

Features

- Uses CRM(CQ) advanced SkyMOS1 technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent $Q_g \times R_{DS(on)}$ product(FOM)
- Qualified according to JEDEC criteria
- 175°C Operating Temperature

Applications

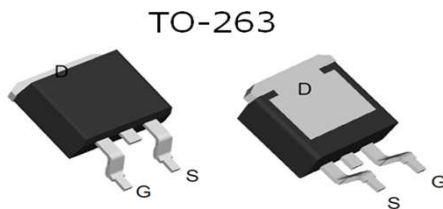
- Motor control and drive
- Battery management
- UPS (Uninterruptible Power Supplies)

Product Summary

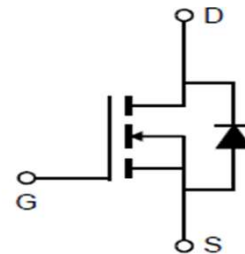
V_{DS}	150V
$R_{DS(on)}$	5.9mΩ
I_D	155A

100% Avalanche Tested

100% DVDS Tested



CRSS070N15NZ



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRSS070N15NZ	CRSS070N15NZ	TO-263	Tape	N/A	N/A	800pcs 1000pcs

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	150	V
Continuous drain current	I_D	155	A
$T_C = 25^\circ\text{C}$ (Silicon limit)		160	
$T_C = 25^\circ\text{C}$ (Package limit)		110	
$T_C = 100^\circ\text{C}$ (Silicon limit)			
Pulsed drain current ($T_C = 25^\circ\text{C}$, t_p limited by T_{jmax})	$I_{D \text{ pulse}}$	620	A
Avalanche energy, single pulse ($I_{AS} = 36\text{A}$, $R_g = 25\Omega$)	E_{AS}	324	mJ
Gate-Source voltage	V_{GS}	± 20	V
Power dissipation ($T_C = 25^\circ\text{C}$)	P_{tot}	333	W
Operating junction and storage temperature	T_j, T_{stg}	-55...+175	$^\circ\text{C}$
Soldering temperature, wave soldering only allowed at leads (1.6mm from case for 10s)	T_{sold}	260	$^\circ\text{C}$

※. Notes: 1. EAS is tested at starting $T_j = 25^\circ\text{C}$, $L = 0.5\text{mH}$, $I_{AS} = 36\text{A}$, $V_{gs} = 10\text{V}$.

Thermal Resistance

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Thermal resistance, junction – case.	R_{thJC}	-	0.33	0.45	°C/W	
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	-	-	62	°C/W	

Electrical Characteristic (at $T_j = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		

Static Characteristic

Drain-source breakdown voltage	BV_{DSS}	150	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate threshold voltage	$V_{GS(th)}$	2	3	4	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	$V_{DS}=150V, V_{GS}=0V$ $T_j=25^{\circ}\text{C}$
		-	-	100		$T_j=150^{\circ}\text{C}$
Gate-source leakage current	I_{GSS}	-	-	100	nA	$V_{GS}=\pm 20V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	5.9	7.0	mΩ	$V_{GS}=10V, I_D=60A$ TO-263
Transconductance	g_{fs}	-	106	-	S	$V_{DS}=5V, I_D=60A$

Dynamic Characteristic

Input Capacitance	C_{iss}	3611	5416	8124	pF	$V_{GS}=0V, V_{DS}=75V,$ $f=1\text{MHz}$
Output Capacitance	C_{oss}	381	572	858		
Reverse Transfer Capacitance	C_{rss}	20.7	31	62		
Gate Total Charge	Q_G	52.7	79	118.5	nC	$V_{GS}=10V, V_{DS}=75V,$ $I_D=60A, f=1\text{MHz}$
Gate-Source charge	Q_{gs}	20.7	31	62.0		
Gate-Drain charge	Q_{gd}	11.3	17	34.0		

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Turn-on delay time	$t_{d(on)}$	10.0	18.0	32.4	ns	V _{ds} =75V I _d =60A R _g =2.7Ω V _{gs} =10V;
Rise time	t_r	55.6	100.0	180.0		
Turn-off delay time	$t_{d(off)}$	32.8	59.0	106.2		
Fall time	t_f	55.0	99.0	178.2		
Gate resistance	R _G	2.6	4.0	6.0	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}	0.6	0.9	1.4	V	V _{GS} =0V, I _{SD} =60A
Body Diode Continuous Forward Current	I _S	-	-	155	A	T _C = 25°C
Body Diode Pulsed Current	I _{S pulse}	-	-	620	A	T _C = 25°C
Body Diode Reverse Recovery Time	t _{rr}	61	122	244	ns	I _{SD} =60A, V _{GS} =0V, dI _F /dt=100A/us;
Body Diode Reverse Recovery Charge	Q _{rr}	353	706	1412	nC	

Typical Performance Characteristics

Fig 1: Output Characteristics

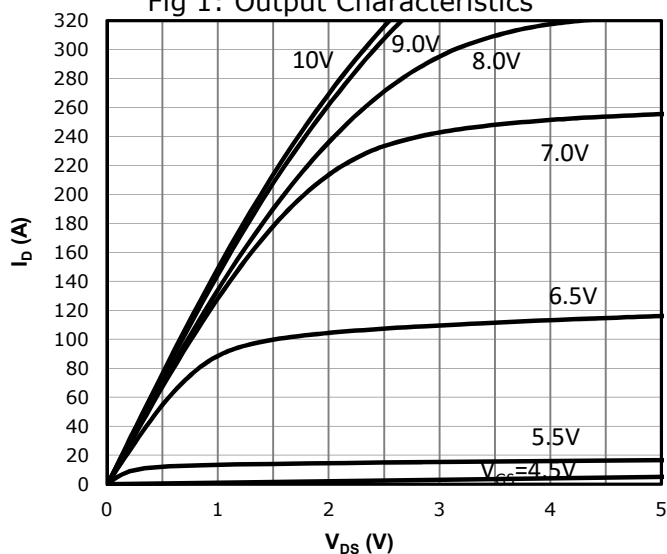


Fig 2: Transfer Characteristics

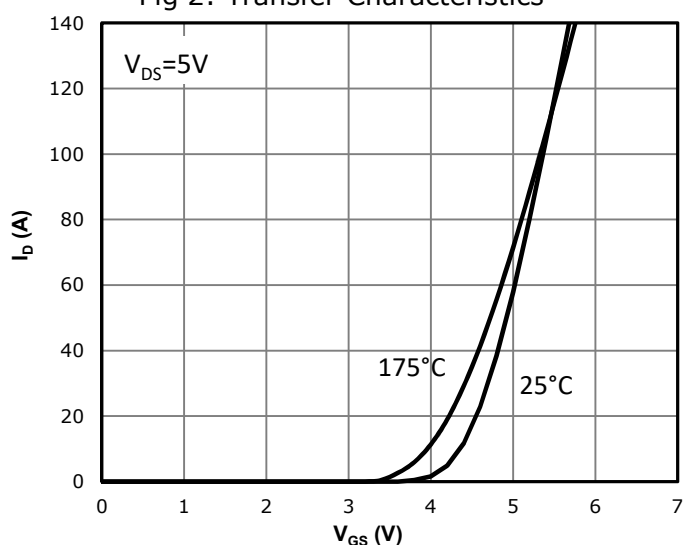


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

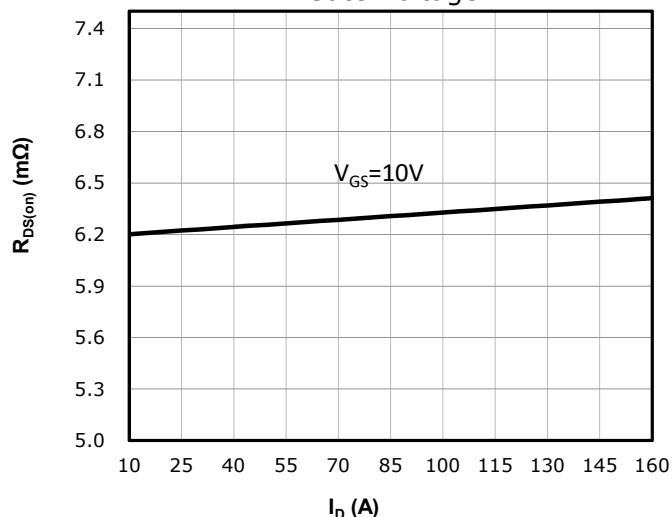


Fig 4: $R_{DS(on)}$ vs Gate Voltage

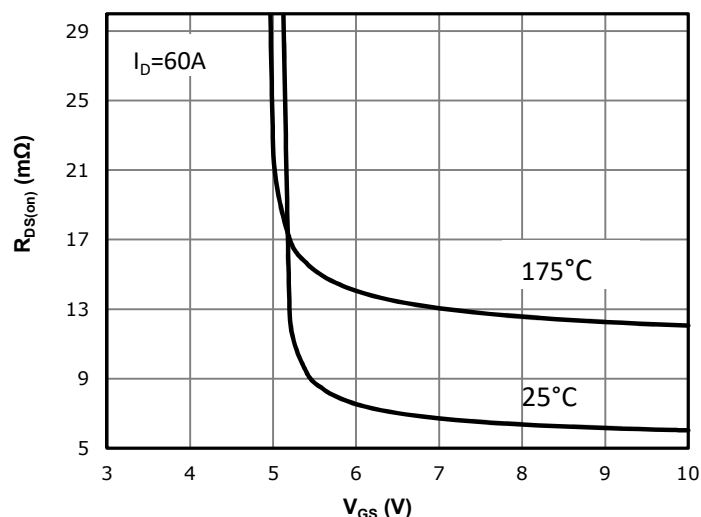


Fig 5: $R_{DS(on)}$ vs. Temperature

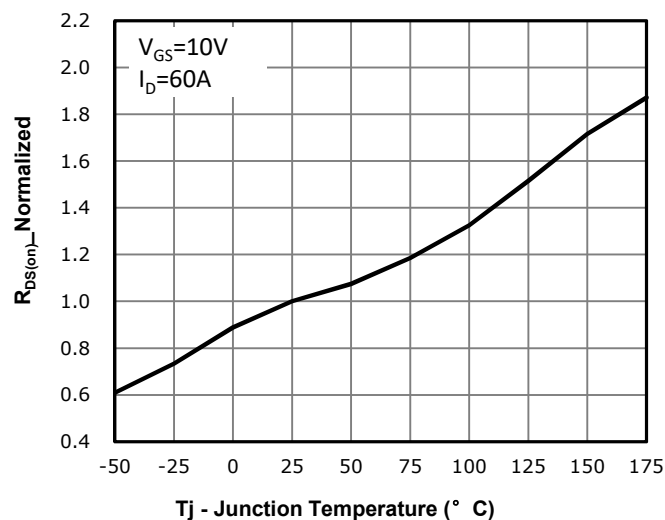


Fig 6: Capacitance Characteristics

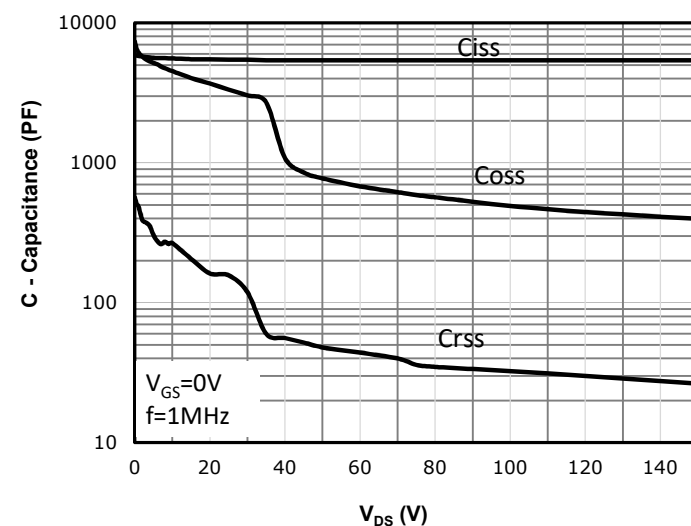


Fig 7: $V_{gs(th)}$ vs. Temperature

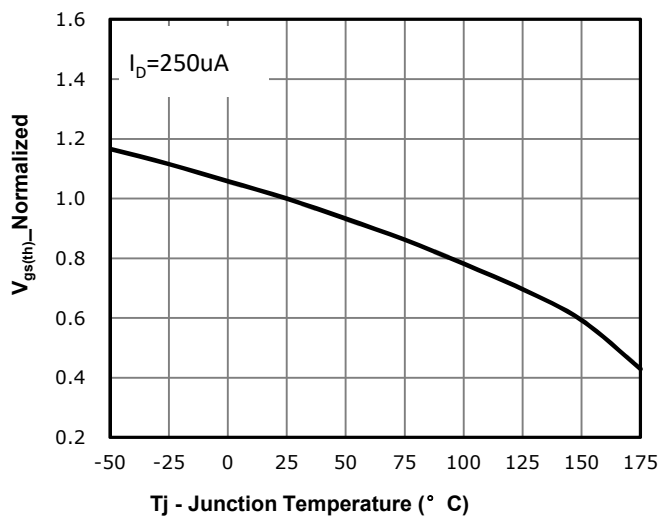


Fig 8: BV_{dss} vs. Temperature

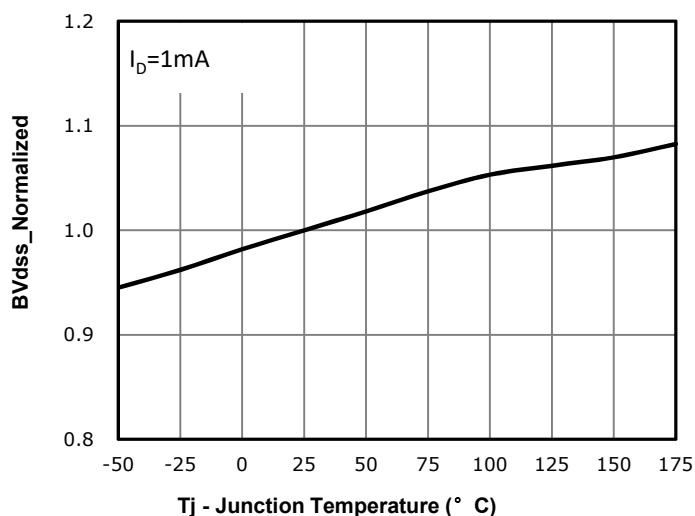


Fig 9: Gate Charge Characteristics

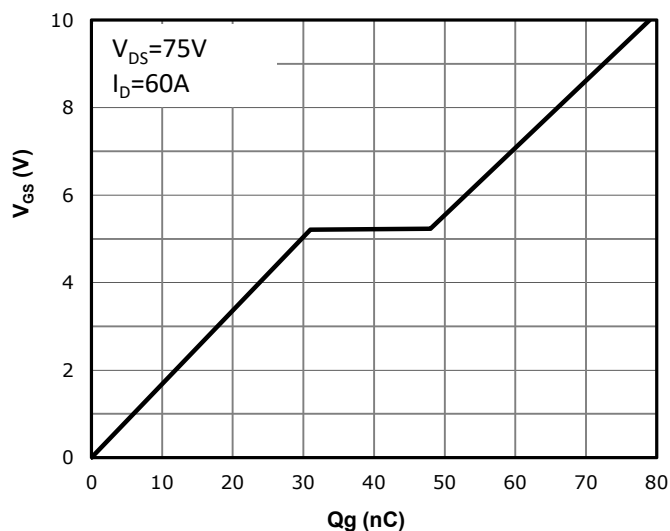


Fig 10: Body-diode Forward Characteristics

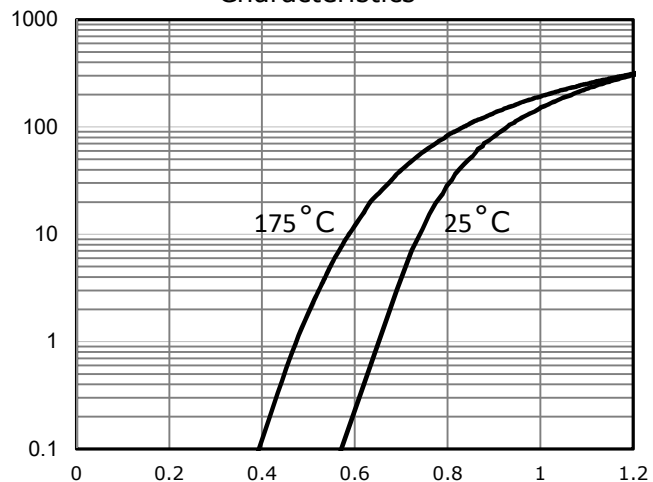


Fig 11: Power Dissipation

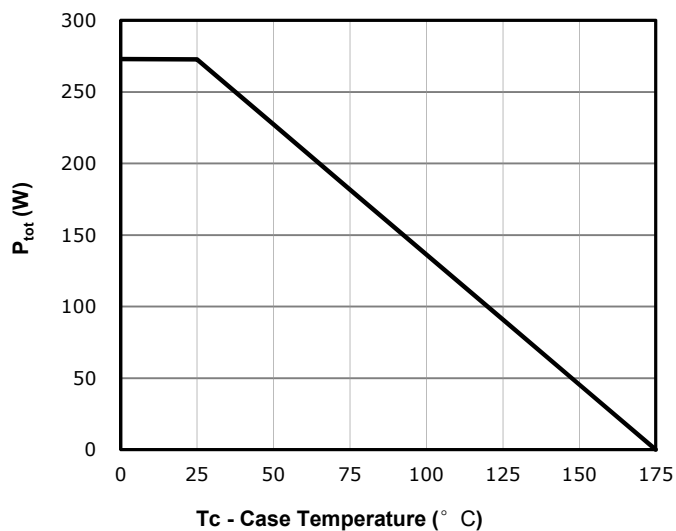


Fig 12: Drain Current Derating

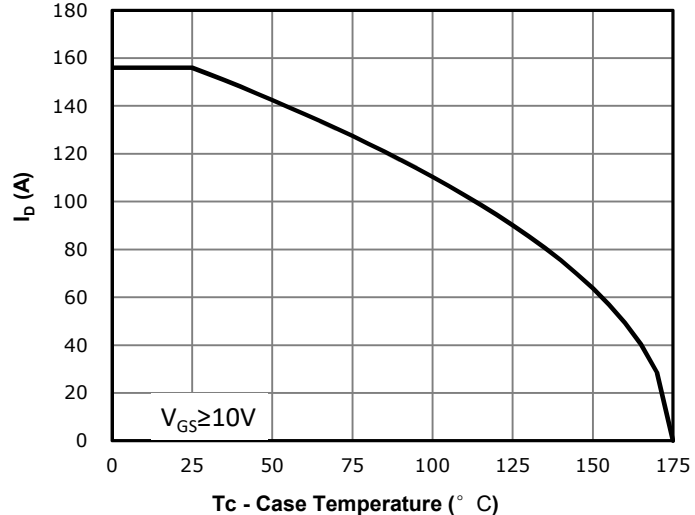


Fig 13: Safe Operating Area

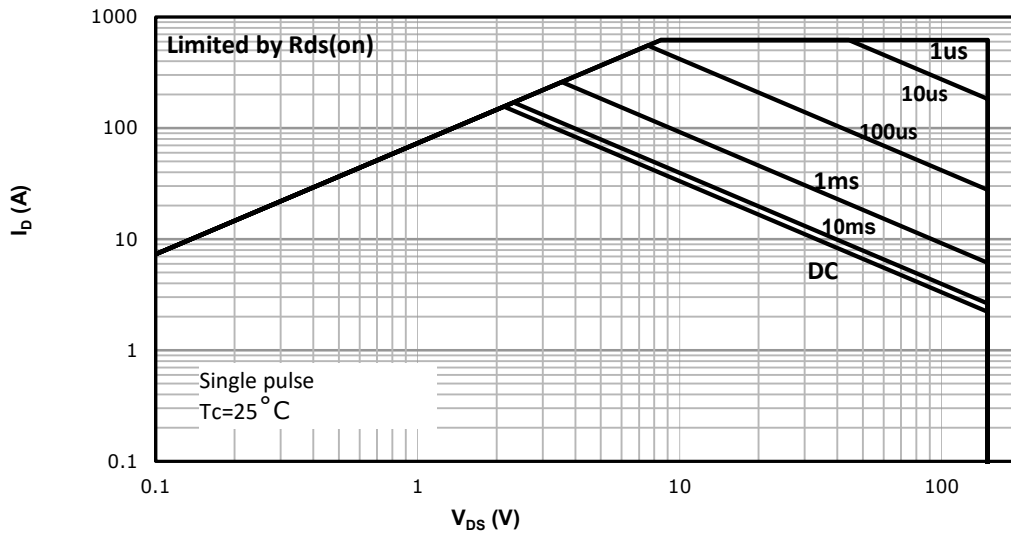
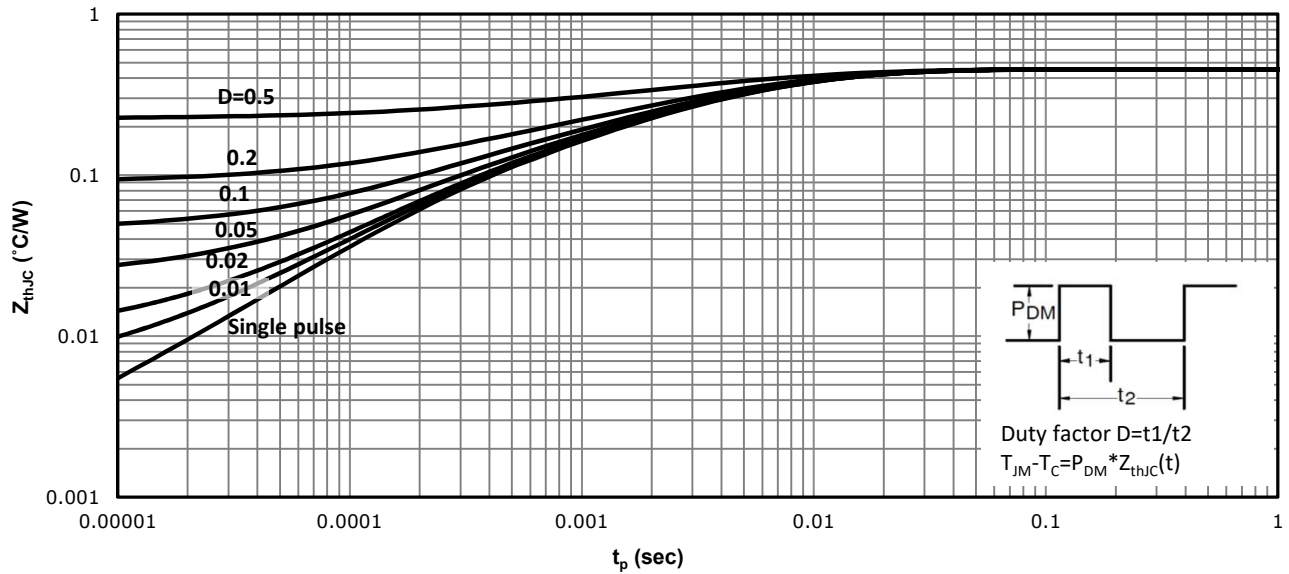
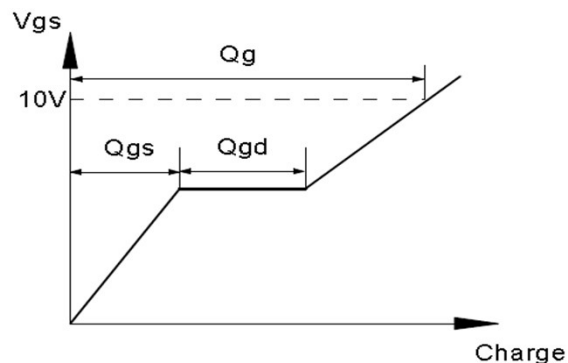
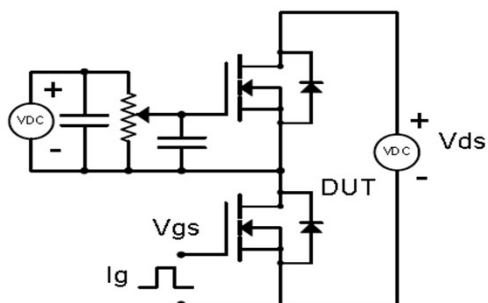


Fig 12: Max. Transient Thermal Impedance

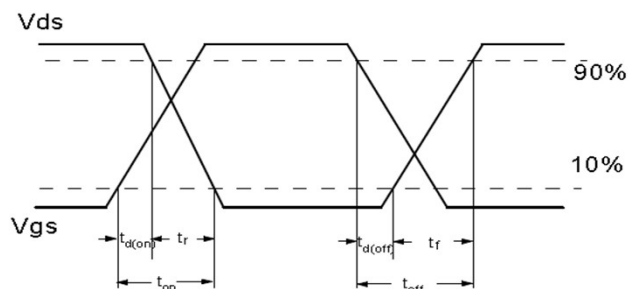
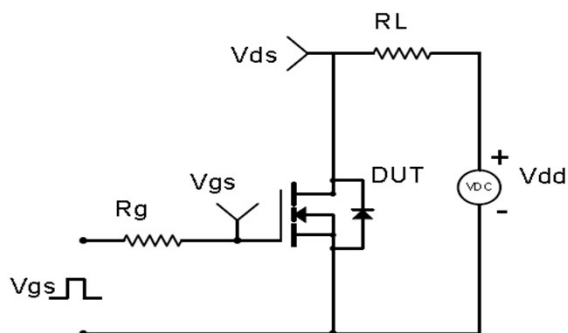


Test Circuit & Waveform

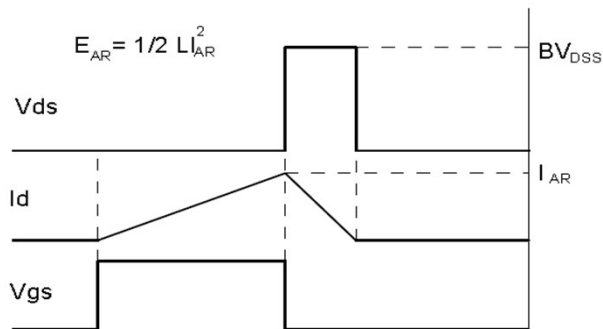
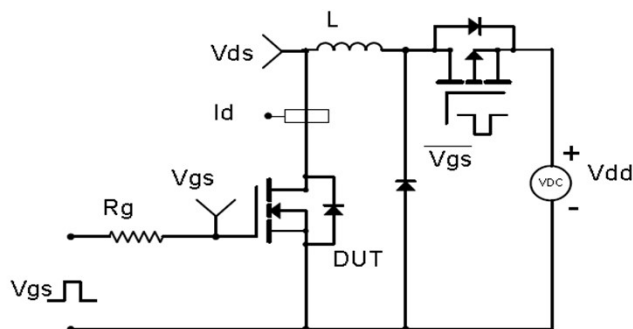
Gate Charge Test Circuit & Waveform



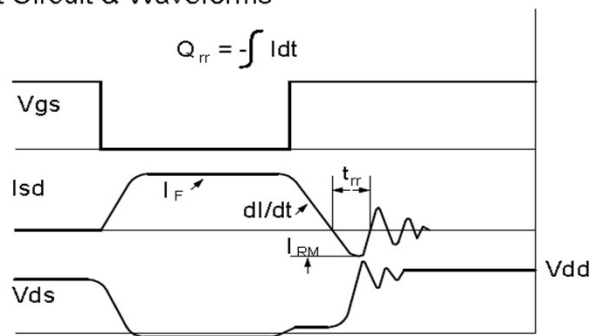
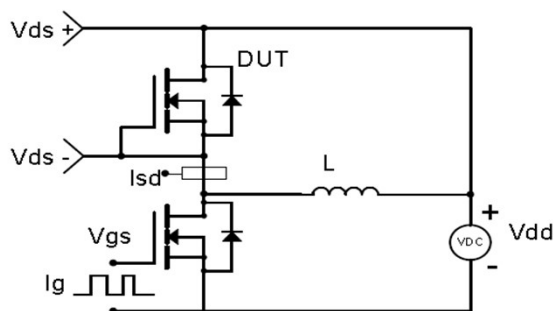
Resistive Switching Test Circuit & Waveforms



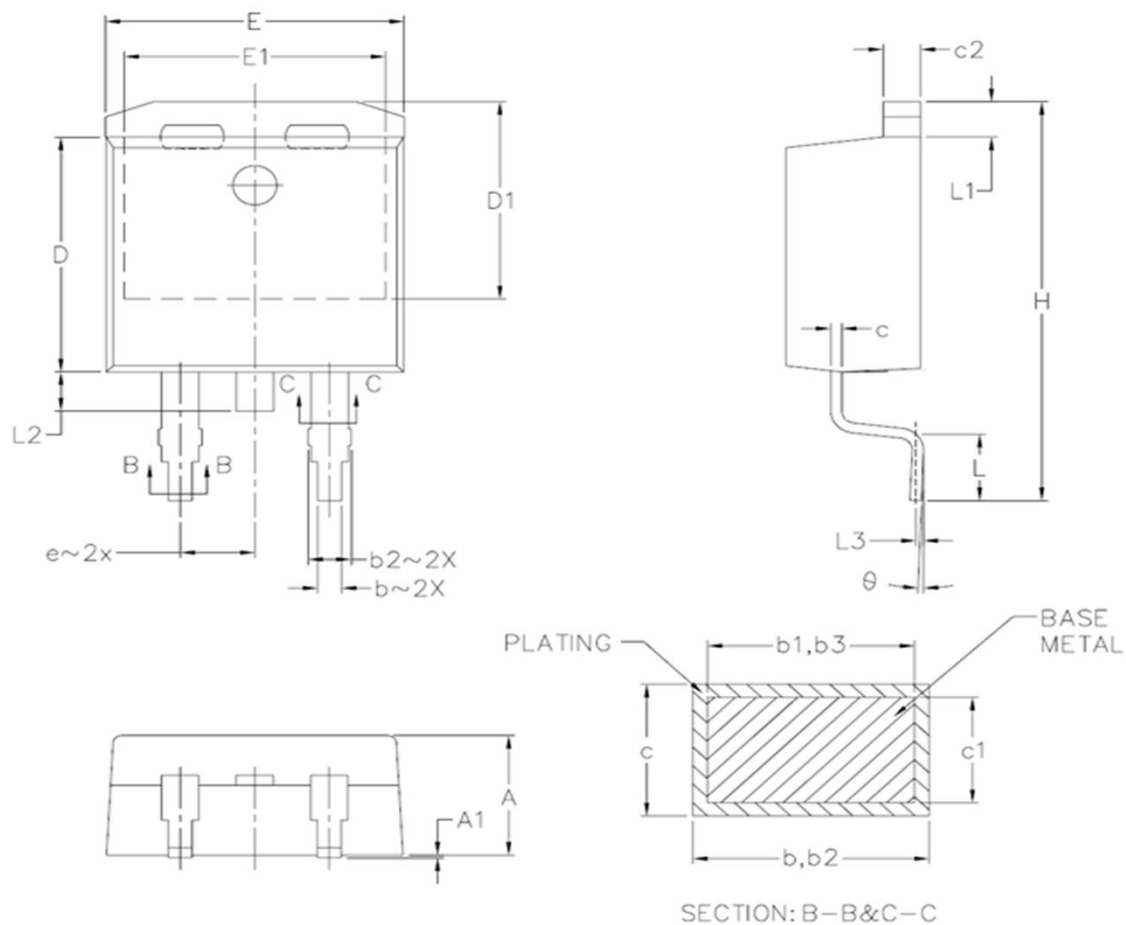
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

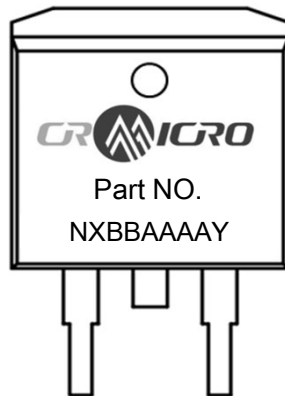


Package Outline: TO-263



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.06	4.83	0.160	0.190
A1	0.00	0.25	0.000	0.010
b	0.50	0.99	0.020	0.039
b2	1.14	1.78	0.045	0.070
c	0.33	0.74	0.013	0.029
c2	1.14	1.65	0.045	0.065
D	8.38	9.65	0.330	0.380
D1	6.86	--	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

Revision	Date	Major changes
1.0	2021/12/25	Priliminary Release;
2.0	2022/6/15	Follow CRMICRO Industrial Product Naming Rule HCRSS070N15N change to CRSS070N15NZ
3.0	2022/9/27	Update Package POD

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 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.