华润微电子(重庆)有限公司

CRSZ020N08NZ

SkyMOS1 N-MOSFET 85V, 1.5mΩ, 270A

Features

- Uses CRM(CQ) advanced SkyMOS1 technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent $Q_g x R_{DS(on)}$ product(FOM)
- Qualified according to JEDEC criteria

Applications

- Motor control and drive
- Battery management System
- UPS(Uninterrupible Power Supplies)

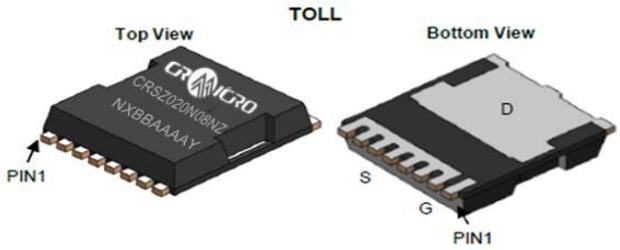
Product Summary

V_{DS}	85V
$R_{DS(on)}$	1.5mΩ
I_D	270A

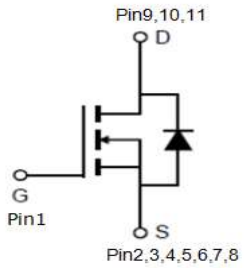
100% DVDS Tested

100% Avalanche Tested

RoHS HF



CRSZ020N08NZ



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRSZ020N08NZ	CRSZ020N08NZ	TOLL	Tape&Reel	N/A	N/A	2000pcs 1200pcs 1800pcs

Absolute Maximum Ratings

Parameter	**Symbol**	**Value**	**Unit**
Drain-source voltage	V_{DS}	85	V
Continuous drain current	I_D		A
T_C = 25°C (Silicon limit)		270	
T_C = 25°C (Package limit)		300	
T_C = 100°C (Silicon limit)		169	
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	1080	A
Avalanche energy, single pulse (ID = 48A, Rg=25Ω)	E_{AS}	576	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation (T_C = 25°C)	P_{tot}	250	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+150	°C

※. Notes:
1.EAS is tested at starting Tj = 25℃, L = 0.5mH, IAS = 48A, VGS = 10V.
2.Repetitive rating, pulse width limited by junction temperature TJ(MAX)=150°C. Ratings are based on low frequency and duty cycles to keep initial TJ =25°C.

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Thermal Resistance

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Thermal resistance, junction – case.	R_{thJC}	-	0.40	0.50	°C/W	-
Thermal resistance, junction_ambient(min. footprint)	R_{thJA}	-	-	52.0	°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}	85	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	2.0	3.0	4.0	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	- -	- -	1 100	μA	V_{DS}=80V,V_{GS}=0V T_j=25°C T_j=125°C
Gate-source leakage current	I_{GSS}	0	±10	±100	nA	V_{GS}=±20V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	1.5	2.0	mΩ	V_{GS}=10V, I_D=90A
Transconductance	g_{fs}	-	227	-	S	V_{DS}=5V,I_D=90A
Dynamic Characteristic						
Input Capacitance	C_{iss}	7531	11297	16945.5	pF	V_{GS}=0V, V_{DS}=40V, f=1MHz
Output Capacitance	C_{oss}	1815	2723	4084.5		
Reverse Transfer Capacitance	C_{rss}	37	55	82.5		
Gate Total Charge	Q_G	119	178	267	nC	V_{GS}=10V, V_{DS}=40V, I_D=90A
Gate-Source charge	Q_{gs}	46	69	103.5		
Gate-Drain charge	Q_{gd}	27	40	60		
Turn-on delay time	$t_{d(on)}$	23	35	52.5	ns	V_{GS}=10V, V_{DD}=40V, R_{G_ext}=3Ω
Rise time	t_r	77	115	172.5		
Turn-off delay time	$t_{d(off)}$	60	90	135		
Fall time	t_f	79	119	178.5		
Gate resistance	R_G	-	2.0	5.5	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}	-	0.92	1.4	V	V_{GS}=0V,I_{SD}=100A
Body Diode Reverse Recovery Time	t_{rr}	50	100	200	ns	I_F=100A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge	Q_{rr}	109	218	436	nC	

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Typical Performance Characteristics

Fig 1: Output Characteristics

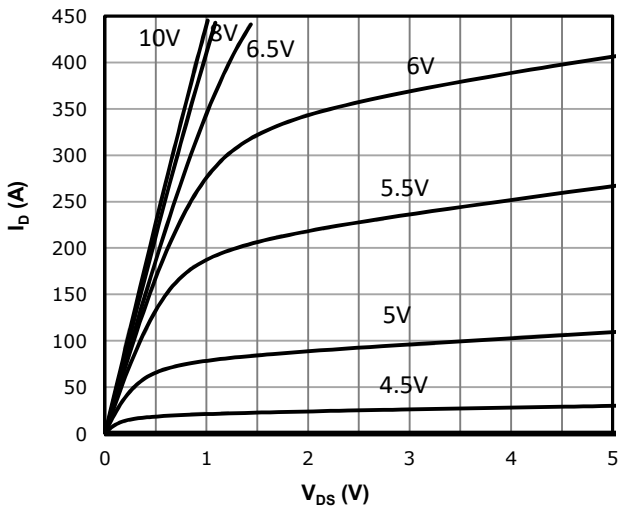


Fig 2: Transfer Characteristics

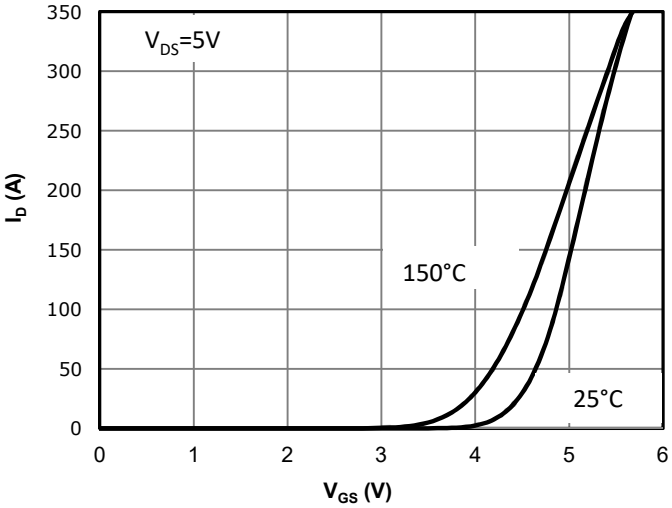


Fig 3: Rds(on) vs Drain Current and Gate Voltage

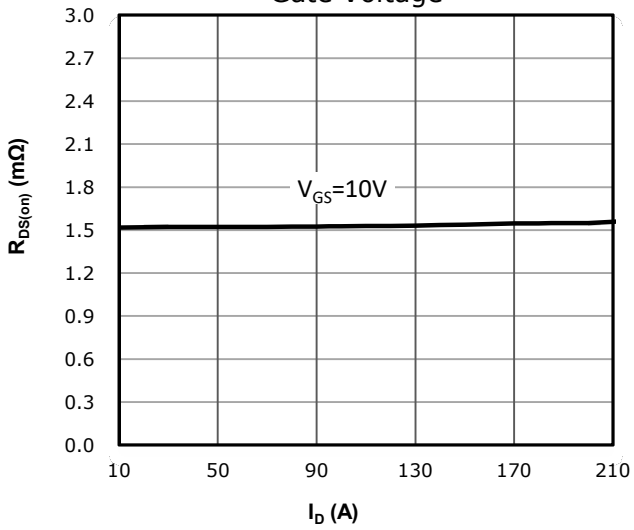


Fig 4: Rds(on) vs Gate Voltage

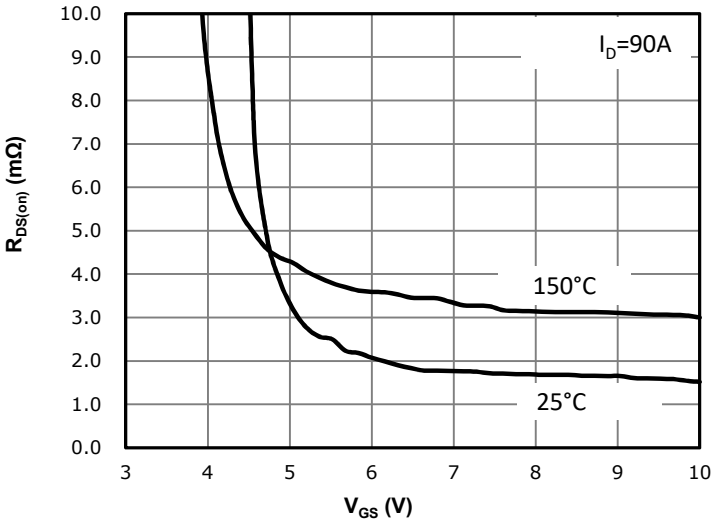


Fig 5: Rds(on) vs. Temperature

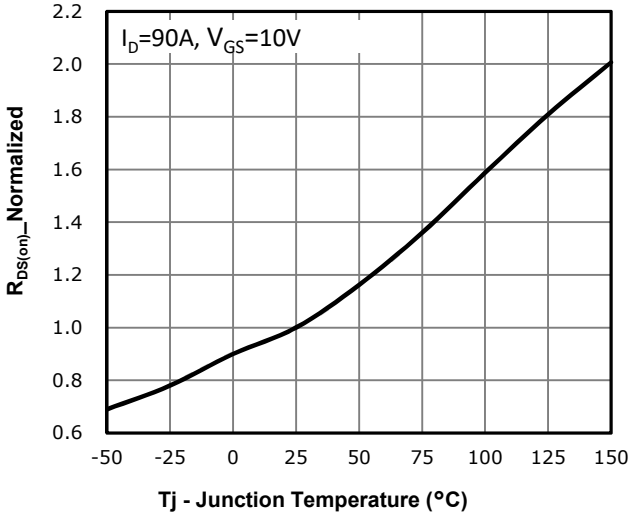
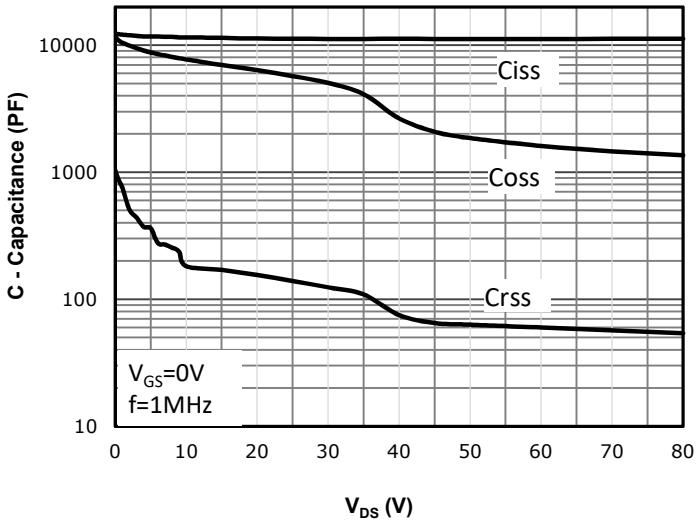


Fig 6: Capacitance Characteristics



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Fig 7: Vgs(th) vs. Temperature

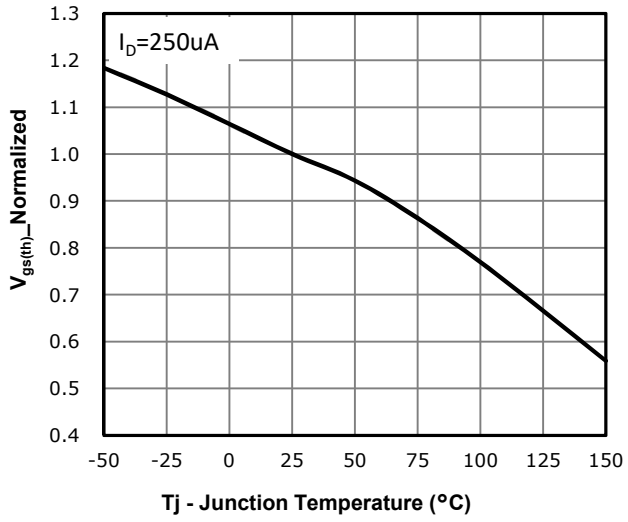


Fig 8: BVdss vs. Temperature

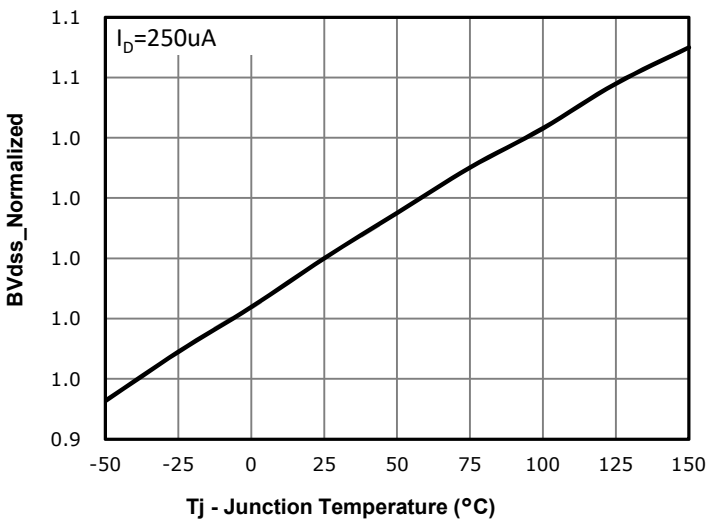


Fig 9: Gate Charge Characteristics

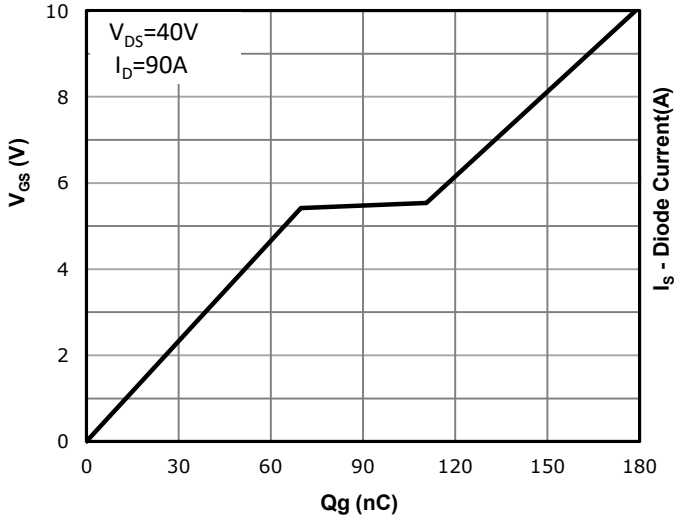


Fig 10: Body-diode Forward Characteristics

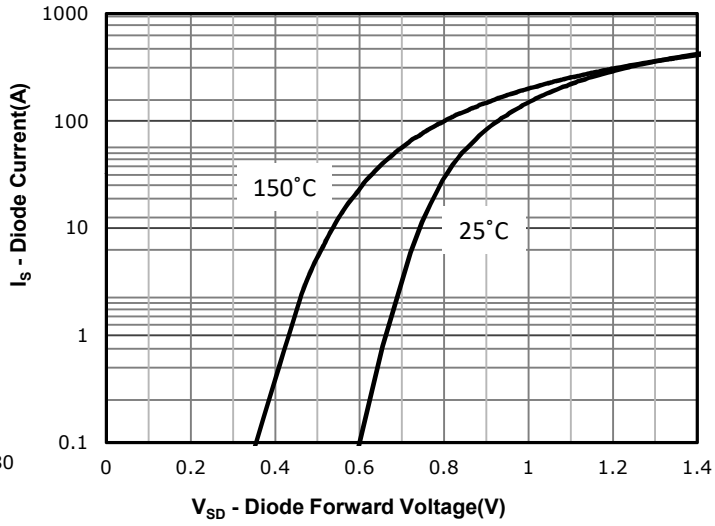


Fig 11: Power Dissipation

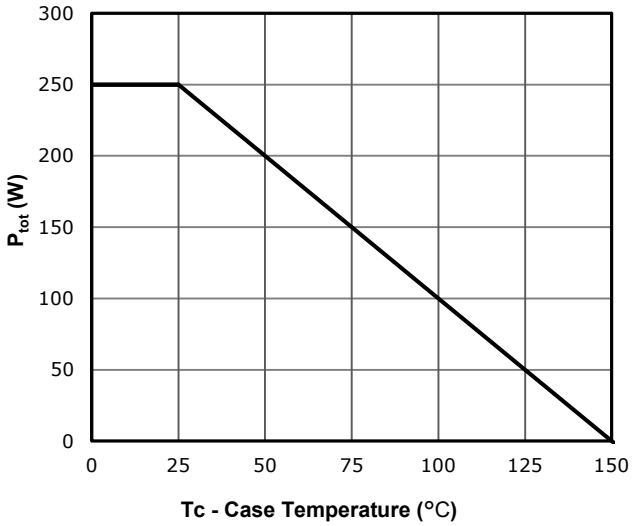
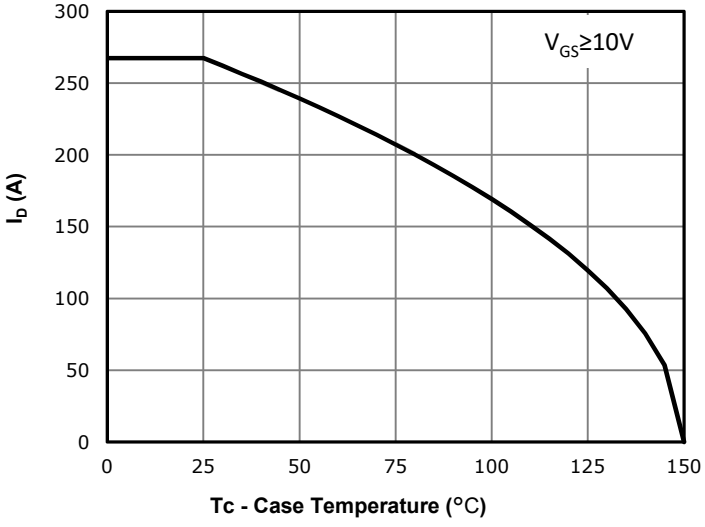


Fig 12: Drain Current Derating



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Fig 13: Safe Operating Area

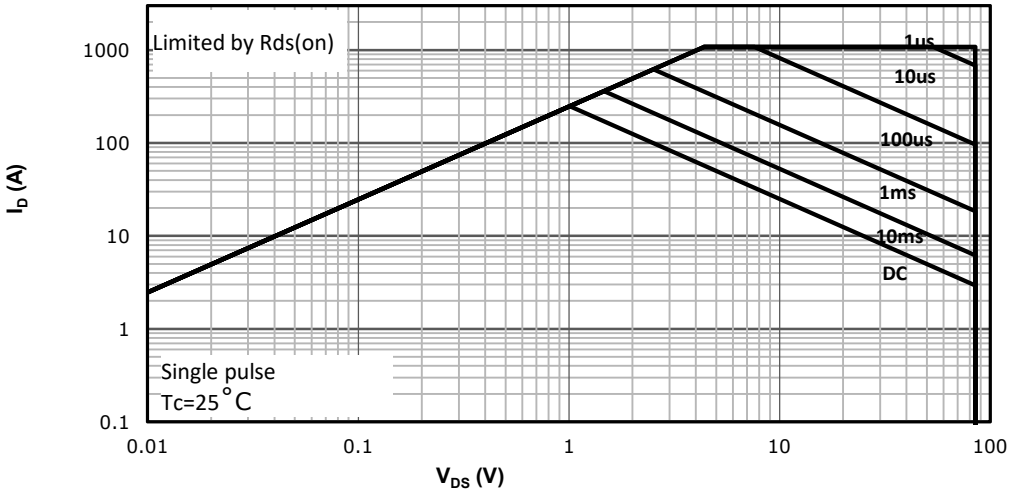
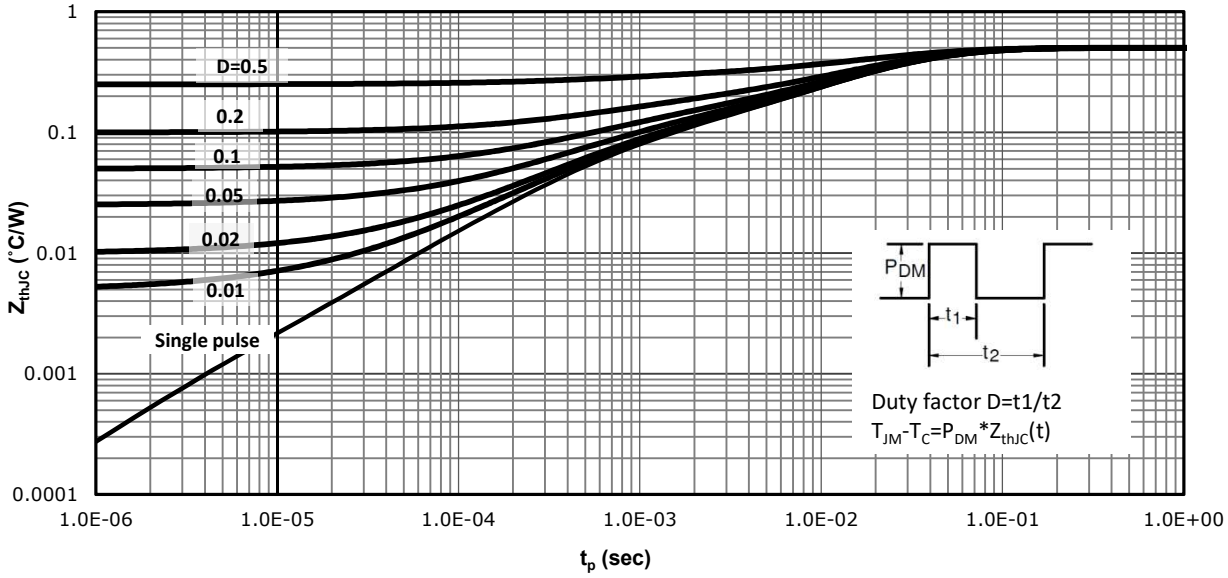


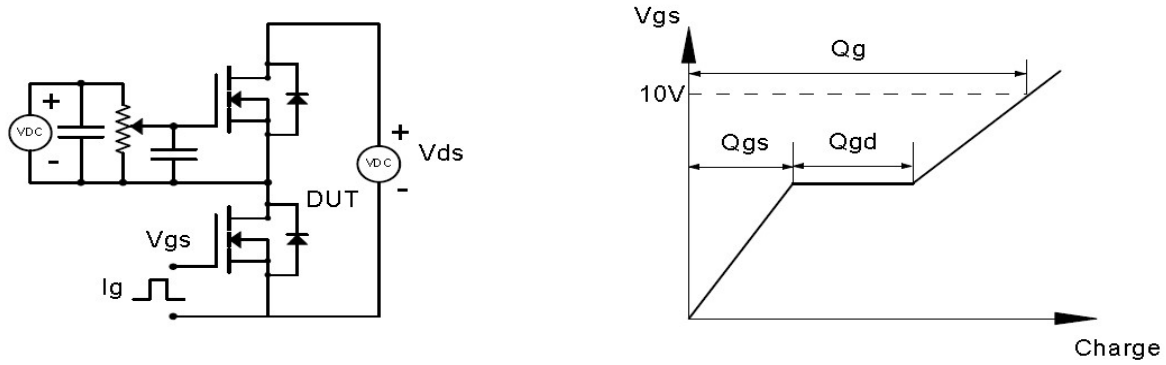
Fig 12: Max. Transient Thermal Impedance



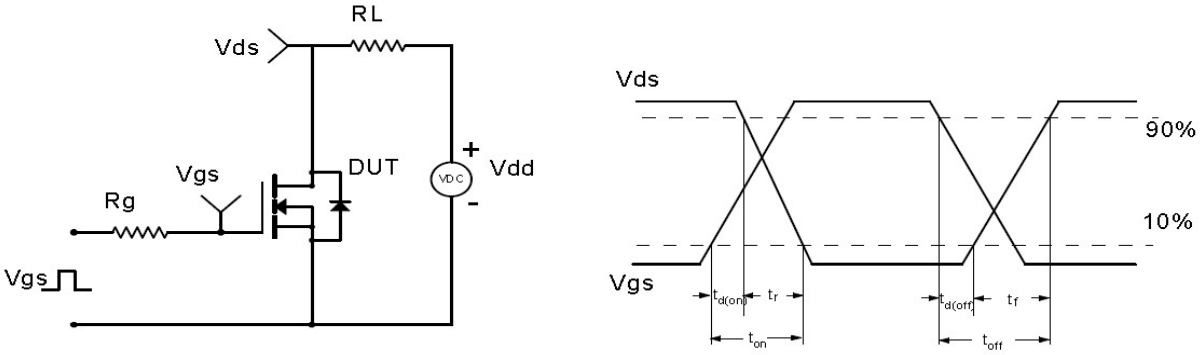
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Test Circuit & Waveform

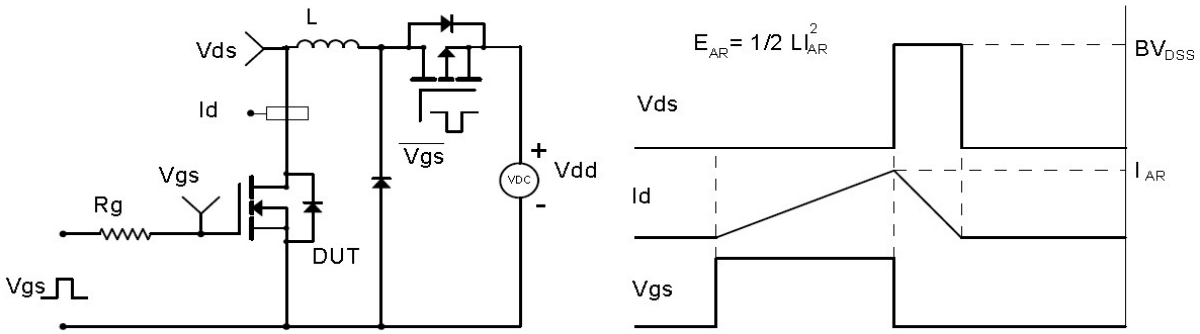
Gate Charge Test Circuit & Waveform



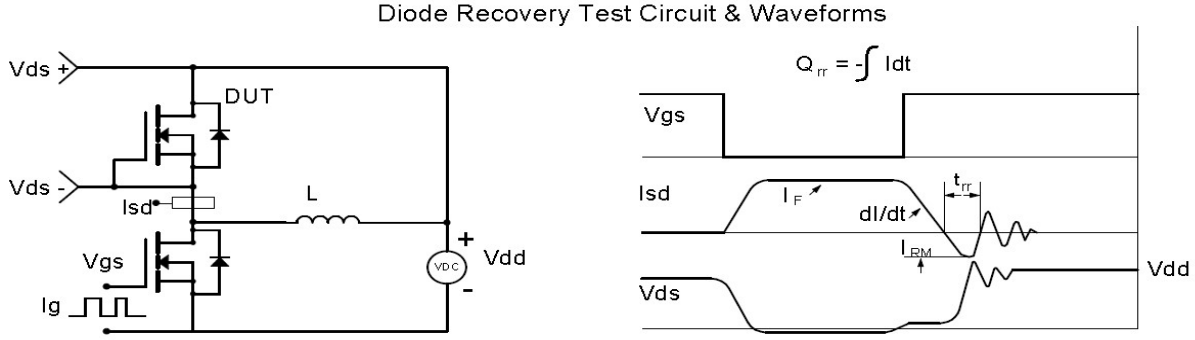
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

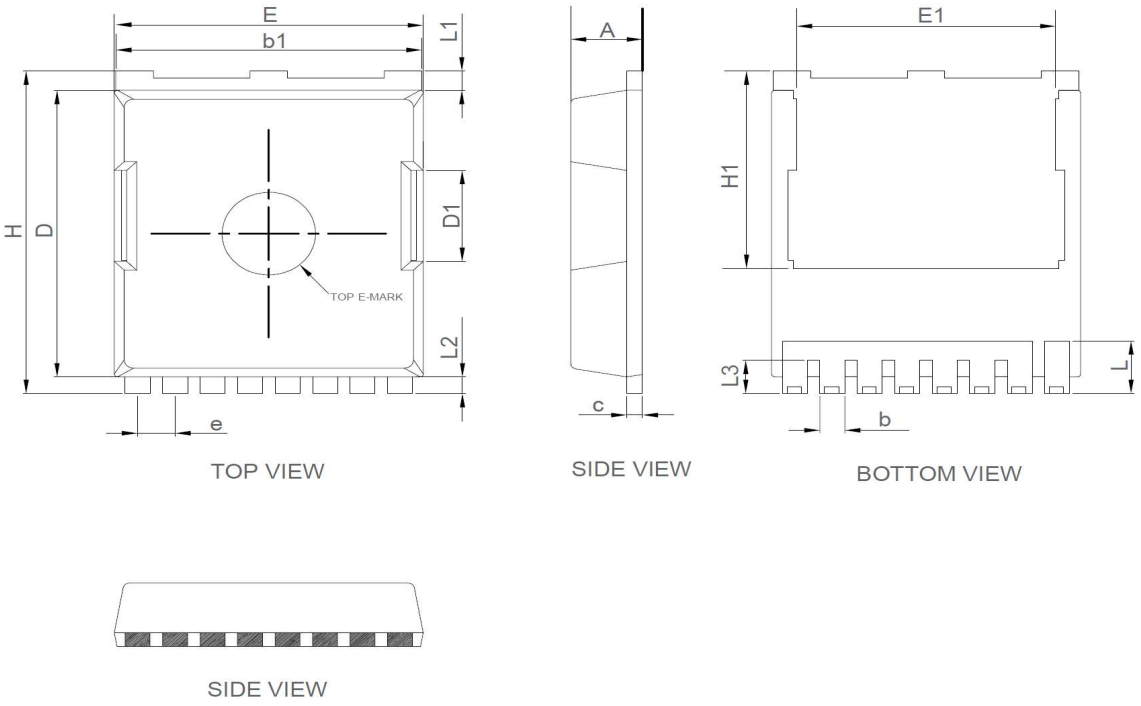


Diode Recovery Test Circuit & Waveforms



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Package Outline: TOLL



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.15	2.45	0.085	0.096
b	0.60	0.90	0.024	0.035
b1	9.65	9.95	0.380	0.392
c	0.35	0.65	0.014	0.026
D	10.18	10.70	0.401	0.421
D1	3.15	3.45	0.124	0.136
E	9.70	10.10	0.382	0.398
E1	7.35	8.45	0.289	0.333
e	1.10	1.30	0.043	0.051
H	11.45	11.95	0.451	0.470
H1	6.55	7.50	0.258	0.295
L	1.35	2.10	0.053	0.083
L1	0.50	0.90	0.020	0.035
L2	0.40	0.80	0.016	0.031
L3	0.95	1.35	0.037	0.053

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Revision History

Revison	Date	Major changes
1.0	2023/8/24	Release of Preliminary version.
2.0	2023/10/26	Update Package Schematic Diagram

Disclaimer

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.

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.

CRM(CQ) reserves the right to improve product design, function and reliability without notice.

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