DSC160N120W

Silicon Carbide MOSFET 1200V, 118mΩ, 14A

重庆平伟半导体股份有限公司

Features

- Uses PingWei advanced PerfectMOS 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

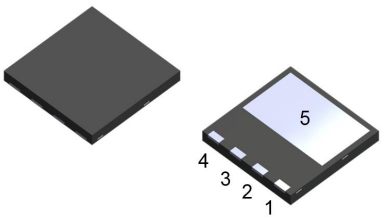
- PFC stages, hard switching PWM stages and resonant switching
- PWM stages for e.g. PC Silverbox, Adapter, LCD & PDP TV,

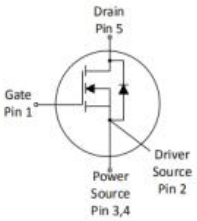
Lighting, Server, Telecom and UPS

Product Summary

V_{DS}	1200V
$R_{DS(on)@10V\ typ}$	118mΩ
I_D	14A

DFN8*8





Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
DSC160N120W	DSC160N120W	DFN8*8	Tape&Reel	13 inches	16mm	4000pcs

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	1200	V
Continuous drain current T_C = 25°C T_C = 100°C	I_D	 14 10	A
Pulsed drain current (T_C = 25°C)	$I_{D\ pulse}$	55	A
Avalanche energy, single pulse (L=5mH)	E_{AS}	63	mJ
Gate-Source voltage,max.transient voltage	V_{GSmax}	-8/+22	V
Gate-Source voltage,max.static voltage	V_{GSsop}	-5/+18	V
T_C = 25°C	P_{tot}	50	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+175	°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	-	-	3.0	°C/W	-
Thermal resistance, junction - ambient(min. footprint)	RthJA	-	-	117.3	°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}	1200	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	2.0	3.89	4.0	V	V_{DS}=V_{GS},I_D=5mA
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	$R_{DS(on)}$	-	118	142	mΩ	Vgs=18V,Id=10A
		-	160	192	mΩ	Vgs=15V,Id=10A
Transconductance	g_{fs}	-	7	-	S	V_{DS}=18V,I_D=10A
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	973	-	pF	V_{GS}=0V, V_{DS}=800V, f=1MHz
Output Capacitance	C_{oss}	-	40	-		
Reverse Transfer Capacitance	C_{rss}	-	5.1	-		
Gate Total Charge	Q_G	-	45	-	nC	Vds=800V,Id=10A ,Vgs=-5/18V
Gate-Source charge	Q_{gs}	-	20	-		
Gate-Drain charge	Q_{gd}	-	12	-		
Turn-on delay time	$t_{d(on)}$	-	20	-	ns	V_{GS}=-5/18V, V_{DD}=800V, R_{G_ext}=0Ω,I_D=00A Timing relative to V_{DS}
Rise time	t_r	-	45	-		
Turn-off delay time	$t_{d(off)}$	-	20	-		
Fall time	t_f	-	15	-		

Gate resistance	R_G	-	6.5	-	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}	- -	4.0 3.6	- -	V	V_{GS}=0V,I_{SD}=10A T_j=25°C T_j=175°C
Body Diode Continuous Forward Current	Is	-	-	55	A	TC = 25°C
Body Diode Pulsed Current	Is pulse	-	-	221	A	TC = 25°C
Body Diode Reverse Recovery Time	t_{rr}	-	10	-	ns	VGS=-5V,I_{SD}=10A, V_R=800V dI/dt=1200A/μs
Body Diode Reverse Recovery Charge	Q_{rr}	-	40	-	nC	

Typical Performance Characteristics

Fig 1: Output Characteristics Tj=25°C

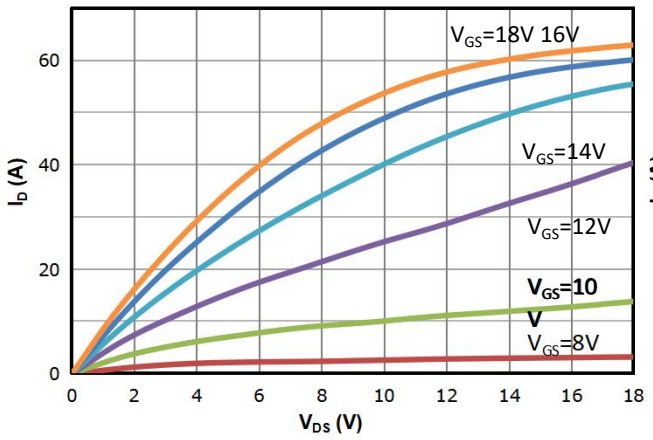


Fig 2: Output Characteristics Tj=175°C

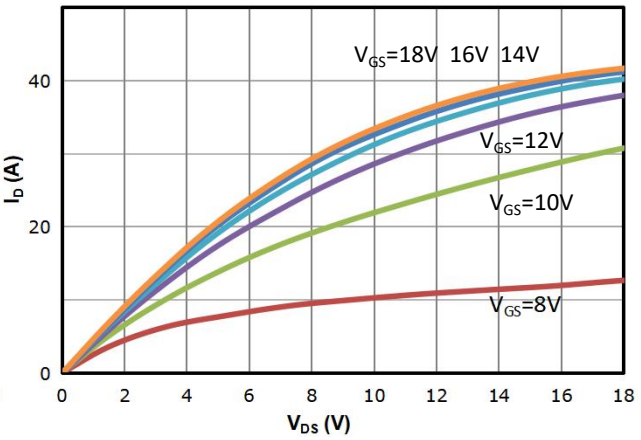


Fig 3: Transfer Characteristics

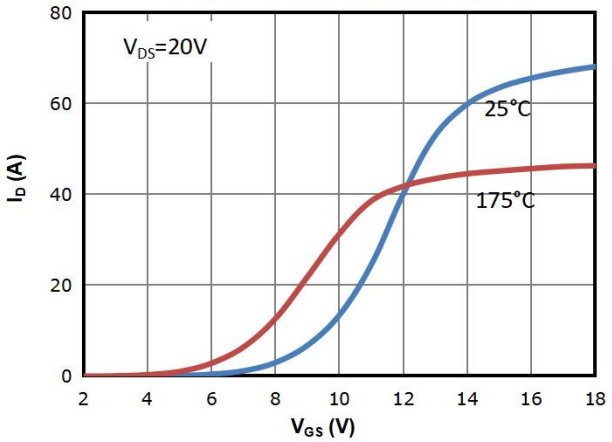


Fig 4: Rds(on) vs Drain Current and Gate Voltage

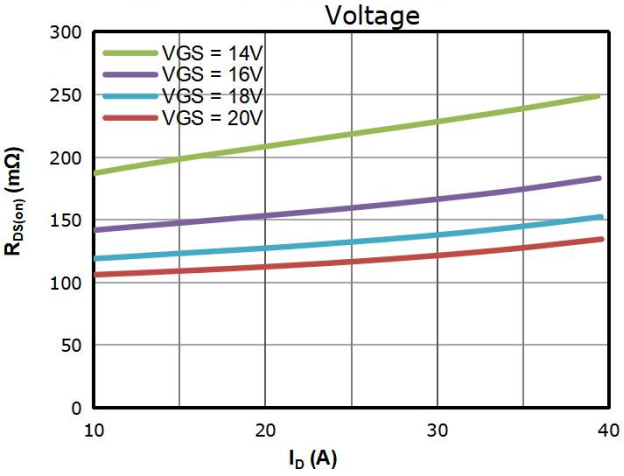


Fig 5: Rds(on) vs. Temperature

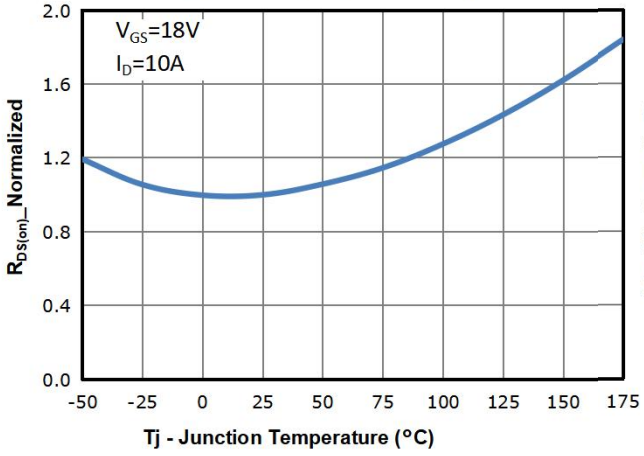


Fig 6: Vgs(th) vs. Temperature

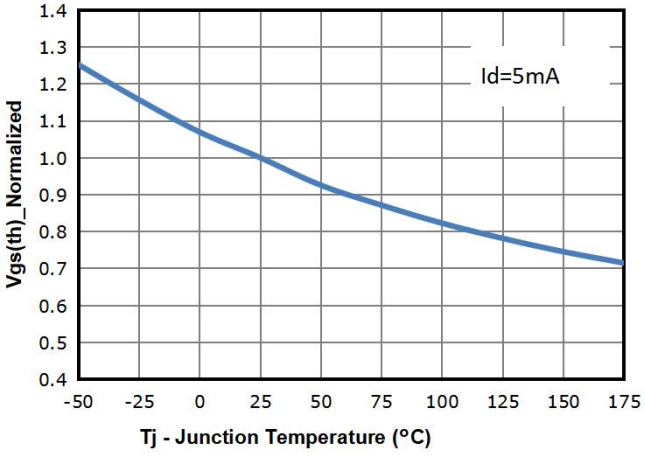


Fig 7: BVdss vs. Temperature

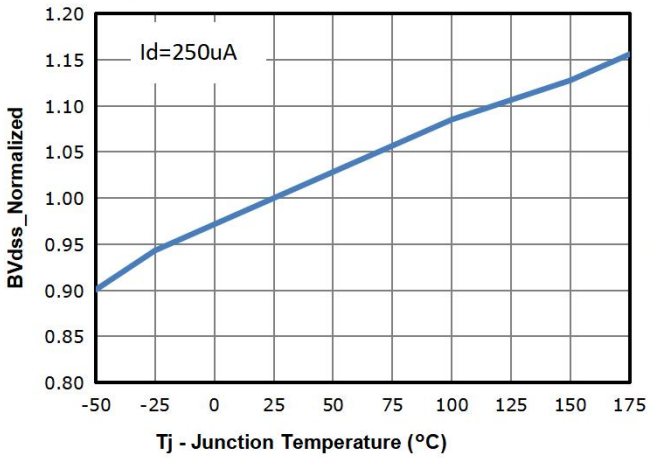


Fig 8: Capacitance Characteristics

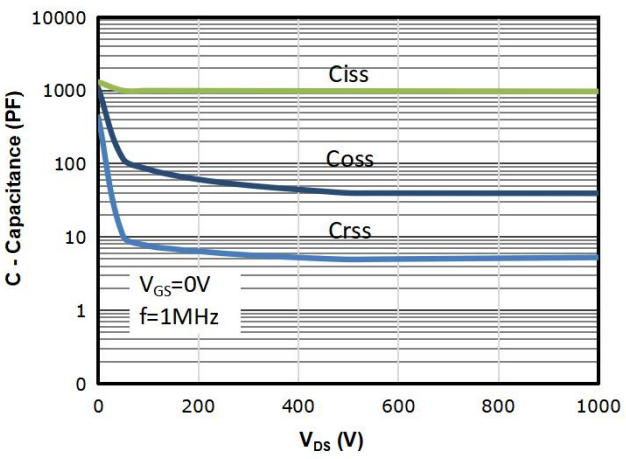


Fig 9: Gate ChargeCharacteristics

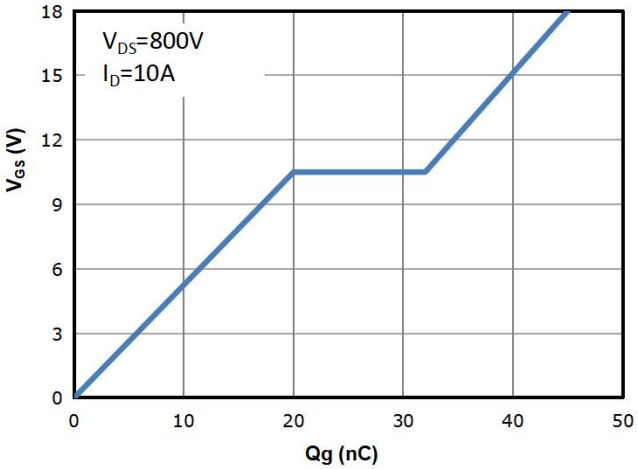


Fig 10: Body-diode Forward Characteristics

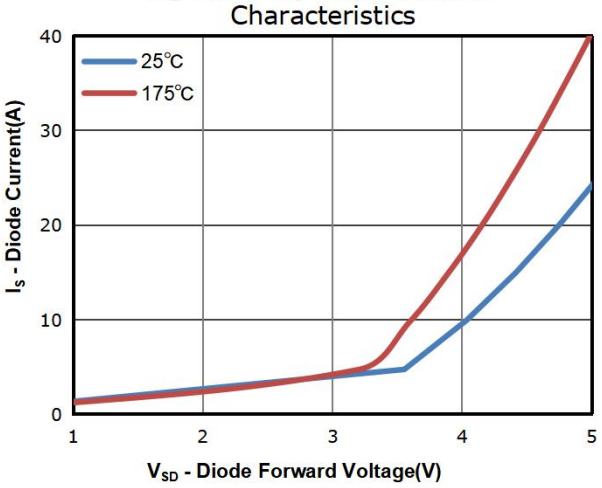


Fig 11: Power Dissipation

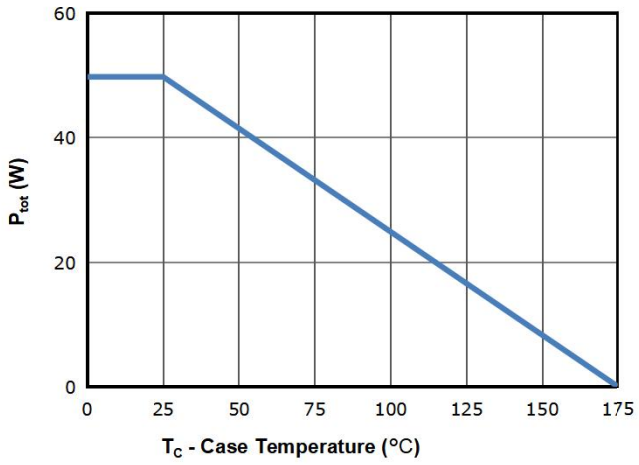


Fig 12: Drain Current Derating

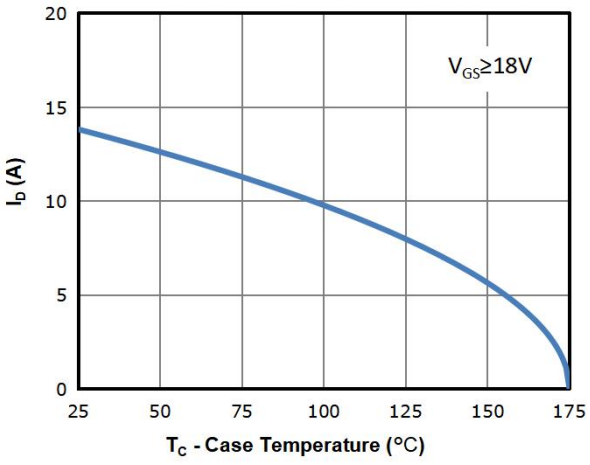


Fig 13: Safe Operating Area

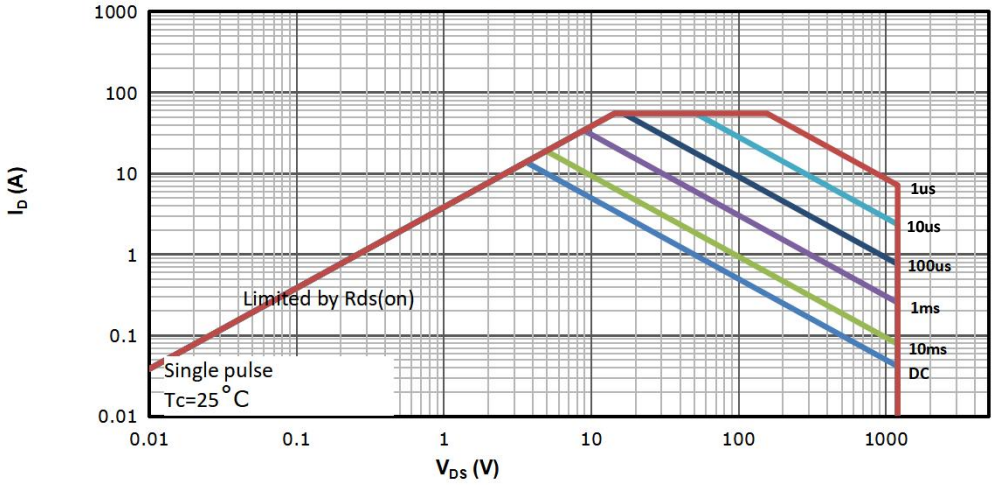
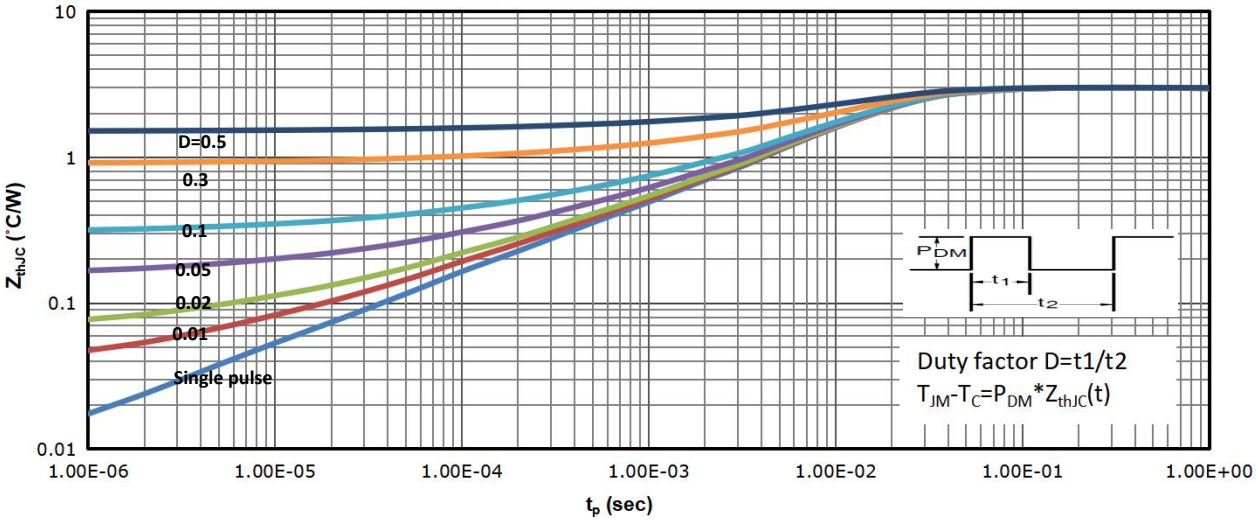
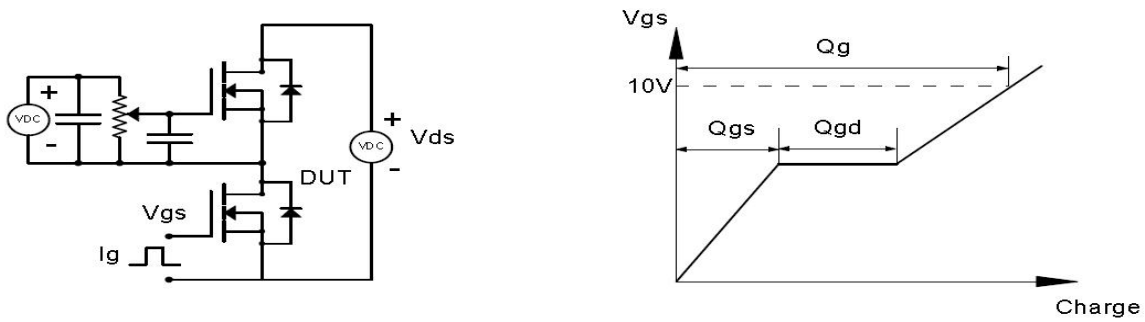


Fig 14: Max. Transient Thermal Impedance

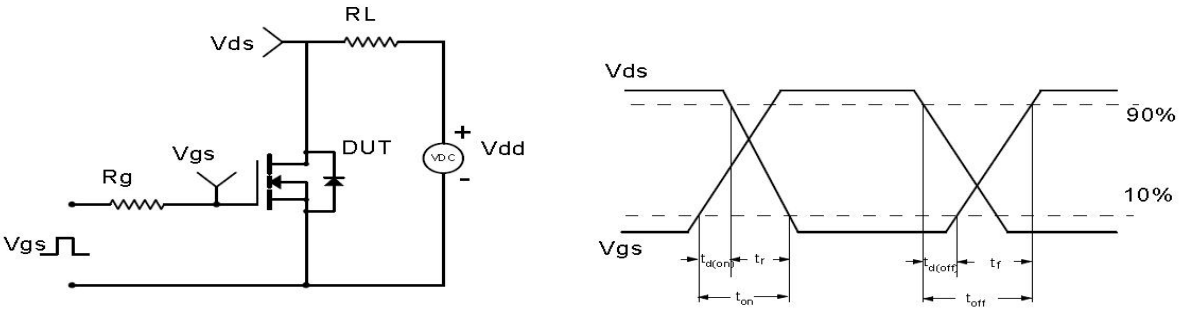


Test Circuit & Waveform

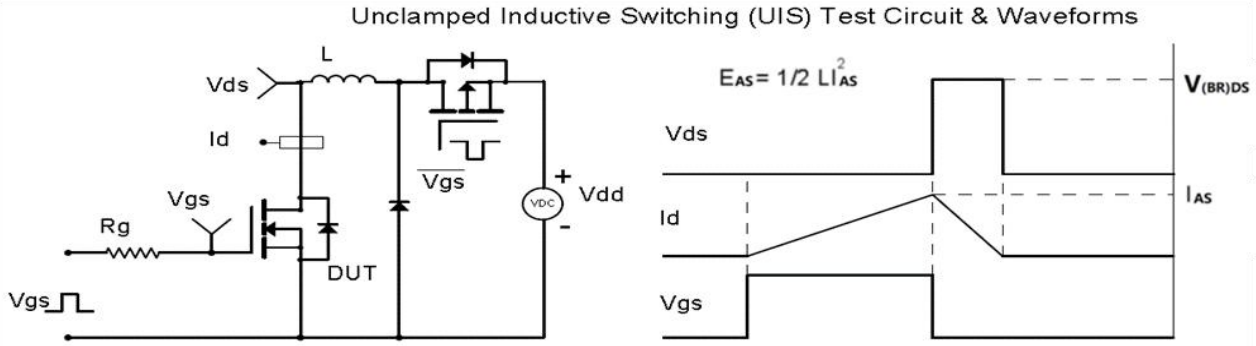
Gate Charge Test Circuit & Waveform



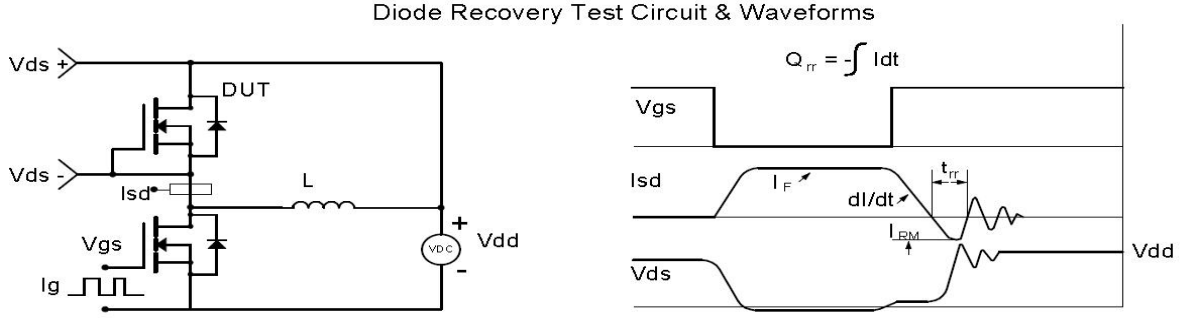
Resistive Switching Test Circuit & Waveforms



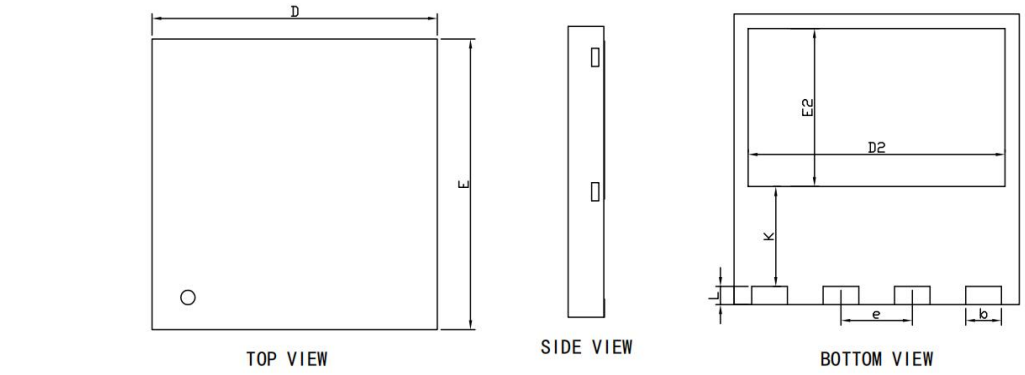
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

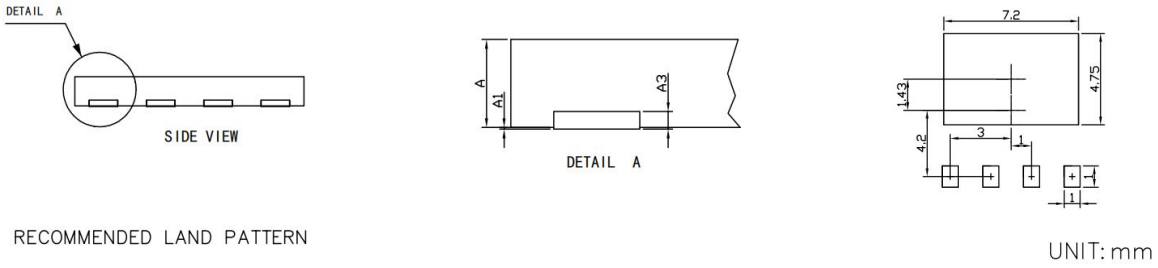


Diode Recovery Test Circuit & Waveforms



Package Outline: DFN8*8





SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.90	1.10	0.035	0.043
A1	0.00	0.05	0.000	0.002
A3	0.20		0.008	
b	0.90	1.10	0.035	0.043
D	7.90	8.10	0.311	0.319
E	7.90	8.10	0.311	0.319
D2	7.10	7.30	0.280	0.287
E2	4.25	4.45	0.167	0.175
e	1.90	2.10	0.075	0.083
K	2.65	2.85	0.104	0.112
L	0.40	0.60	0.016	0.024

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