华润微电子(重庆)有限公司

CRSZ016N10N4Q

SkyMOS4 N-MOSFET 100V, 1.2mΩ, 330A

Features

- Uses CRM(CQ) advanced SkyMOS4 technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent Q_gx$R_{DS(on)}$ product(FOM)
- AEC-Q101 Qualified

Product Summary

V_{DS}	100V
$R_{DS(on).typ}$	1.2mΩ
I_D	330A

100% DVDS Tested
100% Avalanche Tested

Applications

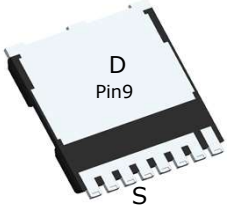
- DCDC Converter
- Switching applications

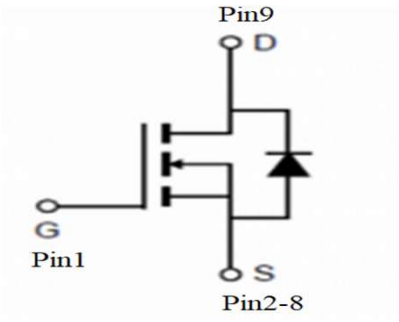
Top View



CRSZ016N10N4Q

Bottom View





Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRSZ016N10N4Q	016N10N4Q	TOLL	Tape&Reel	N/A	N/A	2000pcs

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 = 100°C (Silicon limit)	I_D	 330 235	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	1320	A
Avalanche energy, single pulse (I_D = 88A, Rg=25Ω)[1]	E_{AS}	1936	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation (T_C = 25°C)	P_{tot}	377	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

※. Notes:
EAS is tested at starting Tj = 25℃, L =0.5mH, IAS =88A, VGS = 10V.

©China Resources Microelectronics (Chongqing) Limited

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	0.40	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	42	

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
		100	-	-	V	V_{GS}=0V, I_D=1mA
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}=100V,V_{GS}=0V T_j=25°C T_j=125°C
Gate-source leakage current	I_{GSS}	-	-	±100	nA	V_{GS}=±20V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	1.2	1.6	mΩ	VGS=10V, ID=100A
Transconductance	g_{fs}	-	497	-	S	VDS=5V,ID=100A
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	13087	-	pF	V_{GS}=0V, V_{DS}=50V, f=1MHz
Output Capacitance	C_{oss}	-	2156	-		
Reverse Transfer Capacitance	C_{rss}	-	40	-		
Gate Total Charge	Q_G	-	193	-	nC	V_{GS}=10V, V_{DS}=50V, I_D=100A, f=1MHz
Gate-Source charge	Q_{gs}	-	59	-		
Gate-Drain charge	Q_{gd}	-	44	-		
Turn-on delay time	$t_{d(on)}$	-	40	-	ns	V_{GS}=10V, V_{DD}=50V, R_{G_ext}=3Ω
Rise time	t_r	-	61	-		
Turn-off delay time	$t_{d(off)}$	-	105	-		
Fall time	t_f	-	43	-		
Gate resistance	R_G	-	1.5	-	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz

©China Resources Microelectronics (Chongqing) Limited

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Diode continous forward current	Is	-	-	330	A	Tc = 25°C
Diode pulse current	Is pulse	-	-	1320	A	Tc = 25°C
Body Diode Forward Voltage	V_{SD}	-	0.84	1.4	V	V_{GS}=0V,I_{SD}=100A
Body Diode Reverse Recovery Time	t_{rr}	-	107	-	ns	V_R=50V,I_F=100A,dI/dt=100A/μs
Body Diode Reverse Recovery Charge	Q_{rr}	-	309	-	nC	

©China Resources Microelectronics (Chongqing) Limited

Typical Performance Characteristics

Fig 1: Output Characteristics

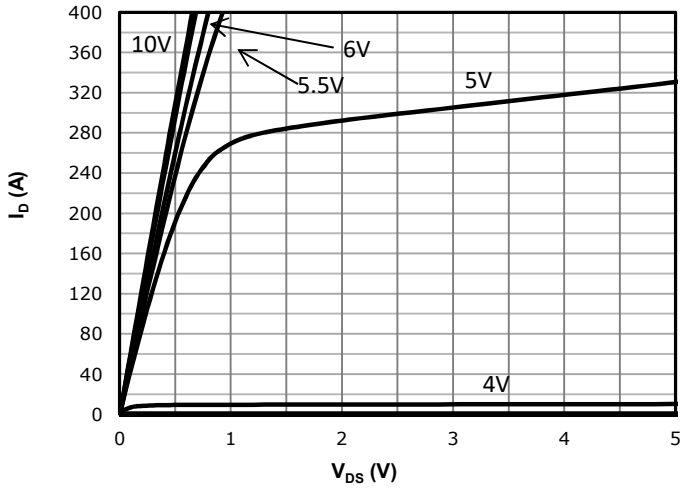


Fig 2: Transfer Characteristics

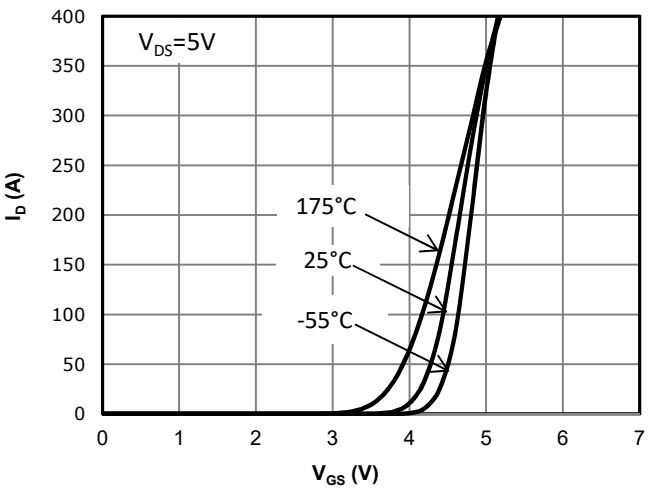


Fig 3: Rds(on) vs Drain Current and Gate Voltage

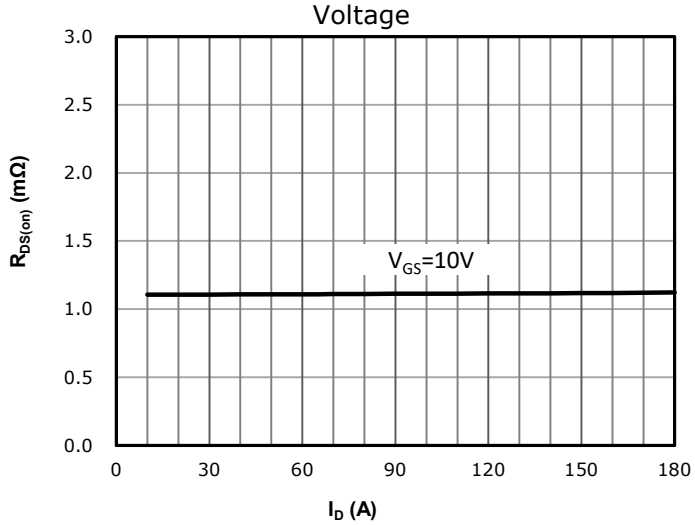


Fig 4: Rds(on) vs Gate Voltage

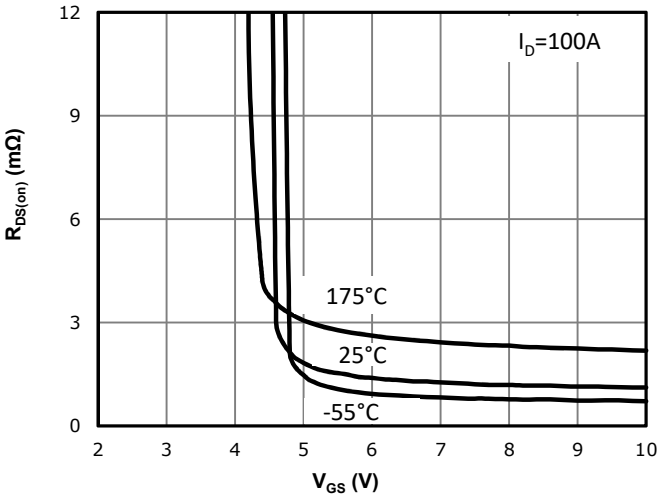


Fig 5: Rds(on) vs. Temperature

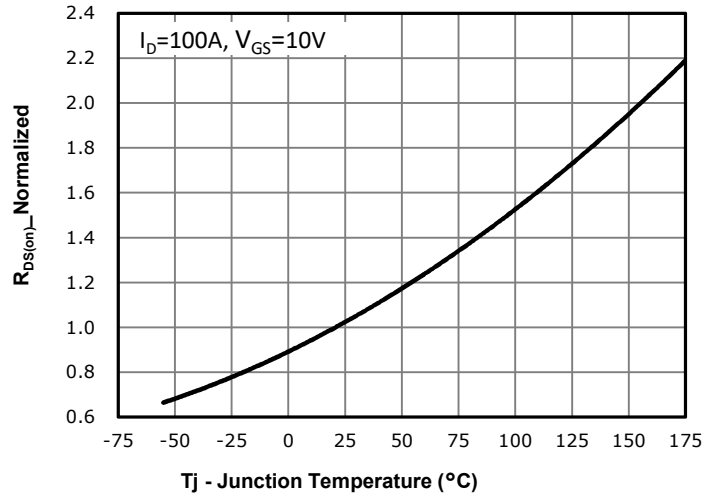
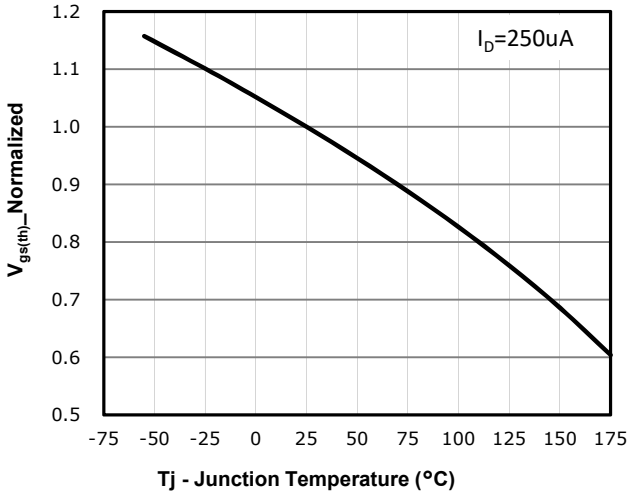


Fig 6: Vgs(th) vs. Temperature



©China Resources Microelectronics (Chongqing) Limited

Fig 7: BVdss vs. Temperature

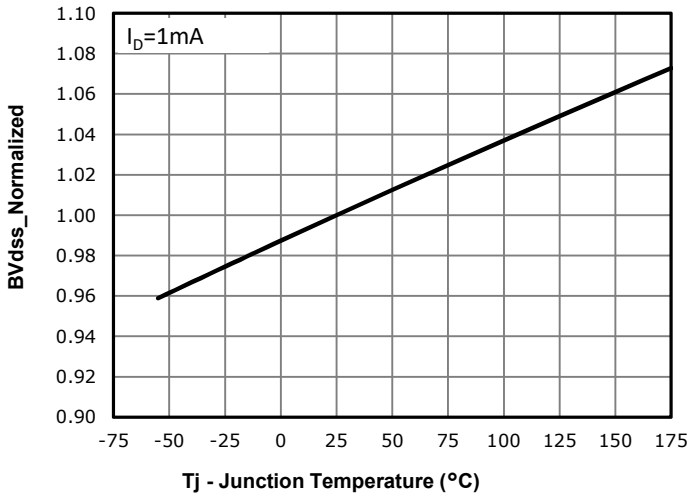


Fig 8: Capacitance Characteristics

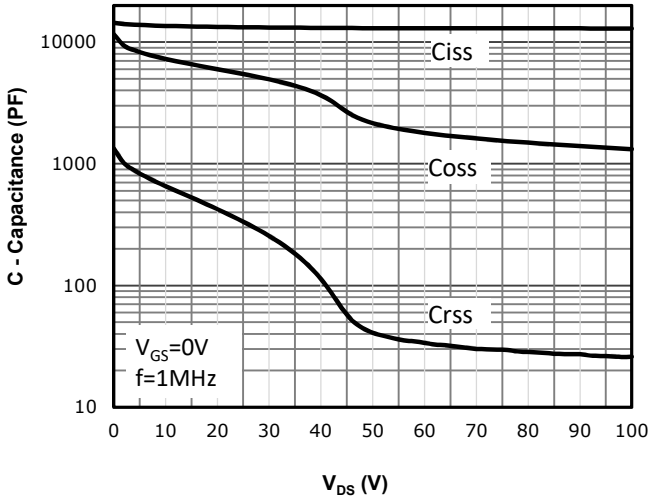


Fig 9: Gate Charge Characteristics

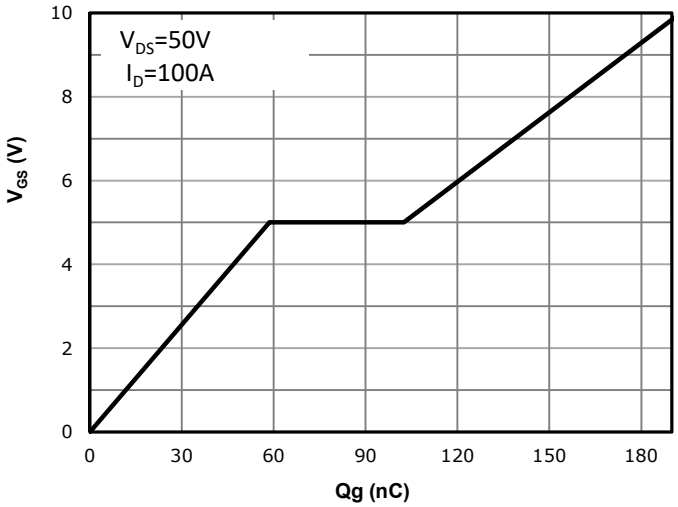


Fig 10: Body-diode Forward Characteristics

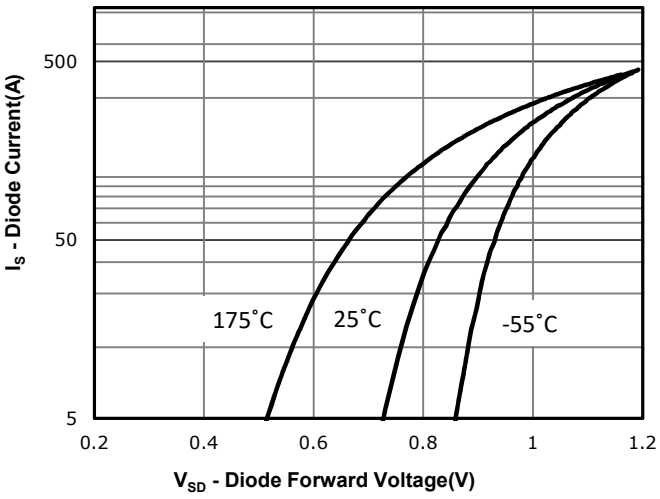


Fig 11: Power Dissipation

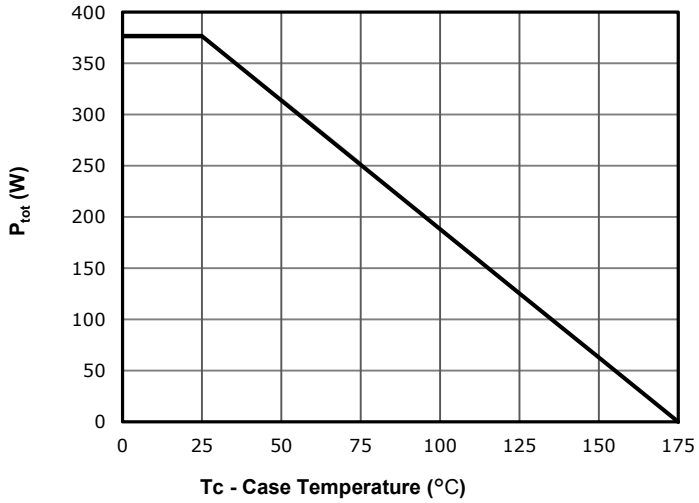
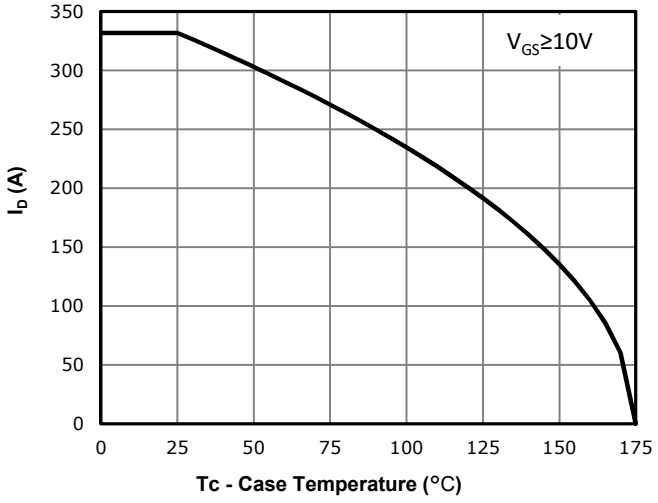


Fig 12: Drain Current Derating



©China Resources Microelectronics (Chongqing) Limited

Fig 13: Safe Operating Area

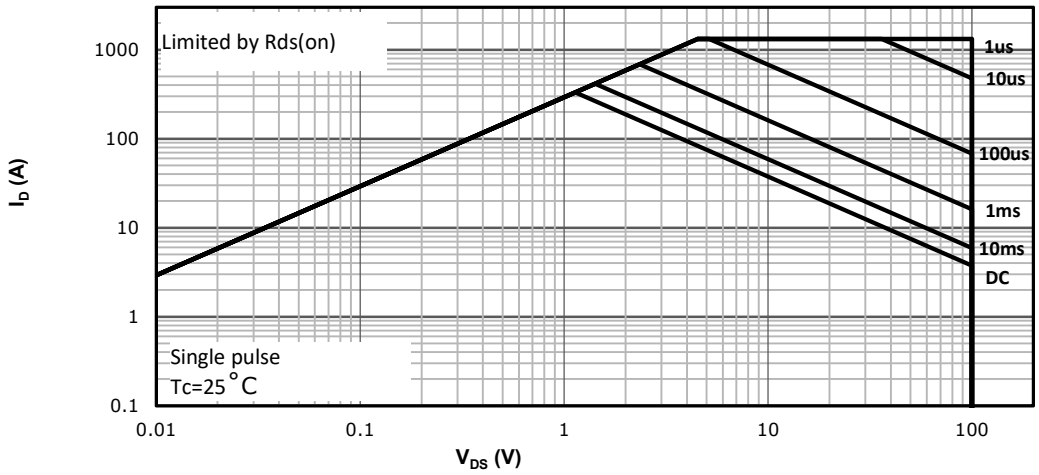
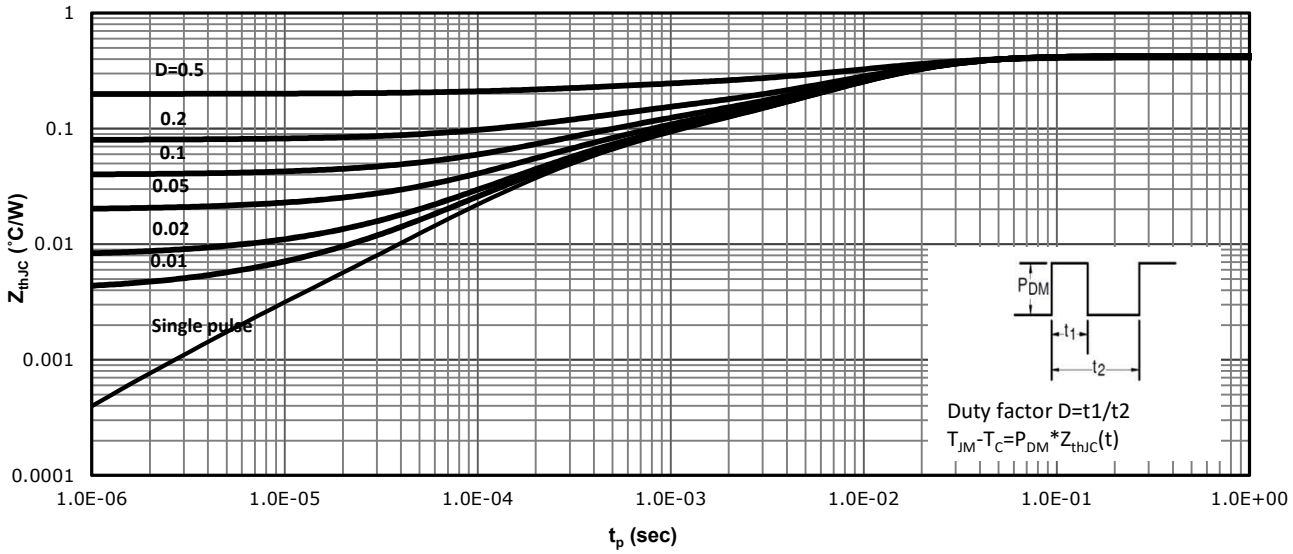


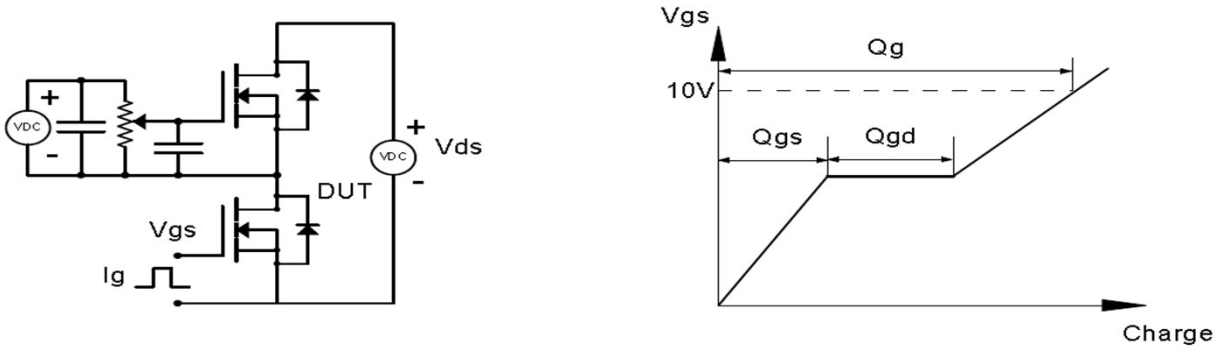
Fig 14: Max. Transient Thermal Impedance



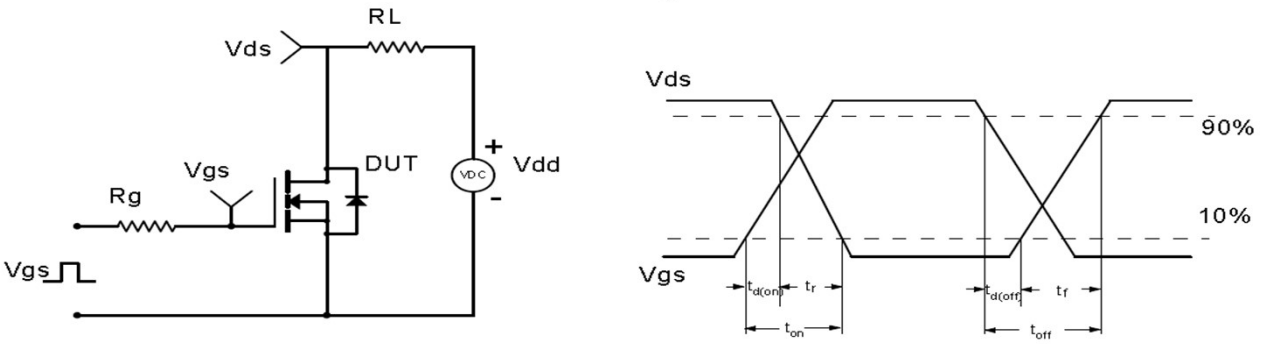
©China Resources Microelectronics (Chongqing) Limited

Test Circuit & Waveform

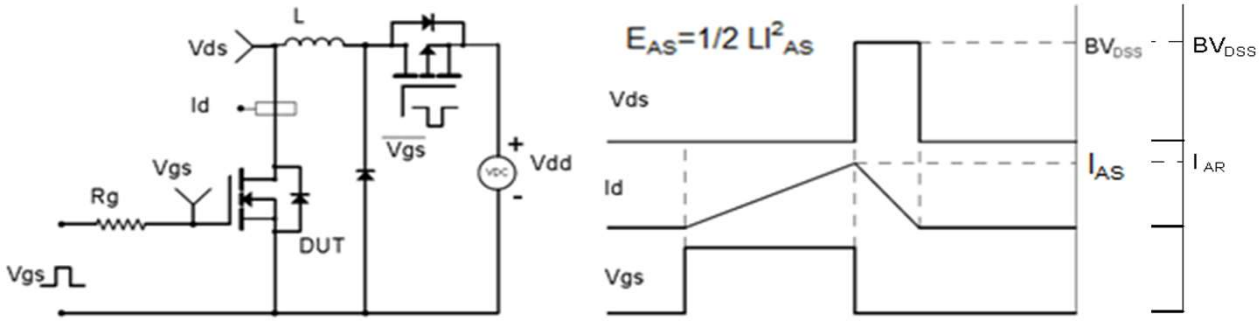
Gate Charge Test Circuit & Waveform



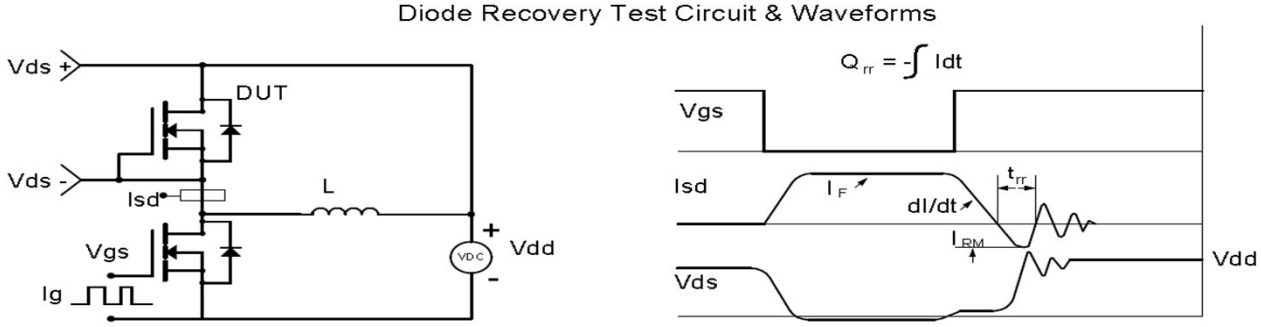
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

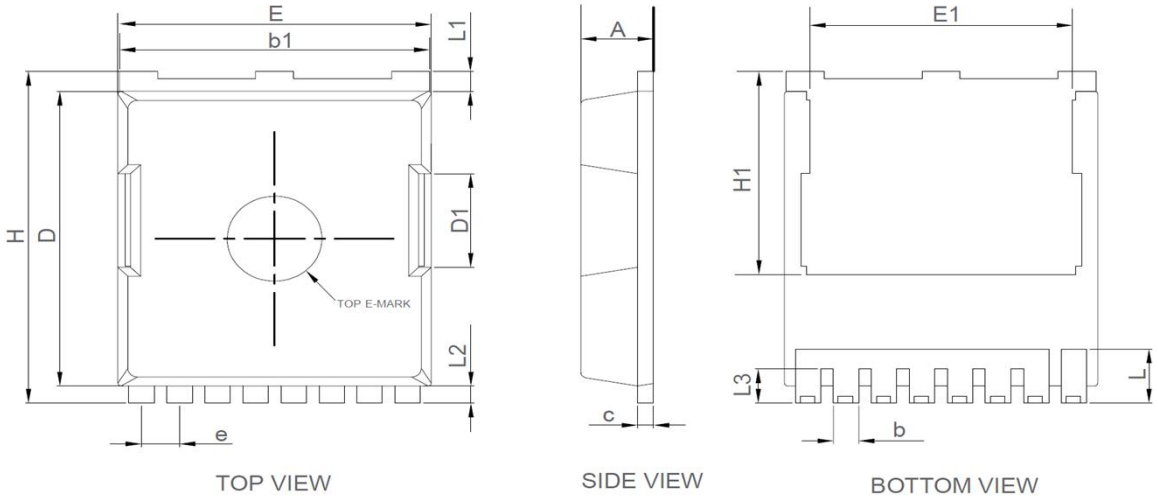


Diode Recovery Test Circuit & Waveforms



©China Resources Microelectronics (Chongqing) Limited

Package Outline: TOLL





SIDE VIEW

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

©China Resources Microelectronics (Chongqing) Limited

Marking



NOTE:
XAAAAAAA-Y
X —Assembly location code
AAAAAAA —Assembly lot NO. last 7digits
Y —Bin code

©China Resources Microelectronics (Chongqing) Limited

Revision History

Revision	Date	Major changes
1.0	2024/7/2	Release of preliminary 1.0 version.
1.1	2024/10/16	$R_{DS(on)}$ max update.
1.2	2025/3/7	Update Fig5/ Fig12/Id/Is/Is pulse.

Disclaimer

CRM reserves the right to change any product or information in this Specification at any time without prior notice.

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics .The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer's technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

The product is not intended for use in applications that require extraordinary levels of quality and reliability, such as aviation/aerospace and life-support devices or systems.

Any and all semicondutor 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.

©China Resources Microelectronics (Chongqing) Limited