华润微电子(重庆)有限公司

CRSS028N10NZ

SkyMOS1 N-MOSFET 100V, 2.3mΩ, 180A

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

Product Summary

V_{DS}	100V
$R_{DS(on)}$	2.3mΩ
I_D	180A

100% DVDS Tested

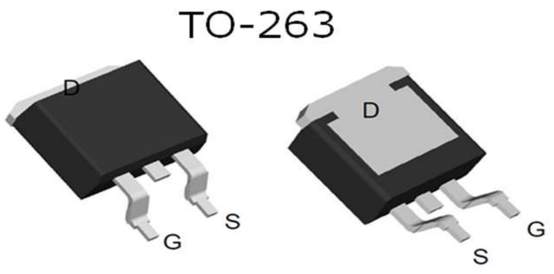
100% Avalanche Tested

RoHS

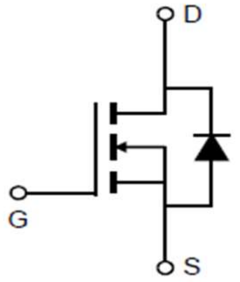
H F

Applications

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



CRSS028N10NZ



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRSS028N10NZ	CRSS028N10NZ	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	I_D		A
T_C = 25°C (Silicon limit)		225	
T_C = 25°C (Package limit)		180	
T_C = 100°C (Silicon limit)		142	
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	720	A
Avalanche energy, single pulse (ID = 46A, Rg=25Ω)	E_{AS}	529	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
Soldering temperature, wave soldering only allowed at leads (1.6mm from case for 10s)	Tsold	245	°C

Thermal Resistance

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Thermal resistance, junction – case.	R_{thJC}	-	0.30	0.50	°C/W	
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	-	-	62	°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}	100	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	2.2	3.0	3.8	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	0 0	0.05 -	1 100	μA	V_{DS}=100V,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	2.3	2.8		V_{GS}=10V, I_D=90A Tj=25°C
Transconductance	g_{fs}	50	197	300	S	V_{DS}=5V,I_D=90A
Dynamic Characteristic						
Input Capacitance	C_{iss}	7570	11355	17035.5	pF	V_{GS}=0V, V_{DS}=50V, f=1MHz
Output Capacitance	C_{oss}	964	1446	2169		
Reverse Transfer Capacitance	C_{rss}	36	54	108		
Gate Total Charge	Q_G	113	169.0	254	nC	V_{GS}=10V, V_{DS}=50V, I_D=90A, f=1MHz
Gate-Source charge	Q_{gs}	45	67.0	101		
Gate-Drain charge	Q_{gd}	20	30	60		

Turn-on delay time	$t_{d(on)}$	23	35	53	ns	V_{GS}=10V, V_{DD}=50V, R_{G_ext}=3.0Ω
Rise time	t_r	74	111	222		
Turn-off delay time	$t_{d(off)}$	56	84	126		
Fall time	t_f	75	112	224		
Gate resistance	R_G	1.5	2.3	3.5	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}	0.5	0.9	1.4	V	V_{GS}=0V,I_{SD}=90A
Body Diode Continuous Forward Current	I_S	-	-	180	A	T_C = 25°C
Body Diode Pulsed Current	$I_{S\ pulse}$	-	-	720	A	T_C = 25°C
Body Diode Reverse Recovery Time	t_{rr}	51	101	202	ns	I_F=90A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge	Q_{rr}	169	338	676	nC	

Typical Performance Characteristics

Fig 1: Output Characteristics

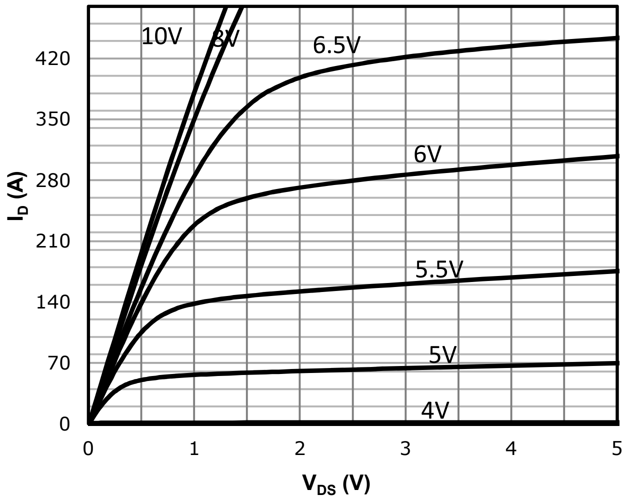
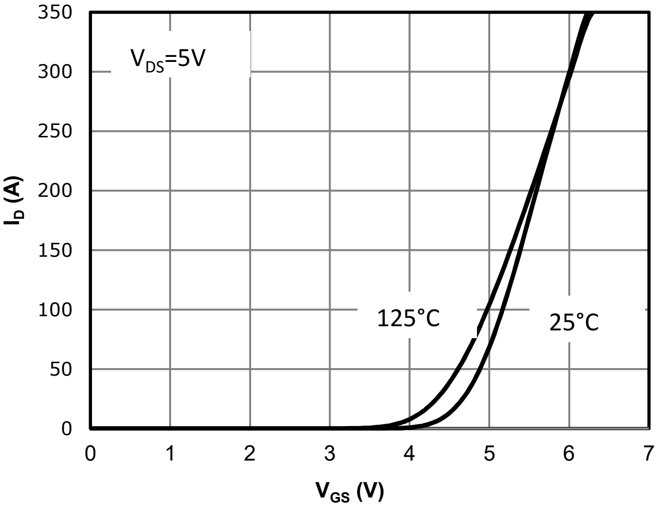


Fig 2: Transfer Characteristics



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

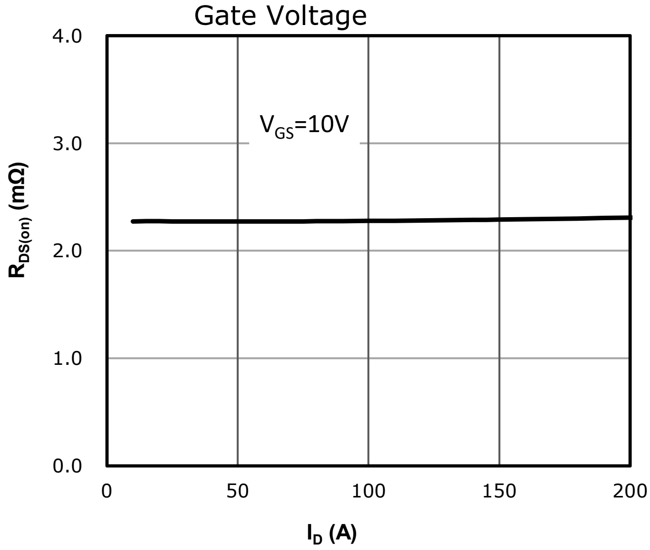


Fig 4: Rds(on) vs Gate Voltage

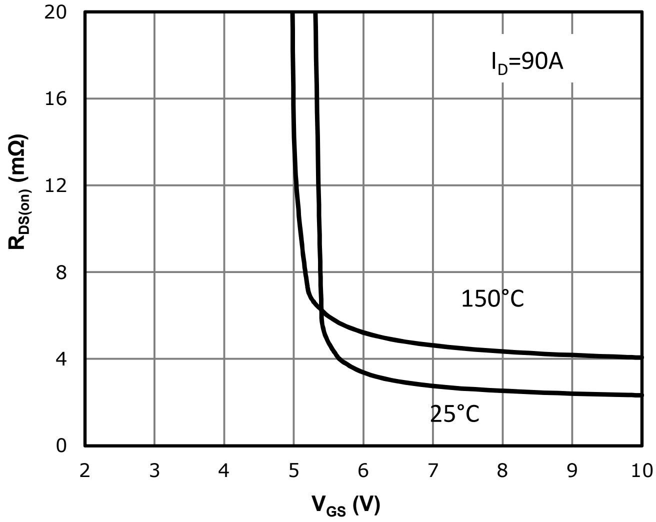


Fig 5: Rds(on) vs. Temperature

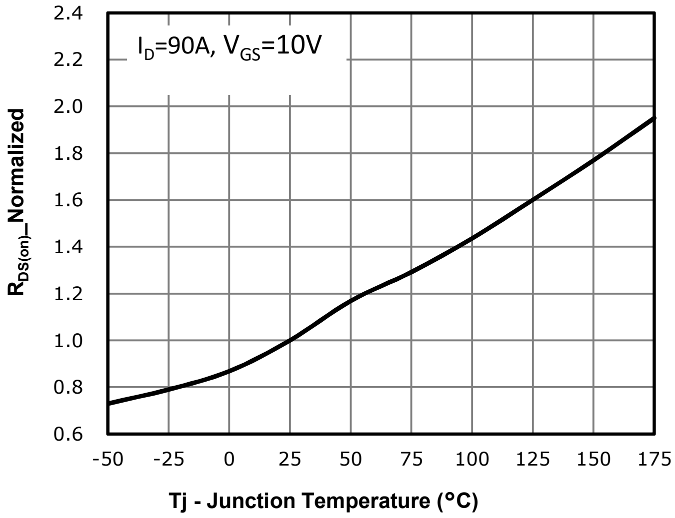


Fig 6: Capacitance Characteristics

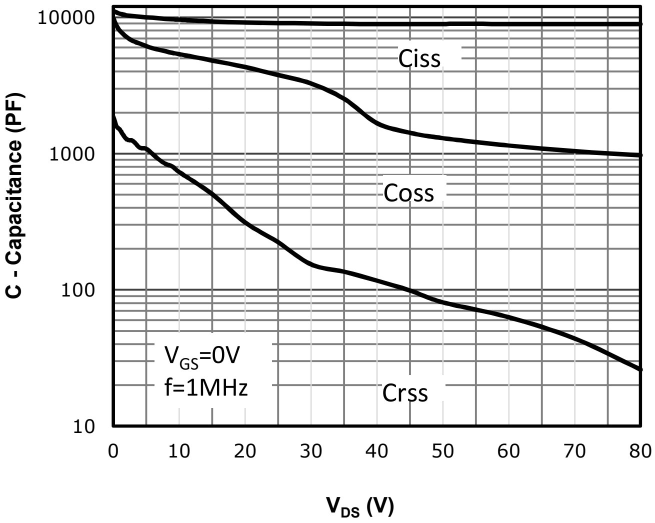


Fig 7: Vgs(th) vs. Temperature

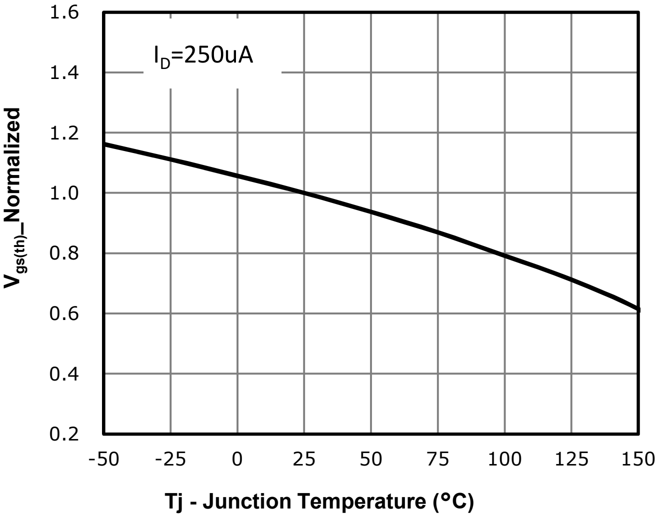


Fig 8: BVdss vs. Temperature

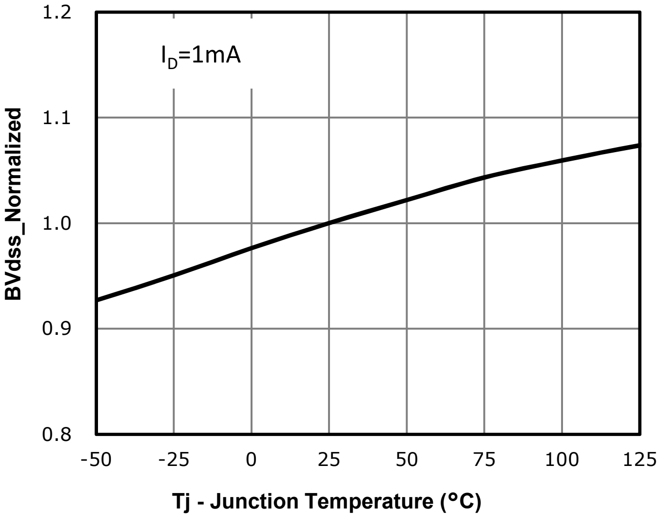


Fig 9: Gate Charge Characteristics

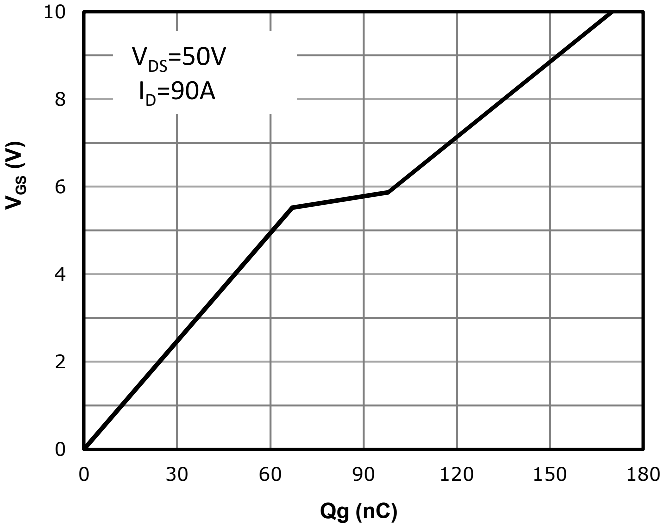


Fig 10: Body-diode Forward Characteristics

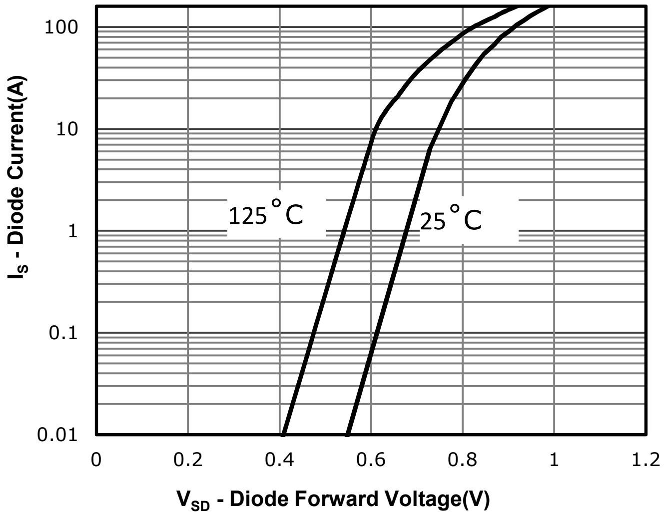


Fig 11: Power Dissipation

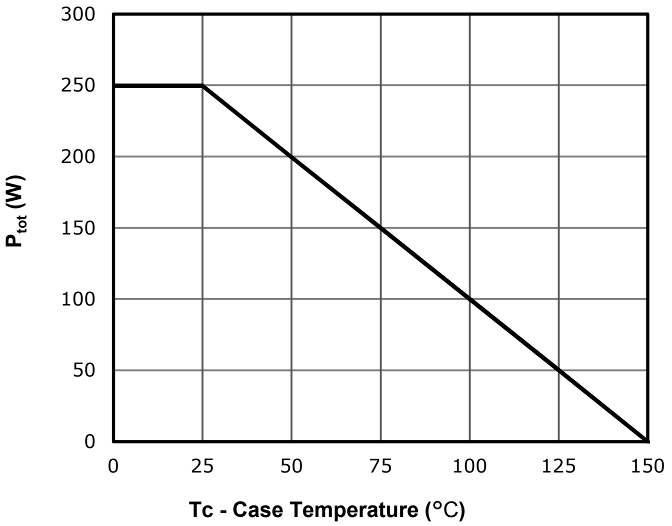


Fig 12: Drain Current Derating

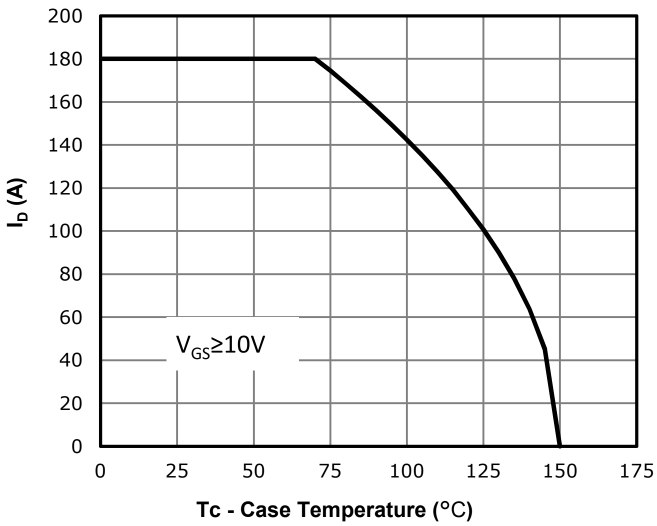


Fig 13: Safe Operating Area

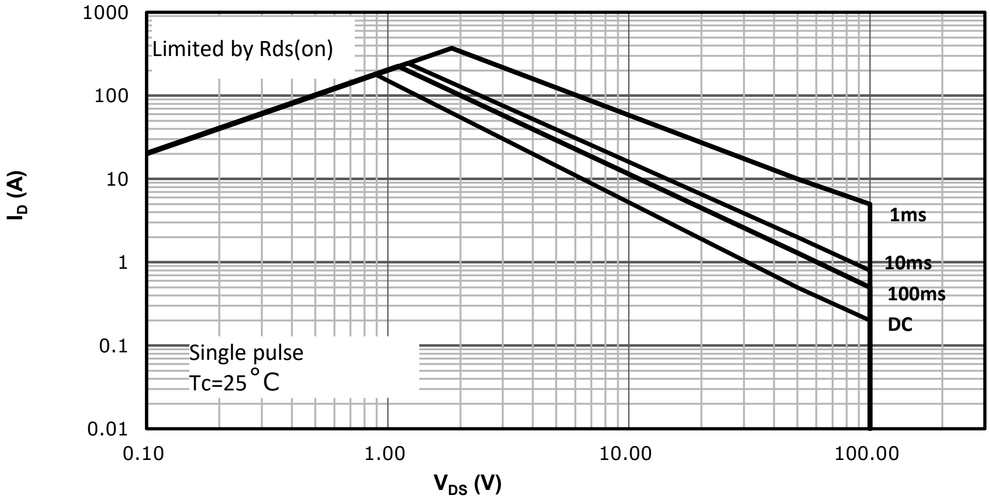
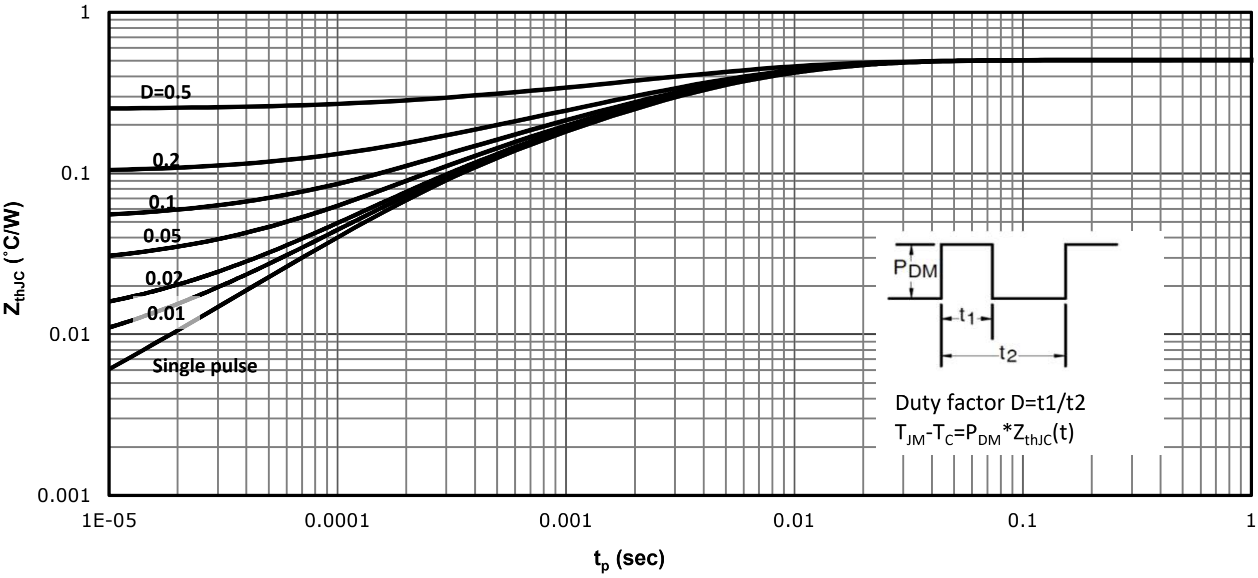
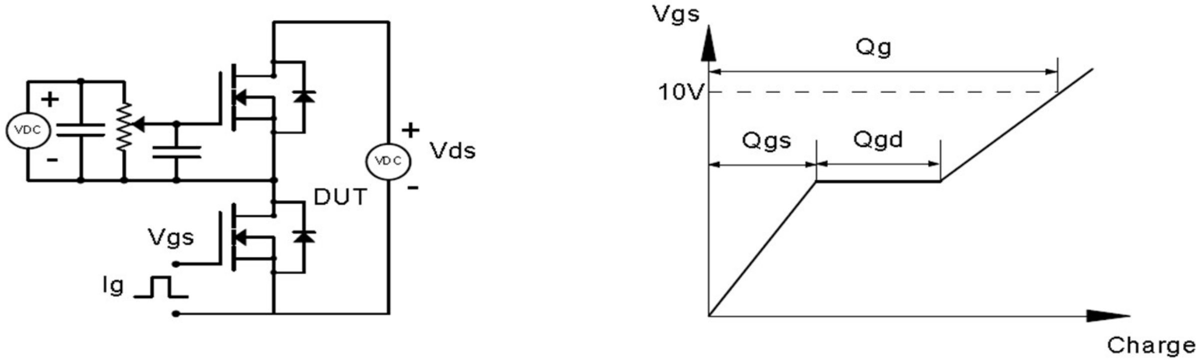


Fig 12: Max. Transient Thermal Impedance

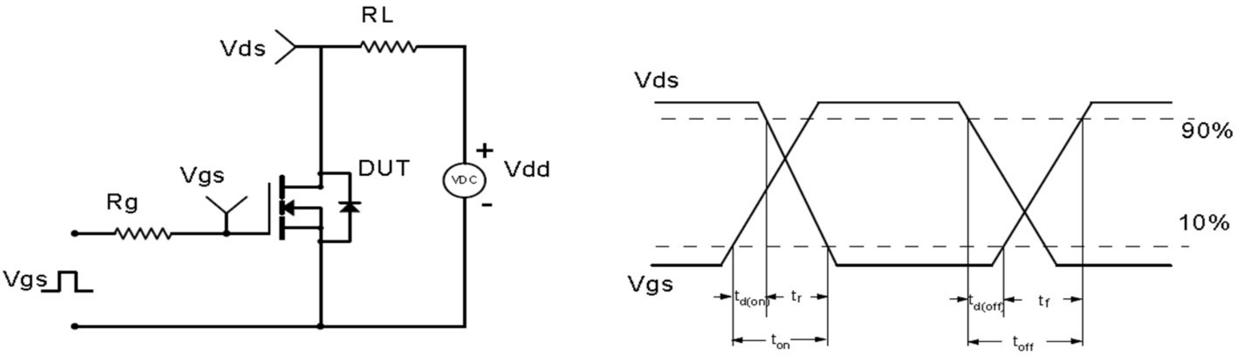


Test Circuit & Waveform

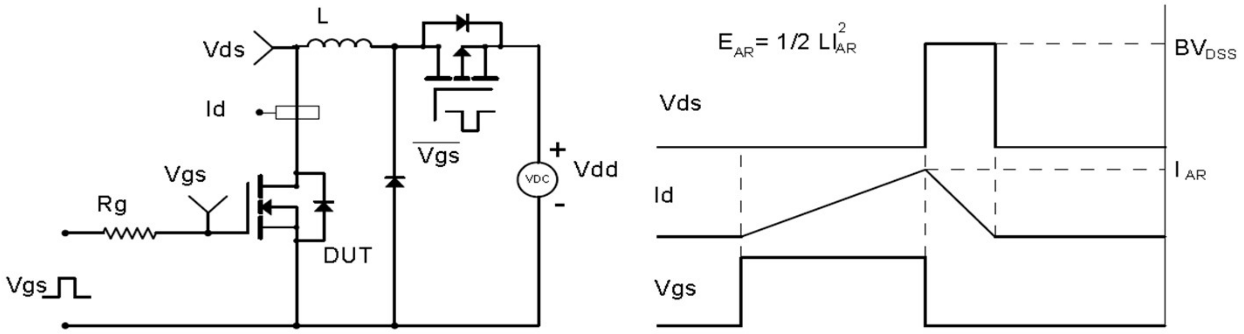
Gate Charge Test Circuit & Waveform



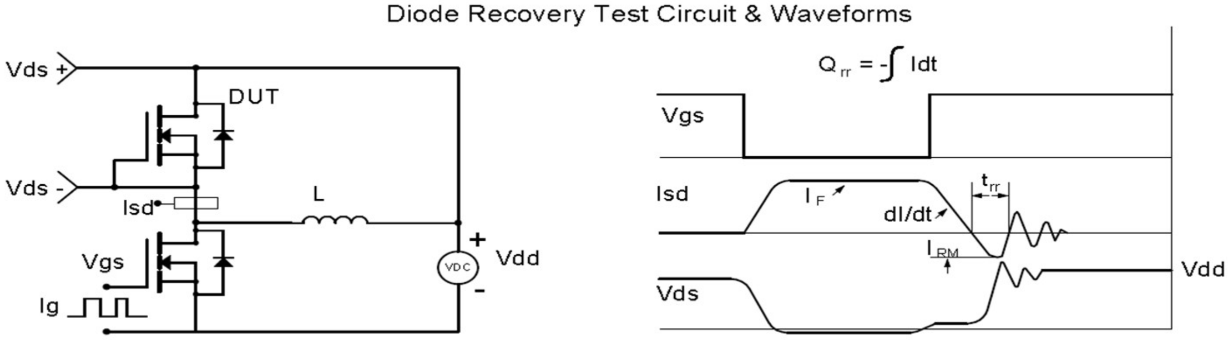
Resistive Switching Test Circuit & Waveforms



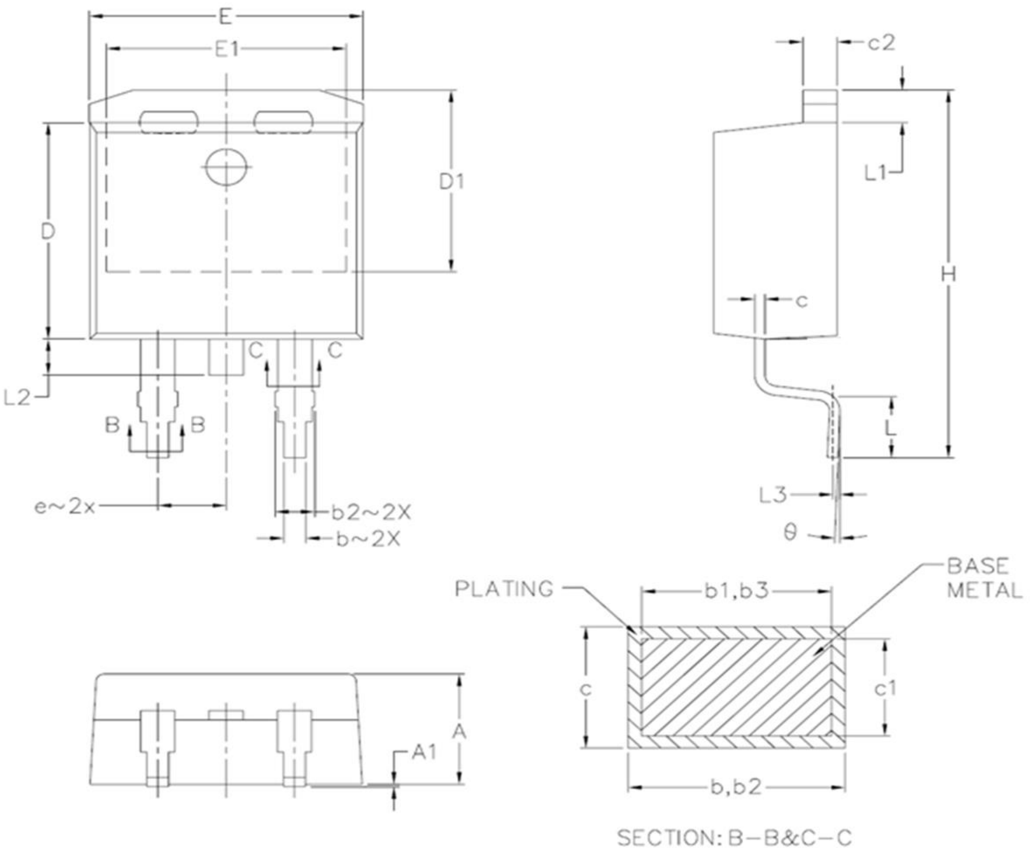
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

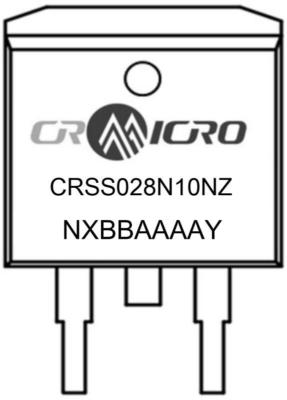


Package Outline: TO-263



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
b2	1.140	1.780	0.045	0.070
c	0.330	0.740	0.013	0.029
c2	1.140	1.650	0.045	0.065
D	8.380	9.650	0.330	0.380
D1	6.860	--	0.270	--
e	2.54 BSC.		0.100 BSC.	
E	9.65	10.67	0.380	0.420
E1	6.22	--	0.245	--
H	14.61	15.88	0.575	0.625
L	1.78	2.79	0.070	0.110
L1	--	1.68	--	0.066
L2	--	1.78	--	0.070
L3	0.254 BSC.		0.010 BSC.	
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	2022/8/31	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.