

General Description

It combines trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for motor driver, 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
- Dual DIE in one package

Application

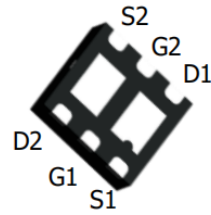
- BLDC Motor driver
- SMPS 2nd Synchronous Rectifier
- Battery protection

Product Summary

$V_{DS} = 20V$

$R_{DS(ON)} = 23m\Omega$

$I_D = 5.8A$



DFN2*2

Ordering Information:

Part NO.	ZMD68223L
Marking	68223
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}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	$I_D @ T_C = 25^\circ C$	5.8	A
	$I_D @ T_C = 75^\circ C$	4.4	A
	$I_D @ T_C = 100^\circ C$	3.6	A
Pulsed Drain Current ^①	I_{DM}	17.4	A
Total Power Dissipation	$P_D @ T_C = 25^\circ C$	18	W
Total Power Dissipation ^②	$P_D @ T_A = 25^\circ C$	0.69	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}	5	mJ
ESD Level (HBM)		Class 1A	



●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	6.9	$^{\circ}C/W$
Thermal resistance, junction - ambient [®]	R_{thJA}	-	-	180	$^{\circ}C/W$
Soldering temperature, wavesoldering for 10s	T_{sold}	-	-	260	$^{\circ}C$

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	0.5	0.8	1.2	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$			1.0	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$			± 100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=5.2A$		23	30	m Ω
		$V_{GS}=2.5V, I_D=5A$		28	38	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=2A$		3		S
Source-drain voltage	V_{SD}	$I_S=5.2A$			1.28	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Gate Resistance	R_g	$f = 1MHz$		1.2		Ω
Input capacitance	C_{iss}	$f = 1MHz$ $V_{DS}=10V$	-	470	-	pF
Output capacitance	C_{oss}		-	58	-	
Reverse transfer capacitance	C_{rss}		-	45	-	

●Gate Charge characteristics($T_a = 25^{\circ}C$)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q_g	$V_{DD}=10V$ $I_D=2A$ $V_{GS}=4.5V$	-	5.9	-	nC
Gate - Source charge	Q_{gs}		-	0.45	-	
Gate - Drain charge	Q_{gd}		-	1.9	-	

Fig.1 Gate-Charge Characteristics

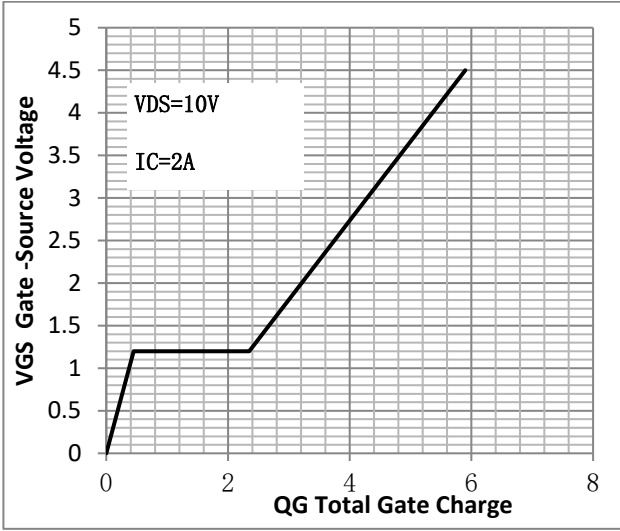


Fig.2 Capacitance Characteristics

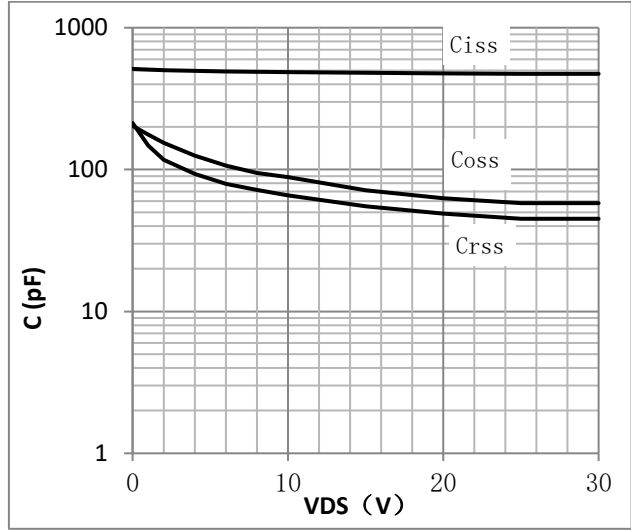


Fig.3 Power Dissipation

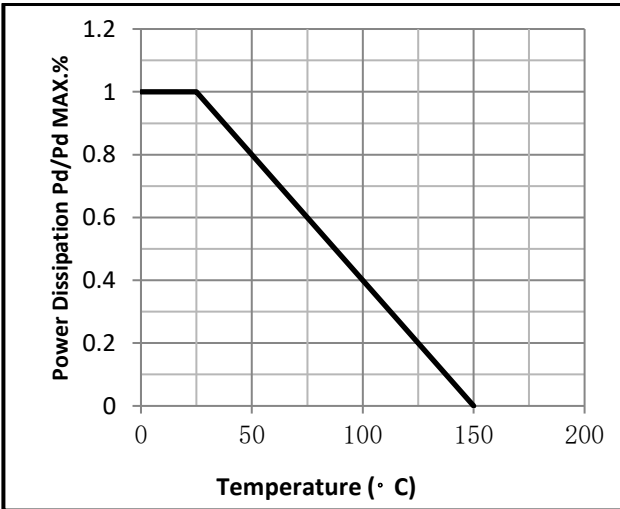


Fig.4 Typical output Characteristics

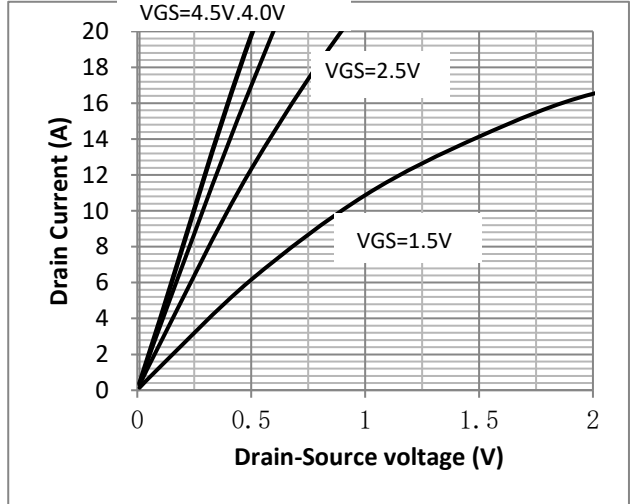


Fig.5 Threshold Voltage V_{GS(th)} V.S Junction Temperature

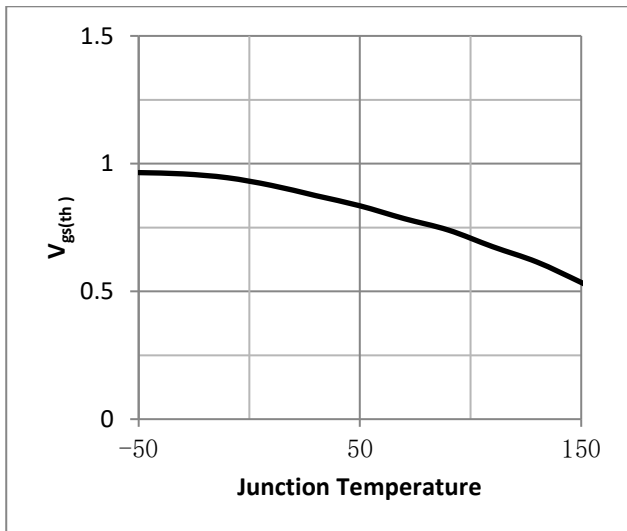


Fig.6 Resistance V.S Drain Current

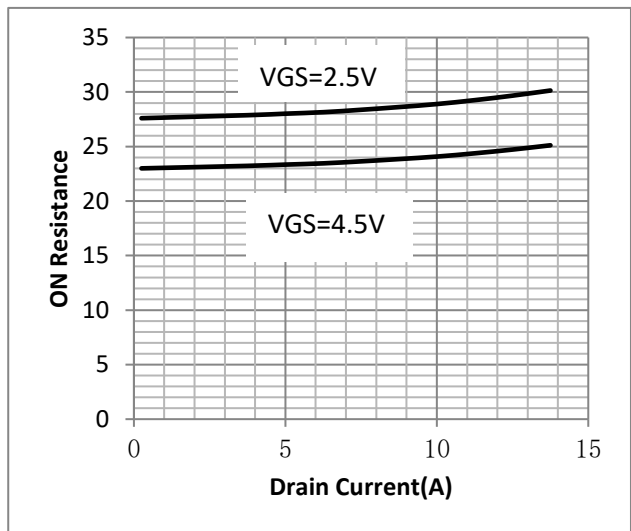


Fig.7 On-Resistance VS Gate Source Voltage

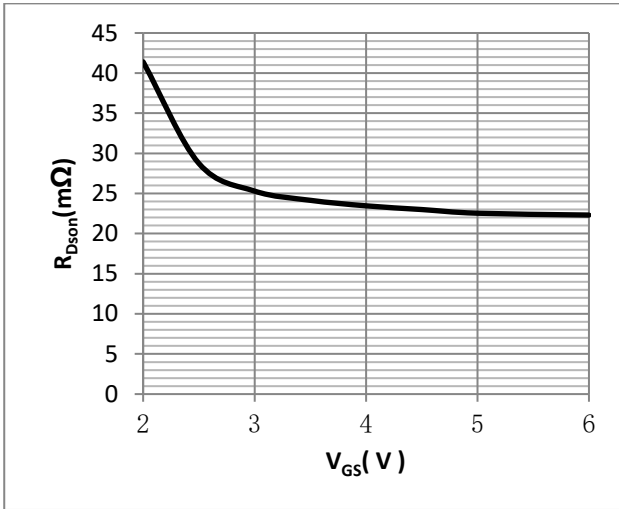


Fig.8 On-Resistance V.S Junction Temperature

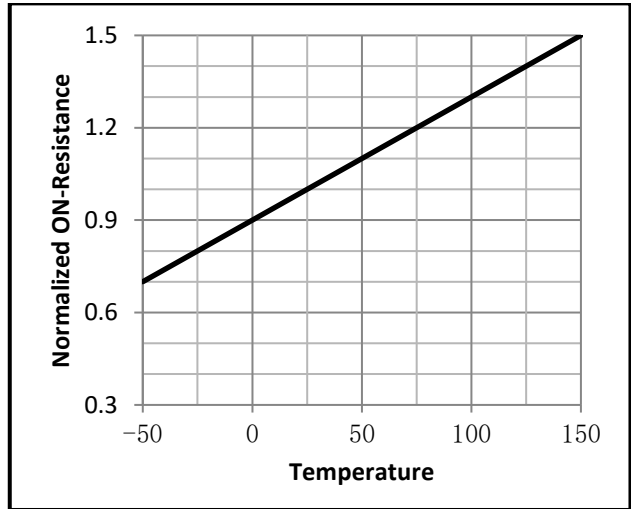


Fig.9 SOA Maximum Safe Operating Area

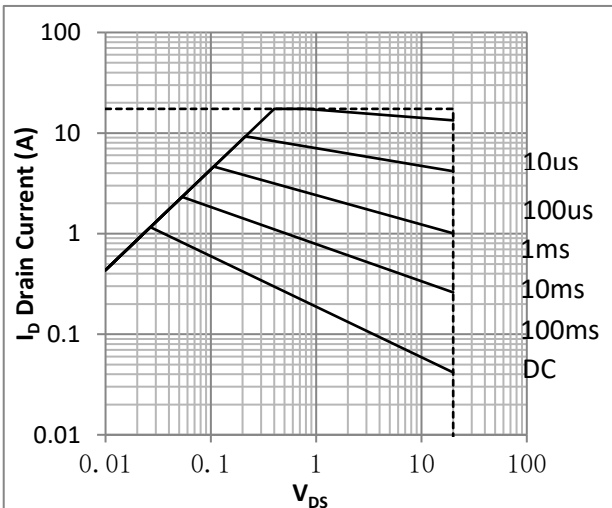


Fig.10 I_D -Junction Temperature

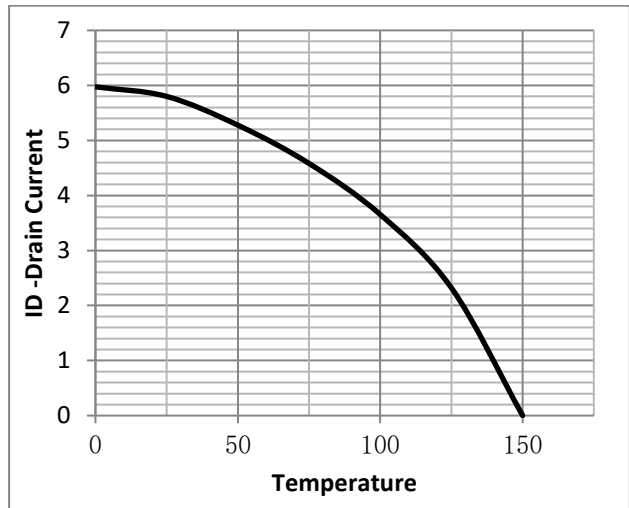


Figure 11. Diode Forward Voltage vs. Current

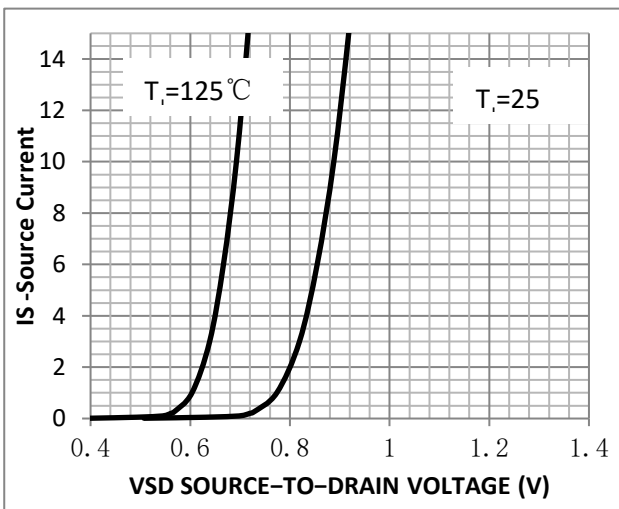


Figure 12. Transfer Characteristics

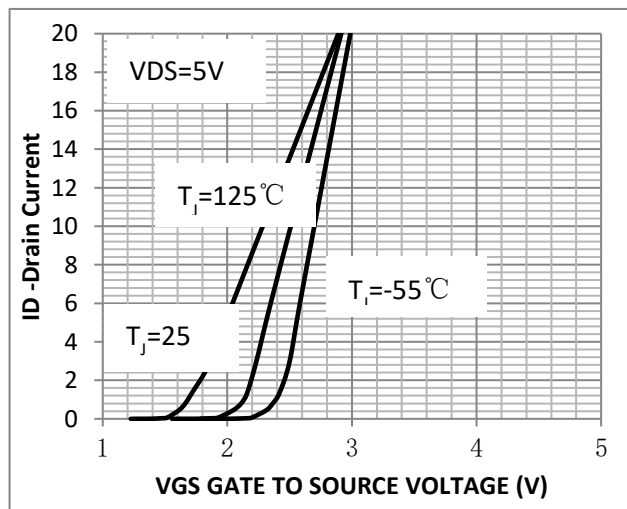


Fig.13 Switching Time Measurement Circuit

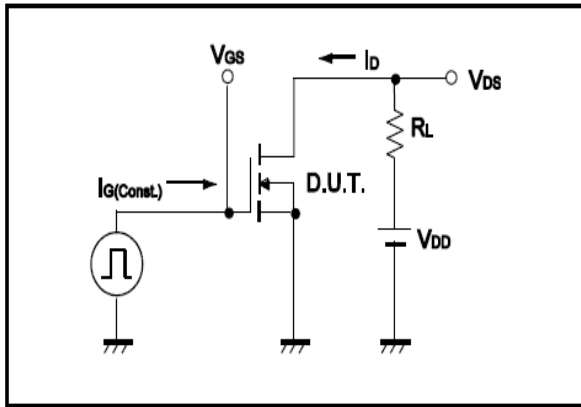


Fig.14 Gate Charge Waveform

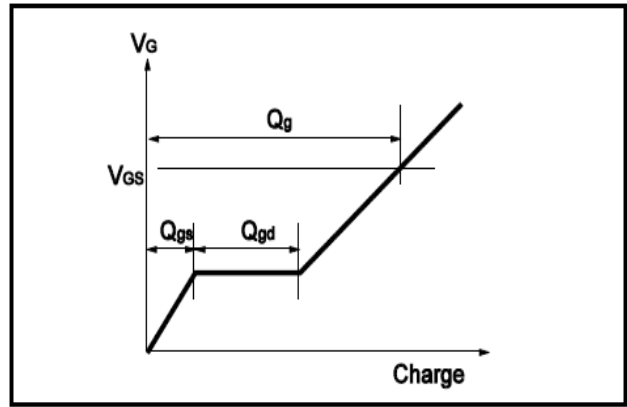


Fig.15 Switching Time Measurement Circuit

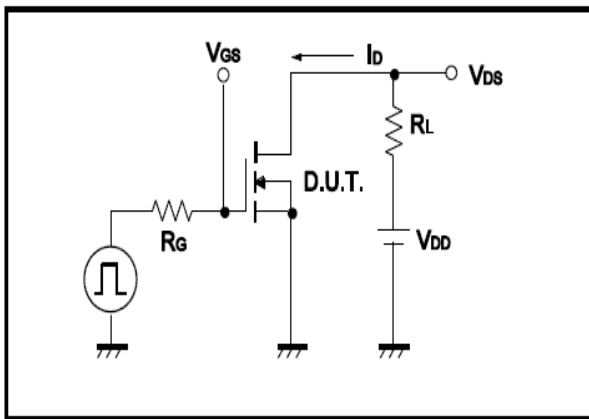


Fig.16 Gate Charge Waveform

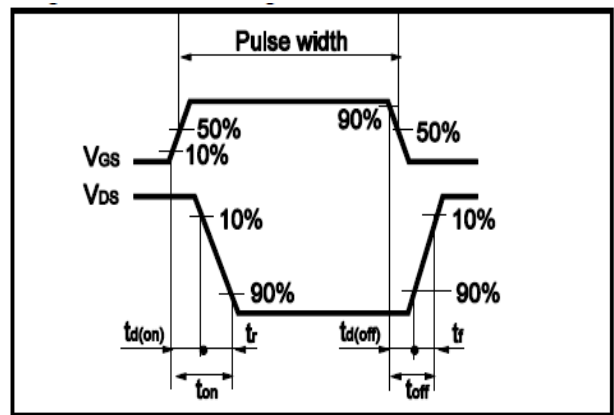


Fig.17 Avalanche Measurement Circuit

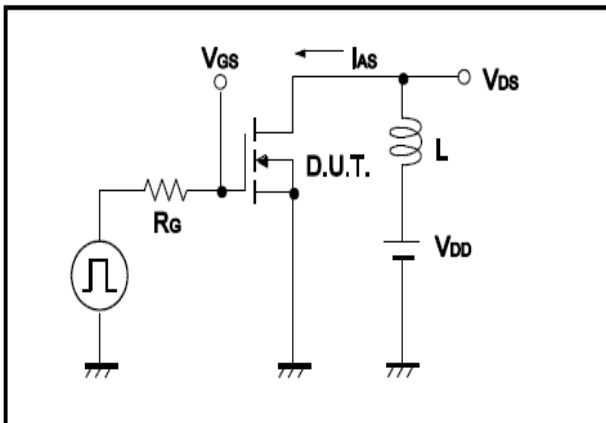
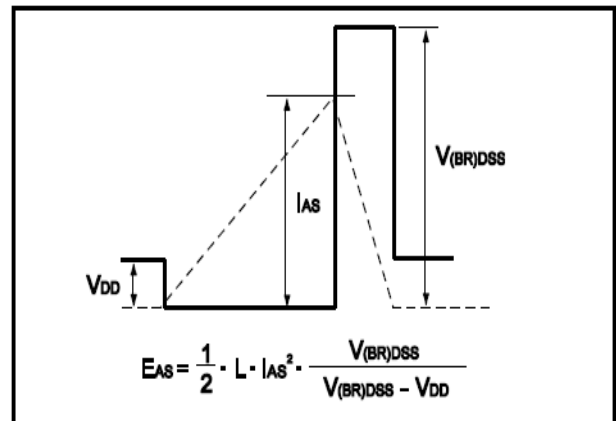
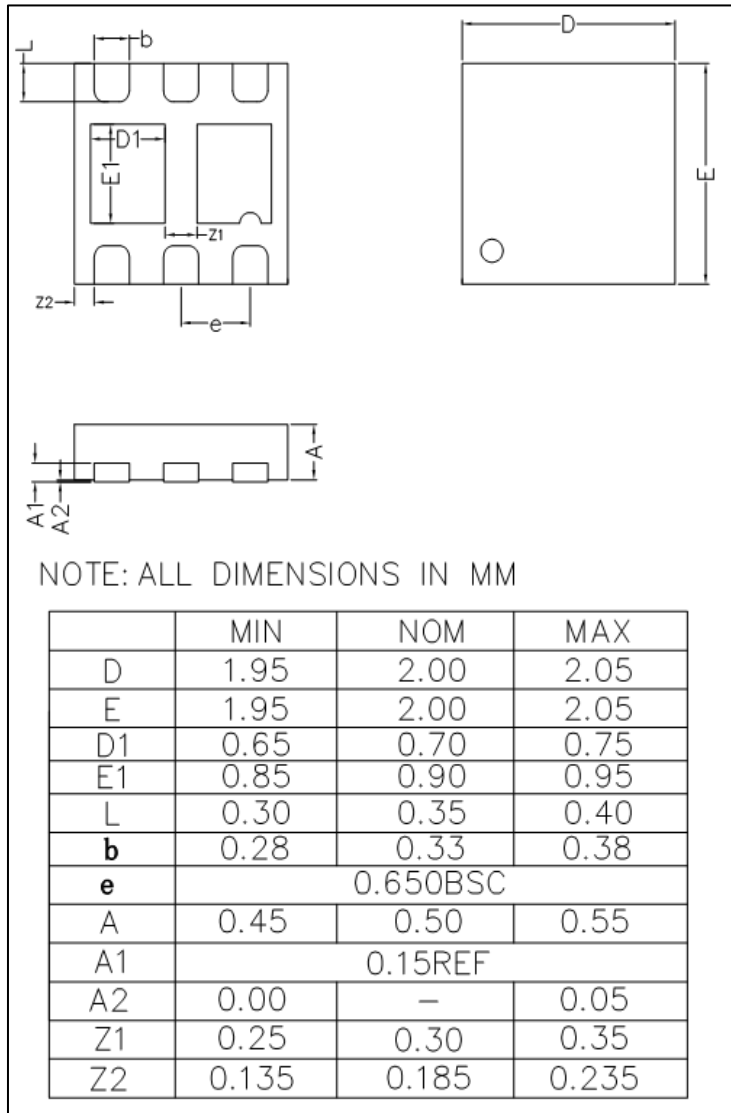


Fig.18 Avalanche Waveform





●Dimensions(DFN2*2)





Note: ① Pulse Test: Pulse width $\leq 300\mu\text{s}$, 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;

Disclaimer

- Reproducing and modifying information of the document is prohibited without permission from ZMJ SEMICONDDUCTORS CO.,LTD.
- ZMJ SEMICONDDUCTORS CO.,LTD. reserves the rights to make changes of the content herein the document anytime without notification. Please refer to our website for the latest document.
- ZMJ SEMICONDDUCTORS CO.,LTD. disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially occurred.
- ZMJ SEMICONDDUCTORS CO.,LTD. does not assume any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.
- Applications shown on the herein document are examples of standard use and operation. Customers are responsible in comprehending the suitable use in particular applications. ZMJ SEMICONDDUCTORS CO.,LTD. makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.
- The products shown herein are not designed and authorized for equipments relating to human life and for any applications concerning life-saving or life-sustaining, such as medical instruments, aerospace machinery et cetera. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify ZMJ SEMICONDDUCTORS CO.,LTD. for any damages resulting from such improper use or sale.
- Since ZMJ uses lot number as the tracking base, please provide the lot number for tracking when complaining.