• General Description

It 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.

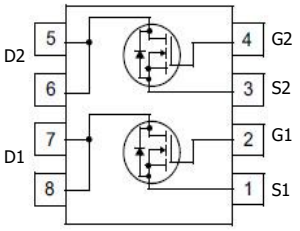
• Features

- ■ Advance high cell density Trench technology
- ■Low $R_{DS(ON)}$ to minimize conductive loss
- ■Low Gate Charge for fast switching
- ■Dual DIE in one package

•Application

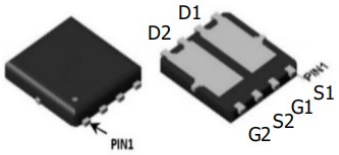
- ■ Synchronus Rectification in DC/DC and AC/DC Converters
- ■ Industrial and Motor Drive applications

• Product Summary



V_{DS1} =40V
V_{DS2} =40V
$R_{DS(ON)1}$ =12mΩ
$R_{DS(ON)2}$ =12mΩ
I_{D1} =28A
I_{D2} =28A

RoHS



DFN5*6

•Ordering Information:

Part NO.	ZMD68403N
Marking	ZMD68403
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

•Absolute Maximum Ratings (T_C =25℃)

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℃	28	A
	$I_{D@}T_C$=75℃	21	A
	$I_{D@}T_C$=100℃	17.5	A
Pulsed Drain Current ①	I_{DM}	84	A
Total Power Dissipation	$P_{D@}T_C$=25℃	73	W
Total Power Dissipation	$P_{D@}T_A$=25℃	2.5	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy (L=0.1mH,V_{GS}=10V,R_g=25Ω,T_J=25℃)	E_{AS}	27	mJ
ESD Level (HBM)		Class 1C	

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	1.7	° C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	50	° C/W
Soldering temperature, wavesoldering 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	1.4		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=14A		12	16	mΩ
		V_{GS}=4.5V, I_D=10A		17	22	mΩ
Forward Transconductance	g_{FS}	V_{DS} =10V, I_D=4A		7		s

•Dynamic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	f = 1MHz V_{DS}=25V	-	1170	-	pF
Output capacitance	C_{oss}		-	120	-	
Reverse transfer capacitance	C_{rss}		-	92	-	
Total gate charge	Q_g	V_{DD} =25V I_D = 20A V_{GS} = 10V	-	21	-	nC
Gate - Source charge	Q_{gs}		-	3.8	-	
Gate - Drain charge	Q_{gd}		-	4.2	-	
Turn-ON Delay time	$t_{D(on)}$	V_{GS}=10V, V_{DS}=15V R_G =3.3Ω, I_D =20A		6		ns
Turn-ON Rise time	t_r			2.0		ns
Turn-Off Delay time	$t_{D(off)}$			34		ns
Turn-Off Fall time	t_f			5.5		ns

Diode Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Source-drain voltage	V_{SD}	Is=14A			1.28	V
Reverse Recovery Time	t_{RR}	V_{DD} = 20 V, dI_S/dt=100 A/us, I_S=30A		8		ns
Reverse Recovery Charge	Q_{RR}			17		ns

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

Fig.1 Power Dissipation

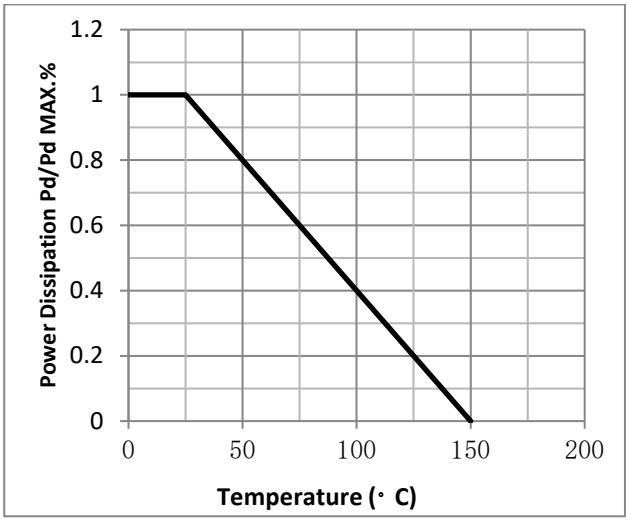


Fig.2 Typical output Characteristics

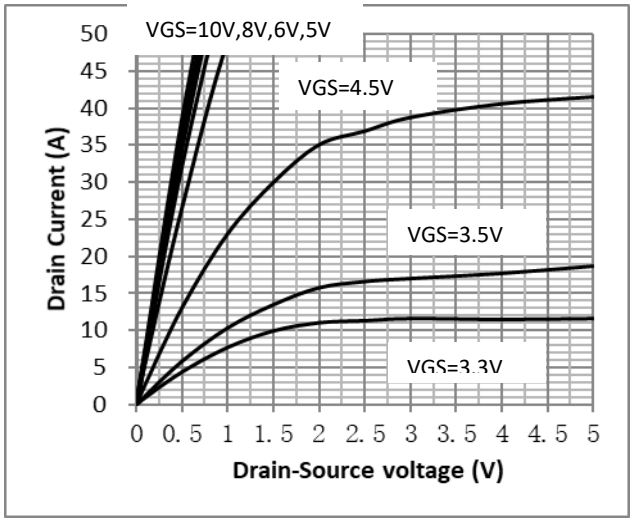


Fig.3 Threshold Voltage V.S Junction Temperature

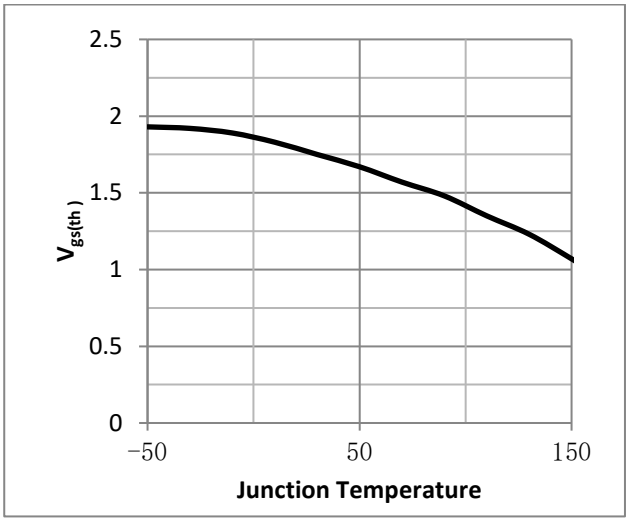


Fig.4 Resistance V.S Drain Current

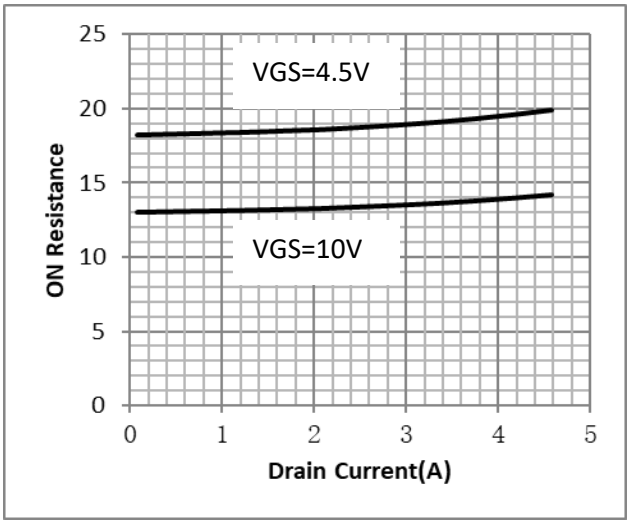


Fig.5 On-Resistance VS Gate Source Voltage

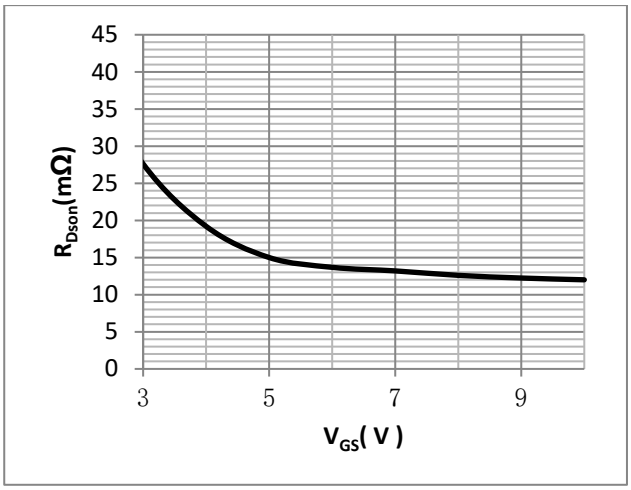


Fig.6 On-Resistance V.S Junction Temperature

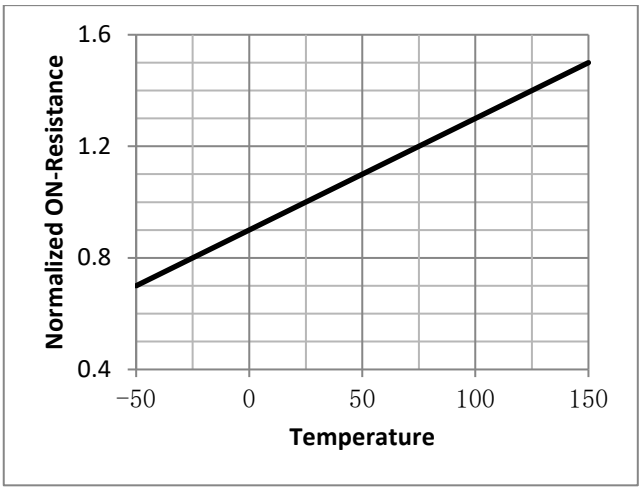


Figure 7. Diode Forward Voltage vs. Current

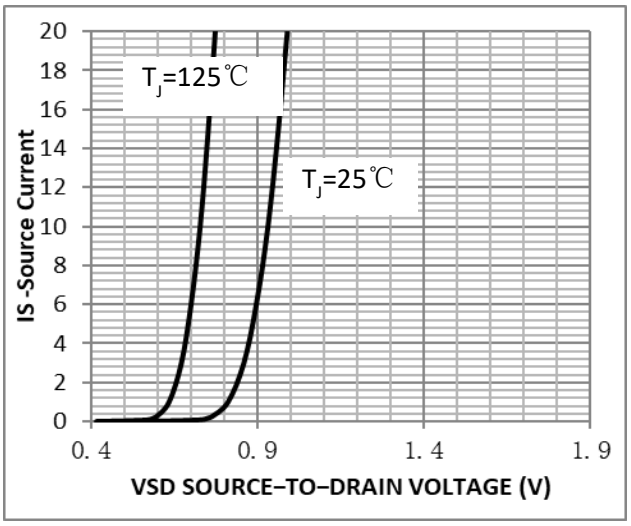


Figure 8. Transfer Characteristics

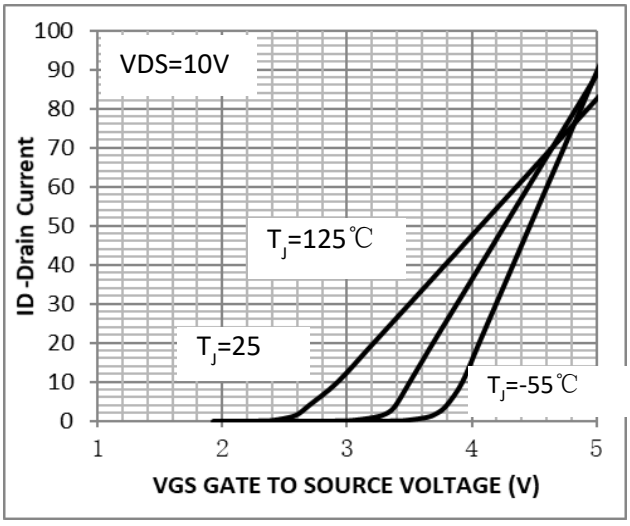


Fig.9 SOA Maximum Safe Operating Area

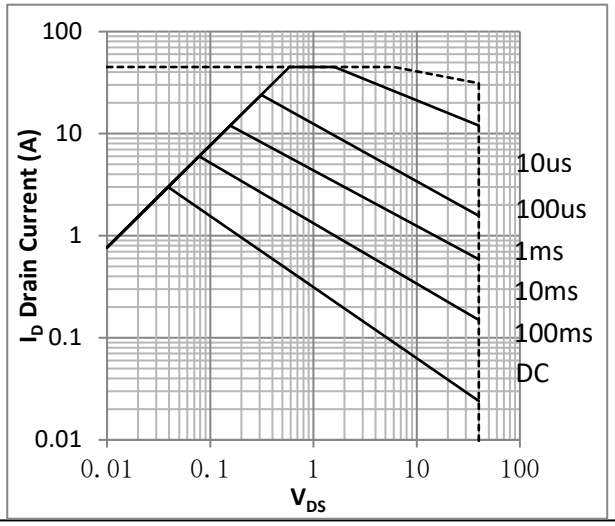


Fig.10 ID-Junction Temperature

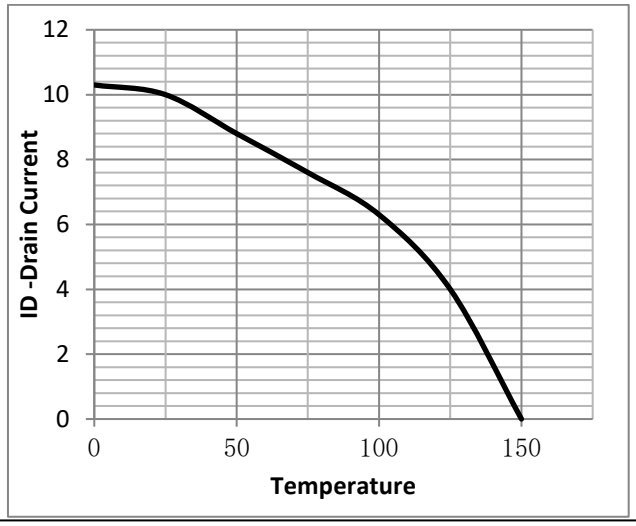


Figure 11. Gate−to−Source and Drain−to−Source Voltage vs. Total Charge

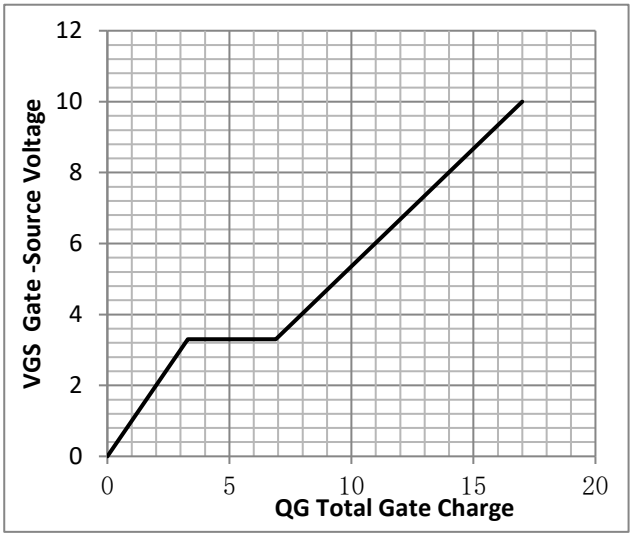


Fig.12 Capacitance Variation

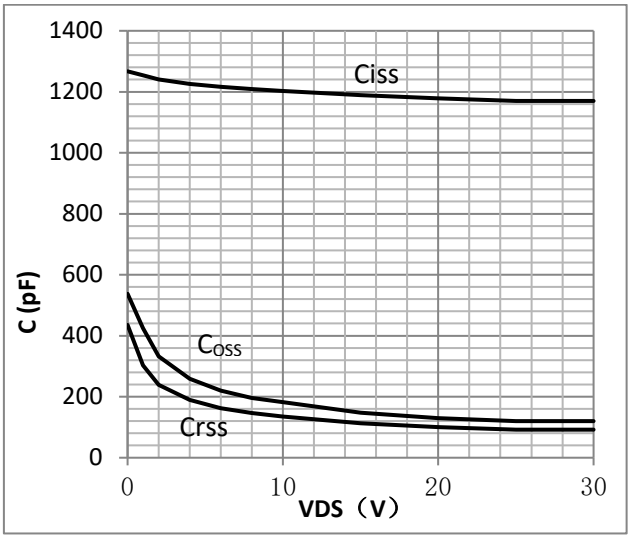


Fig.13 Switching Time Measurement Circuit

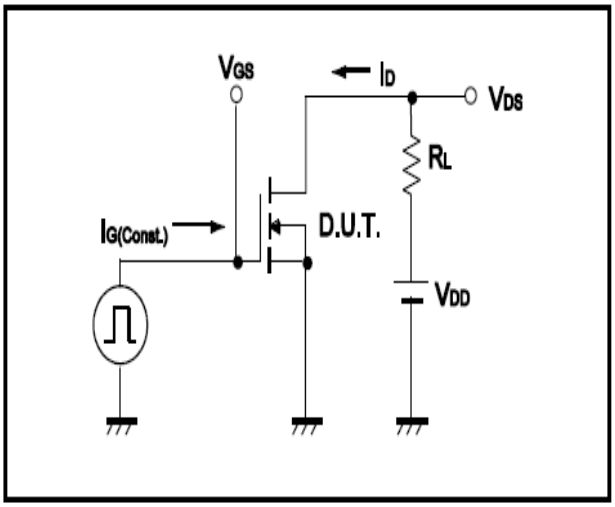


Fig.14 Gate Charge Waveform

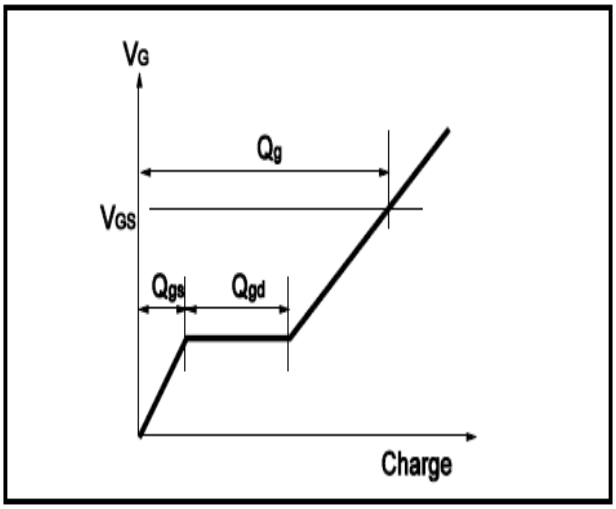


Fig.15 Switching Time Measurement Circuit

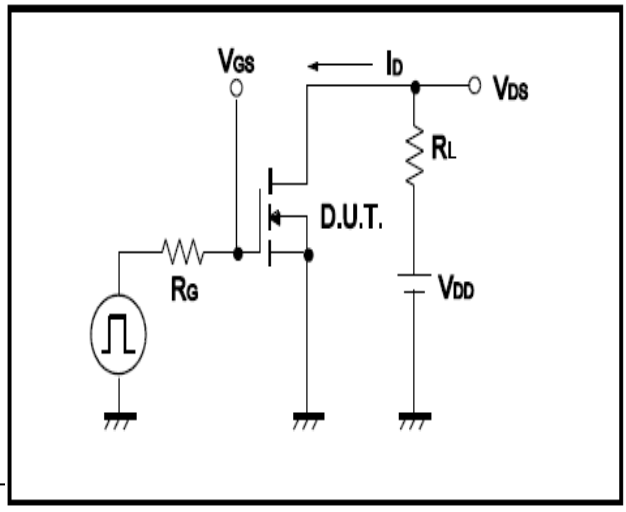


Fig.16 Gate Charge Waveform

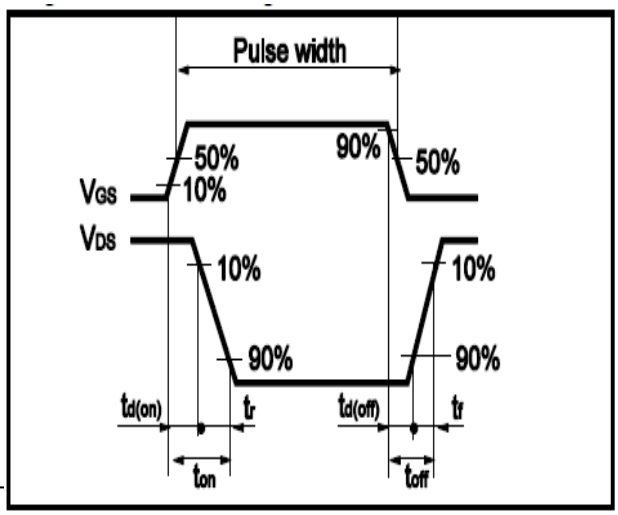


Fig.17 Avalanche Measurement Circuit

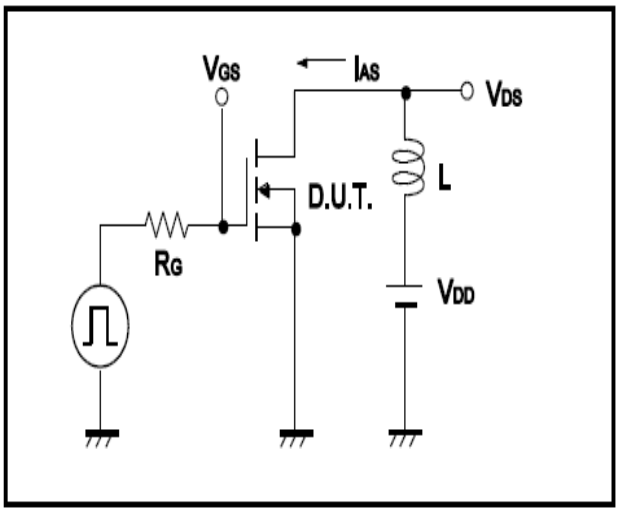
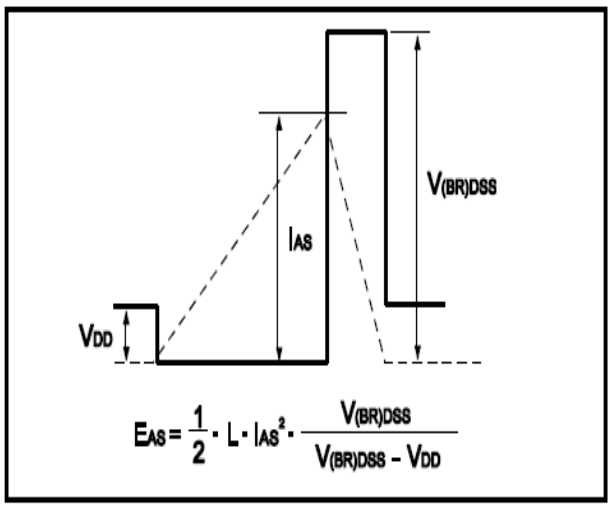
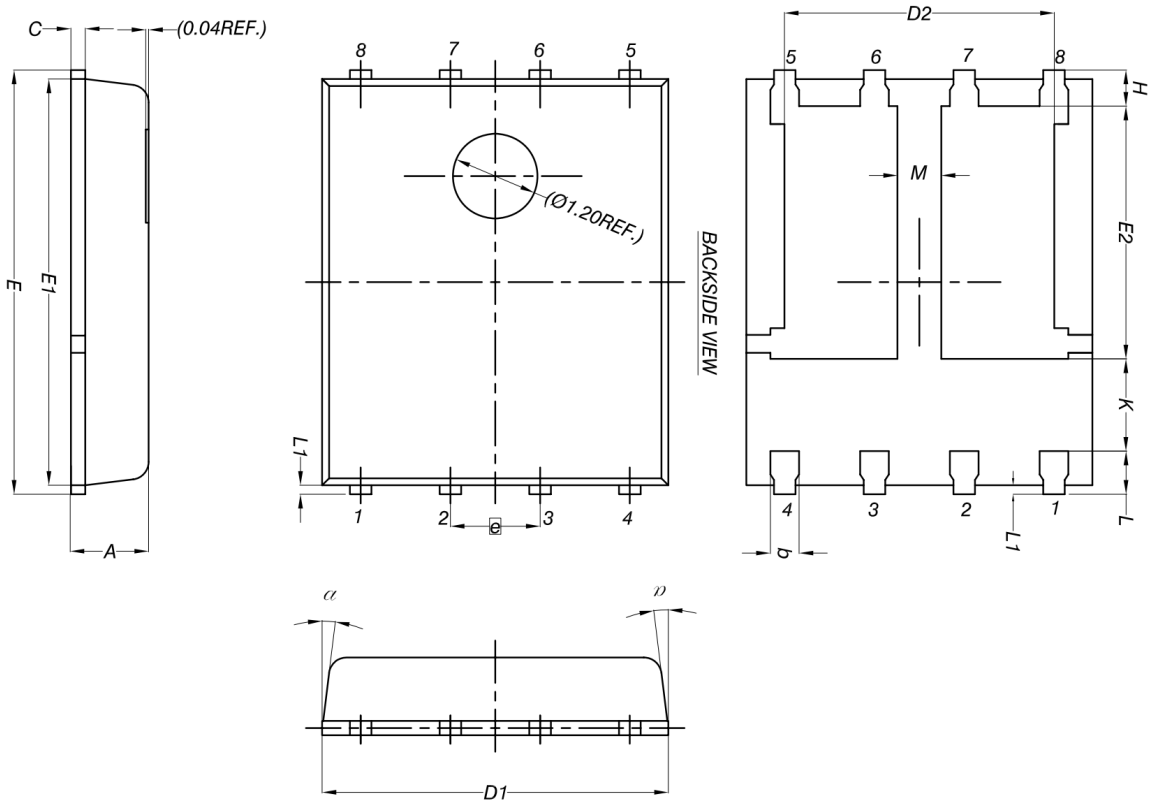


Fig.18 Avalanche Waveform



●Dimensions（DFN5×6）



DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.38	3.58	3.78
e	1.27 BSC		
H	0.41	0.51	0.61
K	1.10	-	-
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
M	0.50	-	-
α	0°	-	12°