华润微电子(重庆)有限公司

CRTD370P10L

Trench P-MOSFET -100V, 31mΩ, -34A

Features

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

Applications

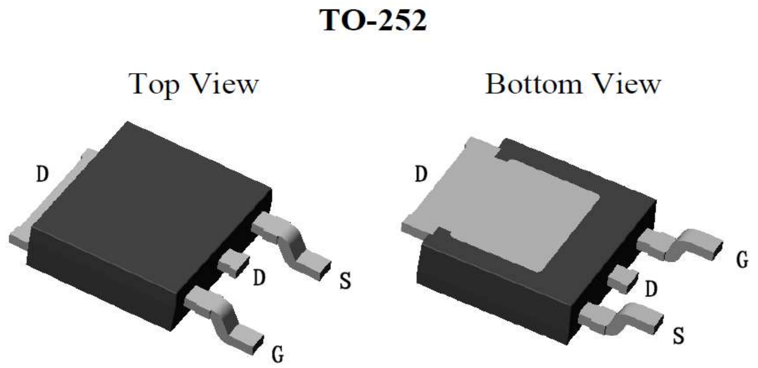
- Motor control and drive
- Battery management
- UPS (Uninterrupible Power Supplies)

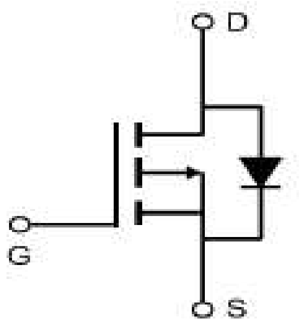
Product Summary

V_{DS}	-100V
$R_{DS(on)\ typ.}$	31mΩ
I_D	-34A

100% DVDS Tested

100% Avalanche Tested





Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRTD370P10L	CRTD370P10L	TO-252	Reel	N/A	N/A	2500pcs

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)		-34	
T_C = 25°C (Package limit)		-66	
T_C = 100°C (Silicon limit)		-21	
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	-135	A
Avalanche energy, single pulse (L=0.5mH, Rg=25Ω)	E_{AS}	95	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation (T_C = 25°C)	P_{tot}	94	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

Thermal Resistance

Parameter	**Symbol**	**Max**	**Unit**
Thermal resistance, junction – case.	R_{thJC}	1.33	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}*	129	

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	$V_{GS(th\ )}$	-1.5	-2.0	-2.5	V	V_{DS}=V_{GS},I_D=-250uA
Zero gate voltage drain current	I_{DSS}	- -	- -	-1 -50	µA	V_{DS}=-100V,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	$R_{DS(on)}$	- - -	31 66 37	37 83 48	mΩ	V_{GS}=-10V, I_D=-22A T_j=25°C T_j=150°C VGS=-4.5V, I_D=-10A
Transconductance	g_{fs}	-	58	-	S	V_{DS}=-5V,I_D=-22A
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	5805	-	pF	V_{GS}=0V, V_{DS}=-50V, f=1MHz
Output Capacitance	C_{oss}	-	178	-		
Reverse Transfer Capacitance	C_{rss}	-	86	-		
Gate Total Charge	Q_G	-	100	-	nC	V_{GS}=-10V, V_{DS}=-50V, I_D=-22A, f=1MHz
Gate-Source charge	Q_{gs}	-	25	-		
Gate-Drain charge	Q_{gd}	-	16	-		
Turn-on delay time	$t_{d(on)}$	-	15	-	ns	V_{GS}=-10V, V_{DD}=-50V, R_{G_ext}=2.7Ω, I_D=-22A
Rise time	t_r	-	44	-		
Turn-off delay time	$t_{d(off)}$	-	90	-		
Fall time	t_f	-	76	-		
Gate resistance	R_G	-	3.8	-	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}	-	-0.87	-1.3	V	V_{GS}=0V,I_{SD}=-22A
Body Diode Forward Current	I_S			-34	A	T_C = 25°C
Body Diode Reverse Recovery Time	t_{rr}	-	33	-	ns	Isd=-22A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge	Q_{rr}	-	54	-	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

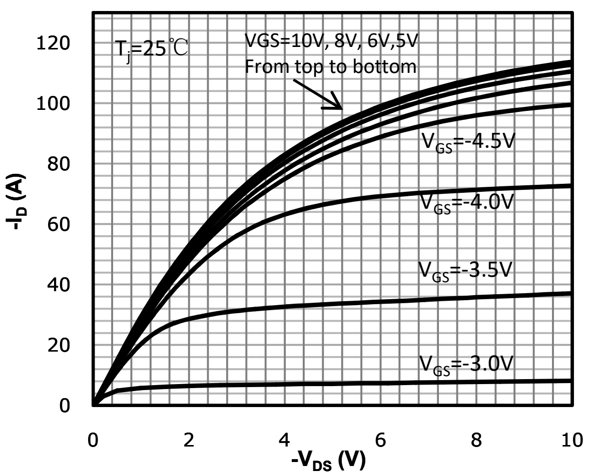


Fig 2: Transfer Characteristics

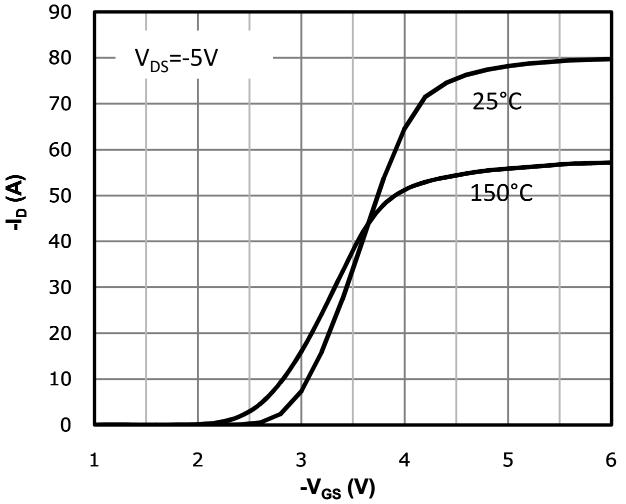


Fig 3: Rds(on) vs Drain Current and Gate Voltage

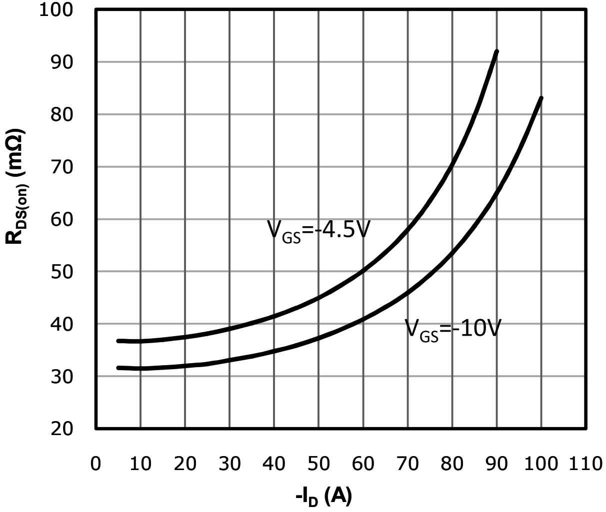


Fig 4: Rds(on) vs Gate Voltage

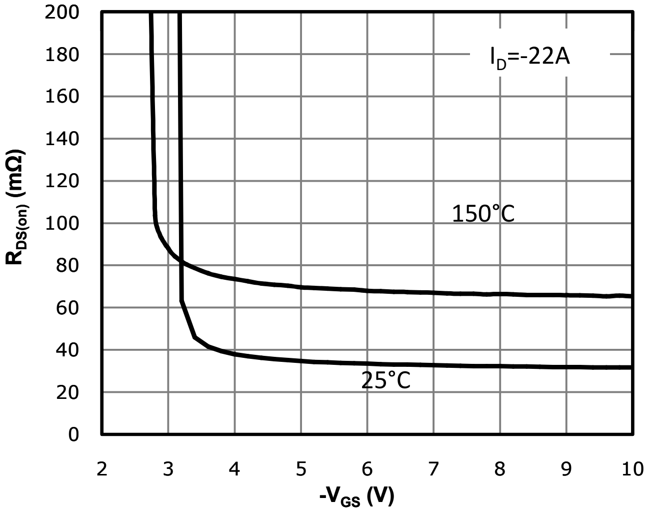


Fig 5: Rds(on) vs. Temperature

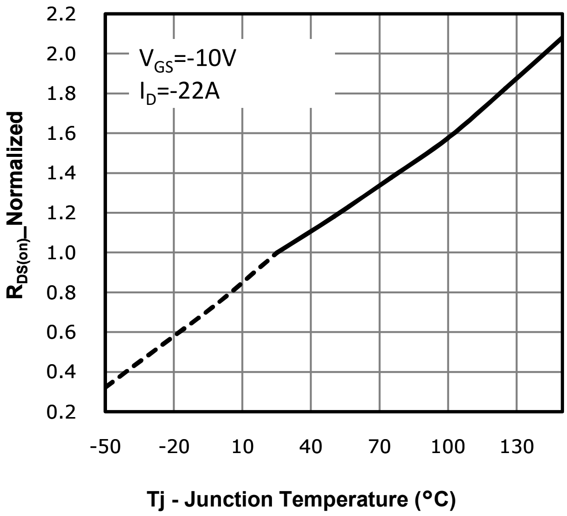
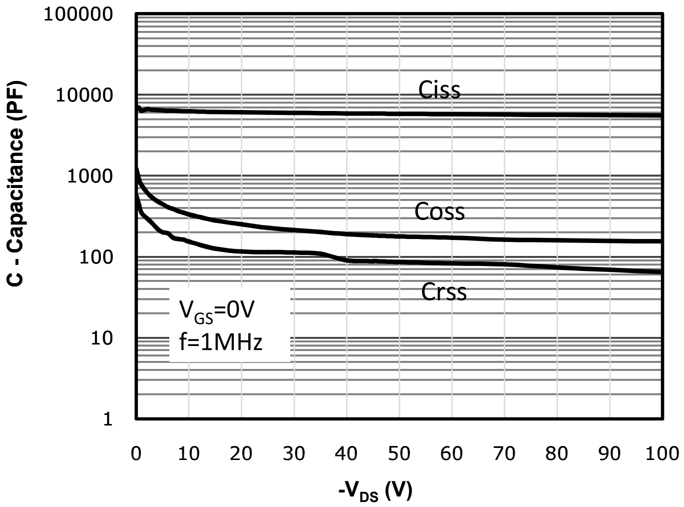


Fig 6: Capacitance Characteristics



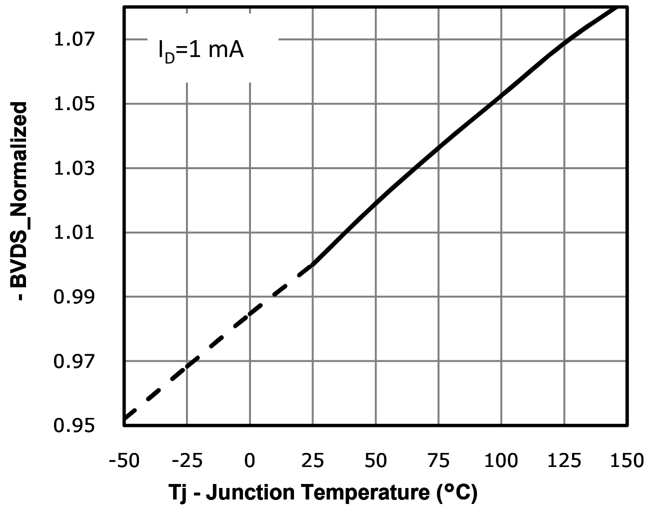


Fig 7: BVDS vs. Temperature

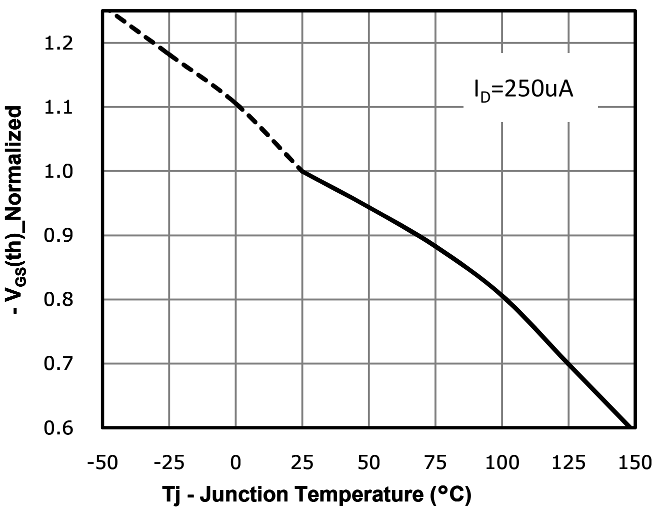


Fig 8: V_{GS}(th) vs. Temperature

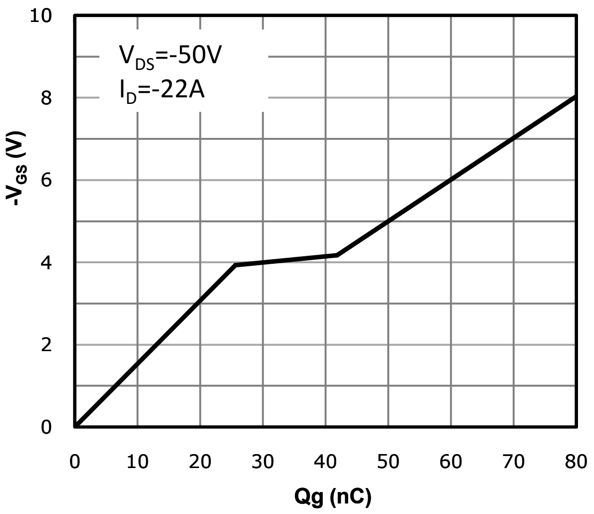


Fig 9: Gate Charge Characteristics

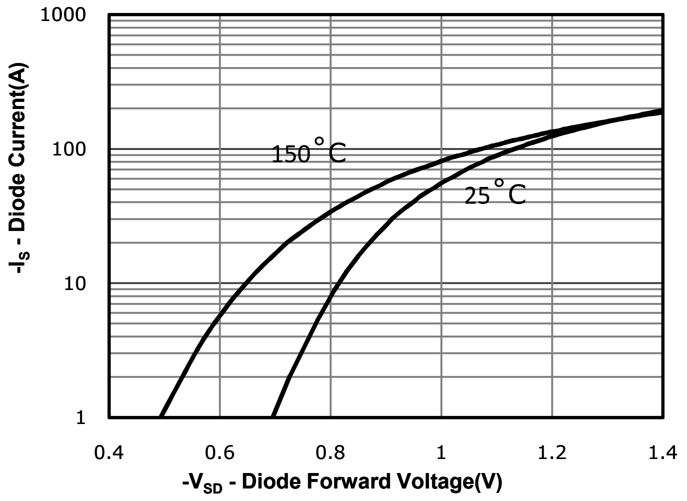


Fig 10: Body-diode Forward Characteristics

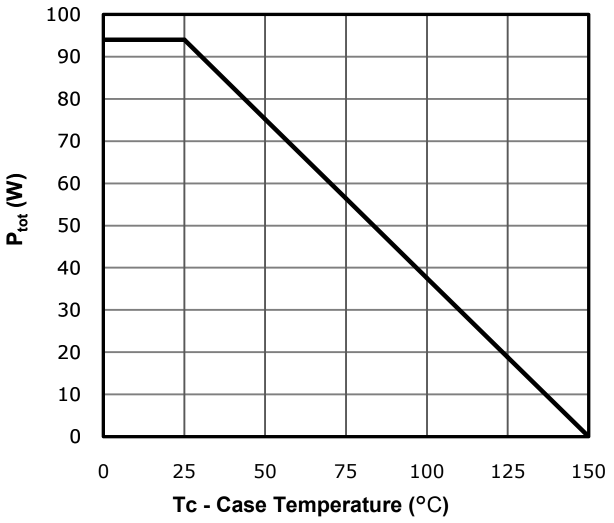


Fig 11: Power Dissipation

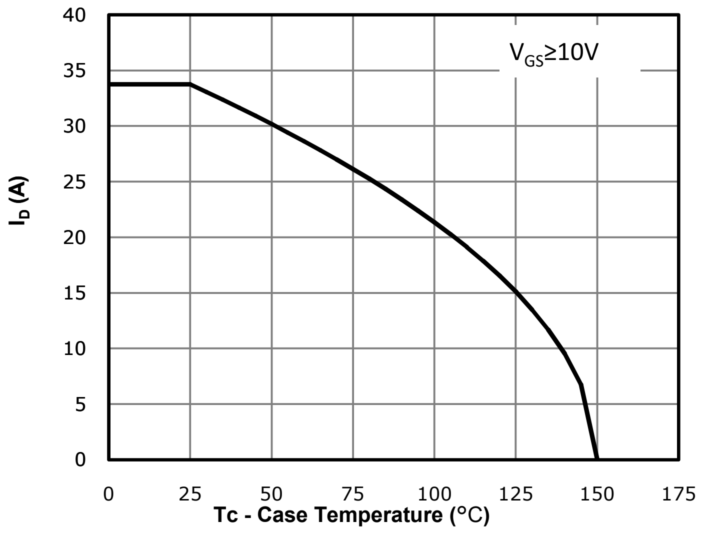


Fig 12: Drain Current Derating

Fig 13: Safe Operating Area

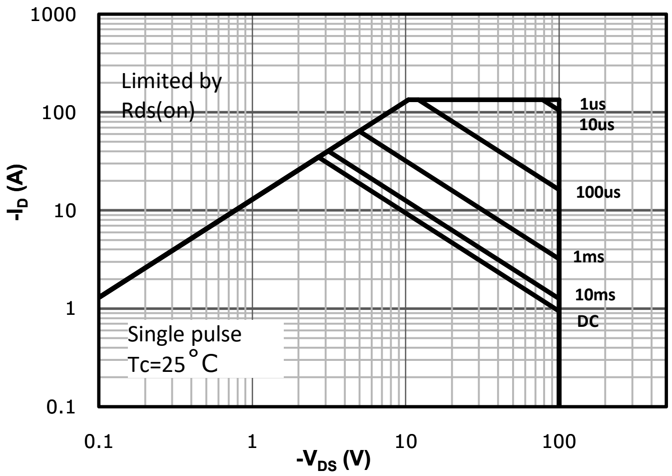
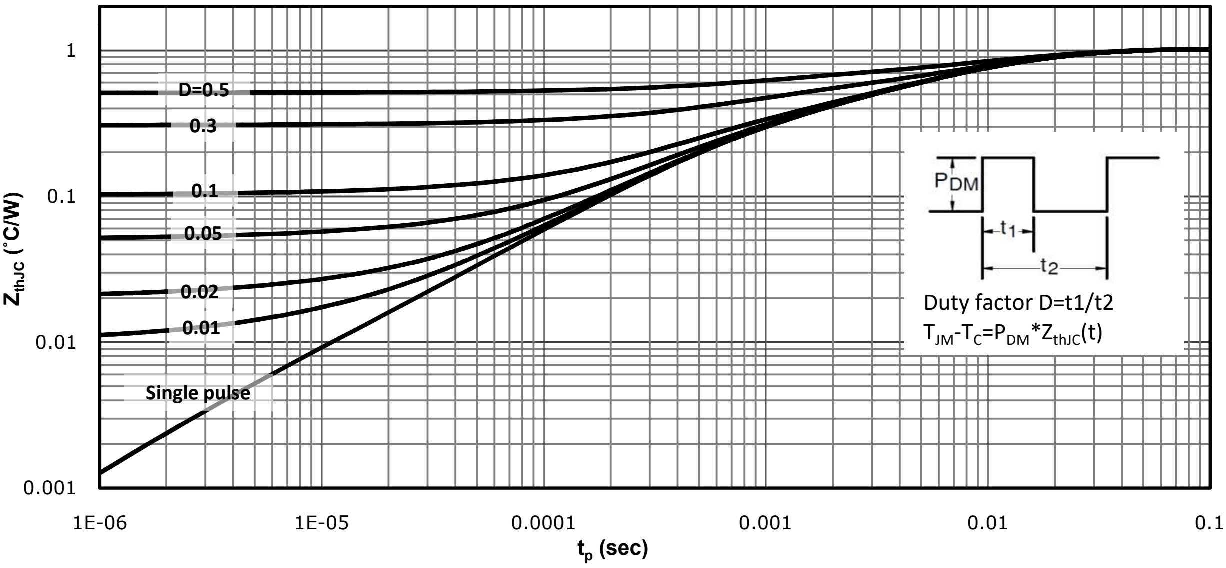
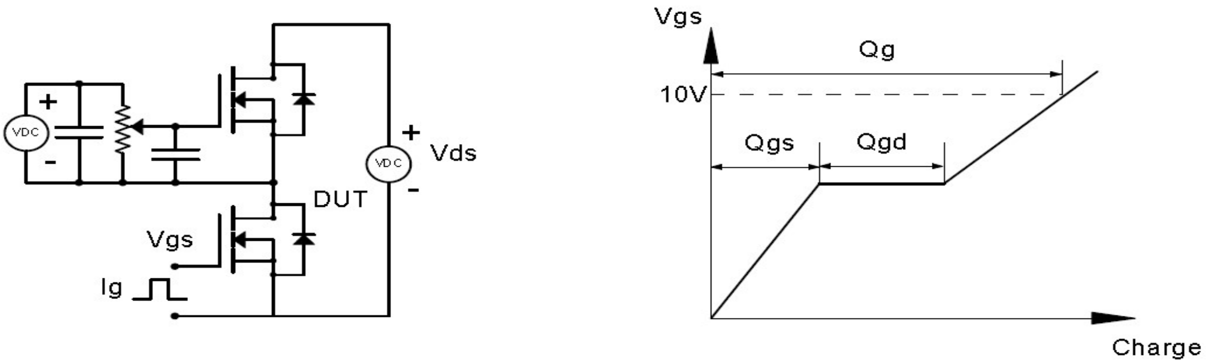


Fig 14: Max. Transient Thermal Impedance

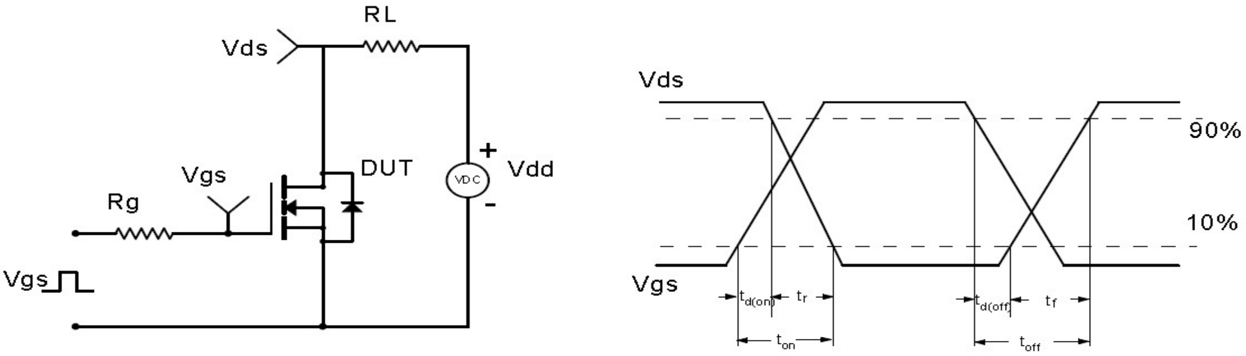


Test Circuit & Waveform

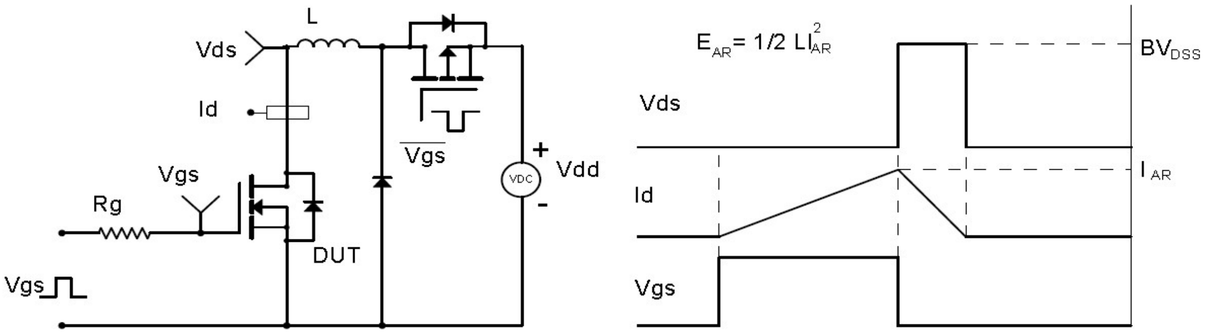
Gate Charge Test Circuit & Waveform



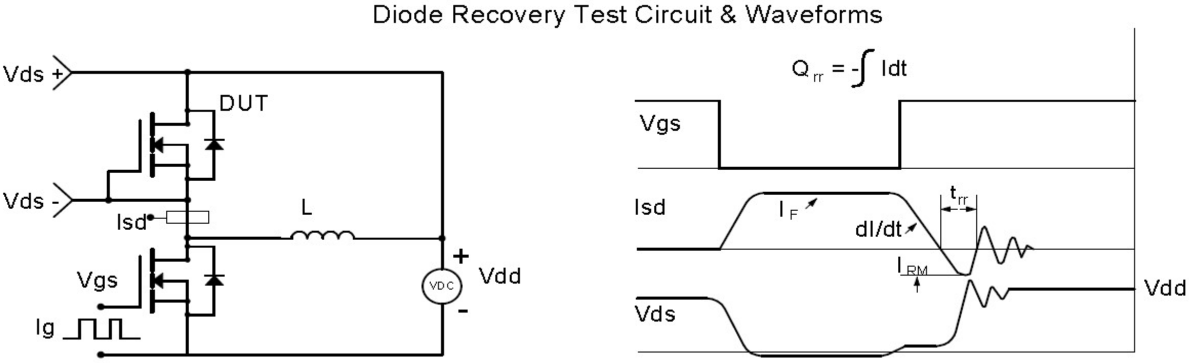
Resistive Switching Test Circuit & Waveforms



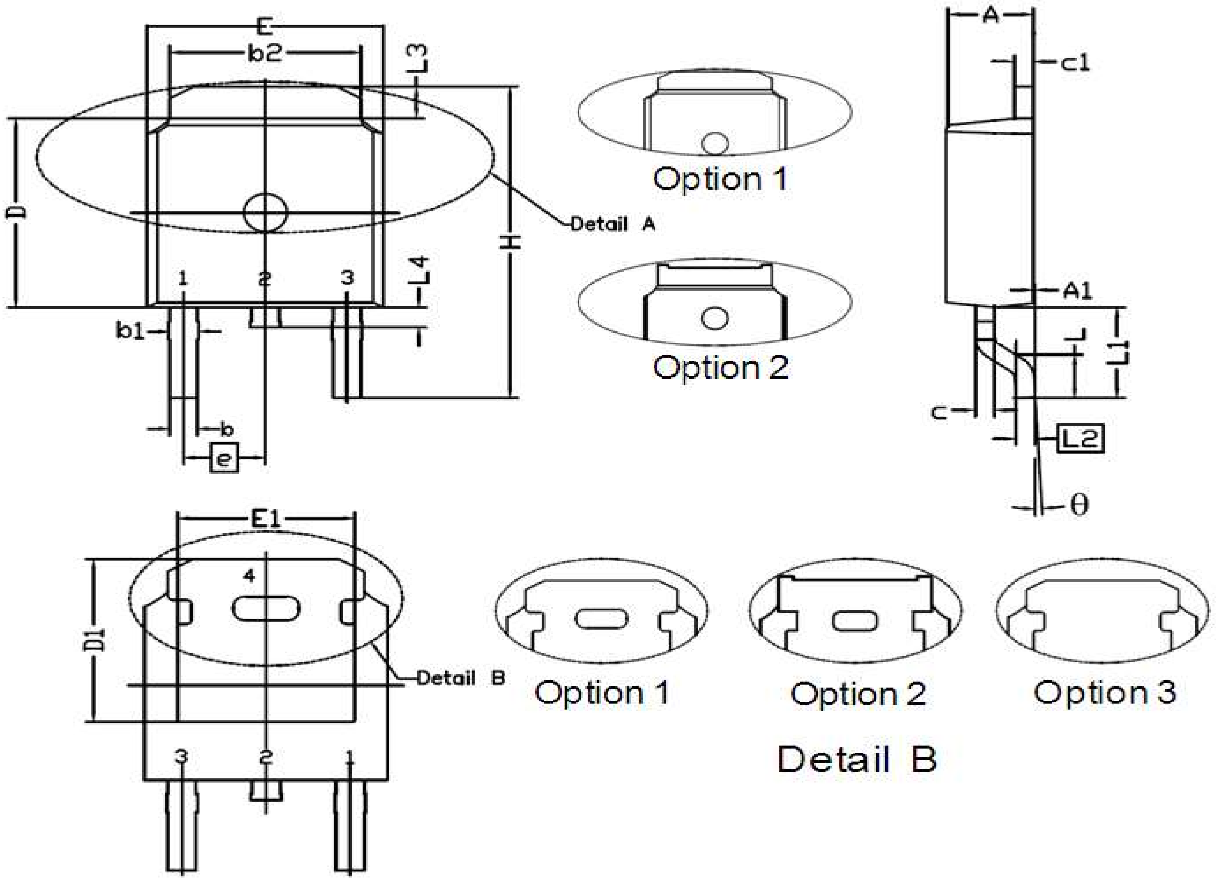
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline: TO-252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.15	2.45	0.085	0.096
A1	0.00	0.15	0.000	0.006
b	0.60	0.91	0.024	0.036
b1	0.65	1.15	0.026	0.045
b2	5.00	5.64	0.197	0.222
c	0.45	0.61	0.018	0.024
c1	0.36	0.66	0.014	0.026
D	5.80	6.30	0.228	0.248
D1	5.21	--	0.205	--
e	2.29 BSC.		0.090 BSC.	
E	6.30	6.90	0.248	0.272
E1	4.40	--	0.173	--
H	9.40	10.48	0.370	0.413
L	1.38	1.78	0.054	0.070
L1	2.92 REF		0.115 REF	
L2	0.508 BSC.		0.020 BSC.	
L3	0.72	1.35	0.028	0.053
L4	0.60	1.20	0.024	0.047
θ	0°	10°	0°	10°

Revision History

Revison	Date	Major changes
1.0	2021/12/17	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.