g _{FS}	V _{DS} = -10V, I _D = -5A		9		s
Diode Forward Voltage	V _{FSD}	I _S = -9A			1.2	V

•Dynamic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = -25V f = 1MHz	-	1650	-	pF
Output capacitance	C _{oss}		-	330	-	
Reverse transfer capacitance	C _{rss}		-	220	-	
Gate Resistance	R _g	f = 1MHz		7.5		Ω
Total gate charge	Q _g	V _{DD} = -20V I _D = -8A V _{GS} = -10V	-	36	-	nC
Gate - Source charge	Q _{gs}		-	4.5	-	
Gate - Drain charge	Q _{gd}		-	8.1	-	
Turn-ON Delay time	t _{D(on)}	V _{GS} = 10V, V _{DS} = 15V R _G = 6Ω, I _D = 15A		14		ns
Turn-ON Rise time	t _r			20		ns
Turn-Off Delay time	t _{D(off)}			125		ns
Turn-Off Fall time	t _f			68		ns
Body Diode Reverse Recovery Time	t _{rr}	I _F = 20A, di/dt = 100A/μs		42		nS
Body Diode Reverse Recovery Charge	Q _{rr}			75		nC

Note: ① Pulse Test : Pulse width $\leq 300\mu\text{s}$, 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

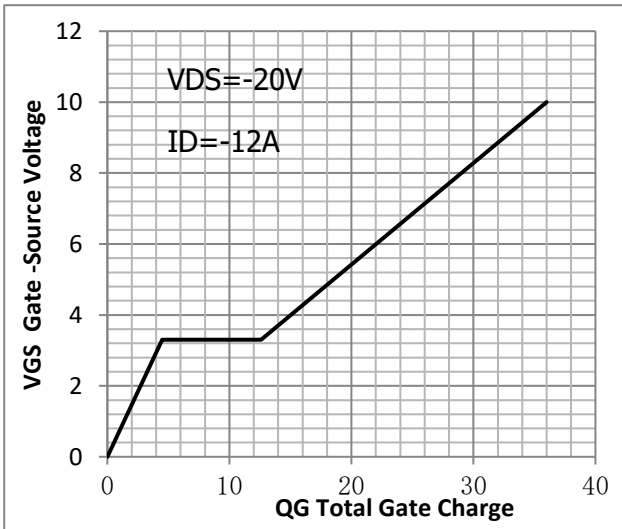


Fig.2 Capacitance Characteristics

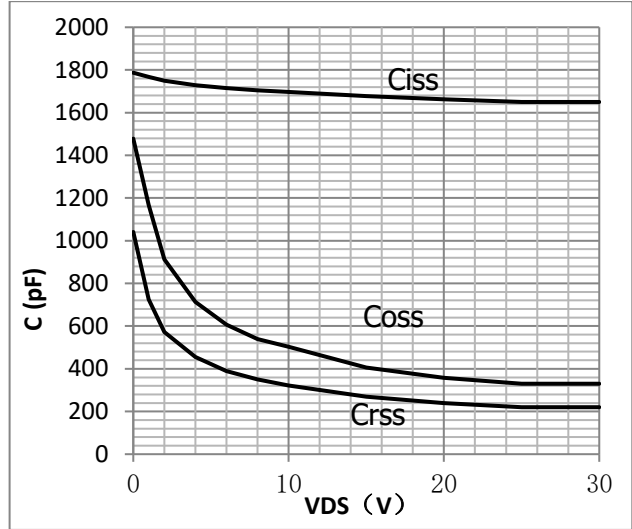


Fig.3 Power Dissipation Derating Curve

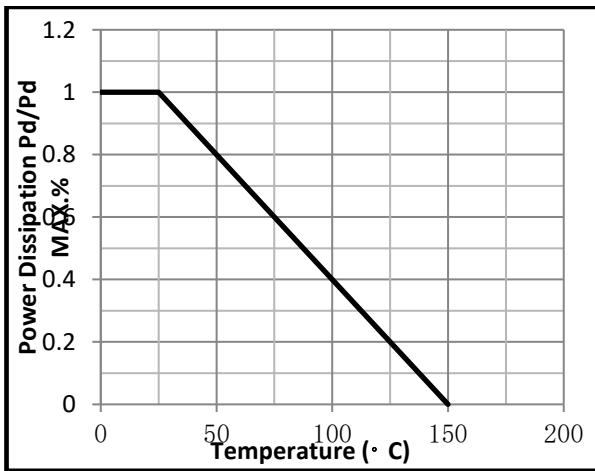


Fig.4 Typical output Characteristics

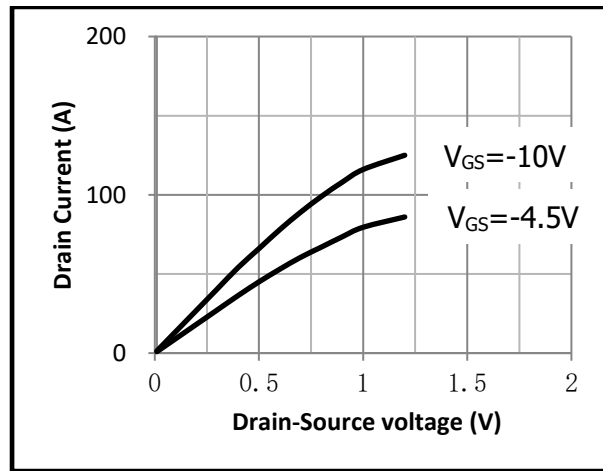


Fig.5 Threshold Voltage V.S Junction Temperature

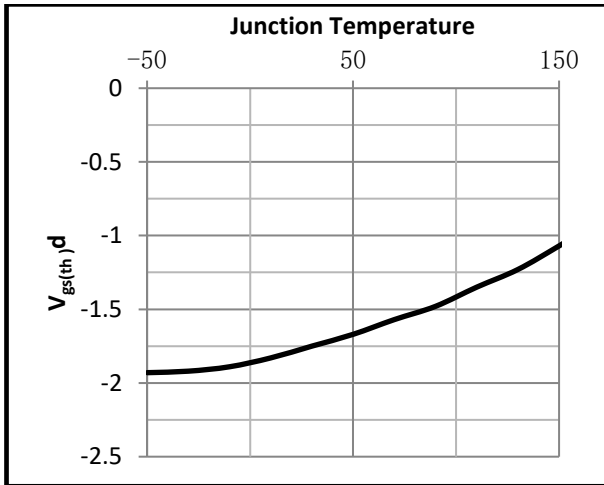


Fig.6 Resistance V.S Drain Current

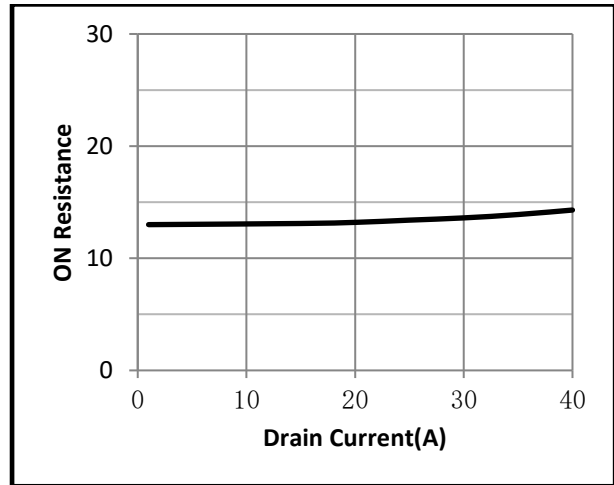


Fig.7 On-Resistance VS Gate Source Voltage

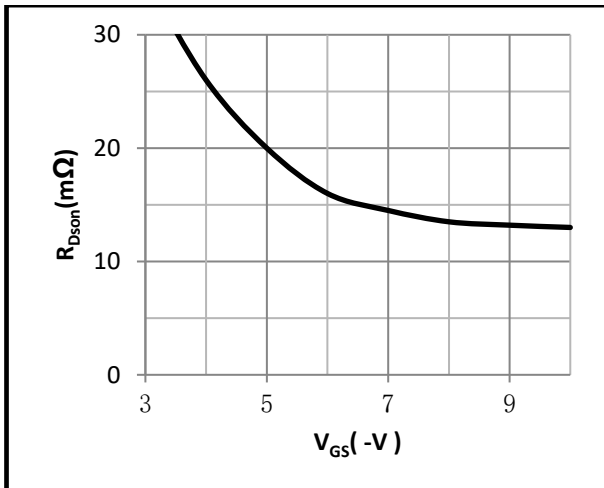


Fig.8 On-Resistance V.S Junction Temperature

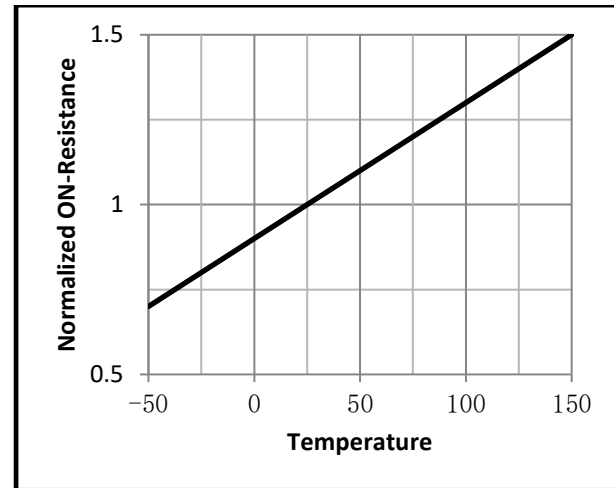


Fig.9 Maximum Forward Biased Safe Operating Area

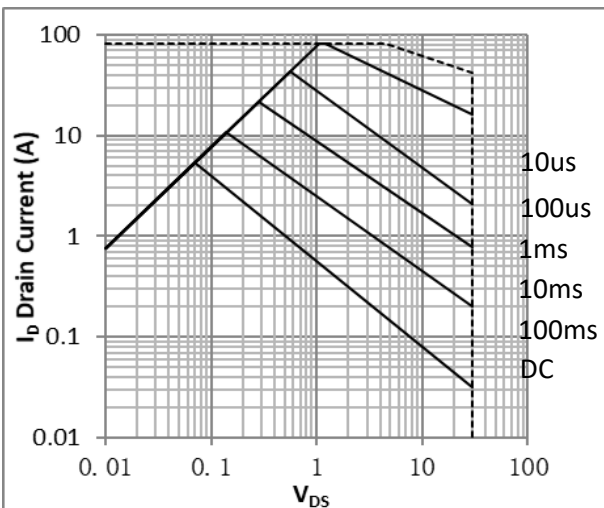


Fig.10 ID-Junction Temperature

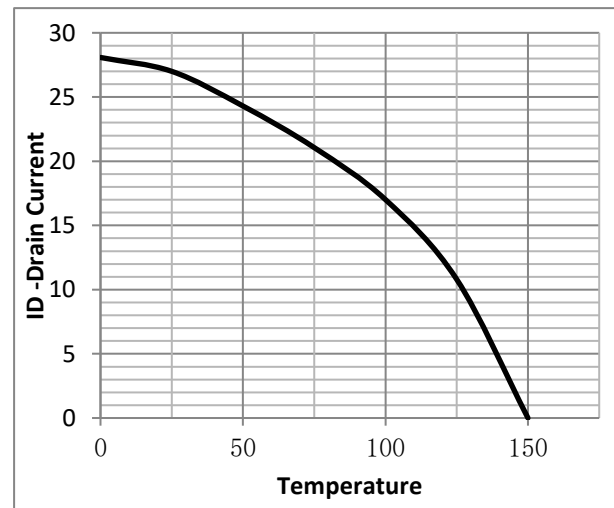


Fig.11 Switching Time Measurement Circuit

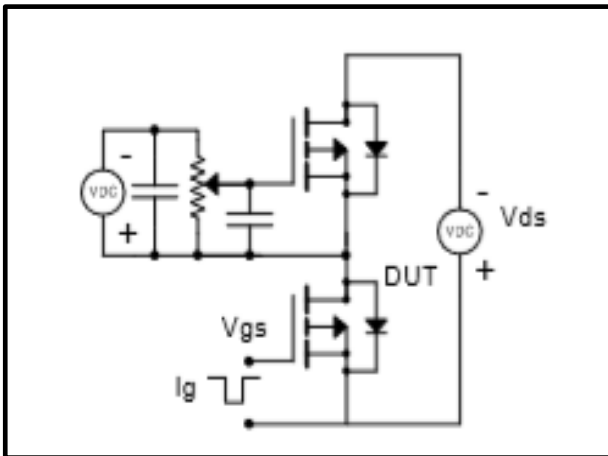


Fig.12 Gate Charge Waveform

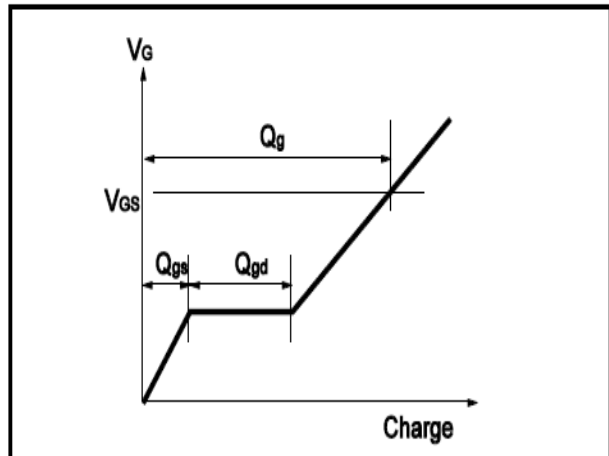


Fig.13 Switching Time Measurement Circuit

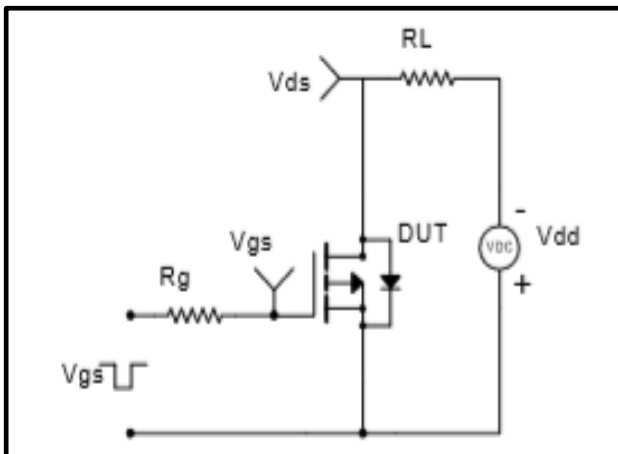
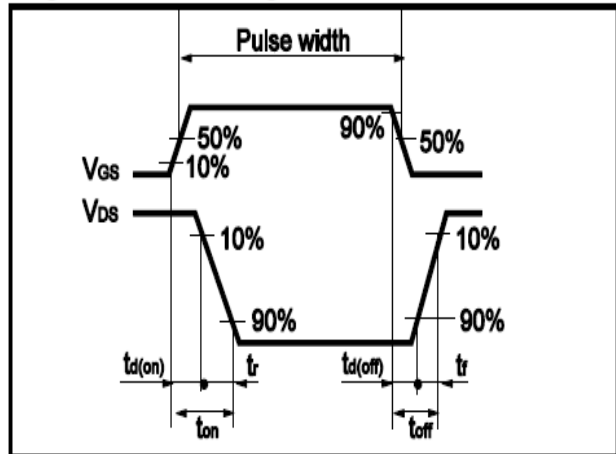


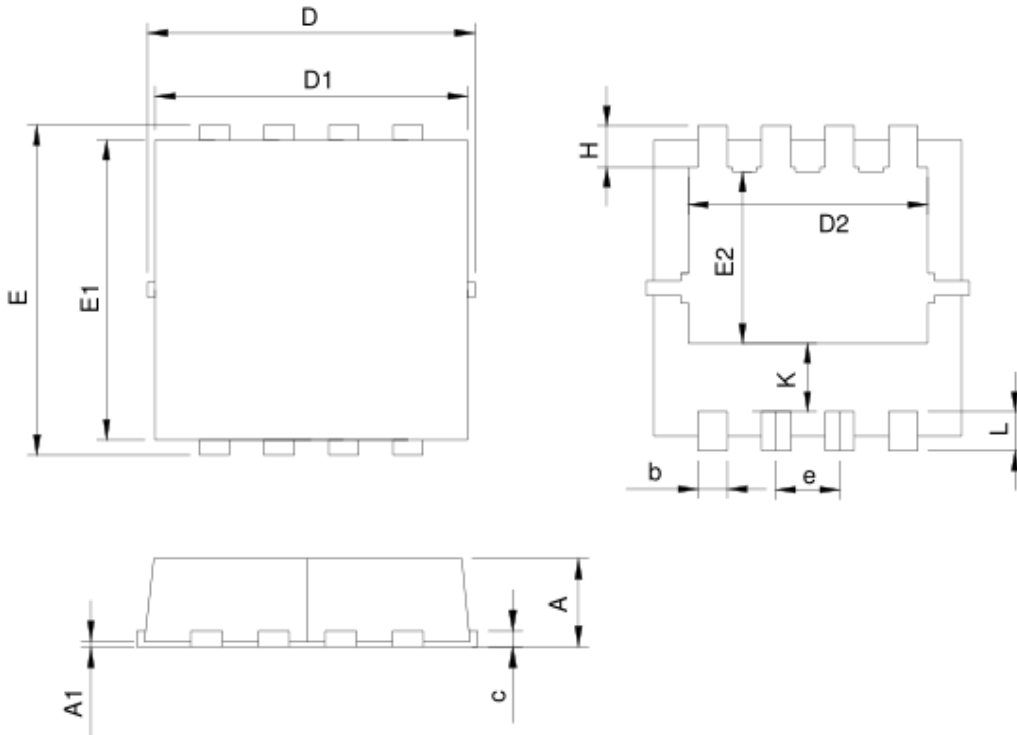
Fig.14 Gate Charge Waveform





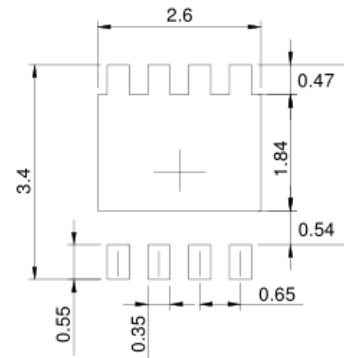
•Dimensions(DFN3×3)

Unit: mm



SYMBOL	DFN3.3x3.3-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	1.00	0.028	0.039
A1	0.00	0.05	0.000	0.002
b	0.25	0.35	0.010	0.014
c	0.14	0.20	0.006	0.008
D	3.10	3.50	0.122	0.138
D1	3.05	3.25	0.120	0.128
D2	2.35	2.55	0.093	0.100
E	3.10	3.50	0.122	0.138
E1	2.90	3.10	0.114	0.122
E2	1.64	1.84	0.065	0.072
e	0.65 BSC		0.026 BSC	
H	0.32	0.52	0.013	0.020
K	0.59	0.79	0.023	0.031
L	0.25	0.55	0.010	0.022

RECOMMENDED LAND PATTERN



UNIT: mm