

UN010N88DE

ROHS

N-Channel Enhancement Mode MOSFET

Product Summary

V _{DS}	100V
I _D	0.28A
R _{DS(ON)} (@V _{GS} =10V I _D =0.25A)	≤6Ω
R _{DS(ON)} (@V _{GS} =4.5V I _D =0.2A)	≤10Ω

Features

- ◆ Advanced Trench Process Technology
- ◆ Low Threshold Voltage
- ◆ Fast Switching Speed
- ◆ Halogen-Free & Lead-Free

Applications

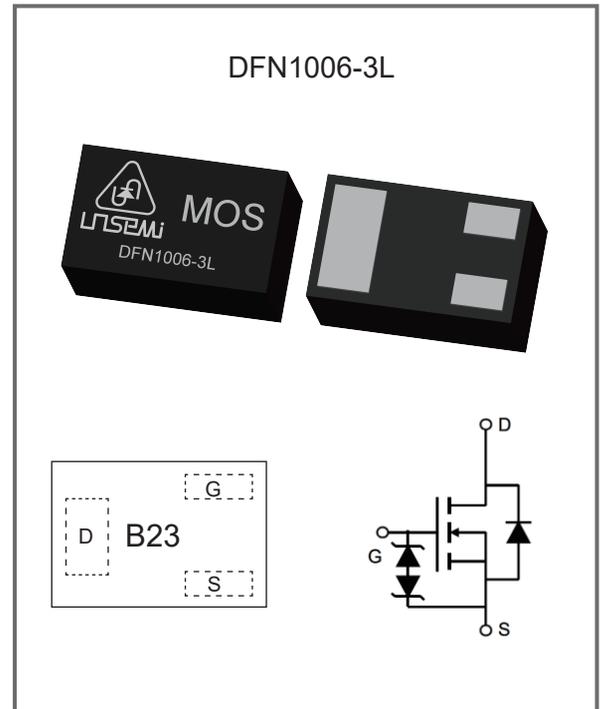
- ◆ Load Switch for Portable Devices
- ◆ Voltage Controlled Small Signal Switch

Package Marking And Ordering information

Part Number	Package Type	Packaging	Reel(pcs)
UN010N88DE	DFN1006-3L	Tape & Reel	10,000



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Absolute Maximum Ratings TA = 25°C unless otherwise specified

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V _{DS}	100	V
Gate- Source Voltage	V _{GS}	±20	V
Continuous Drain Current ¹⁾	I _D	0.28	A
Drain Current, Pulsed ²⁾	I _{DM}	1.8	A
Power Dissipation ¹⁾	P _{tot}	0.71	W
Operating Junction	T _J	-55~150	°C
Storage Temperature Range	T _{stg}	-55~150	°C

Thermal Characteristics

Parameter	Symbol	Max	Units
Thermal Resistance from Junction to Ambient ¹⁾	R _{θJA}	175	°C/W

Note:

1) Part mounted on FR-4 board with recommended pad layout.

2) Pulse width ≤300μs, Duty cycle ≤2%, limited by T_{jmax}.

Electrical Characteristics at TA = 25°C unless otherwise specified

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BVDSS	ID = 250μA	100			V
Drain-Source Leakage Current	IDSS	VGS = 0V , VDS = 80V			1.0	μA
Gate Leakage Current	IGSS	VGS = ±20V			±10	μA
Gate-Source Threshold Voltage	VGS(TH)	VGS = VDS , ID = 1mA	0.8		2.0	V
Drain-Source On-State Resistance	RDS(ON)	VGS = 10V , ID = 0.25A		3.2	6.0	Ω
		VGS = 4.5V , ID = 0.2A		3.8	10	Ω
Body-Diode PARAMETERS						
Drain-Source Diode Forward Voltage	VSD	IS = 0.34A, VGS = 0V			1.3	V
DYNAMIC PARAMETERS						
Forward Transconductance	gts	VDS = 15V, ID = 3.2A		370		S
Input Capacitance	Ciss	VGS = 0V, VDS = 25V F = 1MHz		22		pF
Output Capacitance	Coss			3.5		pF
Reverse Transfer Capacitance	Crss			2.0		pF
Gate charge total	Qg	VDS = 48V, VGS = 10V IDS = 0.5A		7.0		nC
Gate to Source Charge	Qgs			1.4		nC
Gate to Drain Charge	Qgd			2.5		nC
Turn-On Delay Time	td(ON)	VDD = 30V, VGS = 10V ID = 0.28A, RGEN = 50Ω		8.0		ns
Turn-On Rise Time	tr			8.0		ns
Turn-Off Delay Time	td(OFF)			13		ns
Turn-Off Fall Time	tf			16		ns

Electrical Characteristics Curves

Fig. 1 Output Characteristics

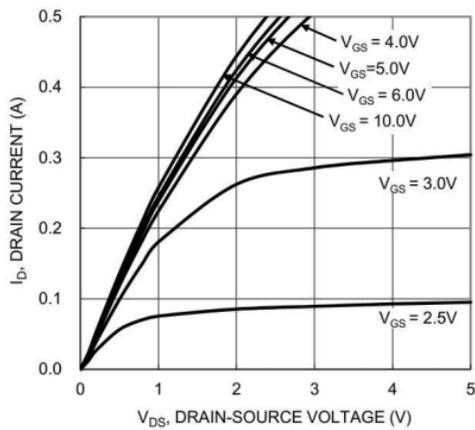


Fig. 2 Transfer Characteristic

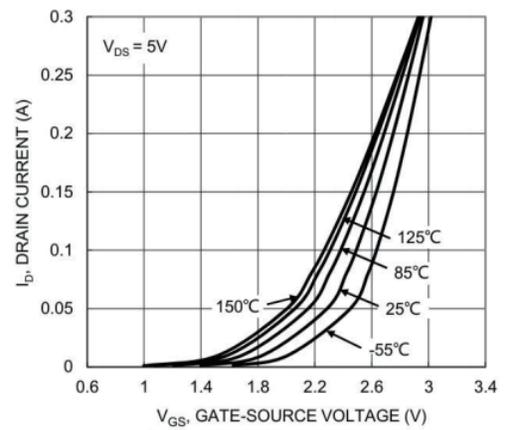


Fig. 3 $R_{DS(ON)}$ — I_D and V_{GS}

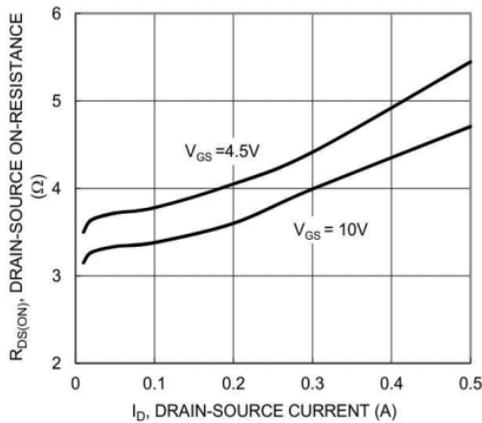


Fig. 4 $R_{DS(ON)}$ — V_{GS}

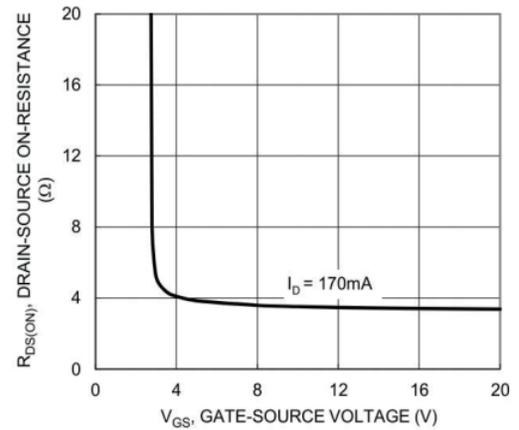


Fig. 5 $R_{DS(ON)}$ — I_D and T_J

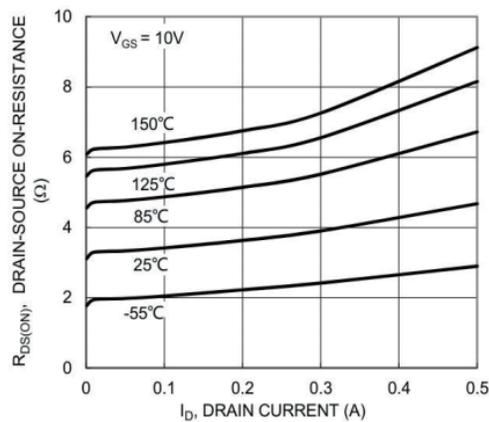
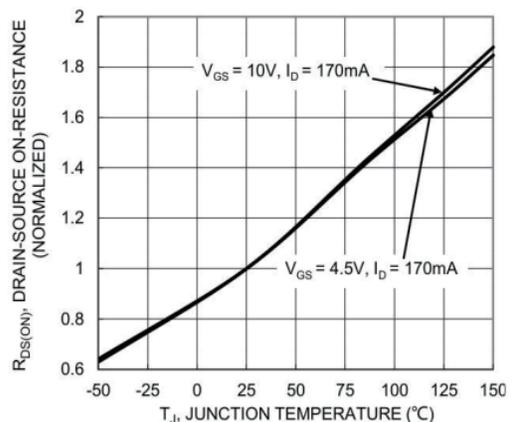


Fig. 6 Normalized $R_{DS(ON)}$ — T_J



Electrical Characteristics Curves

Fig. 7 $R_{DS(ON)} - T_J$

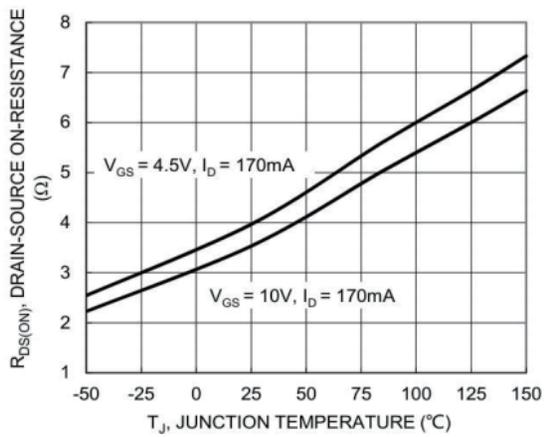


Fig. 8 $V_{GS(TH)} - T_J$

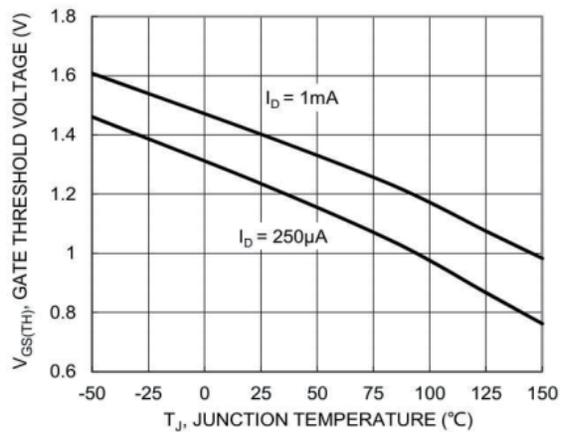


Fig. 9 $I_S - V_{SD}$

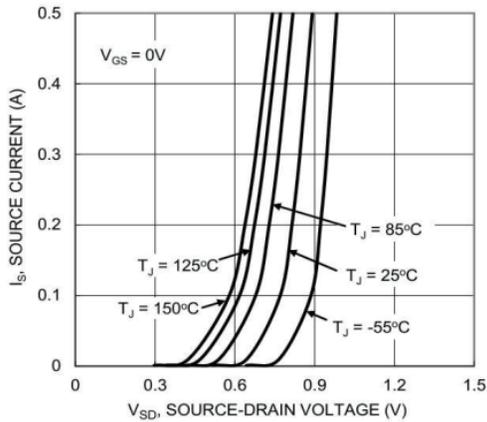


Fig. 10 Typical Junction Capacitance

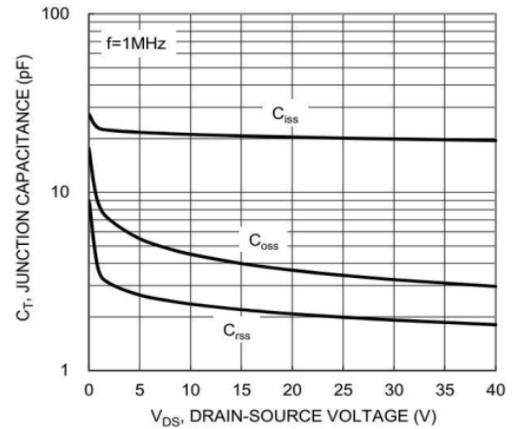
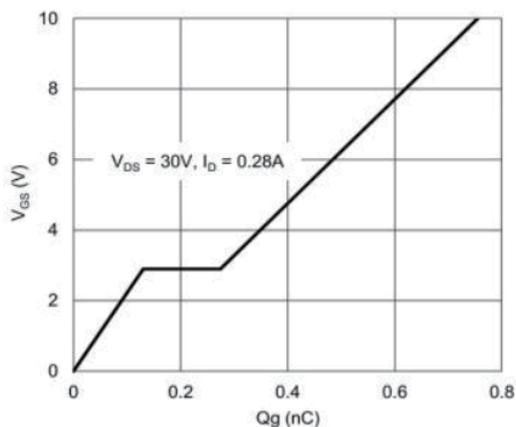
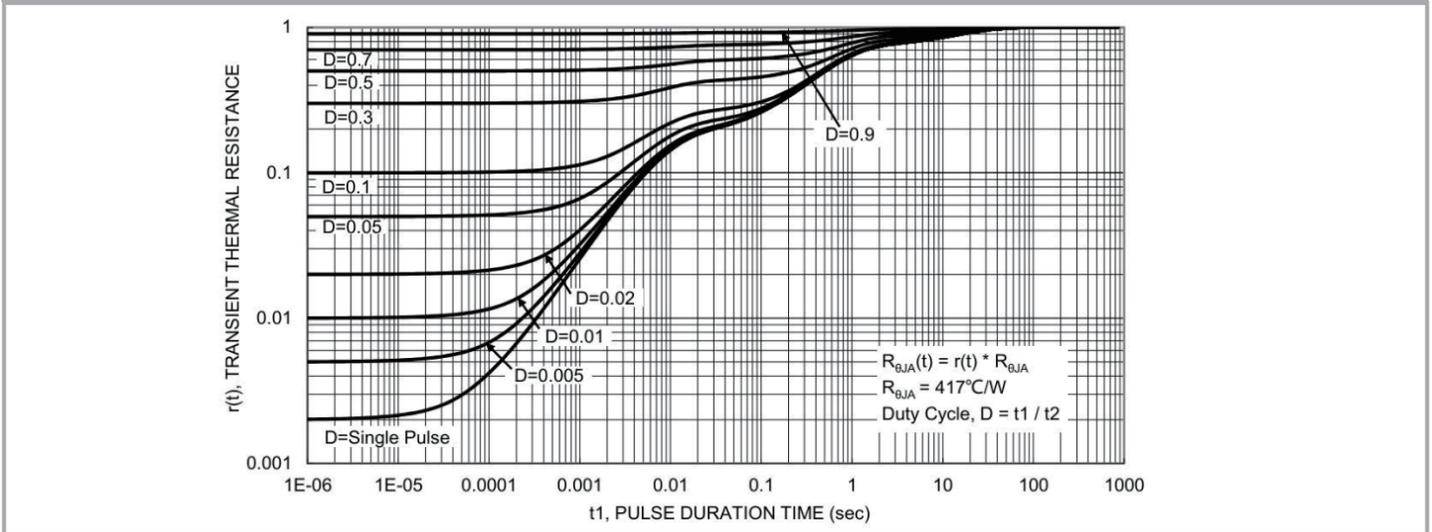


Fig. 11 Gate Charge



Electrical Characteristics Curves

Fig. 12 Transient Thermal Resistance



Test Circuit

Fig.1-1 Switching times test circuit

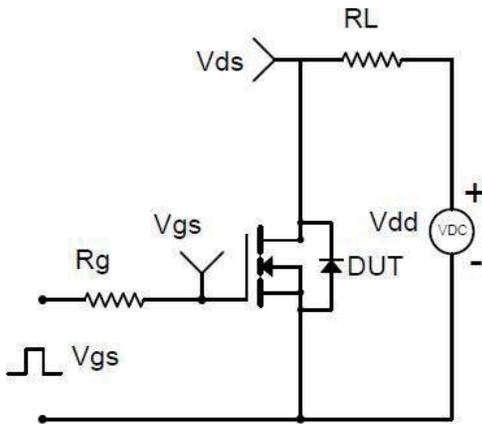


Fig.1-2 Switching Waveform

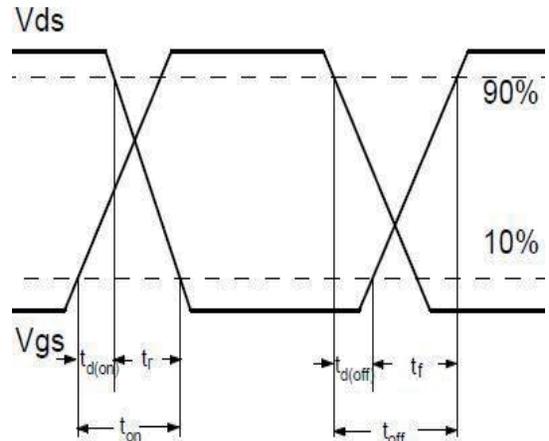


Fig.2-1 Gate charge test circuit

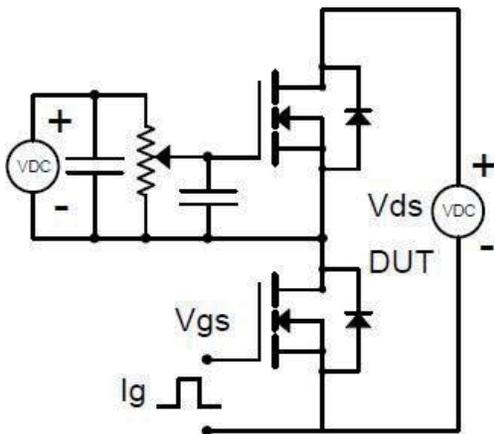


Fig.2-2 Gate charge waveform

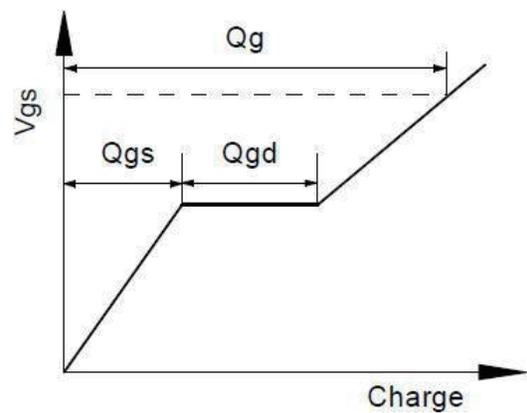


Fig.3-1 Avalanche test circuit

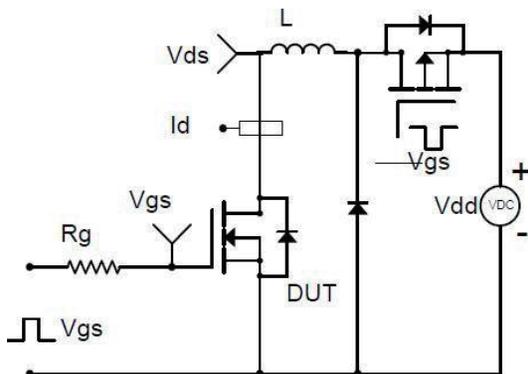
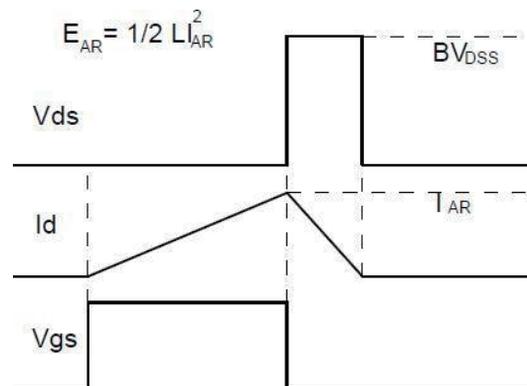
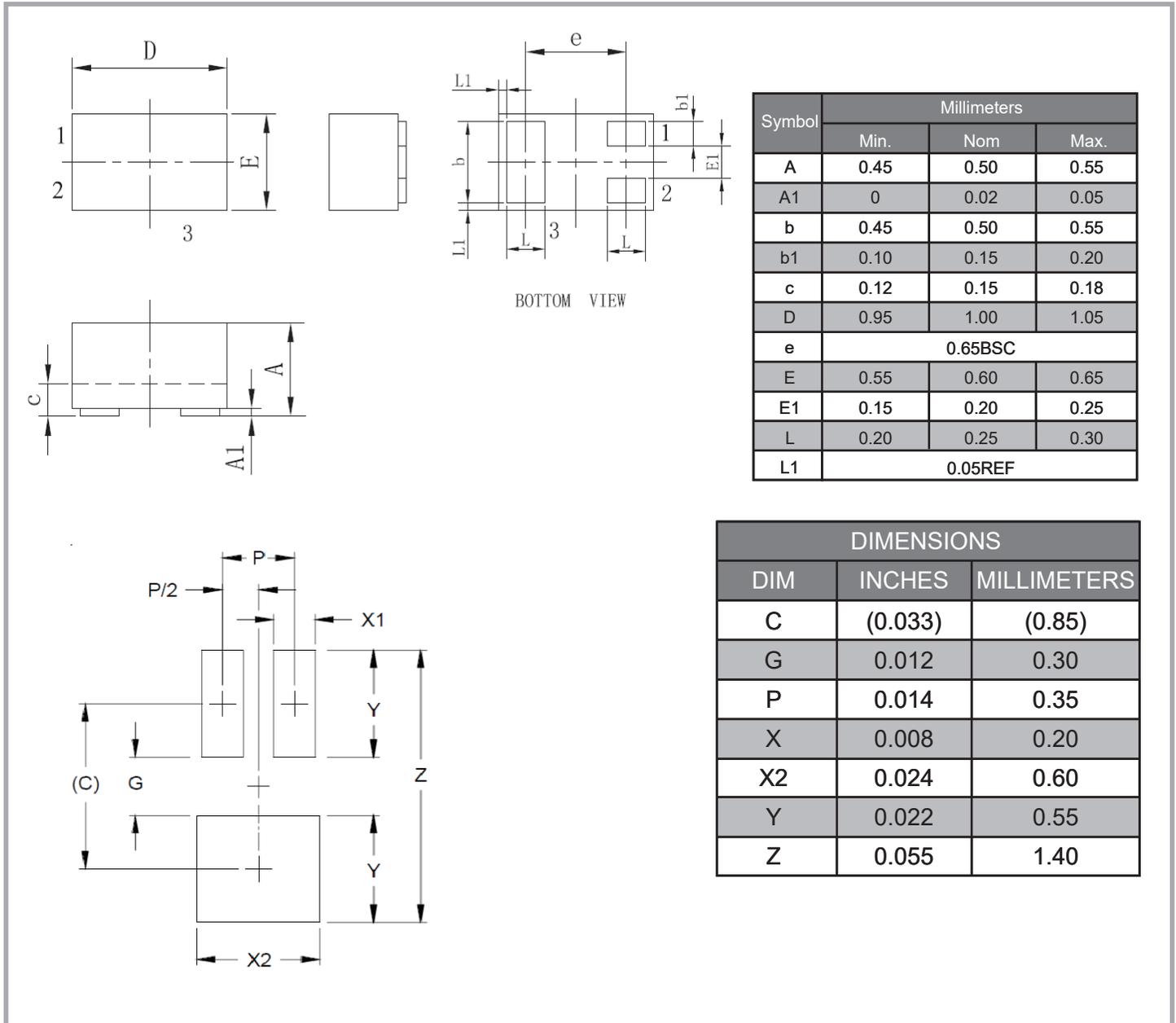


Fig.3-2 Avalanche waveform



DFN1006P3 Package Outline & Dimensions (Units: mm / in)



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