

• General Description

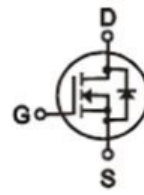
The ZM042N04I combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for load switch and battery protection applications.

• 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


$V_{DS} = 40V$

$R_{DS(ON)} = 5.5m\Omega$

$I_D = 80A$


• Ordering Information:

Part NO.	ZM042N04I
Marking	ZM042N04
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3600

• 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	$I_D @ T_C = 25^\circ C$	80	A
	$I_D @ T_C = 75^\circ C$	60.8	A
	$I_D @ T_C = 100^\circ C$	50.4	A
Pulsed Drain Current ①	I_{DM}	160	A
Total Power Dissipation	$P_D @ T_C = 25^\circ C$	70	W
Total Power Dissipation	$P_D @ T_A = 25^\circ C$	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	E_{AS}	280	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		12		s
Source-drain voltage	VSD	I _S =24A			1.28	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C _{iss}	f = 1MHz	-	2300	-	pF
Output capacitance	C _{oss}		-	300	-	
Reverse transfer capacitance	C _{rss}		-	160	-	

●Gate Charge characteristics(T_a = 25°C)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q _g	V _{DD} =25V	-	20	-	nC
Gate - Source charge	Q _{gs}	I _D = 8A	-	9	-	
Gate - Drain charge	Q _{gd}	V _{GS} = 10V	-	11	-	

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

Fig.1 Power Dissipation

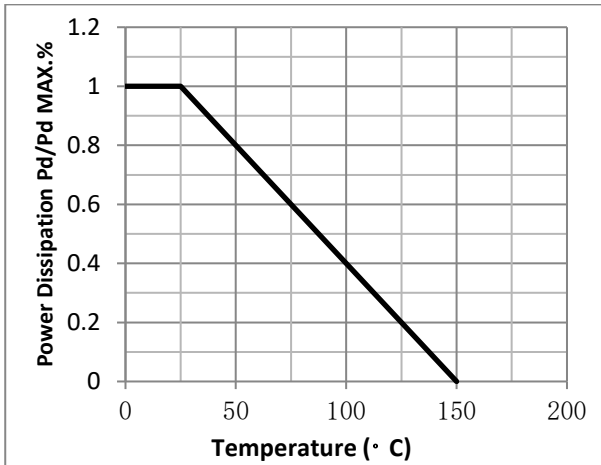


Fig.2 Typical output Characteristics

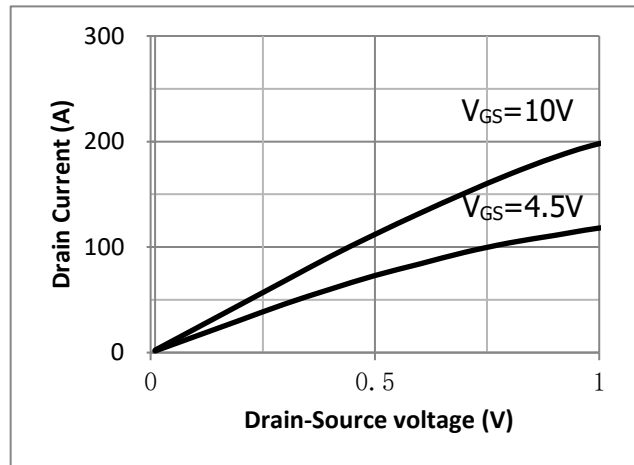


Fig.3 Threshold Voltage V.S Junction Temperature

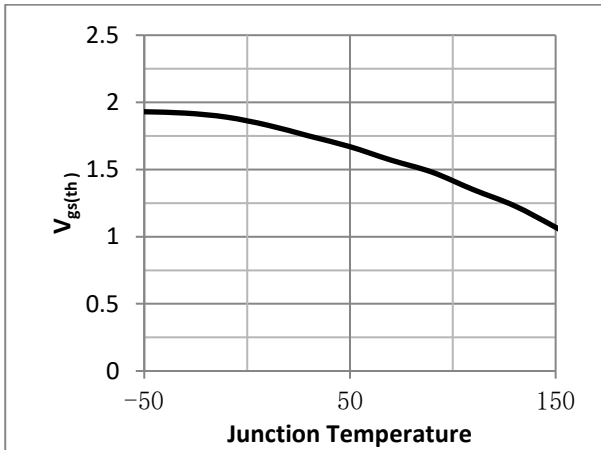


Fig.4 Resistance V.S Drain Current

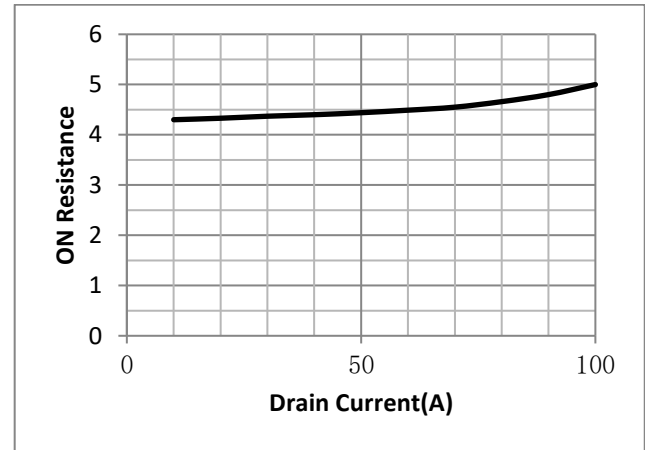


Fig.5 On-Resistance VS Gate Source Voltage

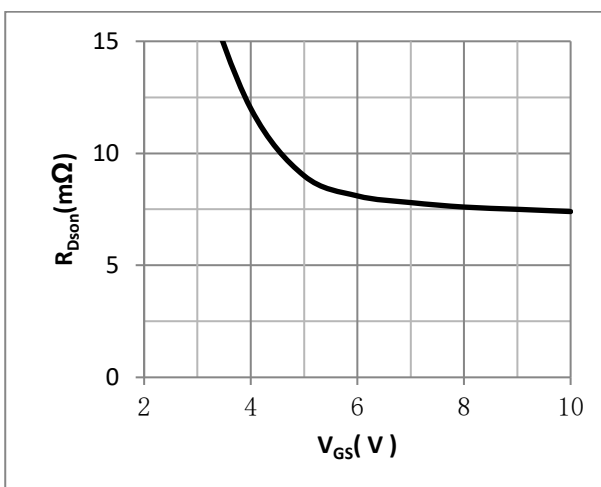


Fig.6 On-Resistance V.S Junction Temperature

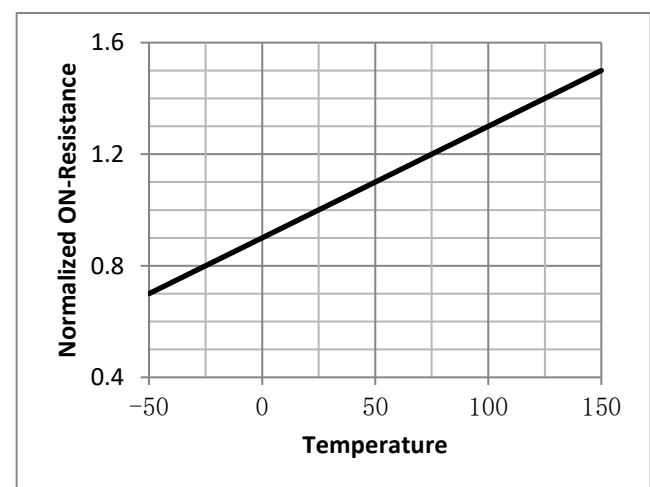


Fig.7 Switching Time Measurement Circuit

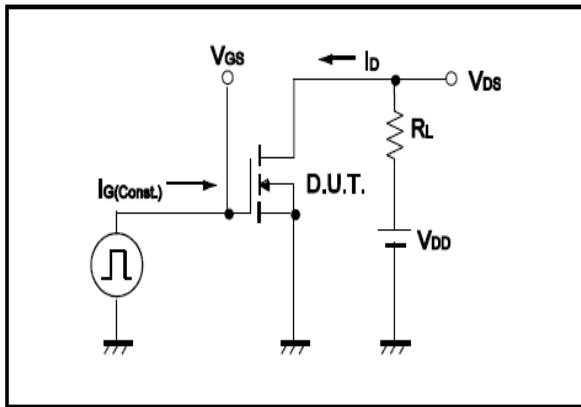


Fig.8 Gate Charge Waveform

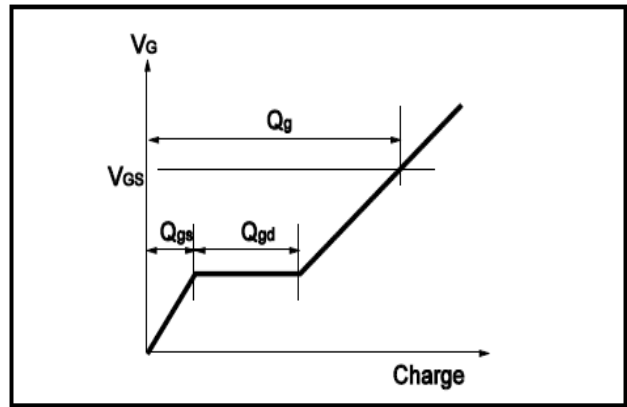


Fig.9 Switching Time Measurement Circuit

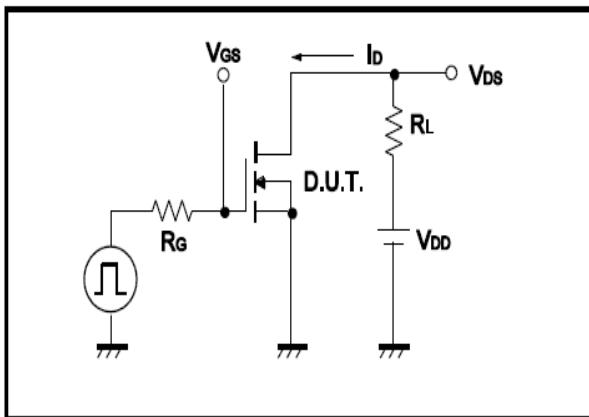


Fig.10 Gate Charge Waveform

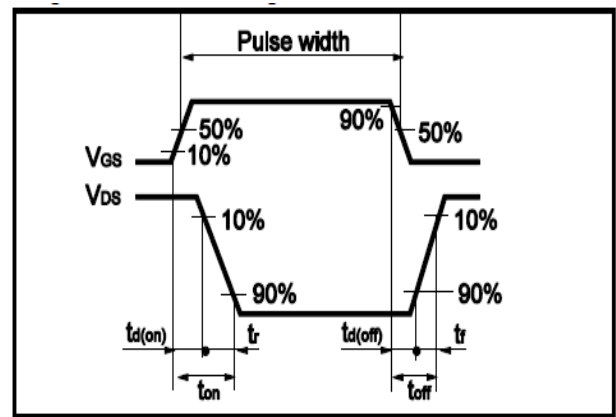


Fig.11 Avalanche Measurement Circuit

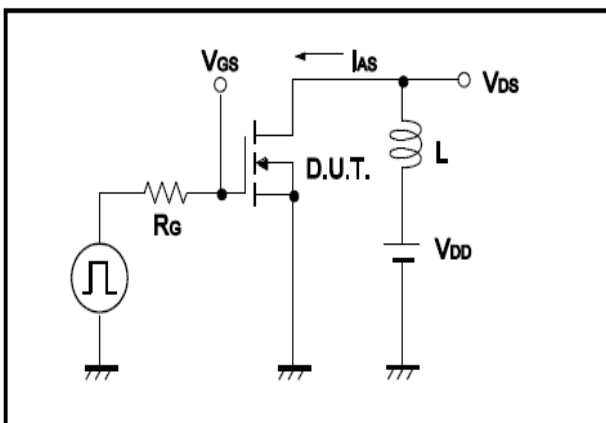
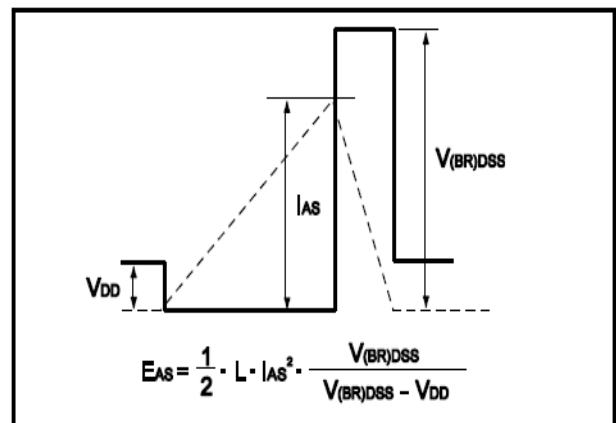


Fig.12 Avalanche Waveform





•Dimensions(TO-251)

Unit: mm

SYMBOL	min	max	SYMBOL	min	max
A	2.10	2.50	D	6.35	6.80
A1	0.95	1.30	D1	5.10	5.50
B	0.80	1.25	E	5.30	6.30
b	0.50	0.80	e	2.24	2.35
b1	0.70	0.90	E1	4.43	4.73
c	0.45	0.60	L	7.00	9.40
c1	0.45	0.60			

