

## Description

### N-channel Enhancement Mode Power MOSFET

#### Features

- 30V, 15A  
 $R_{DS(ON)}$  Typ= 10m $\Omega$  @  $V_{GS} = 10V$   
 $R_{DS(ON)}$  Typ= 16m $\Omega$  @  $V_{GS} = 4.5V$
- Advanced Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge

#### Applications

- Load Switch
- PWM Application
- Power Management



100% UIS TESTED!  
 100%  $\Delta V_{ds}$  TESTED!

Top View      Bottom View

PIN1

PDFN3.3x3.3-8L-D

Marking and Pin Assignment

Schematic Diagram

### Package Marking and Ordering Information

Device Marking	Device	Outline	Package	Reel Size	Reel(pcs)	Per Carton (pcs)
CRMQTL0312AD	CRMQTL0312AD	TAPING	PDFN3.3x3.3-8L-D	13"	5000	50000

### Absolute Maximum Ratings (@ $T_j = 25^\circ C$ unless otherwise specified)

Symbol	Parameter	Value	Units
$V_{DS}$	Drain-to-Source Voltage	30	V
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current	$T_C = 25^\circ C$	15
		$T_C = 100^\circ C$	9
$I_{DM}$	Pulsed Drain Current <sup>(1)</sup>	60	A
$E_{AS}$	Single Pulsed Avalanche Energy <sup>(2)</sup>	20	mJ
$P_D$	Power Dissipation	$T_C = 25^\circ C$	5
$R_{\theta JC}$	Thermal Resistance, Junction to Case	25.0	$^\circ C/W$
$T_J, T_{STG}$	Junction & Storage Temperature Range	-55 to 150	$^\circ C$

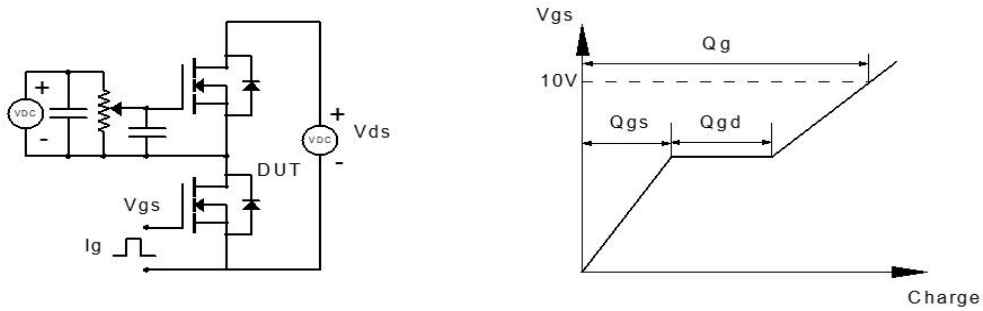


## Electrical Characteristics (T<sub>J</sub> = 25°C unless otherwise specified)

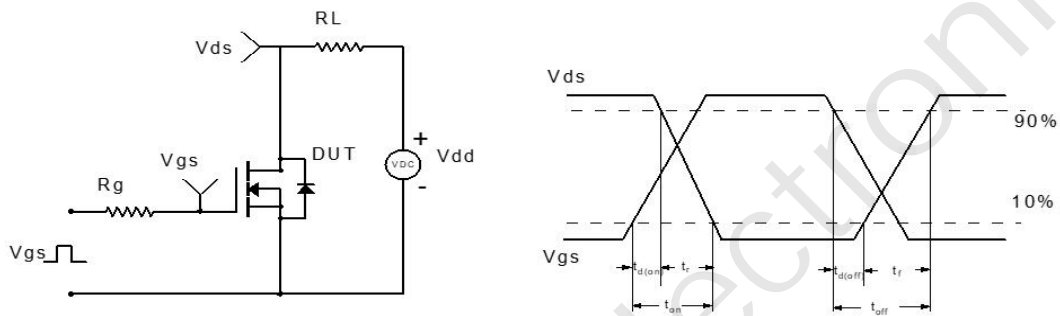
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V	30	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V	-	-	1.0	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V	-	-	±100	nA
<b>On Characteristics</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.0	1.6	2.2	V
R <sub>DS(ON)</sub>	Static Drain-Source ON-Resistance <sup>(3)</sup>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 8A	-	10	13	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 5A	-	16	21	mΩ
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 15V, f = 1MHz	-	805	-	pF
C <sub>oss</sub>	Output Capacitance		-	103	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	82	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> = 0 to 10V V <sub>DS</sub> = 15V, I <sub>D</sub> = 15A	-	16	-	nC
Q <sub>gs</sub>	Gate Source Charge		-	3.6	-	nC
Q <sub>gd</sub>	Gate Drain("Miller") Charge		-	3.4	-	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-On DelayTime	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 15V I <sub>D</sub> = 15A, R <sub>GEN</sub> = 3Ω	-	6	-	ns
t <sub>r</sub>	Turn-On Rise Time		-	16	-	ns
t <sub>d(off)</sub>	Turn-Off DelayTime		-	17	-	ns
t <sub>f</sub>	Turn-Off Fall Time		-	5	-	ns
<b>Drain-Source Diode Characteristics and Max Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	15	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	60	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> = 0V, I <sub>S</sub> = 10A	-	-	1.2	V
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> = 13A, di/dt = 100A/us	-	9.4	-	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge		-	3.3	-	nC

- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
  2. E<sub>AS</sub> condition: Starting T<sub>J</sub>=25C, V<sub>DD</sub>=15V, V<sub>G</sub>=10V, R<sub>G</sub>=25ohm, L=0.5mH, I<sub>AS</sub>=9A
  3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 0.5%.

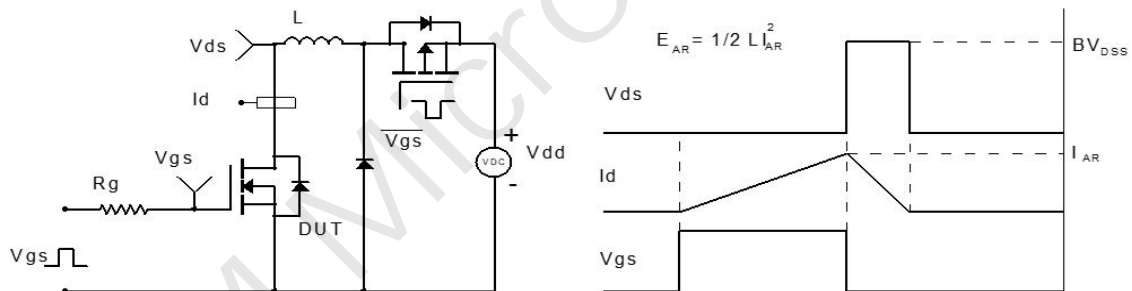
## Test Circuit



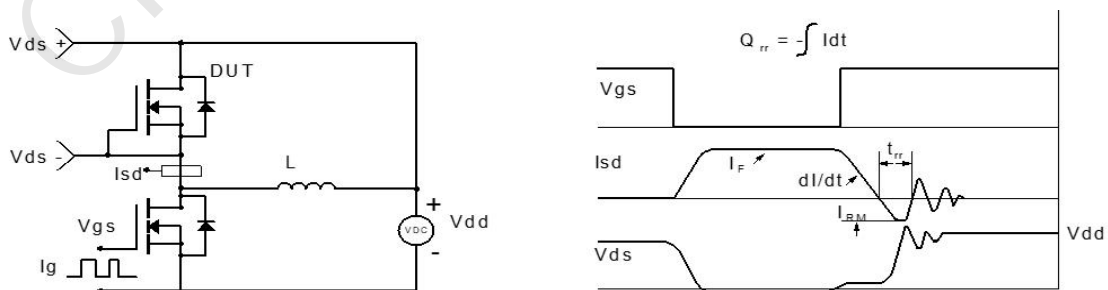
**Figure 1: Gate Charge Test Circuit & Waveform**



**Figure 2: Resistive Switching Test Circuit & Waveform**

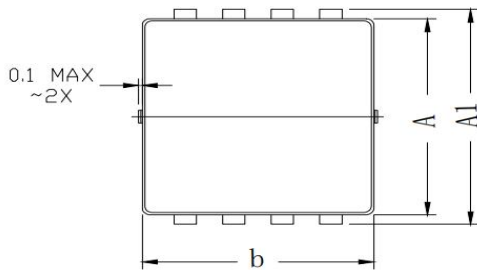
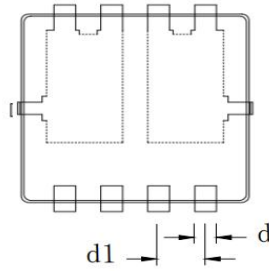
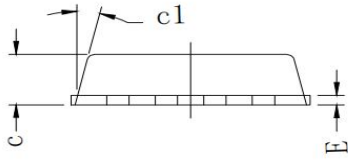


**Figure 3: Unclamped Inductive Switching Test Circuit & Waveform**



**Figure 4: Diode Recovery Test Circuit & Waveform**

## Package Mechanical Data(PDFN3.3x3.3-8L-D)



PKG	COMMON DIMENSION (MM)		
	PDFN 3×3		
Symbol	MIN	MON	MAX
A	3.070	3.100	3.130
A1	3.300	3.400	3.500
b	3.070	3.100	3.130
c	0.770	0.800	0.830
c1	13°		
d	0.300		
d1	0.650		
E	0.152		

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