

**• General Description**

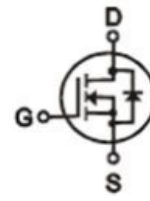
The ZM220N03L combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ .

**• 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**

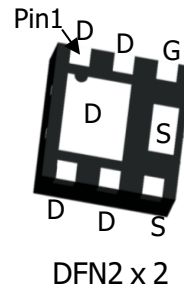
- DC/DC Converters in Computing, Servers
- Isolated DC/DC Converters in Telecom and Industrial
- POL application
- BLDC Motor driver

**• Product Summary**


$V_{DS} = 30V$

$R_{DS(ON)} = 25m\Omega$

$I_D = 5A$



DFN2 x 2

**• Ordering Information:**

Part NO.	ZM220N03L
Marking	220N03
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current <sup>②</sup>	$I_D @ T_C = 25^\circ C$	5	A
	$I_D @ T_C = 75^\circ C$	3.8	A
	$I_D @ T_C = 100^\circ C$	3	A
Pulsed Drain Current <sup>①</sup>	$I_{DM}$	15	A
Total Power Dissipation <sup>②</sup>	$P_D @ T_C = 25^\circ C$	18	W
Total Power Dissipation	$P_D @ T_A = 25^\circ C$	0.9	W
Operating Junction Temperature	$T_J$	-55 to 150	$^\circ C$
Storage Temperature	$T_{STG}$	-55 to 150	$^\circ C$
Single Pulse Avalanche Energy @ $L = 0.1mH$	$E_{AS}$	5	mJ

**•Thermal resistance**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case <sup>②</sup>	R <sub>thJC</sub>	-	-	36	° C/W
Thermal resistance, junction - ambient	R <sub>thJA</sub>	-	-	180	° C/W
Soldering temperature, wavesoldering for 10s	T <sub>sold</sub>	-	-	265	° C

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	30			V
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	0.5	0.9	1.3	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V			1.0	uA
Gate- Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V			±100	nA
Static Drain-source On Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A		25	32	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =5A		33	43	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =2A		5		s
Source-drain voltage	V <sub>SD</sub>	I <sub>S</sub> =5A			1.28	V

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C <sub>iss</sub>	f = 1MHz	-	287	-	pF
Output capacitance	C <sub>oss</sub>		-	54	-	
Reverse transfer capacitance	C <sub>rss</sub>		-	12	-	

**•Gate Charge characteristics(T<sub>a</sub> = 25°C)**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q <sub>g</sub>	V <sub>DD</sub> =15V	-	7.5	-	nC
Gate - Source charge	Q <sub>gs</sub>	I <sub>D</sub> = 3A	-	0.68	-	
Gate - Drain charge	Q <sub>gd</sub>	V <sub>GS</sub> = 4.5V	-	2.4	-	

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

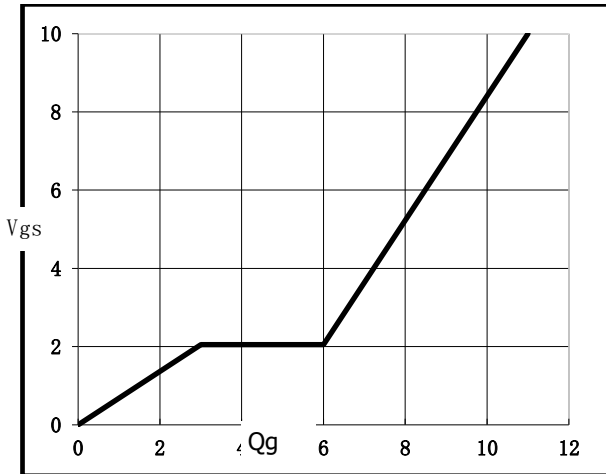


Fig.2 Capacitance Characteristics

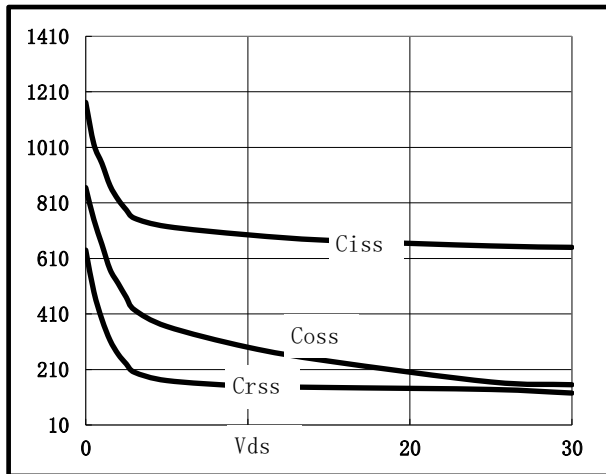


Fig.3 Power Dissipation Derating Curve

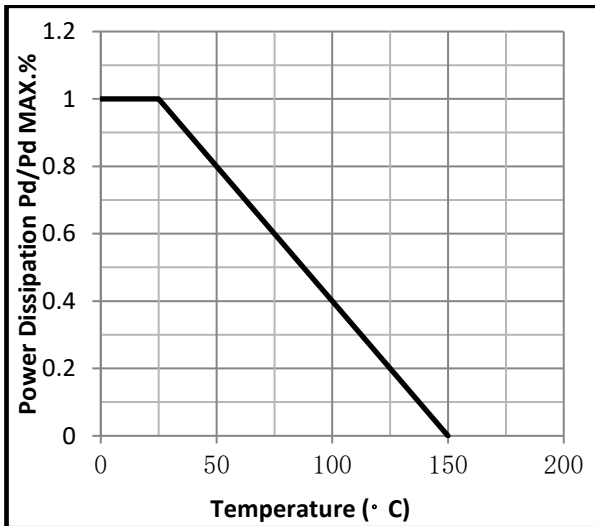


Fig.4 Typical output Characteristics

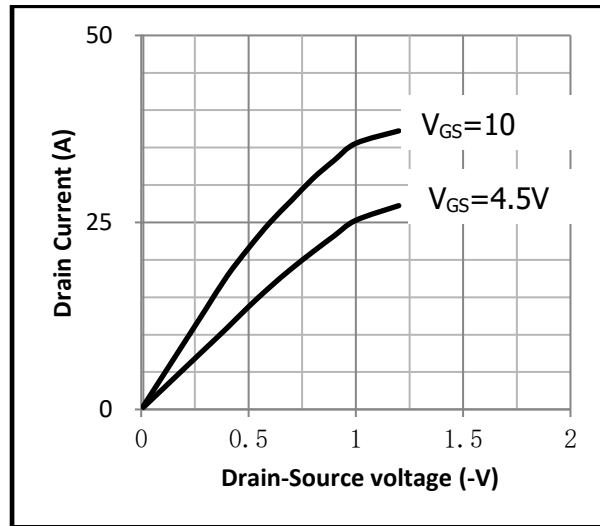


Fig.5 Threshold Voltage V.S Junction Temperature

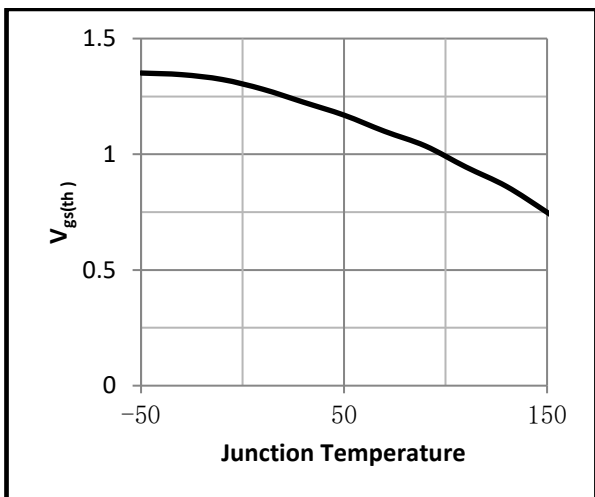


Fig.6 Resistance V.S Drain Current

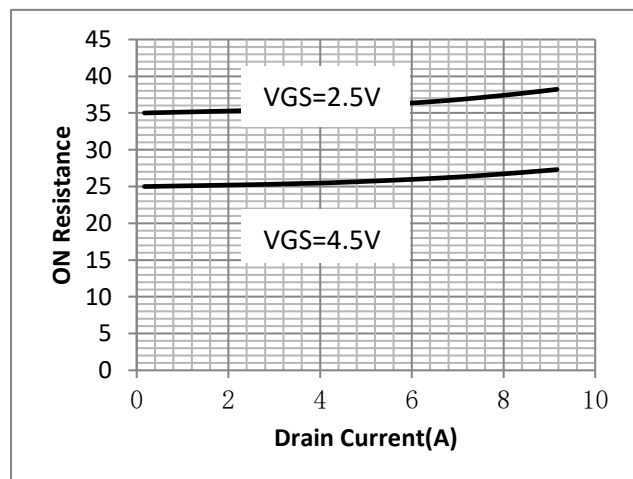


Fig.7 On-Resistance VS Gate Source Voltage

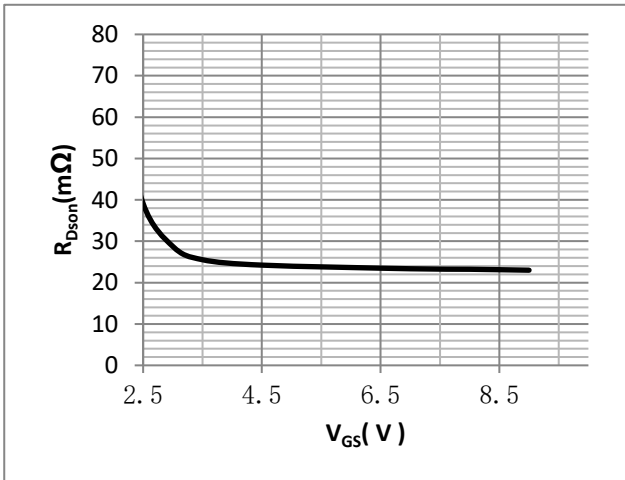


Fig.8 On-Resistance V.S Junction Temperature

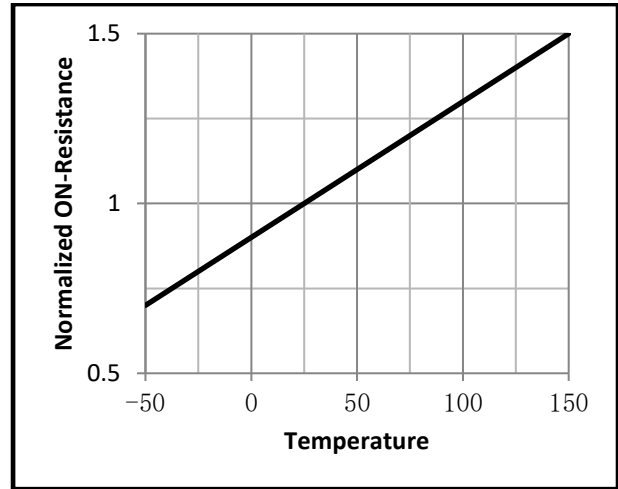


Fig.9 Switching Time Measurement Circuit

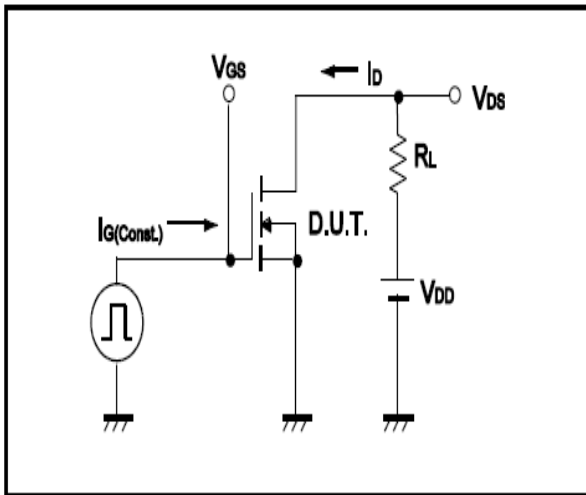


Fig.10 Gate Charge Waveform

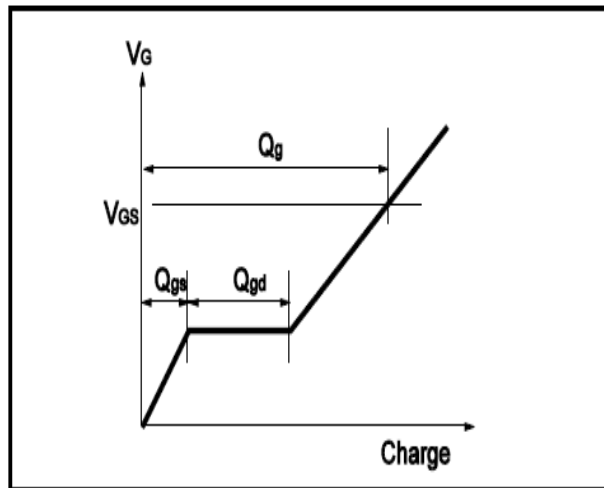


Fig.11 Switching Time Measurement Circuit

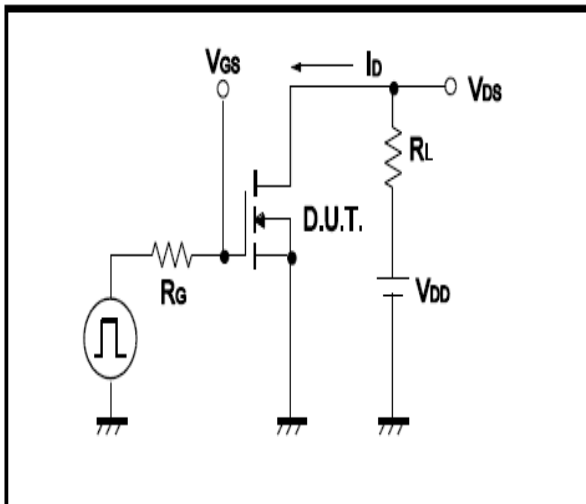
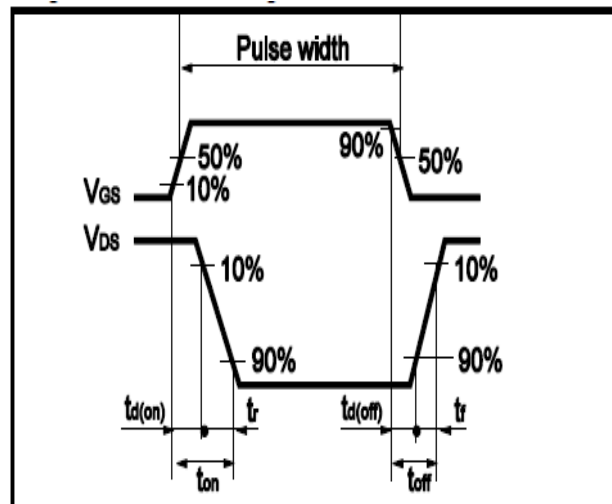


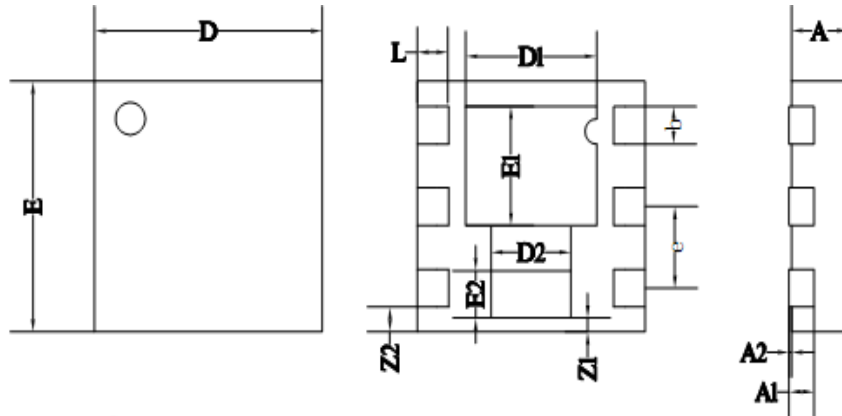
Fig.12 Gate Charge Waveform





•Dimensions(DFN2\*2)

Unit: mm



NOTE:  
All dimensions are in mm

	MIN	NOM	MAX
<b>D</b>	1.95	2.00	2.05
<b>E</b>	1.95	2.00	2.05
<b>D1</b>	1.10	1.15	1.20
<b>E1</b>	0.90	0.95	1.00
<b>D2</b>	0.65	0.70	0.75
<b>E2</b>	0.33	0.38	0.43
<b>L</b>	0.225	0.275	0.325
<b>b</b>	0.25	0.30	0.35
<b>e</b>	0.65BSC		
<b>A</b>	0.45	0.50	0.55
<b>A1</b>	0.20REF		
<b>A2</b>	0.00	-	0.05
<b>Z1</b>	0.06	0.11	0.16
<b>Z2</b>	0.15	0.20	0.25