华润微电子(重庆)有限公司

CRST073N15NZ-Q

SkyMOS1 N-MOSFET 150V, 6.2mΩ, 145A

Features

- Uses CRM(CQ) advanced SkyMOS1 technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent Q_gx$R_{DS(on)}$ product(FOM)
- AEC-Q101 Criteria Qualified
- 175°C Operating Temperature

Applications

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

Product Summary

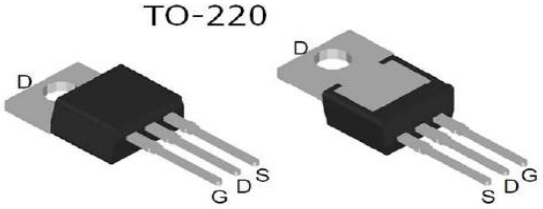
V_{DS}	150V
$R_{DS(on)}$	6.2mΩ
I_D	145A

100% Avalanche Tested

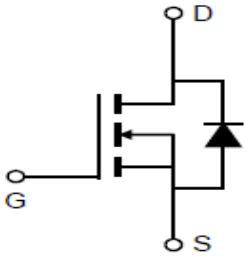
100% DVDS Tested

RoHS HF

TO-220



CRST073N15NZ-Q



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRST073N15NZ-Q	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)	I_D	145	A
T_C = 25°C (Package limit)		160	
T_C = 100°C (Silicon limit)		103	
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	580	A
Avalanche energy, single pulse (I_{AS} = 36A, Rg=25Ω)	E_{AS}	324	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation (T_C = 25°C)	P_{tot}	312	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:1.EAS is tested at starting Tj = 25℃, L = 0.5mH, IAS = 36A, Vgs=10V.

Thermal Resistance

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Thermal resistance, junction – case.	R_{thJC}	-	0.37	0.48	°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}	170	-	-	V	V_{GS}=0V, I_D=250uA
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}=150V,V_{GS}=0V T_j=25°C T_j=150°C
Gate-source leakage current	I_{GSS}	-	-	100	nA	V_{GS}=±20V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	6.2	7.3	mΩ	V_{GS}=10V, I_D=70A TO-220
Transconductance	g_{fs}	-	106	-	S	V_{DS}=5V,I_D=70A
Dynamic Characteristic						
Input Capacitance	C_{iss}	3602	5403	8105	pF	V_{GS}=0V, V_{DS}=75V, f=1MHz
Output Capacitance	C_{oss}	375	562	843		
Reverse Transfer Capacitance	C_{rss}	14.0	21	42		
Gate Total Charge	Q_G	52.7	79	118.5	nC	V_{GS}=10V, V_{DS}=75V, I_D=70A, f=1MHz
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	Vds=75V Id=70A Rg=2.7Ω Vgs=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	0.93	1.4	V	V_{GS}=0V,I_{SD}=70A
Body Diode Continuous Forward Current	I_S	-	-	145	A	T_C = 25°C
Body Diode Pulsed Current	$I_{S\ pulse}$	-	-	580	A	T_C = 25°C
Body Diode Reverse Recovery Time	t_{rr}	61	122	244	ns	ISD=70A, VGS=0V, dIF/dt=100A/us;
Body Diode Reverse Recovery Charge	Q_{rr}	353	706	1412	nC	

Typical Performance Characteristics

Fig 1: Output Characteristics

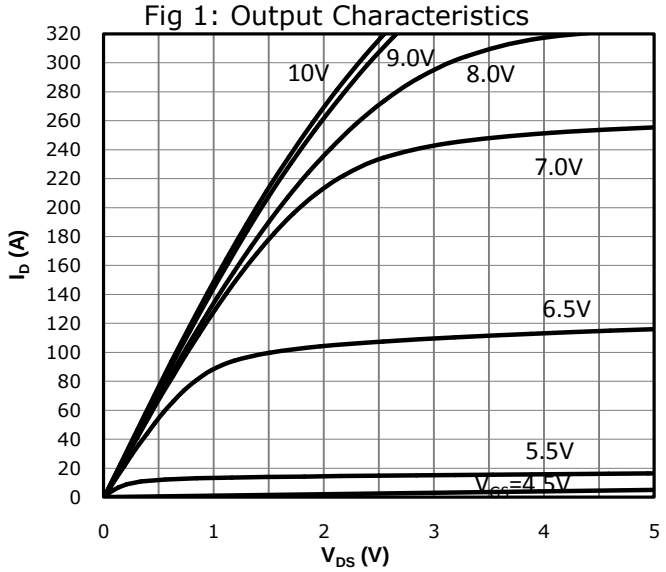


Fig 2: Transfer Characteristics

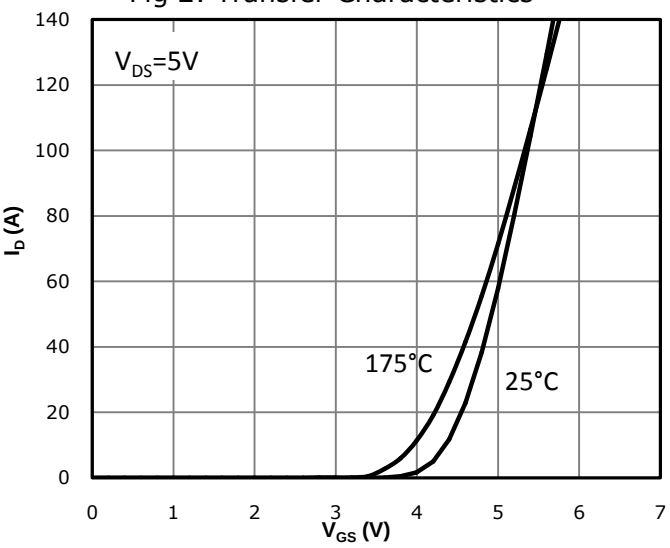


Fig 3: Rds(on) vs Drain Current and Gate Voltage

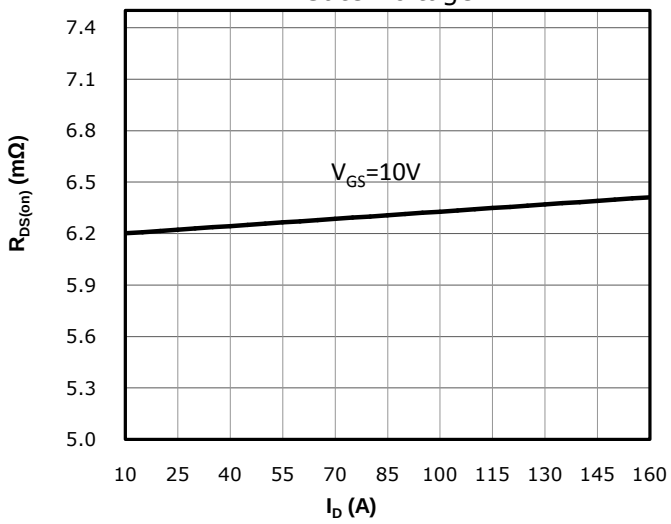


Fig 4: Rds(on) vs Gate Voltage

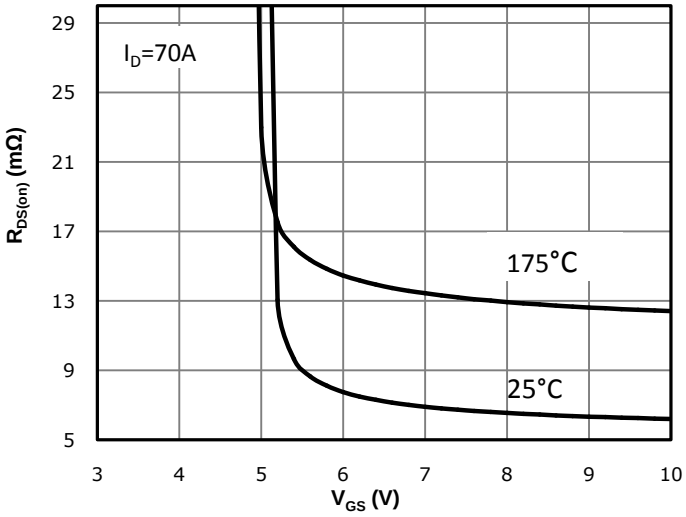


Fig 5: Rds(on) vs. Temperature

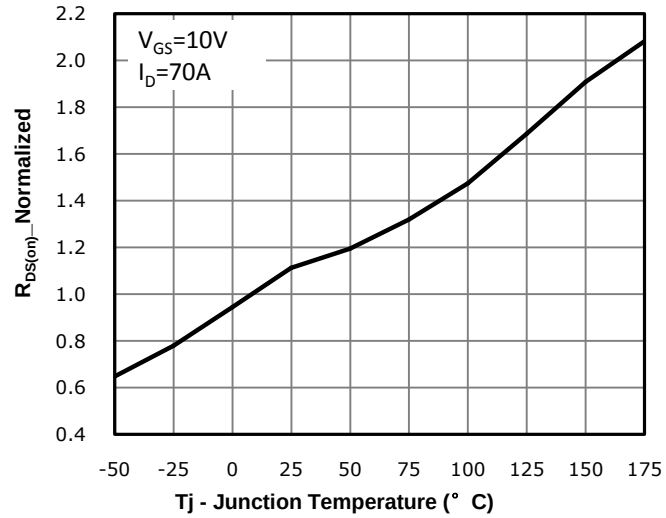


Fig 6: Capacitance Characteristics

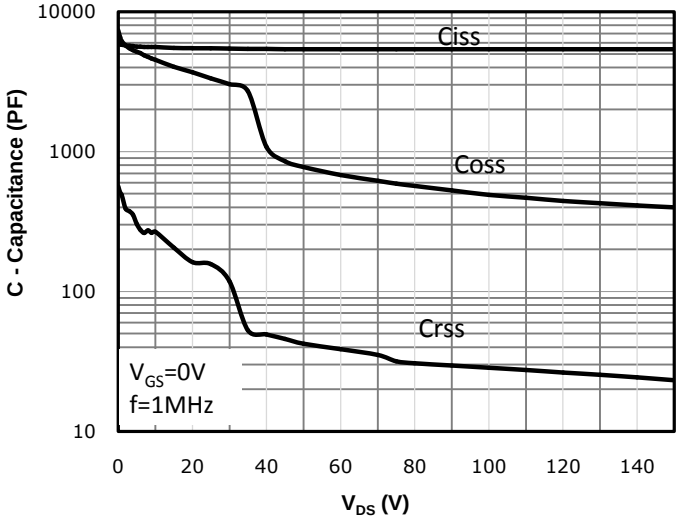


Fig 7: Vgs(th) vs. Temperature

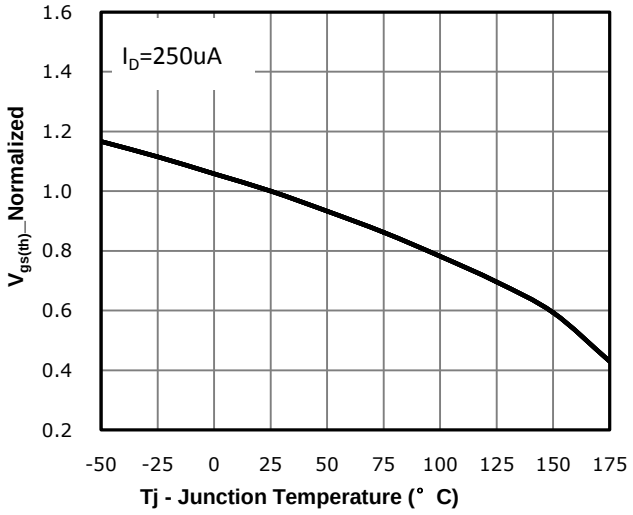


Fig 8: BVdss vs. Temperature

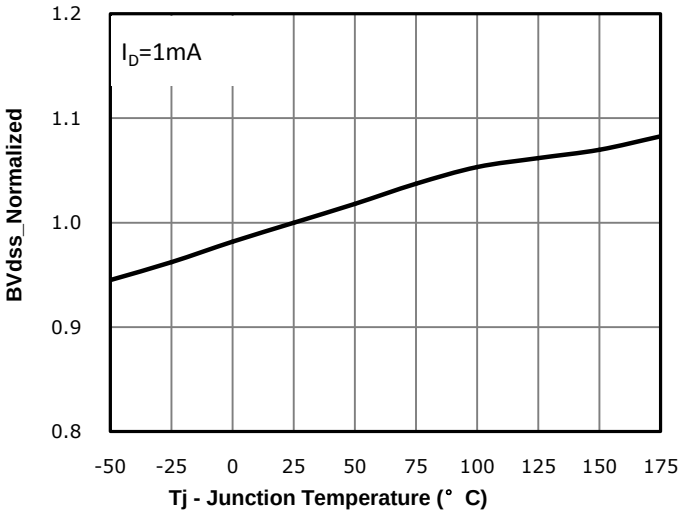


Fig 9: Gate Charge Characteristics

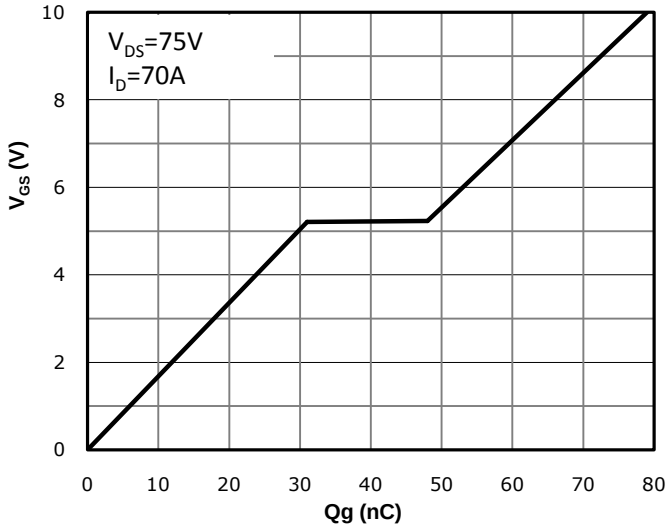


Fig 10: Body-diode Forward Characteristics

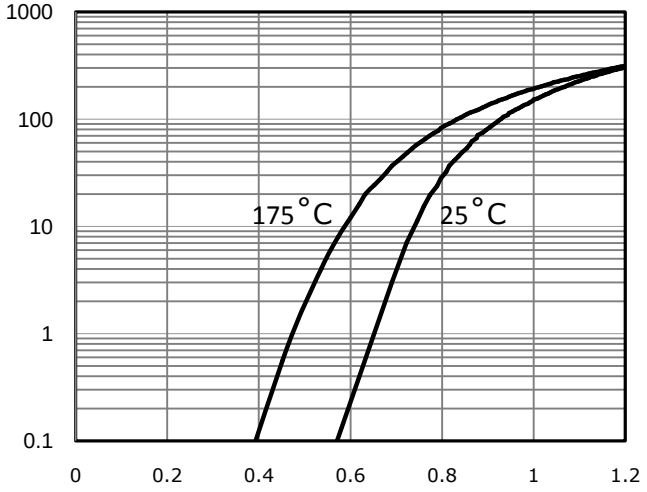


Fig 11: Power Dissipation

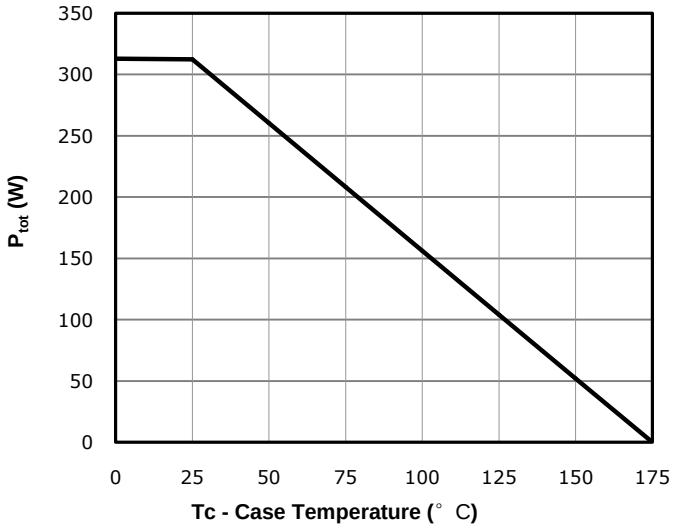


Fig 12: Drain Current Derating

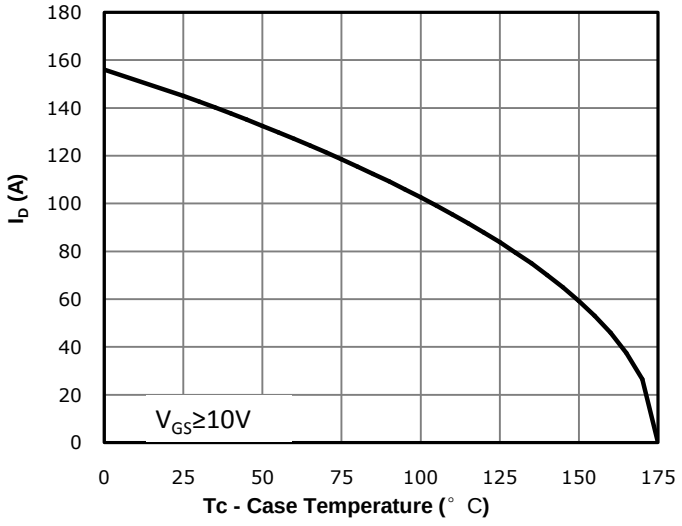


Fig 13: Safe Operating Area

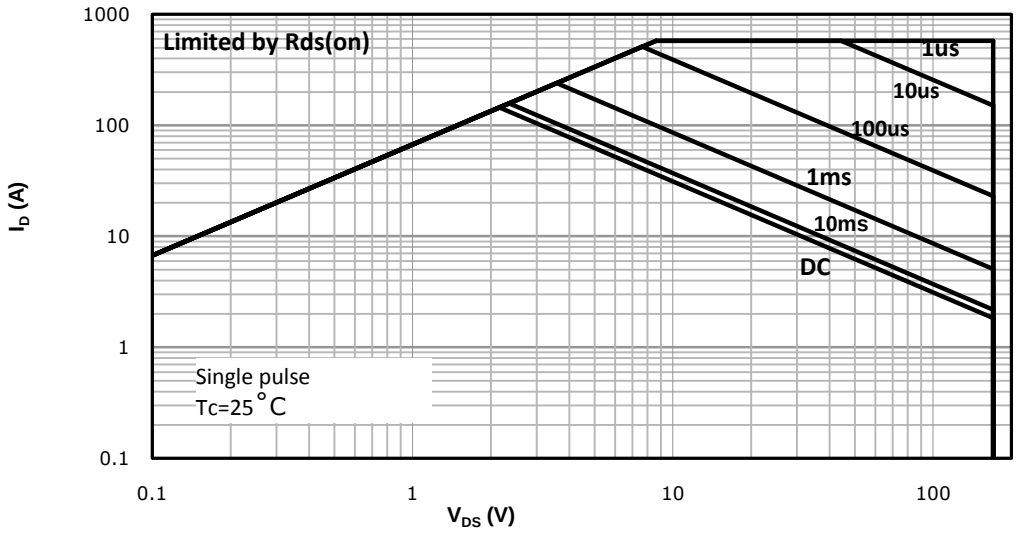
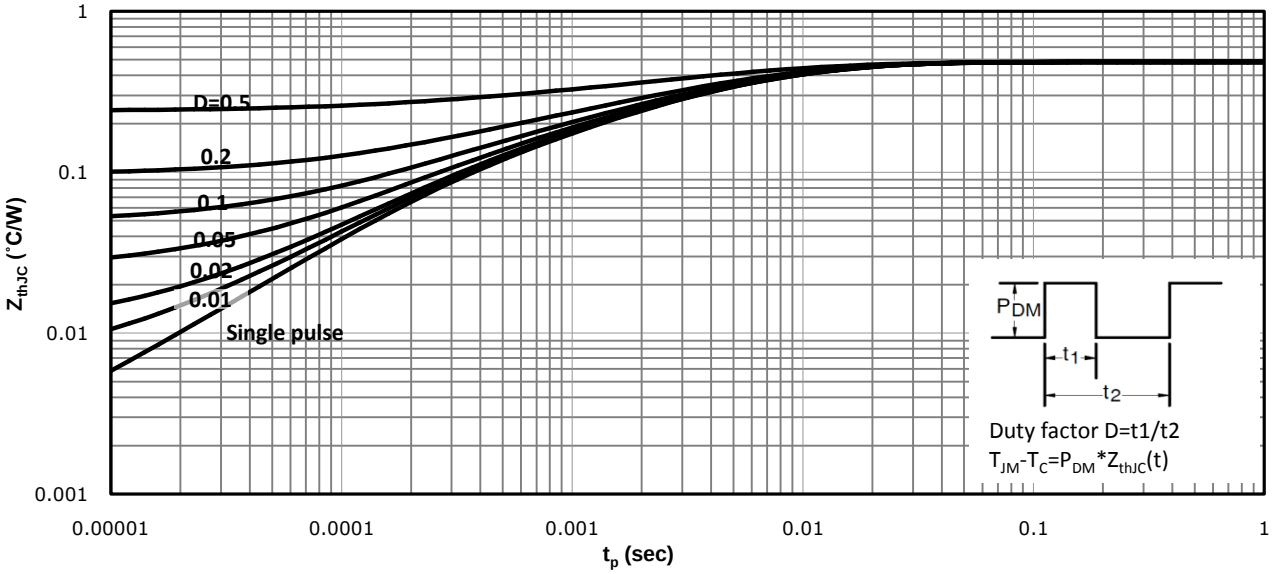
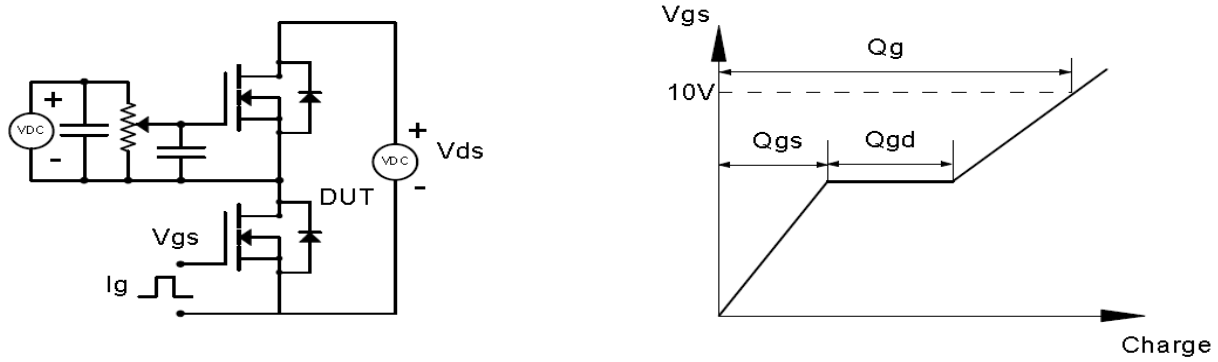


Fig 12: Max. Transient Thermal Impedance

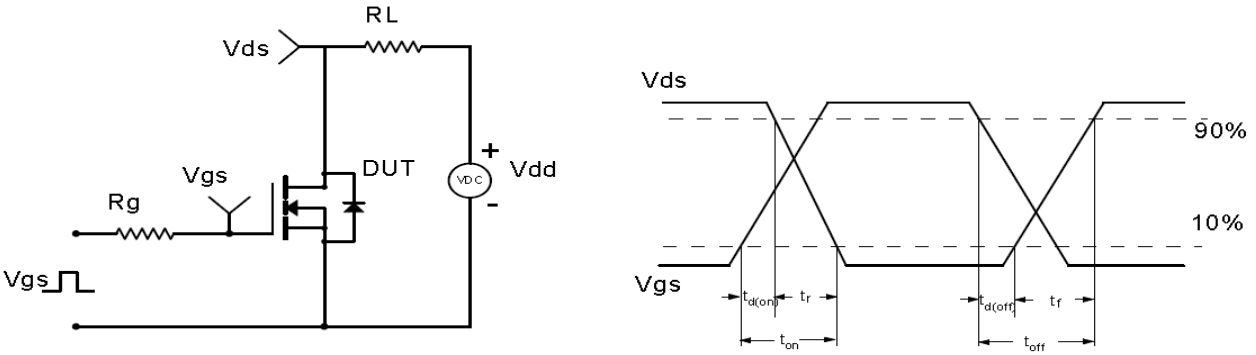


Test Circuit & Waveform

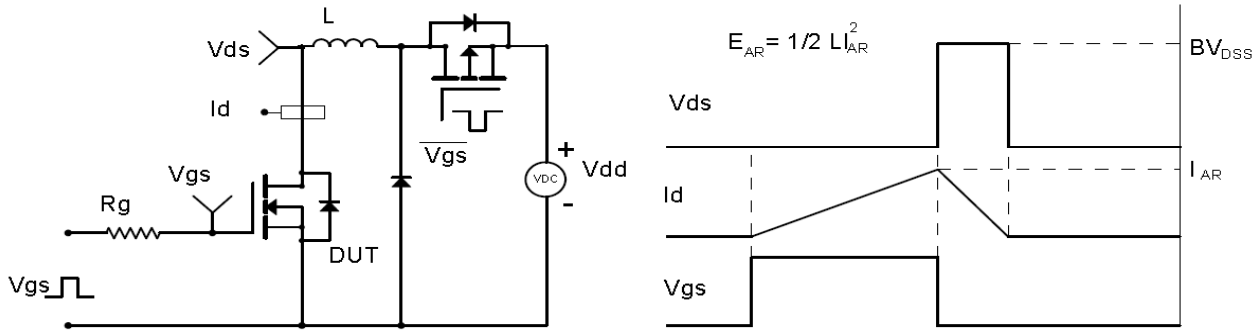
Gate Charge Test Circuit & Waveform



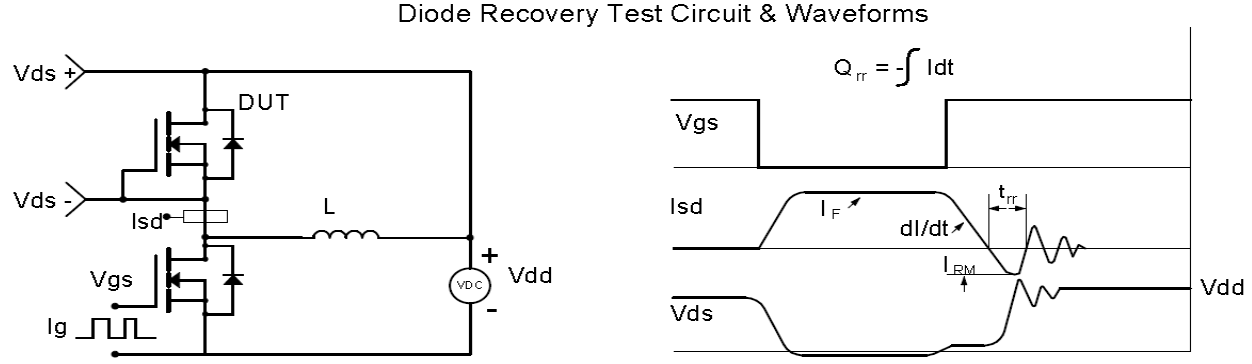
Resistive Switching Test Circuit & Waveforms



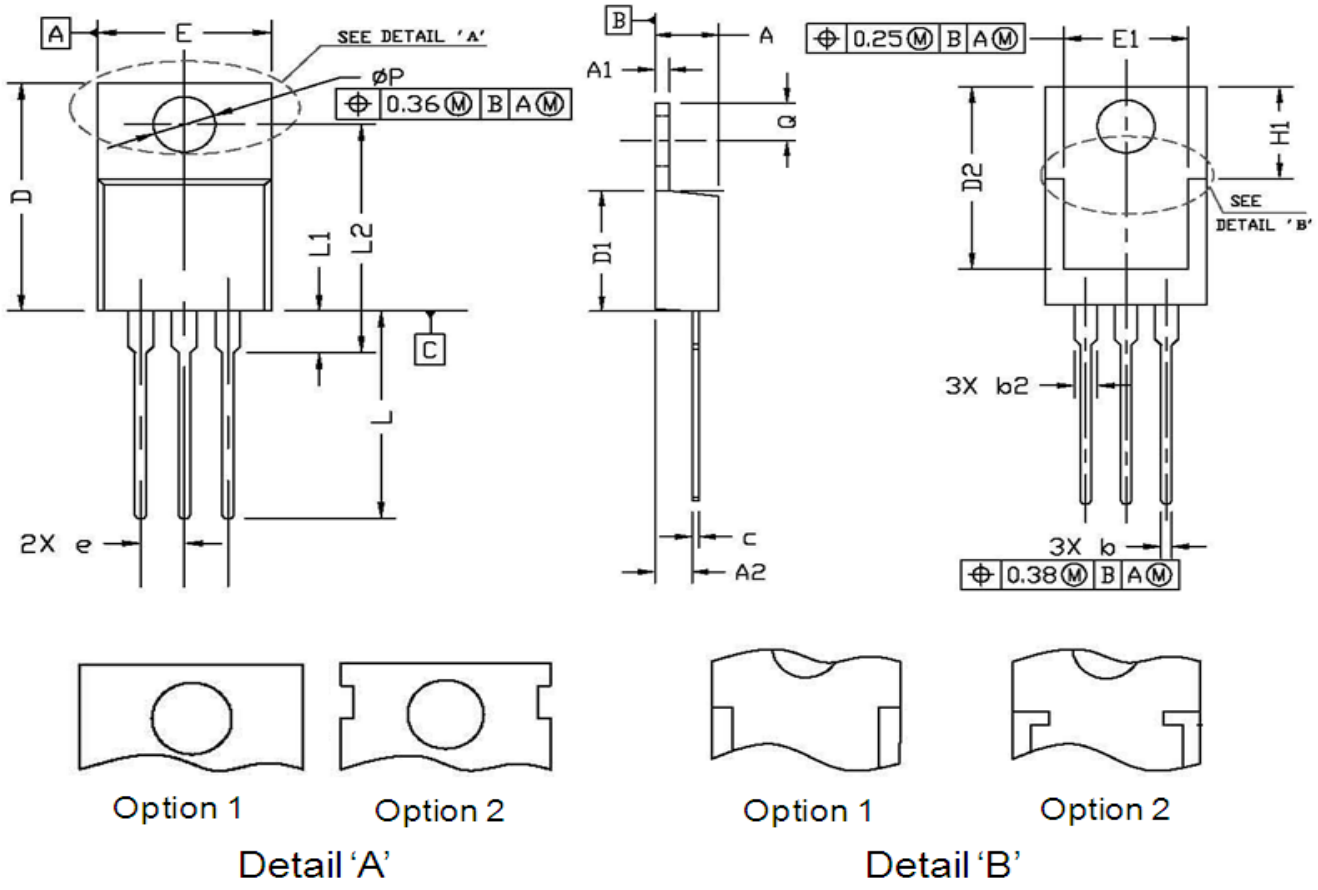
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline: TO-220



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.30	4.80	0.169	0.189
A1	1.20	1.40	0.047	0.055
A2	2.20	2.90	0.087	0.114
b	0.69	0.95	0.027	0.037
b2	1.00	1.60	0.039	0.063
c	0.33	0.65	0.013	0.026
D	14.70	16.20	0.579	0.638
D1	8.59	9.65	0.338	0.380
D2	11.75	13.60	0.463	0.535
e	2.54 BSC.		0.100 BSC.	
E	9.60	10.60	0.378	0.417
E1	7.00	8.90	0.276	0.350
H1	6.00	7.00	0.236	0.276
L	12.60	14.80	0.496	0.583
L1	2.50	3.90	0.098	0.154
L2	12.13	16.50	0.478	0.650
Q	2.40	3.10	0.094	0.122
P	3.50	3.95	0.138	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	2023/11/25	Priliminary Release;

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.