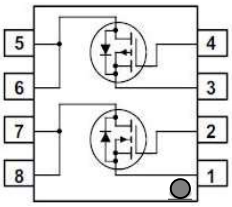
• General Description

It combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. It combines one N channel MOSFET and one P channel MOSFET.

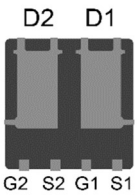
• Product Summary



V_{DS1} =30V
V_{DS2} =-30V
$R_{DS(ON)1}$ =10mΩ
$R_{DS(ON)2}$ =30mΩ
I_{D1} =23A
I_{D2} =-14A

• 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



RoHS

•Application

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

DFN5*6

•Ordering Information:

Part NO.	ZMC88303N
Marking	ZMC88303
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

•N Channel Absolute Maximum Ratings (T_C =25℃)

Parameter	**Symbol**	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	20	V
Continuous Drain Current	I_D@T_C =25℃	23	A
	I_D@T_C =75℃	17.5	A
	I_D@T_C=100℃	14.5	A
Pulsed Drain Current ①	I_{DM}	69	A
Total Power Dissipation	P_D@T_C=25℃	43	W
Total Power Dissipation	P_D@T_A=25℃	2.3	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy	E_{AS}	30	mJ

●P Channel Absolute Maximum Ratings (T_C =25℃)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D@T_C =25℃	-14	A
	I_D@T_C =75℃	-10.6	A
	I_D@T_C=100℃	-8.8	A
Pulsed Drain Current ①	I_{DM}	-42	A
Total Power Dissipation	P_D@T_C=25℃	43	W
Total Power Dissipation	P_D@T_A=25℃	2.3	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy	E_{AS}	67	mJ

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	2.9	° C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	53	° C/W
Soldering temperature, wavesoldering for 10s	T_{sold}	-	-	265	° C

●N Channel Electronic Characteristics

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	$R_{DS(ON)}$	VGS=10V, ID=12A		10	13	mΩ
		VGS=4.5V, ID=10A		13	17	mΩ
Forward Trans conductance	g_{FS}	V_{DS} =25V, I_D=5A		9		s
Source-drain voltage	V_{SD}	Is=23A			1.28	V

●Dynamic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss	f = 1MHz V_{DS}=25V	-	560	-	pF
Output capacitance	Coss		-	81	-	
Reverse transfer capacitance	Crss		-	49	-	
Total gate charge	Qg	V_{DD} = 15V I_D = 12A V_{GS} = 10V	-	10	-	nC
Gate - Source charge	Qgs		-	1.6	-	
Gate - Drain charge	Qgd		-	2.8	-	

●P Channel Electronic Characteristics

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=-9A		30	42	mΩ
		V_{GS}=-4.5V, I_D=-7A		40	52	mΩ
Forward Transconductance	g_{FS}	V_{DS} =-10V, I_D=-5A		9		s

●Dynamic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss	f = 1MHz V_{DS}=-25V	-	850	-	pF
Output capacitance	Coss		-	125	-	
Reverse transfer capacitance	Crss		-	115	-	
Total gate charge	Qg	V_{DD} = -15V I_D = -9A V_{GS} = -10V	-	12	-	nC
Gate - Source charge	Qgs		-	5	-	
Gate - Drain charge	Qgd		-	6	-	

•N Channel characteristics curve

Fig.1 Power Dissipation Derating Curve

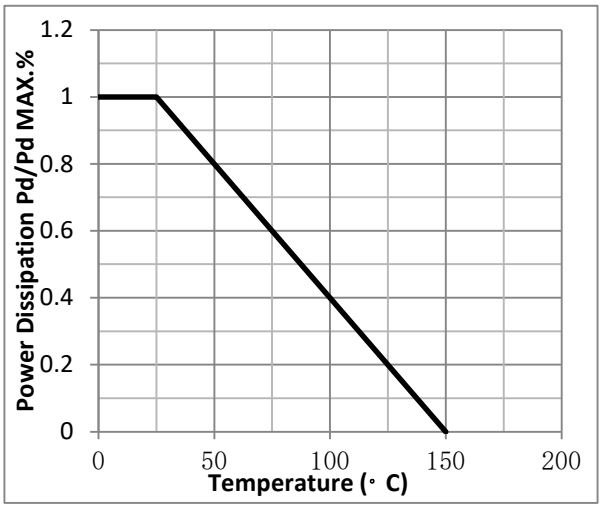


Fig.2 Typical output Characteristics

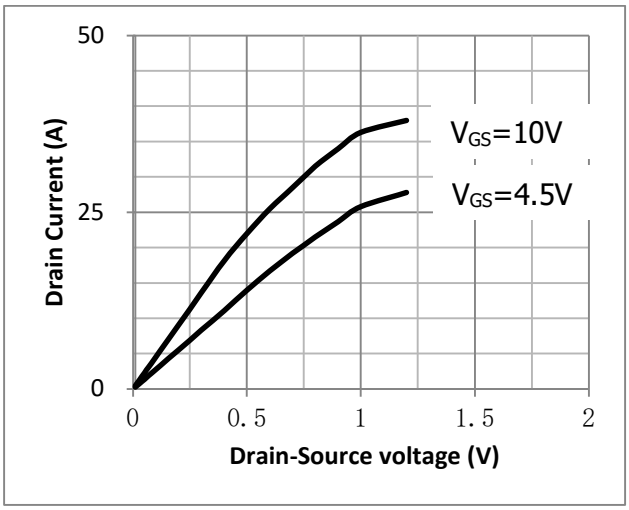


Fig.3 Threshold Voltage V.S Junction Temperature

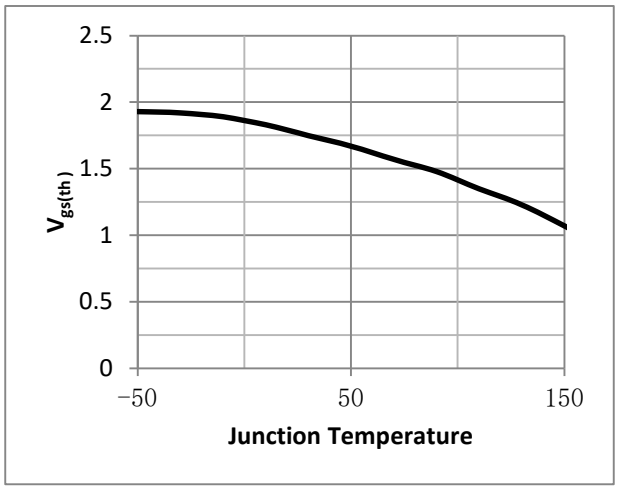


Fig.4 Resistance V.S Drain Current

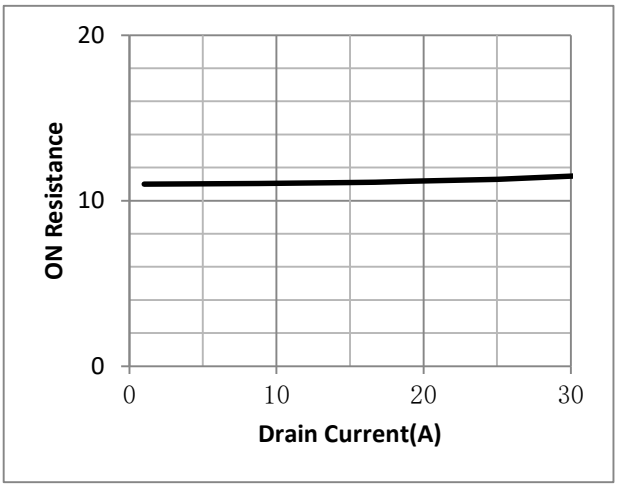


Fig.5 On-Resistance VS Gate Source Voltage

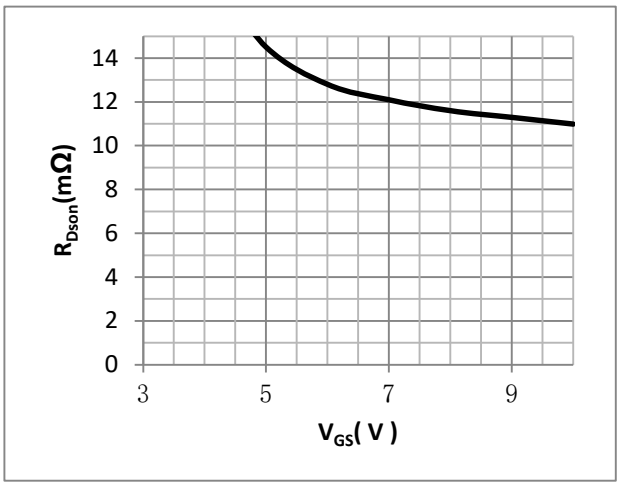
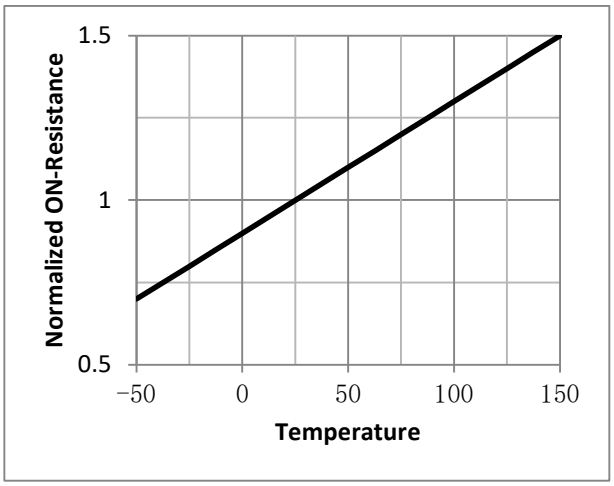


Fig.6 On-Resistance V.S Junction Temperature



•P Channel characteristics curve

Fig.1 Gate-Charge Characteristics

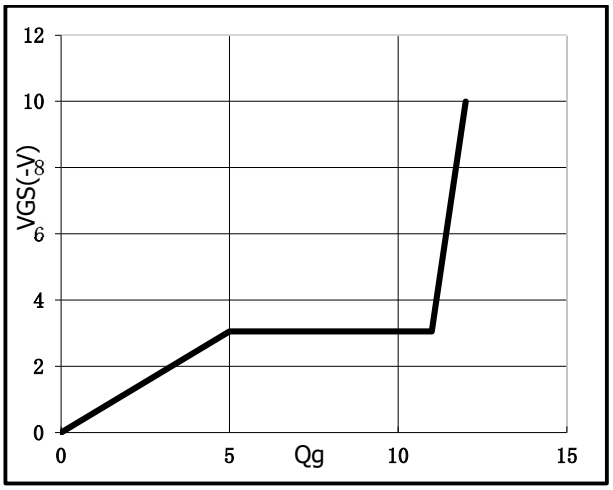


Fig.2 Capacitance Characteristics

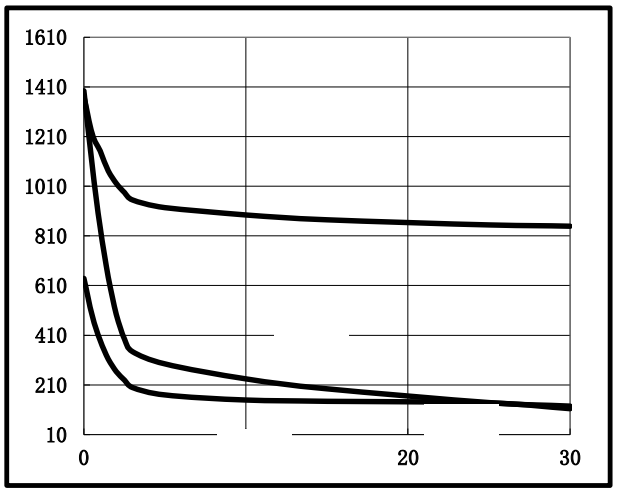


Fig.3 Power Dissipation Derating Curve

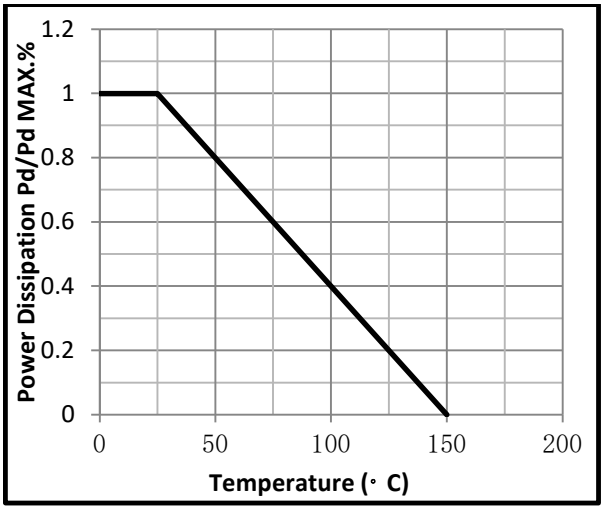


Fig.4 Typical output Characteristics

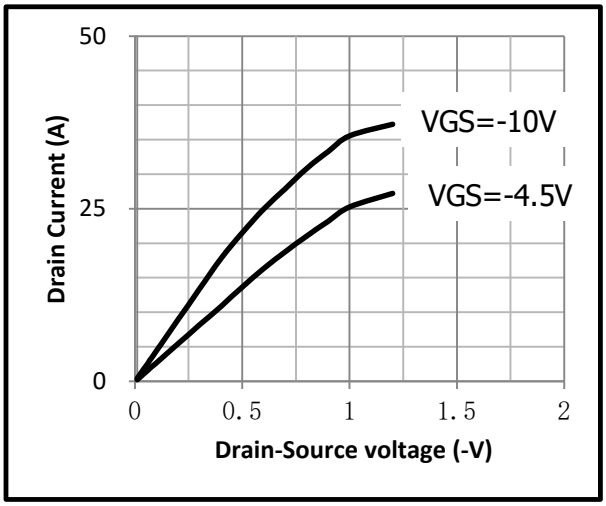


Fig.5 Threshold Voltage V.S Junction Temperature

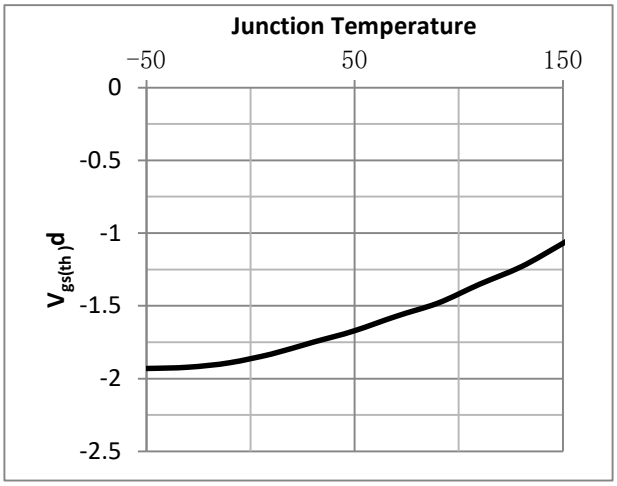


Fig.6 Resistance V.S Drain Current

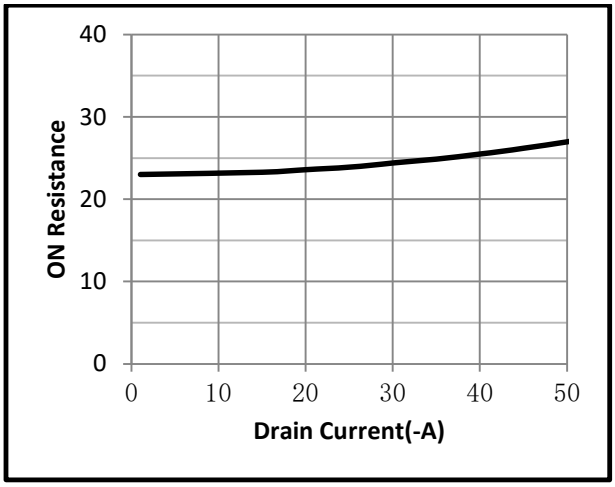


Fig.7 On-Resistance VS Gate Source Voltage

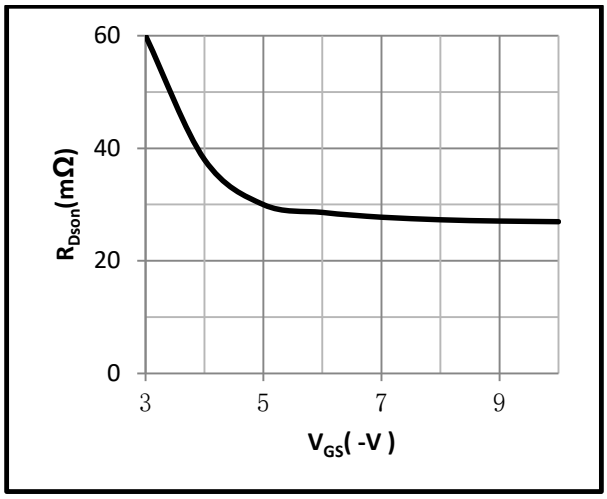


Fig.8 On-Resistance V.S Junction Temperature

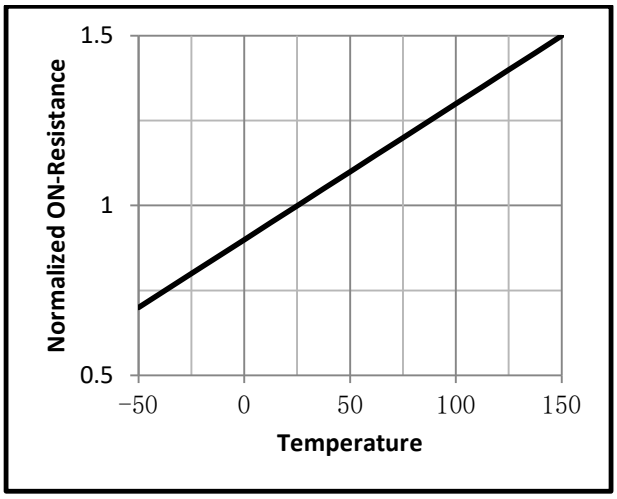


Fig.9 Maximum Forward Biased Safe Operating Area

Fig.10 ID-Junction Temperature

●Test Circuit

Fig.1 Gate Charge Measurement Circuit

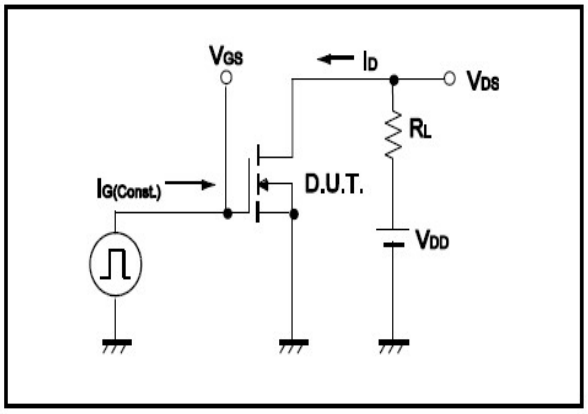


Fig.2 Gate Charge Waveform

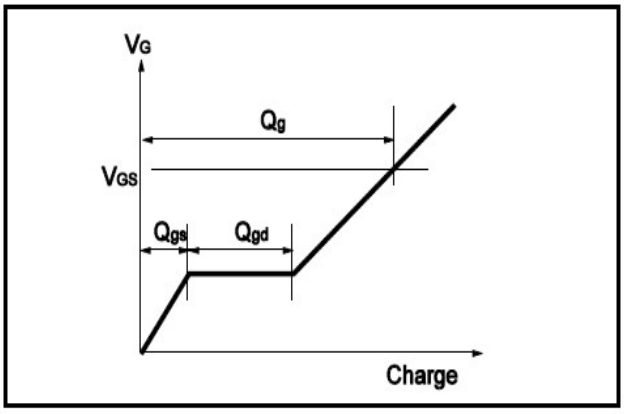


Fig.3 Switching Time Measurement Circuit

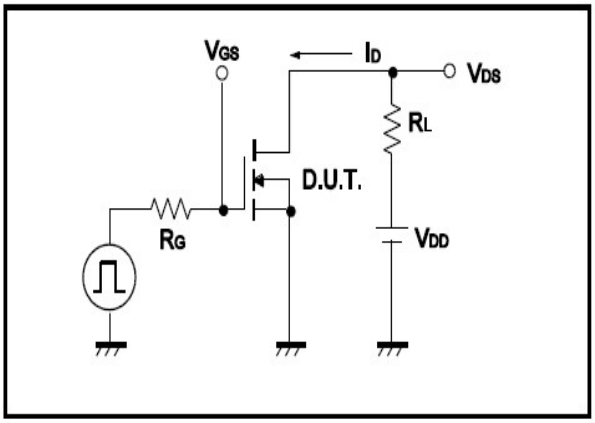


Fig.4 Switching Time Waveform

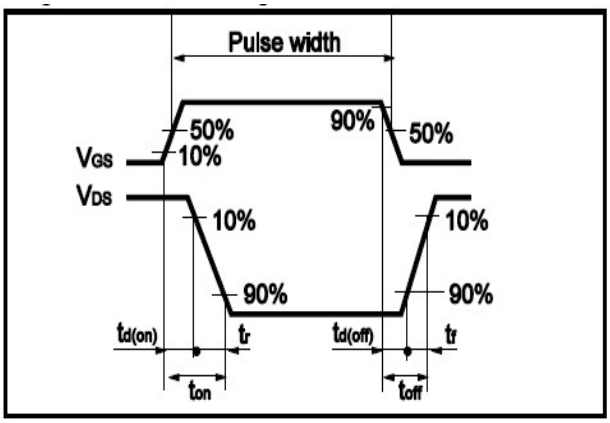


Fig.5 Avalanche Measurement Circuit

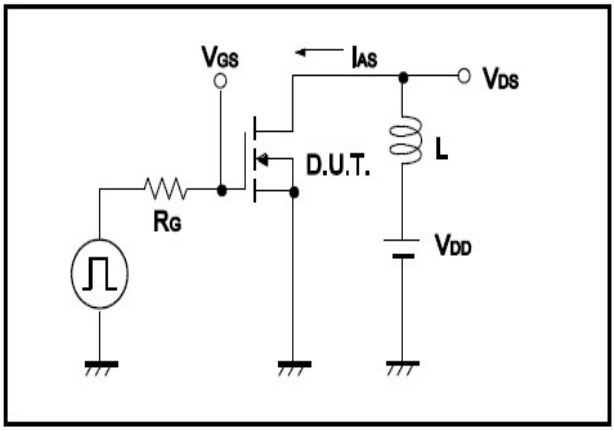
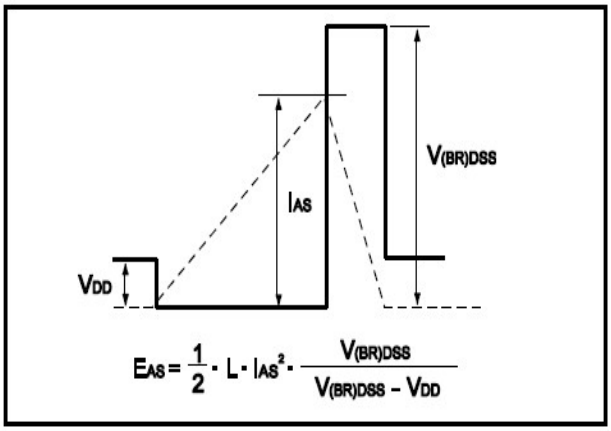
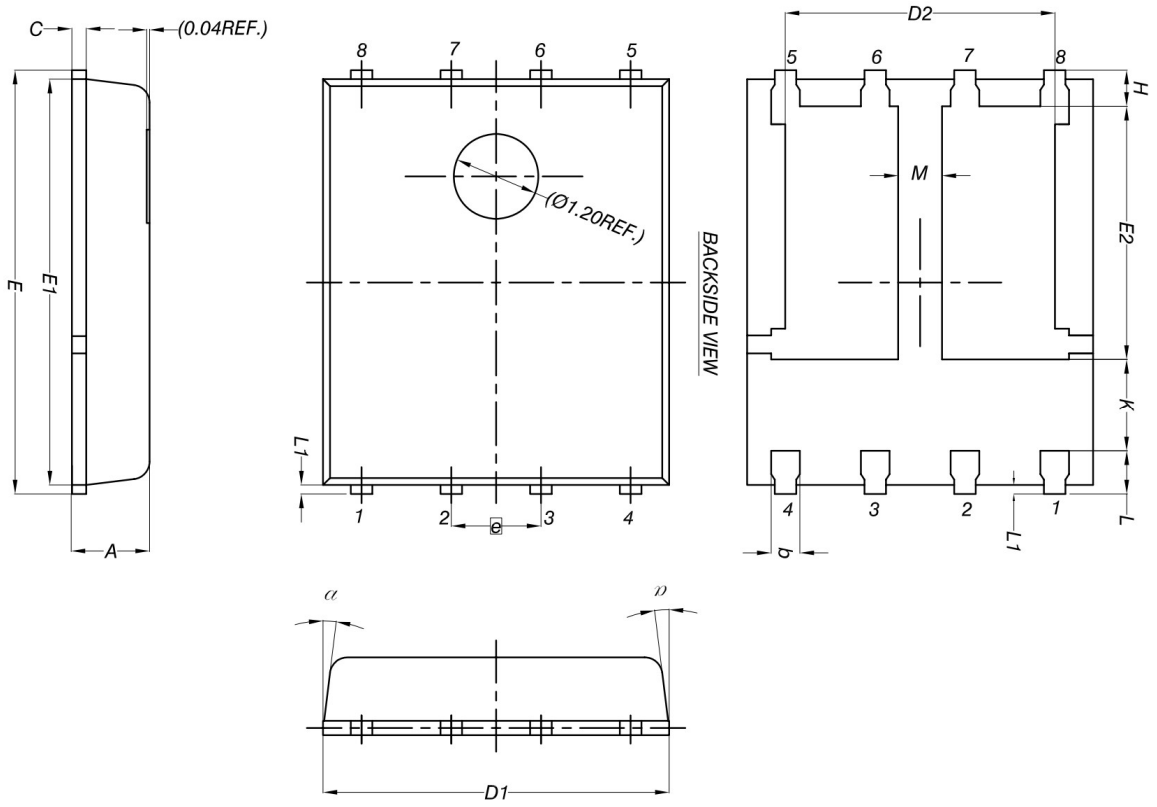


Fig.6 Avalanche Waveform



•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°