

## Description

### N-channel Enhancement Mode Power MOSFET

#### Features

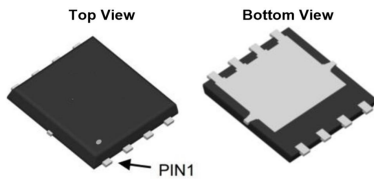
- 100V, 10A  
 $R_{DS(ON)} < 120m\Omega @ V_{GS} = 10V$   
 $R_{DS(ON)} < 130m\Omega @ V_{GS} = 4.5V$
- Advanced Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge

#### Applications

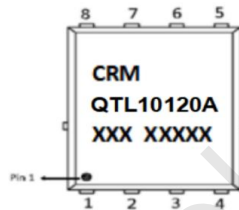
- Load Switch
- PWM Application
- Power Management



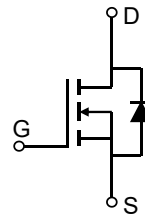
100% UIS TESTED!  
100%  $\Delta V_{ds}$  TESTED!



PDFN3.3X3.3-8L



Marking and Pin Assignment



Schematic Diagram

### Package Marking and Ordering Information

Device Marking	Device	Outline	Package	Reel Size	Reel(pcs)	Per Carton (pcs)
CRMQTL10120A	CRMQTL10120A	TAPING	PDFN3.3x3.3-8L	13"	5000	50000

### Absolute Maximum Ratings (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Value	Units
$V_{DS}$	Drain-to-Source Voltage	100	V
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current	$T_C = 25^\circ\text{C}$	A
		$T_C = 100^\circ\text{C}$	
$I_{DM}$	Pulsed Drain Current <sup>(1)</sup>	40	A
$E_{AS}$	Single Pulsed Avalanche Energy <sup>(2)</sup>	12	mJ
$P_D$	Power Dissipation	$T_C = 25^\circ\text{C}$	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	6.3	$^\circ\text{C/W}$
$T_J, T_{STG}$	Junction & Storage Temperature Range	-55 to 150	$^\circ\text{C}$

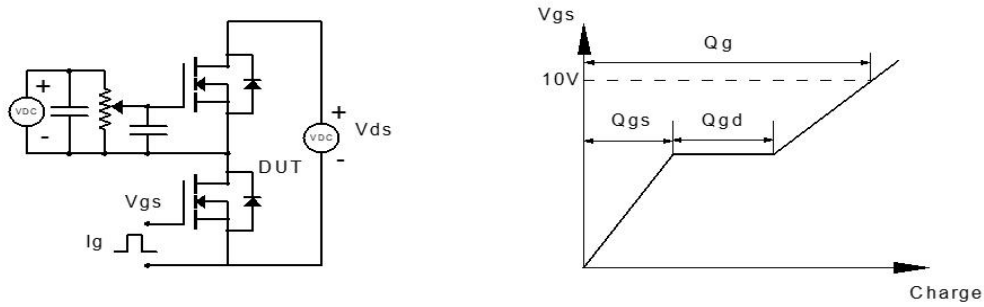


## Electrical Characteristics ( $T_J = 25^\circ\text{C}$ unless otherwise specified)

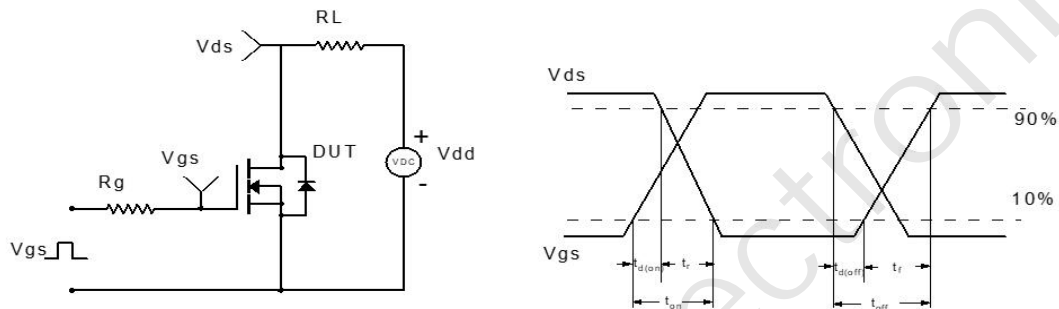
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V	100	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V	-	-	1.0	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V	-	-	±100	nA
On Characteristics						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.0	1.5	2.5	V
R <sub>DS(ON)</sub>	Static Drain-Source ON-Resistance <sup>(3)</sup>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 5A	-	92	120	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 3A	-	100	130	mΩ
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 25V, f = 1MHz	-	811	-	pF
C <sub>oss</sub>	Output Capacitance		-	50	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	35	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> = 0 to 10V V <sub>DS</sub> = 50V, I <sub>D</sub> = 2A	-	12	-	nC
Q <sub>gs</sub>	Gate Source Charge		-	2.2	-	nC
Q <sub>gd</sub>	Gate Drain("Miller") Charge		-	2.5	-	nC
Switching Characteristics						
t <sub>d(on)</sub>	Turn-On DelayTime	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 50V I <sub>D</sub> = 3A, R <sub>GEN</sub> = 1.8Ω	-	7	-	ns
t <sub>r</sub>	Turn-On Rise Time		-	5	-	ns
t <sub>d(off)</sub>	Turn-Off DelayTime		-	16	-	ns
t <sub>f</sub>	Turn-Off Fall Time		-	6	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	10	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	40	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> = 0V, I <sub>S</sub> = 10A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I <sub>F</sub> = 3A, di/dt = 100A/us	-	21	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	21	-	nC

- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
  2.  $E_{AS}$  condition: Starting  $T_J = 25^\circ\text{C}$ ,  $V_{DD} = 30\text{V}$ ,  $V_G = 10\text{V}$ ,  $R_G = 25\Omega$ ,  $L = 0.5\text{mH}$ ,  $I_{AS} = 7\text{A}$
  3. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 0.5\%$ .

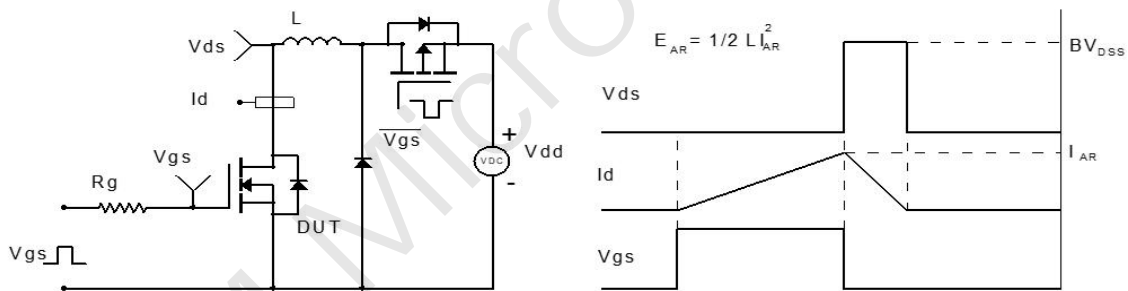
## Test Circuit



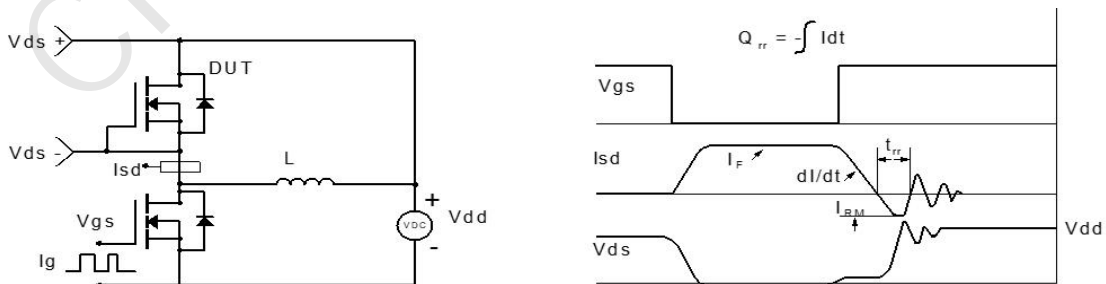
**Figure 1: Gate Charge Test Circuit & Waveform**



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

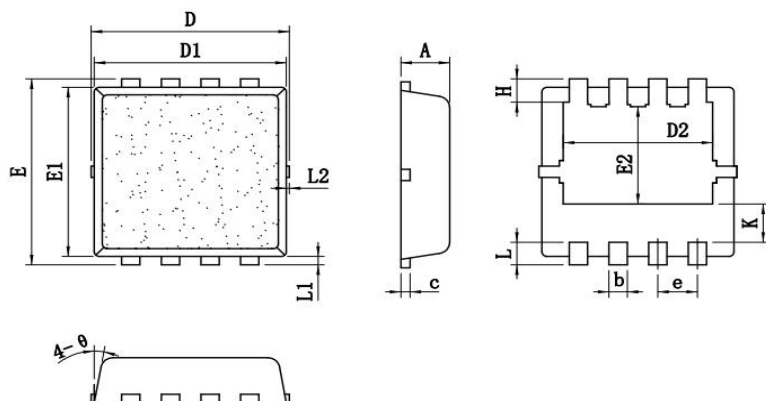


**Figure 3: Unclamped Inductive Switching Test Circuit & Waveform**



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

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



SYMBOL	mm		
	MIN	NOM	MAX
*A	0.70	0.80	0.90
*b	0.25	0.30	0.35
*c	0.10	0.15	0.20
D	3.25BSC		
*D1	3.05	3.15	3.25
D2	2.35	2.45	2.55
*e	0.55	0.65	0.75
E	3.30BSC		
*E1	2.90	3.00	3.10
E2	1.64	1.74	1.84
H	0.32	0.42	0.52
K	0.58	0.68	0.78
L	0.30	0.40	0.50
L1	0.10	0.15	0.20
L2	—	—	0.12
θ	8°	10°	12°

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