

• General Description

The ZM300P04T 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

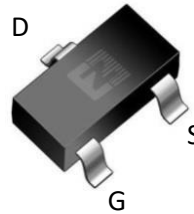
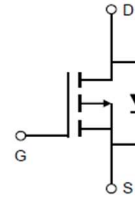
- Load Switches
- DC/DC
- BLDC Motor driver

• Product Summary

$$V_{DS} = -40V$$

$$R_{DS(ON)} = 30m\Omega$$

$$I_D = -5.6A$$



SOT23-3

• Ordering Information:

Part NO.	ZM300P04T
Marking	300P04
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$I_{D@TC=25^\circ C}$	-5.6	A
	$I_{D@TC=75^\circ C}$	-4.4	A
	$I_{D@TC=100^\circ C}$	-3.7	A
Pulsed Drain Current ^①	I_{DM}	-12	A
Total Power Dissipation ^②	P_D	1.5	W
Total Power Dissipation($T_A=25^\circ C$)	$P_{D@TA=25^\circ C}$	0.7	W
Operating Junction Temperature	T_J	-55 to 150	$^\circ C$
Storage Temperature	T_{STG}	-55 to 150	$^\circ C$
Single Pulse Avalanche Energy	E_{AS}	60	mJ

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case ^②	R_{thJC}	-	-	80	° C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	180	° 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}	$V_{GS}=0V, I_D=-250\mu A$	-40			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}	$V_{DS}=-40V, V_{GS}=0V$			1.0	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-5.6A$		30	35	m Ω
		$V_{GS}=-4.5V, I_D=-4A$		42	50	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-10V, I_D=-2A$		10		s
Source-drain voltage	V_{SD}	$I_S=-5.6A$			1.28	V

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	f = 1MHz V _{DS} =-25V	-	1650	-	pF
Output capacitance	C_{oss}		-	330	-	
Reverse transfer capacitance	C_{rss}		-	220	-	

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

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q_g	$V_{DD}=-20V$	-	31	-	nC
Gate - Source charge	Q_{gs}	$I_D=-3A$	-	8	-	
Gate - Drain charge	Q_{gd}	$V_{GS}=-10V$	-	10	-	

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

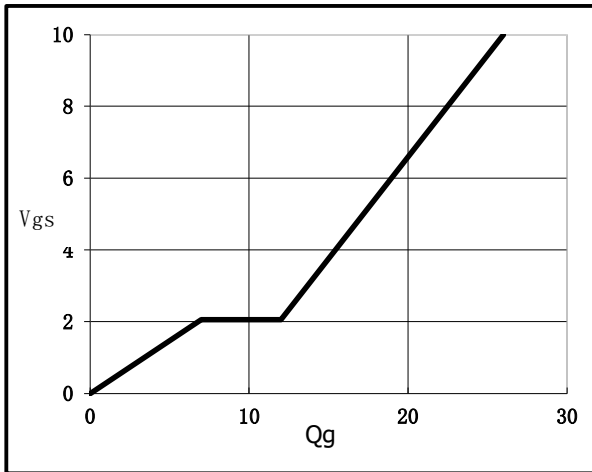


Fig.2 Capacitance Characteristics

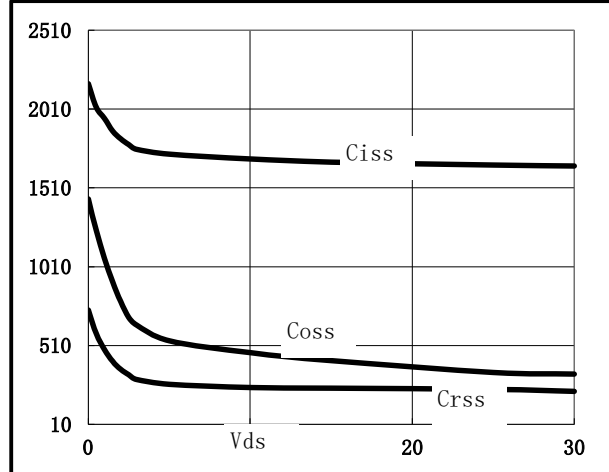


Fig.3 Power Dissipation Derating Curve

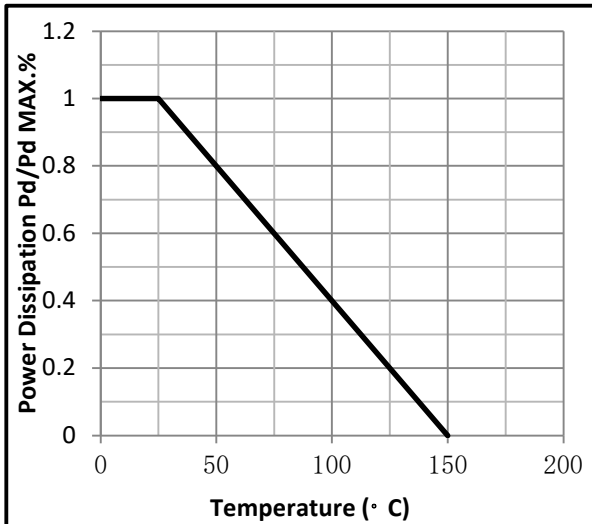


Fig.4 Typical output Characteristics

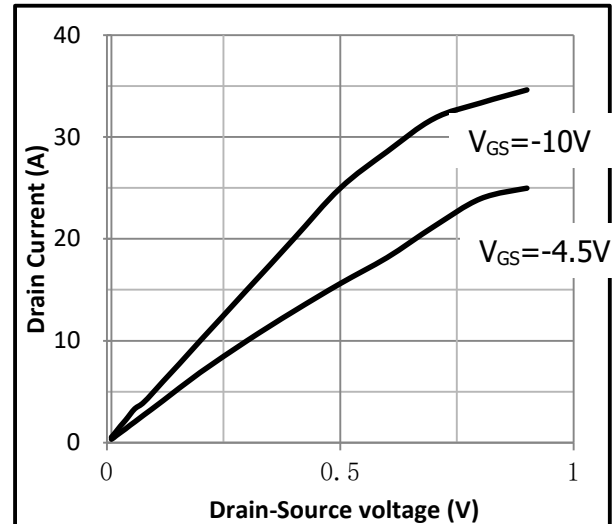


Fig.5 Threshold Voltage V.S Junction Temperature

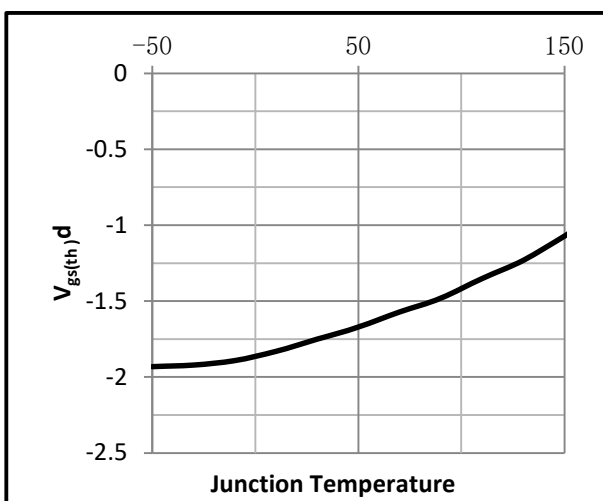


Fig.6 Resistance V.S Drain Current

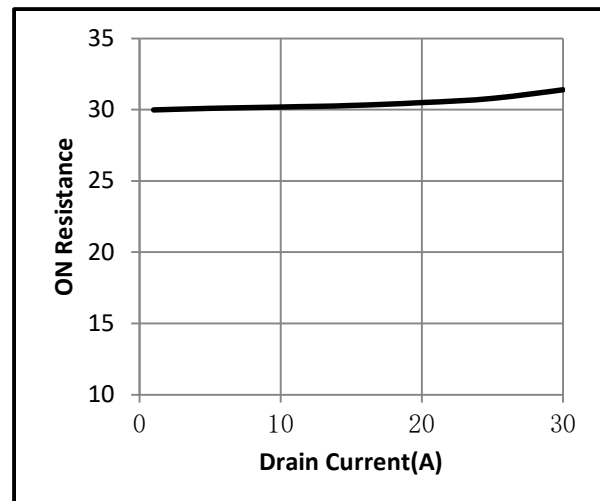


Fig.7 On-Resistance VS Gate Source Voltage

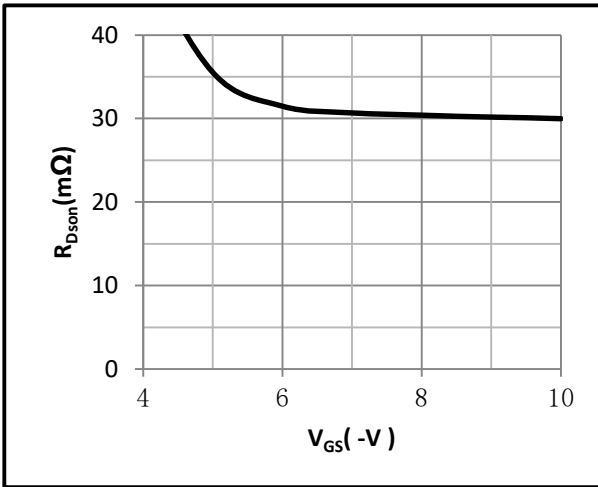


Fig.8 On-Resistance V.S Junction Temperature

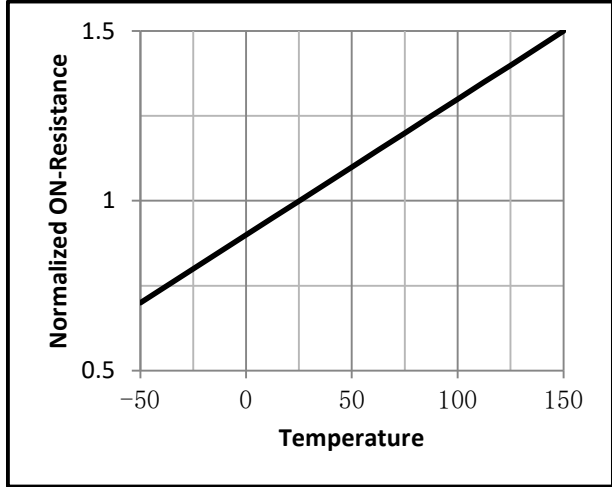


Fig.9 Gate Charge Measurement Circuit

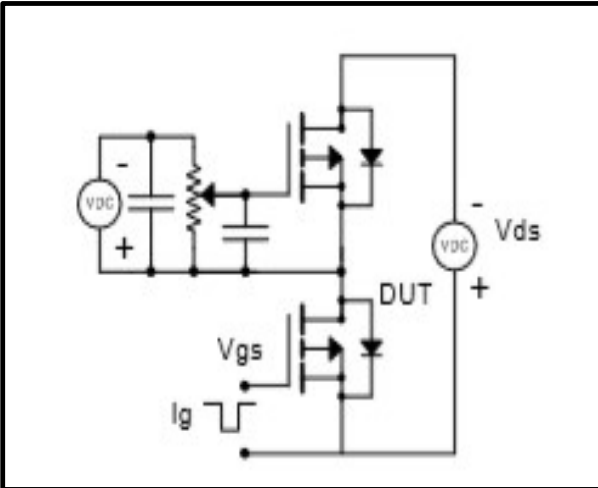


Fig.10 Gate Charge Waveform

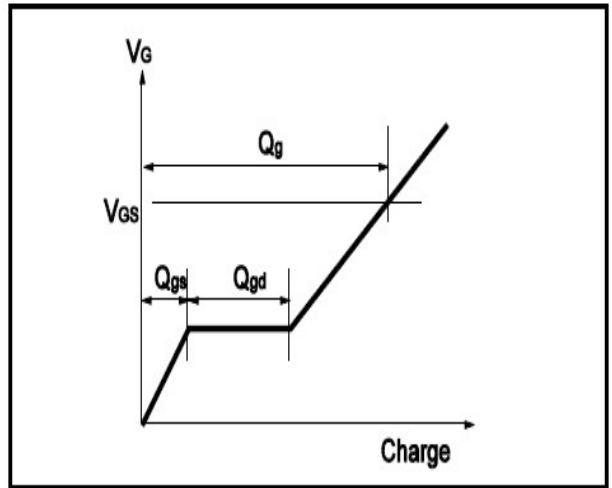


Fig.11 Switching Time Measurement Circuit

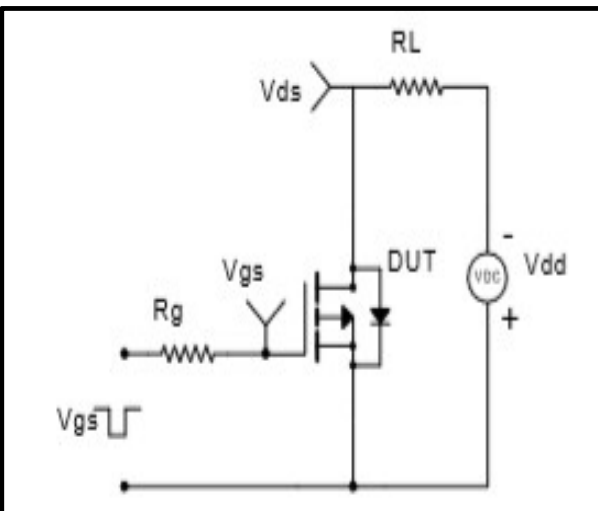
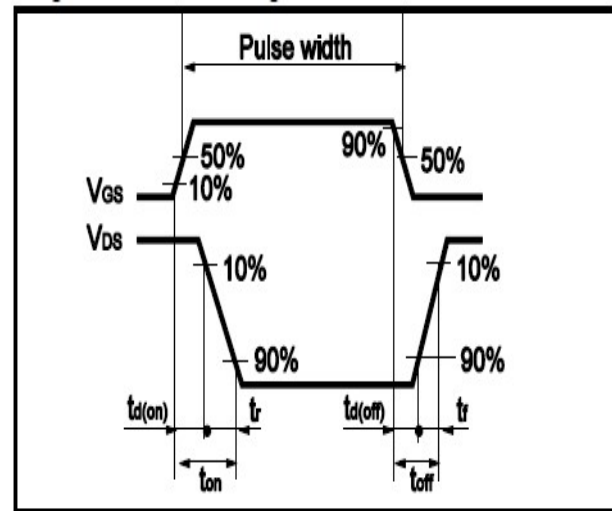
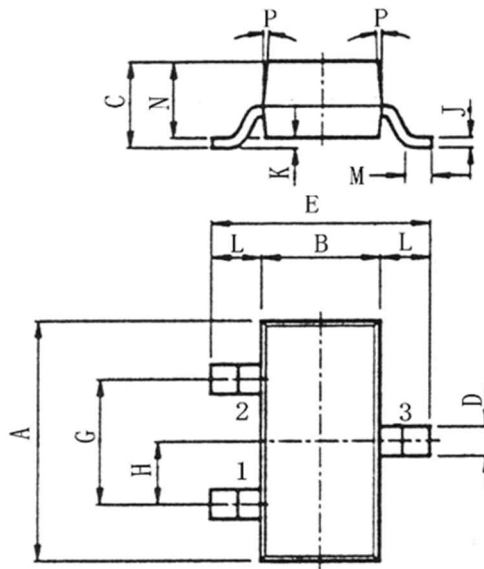


Fig.12 Switching Time Waveform



•Dimensions(SOT23-3)

Unit: mm



SYMBOL	min	nom	max
A	2.70	2.9	3.10
B	1.15	1.3	1.50
C			1.30
D	0.35	0.4	0.55
E	2.20	2.4	2.70
G	1.70	1.9	2.10
H	0.85	0.95	1.05
J	0.05	0.10	0.20
K	0.00		0.10
L	0.45	0.55	0.65
M	0.20		
N	0.90	1.00	1.20
P		7°	