

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



100% DVDS Tested
100% Avalanche Tested

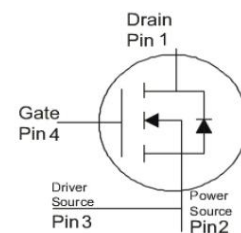
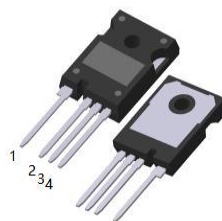
Applications

- PFC stages, hard switching PWM stages and resonant switching
- PWM stages for e.g. PC Silverbox, Adapter
- Lighting, Server, Telecom and UPS

Product Summary

V_{DS}	1200V
$R_{DS(on)}$	34mΩ
I_D	65A

TO-247-4L



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
SC042N120Y4-R	SC042N120Y4	TO-247-4L	Tube	N/A	N/A	30pcs

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	1200	V
Continuous drain current	I_D	65 46	A
$T_C = 25^\circ\text{C}$			
$T_C = 100^\circ\text{C}$			
Pulsed drain current ($T_C = 25^\circ\text{C}$)	$I_{D \text{ pulse}}$	259	A
Avalanche energy, single pulse ($L=5\text{mH}$)	E_{AS}	345	mJ
Gate-Source voltage,max.transient voltage	V_{GSmax}	-8/+22	V
Recommended operating values	V_{GSsop}	-5/+18	V
Power dissipation	P_{tot}	233	W
$T_C = 25^\circ\text{C}$			
Operating junction and storage temperature	T_j, T_{stg}	-55...+175	$^\circ\text{C}$
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.	R _{thJC}	-	-	0.6	°C/W	-
Thermal resistance, junction - ambient(min. footprint)	R _{thJA}	-	-	50.0	°C/W	-

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

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

Static Characteristic

Drain-source breakdown voltage	BV _{DSS}	1200	-	-	V	V _{GS} =0V, I _D =250uA
Gate threshold voltage	V _{GS(th)}	2.2	3.1	4.2	V	V _{DS} =V _{GS} , I _D =10mA
Zero gate voltage drain current	I _{DSS}	-	-	1 100	μA	V _{DS} =1200V, V _{GS} =0V T _j =25°C T _j =175°C
Gate-source leakage current	I _{GSS}	-	-	200	nA	V _{GS} =18V, V _{DS} =0V
		-	-	-100	nA	V _{GS} =-5V, V _{DS} =0V
Drain-source on-state resistance	R _{DS(on)}	-	34	42	Ω	V _{GS} =10V, I _D =30A
Transconductance	g _{fs}	-	23	-	S	V _{DS} =20V, I _D =30A

Dynamic Characteristic

Input Capacitance	C _{iss}	-	2230	-	pF	V _{GS} =0V, V _{DS} =30V, f=1MHz
Output Capacitance	C _{oss}	-	398	-		
Reverse Transfer Capacitance	C _{rss}	-	7	-		
Gate Total Charge	Q _G	-	44	-	nC	V _{DS} =750V, I _D =30A , V _{GS} =10V
Gate-Source charge	Q _{gs}	-	16	-		
Gate-Drain charge	Q _{gd}	-	18	-		
Turn-on delay time	t _{d(on)}	-	11	-	ns	V _{GS} =-5/18V, V _{DD} =800V, R _{G_ext} =5Ω, I _D =33A Timing relative to V _{DS}
Rise time	t _r	-	13	-		
Turn-off delay time	t _{d(off)}	-	25	-		
Fall time	t _f	-	9	-		
Gate resistance	R _G	-	1.4	-	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}	- -	3.4 3.2	5	V	$V_{GS}=0V, I_{SD}=30A$ $T_j=25^{\circ}C$ $T_j=175^{\circ}C$
Body Diode Continuous Forward Current	I_S	-	-	53	A	$TC = 25^{\circ}C$
Body Diode Pulsed Current	I_S pulse	-	-	212	A	$TC = 25^{\circ}C$
Body Diode Reverse Recovery Time	t_{rr}	-	16	-	ns	$V_{GS}=-5V, I_{SD}=33A,$ $V_R=800V$
Body Diode Reverse Recovery Charge	Q_{rr}	-	121	-	nC	$dI/dt=1200A/\mu s$

Typical Performance Characteristics

Fig 1: Output Characteristics $T_j=25^\circ\text{C}$

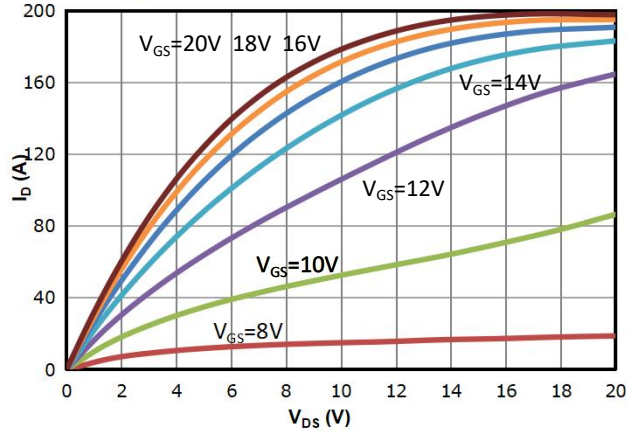


Fig 2: Output Characteristics $T_j=175^\circ\text{C}$

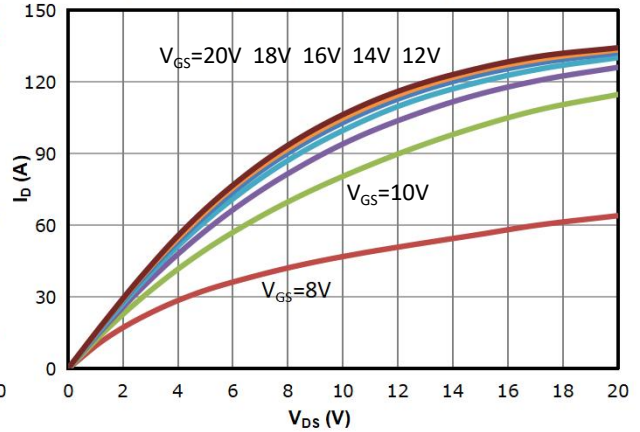


Fig 3: Transfer Characteristics

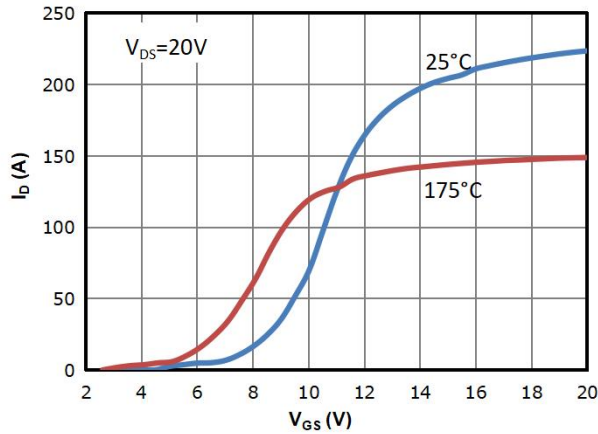


Fig 4: $R_{DS(on)}$ vs Drain Current and Gate Voltage

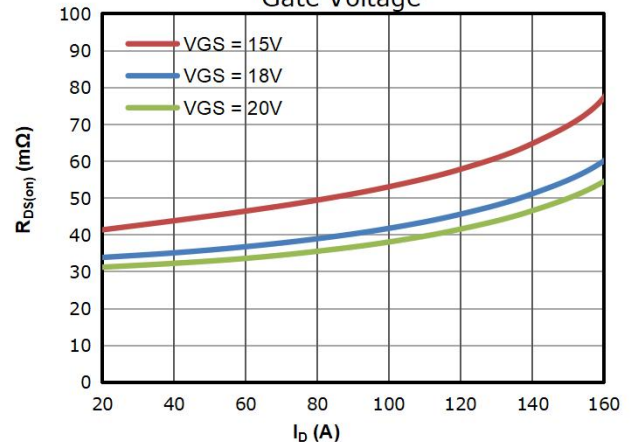


Fig 5: $R_{DS(on)}$ vs. Temperature

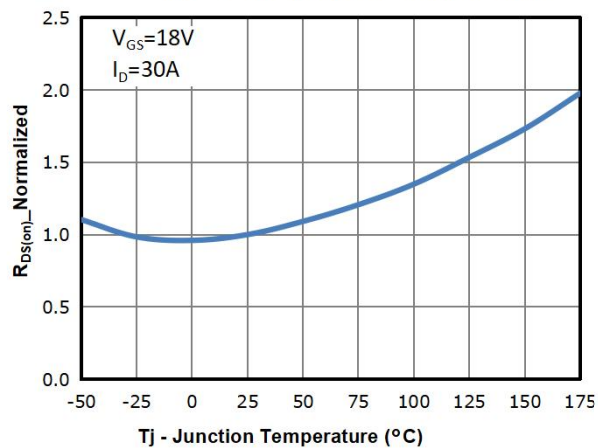


Fig 6: $V_{GS(th)}$ vs. Temperature

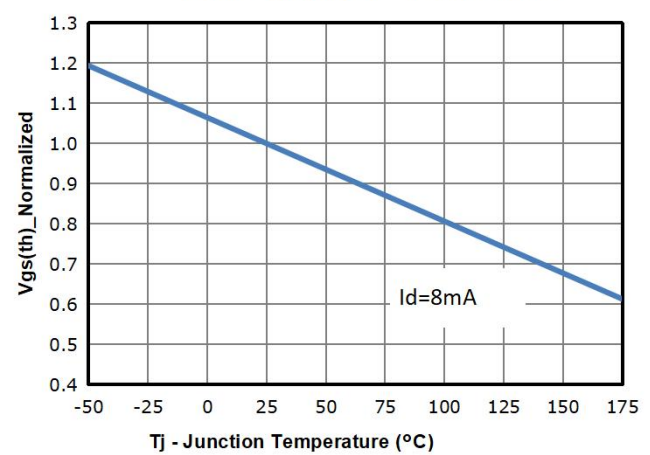


Fig 7: BVdss vs. Temperature

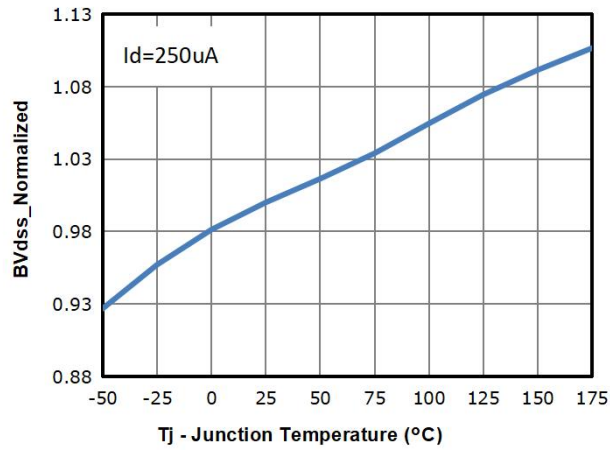


Fig 8: Capacitance Characteristics

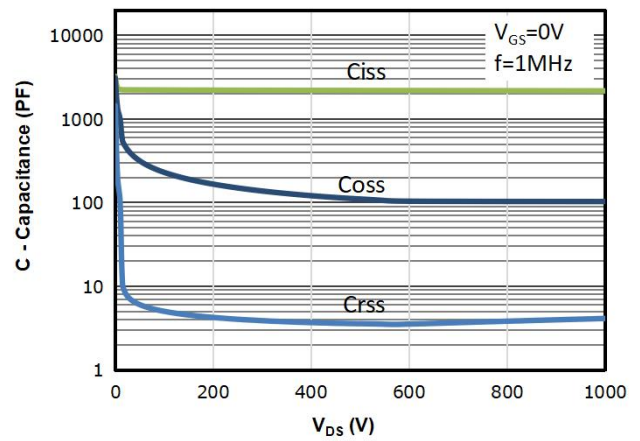


Fig 9: Gate Charge Characteristics

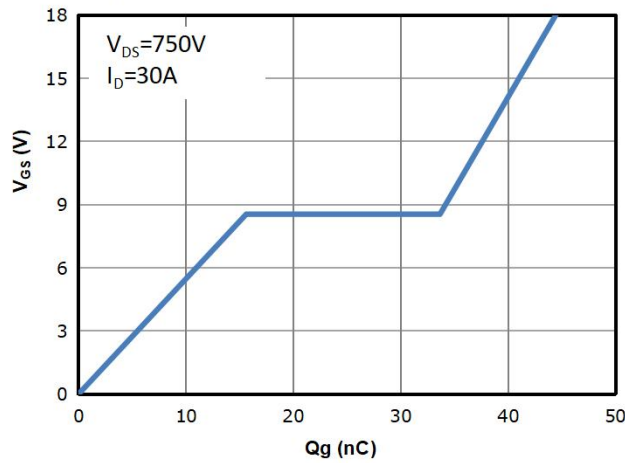


Fig 10: Body-diode Forward Characteristics

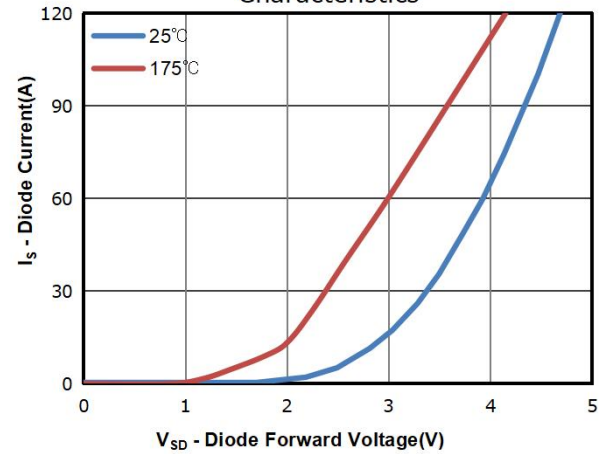


Fig 11: Power Dissipation

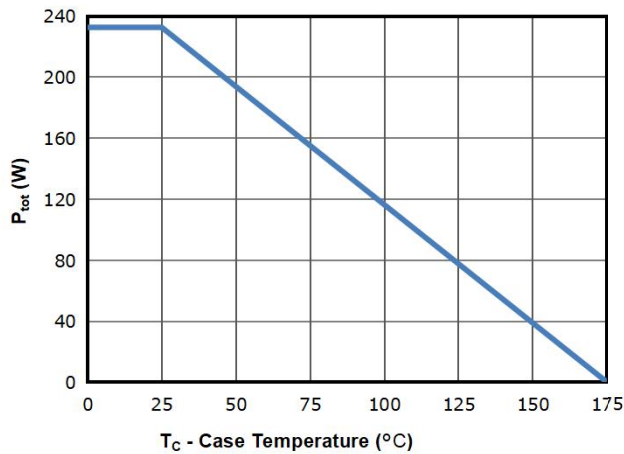


Fig 12: Drain Current Derating

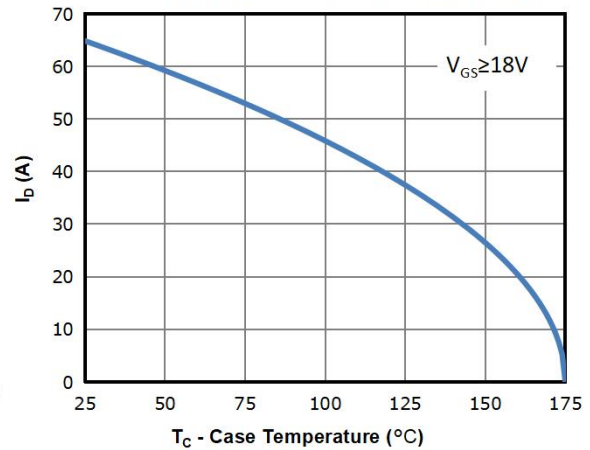


Fig 13: Safe Operating Area

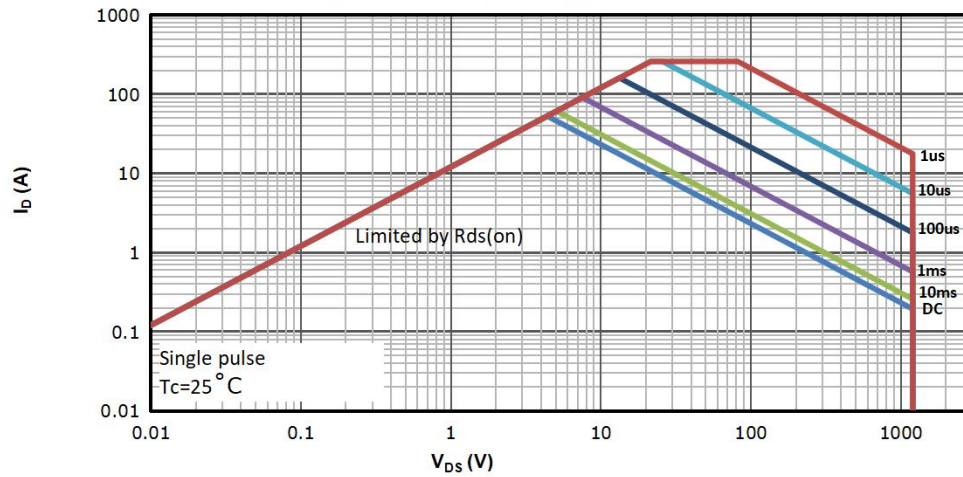
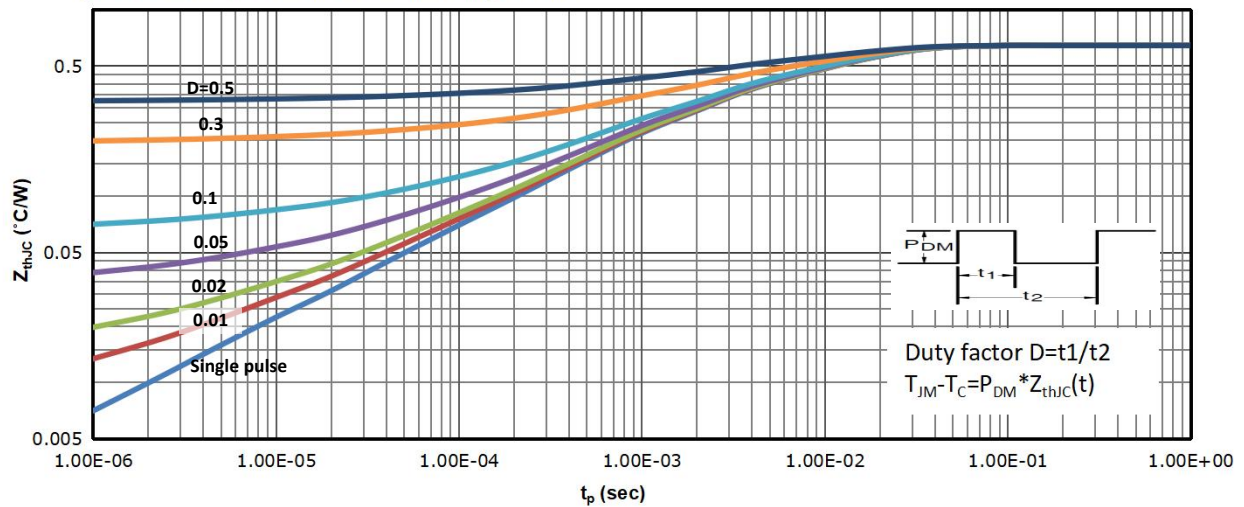
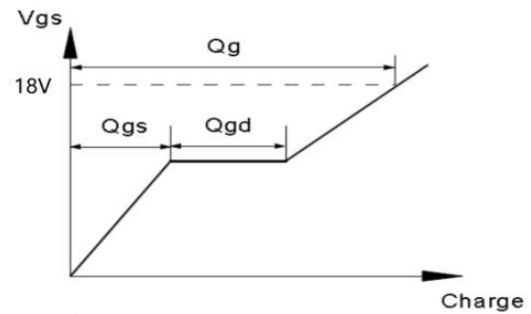
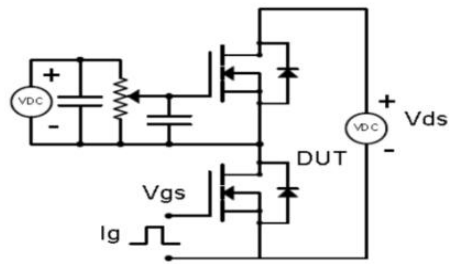


Fig 14: Max. Transient Thermal Impedance

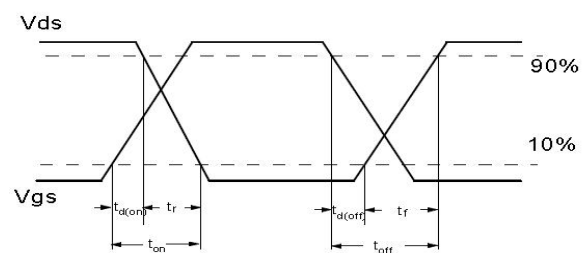
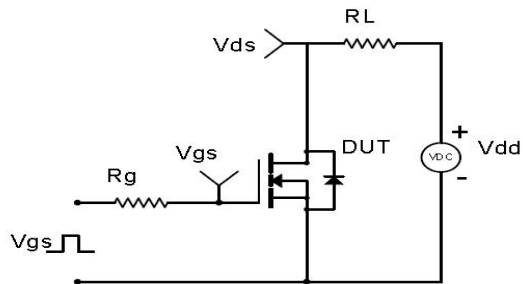


Test Circuit & Waveform

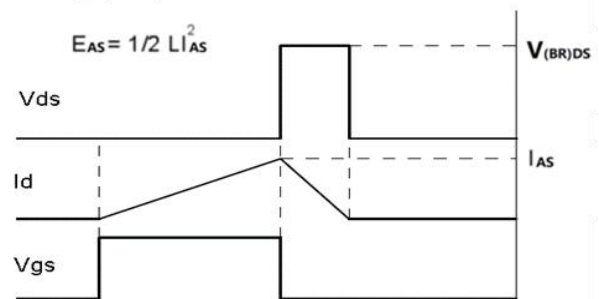
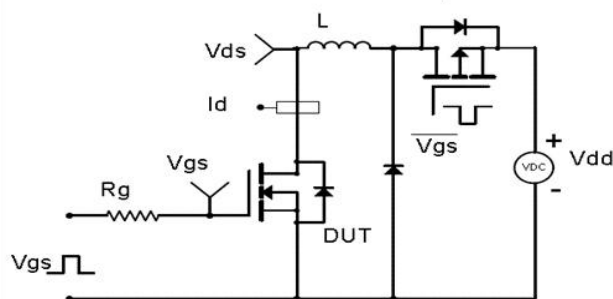
Gate Charge Test Circuit & Waveform



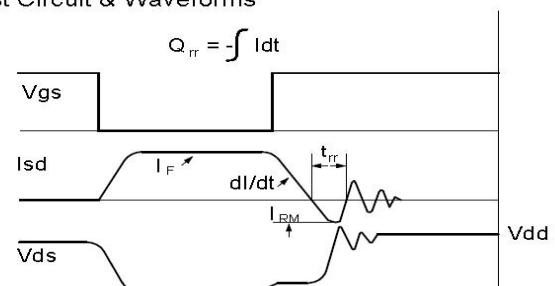
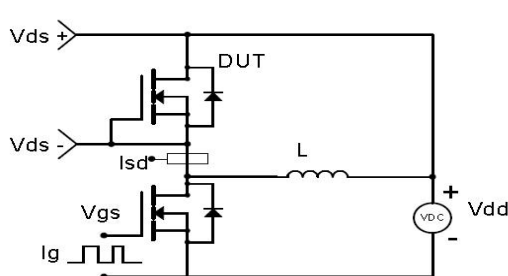
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

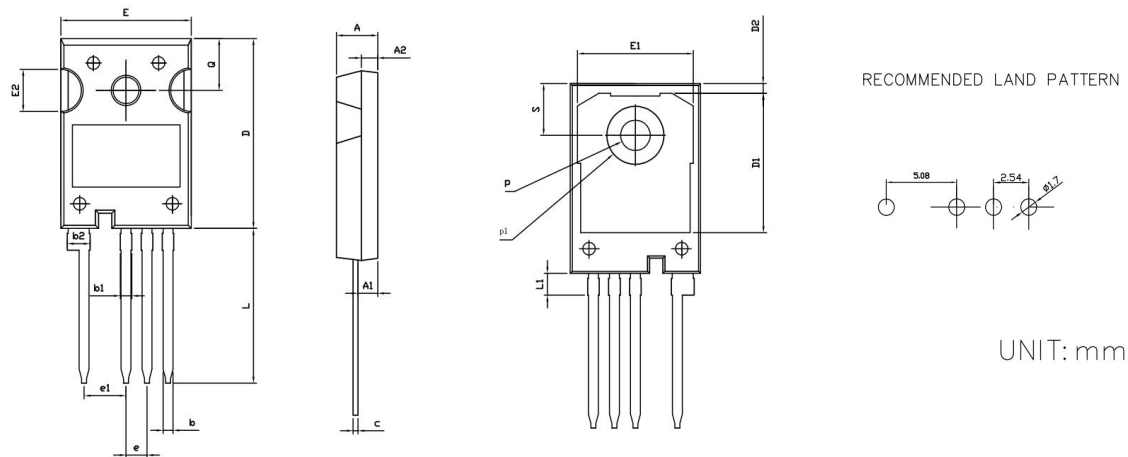


Diode Recovery Test Circuit & Waveforms





Package Outline: TO-247-4L



SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.80	5.20	0.189	0.205
A1	2.25	2.45	0.089	0.096
A2	1.85	2.15	0.073	0.085
b	1.05	1.35	0.041	0.053
b1	1.00	1.60	0.039	0.063
b2	2.35	2.95	0.093	0.116
c	0.50	0.70	0.020	0.028
D	22.34	22.74	0.880	0.895
D1	16.00	17.00	0.630	0.669
D2	0.97	1.37	0.038	0.054
e	2.34	2.74	0.092	0.108
e1	4.88	5.28	0.192	0.208
E	15.60	16.00	0.614	0.630
E1	13.50	14.50	0.531	0.571
E2	4.80	5.20	0.189	0.205
L	18.08	18.68	0.712	0.735
L1	2.38	2.78	0.094	0.109
p	3.50	3.70	0.138	0.146
p1	6.60	7.00	0.260	0.276
Q	6.00	6.30	0.236	0.248
S	6.00	6.30	0.236	0.248

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.

Buyer is responsible for its products and applications using PingWei products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by PingWei.

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