

**• General Description**

The ZM180P02L 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**

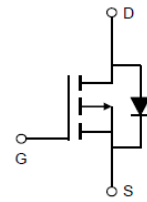
- MB/VGA Vcore
- SMPS 2<sup>nd</sup> Synchronous Rectifier
- POL application
- BLDC Motor driver

**• Ordering Information:**

Part NO.	ZM180P02L
Marking	ZM180P02
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

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

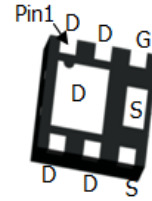
Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 8$	V
Continuous Drain Current	$I_D @ T_C = 25^\circ\text{C}$	-18	A
	$I_D @ T_C = 75^\circ\text{C}$	-13.68	A
	$I_D @ T_C = 100^\circ\text{C}$	-11.34	A
Pulsed Drain Current <sup>①</sup>	$I_{DM}$	-54	A
Total Power Dissipation <sup>②</sup>	$P_D @ T_C = 25^\circ\text{C}$	18	W
Total Power Dissipation	$P_D @ T_A = 25^\circ\text{C}$	0.9	W
Operating Junction Temperature	$T_J$	-55 to 150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 to 150	$^\circ\text{C}$
Single Pulse Avalanche Energy	$E_{AS}$	30	mJ

**• Product Summary**


$V_{DS} = -20\text{V}$

$R_{DS(ON)} = 16\text{m}\Omega$

$I_D = -18\text{A}$



DFN 2 x 2

**•Thermal resistance**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case <sup>②</sup>	R <sub>thJC</sub>	-	-	7.0	° C/W
Thermal resistance, junction - ambient	R <sub>thJA</sub>	-	-	140	° 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	-20			V
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = -250uA	-0.4		-1.0	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V			-1.0	uA
Gate- Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±8V, 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> = -8A		20	25	mΩ
		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -6A		26	33	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = -5V, I <sub>D</sub> = -5A		9		s
Source-drain voltage	V <sub>SD</sub>	I <sub>S</sub> = -8A			1.28	V

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C <sub>iss</sub>	f = 1MHz	-	1200	-	pF
Output capacitance	C <sub>oss</sub>		-	235	-	
Reverse transfer capacitance	C <sub>rss</sub>		-	120	-	

**•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> = 25V	-	12	-	nC
Gate - Source charge	Q <sub>gs</sub>	I <sub>D</sub> = 8A	-	4	-	
Gate - Drain charge	Q <sub>gd</sub>	V <sub>GS</sub> = 10V	-	6	-	

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 Power Dissipation Derating Curve

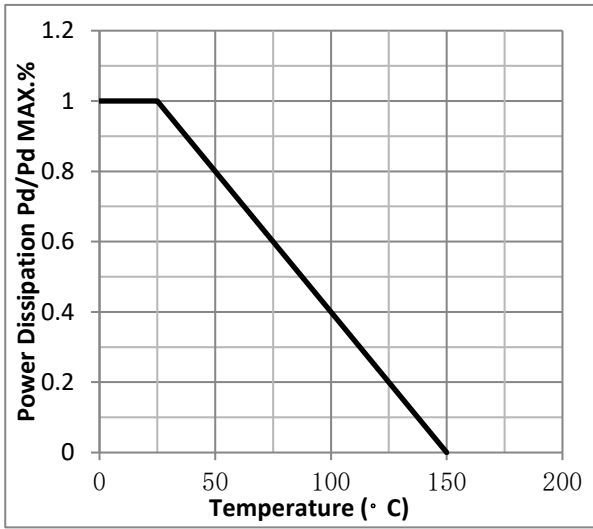


Fig.2 Typical output Characteristics

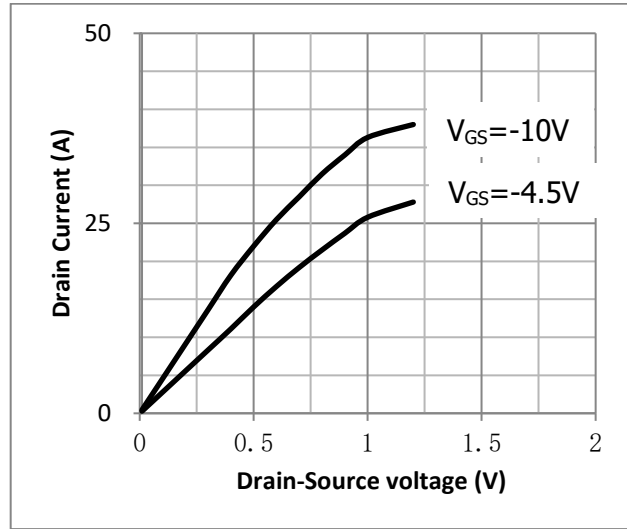


Fig.3 Threshold Voltage V.S Junction Temperature

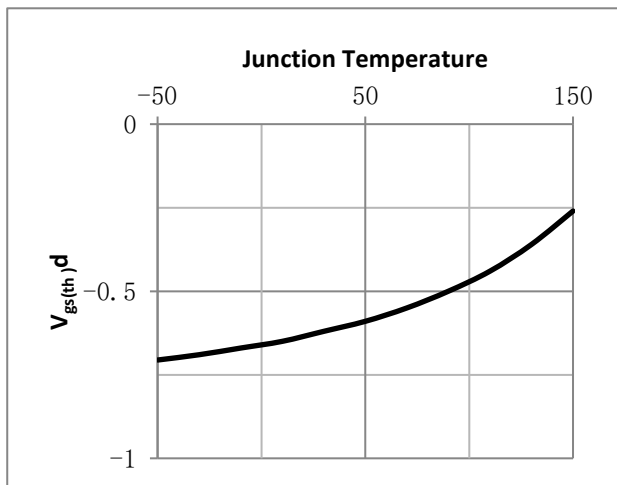


Fig.4 Resistance V.S Drain Current

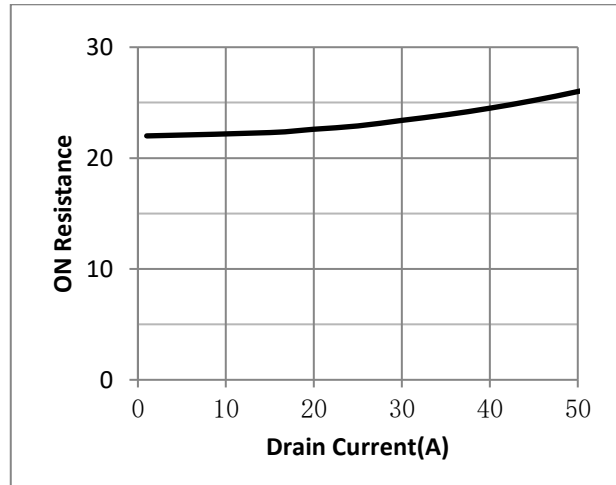


Fig.5 On-Resistance VS Gate Source Voltage

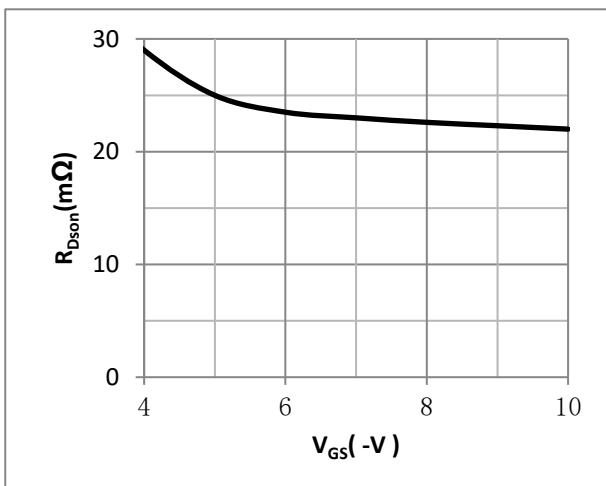


Fig.6 On-Resistance V.S Junction Temperature

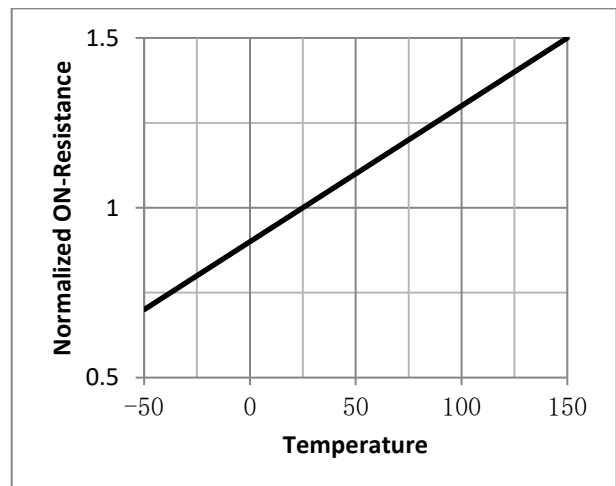


Fig.7 Switching Time Measurement Circuit

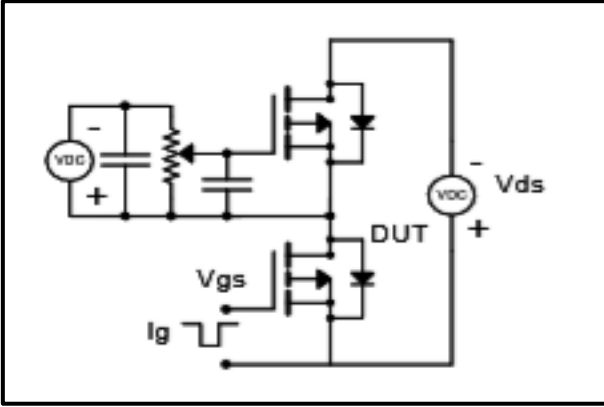


Fig.8 Gate Charge Waveform

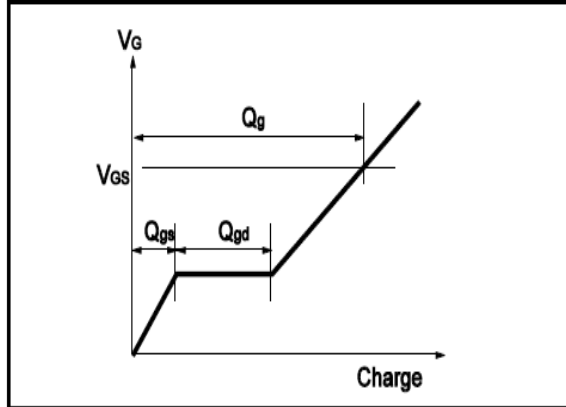


Fig.9 Switching Time Measurement Circuit

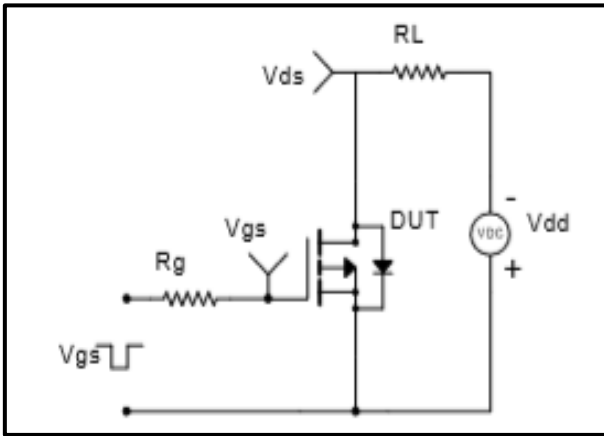


Fig.10 Gate Charge Waveform

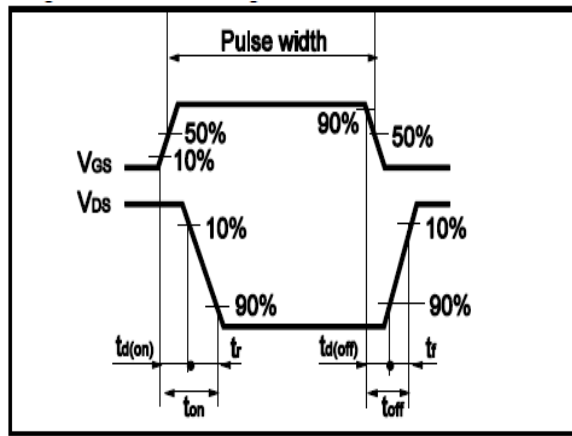


Fig.11 Avalanche Measurement Circuit

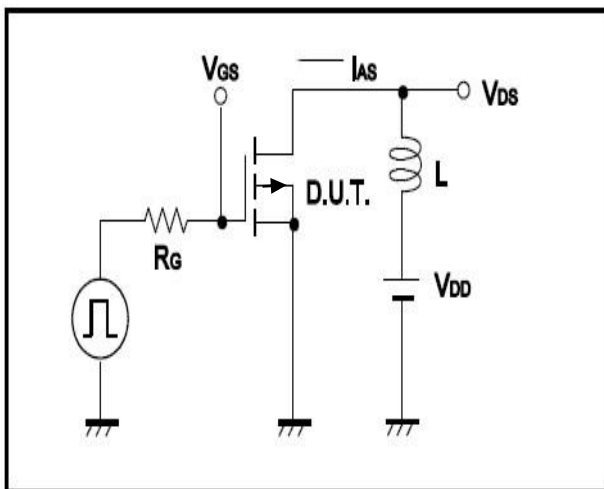
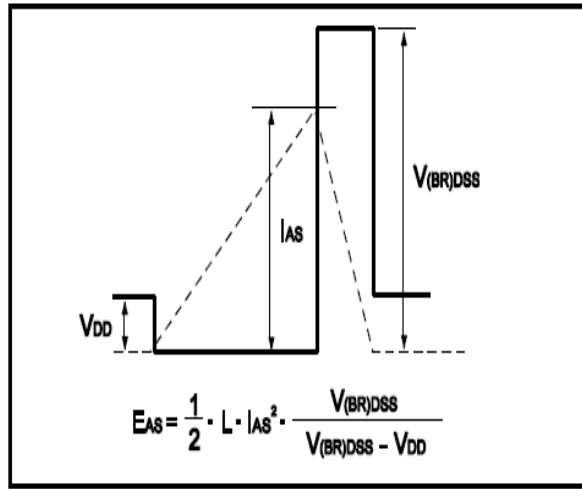
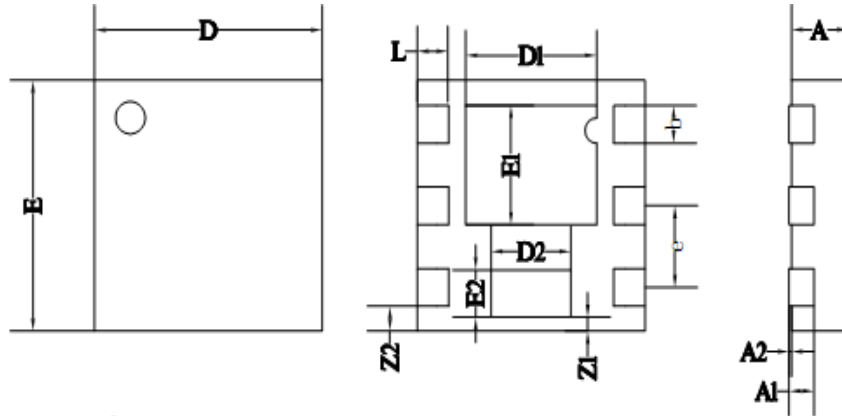


Fig.12 Avalanche Waveform



•Dimensions(DFN2\*2)

Unit: mm



NOTE:  
 All dimensions are in mm

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