

# PW080N10GS

Perfect MOS5 N-MOSFET 100V, 6.5mΩ, 85A



重庆平伟实业股份有限公司

## Features

- Uses PingWei advanced PerfectMOS5 technology
- Extremely low on-resistance  $R_{DS(on)}$
- Excellent  $Q_g \times R_{DS(on)}$  product(FOM)
- Excellent Low Ciss
- Qualified according to JEDEC criteria

## Benefits

- High robustness and reliability
- Increases maximum current capability
- Low power loss, high power density
- Easy paralleling

## Applications

- Synchronous Rectification for AC/DC Quick Charger
- Battery management
- UPS (Uninterruptible Power Supplies)

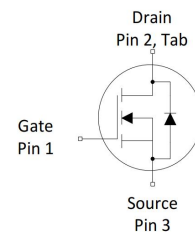
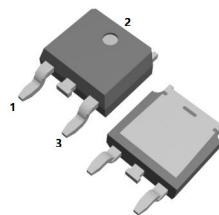


**100% DVDS Tested**  
**100% Avalanche Tested**

## Product Summary

$V_{DS}$	100V
$R_{DS(on)@10V}$ typ	6.5mΩ
$I_D$	85A

TO-252-2L



## Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
PW080N10GS	080N10GS	TO-252-2L	Tape&Reel	13 inches	16mm	2500pcs

## Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	$V_{DS}$	100	V
Continuous drain current	$I_D$	85	A
$T_C = 25^\circ\text{C}$ (Silicon limit)		100	
$T_C = 25^\circ\text{C}$ (Package limit)		54	
$T_C = 100^\circ\text{C}$ (Silicon limit)		9	
$T_a = 25^\circ\text{C}$			
Pulsed drain current ( $T_C = 25^\circ\text{C}$ , $t_p = 100\mu\text{s}$ )	$I_{D\ pulse}$	340	A
Avalanche energy, single pulse ( $L=0.5\text{mH}$ , $V_{ds}=50\text{V}$ )	$E_{AS}$	64	mJ
Gate-Source voltage	$V_{GS}$	$\pm 20$	V
Power dissipation	$P_{tot}$	105	W
$T_C = 25^\circ\text{C}$		1.1	
$T_a = 25^\circ\text{C}$			
Operating junction and storage temperature	$T_j, T_{stg}$	-55...+150	$^\circ\text{C}$
Soldering temperature, wave soldering only allowed at leads (1.6mm from case for 10s)	$T_{sold}$	260	$^\circ\text{C}$

## Thermal Resistance

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Thermal resistance, junction – case.	RthJC	-	0.75	1.2	°C/W	-
Thermal resistance, junction - ambient(min. footprint)	RthJA	-	-	113	°C/W	-

## Electrical Characteristic (at Tj = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		

## Static Characteristic

Drain-source breakdown voltage	$BV_{DSS}$	100	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate threshold voltage	$V_{GS(th)}$	2	-	4	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Zero gate voltage drain current	$I_{DSS}$	-	0.02	1	$\mu A$	$V_{DS}=100V, V_{GS}=0V$ $T_j=25^\circ C$ $T_j=150^\circ C$
Gate-source leakage current	$I_{GSS}$	-	$\pm 10$	$\pm 100$	nA	$V_{GS}=\pm 20V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	6.5	8.0	mΩ	$V_{GS}=10V, I_D=40A$
Transconductance	$g_{fs}$	-	45	-	S	$V_{DS}=5V, I_D=40A$

## Dynamic Characteristic

Input Capacitance	$C_{iss}$	-	2042	-	pF	$V_{GS}=0V, V_{DS}=50V,$ $f=1MHz$
Output Capacitance	$C_{oss}$	-	1002	-		
Reverse Transfer Capacitance	$C_{rss}$	-	75	-		
Gate Total Charge	$Q_G$	-	37	-	nC	$V_{DS}=50V, I_D=40A,$ $V_{GS}=10V$
Gate-Source charge	$Q_{gs}$	-	13	-		
Gate-Drain charge	$Q_{gd}$	-	3	-		
Turn-on delay time	$t_{d(on)}$	-	22	-	ns	$V_{GS}=10V, V_{DD}=50V,$ $R_{G\_ext}=10\Omega, I_D=13A$
Rise time	$t_r$	-	2	-		
Turn-off delay time	$t_{d(off)}$	-	44	-		
Fall time	$t_f$	-	5	-		
Gate resistance	$R_G$	-	1.5	-	Ω	$V_{GS}=0V, V_{DS}=0V,$ $f=1MHz$



## Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	$V_{SD}$	-	0.9	1.2	V	$V_{GS}=0V, I_{SD}=40A$
Body Diode Continuous Forward Current	$I_S$	-	-	85	A	$TC = 25^{\circ}C$
Body Diode Pulsed Current	$I_S$ pulse	-	-	340	A	$TC = 25^{\circ}C$
Body Diode Reverse Recovery Time	$t_{rr}$	-	62	-	ns	$I_F=1A, dI/dt=100A/\mu s$
Body Diode Reverse Recovery Charge	$Q_{rr}$	-	129	-	nC	



## Typical Performance Characteristics

Fig 1: Output Characteristics

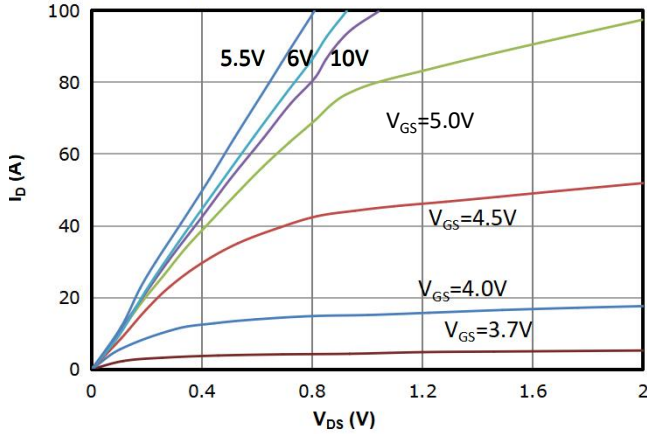


Fig 2: Transfer Characteristics

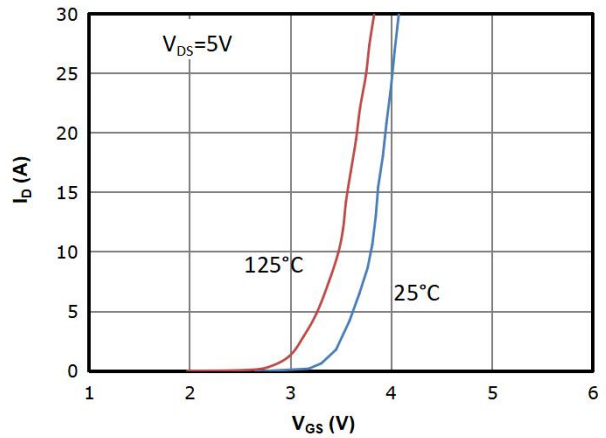


Fig 3:  $R_{DS(on)}$  vs Drain Current and Gate Voltage

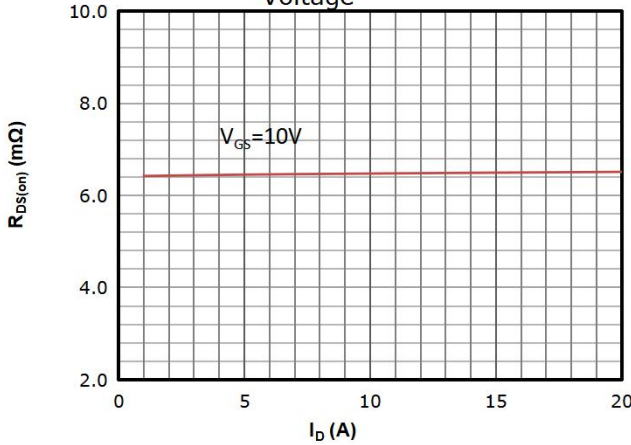


Fig 4:  $R_{DS(on)}$  vs Gate Voltage

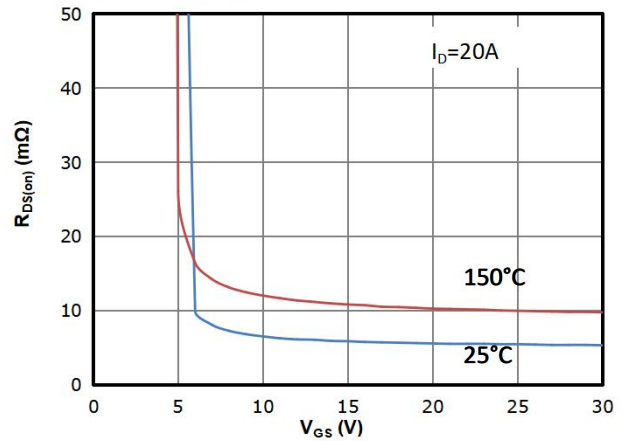


Fig 5:  $R_{DS(on)}$  vs. Temperature

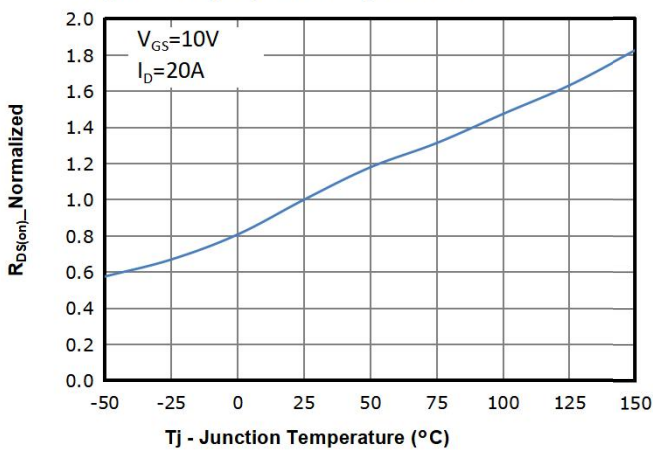


Fig 6:  $V_{GS(th)}$  vs. Temperature

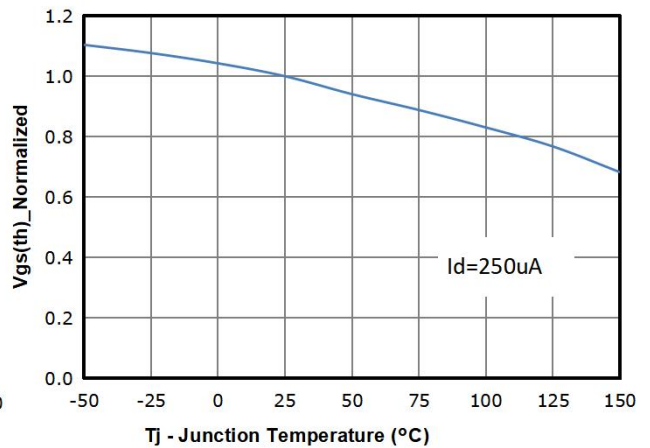




Fig 7: BVdss vs. Temperature

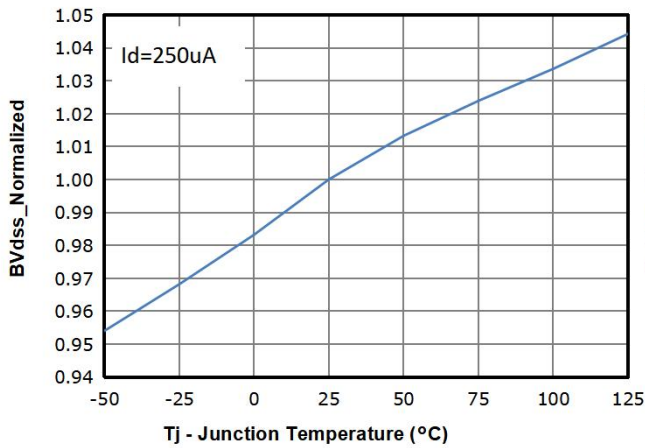


Fig 8: Capacitance Characteristics

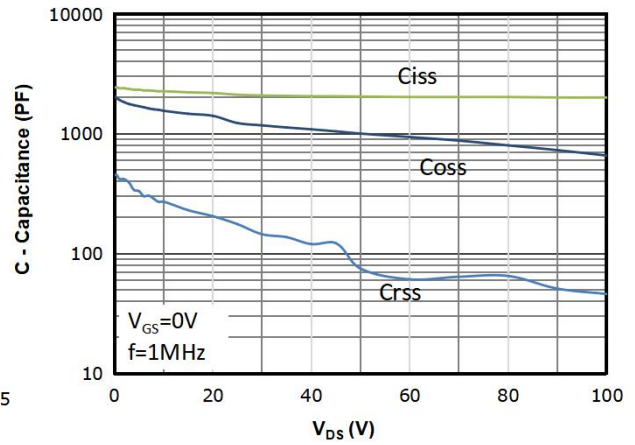


Fig 9: Gate Charge Characteristics

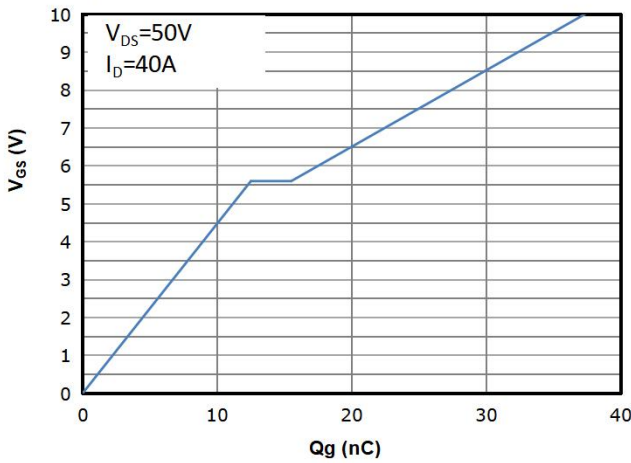


Fig 10: Body-diode Forward Characteristics

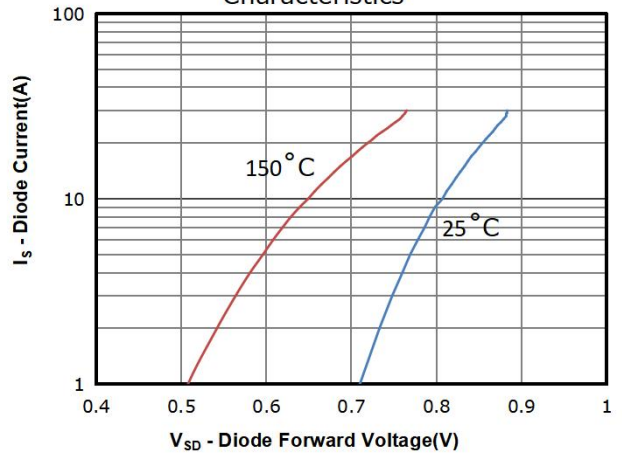


Fig 11: Power Dissipation

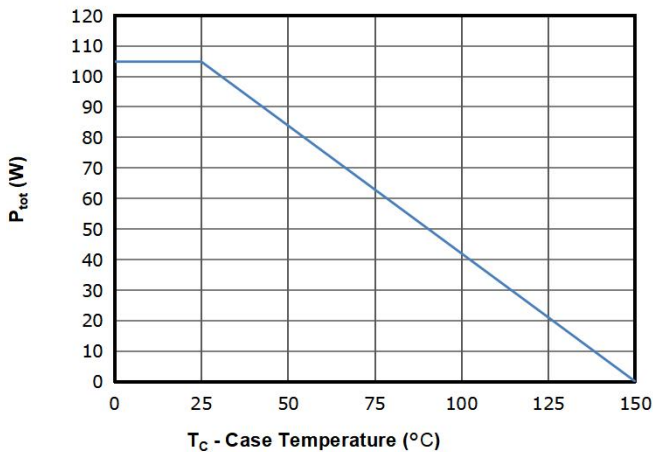


Fig 12: Drain Current Derating

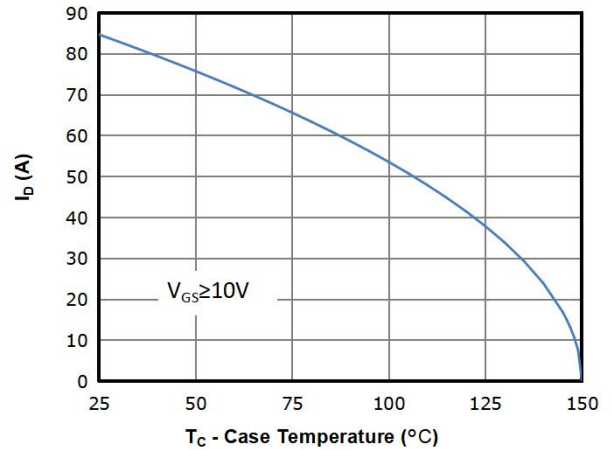




Fig 13: Safe Operating Area

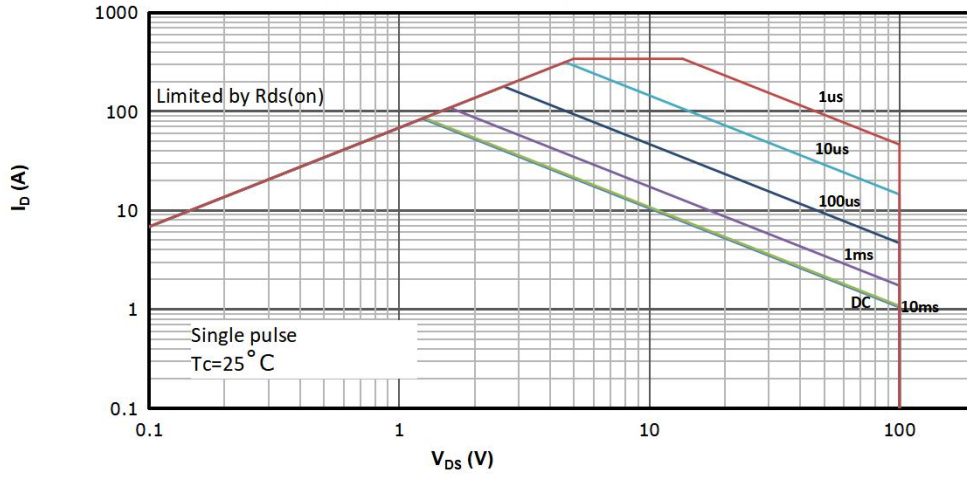
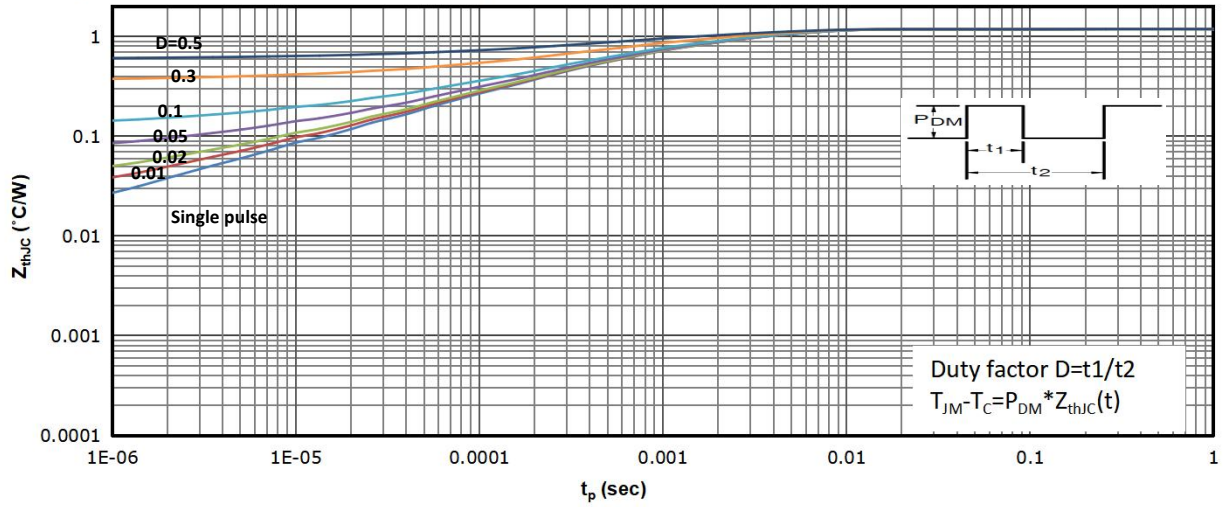


Fig 14: Max. Transient Thermal Impedance

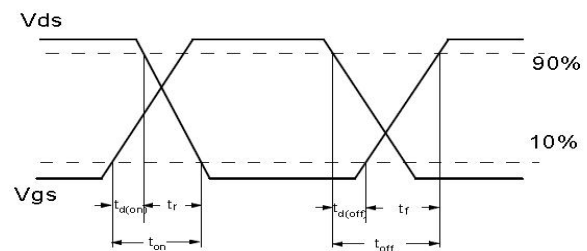


## Test Circuit & Waveform

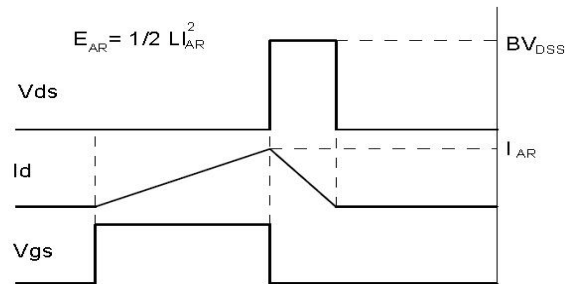
Gate Charge Test Circuit & Waveform



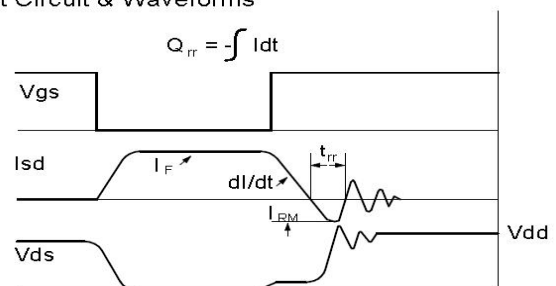
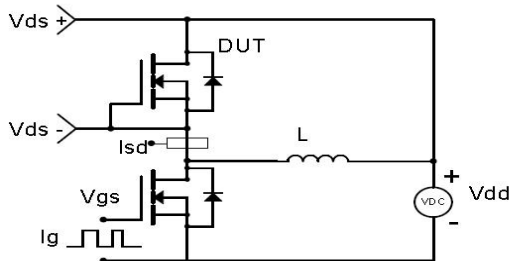
Resistive Switching Test Circuit & Waveforms



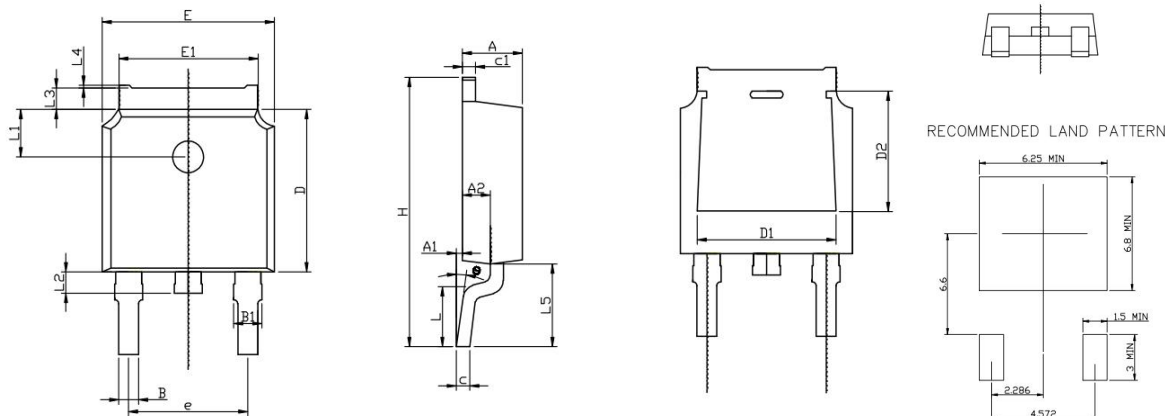
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



## Package Outline: TO-252-2L



UNIT: mm

SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.15	2.45	0.085	0.096
A1	0.05	0.20	0.002	0.008
A2	0.91	1.22	0.036	0.048
B	0.66	0.86	0.026	0.034
B1	0.93	1.23	0.037	0.048
C	0.40	0.60	0.016	0.024
C1	0.40	0.60	0.016	0.024
D	5.95	6.25	0.234	0.246
D1	4.80		0.189	
D2	3.80		0.150	
E	6.45	6.75	0.254	0.266
E1	5.12	5.52	0.202	0.217
L	1.65		0.065	
L1	1.58	1.98	0.062	0.078
L2	0.60	1.00	0.024	0.039
L3	0.70	1.00	0.028	0.039
L4	0.00	0.20	0.000	0.008
L5	2.80	3.40	0.110	0.134
H	9.80	10.40	0.386	0.409
θ	0.00	8.00	0.000	0.315
e	4.57		0.180	





## Revision History

Revision	Date	Major changes
1.0	2022/9/17	Release of Formal Version.

## Disclaimer

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