• General Description

The ZM042N04P combines trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for load switch and battery protection applications.

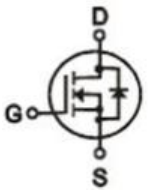
• Features

- ■ Advance high cell density Trench technology
- ■Low $R_{DS(ON)}$ to minimize conductive loss
- ■Low Gate Charge for fast switching
- ■Low Thermal resistance

•Application

- ■MB/VGA Vcore
- ■SMPS 2nd Synchronous Rectifier
- ■POL application
- ■BLDC Motor driver

• Product Summary



V_{DS} =40V

$R_{DS(ON)}$ =5.5mΩ

I_D =100A

TO-220

•Ordering Information:

Part NO.	ZM042N04P
Marking	ZM042N04
Packing Information	TUBE
Basic ordering unit (pcs)	1000

•Absolute Maximum Ratings (T_C =25℃)

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℃	100	A
	$I_{D@}$TC=75℃	76	A
	I_{D} @TC=100℃	63	A
Pulsed Drain Current ①	I_{DM}	220	A
Total Power Dissipation(TC=25℃)	P_D@TC=25℃	100	W
Total Power Dissipation(TA=25℃)	P_D@TA=25℃	3.5	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy	E_{AS}	150	mJ

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	2.1	°C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	65	°C/W
Soldering temperature, wave soldering 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	40			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}=40V, V_{GS} =0V			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=24A		5.5	7	mΩ
		V_{GS}=4.5V, I_D=12A		8	10	mΩ
Forward Trans conductance	g_{FS}	V_{DS} =25V, I_D=10A		16		s
Source-drain voltage	V_{SD}	Is=24A		0.8	1.2	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss	f = 1MHz VDS=25V	-	2800	-	pF
Output capacitance	Coss		-	350	-	
Reverse transfer capacitance	Crss		-	260	-	

●Gate Charge characteristics(T_a = 25℃)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Qg	V_{DD} =25V I_D = 8A V_{GS} = 10V	-	22	-	nC
Gate - Source charge	Qgs		-	8	-	
Gate - Drain charge	Qgd		-	11	-	

Note: ① Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2% ;

Fig.1 SOA Maximum Safe Operating Area

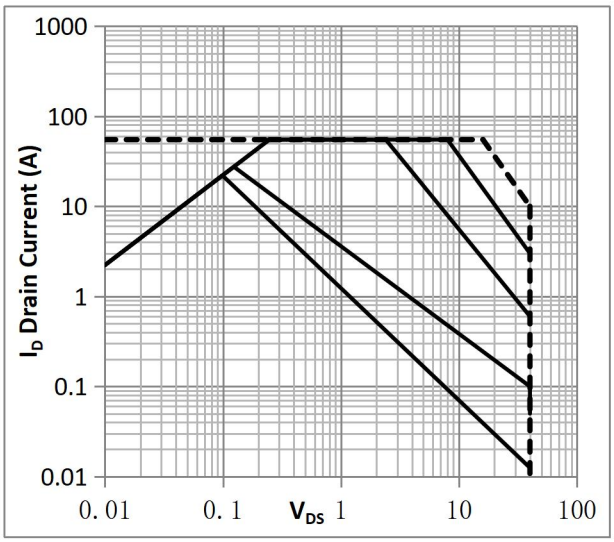


Fig.2 ID-Junction Temperature

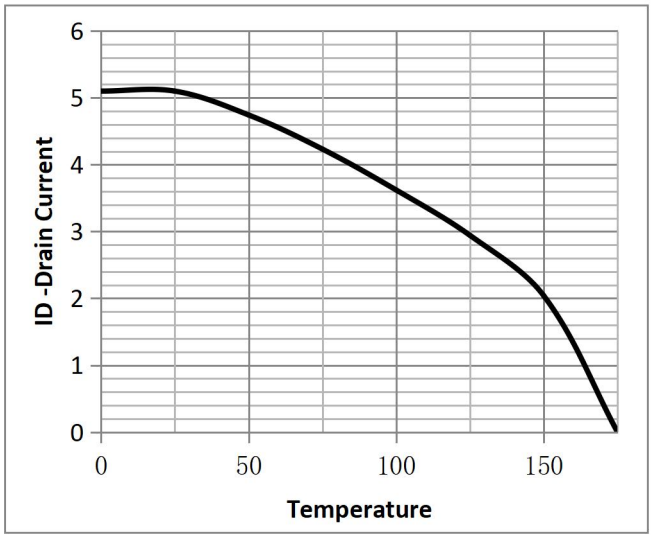


Fig.3 Gate-Charge Characteristics

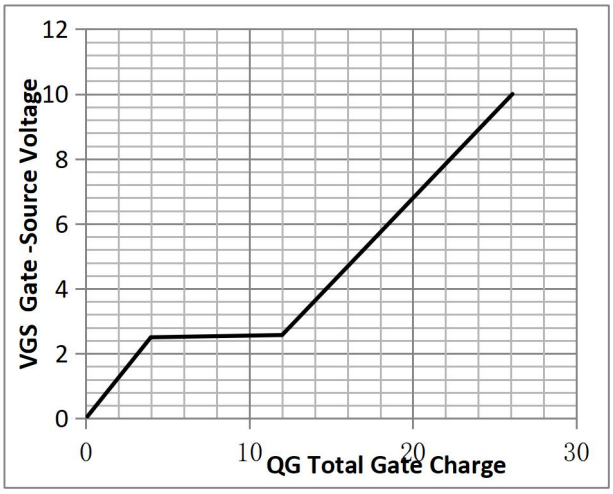


Fig.4 Capacitance Characteristics

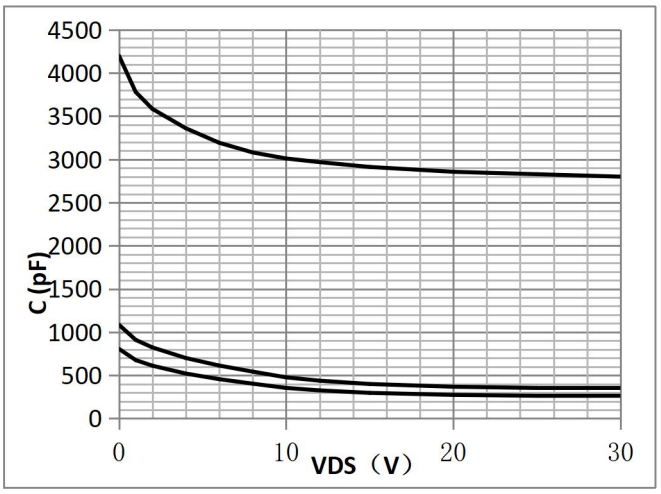


Fig.5 Power Dissipation

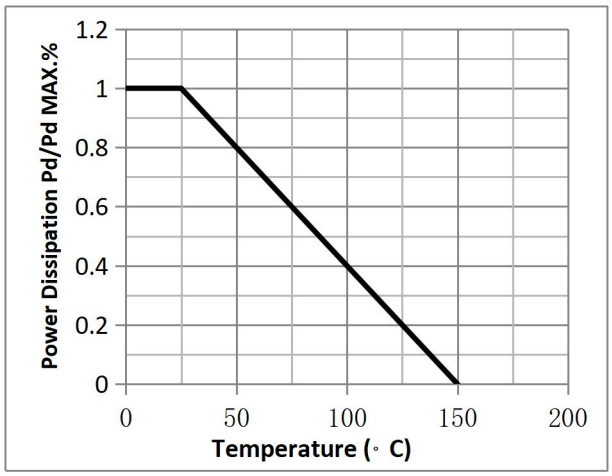


Fig.6 Typical output Characteristics

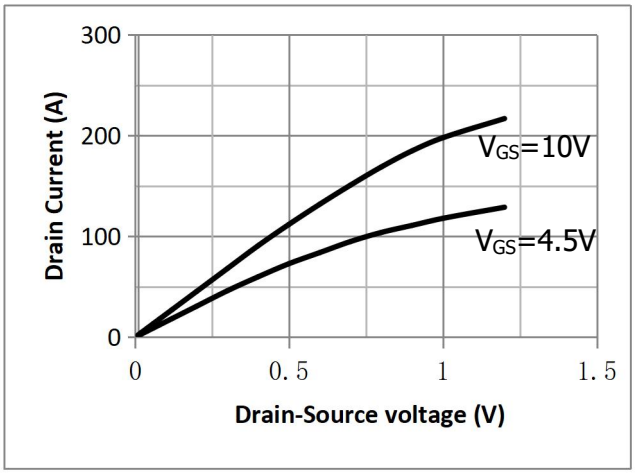


Fig.7 Threshold Voltage V.S Junction Temperature

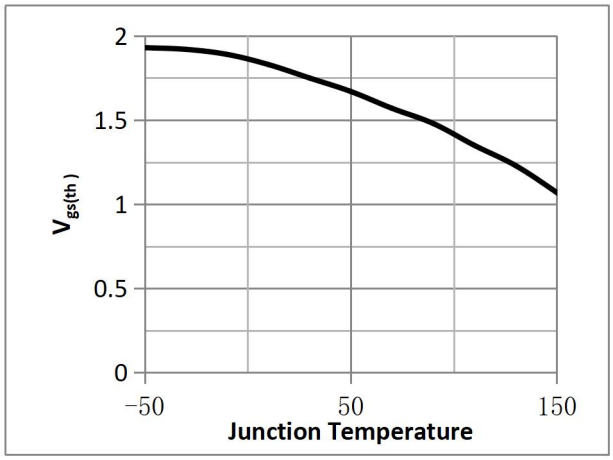


Fig.8 Resistance V.S Drain Current

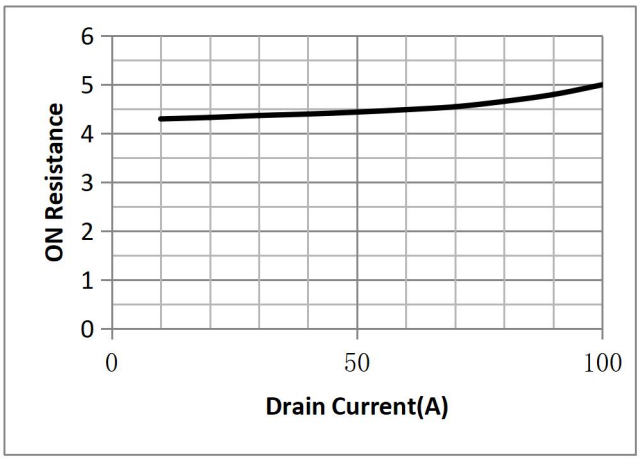


Fig.9 On-Resistance VS Gate Source Voltage

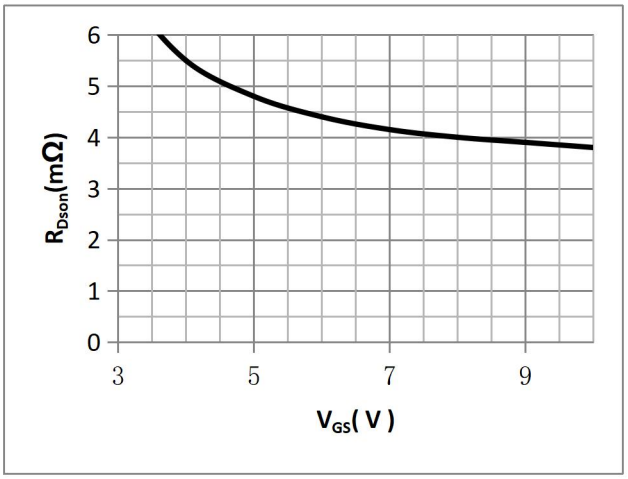


Fig.10 On-Resistance V.S Junction Temperature

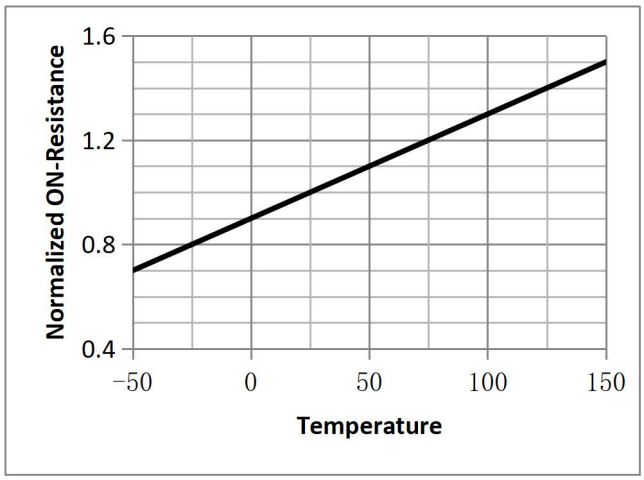


Fig.11 Switching Time Measurement Circuit

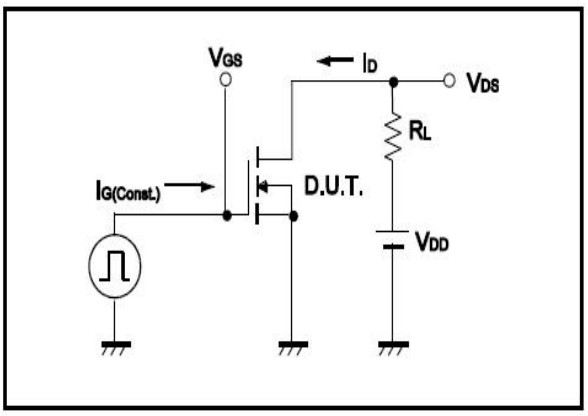


Fig.12 Gate Charge Waveform

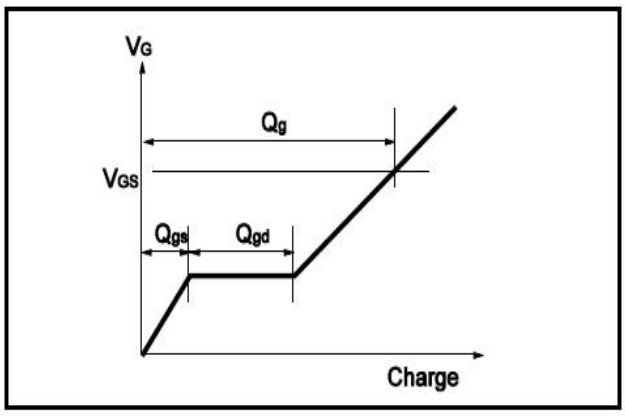


Fig.9 Switching Time Measurement Circuit

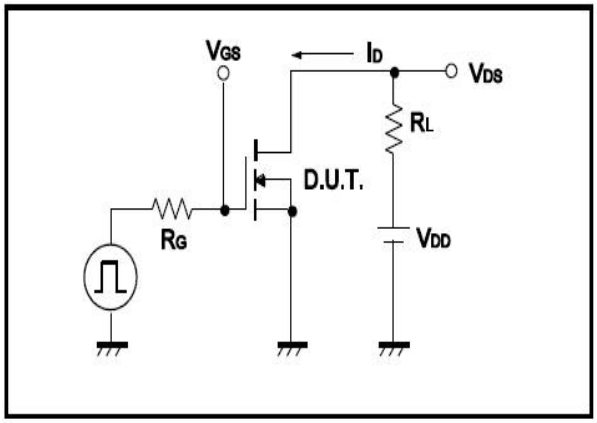


Fig.10 Gate Charge Waveform

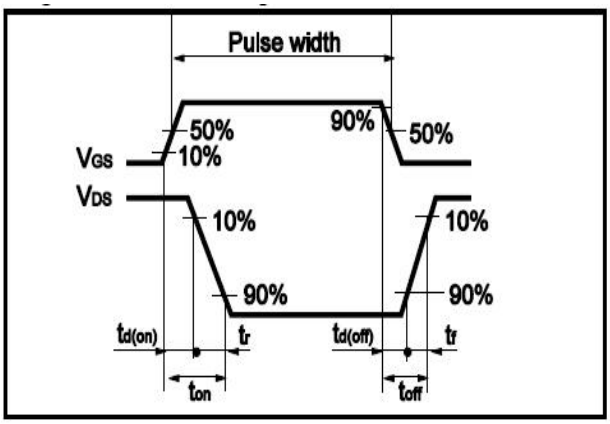


Fig.11 Avalanche Measurement Circuit

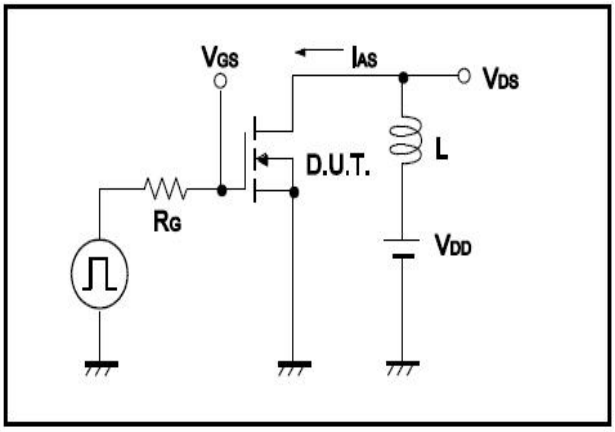
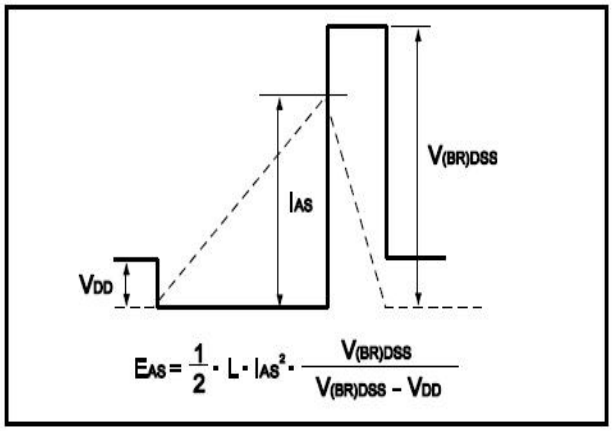


Fig.12 Avalanche Waveform



• Dimensions (TO-220)

Unit：mm

SYMBOL	min	nom	max	SYMBOL	min	nom	max
A	4.00		4.80	E	9.90		10.70
B	1.20		1.50	e		2.54	
B1	1.00		1.40	F	1.10		1.45
b1	0.65		1.00	L	12.50		14.50
c	0.35		0.75	L1	3.00	3.50	4.00
D	15.00		16.50	Q	2.50		3.00
D1	5.90		6.90	Q1	2.00		3.00
				ΦP	3.60		3.90