

Features

- Uses PingWei advanced PerfectMOS 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

Beneficts

- 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)

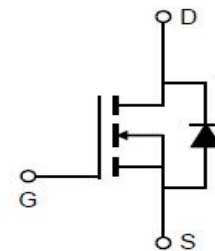
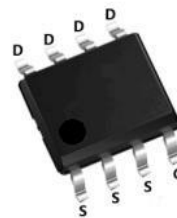


100% DVDS Tested
100% Avalanche Tested

Product Summary

V_{DS}	-40V
$R_{DS(on)}@10V$ typ	10.5mΩ
$R_{DS(on)}@4.5V$ typ	14.2mΩ
I_D	-11A

SOP-8



Package Marking and Ordering Informati

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
PW150P04PL	150P04PL	SOP-8	Tape&Reel	13 inches	12mm	3000pcs

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	-40	V
Continuous drain current $T_C = 25^\circ\text{C}$ (Silicon limit) $T_C = 25^\circ\text{C}$ (Package limit) $T_C = 100^\circ\text{C}$ (Silicon limit)	I_D	-11 -43 -7	A
Pulsed drain current ($T_C = 25^\circ\text{C}$, $t_p = 100\mu\text{s}$)	$I_{D \text{ pulse}}$	-44	A
Avalanche energy, single pulse ($L=0.5\text{mH}$, $V_{ds}=-32\text{V}$)	E_{AS}	83	mJ
Gate-Source voltage	V_{GS}	± 20	V
Power dissipation $T_C = 25^\circ\text{C}$	P_{tot}	3	W
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 - ambient(min. footprint)	RthJA	-	-	41	°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}	-40	-	-	V	V _{GS} =0V, I _D =-250uA
Gate threshold voltage	V _{GS(th)}	-1.0	-	-2.5	V	V _{DS} =V _{GS} , I _D =-250uA
Zero gate voltage drain current	I _{DSS}	-	-	-1	μA	V _{DS} =-40V, V _{GS} =0V
		-	-	-100		T _j =25°C T _j =150°C
Gate-source leakage current	I _{GSS}	-	±10	±100	nA	V _{GS} =±20V, V _{DS} =0V
Drain-source on-state resistance	R _{DS(on)}	-	10.5	15	mΩ	V _{GS} =-10V, I _D =-8A
		-	14.2	20		V _{GS} =-4.5V, I _D =-8A
Transconductance	g _{fs}	-	28	-	S	V _{DS} =-5V, I _D =-8A

Dynamic Characteristic

Input Capacitance	C _{iss}	-	3144	-	pF	V _{GS} =0V, V _{DS} =-20V, f=1MHz
Output Capacitance	C _{oss}	-	285	-		
Reverse Transfer Capacitance	C _{rss}	-	244	-		
Gate Total Charge	Q _G	-	28	-	nC	V _{DS} =-20V, I _D =-8A , V _{GS} =-10V
Gate-Source charge	Q _{gs}	-	8	-		
Gate-Drain charge	Q _{gd}	-	8.5	-		
Turn-on delay time	t _{d(on)}	-	38	-	ns	V _{GS} =-10V, V _{DD} =-15V, R _{G_ext} =3Ω, I _D =-8A
Rise time	t _r	-	31.0	-		
Turn-off delay time	t _{d(off)}	-	90	-		
Fall time	t _f	-	9.2	-		
Gate resistance	R _G	-	9.2	-	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}	-	-0.88	-1.2	V	$V_{GS}=0V, I_{SD}=-20A$
Body Diode Continuous Forward Current	I_S	-	-	-11	A	TC = 25°C
Body Diode Pulsed Current	I_S pulse	-	-	-44	A	TC = 25°C
Body Diode Reverse Recovery Time	t_{rr}	-	-	-	ns	-
Body Diode Reverse Recovery Charge	Q_{rr}	-	-	-	nC	

Typical Performance Characteristics

Fig 1: Output Characteristics

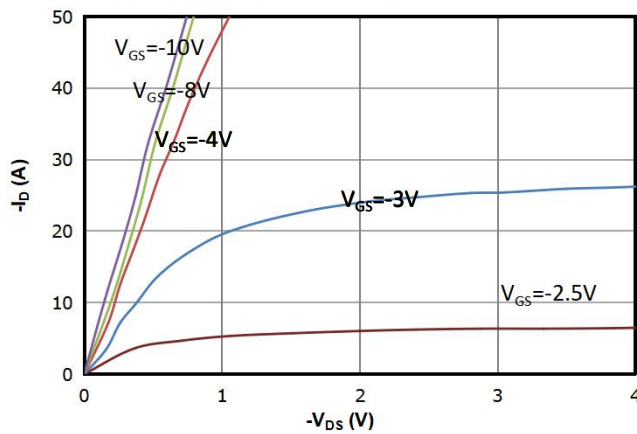


Fig 2: Transfer Characteristics

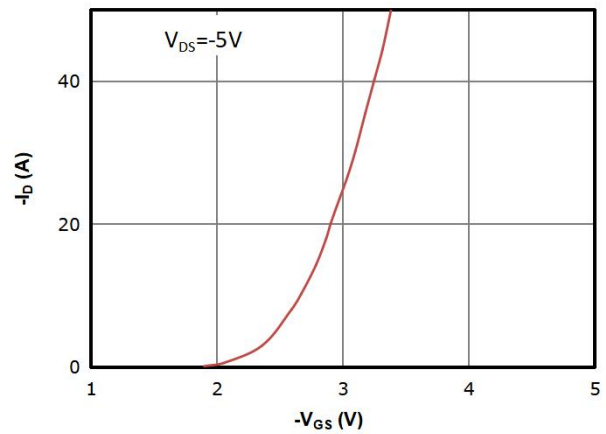


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

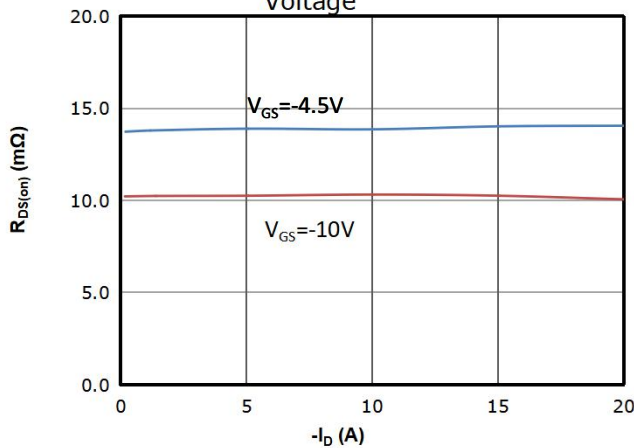


Fig 4: $R_{DS(on)}$ vs Gate Voltage

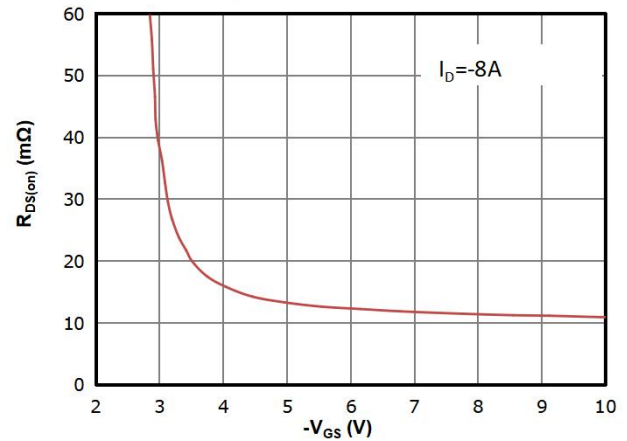


Fig 5: $R_{DS(on)}$ vs. Temperature

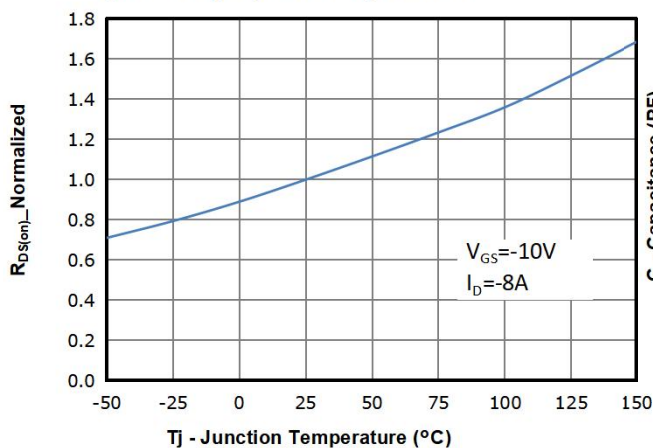


Fig 6: Capacitance Characteristics

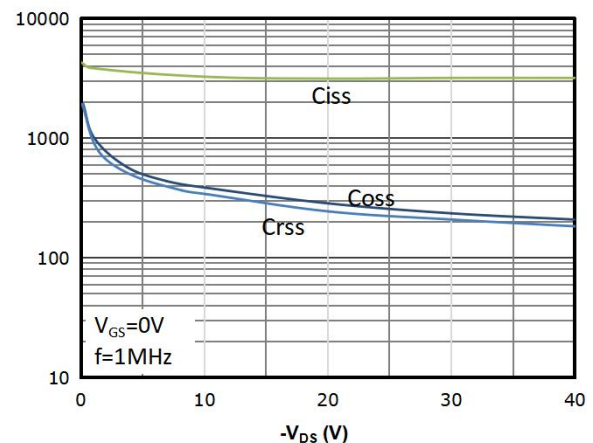


Fig7: Gate Charge Characteristics

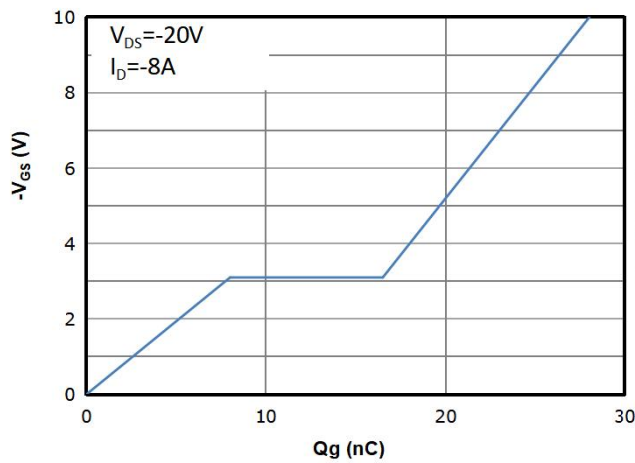


Fig 8: Body-diode Forward Characteristics

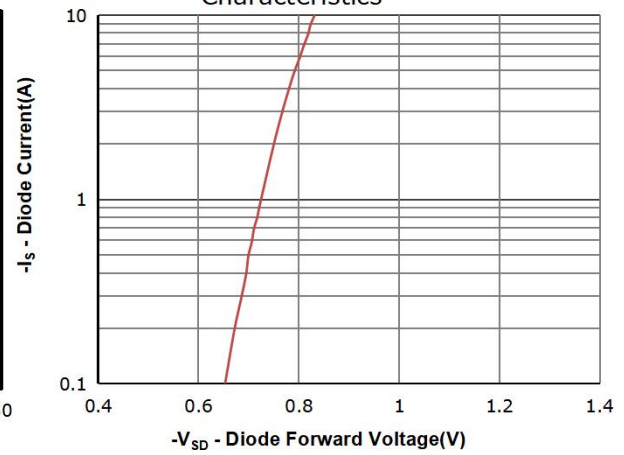


Fig 9: Power Dissipation

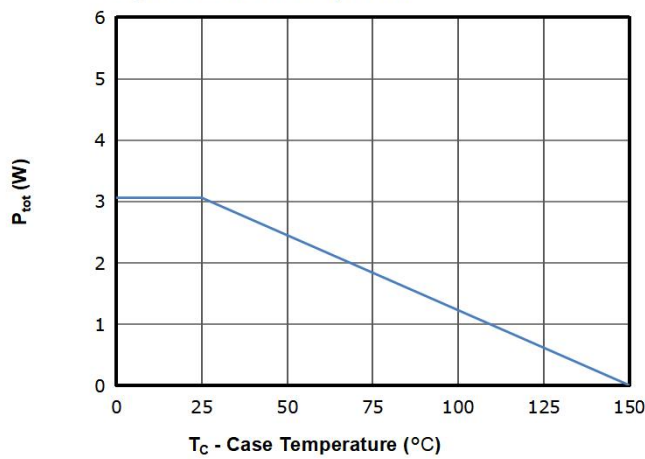


Fig 10: Drain Current Derating

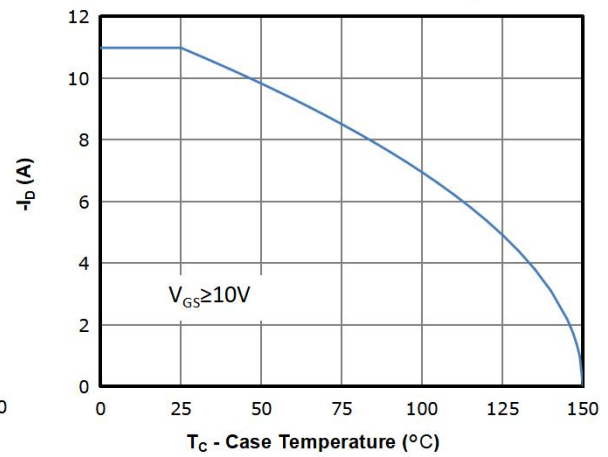


Fig 11: Safe Operating Area

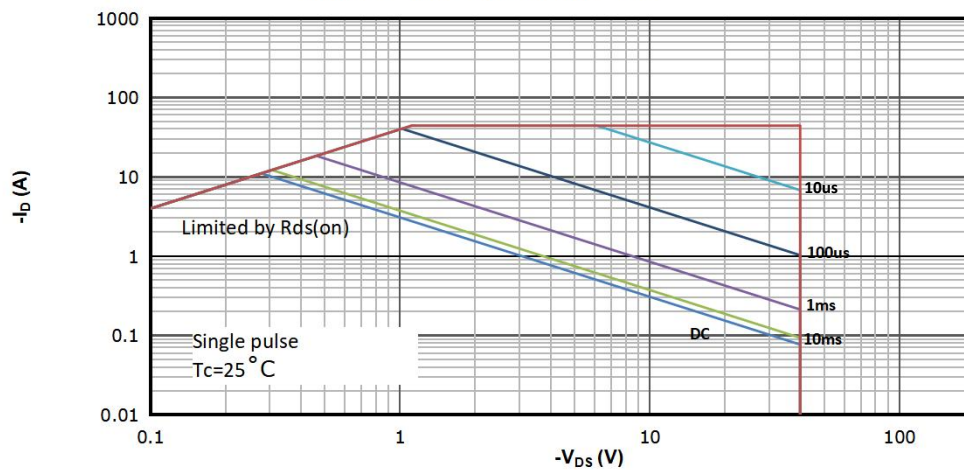
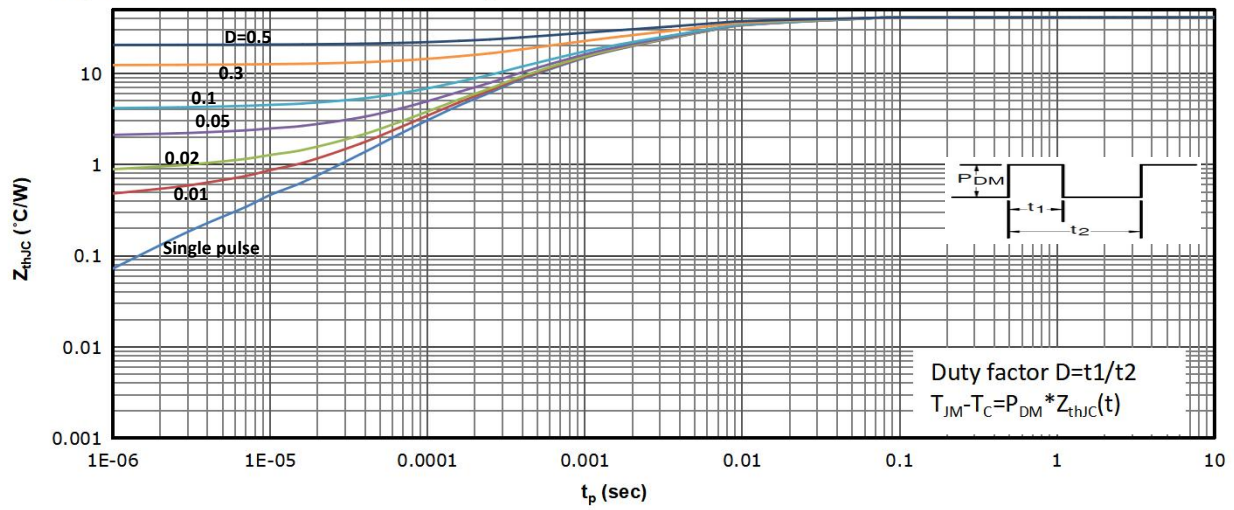
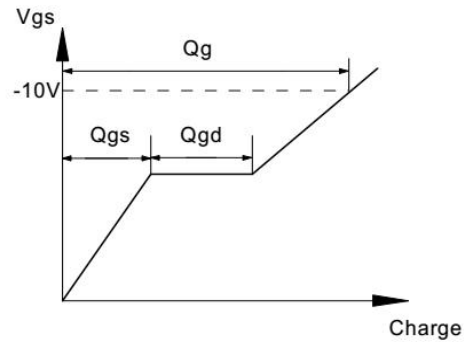
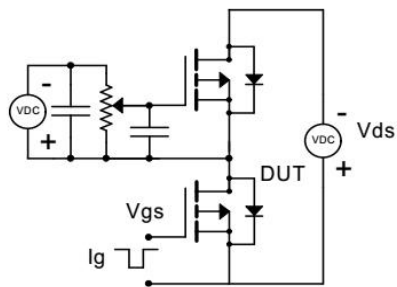


Fig 12: Max. Transient Thermal Impedance

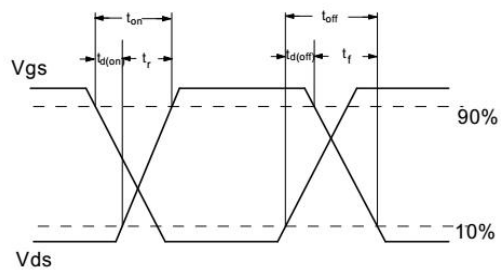
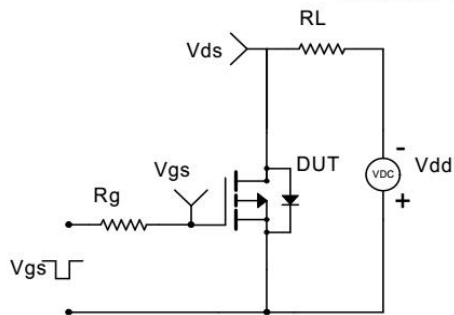


Test Circuit & Waveform

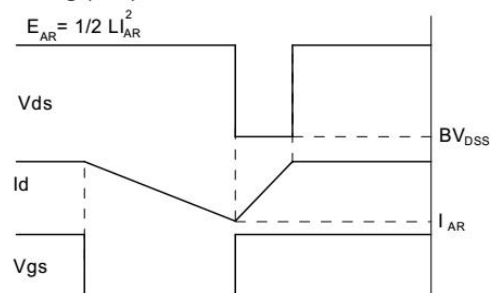
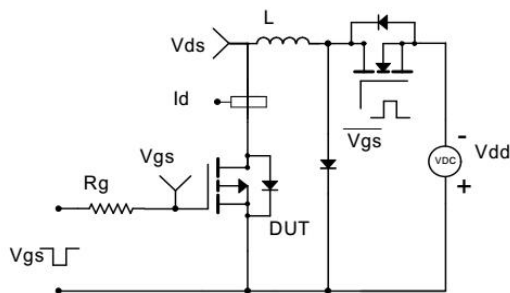
Gate Charge Test Circuit & Waveform



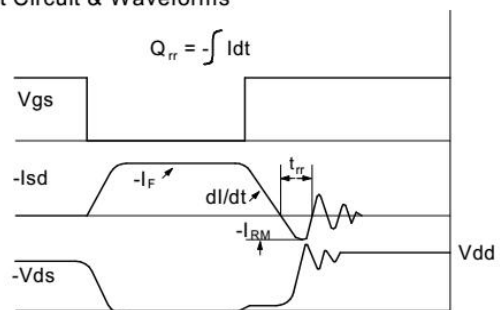
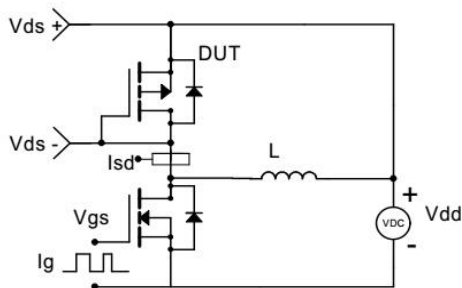
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

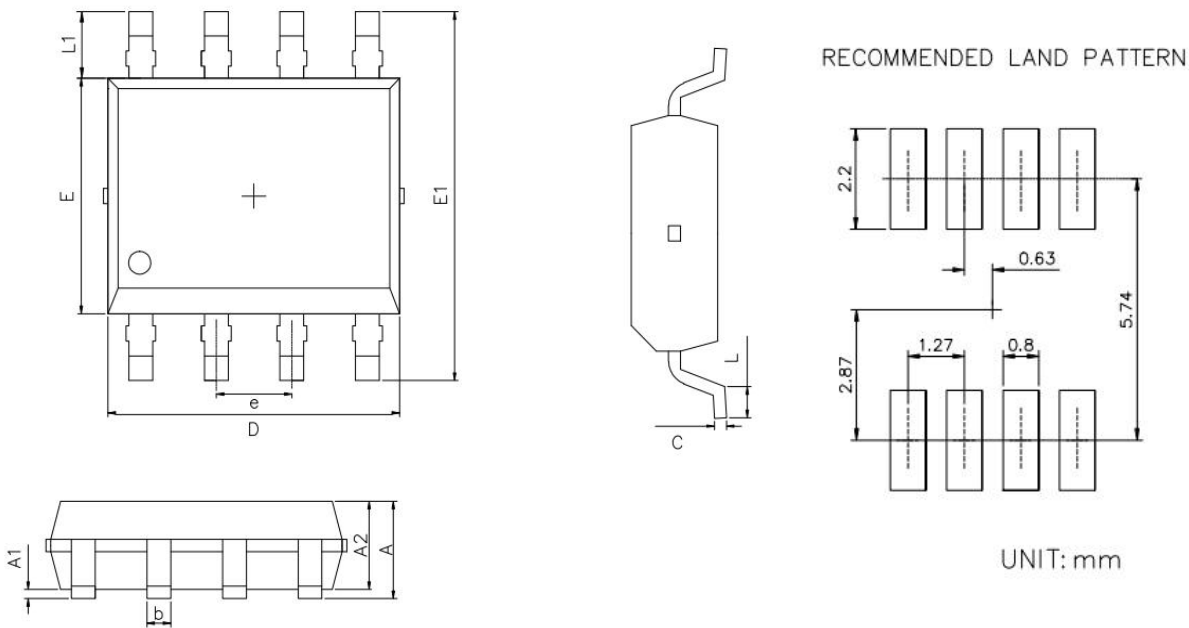


Diode Recovery Test Circuit & Waveforms





Package Outline: SOP-8



SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
A2	1.25	1.65	0.049	0.065
b	0.30	0.50	0.012	0.020
c	0.17	0.25	0.007	0.010
D	4.80	5.10	0.189	0.201
E	3.72	4.02	0.146	0.158
E1	5.95	6.25	0.234	0.246
e	1.27		0.050	
L	0.40	0.90	0.016	0.035
L1	0.92	1.22	0.036	0.048



Revision History

Revision	Date	Major changes
1.0	2023/3/7	Release of Formal Version.

Disclaimer

Any and all semiconductor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customer are solely responsible for providing adequate safe measures when design their systems.

Unless otherwise specified in the datasheet, the product is designed and qualified as a standard commercial product and is not intended for use in applications that require extraordinary levels of quality and reliability, such as automotive, aviation/aerospace and life-support devices or systems.

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