● 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

■Low Thermal resistance

■Wettable Flanks

●Application

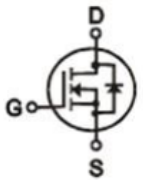
■MB/VGA Vcore

■SMPS 2nd Synchronous Rectifier

■POL application

■BLDC Motor driver

● Product Summary

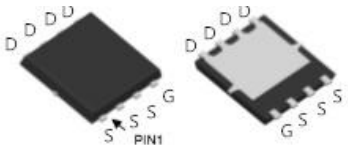


V_{DS} =40V

$R_{DS(ON)}$ =0.7mΩ

I_D =310A

RoHS



DFN5 x 6

●Ordering Information:

Part NO.	ZMS008N04NC
Marking	ZMS008N04
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℃	310	A
	I_D @T_C=75℃	235	A
	I_D @T_C=100℃	195	A
Pulsed Drain Current ①	I_{DM}	930	A
Total Power Dissipation	P_D@T_C=25℃	138	W
Total Power Dissipation	P_D@T_A=25℃	3.5	W
Operating Junction Temperature	T_J	-55 to 175	℃
Storage Temperature	T_{STG}	-55 to 175	℃

Single Pulse Avalanche Energy (L=0.5mH, VGS=10V, Rg=25Ω,TJ=25	E_{AS}	1200	mJ
Single Pulse Avalanche Energy (L=0.1mH,VGS=10V,Rg=25Ω,TJ=25	E_{AS}	661	mJ

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	0.9	° C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	36	° C/W
Soldering temperature, wave soldering 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=100A		0.7	0.91	mΩ
		V_{GS}=4.5V, I_D=70A		1.0	1.3	mΩ
Forward Transconductance	g_{FS}	V_{DS} =25V, I_D=50A		30		s
Source-drain voltage	V_{SD}	Is=100A			1.28	V

●Dynamic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss	f = 1MHz, V_{DS}=25V	-	6250	-	pF
Output capacitance	Coss		-	1760	-	
Reverse transfer capacitance	Crss		-	100	-	
Gate Risistance	R_g	f = 1MHz		1.6		Ω
Total gate charge	Qg	V_{DD} =20V, I_D = 20A, V_{GS} = 10V	-	104	-	nC
Gate - Source charge	Qgs		-	11	-	
Gate - Drain charge	Qgd		-	32	-	
Turn-ON Delay time	$t_{D(on)}$	V_{GS}=10V, V_{DS}=15V		23		ns
Turn-ON Rise time	t_r			26		ns

Turn-Off Delay time	$t_{D(off)}$	R_G =6Ω, I_D =25A		65		ns
Turn-Off Fall time	t_f			17		ns
Reverse Recovery Time	t_{RR}	V_{DD} = 20 V, dI_S/dt = 100 A/s, I_S = 30 A		65		ns
Charge Time	t_a			25		ns
Discharge Time	t_b			29		ns
Reverse Recovery Charge	Q_{RR}			95		nC

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

Fig.1 Power Dissipation

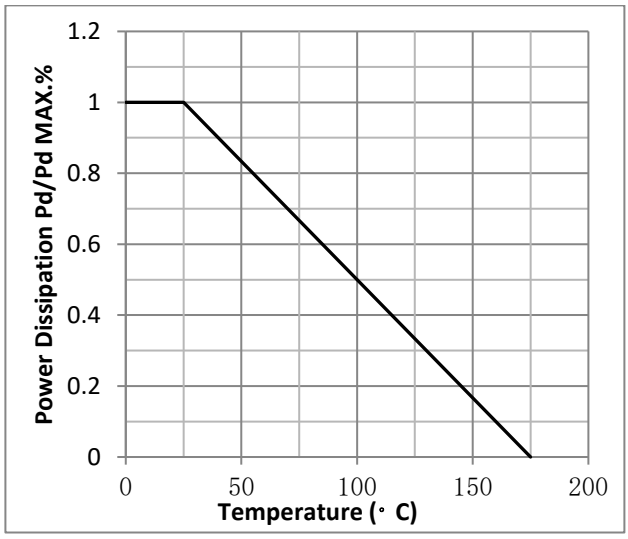


Fig.2 Typical output Characteristics

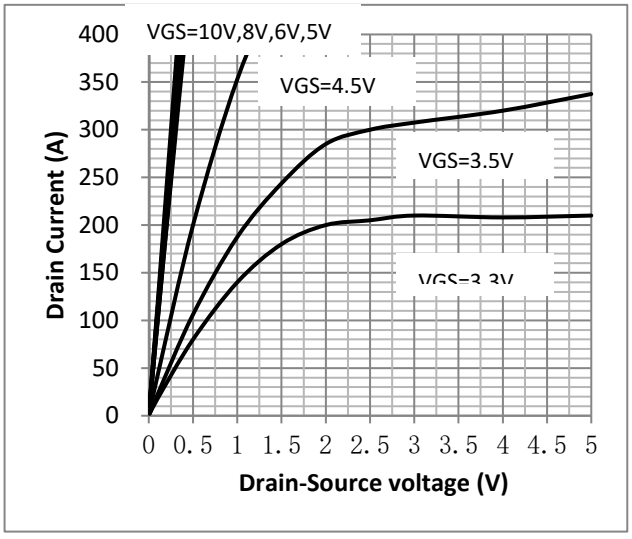


Fig.3 Threshold Voltage V.S Junction Temperature

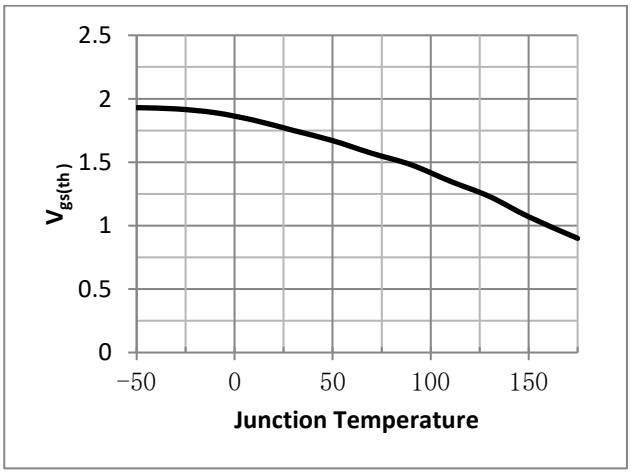


Fig.4 Resistance V.S Drain Current

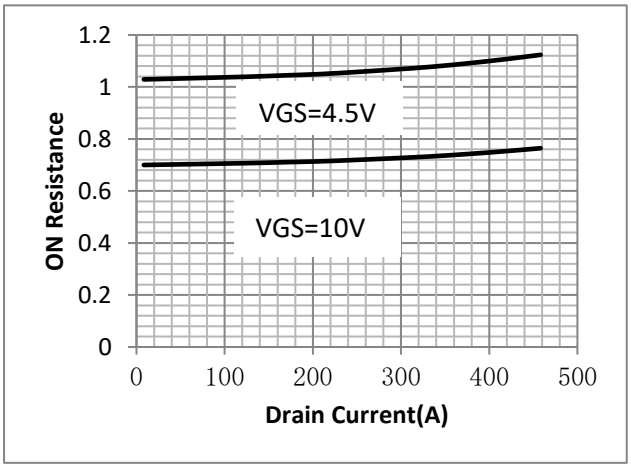


Fig.5 On-Resistance VS Gate Source Voltage

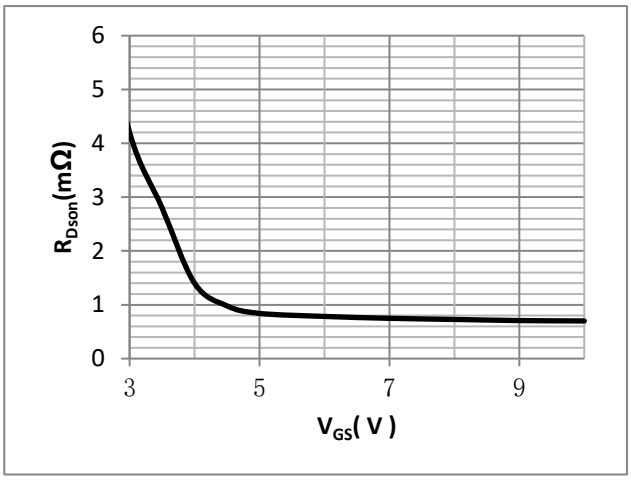


Fig.6 On-Resistance V.S Junction Temperature

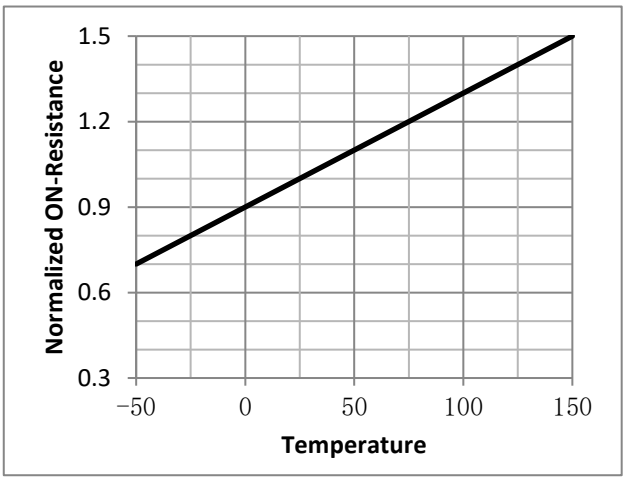


Fig.7 Gate Charge Characteristics

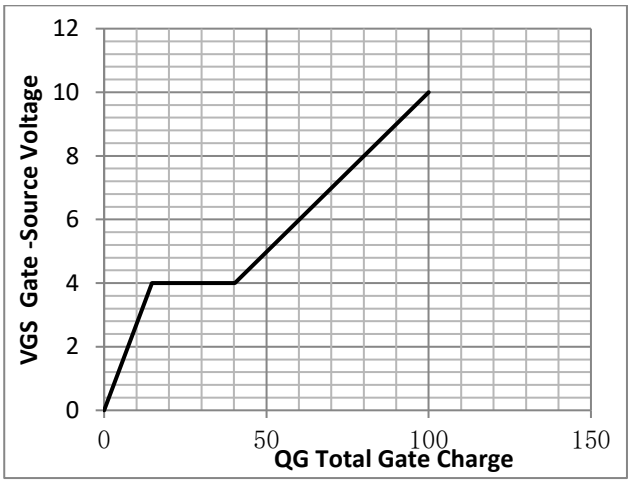


Fig.8 Capacitance vs Vds

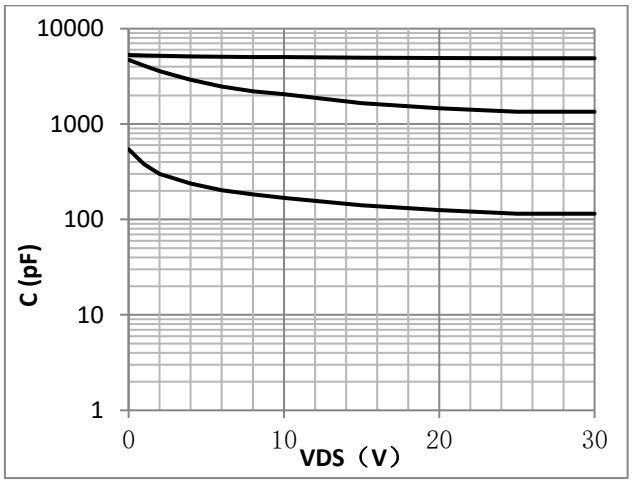


Fig.9 Diode Forward Voltage vs. Current

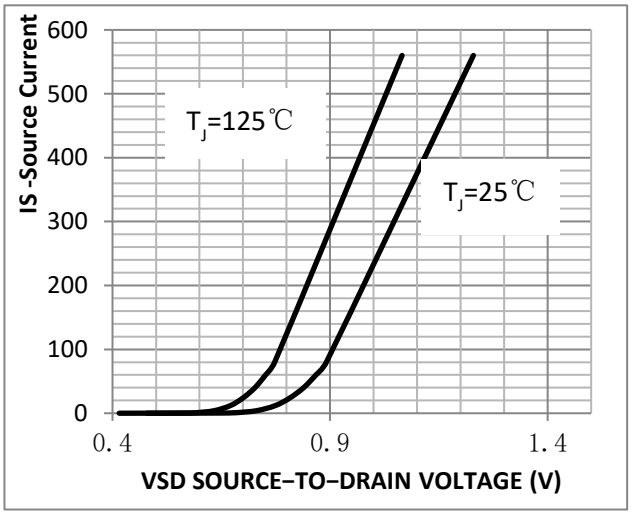


Fig.10 Capacitance Variation

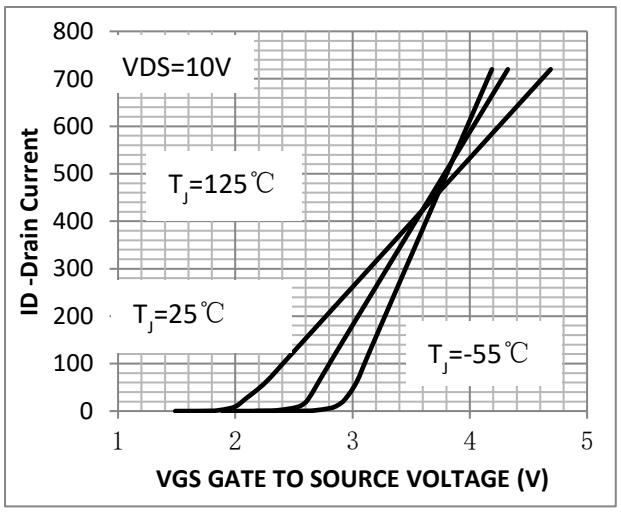


Fig.11 SOA Maximum Safe Operating Area

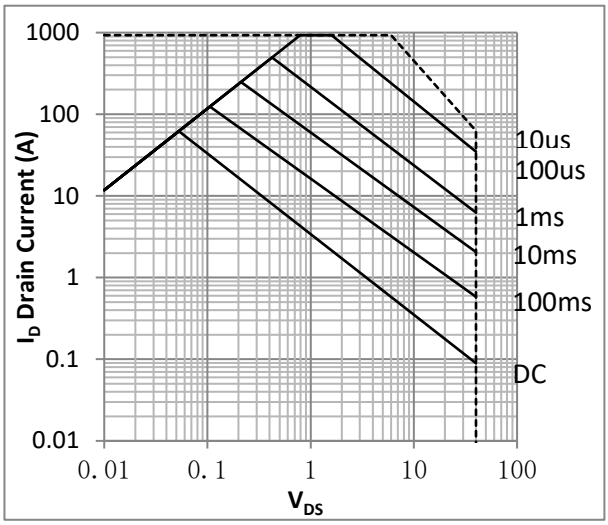


Fig.12 ID-Junction Temperature

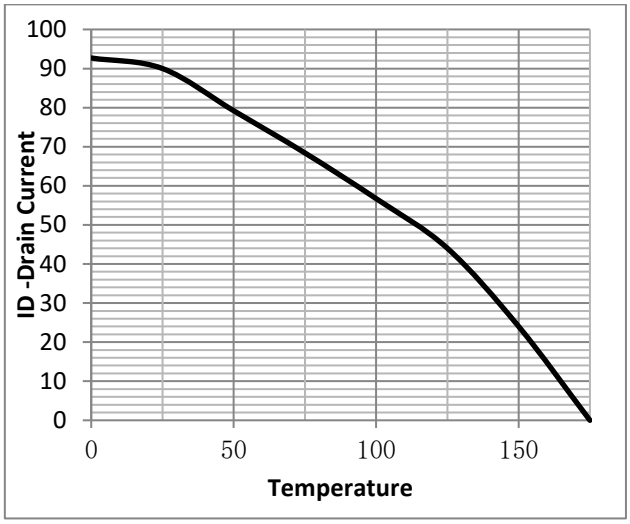


Fig.13 Normalized Maximum Transient Thermal Impedance

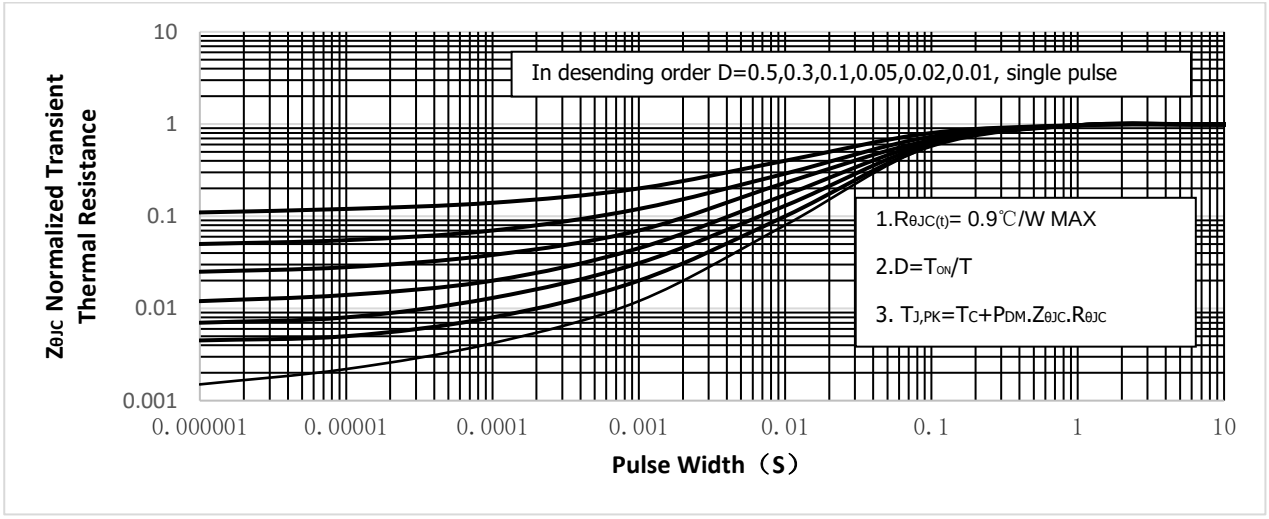


Fig.14 Switching Time Measurement Circuit

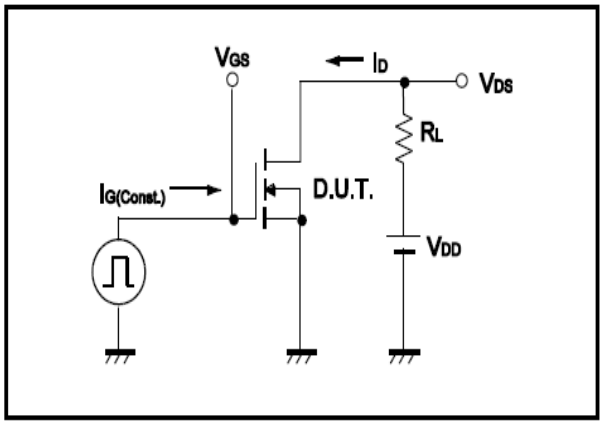


Fig.15 Gate Charge Waveform

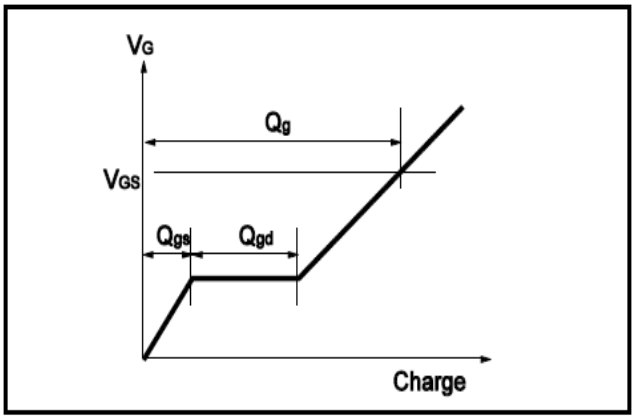


Fig.16 Resistive Switching Test Circuit

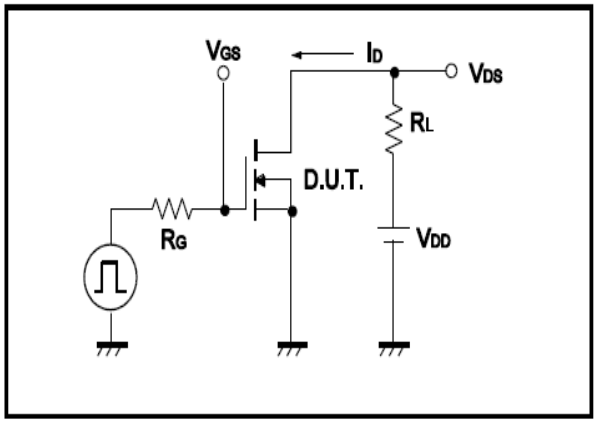


Fig.17 Resistive Switching Test Waveform

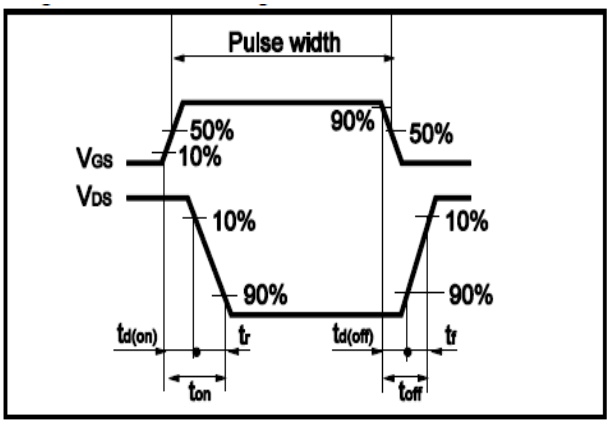


Fig.18 Avalanche Measurement Circuit

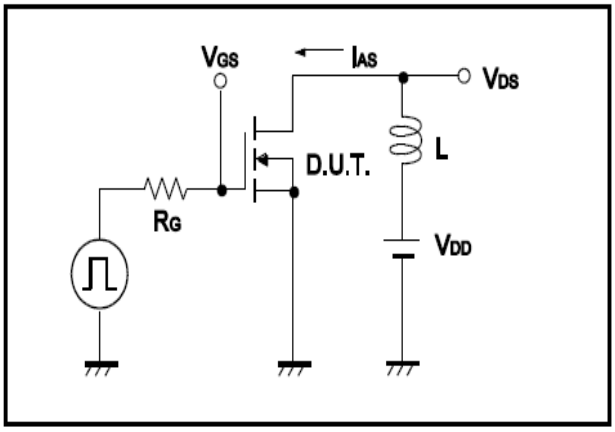
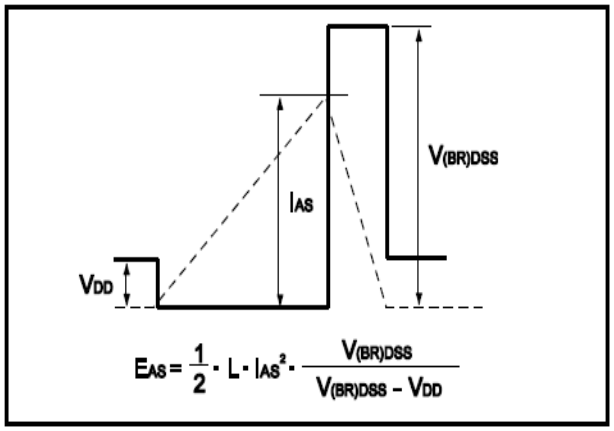
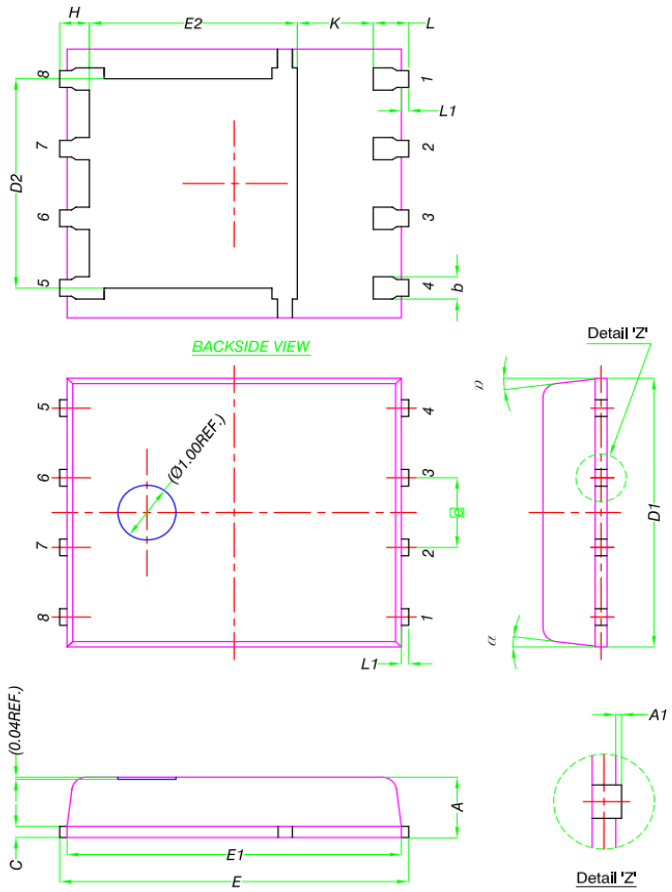


Fig.19 Avalanche Waveform



•Dimensions（DFN5×6）

Unit：mm



DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
A1	0	-	0.05
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
α	0°	-	12°