

• General Description

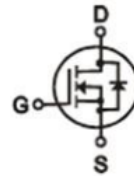
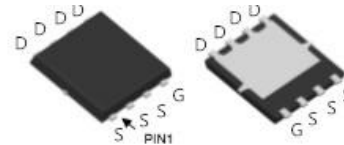
The ZM074N04N combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

• Features

- Advance high cell density Trench technology
- Low $R_{DS(ON)}$ to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance

• Application

- MB/VGA Vcore
- SMPS 2nd Synchronous Rectifier
- POL application
- BLDC Motor driver

• Product Summary

 $V_{DS}=40V$
 $R_{DS(ON)}=8m\Omega$
 $I_D=60A$

DFN5 x 6
• Ordering Information:

Part NO.	ZM074N04N
Marking	ZM074N04
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}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$I_D@T_C=25^\circ C$	60	A
	$I_D@T_C=75^\circ C$	45.6	A
	$I_D@T_C=100^\circ C$	37.8	A
Pulsed Drain Current ^①	I_{DM}	150	A
Total Power Dissipation ^②	$P_D@T_C=25^\circ C$	85	W
Total Power Dissipation	$P_D@T_A=25^\circ C$	3.4	W
Operating Junction Temperature	T_J	-55 to 175	$^\circ C$
Storage Temperature	T_{STG}	-55 to 175	$^\circ C$
Single Pulse Avalanche Energy ($L=0.5mH, V_{GS}=10V, R_g=25\Omega, T_J=25^\circ C$)	E_{AS}	165	mJ

Single Pulse Avalanche Energy ($L=0.1\text{mH}, V_{GS}=10\text{V}, R_g=25\Omega, T_J=25^\circ\text{C}$)	E_{AS}	66	mJ
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● Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case ^②	R_{thJC}	-	-	1.5	$^\circ\text{C/W}$
Thermal resistance, junction - ambient	R_{thJA}	-	-	37	$^\circ\text{C/W}$
Soldering temperature, wave soldering for 10s	T_{sold}	-	-	265	$^\circ\text{C}$

● Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	40			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu\text{A}$	1.2		2.5	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=40\text{V}, V_{GS}=0\text{V}$			1.0	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$			± 100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=24\text{A}$		8	10.4	$\text{m}\Omega$
		$V_{GS}=4.5\text{V}, I_D=12\text{A}$		13	16	$\text{m}\Omega$
Forward Trans conductance	g_{FS}	$V_{DS}=25\text{V}, I_D=10\text{A}$		30		S
Source-drain voltage	V_{SD}	$I_S=24\text{A}$			1.28	V

● Dynamic Characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	$f = 1\text{MHz}$ $V_{DS}=25\text{V}$	-	1650	-	pF
Output capacitance	C_{oss}		-	260	-	
Reverse transfer capacitance	C_{rss}		-	140	-	
Total gate charge	Q_g	$V_{DD}=25\text{V}$ $I_D=20\text{A}$ $V_{GS}=10\text{V}$	-	27	-	nC
Gate - Source charge	Q_{gs}		-	8.6	-	
Gate - Drain charge	Q_{gd}		-	13.8	-	
Turn-ON Delay time	$t_{D(on)}$	$V_{GS}=10\text{V}, V_{DS}=15\text{V}$ $R_G=3.3\Omega,$ $I_D=20\text{A}$		8		ns
Turn-ON Rise time	t_r			2.5		ns
Turn-Off Delay time	$t_{D(off)}$			41		ns
Turn-Off Fall time	t_f			8		ns

Diode Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Reverse Recovery Time	t_{RR}	$V_{DD} = 20 V, dI_S/dt = 100 A/s, I_S = 30A$		11		ns
Reverse Recovery Charge	Q_{RR}			20		ns

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

Fig.1 Power Dissipation

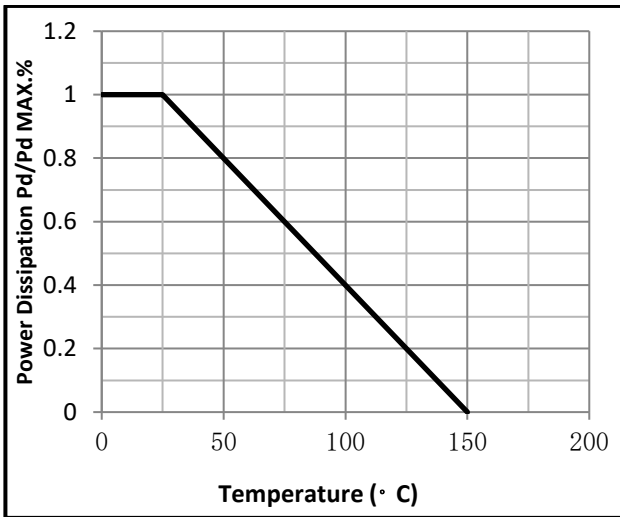


Fig.2 Typical output Characteristics

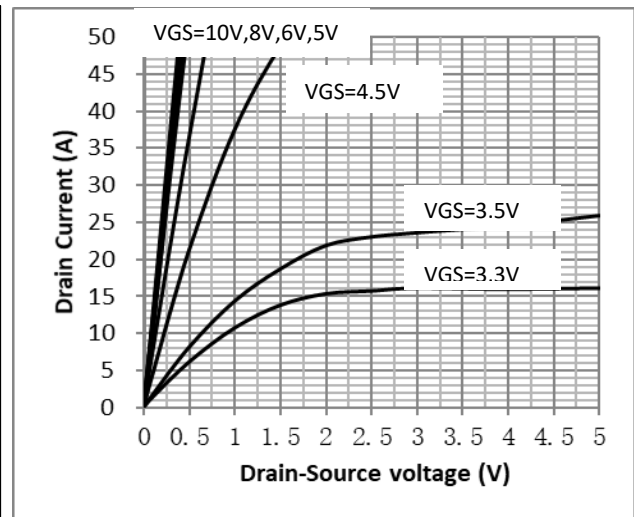


Fig.3 Threshold Voltage V.S Junction Temperature

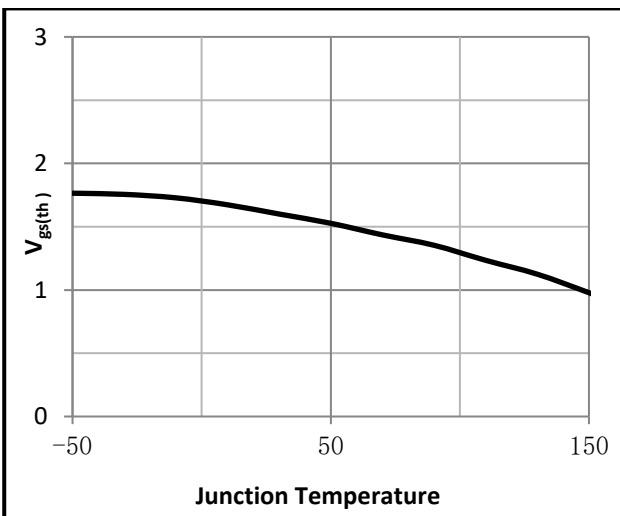


Fig.4 Resistance V.S Drain Current

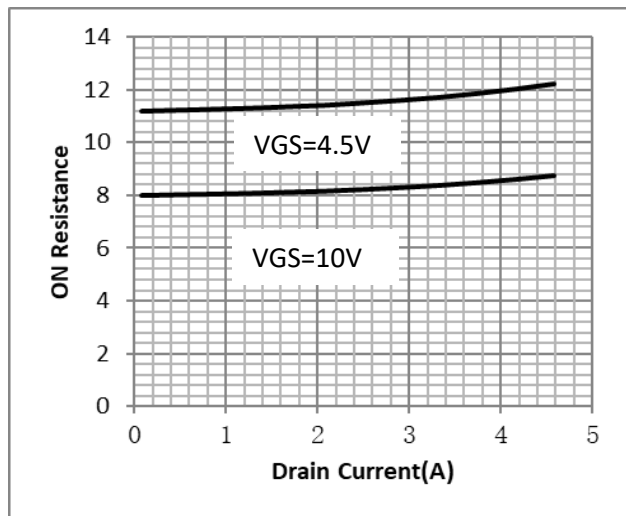


Fig.5 On-Resistance VS Gate Source Voltage

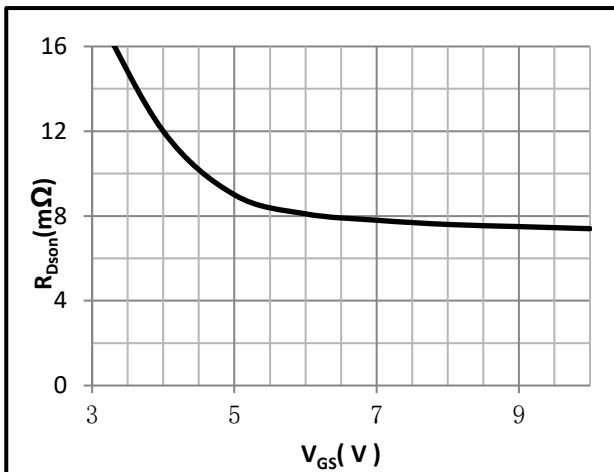


Fig.6 On-Resistance V.S Junction Temperature

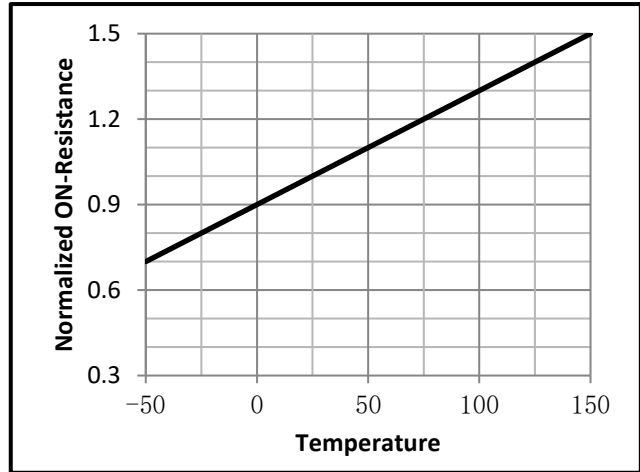


Fig.7 SOA Maximum Safe Operating Area

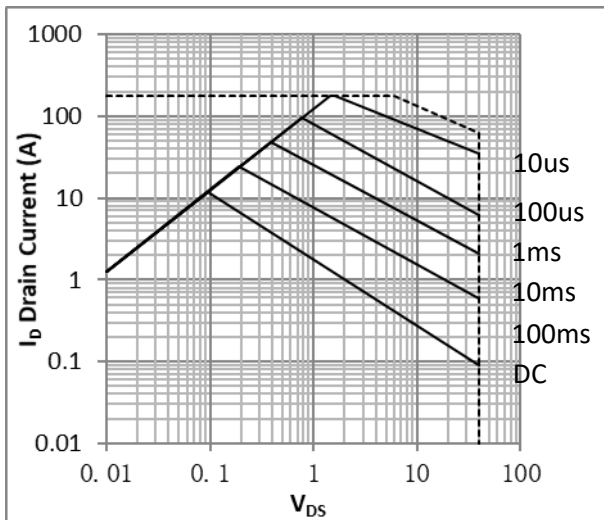


Fig.8 ID-Junction Temperature

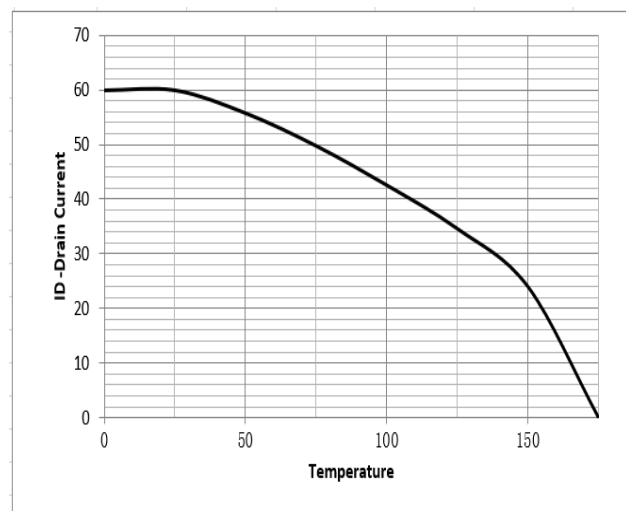


Figure 9. Diode Forward Voltage vs. Current

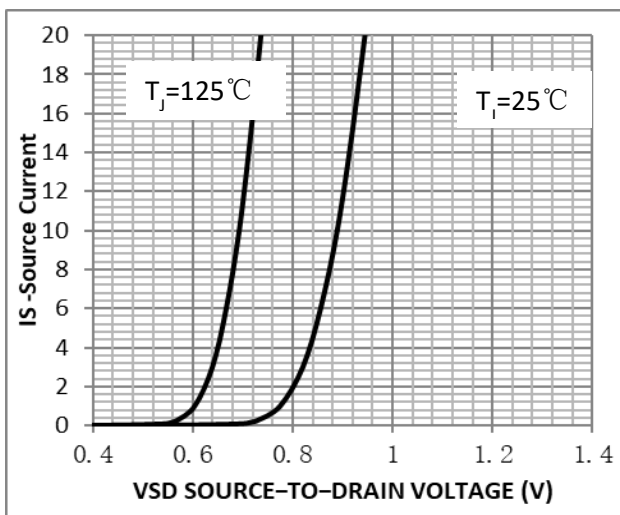


Figure 10. Transfer Characteristics

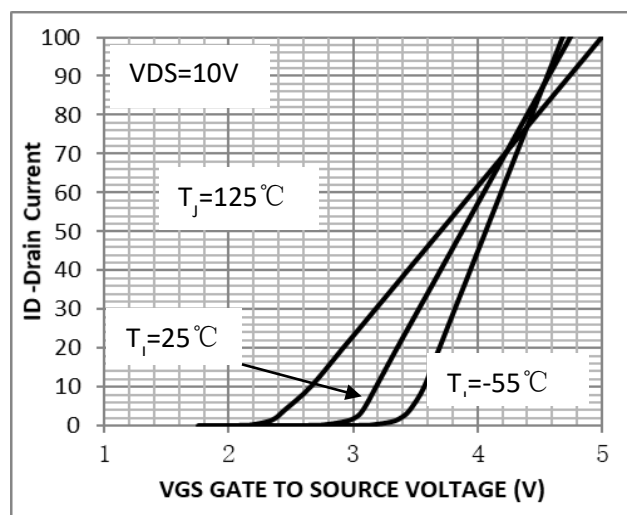


Figure 11. Gate-to-Source and Drain-to-Source Voltage vs. Total Charge

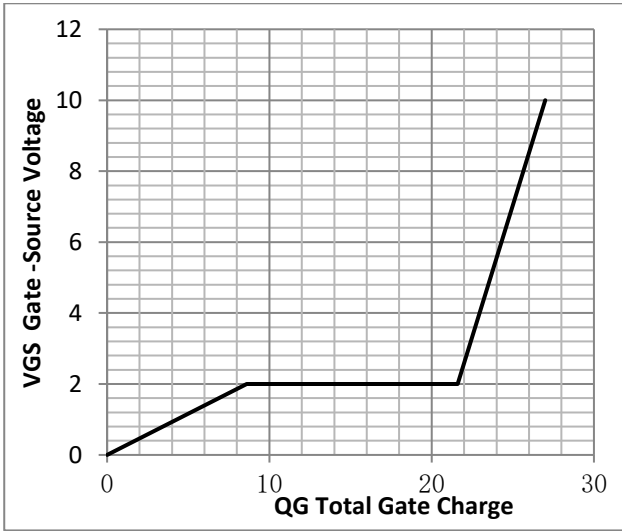


Fig.12 Capacitance Variation

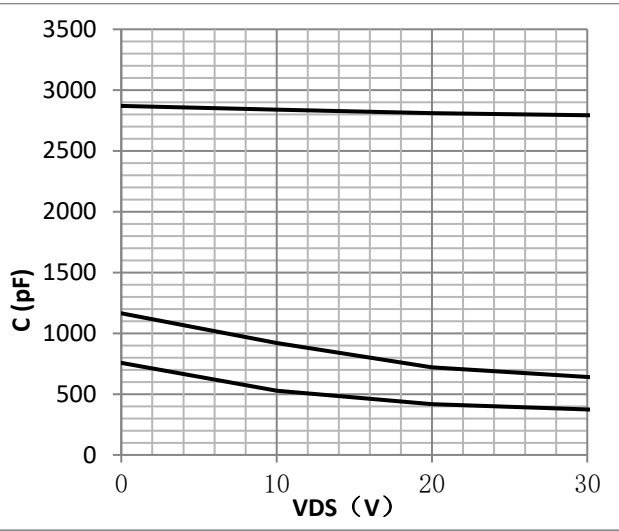


Fig.13 Switching Time Measurement Circuit

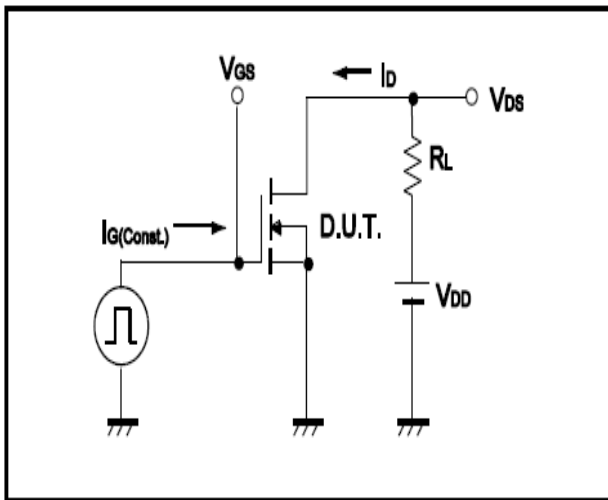


Fig.14 Gate Charge Waveform

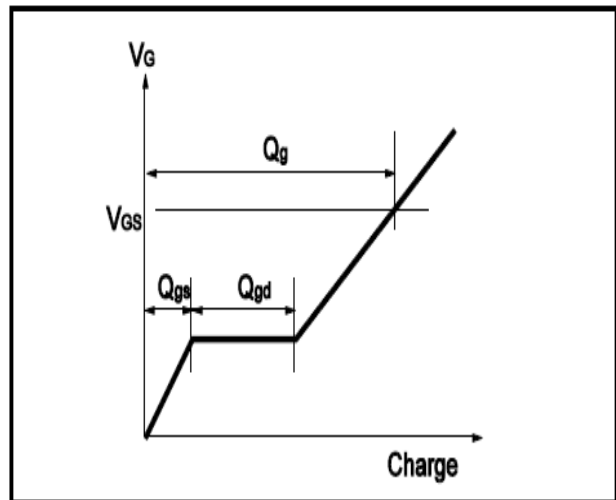


Fig.15 Switching Time Measurement Circuit

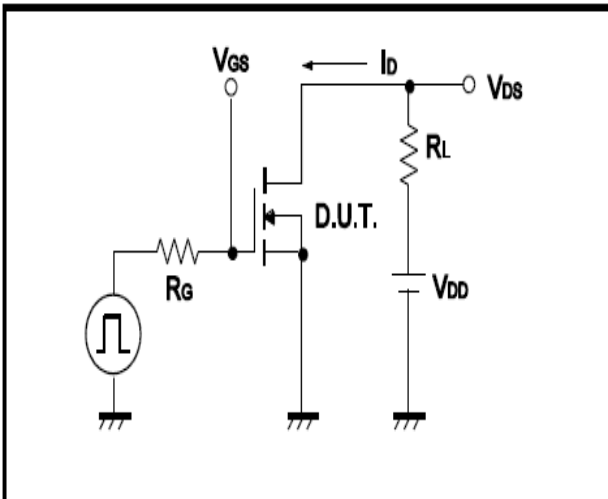


Fig.16 Gate Charge Waveform

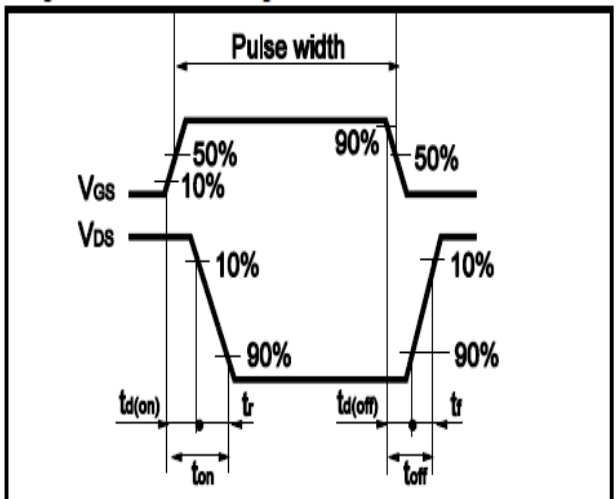


Fig.17 Avalanche Measurement Circuit

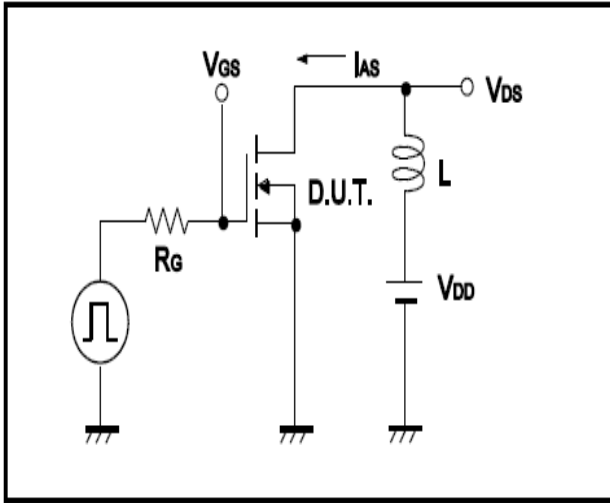
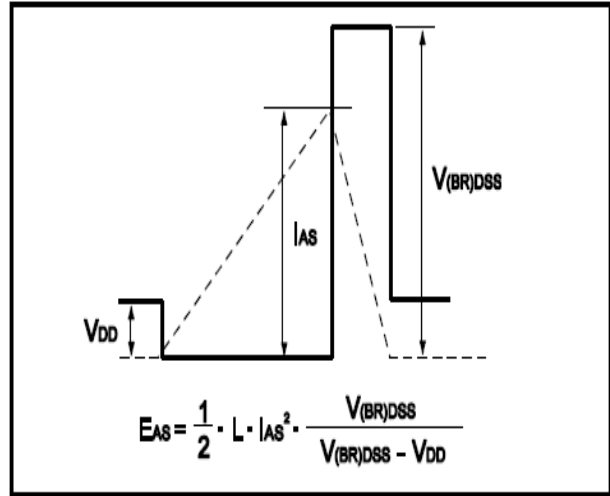


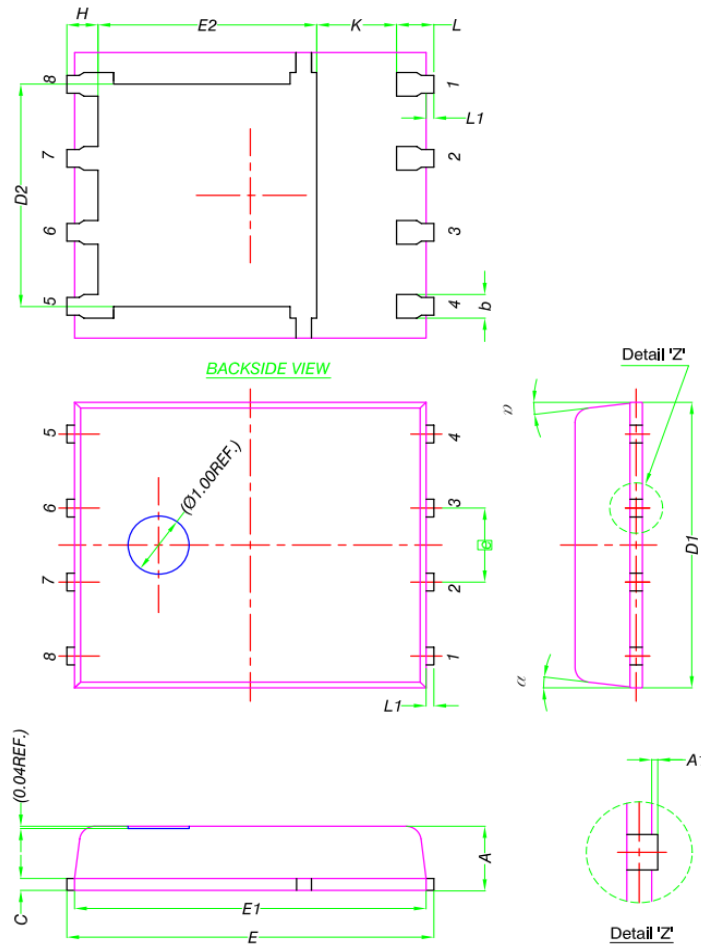
Fig.18 Avalanche Waveform





•Dimensions (DFN5×6)

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°