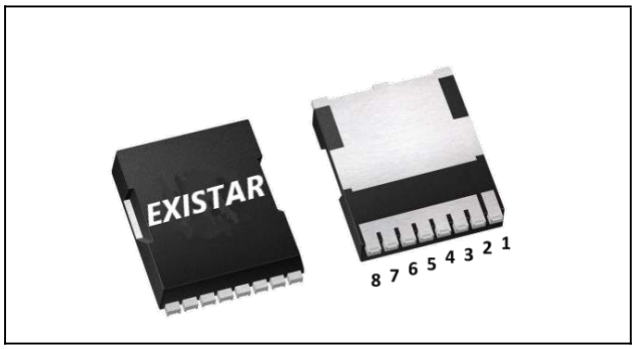
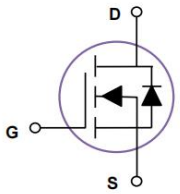
N-Channel 100V MOSFET

E100N1P9OH1

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
100V	1.9 @ V_{GS} = 10V	270

TOLL-8





Pb-free
RoHS
COMPLIANT
HALOGEN
FREE

Features

- Low $R_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested

Applications

- DC/DC conversion
- Power switch
- PD charger
- Moto driver

Package And Ordering Information

Ordering code	Package	Marking
E100N1P9OH1	TOLL-8	E100N1P9OH1

Ordering Information

Package	Units/ Reel	Reels/ Inner Box	Units/ Inner Box
TOLL-8	2000	1	2000

Key Performance Parameters

Parameter	Value	Unit
VDS, min @ Tj(max)	100	V
ID, pulse	1080	A
RDS(ON), max @ VGS=10V	1.9	mΩ
Qg	106	nC

Absolute Maximum Ratings at Tj=25°C Unless Otherwise Noted

Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{DS}	100	V
Gate-source voltage		V_{GS}	±20	
Continuous drain current	T_C=25°C	I_D	270	A
	T_C=100°C		-	
Pulsed drain current		$I_{D,pulse}$	1080	
Avalanche energy, single pulse		E_{AS}	504	mJ
Power dissipation	T_C=25°C	P_D	250	W
	T_A=25°C		-	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to 175	℃

Thermal Characteristics

Parameter		Symbol	Max.	Unit
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	0.6	°C/W
Thermal resistance, junction-to-ambient	Steady state	$R_{\theta JA}$	62	

Electrical Characteristics at Tj=25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Static						
Drain to source breakdown voltage	$V_{(BR)DSS}$	100			V	V_{GS} = 0, I_D = 250 μA
Gate-source threshold voltage	$V_{GS(th)}$	2	3	4	V	V_{DS} = V_{GS}, I_D = 250 μA
Gate-body leakage	I_{GSS}			±100	nA	V_{DS} = 0 V, V_{GS} = ±20 V
Zero gate voltage drain current	I_{DSS}			1	μA	V_{DS} = 100 V, V_{GS} = 0 V
Drain-source on-resistance	$R_{DS(on)}$		1.6	1.9	mΩ	V_{GS} = 10 V, I_D = 50 A
Gate resistance	Rg		0.9		Ω	f=1MHz

Gate Charge						
Total gate charge	Qg		106		nC	V_{DS} = 50 V, I_D = 25 A, V_{GS} = 10 V
Gate-source charge	Qgs		30			
Gate-drain charge	Qgd		23			
Dynamic						
Turn-on delay time	$t_{d(on)}$		27		ns	V_{DS} = 50 V, I_D =25 A, V_{GS} = 10 V, R_{GEN} = 2 Ω
Rise time	t_r		22			
Turn-off delay time	$t_{d(off)}$		51			
Fall time	t_f		20			
Input capacitance	C_{iss}		7790		pF	V_{DS} =25 V, V_{GS} = 0 V, f = 100kHz
Output capacitance	C_{oss}		4230			
Reverse transfer capacitance	C_{rss}		250			
Body Diode						
Diode forward voltage	V_{SD}		-	1.3	V	V_{GS} = 0 V, I_S = 20 A
Reverse recovery time	t_{rr}		136		ns	V_R= 50 V, I_S =25 A, di/dt = 100 A/μs
Reverse recovery charge	Q_{rr}		219		nC	
Peak reverse recovery current	I_{rrm}		2.9		A	

Electrical Characteristics Diagrams

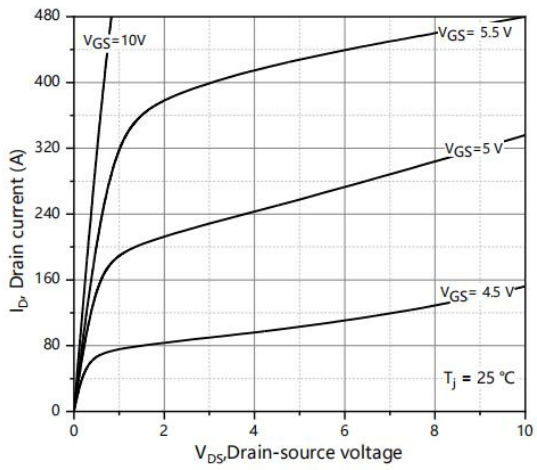


Figure 1. Typ. output characteristics

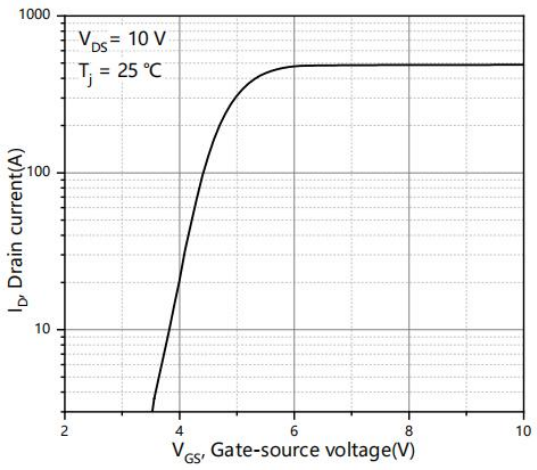


Figure 2. Typ. transfer characteristics

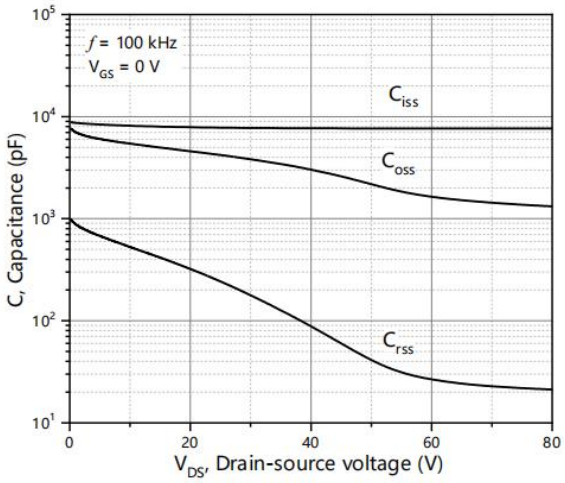


Figure 3. Typ. capacitances

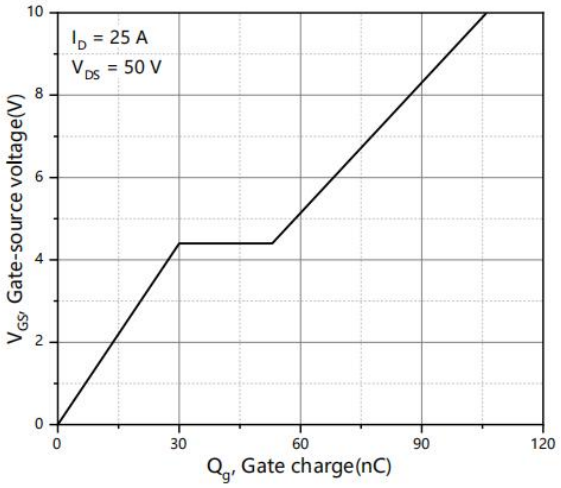


Figure 4. Typ. gate charge

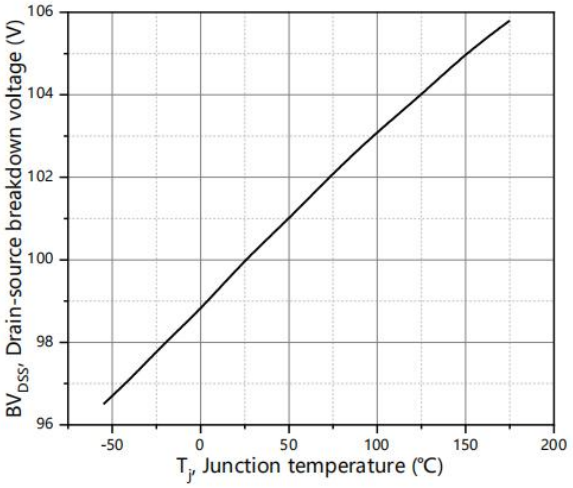


Figure 5. Drain-source breakdown voltage

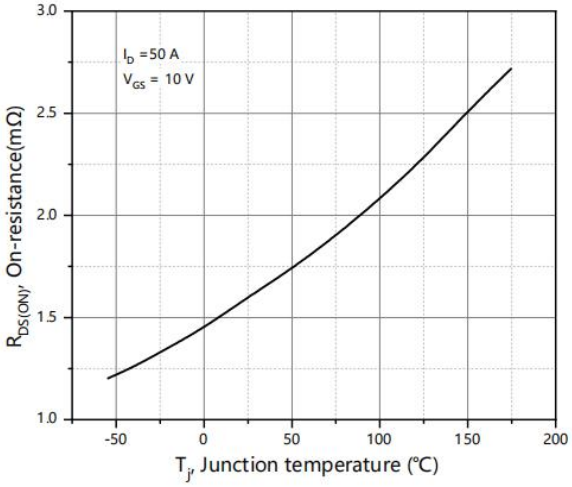


Figure 6. Drain-source on-state resistance

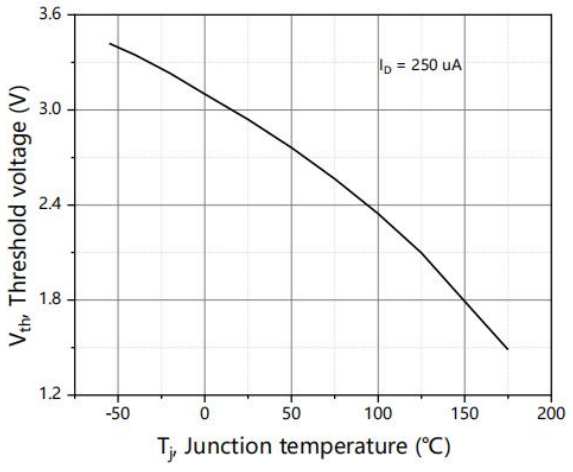


Figure 7. Threshold voltage

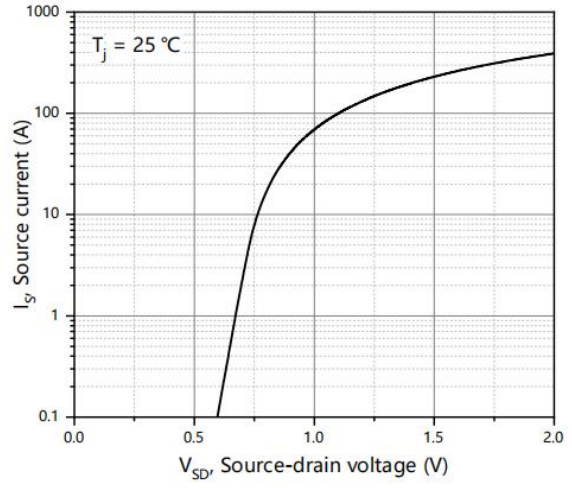


Figure 8. Forward characteristic of body diode

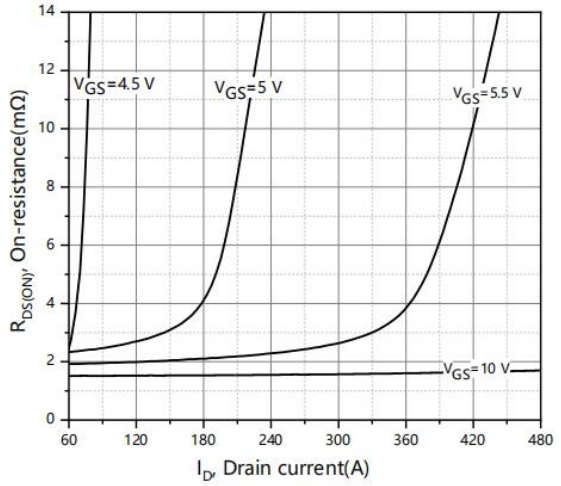


Figure 9. Drain-source on-state resistance

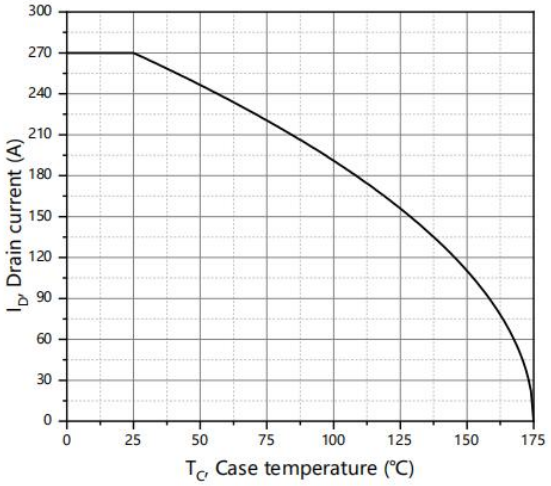


Figure 10. Drain current

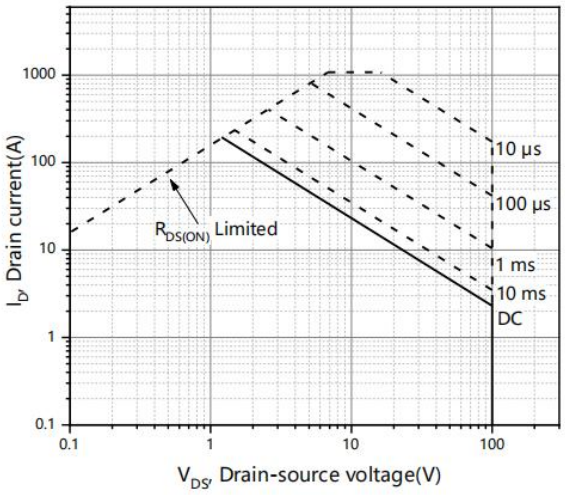


Figure 11. Safe operation area T_C=25℃

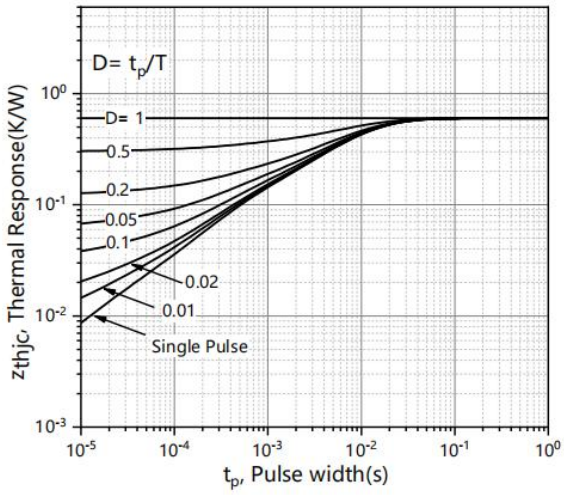


Figure 12. Max. transient thermal impedance

Test circuits and waveforms

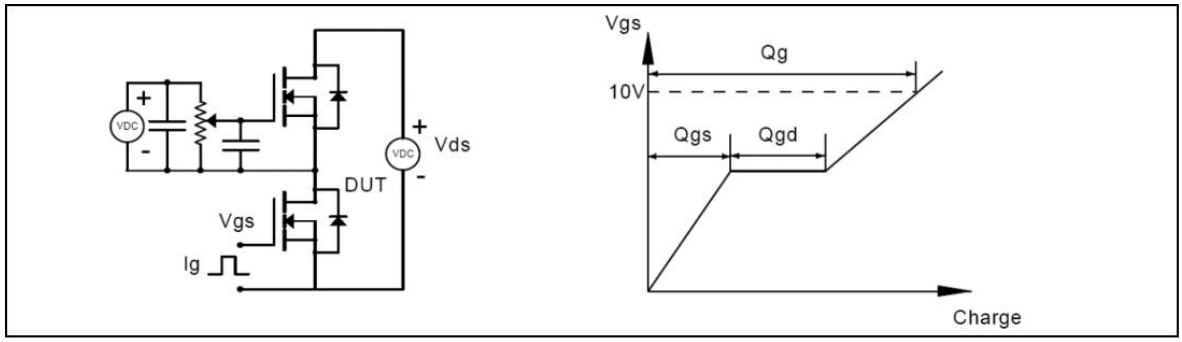


Figure 1. Gate charge test circuit & waveform

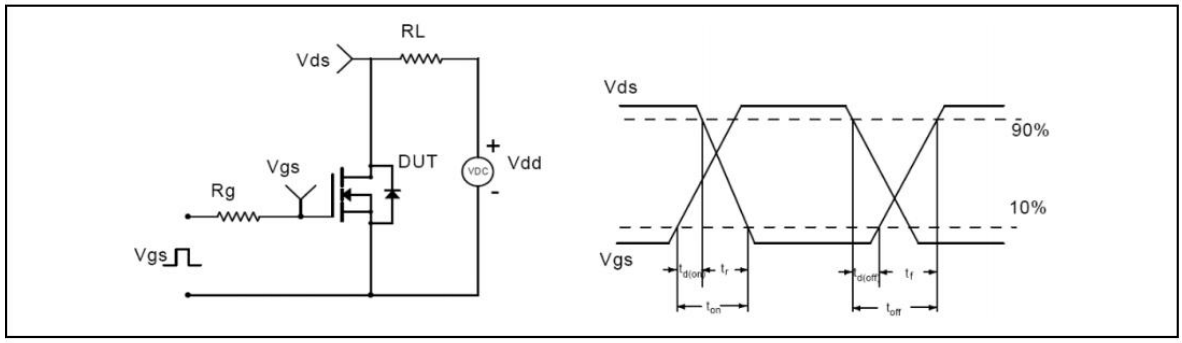


Figure 2. Switching time test circuit & waveforms

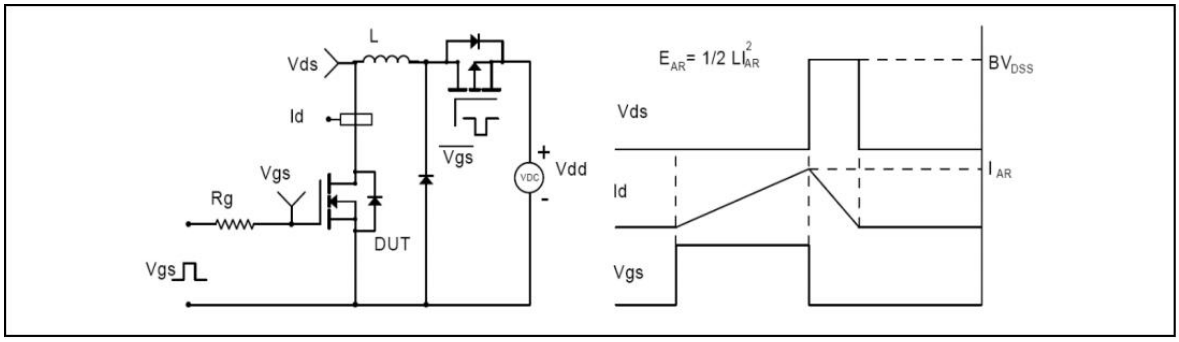


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

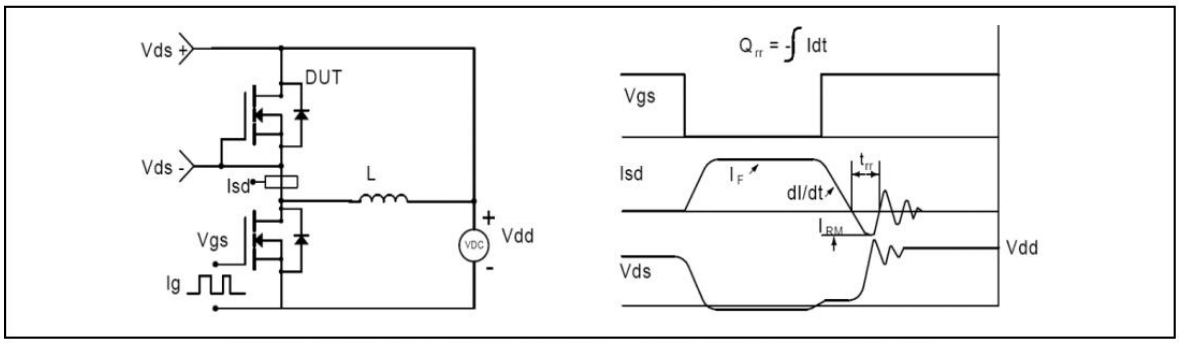
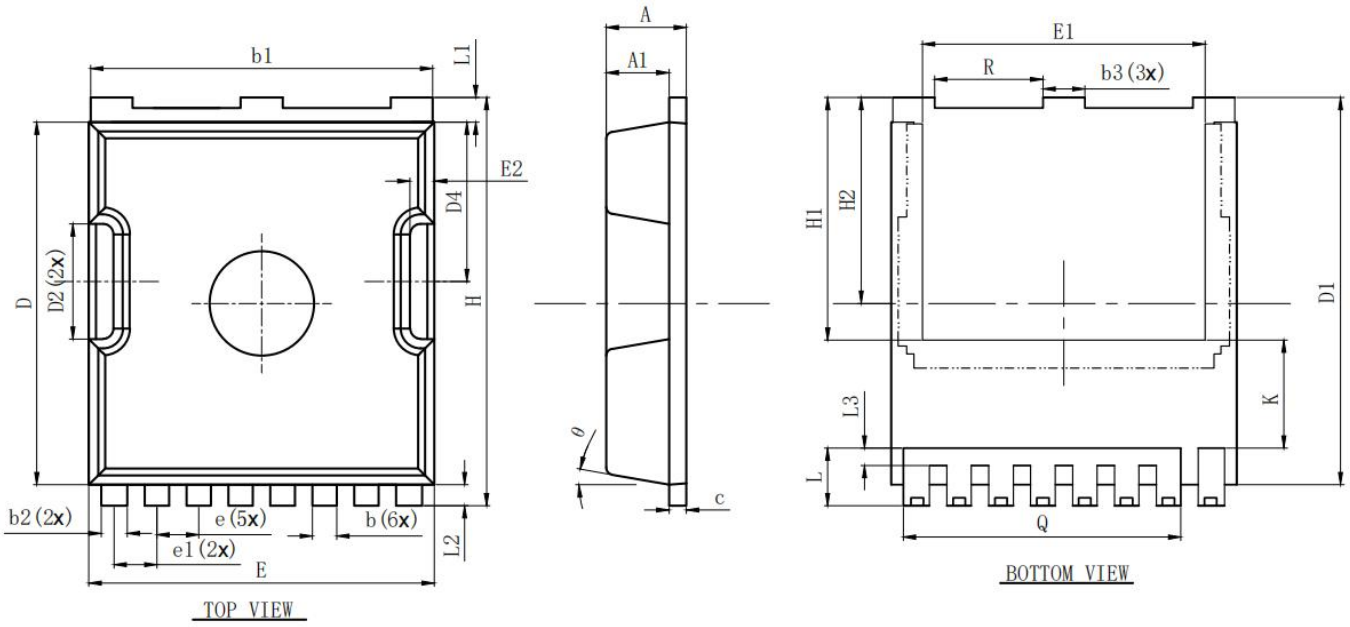
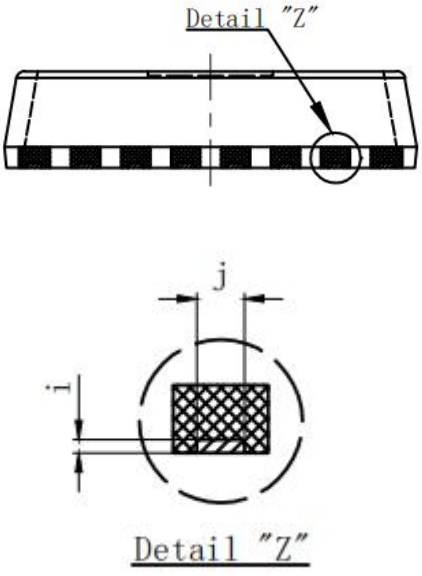


Figure 4. Diode reverse recovery test circuit & waveforms

Package Outline Dimensions





SYMBOL	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.200	2.300	2.400
A1	1.700	1.800	1.900
b	0.600	0.700	0.800
b1	9.700	9.800	9.900
b2	0.650	0.750	0.850
b3	1.100	1.200	1.300
c	0.400	0.500	0.600
D	10.300	10.400	10.500
D1	11.000	11.100	11.200
D2	3.200	3.300	3.400
D4	4.470	4.570	4.670
E	9.800	9.900	10.000
E1	8.000	8.100	8.200
E2	0.500	0.600	0.700
e	1.200 BSC		
e1	1.225 BSC		
H	11.600	11.700	11.800
H1	6.950 BSC		
H2	5.900 BSC		
i	0.100 REF.		
j	0.350 REF.		
K	3.100 REF.		
L	1.550	1.650	1.750
L1	0.600	0.700	0.800
L2	0.500	0.600	0.700
L3	0.400	0.500	0.600
Q	7.950 REF.		
R	3.000	3.100	3.200
θ	10° REF.		

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