• General Description

The ZMS070N10D combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

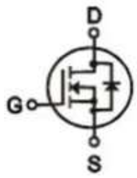
• Features

- ■Low $R_{DS(ON)}$ to minimize conductive loss
- ■Low Gate Charge for fast switching
- ■Low Thermal resistance

•Application

- ■SMPS 2nd Synchronous Rectifier
- ■Load switch
- ■BLDC Motor driver

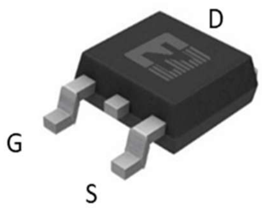
• Product Summary



V_{DS} =100V

$R_{DS(ON)}$ =7mΩ

I_D =75A



TO-252

•Ordering Information:

Part NO.	ZMS070N10D
Marking	ZMS070N10
Packing Information	REEL TAPE
Basic ordering unit (pcs)	2500

•Absolute Maximum Ratings (T_C =25℃)

Parameter	Symbol	Conditions	Rating	Unit
Drain-Source Voltage	V_{DS}	25 °C ≤ T_j ≤ 175 °C	100	V
Gate-Source Voltage	V_{GS}	Pulsed ①	+20/-20	V
Continuous Drain Current	I_D	T_C=25℃	75	A
	I_D	T_C=75℃	54	A
	I_D	T_C=100℃	38	A
Pulsed Drain Current	I_{DM}	pulsed; t_p ≤ 10 μs; T_{mb} = 25 °C;	225	A
Total Power Dissipation	P_D	T_C=25℃	71	W
Total Power Dissipation	P_D	T_A=25℃	3.0	W
Operating Junction Temperature	T_J		-55 to 175	℃
Storage Temperature	T_{STG}		-55 to 175	℃
Single Pulse Avalanche Energy	E_{AS}	L=0.1mH, VGS=10V, Rg=25Ω, T_J=25℃	120	mJ
ESD Level (HBM)			Class 1C	

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	2.1	° C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	50	° C/W
Soldering temperature	T_{sold}	-	-	260	° C

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V, I_D =250uA	100			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}=100V, 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=30A		7	9	mΩ
		V_{GS}=4.5V, I_D=20A③		9	11	mΩ
Forward Transconductance	g_{FS}	V_{DS} =25V, I_D=10A		16		s
Diode Forward Voltage	V_{FSD}	I_S=30A			1.2	V

•Dynamic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss	f = 1MHz, V_{DS}=25V	-	2190	-	pF
Output capacitance	Coss		-	1130	-	
Reverse transfer capacitance	Crss		-	138	-	
Gate Risistance	R_g	f = 1MHz		1.6		Ω
Total gate charge	Qg	V_{DD} = 15V, I_D = 5A, V_{GS} = 10V	-	33	-	nC
	Qg(4.5v)			16		
Gate - Source charge	Qgs		-	6.8	-	
Gate - Drain charge	Qgd		-	5.8	-	
Turn-ON Delay time	$t_{D(on)}$	V_{GS}=10V, V_{DS}=15V, R_G =6Ω, I_D =15A		14		ns
Turn-ON Rise time	t_r			21		ns
Turn-Off Delay time	$t_{D(off)}$			28		ns
Turn-Off Fall time	t_f			7		ns
Reverse Recovery Time	t_{RR}	V_{DD} = 20 V, dI_S/dt = 100 A/s, I_S = 30 A		56		ns
Reverse Recovery Charge	Q_{RR}			67		nC

Fig.1 Gate-Charge Characteristics

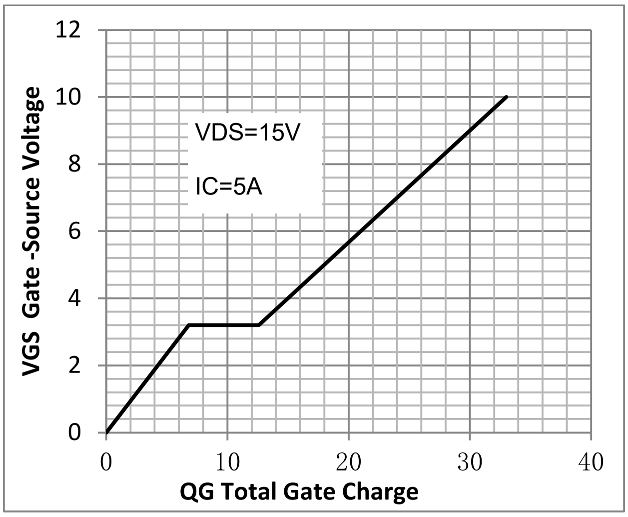


Fig.2 Capacitance Characteristics

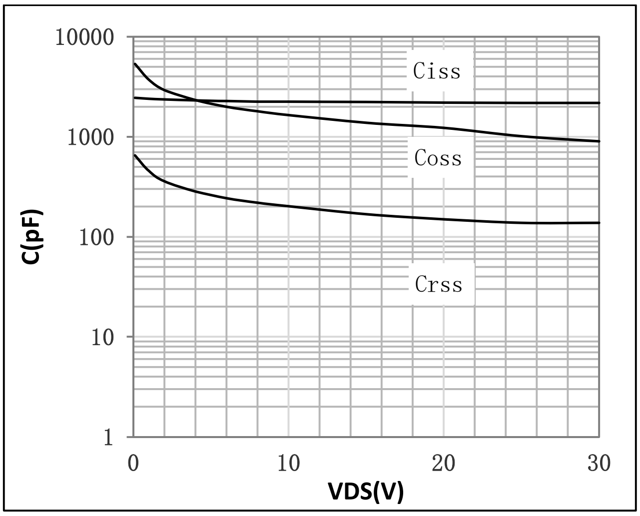


Fig.3 Power Dissipation

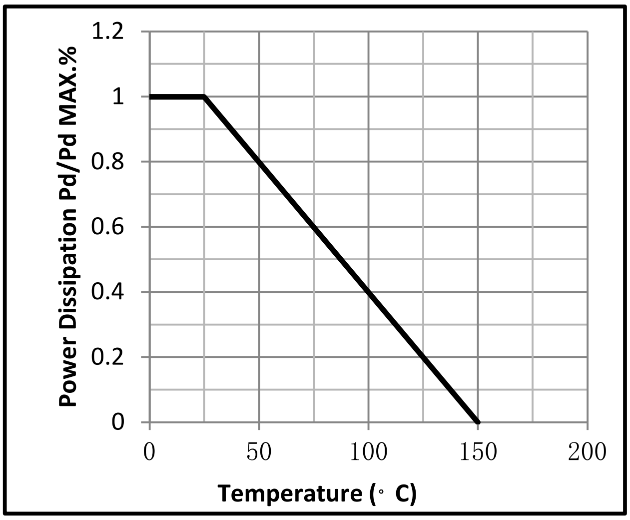


Fig.4 Typical output Characteristics

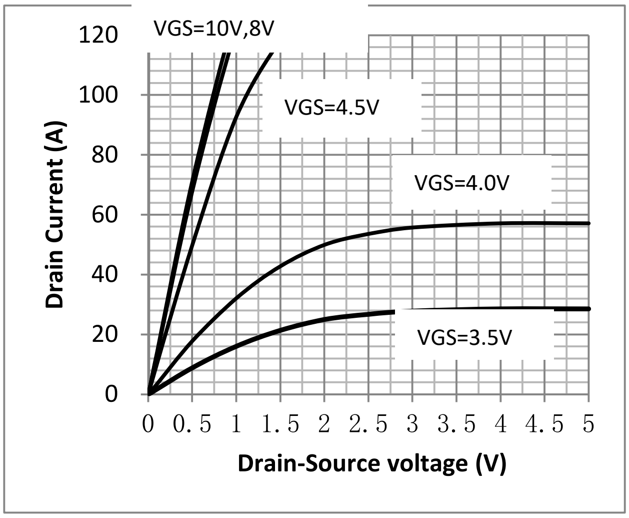


Fig.5 Threshold Voltage V.S Junction Temperature

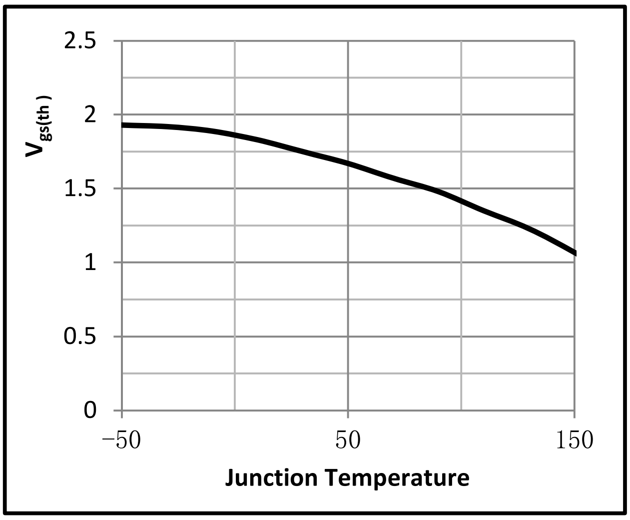


Fig.6 Resistance V.S Drain Current

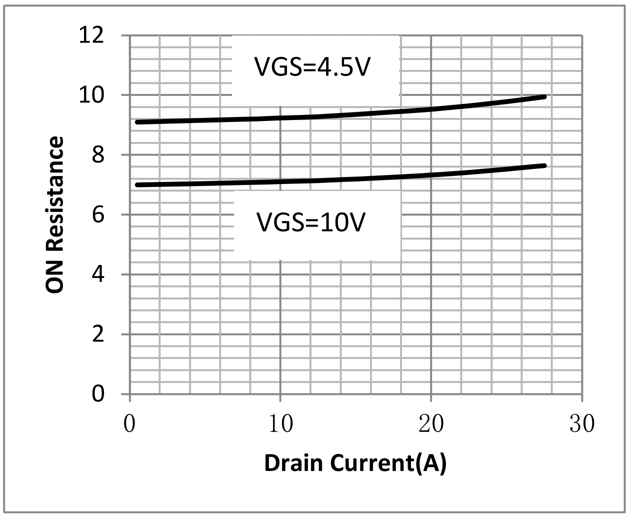


Fig.7 On-Resistance VS Gate Source Voltage

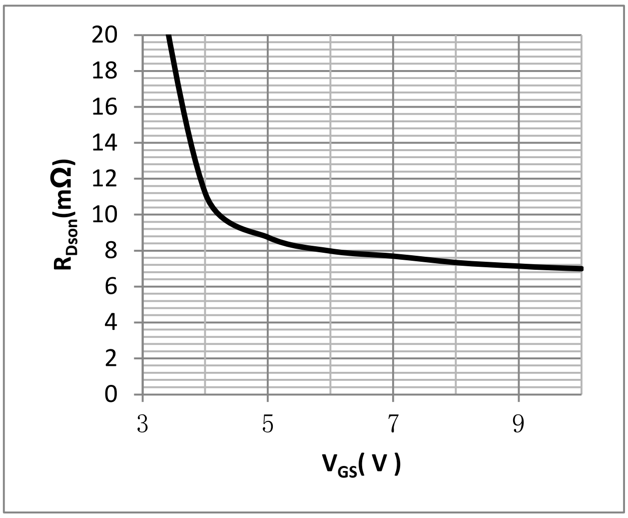


Fig.8 On-Resistance V.S Junction Temperature

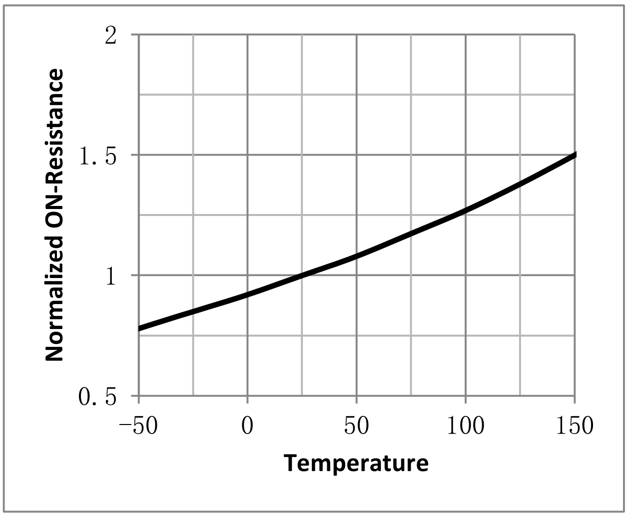


Fig.9 Diode Forward Voltage vs. Current

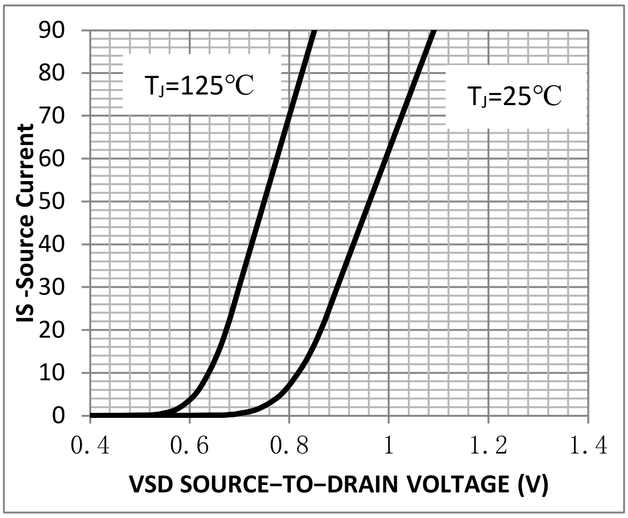


Figure.10 Transfer Characteristics

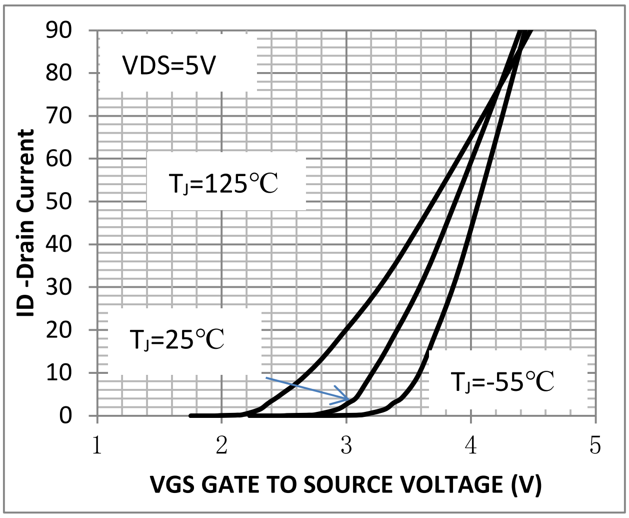


Fig.11 SOA Maximum Safe Operating Area

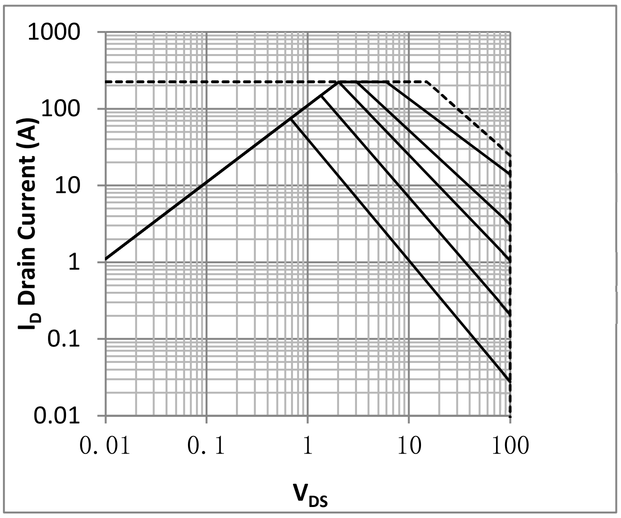


Fig.12 ID-Junction Temperature

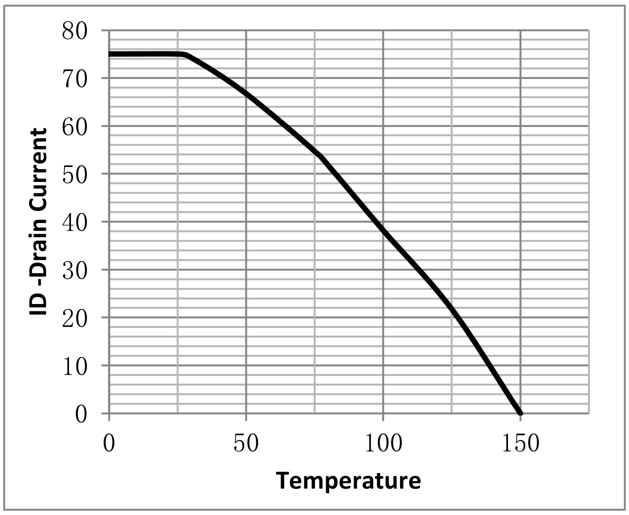


Fig.13 Gate Charge Measurement Circuit

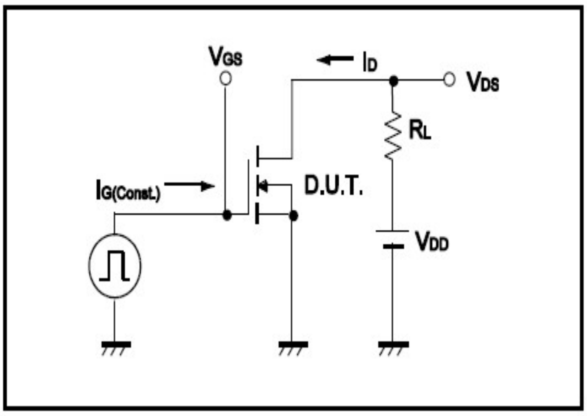


Fig.14 Gate Charge Waveform

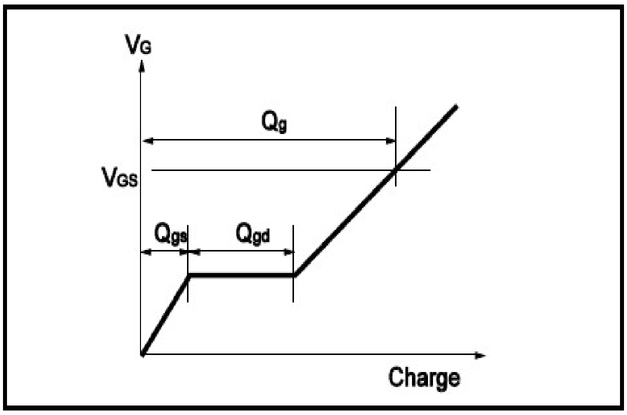


Fig.15 Switching Time Measurement Circuit

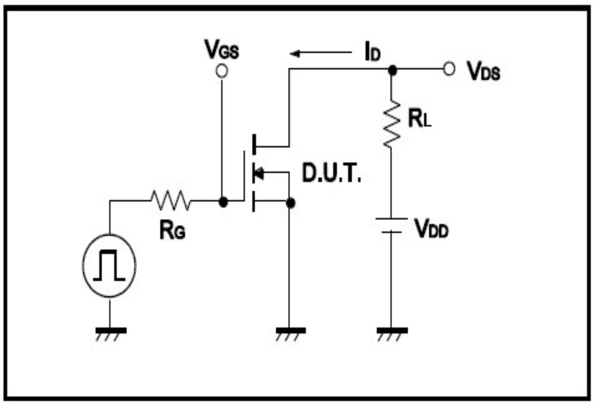


Fig.16 Switching Time Waveform

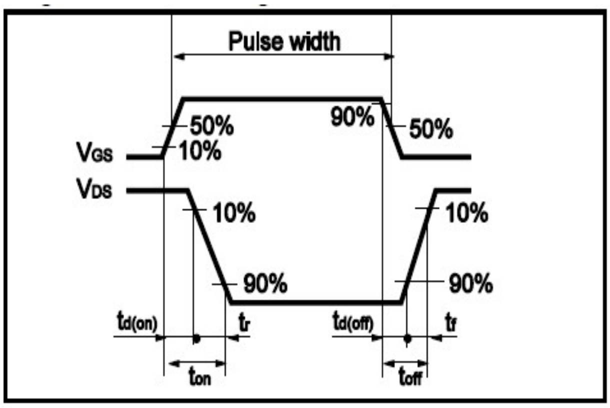


Fig.17 Avalanche Measurement Circuit

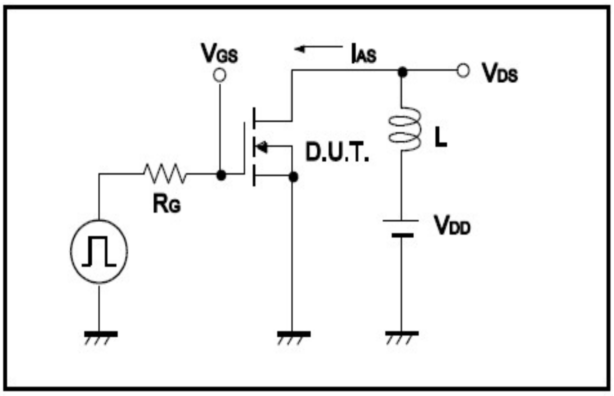
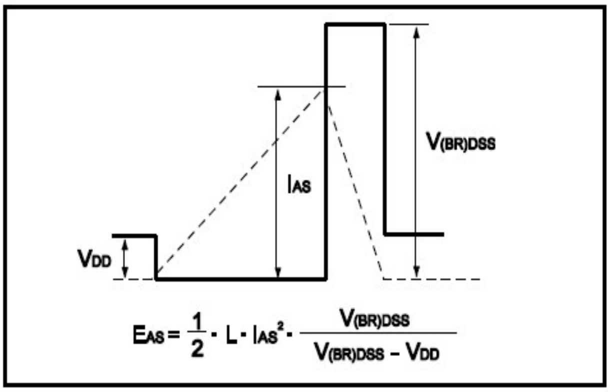
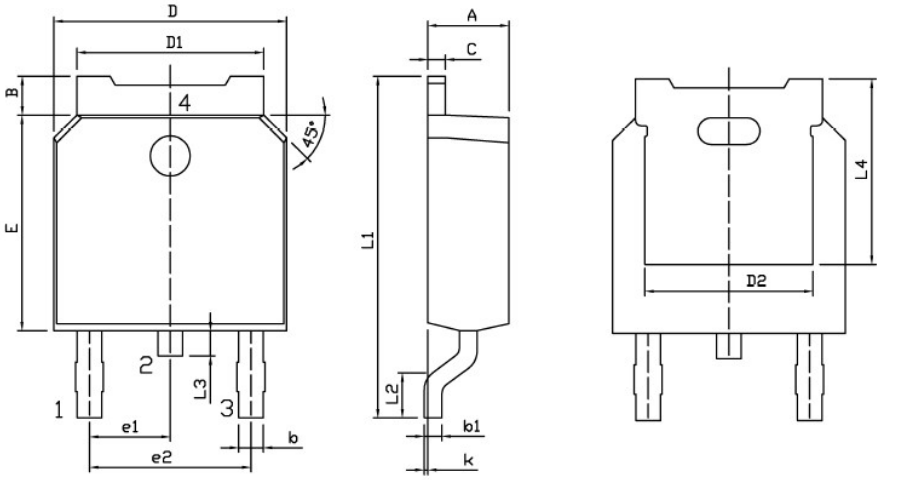
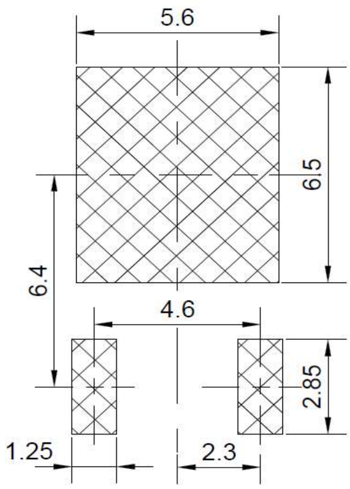


Fig.18 Avalanche Waveform



● Dimensions (TO-252)





Land Pattern
(Only for Reference)

Dimensions In Millimeters					
Symbol	MIN	MAX	Symbol	MIN	MAX
A	2.20	2.40	E	5.95	6.25
B	0.95	1.25	e1	2.24	2.34
b	0.70	0.90	e2	4.43	4.73
b1	0.45	0.55	L1	9.85	10.35
C	0.45	0.55	L2	1.70	2.00
D	6.45	6.75	L3	0.60	0.90
D1	5.10	5.50	L4	5.05	
D2	4.85		k	0.00	0.10

Note:

① Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%, Accumulation time ≤50 hours; For DC， the following test conditions can be passed: VGS=+15V/-5V, Tj=175℃, t=1000 hours；

② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate；

③ Vgs≥4.5V is required for practical application.

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