华润微电子(重庆)有限公司

CRTD360N10LZ

Trench N-MOSFET 100V, 30mΩ, 36A

Features

- Uses CRM(CQ) advanced Trench MOS technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent $Q_g x R_{DS(on)}$ product(FOM)
- Qualified according to JEDEC criteria
- AEC-Q101 Pass

Applications

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

Product Summary

V_{DS}	100V
$R_{DS(on)}$ typ.	30mΩ
I_D	36A

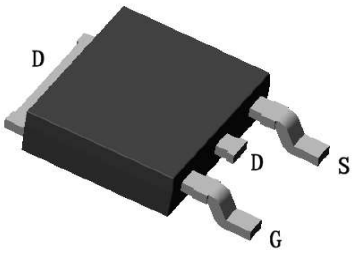
100% DVDS Tested

100% Avalanche Tested

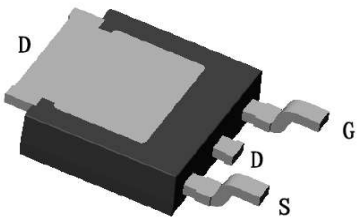
RoHS HF

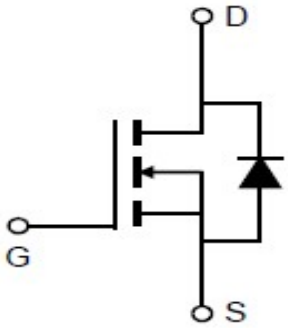
TO-252

Top View



Bottom View





Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRTD360N10LZ	360N10LZ	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 T_C = 25°C (Silicon limit) T_C = 100°C (Silicon limit)	I_D	 36 23	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	144	A
Avalanche energy, single pulse (L=0.5mH, Rg=25Ω)	E_{AS}	36	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation (T_C = 25°C)	P_{tot}	93	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)	T_{sold}	260	°C

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Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	1.61	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}*	84	

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	$V_{GS(th)}$	1.3	1.7	2.2	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	- -	- -	1 100	μA	V_{DS}=80V,V_{GS}=0V T_j=25°C T_j=175°C
Gate-source leakage current	I_{GSS}	-	-	±100	nA	V_{GS}=±20V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	- - -	30 87 31	36 - 40	mΩ	V_{GS}=10V, I_D=18A, T_j=25°C T_j=175°C V_{GS}=4.5V, I_D=15A,
Transconductance	g_{fs}	-	72	-	S	V_{DS}=5V,I_D=18A
Dynamic Characteristic						
Input Capacitance	C_{iss}	1256	2512	5024	pF	V_{GS}=0V, V_{DS}=50V, f=1MHz
Output Capacitance	C_{oss}	48	96	192		
Reverse Transfer Capacitance	C_{rss}	28	55	110		
Gate Total Charge	Q_G	-	60	-	nC	V_{GS}=10V, V_{DS}=50V, I_D=18A
Gate-Source charge	Q_{gs}	-	9	-		
Gate-Drain charge	Q_{gd}	-	13	-		
Turn-on delay time	$t_{d(on)}$	-	10	-	ns	V_{GS}=10V, V_{DD}=50V, R_{G_ext}=2.7Ω, I_D=18A
Rise time	t_r	-	26	-		
Turn-off delay time	$t_{d(off)}$	-	44	-		
Fall time	t_f	-	55	-		
Gate resistance	R_G	0.2	1.1	3	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz

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Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.8	1.3	V	V_{GS}=0V,I_{SD}=18A
Body Diode Continuous Forward Current	I_S			36	A	T_C = 25°C
Body Diode Reverse Recovery Time	t_{rr}	-	36	-	ns	I_F=18A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge	Q_{rr}	-	59	-	nC	

*The value of R_{thJA} is measured by placing the device in a still air box which is one cubic foot.

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Typical Performance Characteristics

Fig 1: Output Characteristics

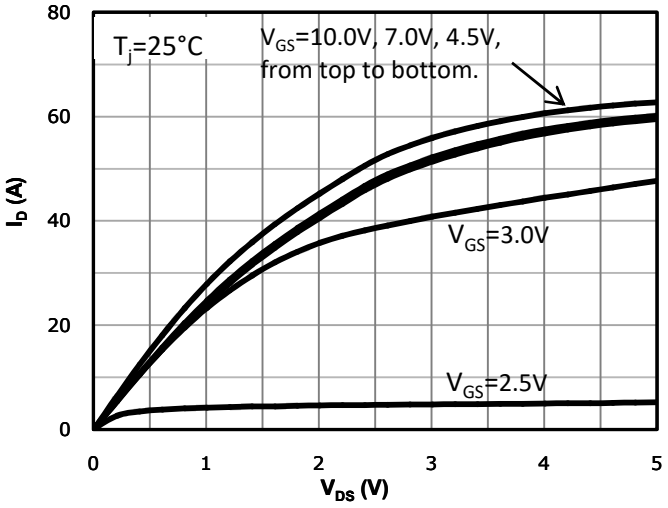


Fig 2: Transfer Characteristics

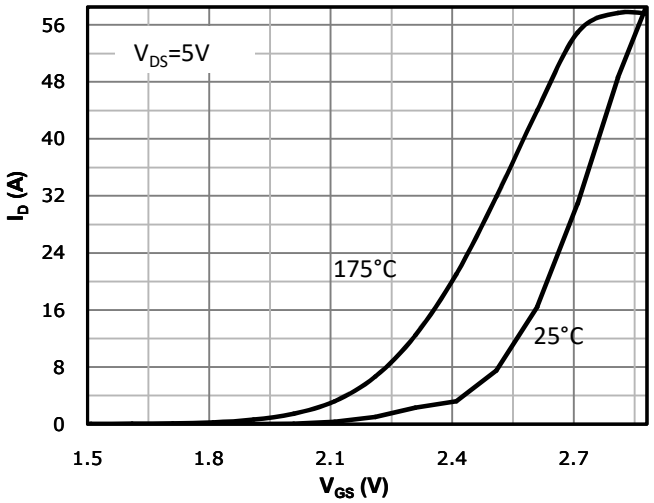


Fig 3: Rds(on) vs Drain Current and Gate Voltage

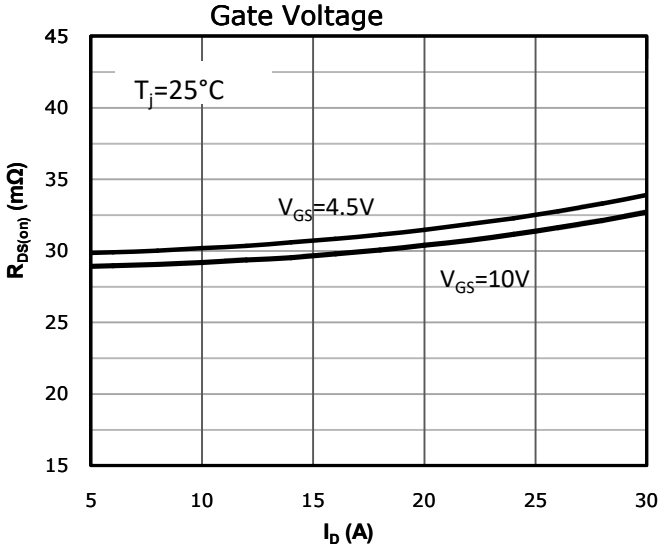


Fig 4: Rds(on) vs Gate Voltage

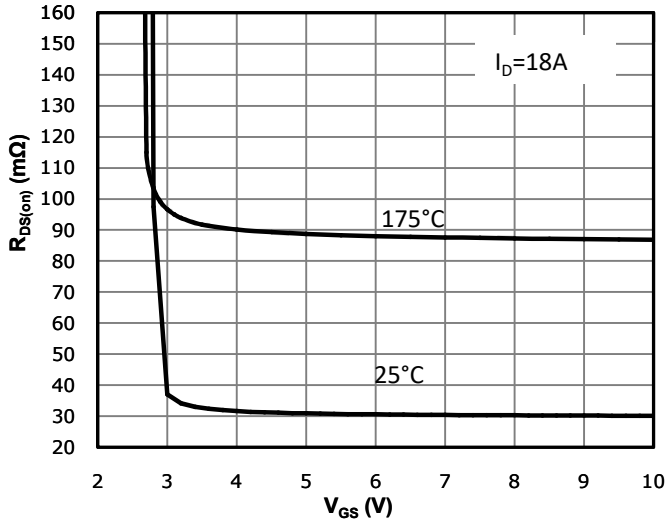


Fig 5: R_{DS}(on) vs. Temperature

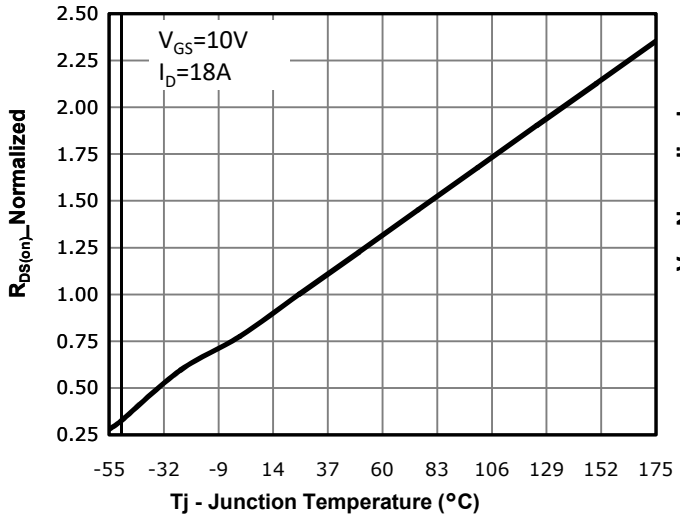
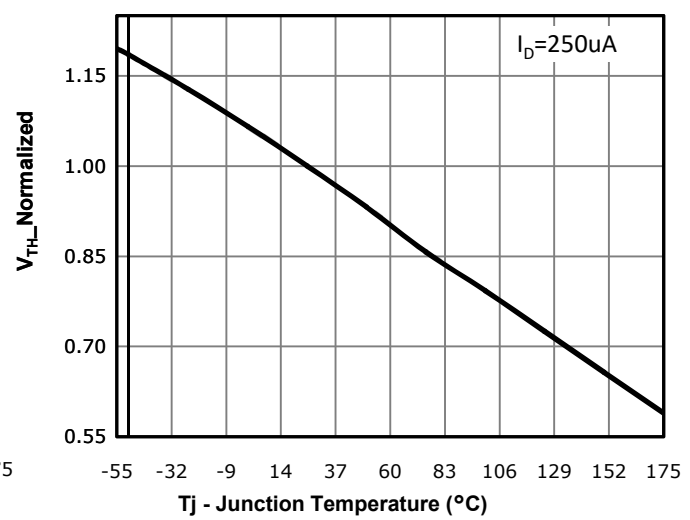


Fig 6: V_{TH} vs. Temperature



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Fig 7: BV_{DSS} vs. Temperature

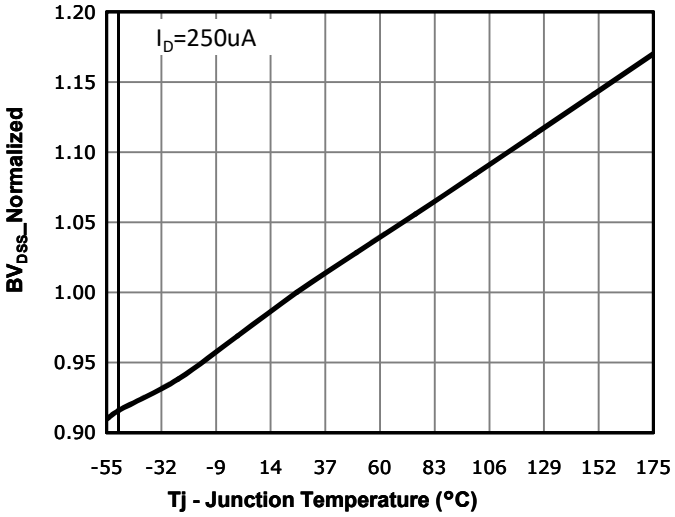


Fig 8: Capacitance Characteristics

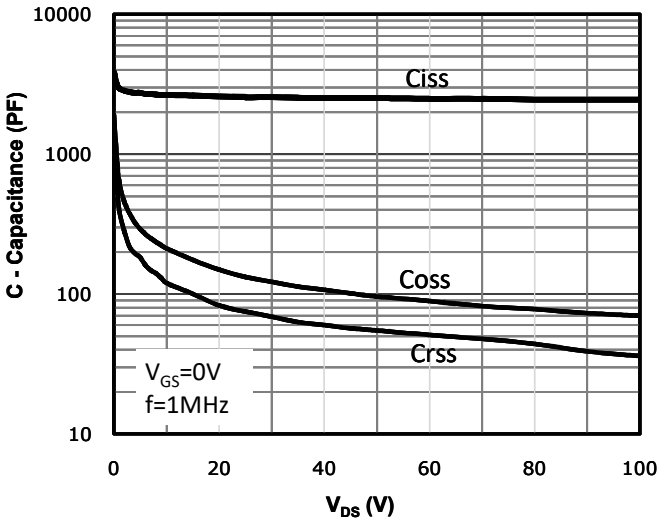


Fig 9: Gate Charge Characteristics

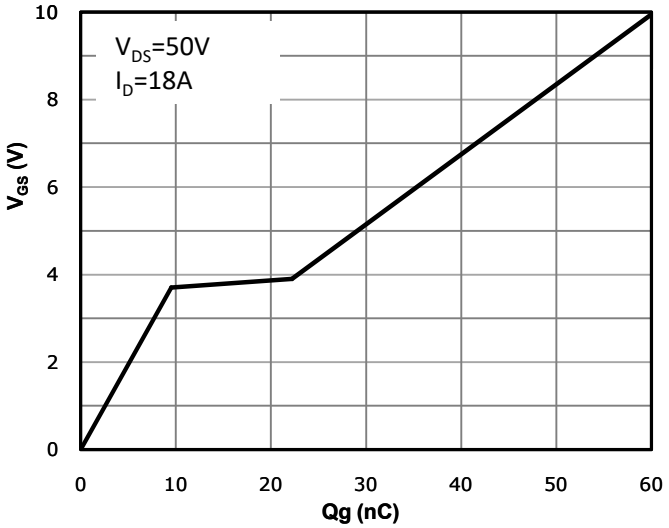


Fig 10: Body-diode Forward Characteristics

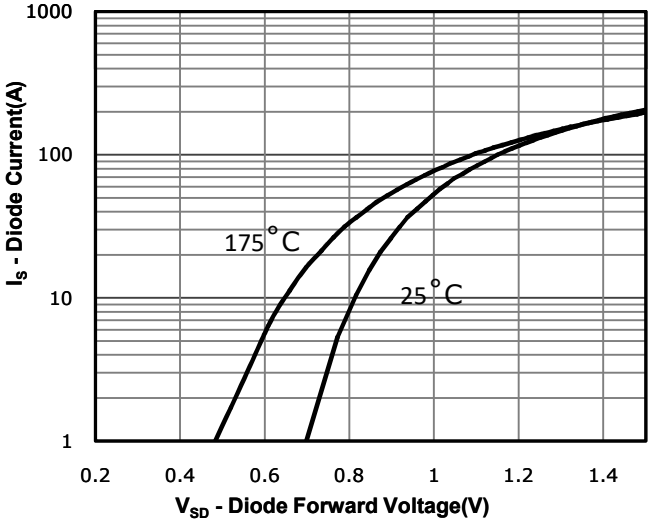


Fig 11: Power Dissipation

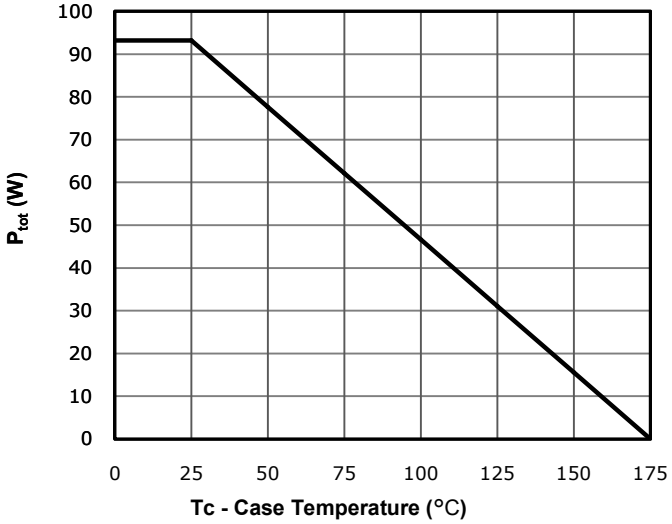
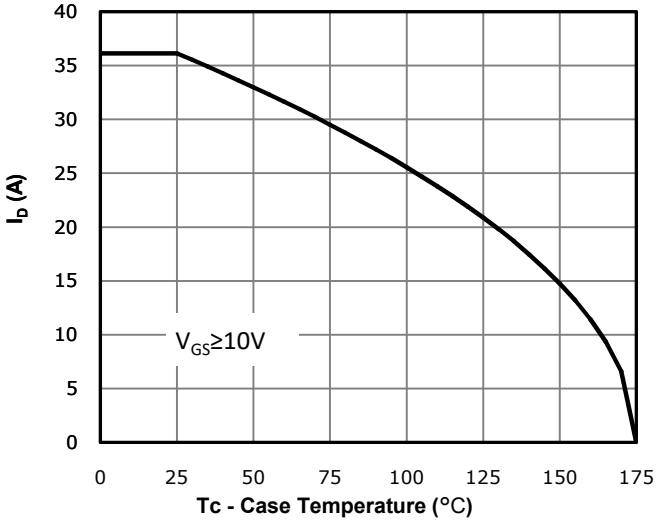


Fig 12: Drain Current Derating



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Fig 13: Safe Operating Area

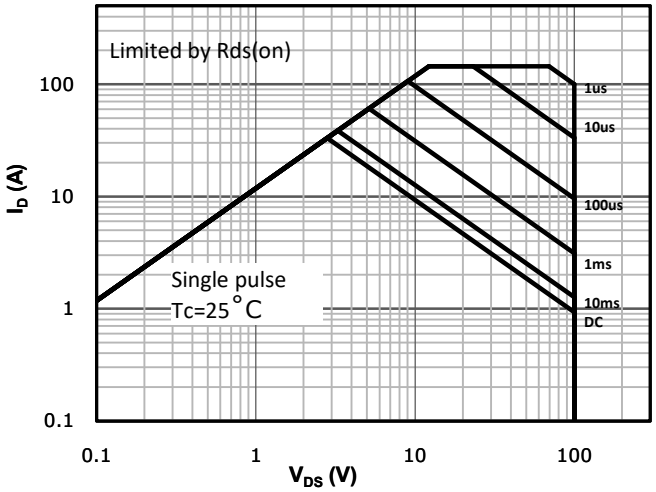
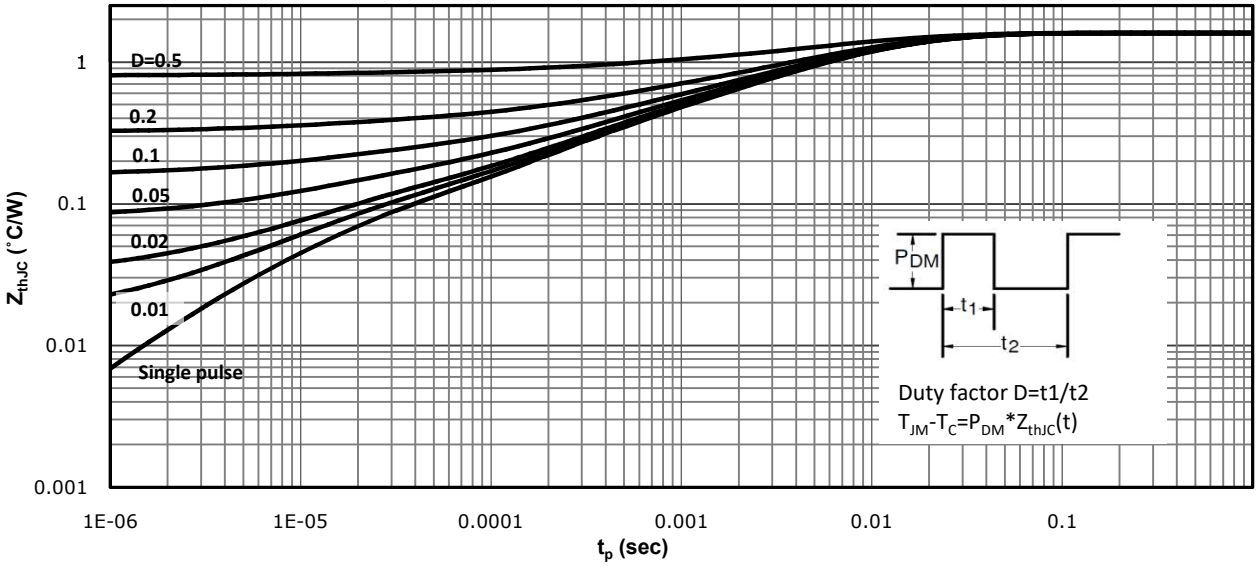


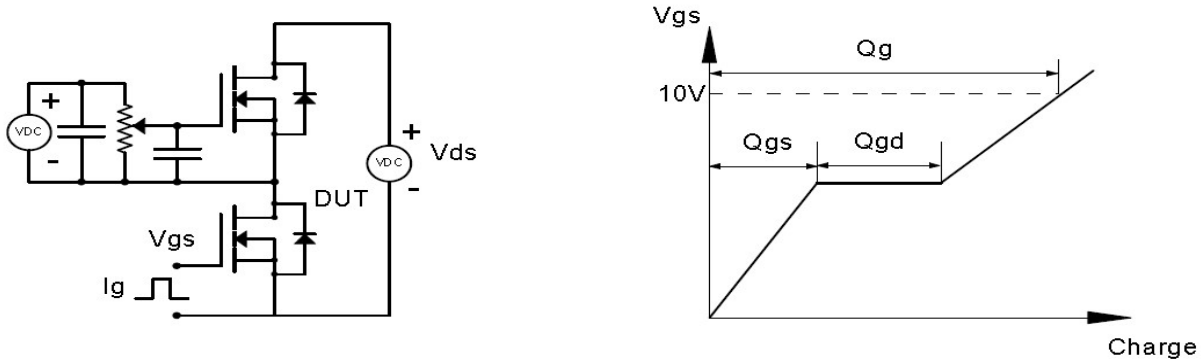
Fig 14: Max. Transient Thermal Impedance



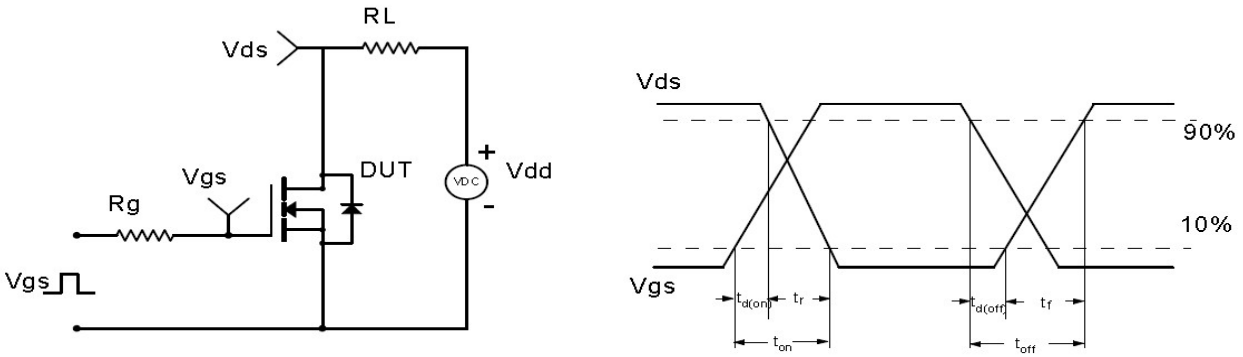
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Test Circuit & Waveform

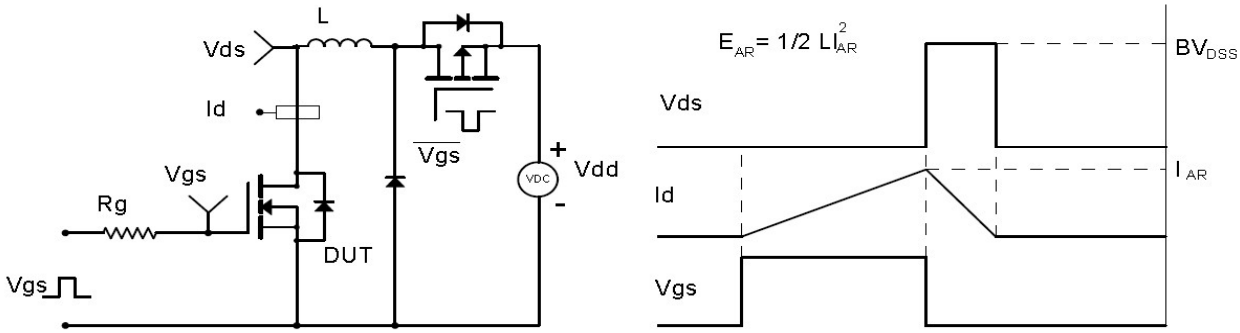
Gate Charge Test Circuit & Waveform



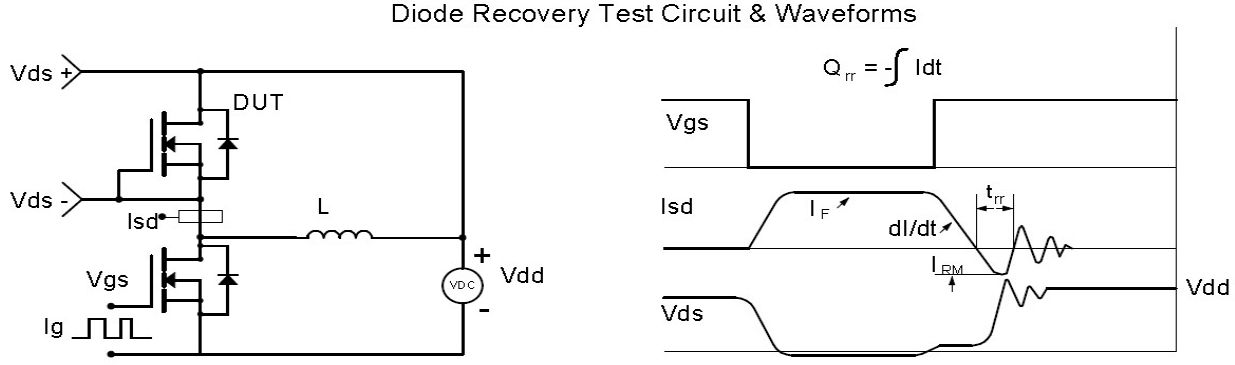
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

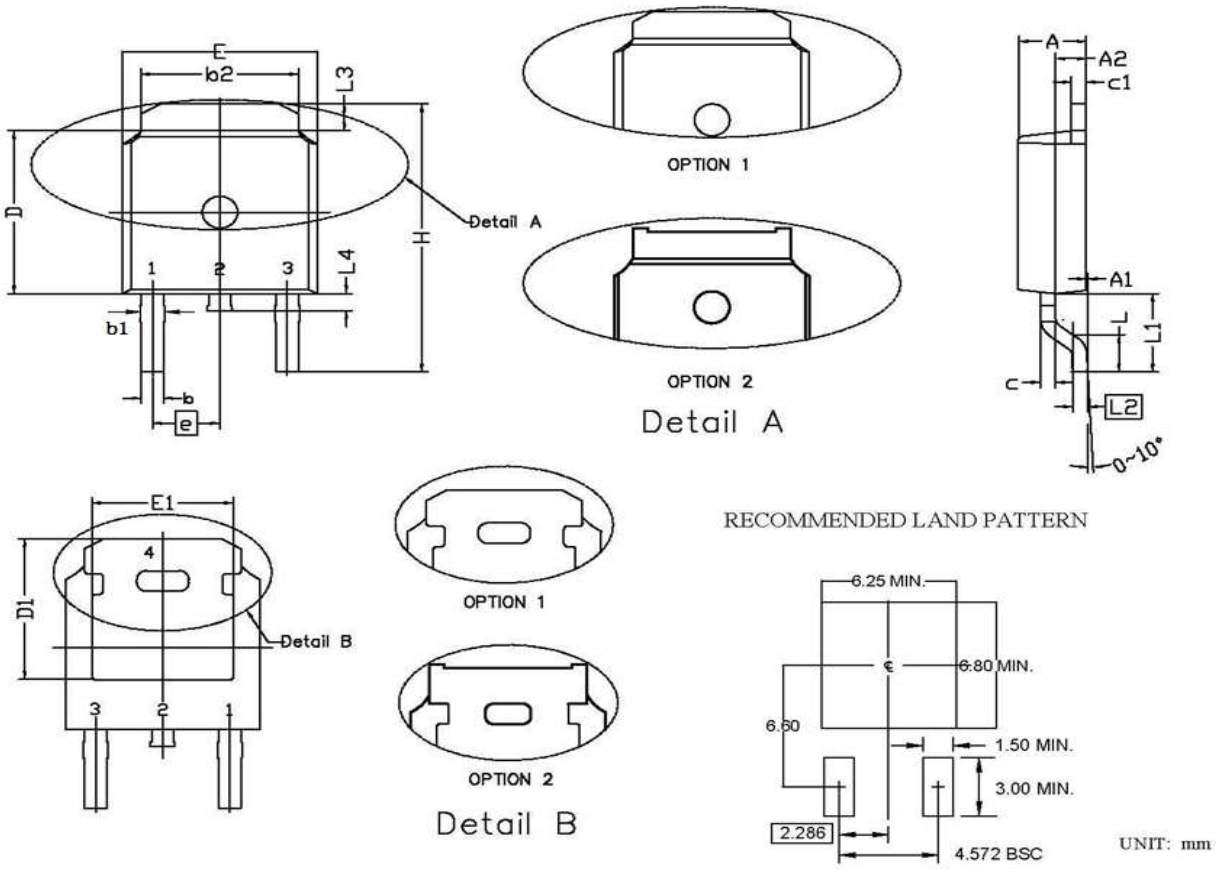


Diode Recovery Test Circuit & Waveforms



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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
A2	0.76	1.36	0.030	0.054
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	5.00	6.00	0.197	0.236
e	2.29 BSC.		0.090 BSC.	
E	6.30	6.90	0.248	0.272
E1	4.55	5.30	0.179	0.209
H	9.40	10.48	0.370	0.413
L	1.18	1.70	0.046	0.067
L1	2.92 REF		0.115 REF	
L2	0.36	0.66	0.014	0.026
L3	0.72	1.35	0.028	0.053
L4	0.60	1.20	0.024	0.047

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Revision History

Revision	Date	Major changes
1.0	2023/3/16	Release of formal version

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