PWE180N65BS

Perfect MOS6 N-MOSFET 650V, 150mΩ, 20A

重庆平伟实业股份有限公司

Features

- Uses PingWei advanced PerfectMOS6 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

100% DVDS Tested
100% AvalancheTested

Applications

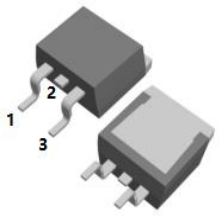
- PFC stages, hard switching PWM stages and resonant switching
- PWM stages for e.g. PC Silverbox, Adapter, LCD & PDP TV,

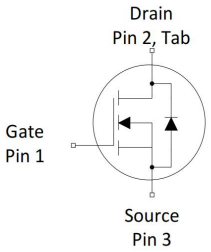
Lighting, Server, Telecom and UPS

Product Summary

V_{DS}	650V
$R_{DS(on)@10V\ typ}$	150mΩ
I_D	20A

TO-263-2L





Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
PWE180N65BS	E180N65BS	TO-263-2L	Tape&Reel	13 inches	24mm	800pcs

Absolute Maximum Ratings

Parameter	**Symbol**	**Value**	**Unit**
Drain-source voltage	V_{DS}	650	V
Continuous drain current T_C = 25°C (Silicon limit) T_C = 100°C (Silicon limit)	I_D	 20 13	A
Pulsed drain current (T_C = 25°C, t_p =100uS)	$I_{D\ pulse}$	80	A
Avalanche energy, single pulse (L=10mH，Vds=50V)	E_{AS}	195	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation T_C = 25°C Ta = 25°C	P_{tot}	 125 1.5	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

Thermal Resistance

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Thermal resistance, junction – case.	RthJC	-	-	1.0	°C/W	-
Thermal resistance, junction - ambient(min. footprint)	RthJA	-	-	82	°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}	650	-	-	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}	- -	0.04 -	1 100	μA	V_{DS}=650V,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	$R_{DS(on)}$	-	150	180	mΩ	Vgs=10V,Id=10A
Transconductance	g_{fs}	-	12	-	S	V_{DS}=5V,I_D=10A
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	1625	-	pF	V_{GS}=0V, V_{DS}=400V, f=1MHz
Output Capacitance	C_{oss}	-	52	-		
Reverse Transfer Capacitance	C_{rss}	-	43	-		
Gate Total Charge	Q_G	-	42	-	nC	Vds=520V,Id=20A ,Vgs=10V
Gate-Source charge	Q_{gs}	-	11	-		
Gate-Drain charge	Q_{gd}	-	18	-		
Turn-on delay time	$t_{d(on)}$	-	30	-	ns	V_{GS}=10V, V_{DD}=325V, R_{G_ext}=10Ω,ID=3.6A
Rise time	t_r	-	40	-		
Turn-off delay time	$t_{d(off)}$	-	50	-		
Fall time	t_f	-	25	-		
Gate resistance	R_G	-	10	-	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}	-	0.83	1.5	V	V_{GS}=0V,I_{SD}=10A
Body Diode Continuous Forward Current	Is	-	-	20	A	TC = 25°C
Body Diode Pulsed Current	Is pulse	-	-	81	A	TC = 25°C
Body Diode Reverse Recovery Time	t_{rr}	-	256	-	ns	I_F=1A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge	Q_{rr}	-	2542	-	nC	

Typical Performance Characteristics

Fig 1: Output Characteristics

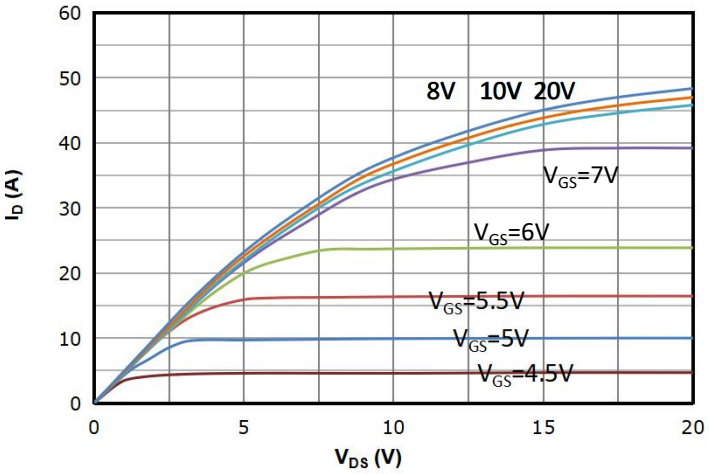


Fig 2: Transfer Characteristics

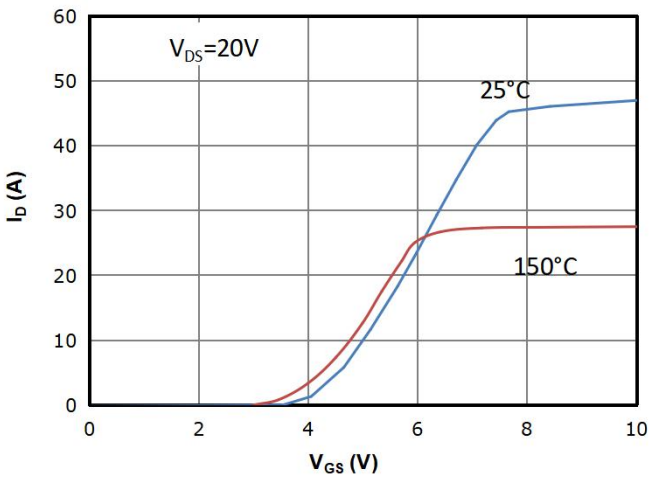


Fig 3: Rds(on) vs Drain Current and Gate Voltage

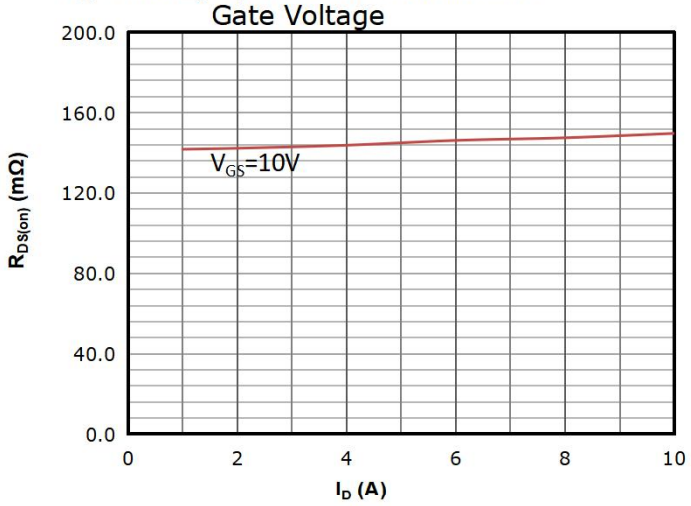


Fig 4: Rds(on) vs Gate Voltage

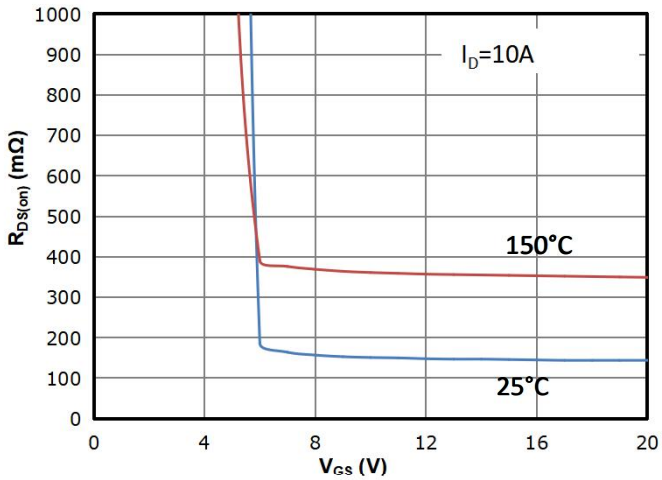


Fig 5: Rds(on) vs. Temperature

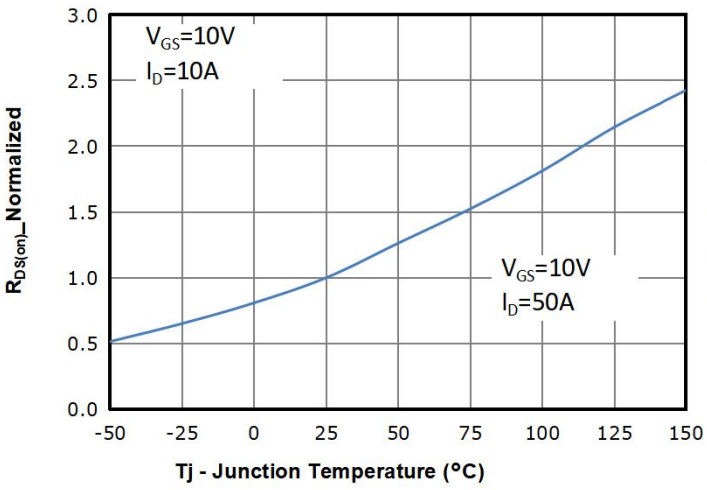


Fig 6: Vgs(th) vs. Temperature

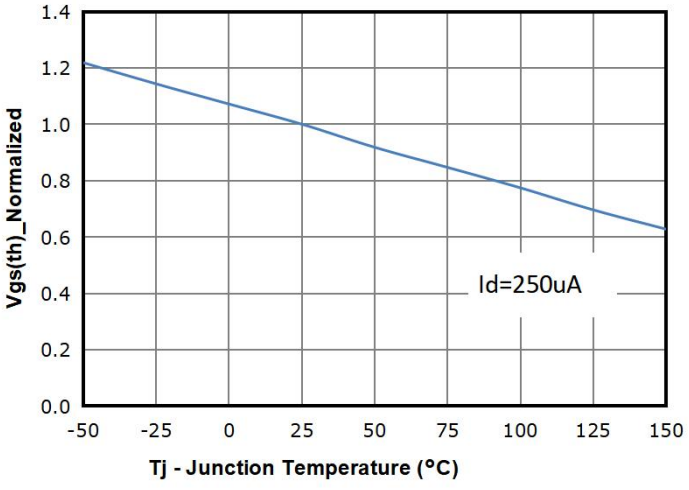


Fig 7: BVdss vs. Temperature

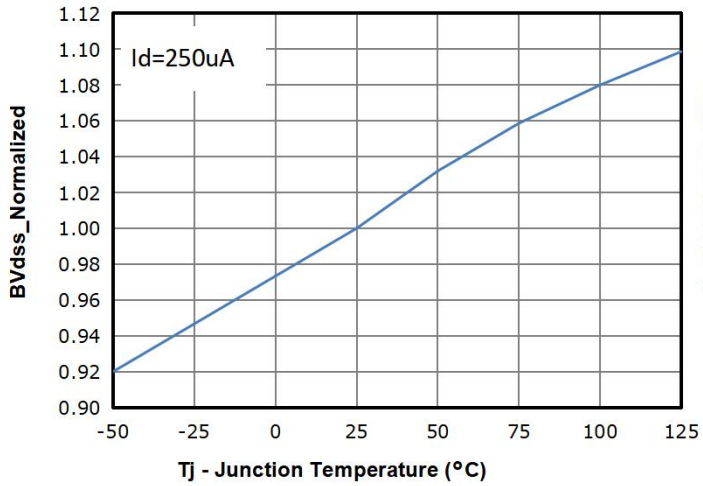


Fig 8: Capacitance Characteristics

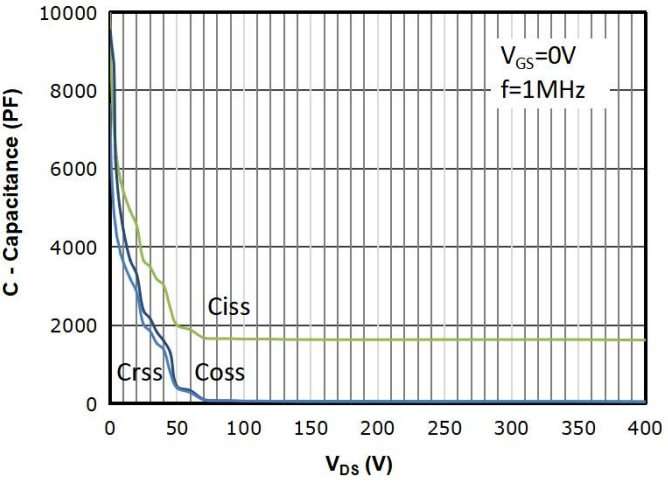


Fig 9: Gate ChargeCharacteristics

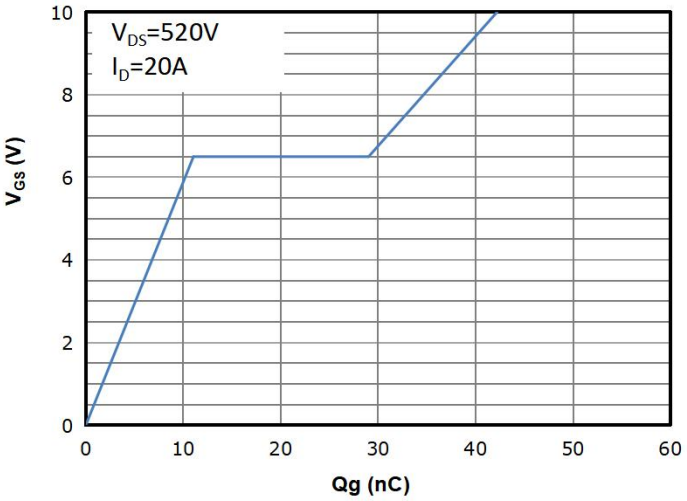


Fig 10: Body-diode Forward Characteristics

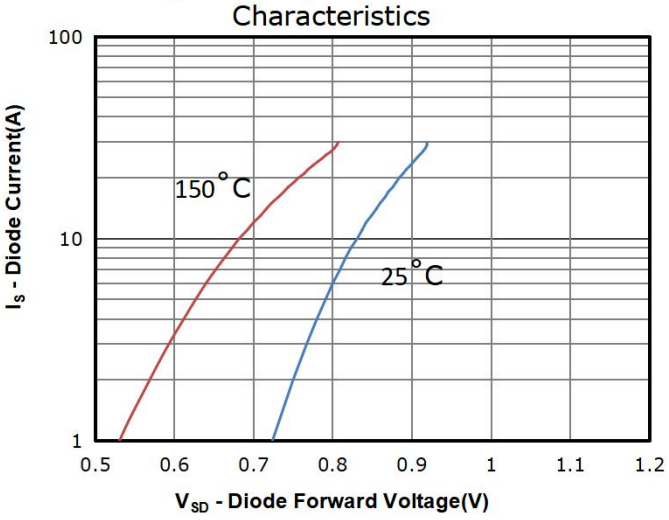


Fig 11: Power Dissipation

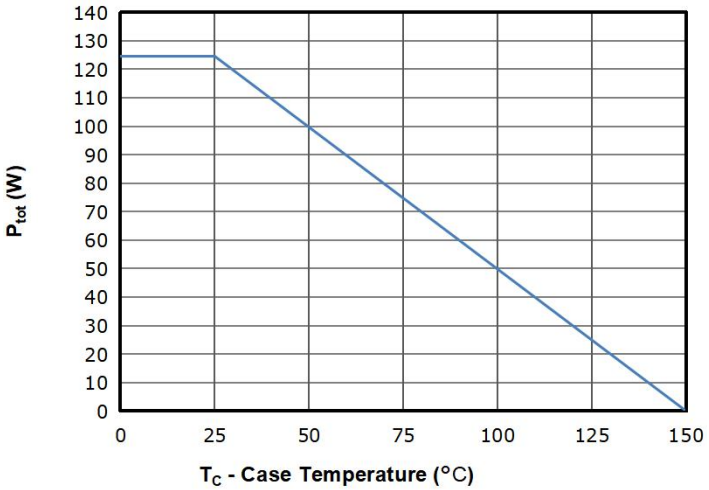


Fig 12: Drain Current Derating

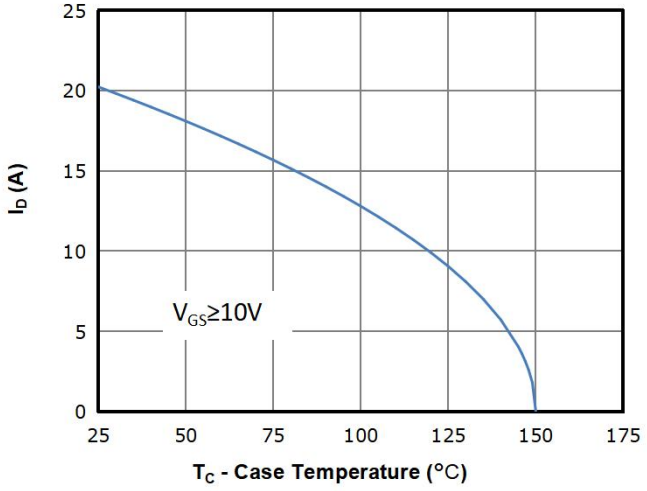


Fig 13: Safe Operating Area

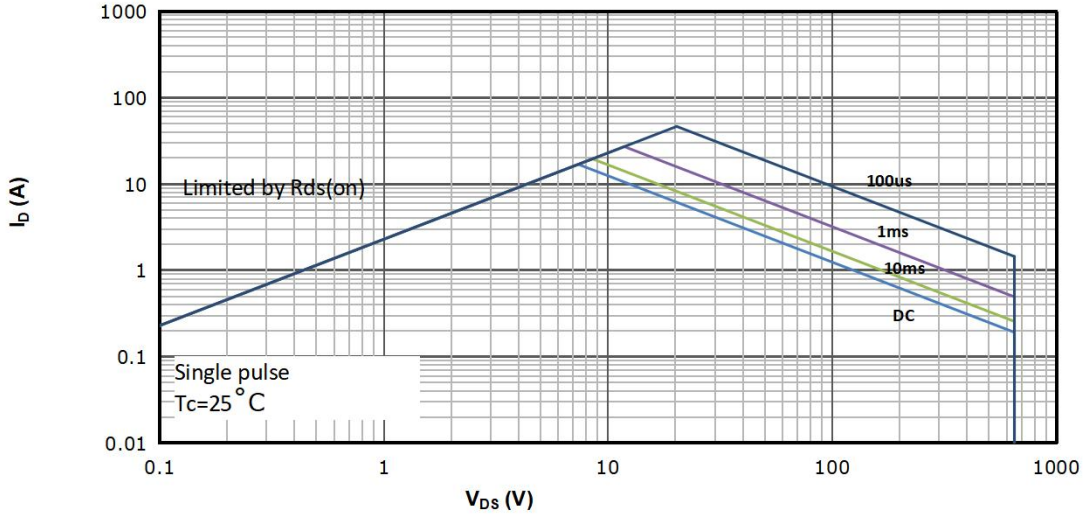
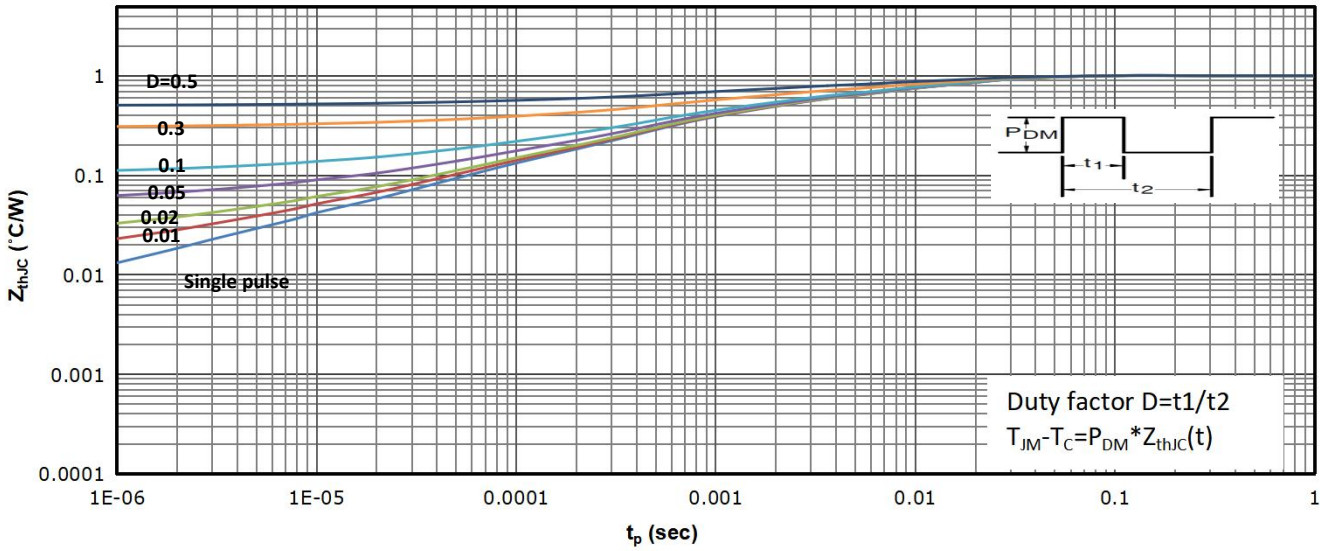
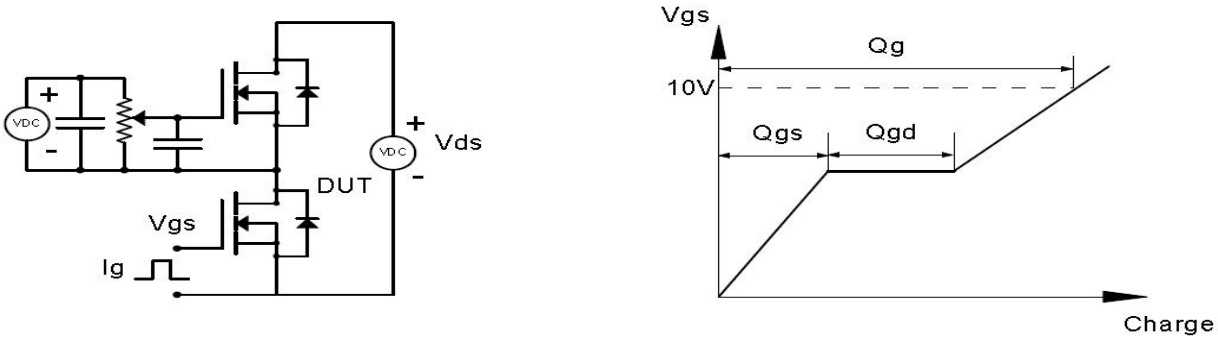


Fig 14: Max. Transient Thermal Impedance

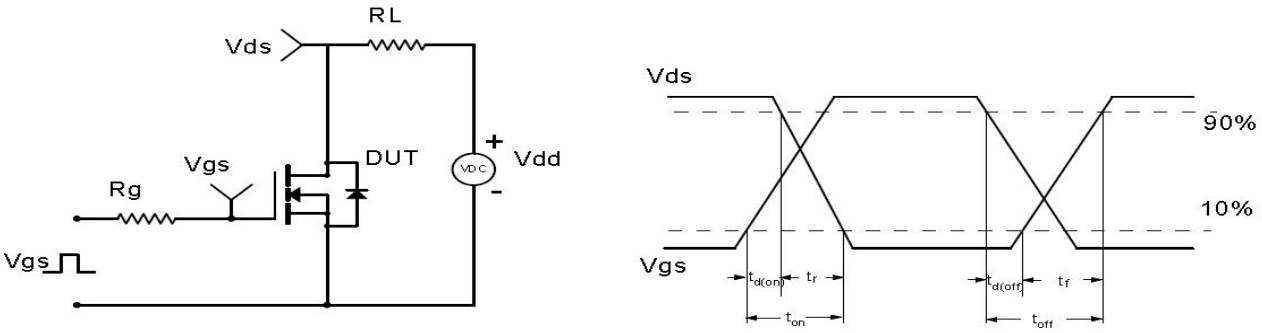


Test Circuit & Waveform

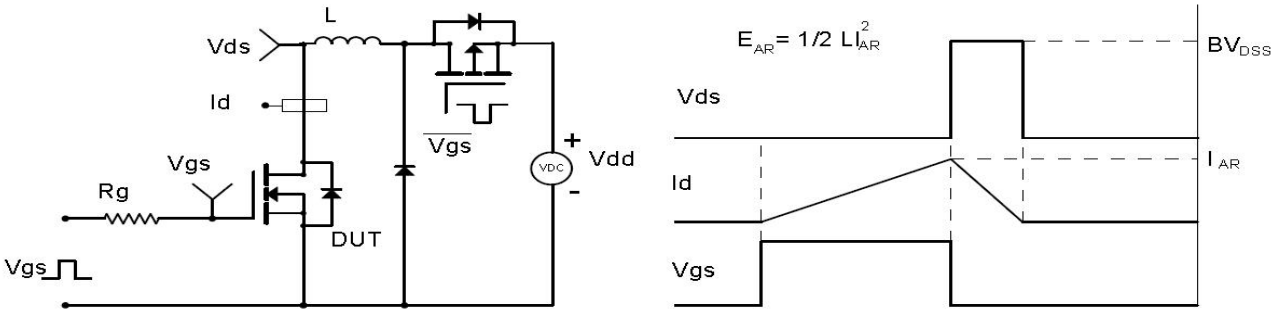
Gate Charge Test Circuit & Waveform



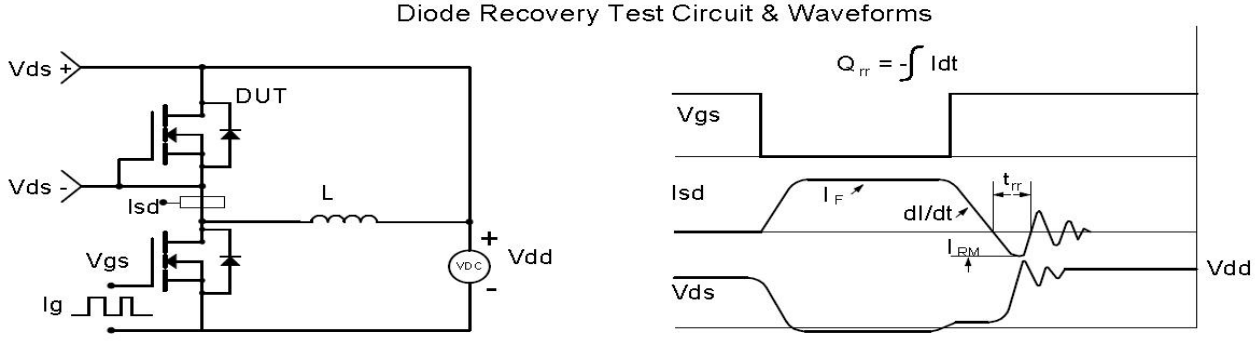
Resistive Switching Test Circuit & Waveforms



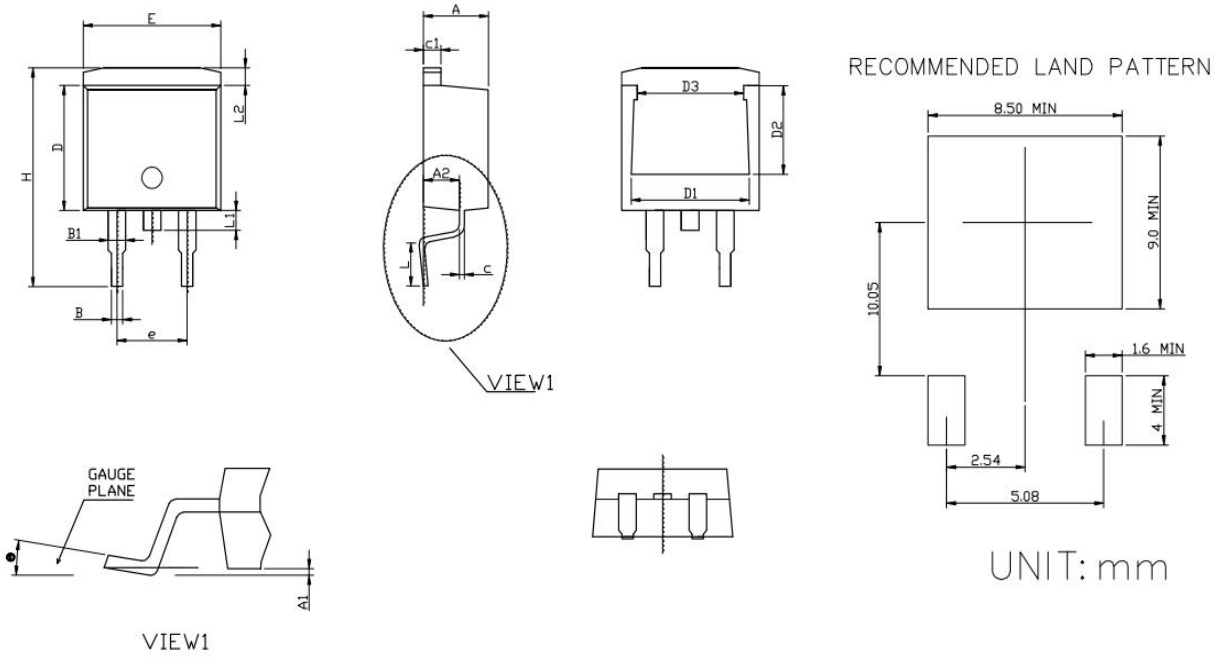
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline: TO-263-2L



SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.50	4.90	0.177	0.193
A1	0.05	0.30	0.002	0.012
A2	2.45	2.70	0.096	0.106
B	0.72	0.92	0.028	0.036
B1	1.12	1.42	0.044	0.056
C	0.28	0.48	0.011	0.019
C1	1.17	1.37	0.046	0.054
D	8.46	8.86	0.333	0.349
D1	7.90	8.40	0.311	0.331
D2	5.50	5.90	0.217	0.232
D3	7.10	7.50	0.280	0.295
E	9.85	10.45	0.388	0.411
e	5.08		0.200	
H	14.75	15.55	0.581	0.612
L	2.30	2.80	0.091	0.110
L1	1.20	1.60	0.047	0.063
L2	1.01	1.50	0.040	0.059
θ	0.00	8.00	0.000	0.315

Revision History

Revison	Date	Major changes
1.0	2022/8/27	Release of Foraml Version.

Disclaimer

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