CRTD028N03L4

Trench N-MOSFET 30V, 2.0mΩ, 160A

Features

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

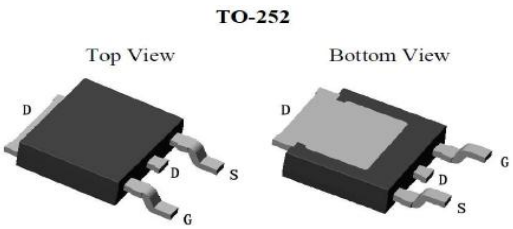
Product Summary

V_{DS}	30V
$R_{DS(on).typ}$	2.0mΩ
I_D	160A

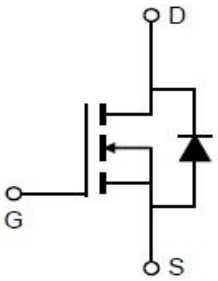
100% DVDS Tested
100% Avalanche Tested

Applications

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



CRTD028N03L4



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRTD028N03L4	CRTD028N03L4	TO-252	Tape	N/A	N/A	2500pcs

Absolute Maximum Ratings

Parameter	**Symbol**	**Value**	**Unit**
Drain-source voltage	V_{DS}	30	V
Continuous drain current T_C = 25°C (Silicon limit) T_C = 100°C (Silicon limit)	I_D	 160 100	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	640	A
Avalanche energy, single pulse (I_D = 40A, Rg=25Ω)[1]	E_{AS}	405	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation (T_C = 25°C)	P_{tot}	96	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

※. Notes:
1.EAS is tested at starting Tj = 25℃, L = 0.5mH, IAS =40A, Vds = 30V.

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	1.30	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	62.5	

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}	30	-	-	V	V_{GS}=0V, I_D=250uA
		30	-	-	V	V_{GS}=0V, I_D=1mA
Gate threshold voltage	$V_{GS(th)}$	0.9	1.3	2.0	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	- -	- -	1 100	μA	V_{DS}=30V,V_{GS}=0V T_j=25°C T_j=125°C
Gate-source leakage current	I_{GSS}	-	-	±100	nA	V_{GS}=±20V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	- -	2.0 2.7	2.6 3.6	mΩ	VGS=10V, ID=19A VGS=4.5V, ID=19A
Transconductance	g_{fs}	-	76.4	-	S	V_{DS}=5V, I_D=19A
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	4531	-	pF	V_{GS}=0V, V_{DS}=15V, f=1MHz
Output Capacitance	C_{oss}	-	502	-		
Reverse Transfer Capacitance	C_{rss}	-	469	-		
Gate Total Charge	Q_G	-	100.6	-	nC	V_{GS}=10V, V_{DS}=15V, I_D=19A
Gate-Source charge	Q_{gs}	-	17.0	-		
Gate-Drain charge	Q_{gd}	-	18.6	-		
Turn-on delay time	$t_{d(on)}$	-	14.3	-	ns	V_{GS}=10V, V_{DD}=15V, R_{G_ext}=3Ω
Rise time	t_r	-	56.7	-		
Turn-off delay time	$t_{d(off)}$	-	76.2	-		
Fall time	t_f	-	23.7	-		
Gate resistance	R_G	-	1.3	-	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}	-	0.78	1.4	V	V_{GS}=0V,I_{SD}=19A
Body Diode Reverse Recovery Time	t_{rr}	-	20.4	-	ns	I_F=19A,dI/dt=100A/μs
Body Diode Reverse Recovery Charge	Q_{rr}	-	6.1	-	nC	

Typical Performance Characteristics

Fig 1: Output Characteristics

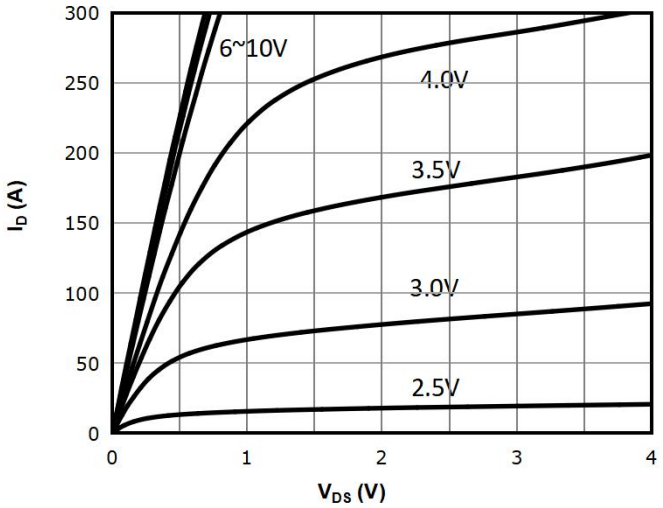


Fig 2: Transfer Characteristics

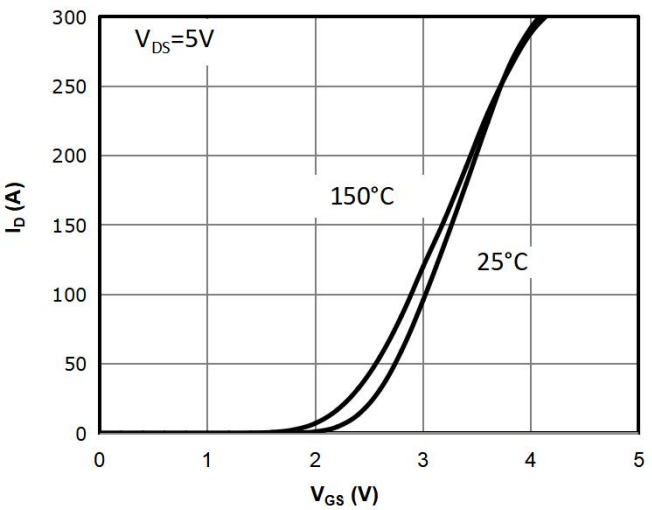


Fig 3: Rds(on) vs Drain Current and Gate Voltage

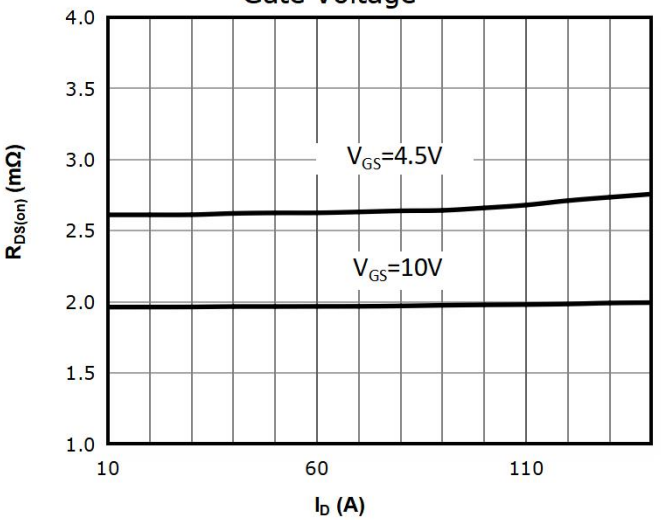


Fig 4: Rds(on) vs Gate Voltage

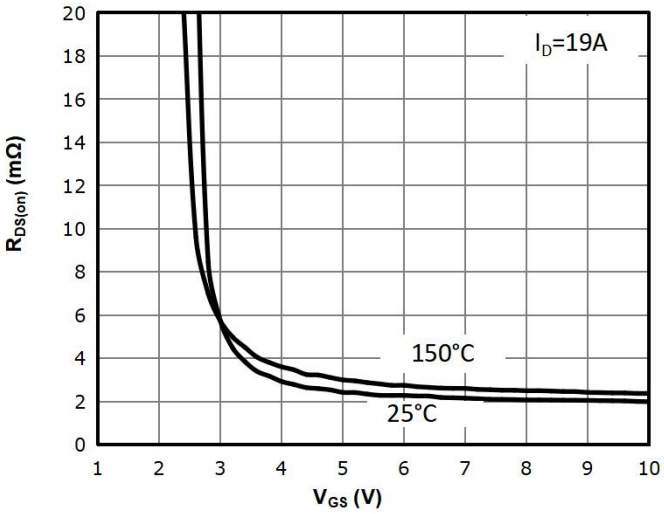


Fig 5: Rds(on) vs. Temperature

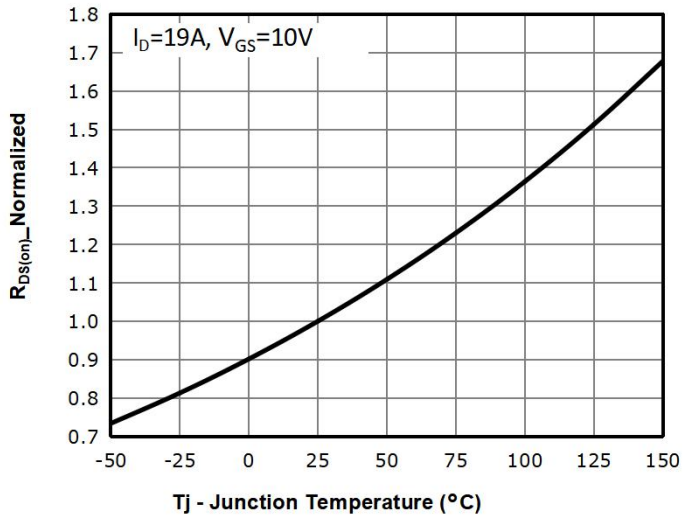


Fig 6: Vgs(th) vs. Temperature

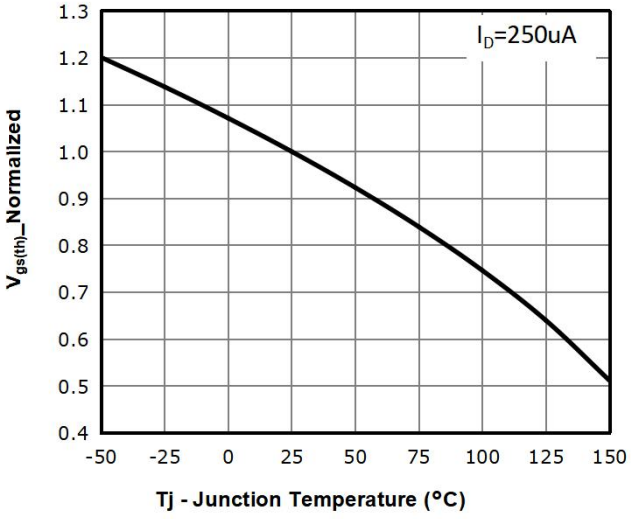


Fig 7: BVdss vs. Temperature

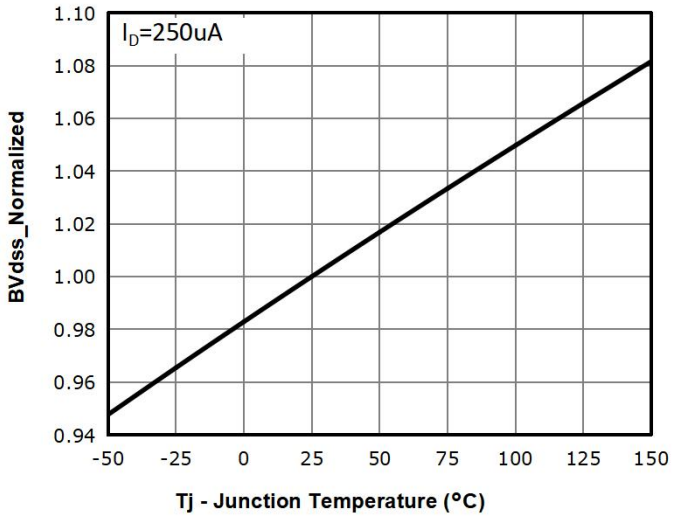


Fig 8: Capacitance Characteristics

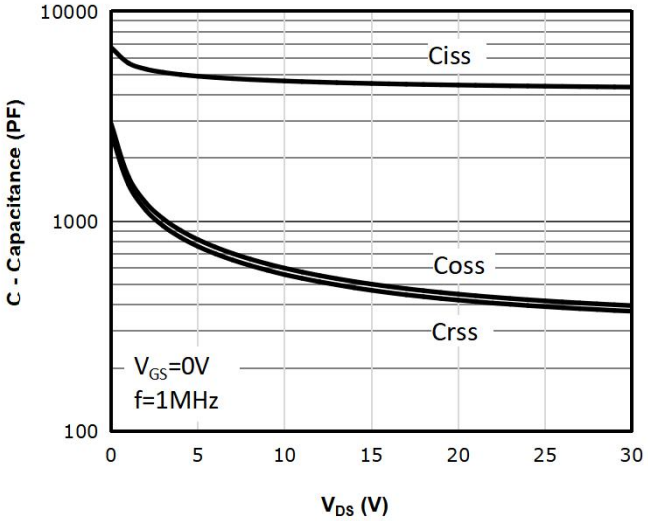


Fig 9: Gate Charge Characteristics

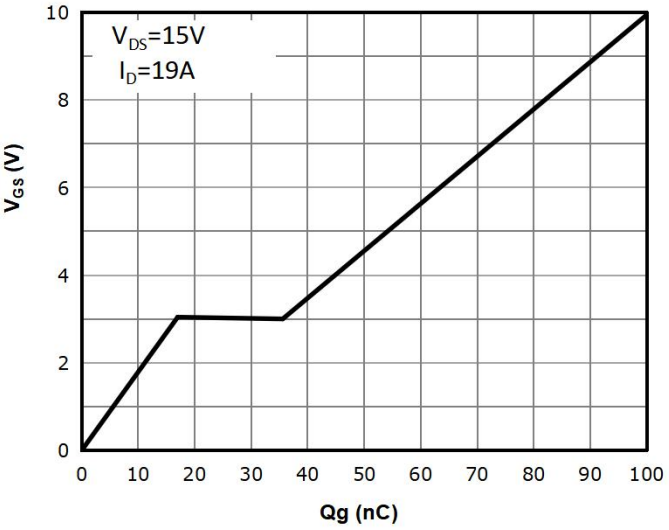


Fig 10: Body-diode Forward Characteristics

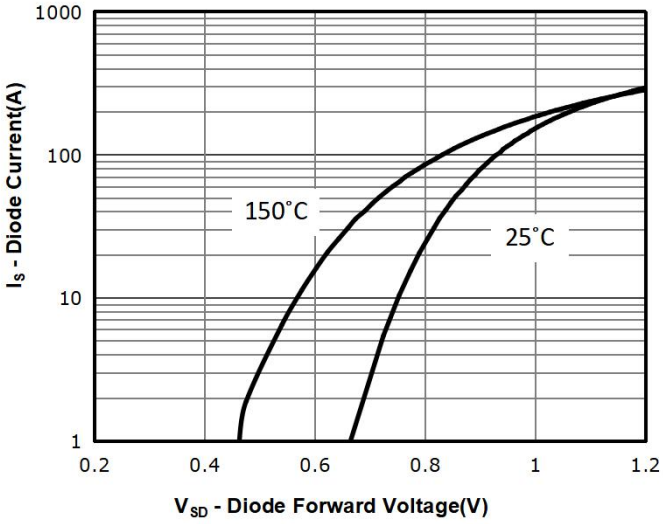


Fig 11: Power Dissipation

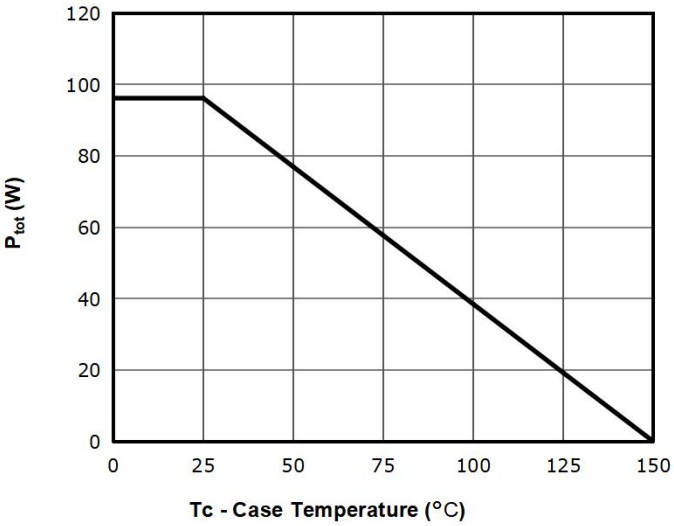


Fig 12: Drain Current Derating

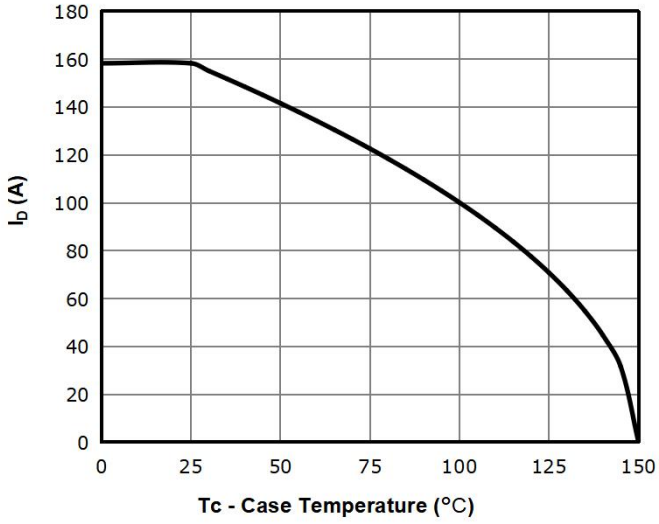


Fig 13: Safe Operating Area

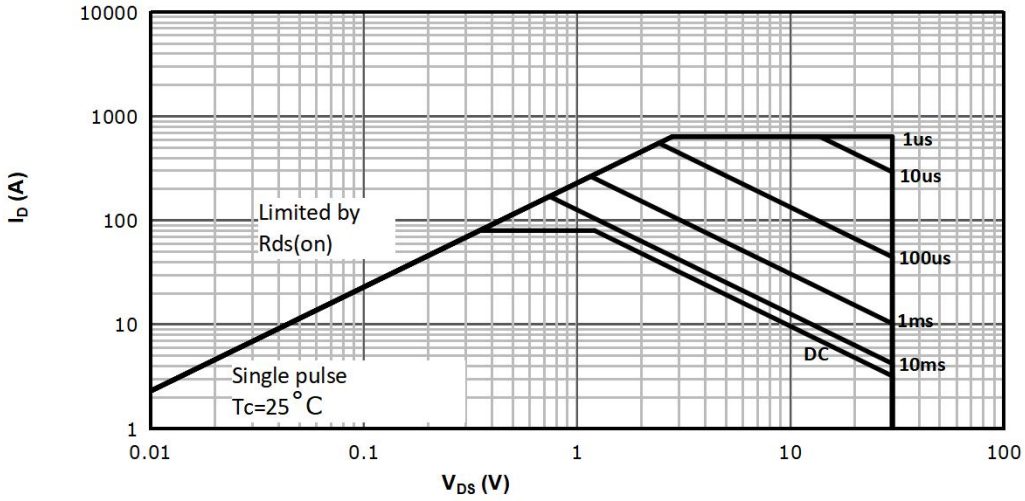
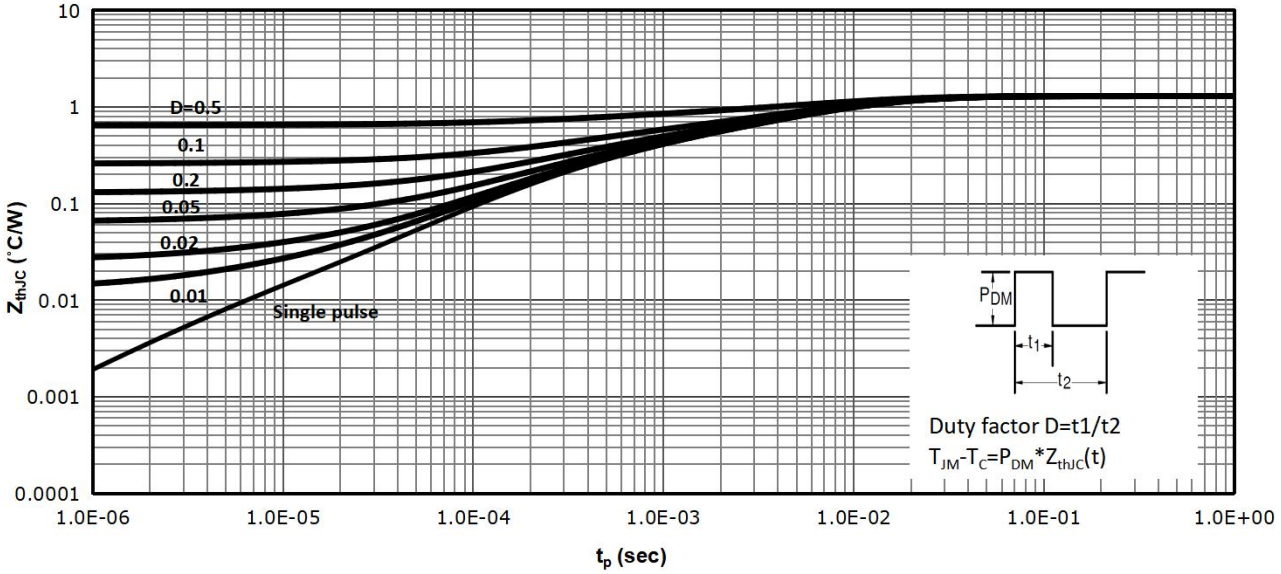
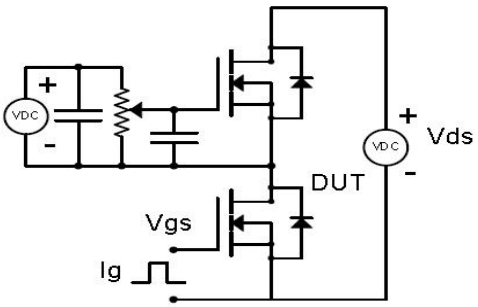


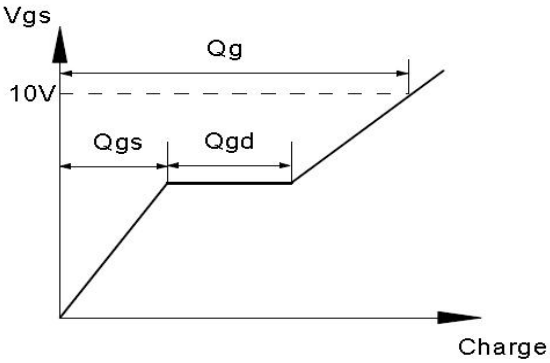
Fig 14: Max. Transient Thermal Impedance



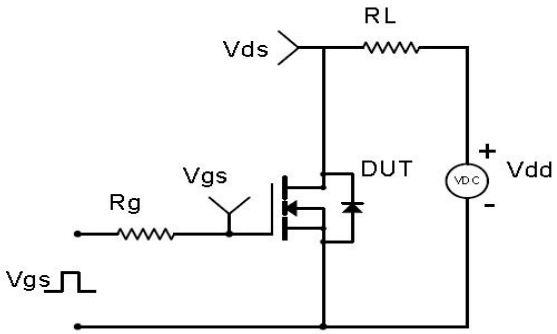
Test Circuit & Waveform

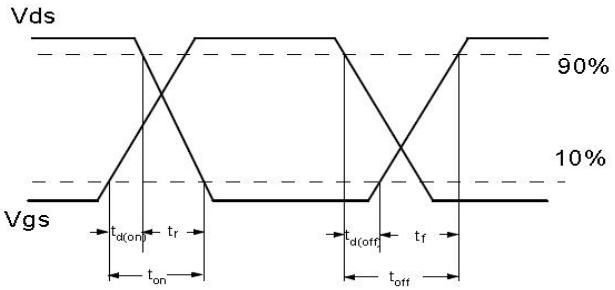
Gate Charge Test Circuit & Waveform



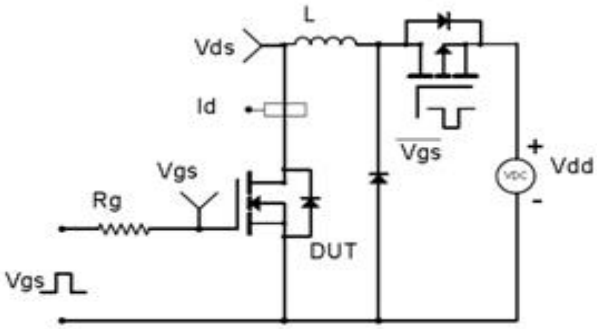


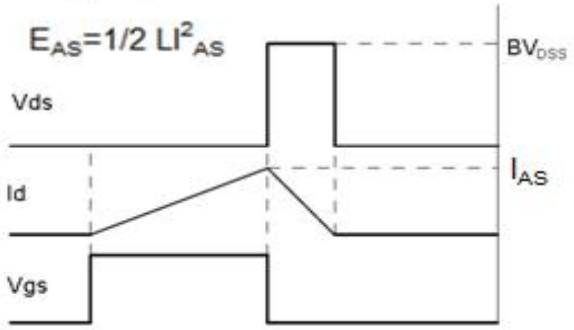
Resistive Switching Test Circuit & Waveforms



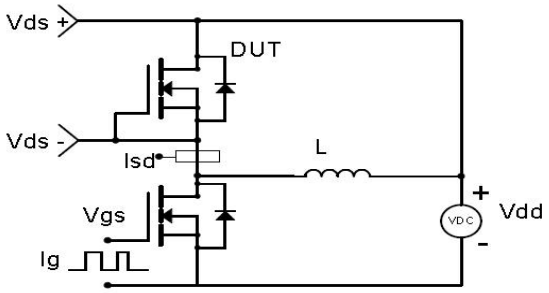


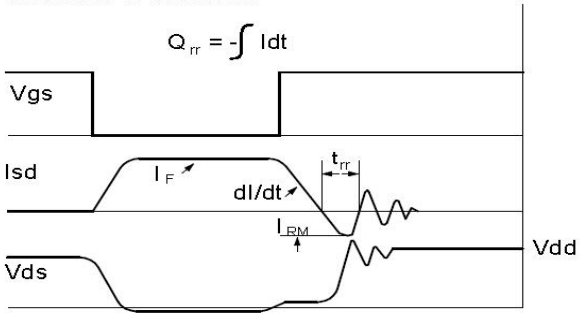
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



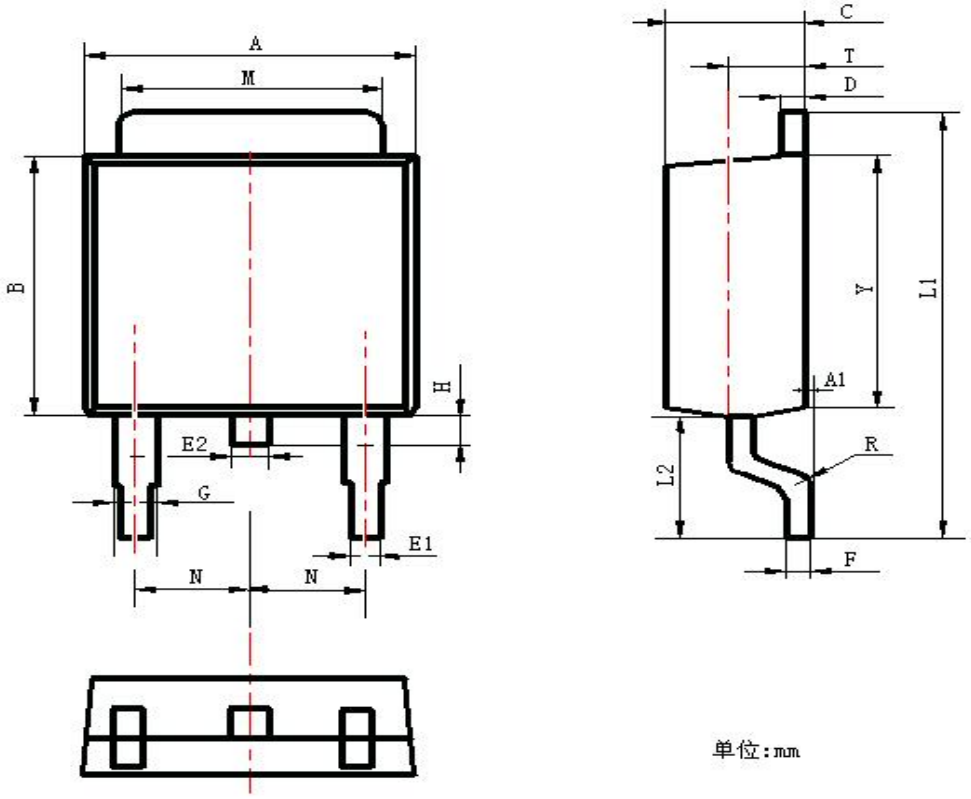


Diode Recovery Test Circuit & Waveforms





Package Outline: TO-252



Symbol	Values(mm)	
	Min.	Max.
A	6.300	6.900
A1	0.000	0.160
B	5.700	6.300
C	2.100	2.500
D	0.300	0.700
E1	0.600	0.900
E2	0.700	1.000
F	0.300	0.600
G	0.700	1.200
L1	9.600	10.500
L2	2.700	3.100
H	0.400	1.000
M	5.100	5.500
N	2.090	2.490
R	0.300	
T	1.400	1.600
Y	5.100	6.300

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	2025/7/8	Release of Preliminary version

Disclaimer

CRM reserves the right to change any product or information in this Specification at any time without prior notice.

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