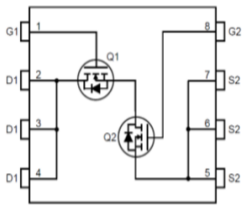
● General Description

The ZMD68311M combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. Two N Channel MOSFET inside for dual DIE implication.

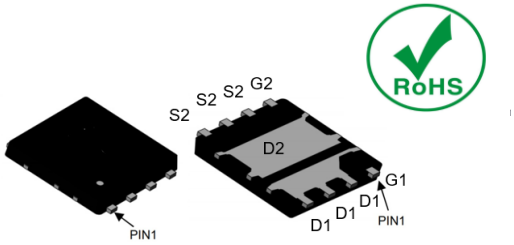
● Product Summary



V_{DS1} =30V
V_{DS2} =30V
$R_{DS(ON)1}$ =10mΩ
$R_{DS(ON)2}$ =8mΩ
I_{D1} =12A
I_{D2} =15A

● 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



DFN3*3

●Application

- ■ Power Management in Notebook Computer
- ■ BLDC Motor driver

●Ordering Information:

Part NO.	ZMD68311M
Marking	68311
Packing Information	REEL TAPE
Basic ordering unit (pcs)	5000

●Absolute Maximum Ratings (T_C =25℃) (Q1)

Parameter	**Symbol**	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	$I_{D@}$TC=25℃	12	A
	$I_{D@}$TC=75℃	9.1	A
	$I_{D@}$TC=100℃	7.5	A
Pulsed Drain Current ①	I_{DM}	36	A
Total Power Dissipation(TC=25℃)	P_D@TC=25℃	17	W
Total Power Dissipation(TA=25℃)	P_D@TA=25℃	0.9	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy@L=0.1mH	E_{AS}	10	mJ

●Thermal resistance(Q1)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case②	R_{thJC}	-	-	7.1	°C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	140	°C/W
Soldering temperature, wavesoldering for 10s	T_{sold}	-	-	265	°C

●Electronic Characteristics(Q1)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V,I_D =250uA	30			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}=30V, 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=12A		10	13	mΩ
		V_{GS}=4.5V, I_D=10A		14	17	mΩ
Forward Transconductance	g_{FS}	V_{DS} =25V, I_D=10A		5		s
Source-drain voltage	V_{SD}	Is=12A			1.28	V

●Electronic Characteristics(Q1)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	f = 1MHz	-	850	-	pF
Output capacitance	C_{oss}		-	190	-	
Reverse transfer capacitance	C_{rss}		-	100	-	

●Gate Charge characteristics(T_a = 25℃)(Q1)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q_g	V_{DD} = 25V	-	10	-	nC
Gate - Source charge	Q_{gs}	I_D = 5A	-	3.5	-	
Gate - Drain charge	Q_{gd}	V_{GS} = 10V	-	5	-	

●Absolute Maximum Ratings (T_C =25℃) (Q2)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	$I_{D@}$TC=25℃	15	A
	$I_{D@}$TC=75℃	11.4	A
	$I_{D@}$TC=100℃	9.5	A
Pulsed Drain Current ①	I_{DM}	45	A
Total Power Dissipation(TC=25℃)	P_D@TC=25℃	17	W
Total Power Dissipation(TA=25℃)	P_D@TA=25℃	0.9	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy@L=0.1mH	E_{AS}	32	mJ

●Thermal resistance(Q2)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case②	R_{thJC}	-	-	7.1	° C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	140	° C/W
Soldering temperature, wavesoldering for 10s	T_{sold}	-	-	265	° C

●Electronic Characteristics(Q2)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V,I_D =250uA	30			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}=30V, 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=15A		8.0	10.5	mΩ
		V_{GS}=4.5V, I_D=10A		11	14.3	mΩ
Forward Transconductance	g_{FS}	V_{DS} =25V, I_D=10A		10		s
Source-drain voltage	V_{SD}	Is=15A			1.28	V

●Electronic Characteristics(Q2)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	f = 1MHz	-	1150	-	pF
Output capacitance	C_{oss}		-	235	-	
Reverse transfer capacitance	C_{rss}		-	120	-	

●Gate Charge characteristics(T_a = 25℃)(Q2)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q_g	V_{DD} = 25V	-	12	-	nC
Gate - Source charge	Q_{gs}	I_D = 5A	-	4	-	
Gate - Drain charge	Q_{gd}	V_{GS} = 10V	-	6	-	

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

●characteristics curve(Q1)

Fig.1 Power Dissipation Derating Curve

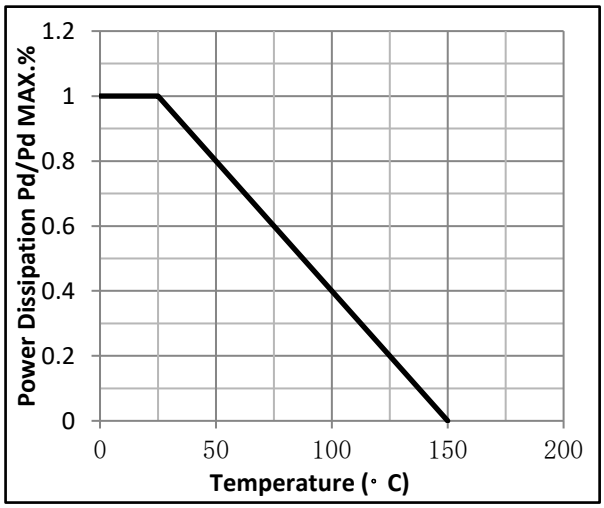


Fig.2 Typical output Characteristics

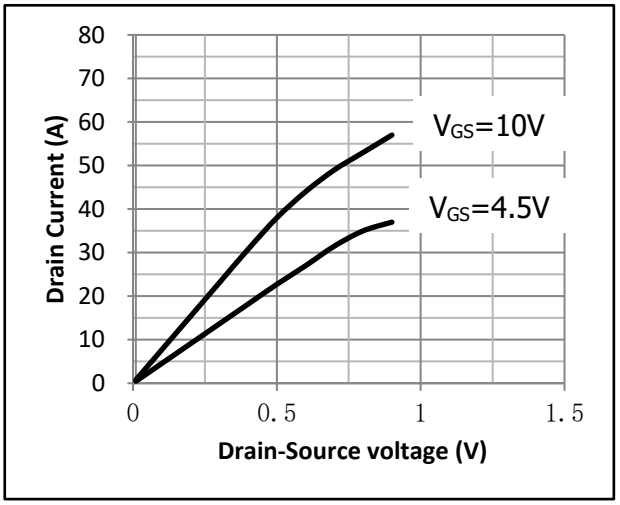


Fig.3 Threshold Voltage V.S Junction Temperature

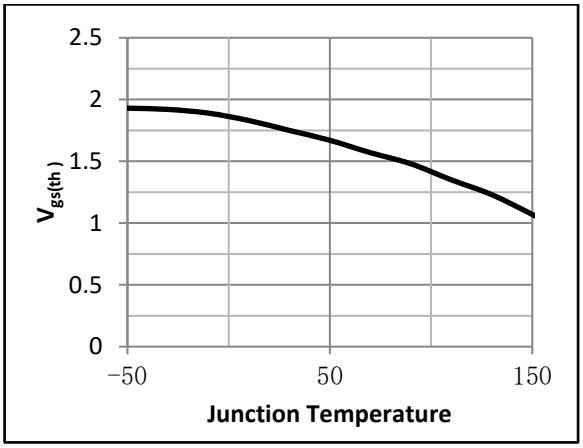


Fig.4 Resistance V.S Drain Current

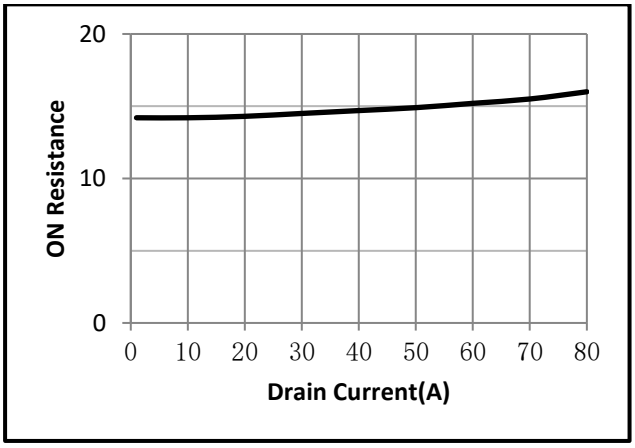


Fig.5 On-Resistance VS Gate Source Voltage

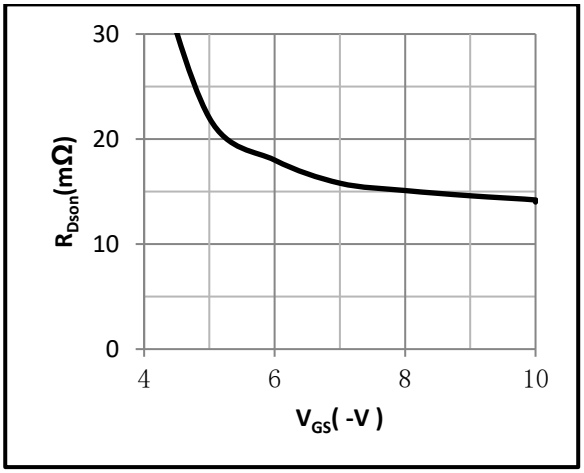
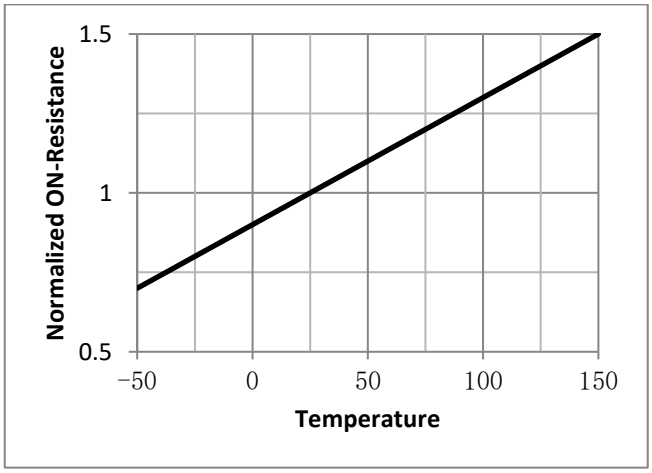


Fig.6 On-Resistance V.S Junction Temperature



●characteristics curve(Q2)

Fig.1 Power Dissipation

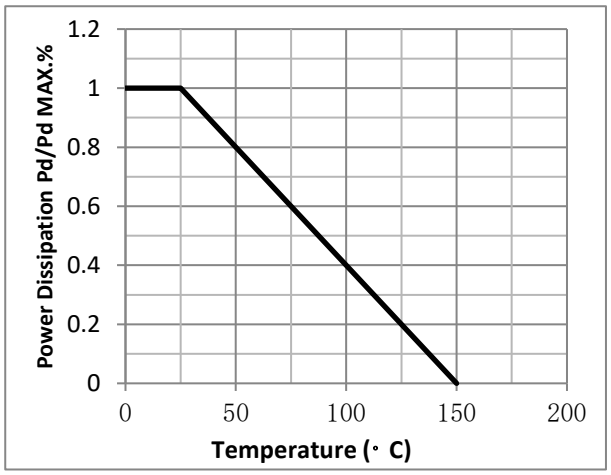


Fig.2 Typical output Characteristics

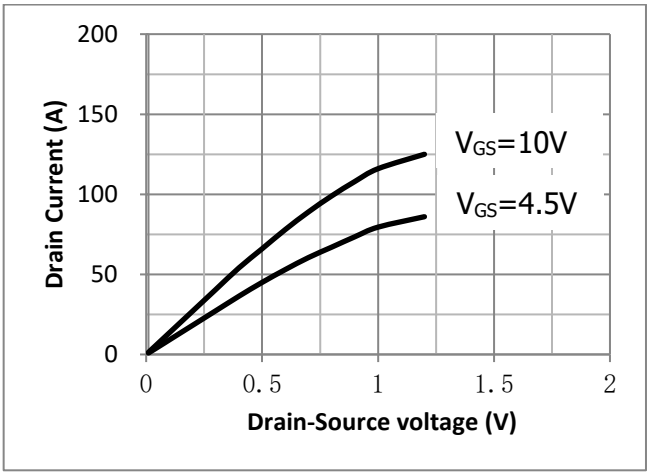


Fig.3 Threshold Voltage V.S Junction Temperature

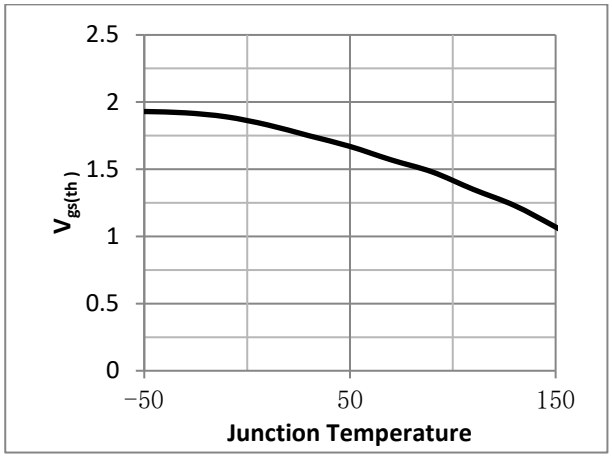


Fig.4 Resistance V.S Drain Current

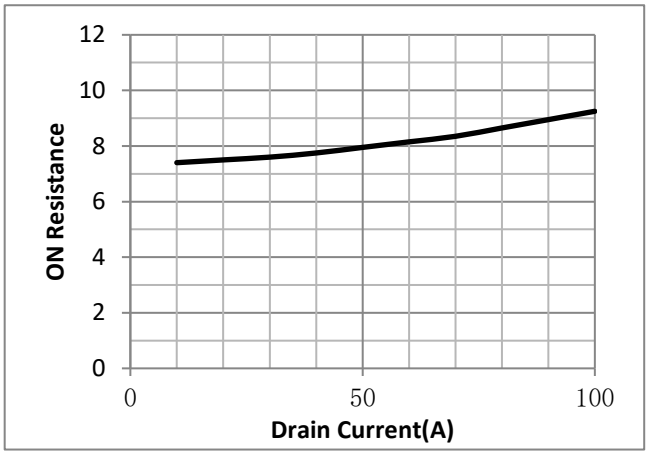


Fig.5 On-Resistance VS Gate Source Voltage

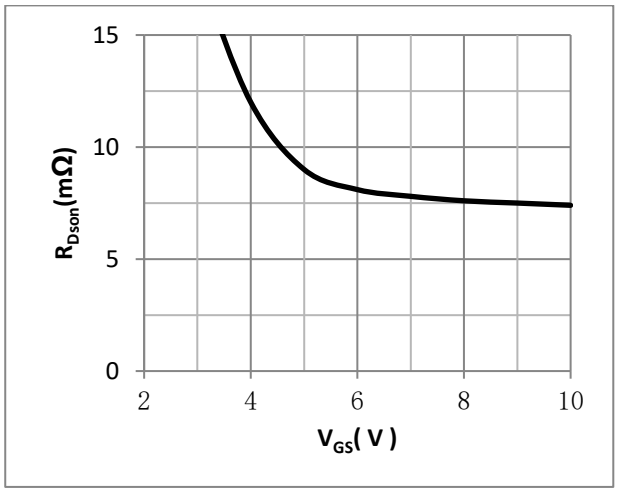
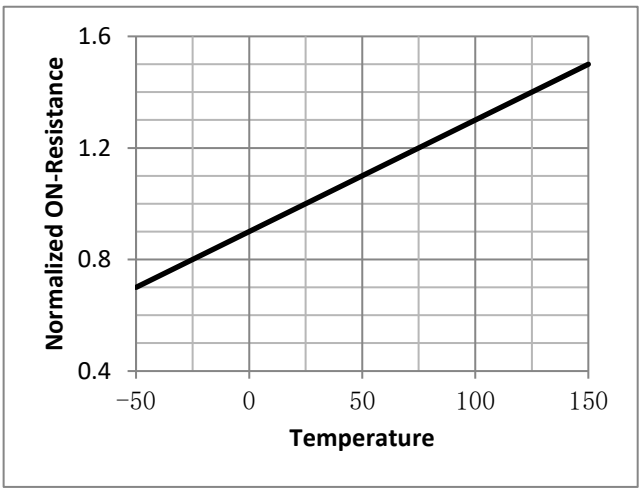


Fig.6 On-Resistance V.S Junction Temperature



●Test Circuit

Fig.1 Switching Time Measurement Circuit

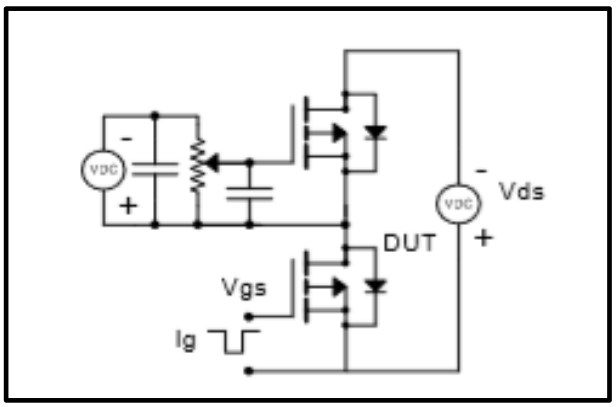


Fig.2 Gate Charge Waveform

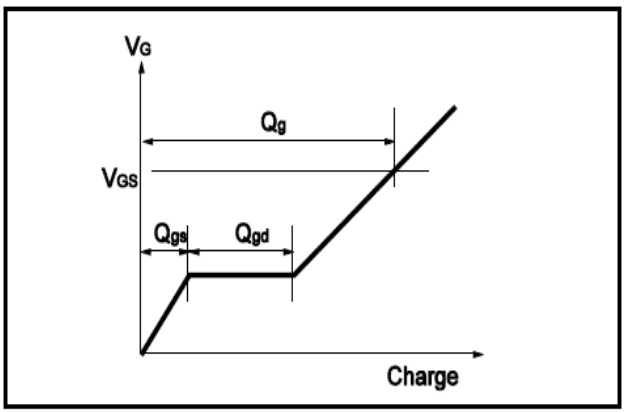


Fig.3 Switching Time Measurement Circuit

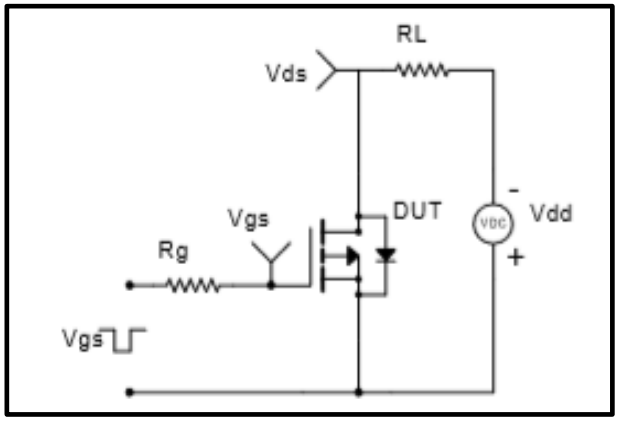


Fig.4 Gate Charge Waveform

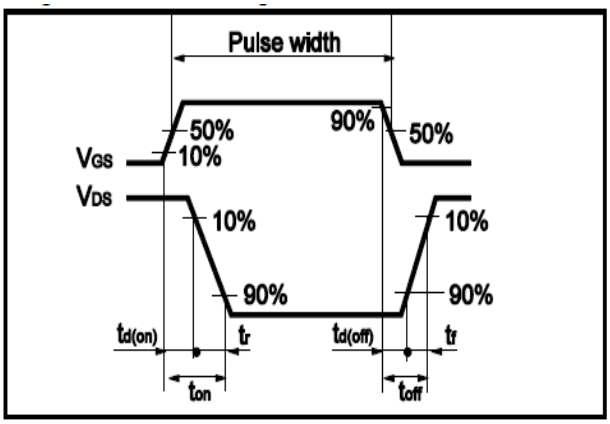


Fig.5 Avalanche Measurement Circuit

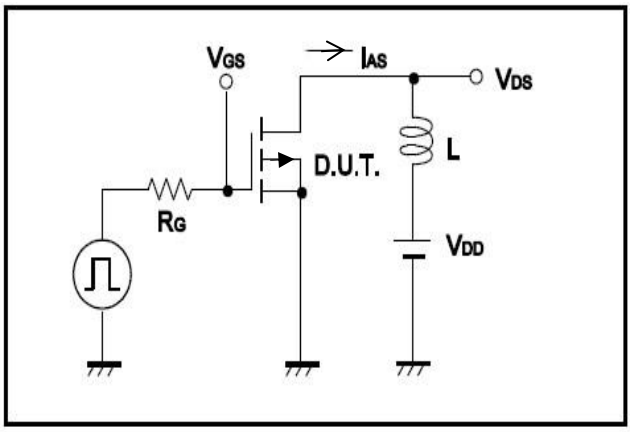
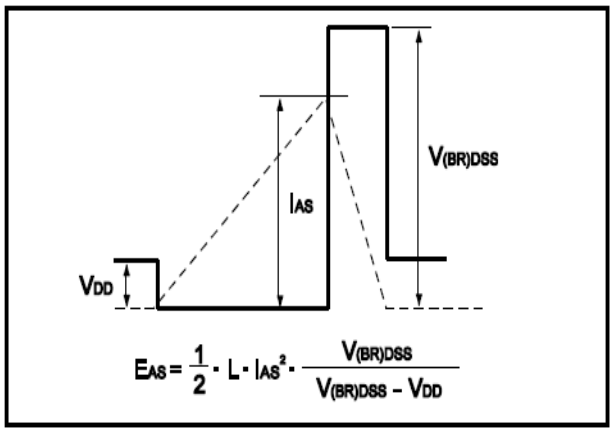


Fig.6 Avalanche Waveform



•Dimensions（DFN3×3）

Unit：mm