华润微电子(重庆)有限公司

CRTS095N10N

Trench N-MOSFET 100V, 6.2mΩ, 130A

Features

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

Applications

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

Product Summary

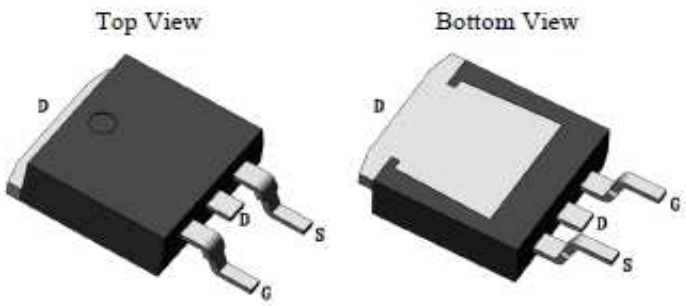
V_{DS}	100V
$R_{DS(on)\ typ.}$	6.2mΩ
I_D	130A

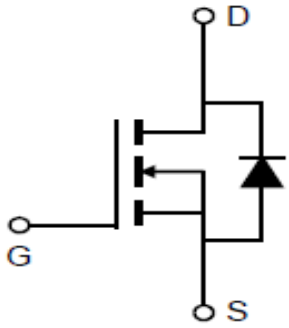
100% DVDS Tested

100% Avalanche Tested

RoHS HF

TO-263





Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRTS095N10N	CRTS095N10N	TO-263	Reel	N/A	N/A	800pcs

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)	I_D	 130 160 82	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	520	A
Avalanche energy, single pulse (L=0.5mH, Rg=25Ω)	E_{AS}	400	mJ
Gate-Source voltage	V_{GS}	±25	V
Power dissipation (T_C = 25°C)	P_{tot}	280	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)	T_{sold}	260	°C

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Thermal Resistance

Parameter	Symbol	Typ	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	0.34	0.45	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}*	65	91	

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	3	3.6	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	- -	0.05 20	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}=±25V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	- -	6.2 13.5	9.5 16.5	mΩ	V_{GS}=10V, I_D=50A, T_j=25°C T_j=150°C
Transconductance	g_{fs}	-	110	-	S	V_{DS}=5V,I_D=50A
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	7431	13376	pF	V_{GS}=0V, V_{DS}=50V, f=1MHz
Output Capacitance	C_{oss}	-	617	1111		
Reverse Transfer Capacitance	C_{rss}	-	254	508		
Gate Total Charge	Q_G	-	168	269	nC	V_{GS}=10V, V_{DS}=50V, I_D=50A, f=1MHz
Gate-Source charge	Q_{gs}	-	43	69		
Gate-Drain charge	Q_{gd}	-	52	83		
Turn-on delay time	$t_{d(on)}$	-	27	-	ns	V_{GS}=10V, V_{DD}=50V, R_{G_ext}=2.7Ω,ID=50A
Rise time	t_r	-	97	-		
Turn-off delay time	$t_{d(off)}$	-	84	-		
Fall time	t_f	-	102	-		
Gate resistance	R_G	-	1.2	3	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}	-	0.9	1.3	V	V_{GS}=0V,I_{SD}=50A
Body Diode Continuous Forward Current	I_S			130	A	T_C = 25°C
Body Diode Reverse Recovery Time	t_{rr}	-	85	128	ns	I_F=50A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge	Q_{rr}	-	263	395	nC	

*The value of R_{thJA} is measured by placing the device in a still air box which is one cubic foot.

Typical Performance Characteristics

Fig 1: Output Characteristics

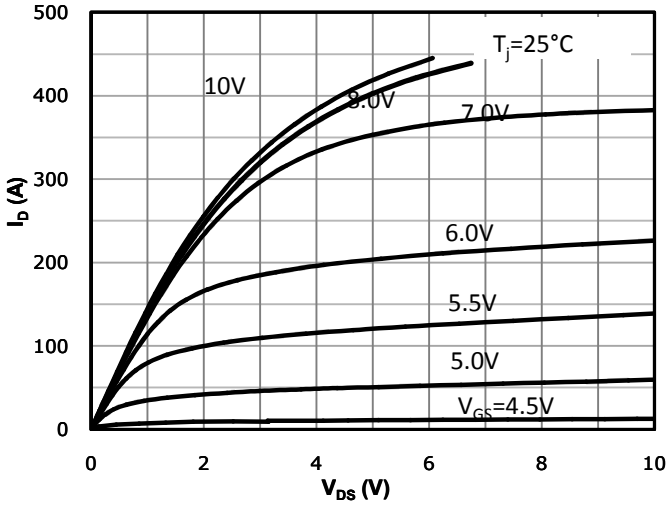


Fig 2: Transfer Characteristics

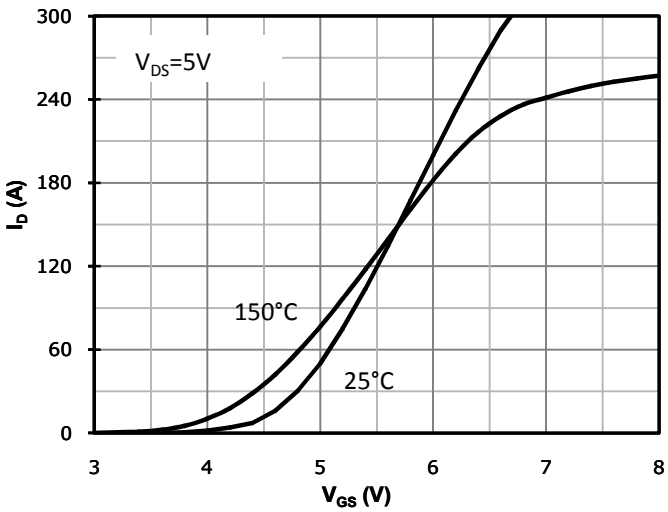


Fig 3: Rds(on) vs Drain Current and Gate Voltage

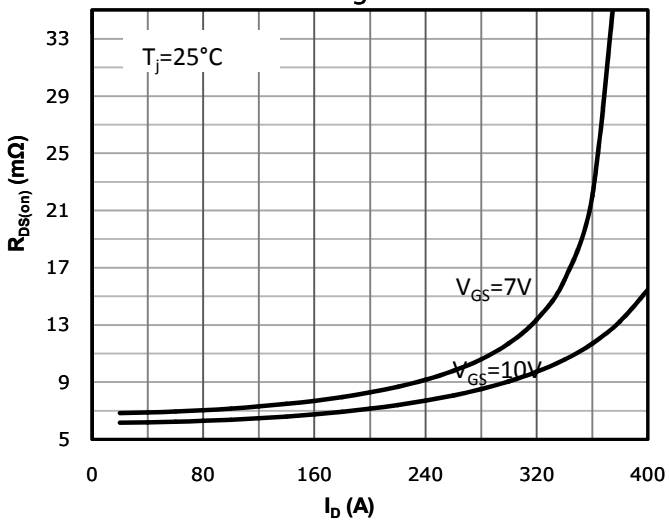


Fig 4: Rds(on) vs Gate Voltage

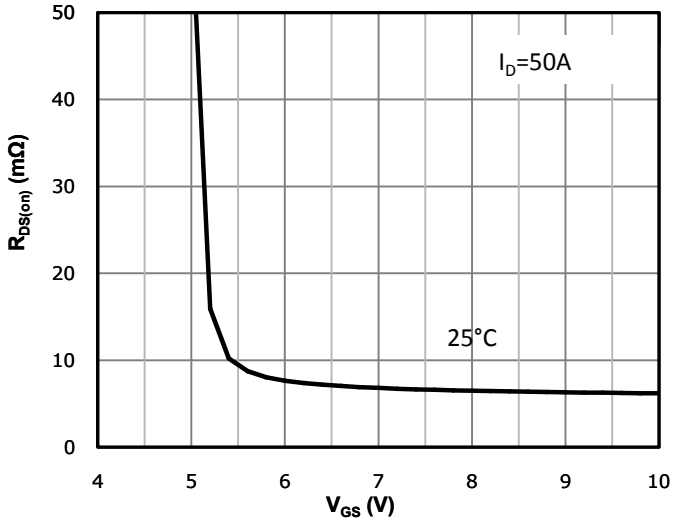


Fig 5: Rds(on) vs. Temperature

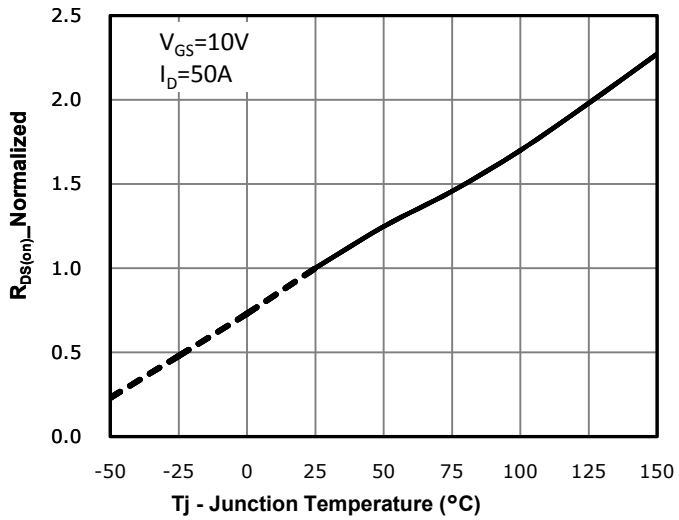


Fig 6: Vgs(th) vs. Temperature

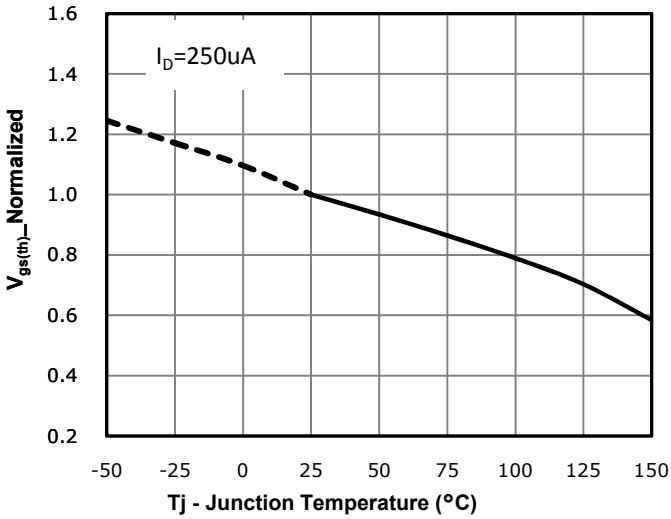


Fig 7: Gate Charge Characteristics

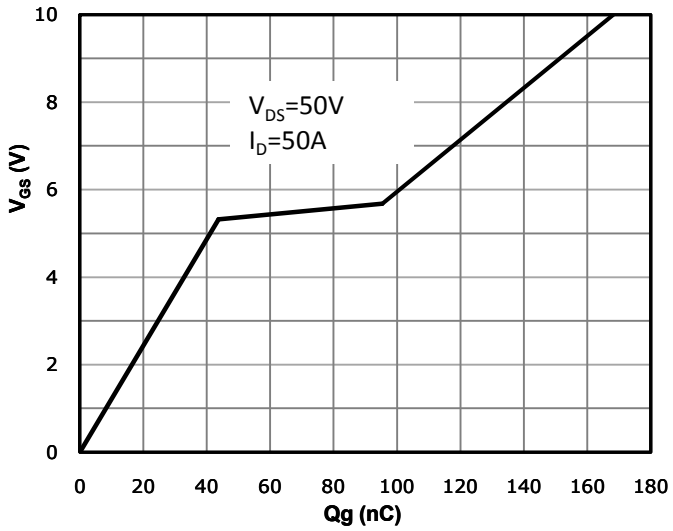


Fig 8: Capacitance Characteristics

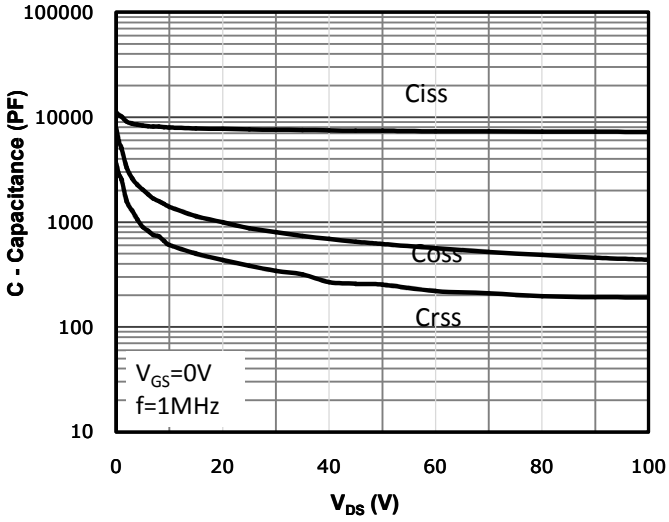


Fig 9: Body-diode Forward Characteristics

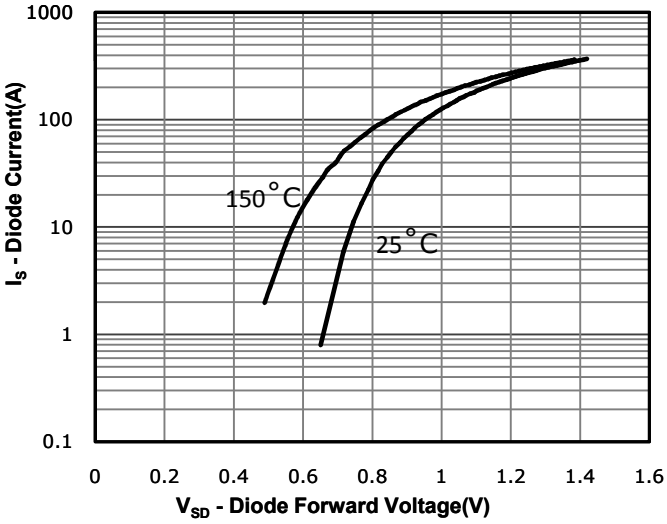


Fig 10: Power Dissipation

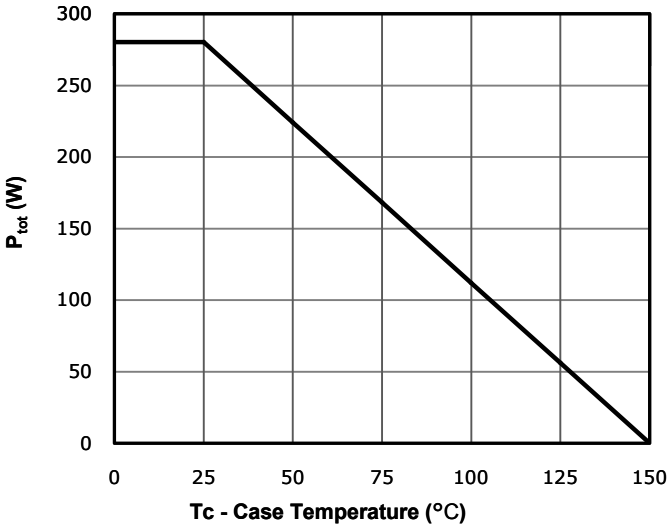


Fig 11: Drain Current Derating

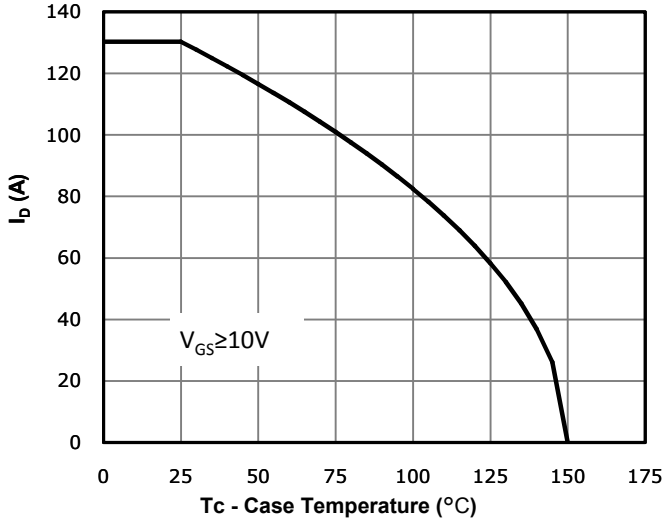


Fig 12: Safe Operating Area

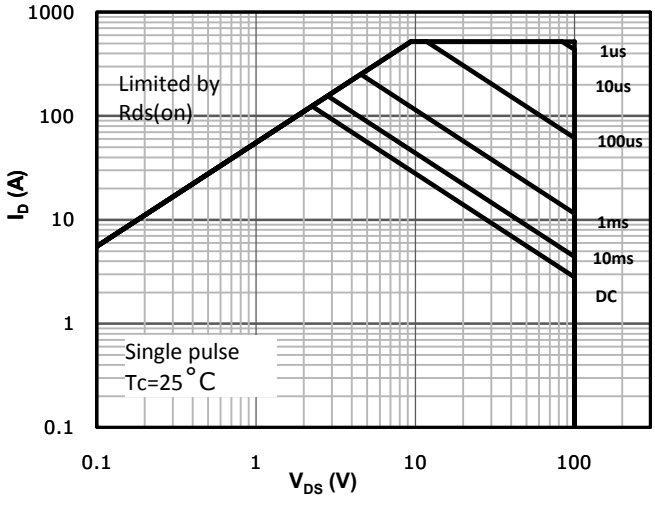
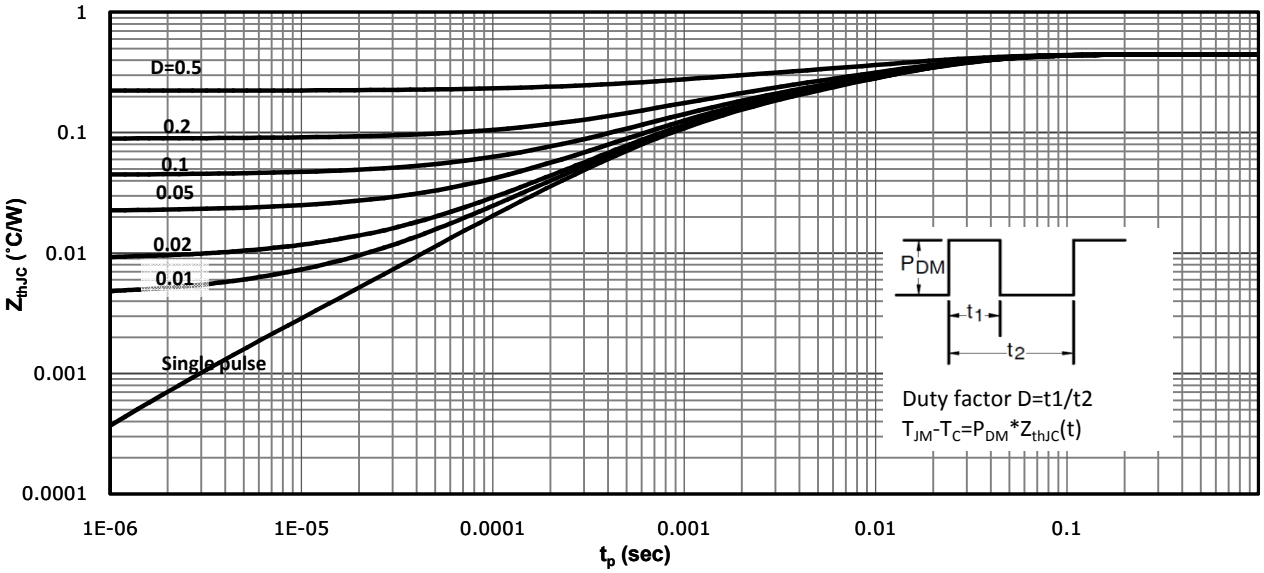
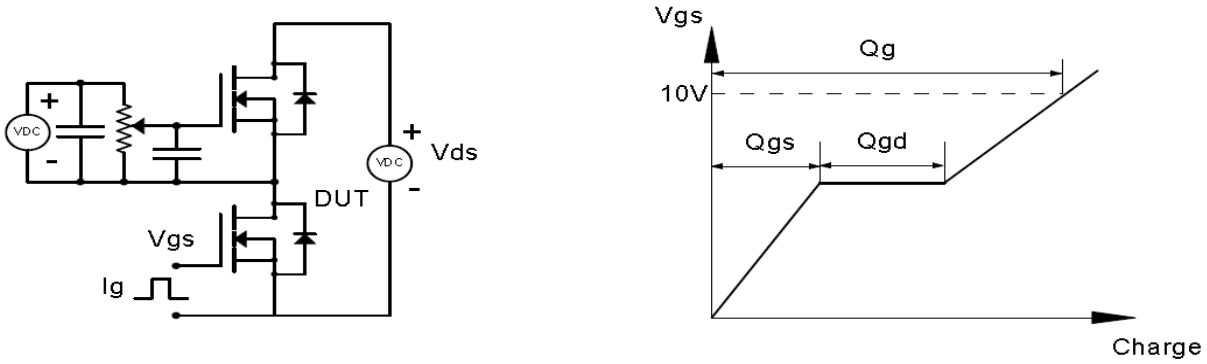


Fig 13: Max. Transient Thermal Impedance

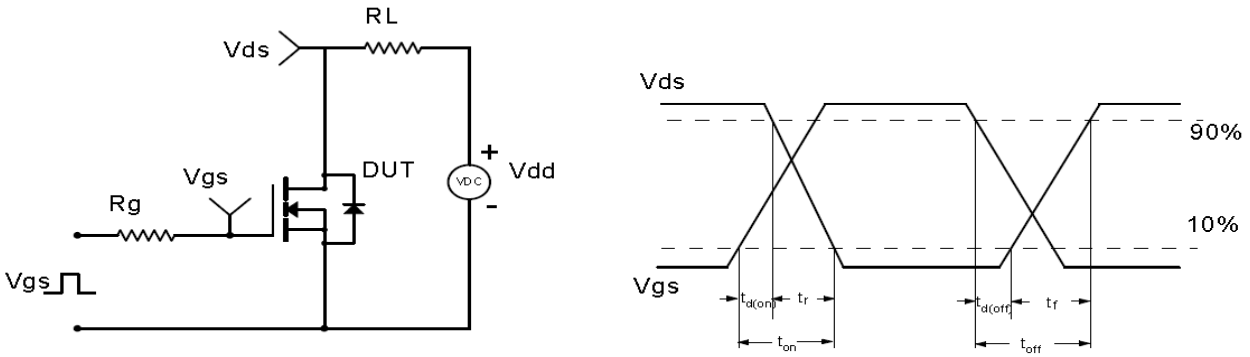


Test Circuit & Waveform

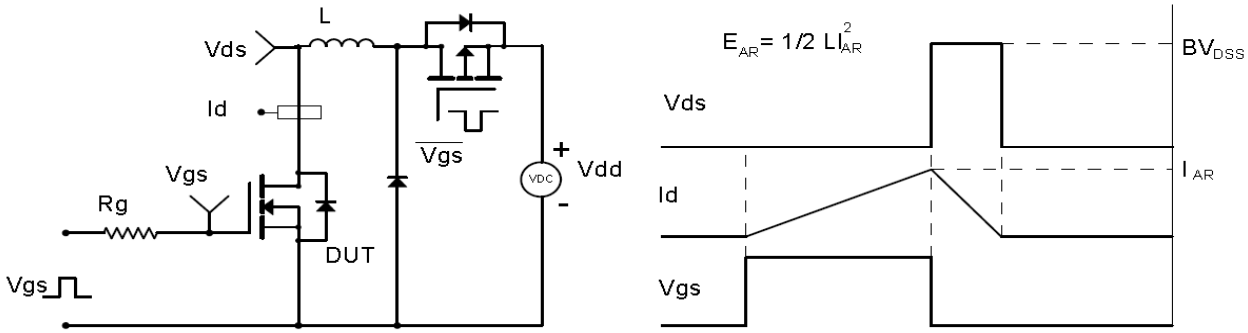
Gate Charge Test Circuit & Waveform



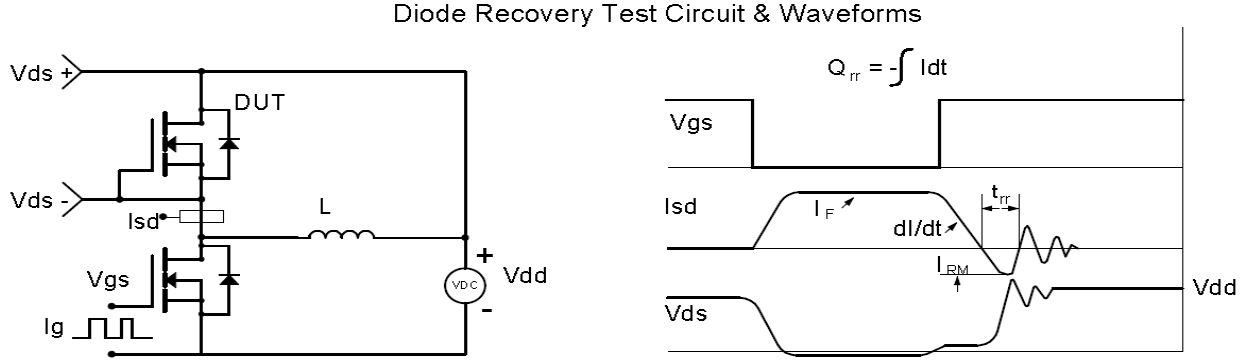
Resistive Switching Test Circuit & Waveforms



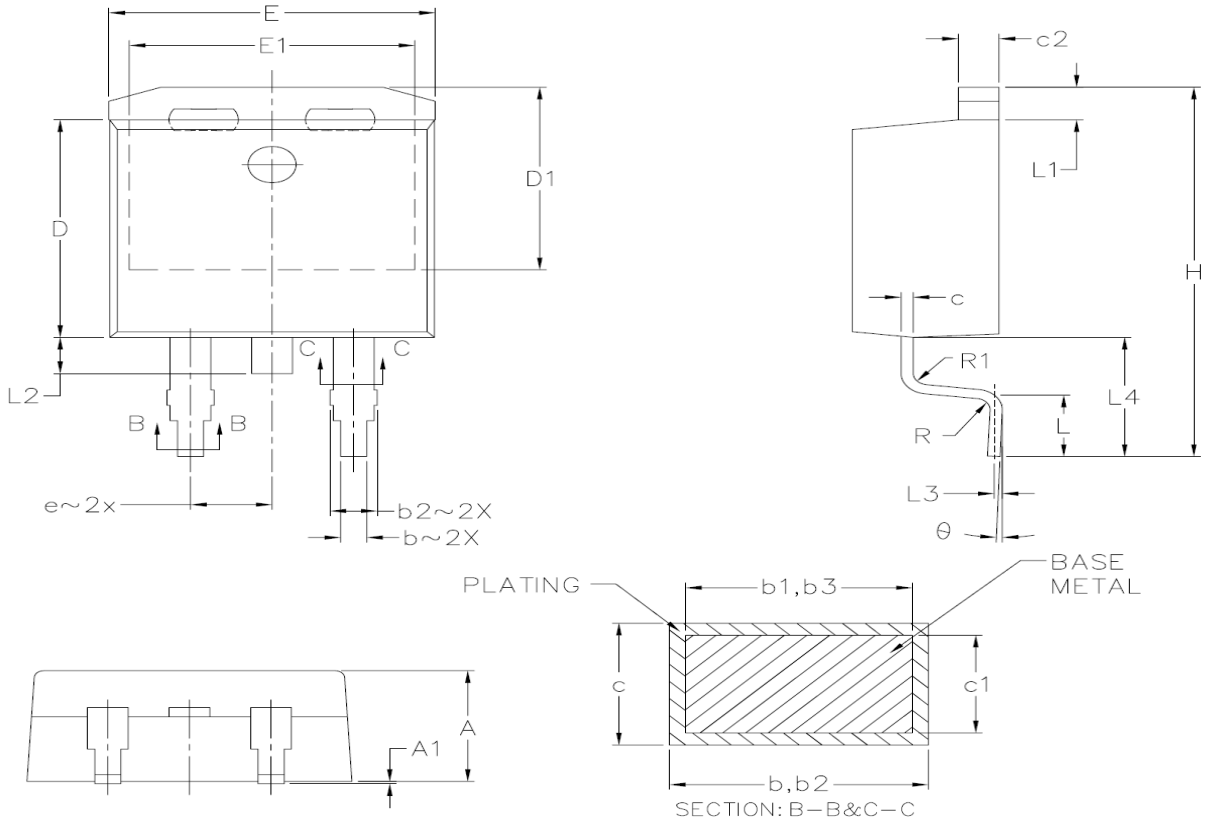
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

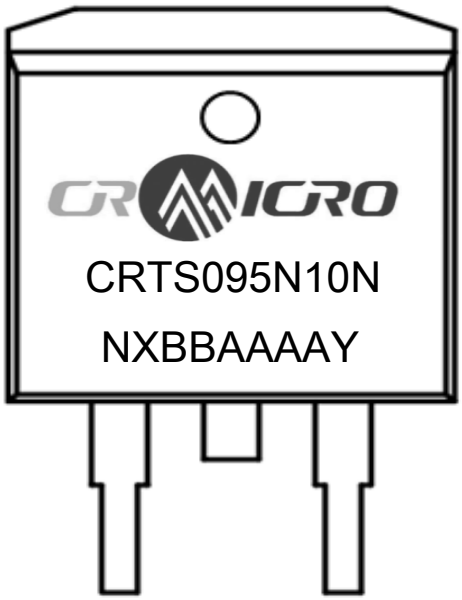


Package Outline: TO-263



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.060	4.830	0.160	0.190
A1	0.000	0.254	0.000	0.010
b	0.500	0.991	0.020	0.039
b1	0.500	0.890	0.020	0.035
b2	1.140	1.780	0.045	0.070
b3	1.140	1.730	0.045	0.068
c	0.381	0.737	0.015	0.029
c1	0.381	0.584	0.015	0.023
c2	1.143	1.651	0.045	0.065
D	8.382	9.652	0.330	0.380
D1	6.858	--	0.270	--
e	2.54 BSC.		0.100 BSC.	
E	9.652	10.668	0.380	0.420
E1	6.223	--	0.245	--
H	14.605	15.880	0.575	0.625
L	1.778	2.794	0.070	0.110
L1	--	1.676	--	0.066
L2	--	1.778	--	0.070
L3	0.254 BSC.		0.010 BSC.	
L4	4.780	5.280	0.188	0.208
θ	0°	8°	0°	8°

Marking



NOTE:
NXBBAAAAY

N	—Wire Bond code
X	—Assembly location code
BB	—Fab code
AAAA	—Lot code
Y	—Bin code

Revision History

Revison	Date	Major changes
1.0	2019/12/31	Release of formal version

Disclaimer

Unless otherwise specified in the datasheet, the product is designed and qulified 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 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.

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