华润微电子(重庆)有限公司

CRST073N15NZ

SkyMOS1 N-MOSFET 150V, 6.2mΩ, 141A

Features

- Uses CRM(CQ) advanced SkyMOS1 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

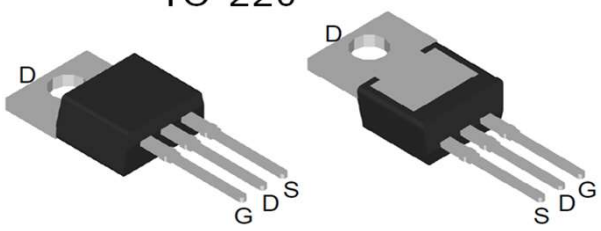
V_{DS}	150V
$R_{DS(on)}$	6.2mΩ
I_D	141A

100% DVDS Tested

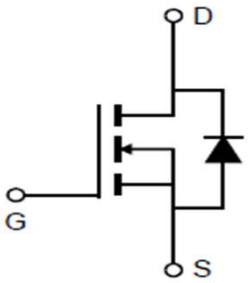
100% Avalanche Tested

RoHS HF

TO-220



CRST073N15NZ



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRST073N15NZ	CRST073N15NZ	TO-220	Tube	N/A	N/A	50pcs

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	150	V
Continuous drain current T_C = 25°C (Silicon limit) T_C = 25°C (Package limit) T_C = 100°C (Silicon limit)	I_D	 141 160 89	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	564	A
Avalanche energy, single pulse (I_{AS} = 36A, Rg=25Ω)	E_{AS}	380	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation (T_C = 25°C)	P_{tot}	227	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	260	°C

Thermal Resistance

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Thermal resistance, junction – case.	R_{thJC}	-	0.31	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}	150	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	2	3	4	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	0 0	- -	1 100	μA	V_{DS}=150V,V_{GS}=0V T_j=25°C T_j=125°C
Gate-source leakage current	I_{GSS}	0	-	100	nA	V_{GS}=±20V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	3	6.2	7.3	mΩ	V_{GS}=10V, I_D=60A Tj=25°C
Transconductance	g_{fs}	50	106	200	S	V_{DS}=5V,I_D=60A
Dynamic Characteristic						
Input Capacitance	C_{iss}	3611	5416	8124	pF	V_{GS}=0V, V_{DS}=75V, f=1MHz
Output Capacitance	C_{oss}	381	572	858		
Reverse Transfer Capacitance	C_{rss}	21	31	62		
Gate Total Charge	Q_G	53	79	119	nC	V_{GS}=10V, V_{DS}=75V, I_D=60A, f=1MHz
Gate-Source charge	Q_{gs}	21	31	62		
Gate-Drain charge	Q_{gd}	11	17	34		

Turn-on delay time	$t_{d(on)}$	10	18	32.4	ns	Vds=75V Id=100A Rg=2.7Ω Vgs=10V;
Rise time	t_r	56	100	180		
Turn-off delay time	$t_{d(off)}$	33	59	106		
Fall time	t_f	55	99	178		
Gate resistance	R_G	3	4	6	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	-	-	141	A	T_C = 25°C
Body Diode Pulsed Current	$I_{S\ pulse}$	-	-	564	A	T_C = 25°C
Body Diode Reverse Recovery Time	t_{rr}	61	122	244	ns	ISD=60A, VGS=0V, dIF/dt=100A/us;
Body Diode Reverse Recovery Charge	Q_{rr}	353	706	1412	nC	

Typical Performance Characteristics

Fig 1: Output Characteristics

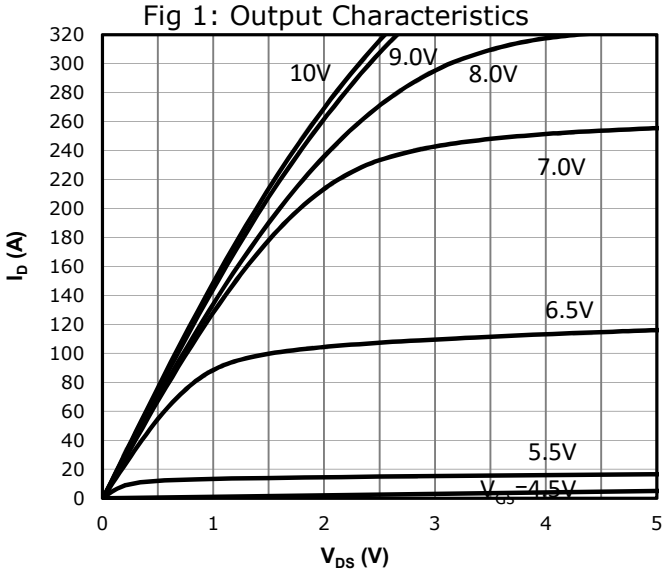


Fig 2: Transfer Characteristics

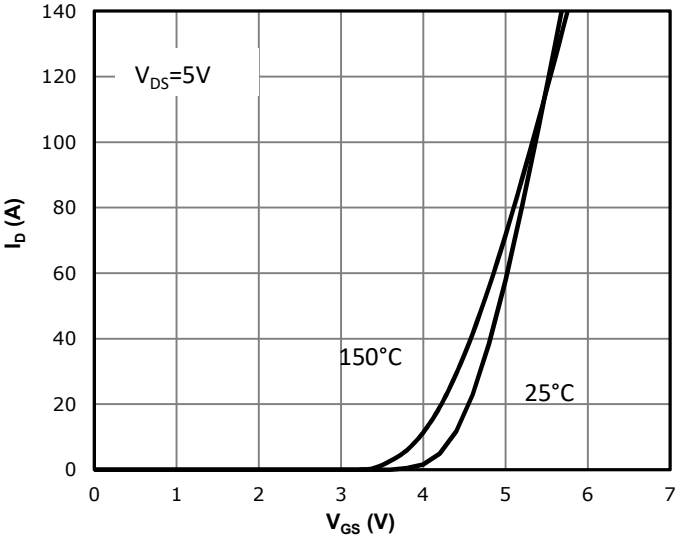


Fig 3: Rds(on) vs Drain Current and Gate Voltage

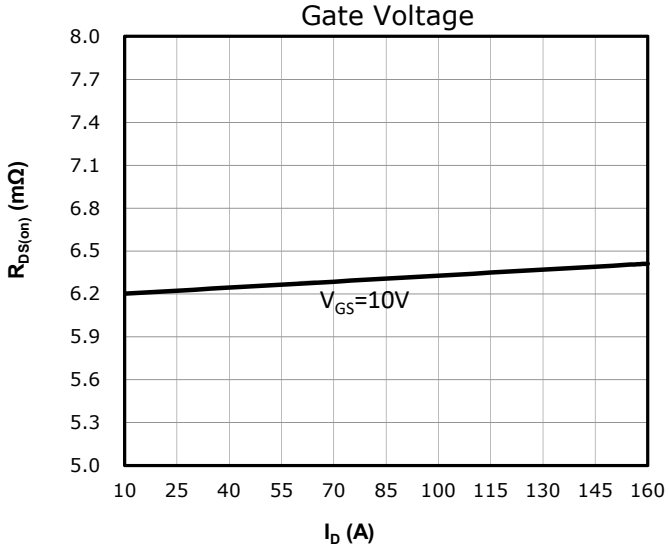


Fig 4: Rds(on) vs Gate Voltage

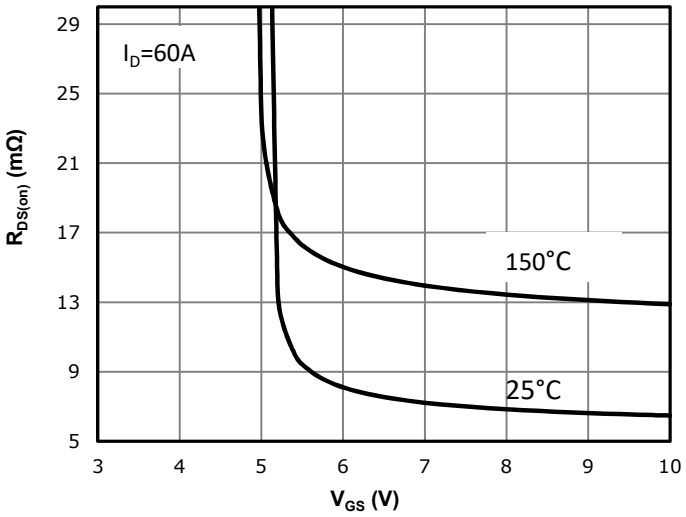


Fig 5: Rds(on) vs. Temperature

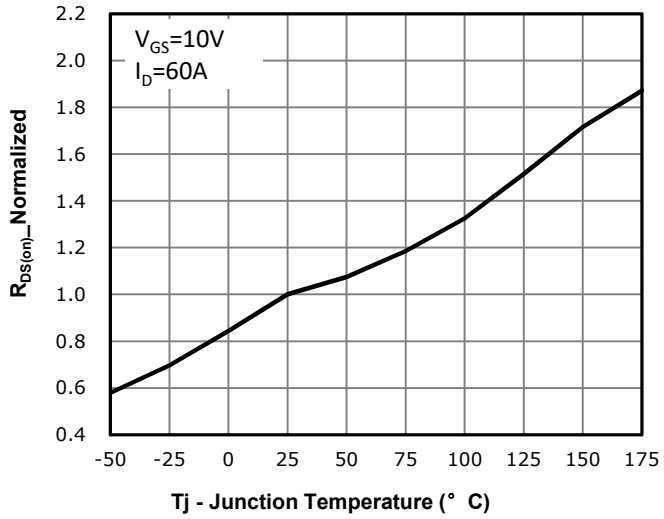


Fig 6: Capacitance Characteristics

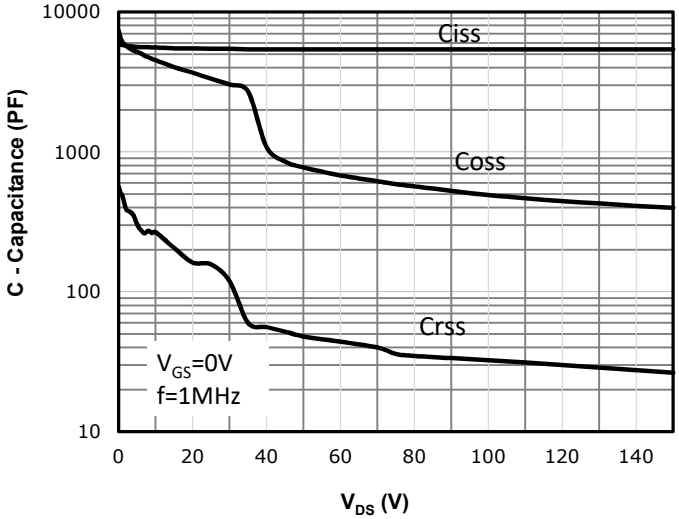


Fig 7: Vgs(th) vs. Temperature

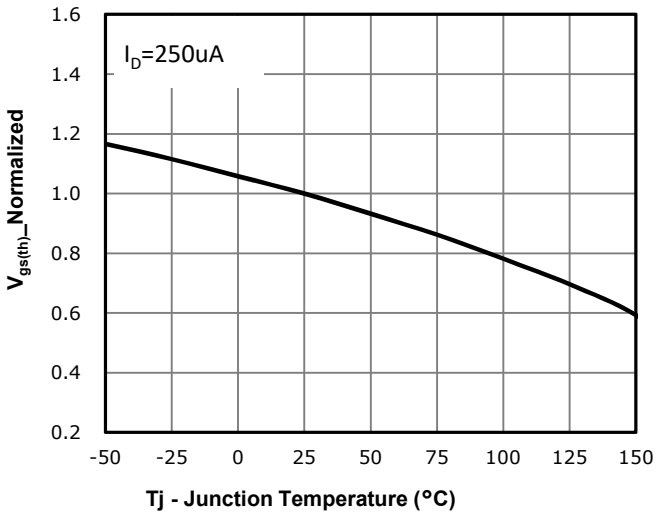


Fig 8: BVdss vs. Temperature

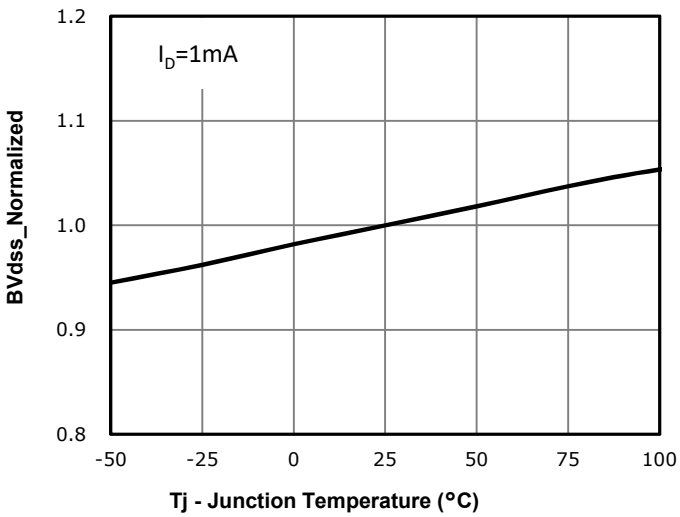


Fig 9: Gate Charge Characteristics

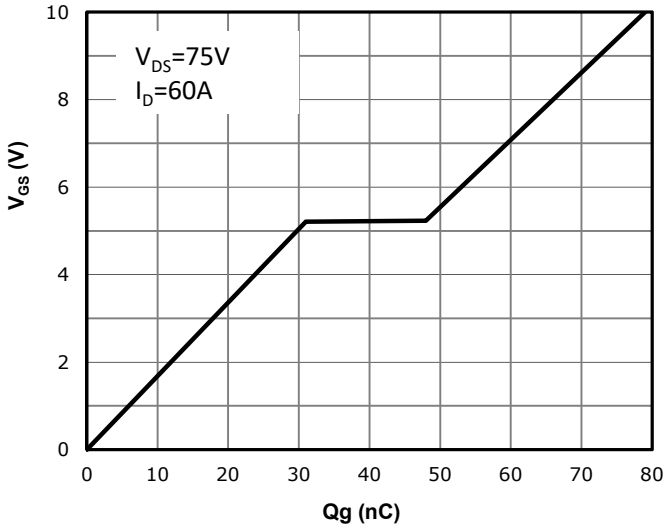


Fig 10: Body-diode Forward Characteristics

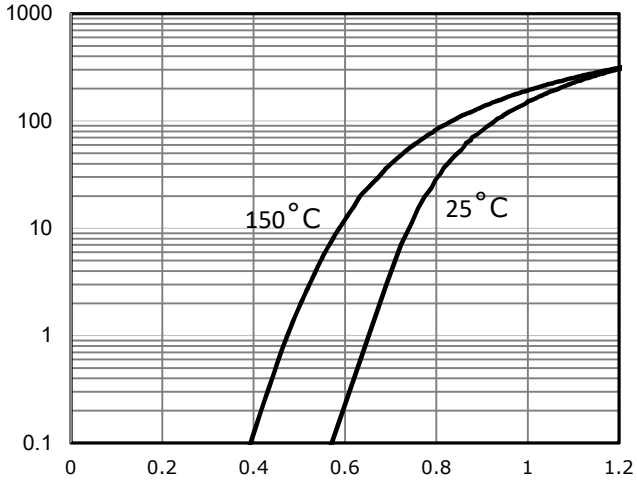


Fig 11: Power Dissipation

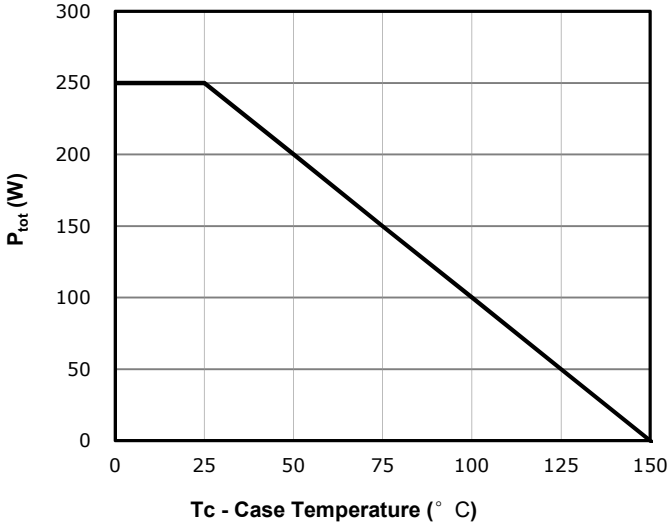


Fig 12: Drain Current Derating

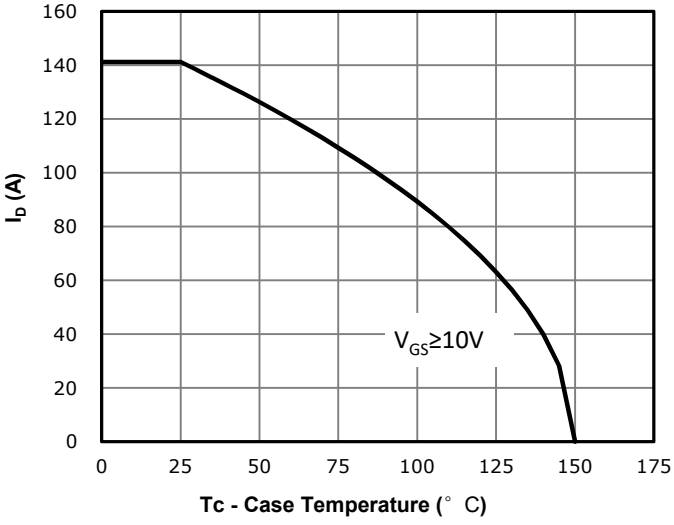


Fig 13: Safe Operating Area

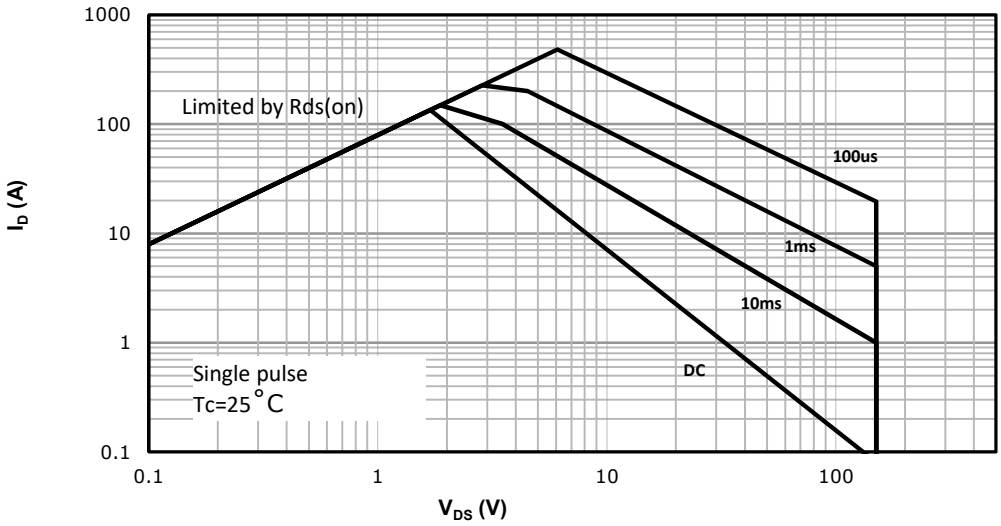
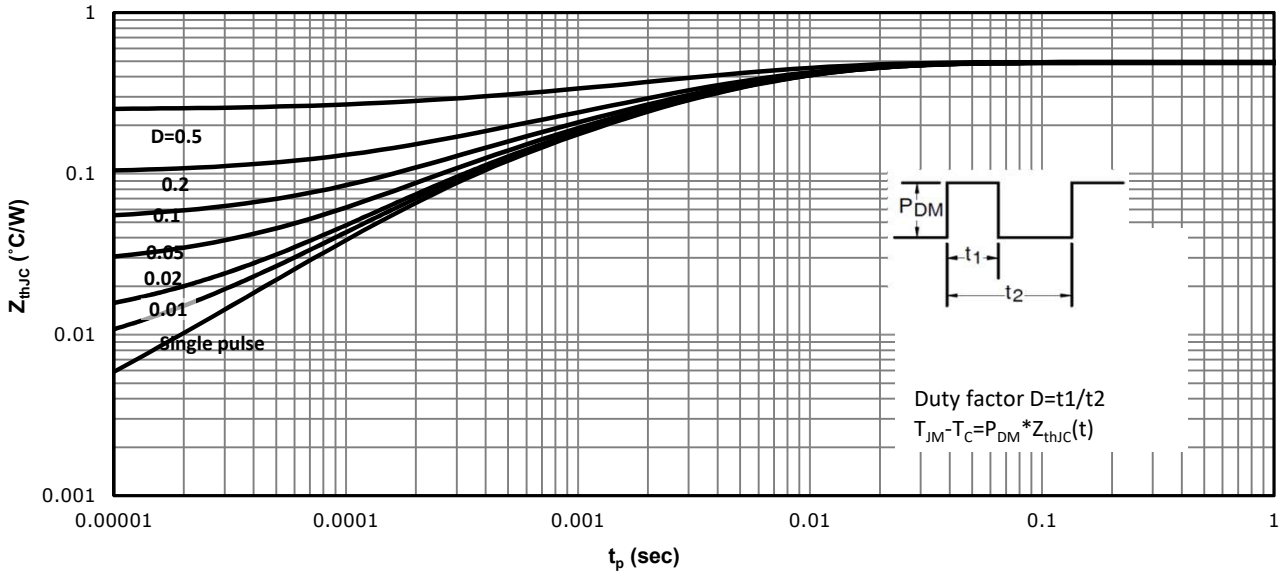
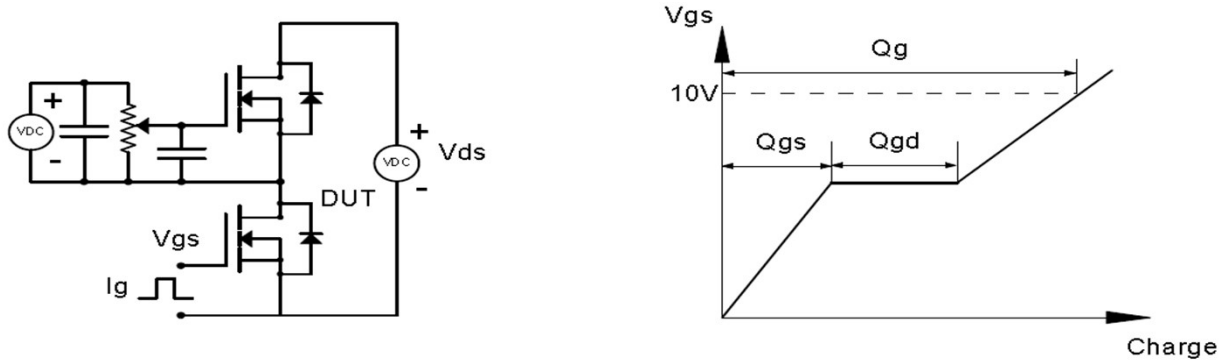


Fig 12: Max. Transient Thermal Impedance

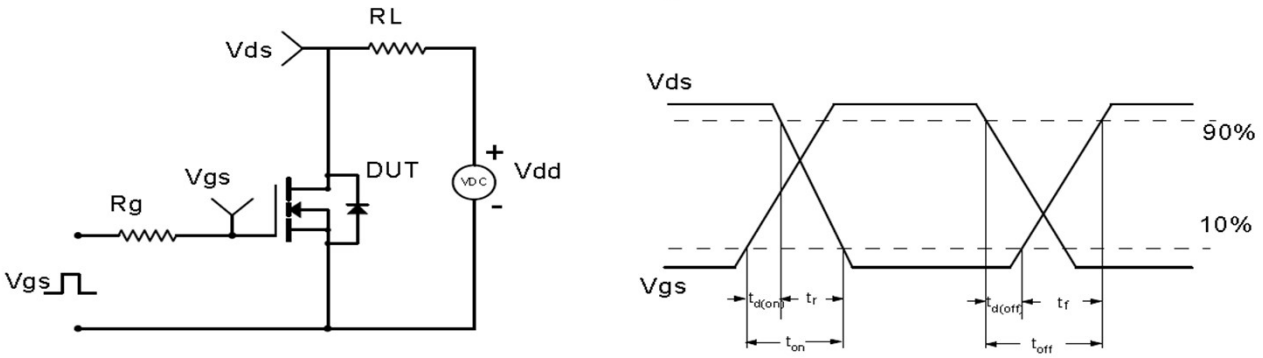


Test Circuit & Waveform

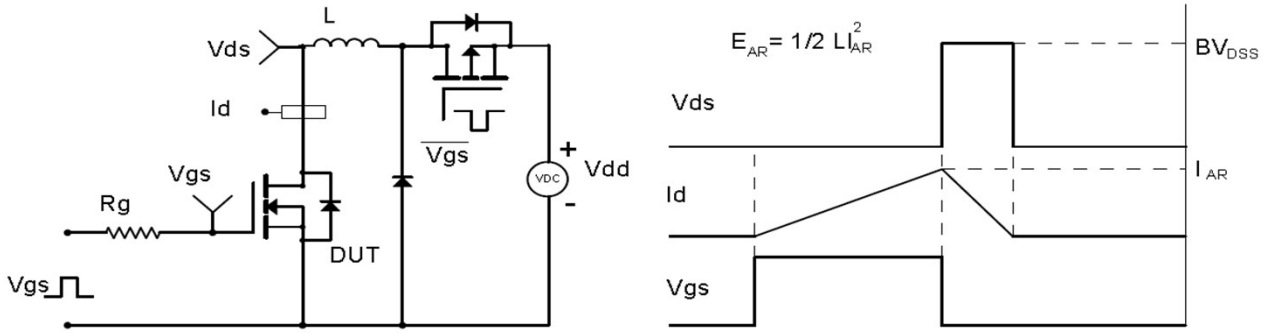
Gate Charge Test Circuit & Waveform



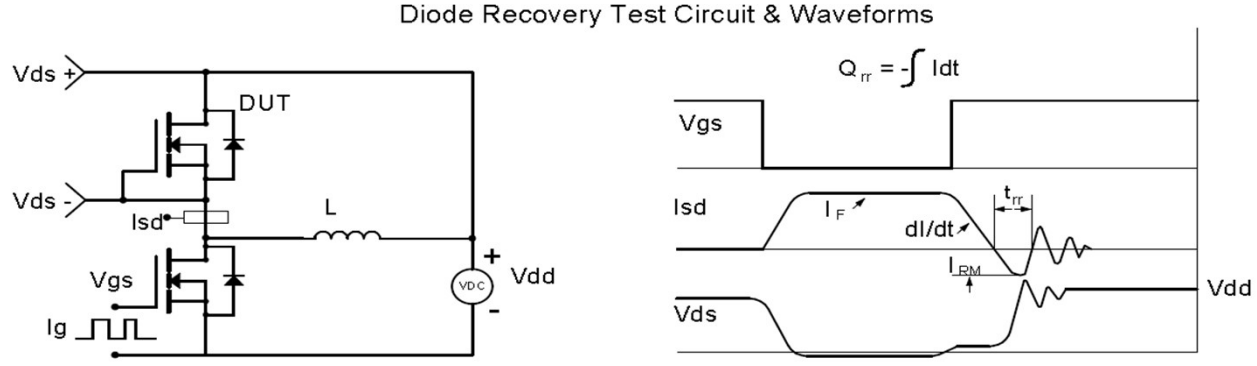
Resistive Switching Test Circuit & Waveforms



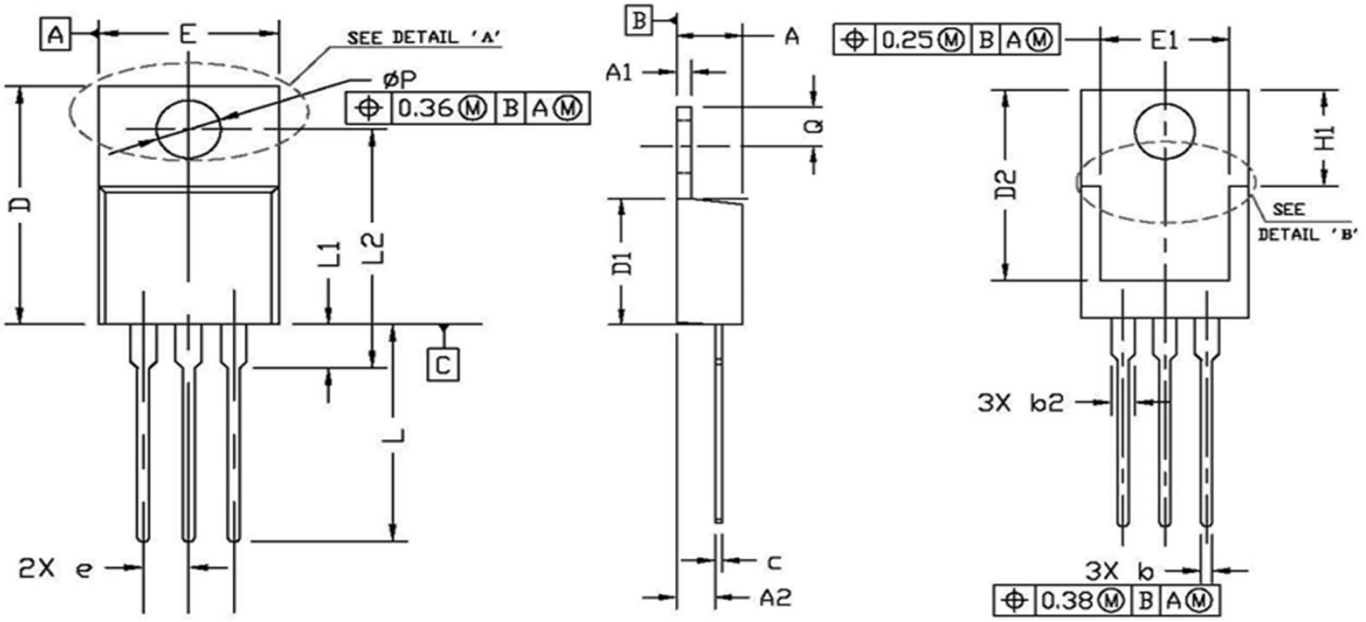
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

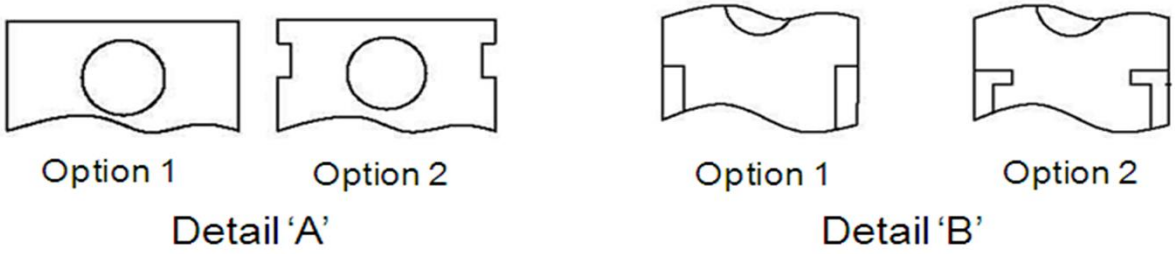


Diode Recovery Test Circuit & Waveforms



Package Outline: TO-220-3L

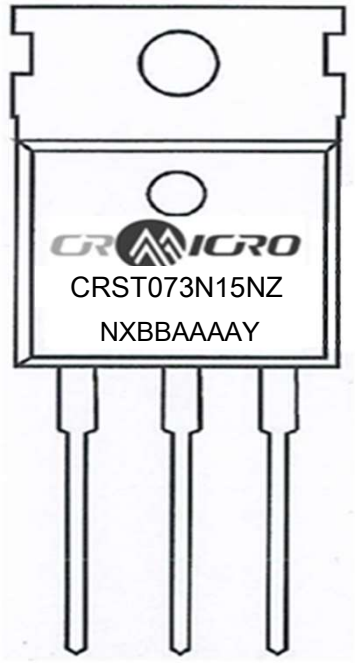




Detail 'A' Detail 'B'

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.42	4.72	0.174	0.186
A1	1.20	1.40	0.047	0.055
A2	2.35	2.90	0.093	0.114
b	0.71	0.91	0.028	0.036
b2	1.20	1.38	0.047	0.054
c	0.45	0.60	0.018	0.024
D	14.70	16.00	0.579	0.630
D1	8.80	9.50	0.346	0.374
D2	11.75	13.60	0.463	0.535
e	2.54 BSC.		0.100 BSC.	
E	9.70	10.40	0.382	0.409
E1	7.00	8.90	0.276	0.350
H1	6.10	6.50	0.240	0.256
L	12.80	14.80	0.504	0.583
L1	2.50	3.90	0.098	0.154
L2	12.13	16.50	0.478	0.650
Q	2.60	3.00	0.102	0.118
P	3.60	3.95	0.142	0.156

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	2022/9/2	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.