PW120N10ES

Perfect MOS5 N-MOSFET 100V, 10mΩ, 60A

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 $Q_g x R_{DS(on)}$ 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 paralleing

Applications

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

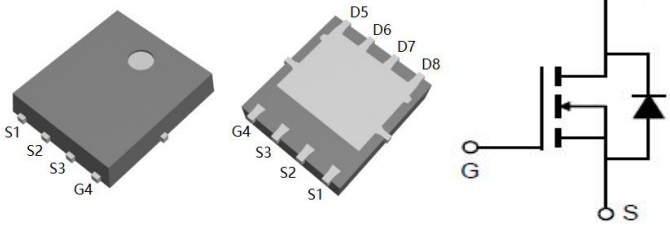
100% DVDS Tested

100% AvalancheTested

Product Summary

V_{DS}	100V
$R_{DS(on)@10V\ typ}$	10mΩ
I_D	60A

DFN5x6



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
PW120N10ES	120N10ES	DFN5x6	Tape&Reel	13 inches	12mm	5000pcs

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	100	V
Continuous drain current T_C = 25°C (Silicon limit) T_C = 25°C (Package limit) T_C = 100°C (Silicon limit) Ta = 25°C	I_D	 63 60 40 8	A
Pulsed drain current (T_C = 25°C, t_p =100uS)	$I_{D\ pulse}$	240	A
Avalanche energy, single pulse (L=0.5mH，Vds=50V)	E_{AS}	36	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation T_C = 25°C Ta = 25°C	P_{tot}	 83 1.4	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+150	°C
Soldering temperature, wave soldering only allowed at leads (1.6mm from case for 10s)	Tsold	260	°C

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Thermal Resistance

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Thermal resistance, junction – case.	RthJC	-	1.27	1.5	°C/W	-
Thermal resistance, junction - ambient(min. footprint)	RthJA	-	-	91	°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=250uA
Gate threshold voltage	$V_{GS(th)}$	2	-	4	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	- -	0.02 -	1 100	μA	V_{DS}=100V,V_{GS}=0V 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	$R_{DS(on)}$	-	10.0	12.0	mΩ	Vgs=10V,Id=20A
Transconductance	g_{fs}	-	26	-	S	V_{DS}=5V,I_D=20A
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	1251	-	pF	V_{GS}=0V, V_{DS}=50V, f=1MHz
Output Capacitance	C_{oss}	-	434	-		
Reverse Transfer Capacitance	C_{rss}	-	30	-		
Gate Total Charge	Q_G	-	24	-	nC	Vds=80V,Id=20A ,Vgs=10V
Gate-Source charge	Q_{gs}	-	7	-		
Gate-Drain charge	Q_{gd}	-	9	-		
Turn-on delay time	$t_{d(on)}$	-	12	-	ns	V_{GS}=10V, V_{DD}=50V, R_{G_ext}=5Ω,I_D=20A
Rise time	t_r	-	38	-		
Turn-off delay time	$t_{d(off)}$	-	20	-		
Fall time	t_f	-	6	-		
Gate resistance	R_G	-	1.3	-	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz

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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	Is	-	-	60	A	TC = 25°C
Body Diode Pulsed Current	Is pulse	-	-	240	A	TC = 25°C
Body Diode Reverse Recovery Time	t_{rr}	-	56	-	ns	V_R=45V,I_F=5A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge	Q_{rr}	-	139	-	nC	

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Typical Performance Characteristics

Fig 1: Output Characteristics

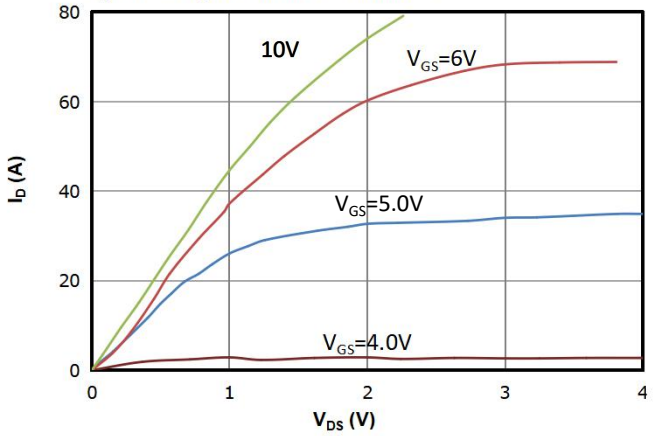

Fig 2: Transfer Characteristics

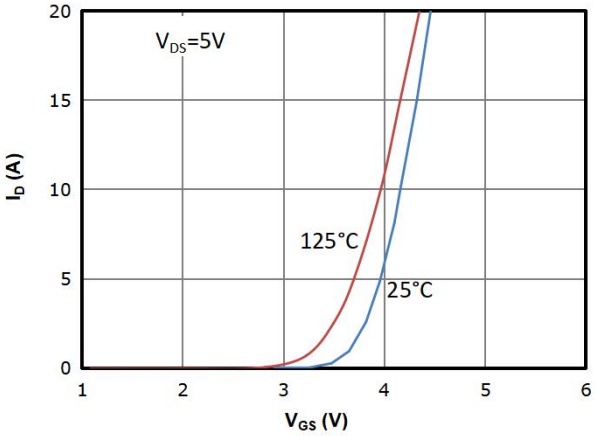

Fig 3: Rds(on) vs Drain Current and Gate Voltage

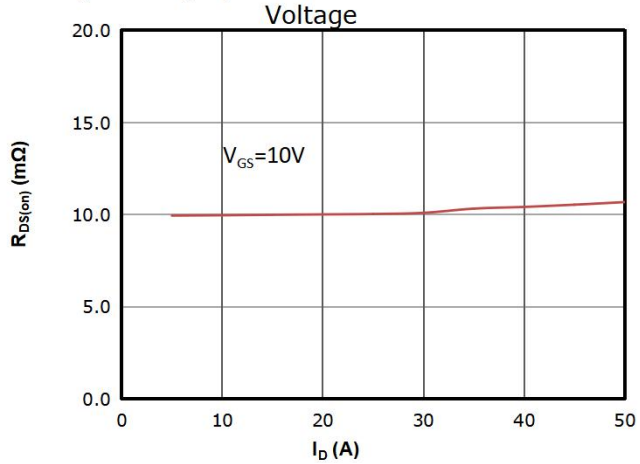

Fig 4: Rds(on) vs Gate Voltage

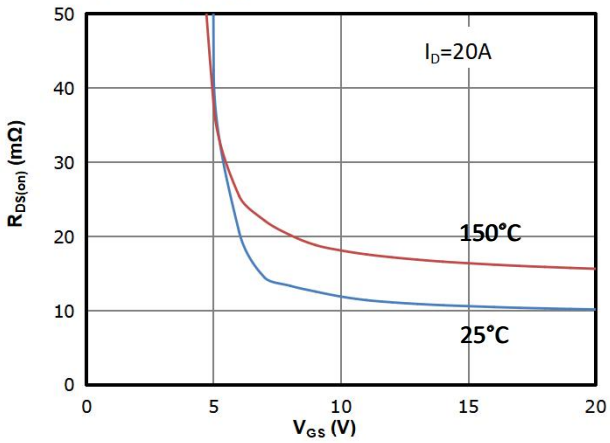

Fig 5: Rds(on) vs. Temperature

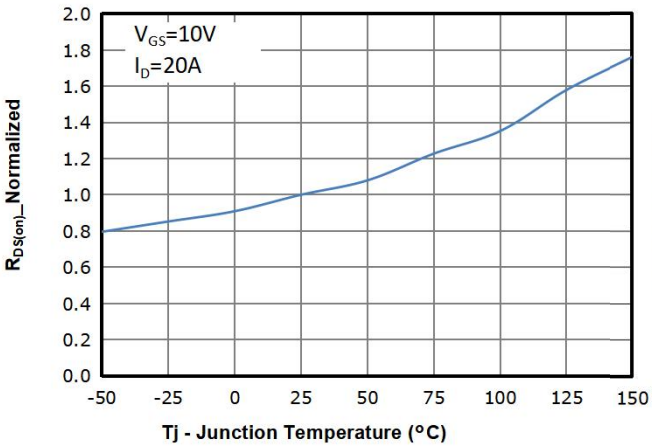

Fig 6: Vgs(th) vs. Temperature

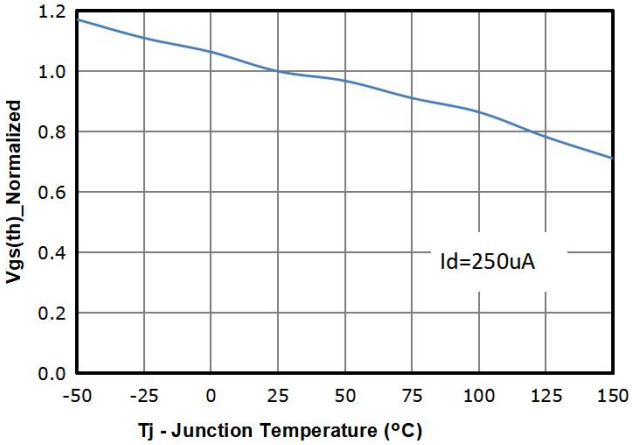

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Fig 7: BVdss vs. Temperature

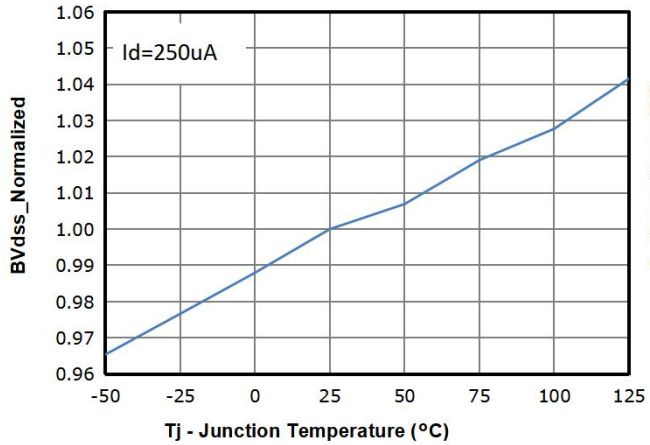


Fig 8: Capacitance Characteristics

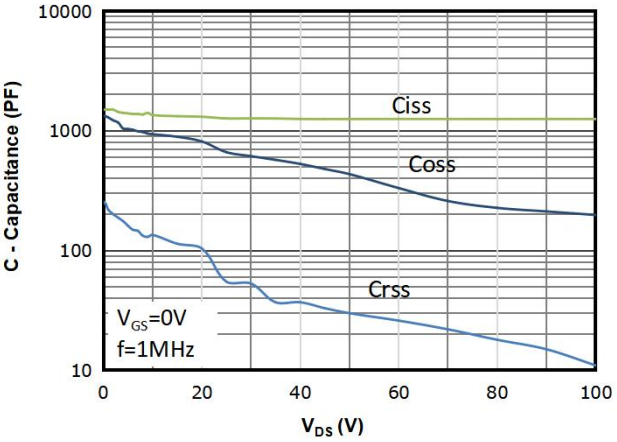


Fig 9: Gate ChargeCharacteristics

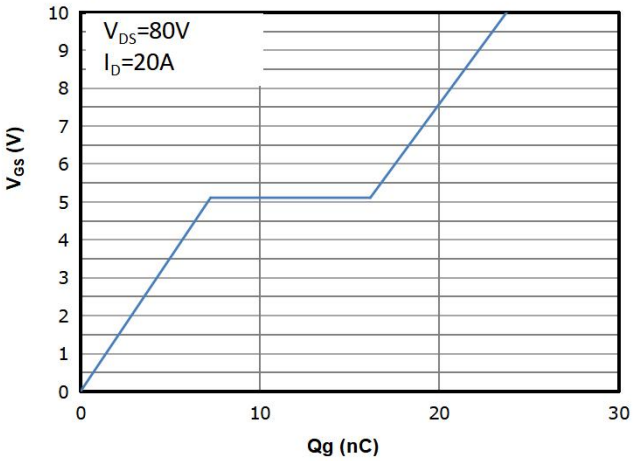


Fig 10: Body-diode Forward Characteristics

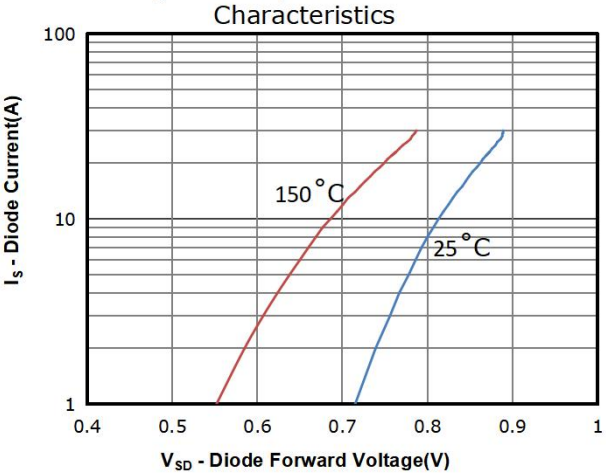


Fig 11: Power Dissipation

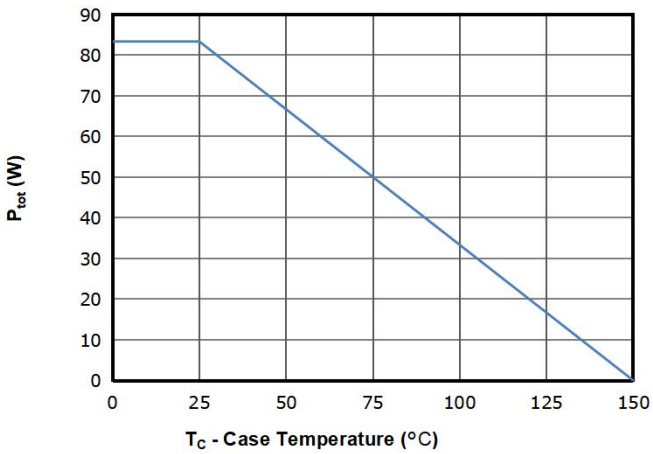


Fig 12: Drain Current Derating

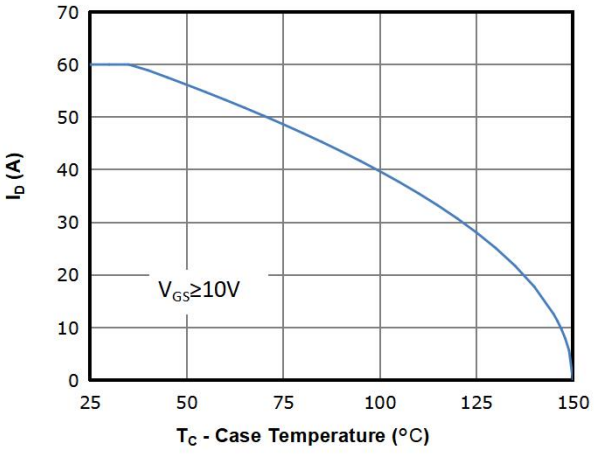


Fig 13: Safe Operating Area

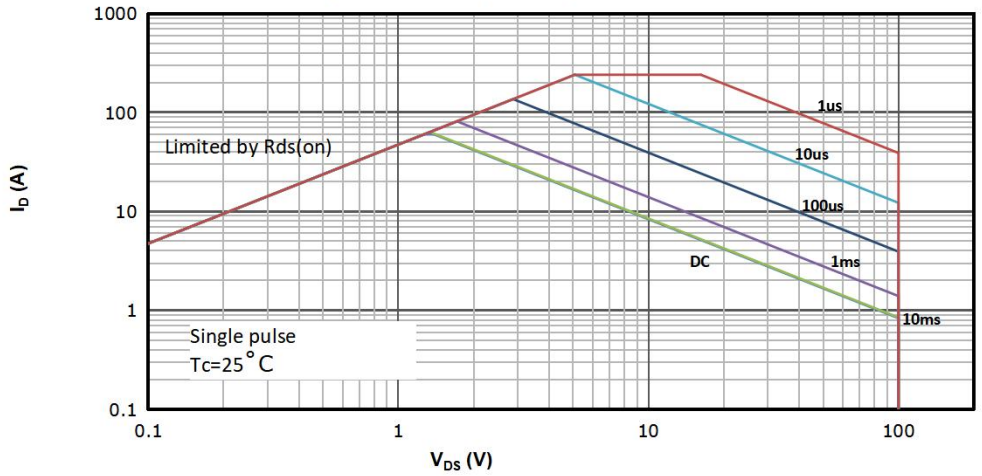
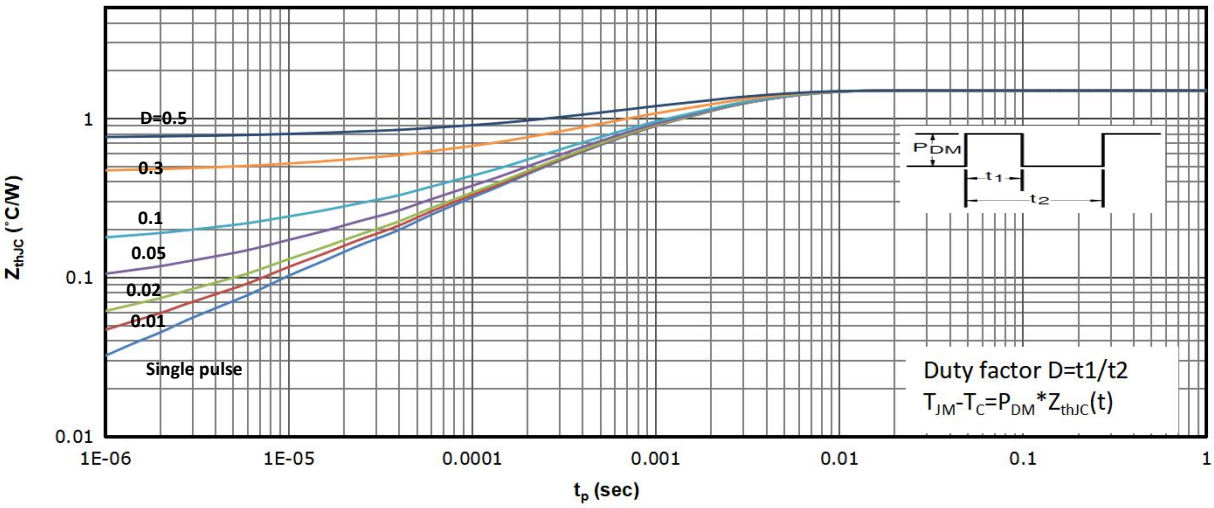
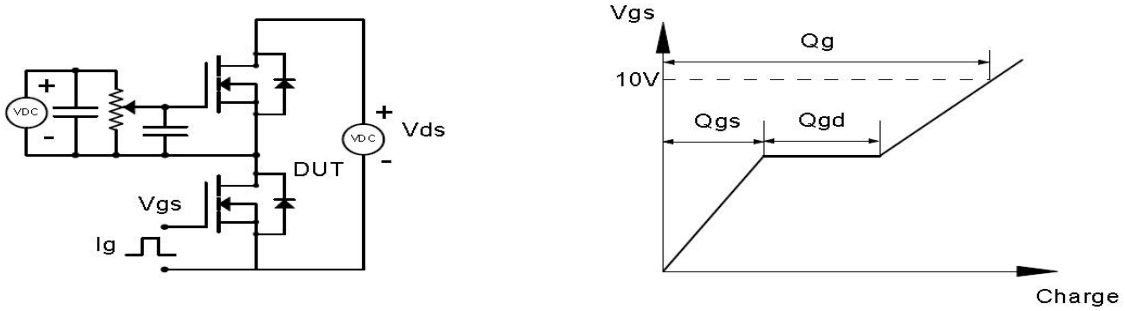


Fig 14: Max. Transient Thermal Impedance

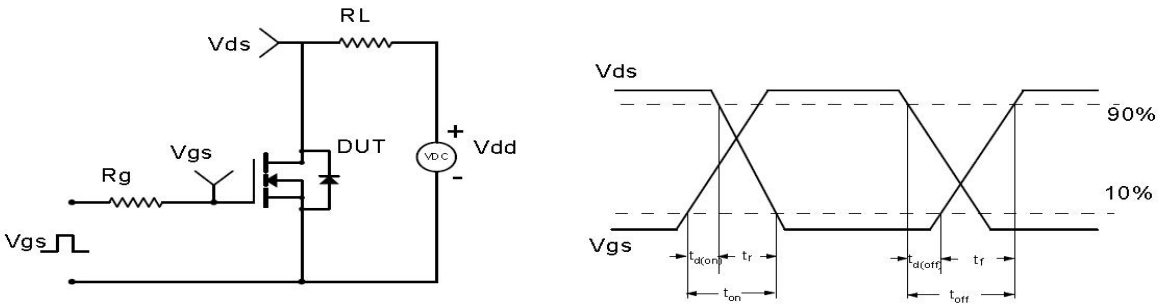


Test Circuit & Waveform

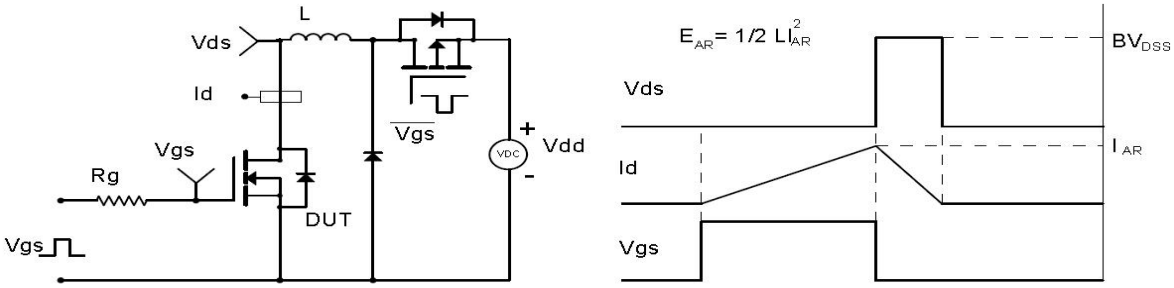
Gate Charge Test Circuit & Waveform



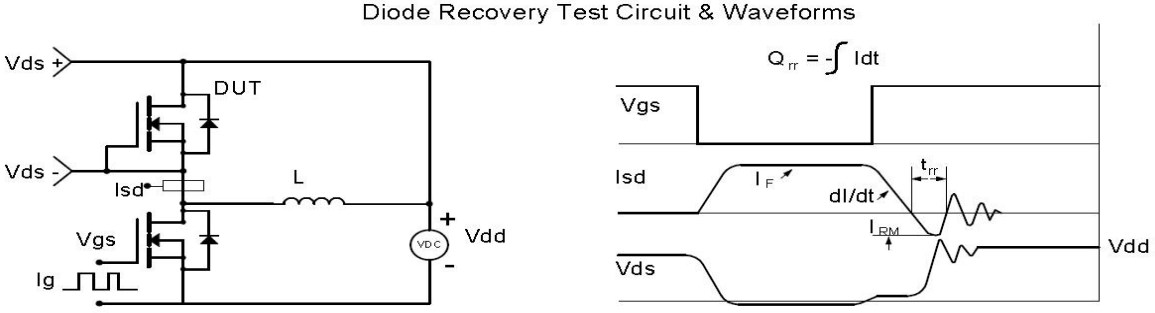
Resistive Switching Test Circuit & Waveforms



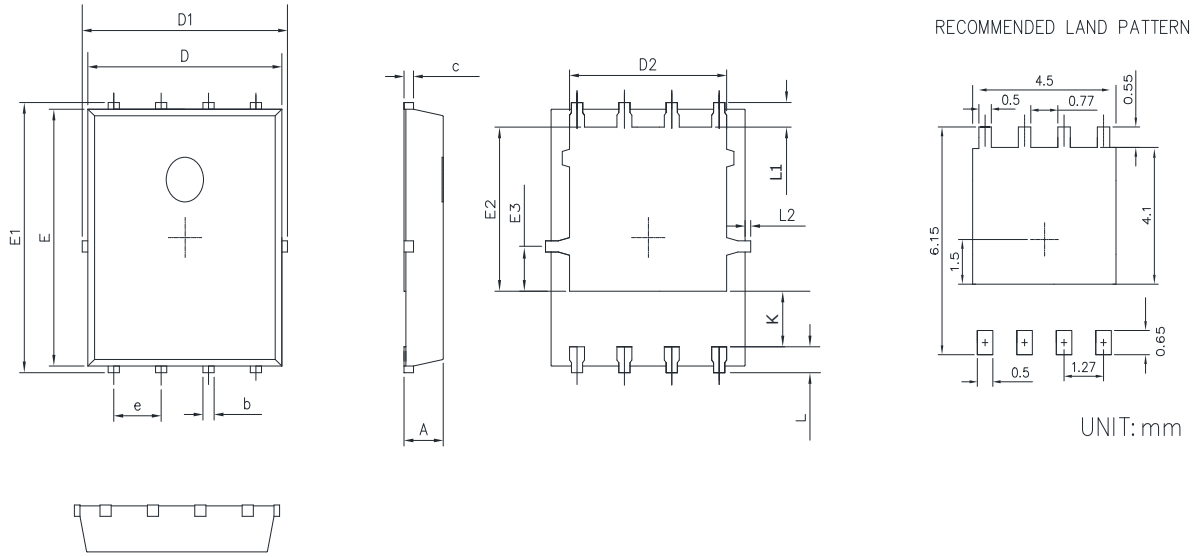
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline: DFN5X6



SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.90	1.10	0.035	0.043
b	0.25	0.50	0.010	0.020
c	0.10	0.30	0.004	0.012
D	4.80	5.30	0.189	0.209
D1	4.90	5.50	0.193	0.217
D2	3.92	4.20	0.154	0.165
E	5.65	5.85	0.222	0.230
E1	5.90	6.20	0.232	0.244
E2	3.33	3.78	0.131	0.149
E3	0.80	1.00	0.031	0.039
e	1.27		0.050	
L	0.40	0.70	0.016	0.028
L1	0.65		0.026	
L2	0.00	0.15	0.000	0.006
K	1.00	1.50	0.039	0.059

Revision History

Revison	Date	Major changes
1.0	2023/3/14	Release of Formal Version.
1.1	2023/5/16	Update the Tdon/Tr/Tdoff/Tf parameter and Test Condition.

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