

### Description

### Features

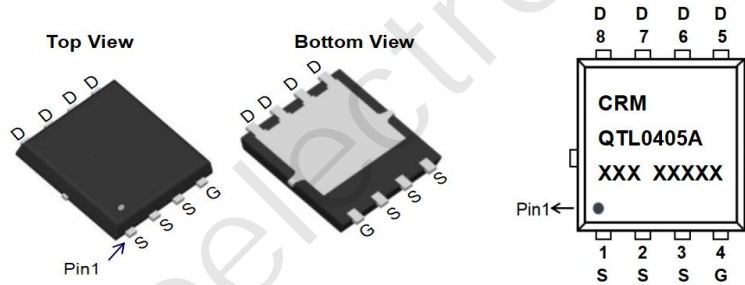
- 40V, 52A
- $R_{DS(ON)}$  Typ = 5.5mΩ @  $V_{GS} = 10V$
- $R_{DS(ON)}$  Typ = 8mΩ @  $V_{GS} = 4.5V$
- Advanced Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead Free
- 100% UIS TESTED!
- 100%  $\Delta V_d$ s TESTED!



Schematic Diagram

### Application

- Load Switch
- PWM Application
- Power Management



Marking and Pin Assignment

### Package Marking and Ordering Information

Device	Marking	Package	Outline	Reel Size	Reel (pcs)	Per Carton (pcs)
CRMQTL0405A	CRMQTL0405A	PDFN3.3x3.3-8L	TAPING	13"	5000	50000

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

Symbol	Parameter	Value	Units
$V_{DS}$	Drain-to-Source Voltage	40	V
$V_{GS}$	Gate-to-Source Voltage	±20	V
$I_D$	Continuous Drain Current	$T_C = 25^\circ\text{C}$	52
		$T_C = 100^\circ\text{C}$	31.2
$I_{DM}$	Pulsed Drain Current <sup>(1)</sup>	208	A
$E_{AS}$	Single Pulsed Avalanche Energy <sup>(2)</sup>	77	mJ
$P_D$	Power Dissipation	$T_C = 25^\circ\text{C}$	33
$R_{\theta JC}$	Thermal Resistance, Junction to Case	3.8	$^\circ\text{C/W}$
$T_J, T_{STG}$	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	40	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 40V, 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	1.1	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> = 15A	-	5.5	7.1	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 10A	-	8	10.4	mΩ
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 20V, f = 1MHz	-	2450	-	pF
C <sub>oss</sub>	Output Capacitance		-	182	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	144	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> = 0 to 10V V <sub>DS</sub> = 20V, I <sub>D</sub> = 20A	-	48	-	nC
Q <sub>gs</sub>	Gate Source Charge		-	10	-	nC
Q <sub>gd</sub>	Gate Drain("Miller") Charge		-	10	-	nC
Switching Characteristics						
t <sub>d(on)</sub>	Turn-On DelayTime	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 20V I <sub>D</sub> = 20A, R <sub>GEN</sub> = 3Ω	-	10	-	ns
t <sub>r</sub>	Turn-On Rise Time		-	28	-	ns
t <sub>d(off)</sub>	Turn-Off DelayTime		-	40	-	ns
t <sub>f</sub>	Turn-Off Fall Time		-	7	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current	V <sub>GS</sub> = 0V, I <sub>S</sub> = 15A	-	-	52	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	208	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage		-	-	1.2	V
trr	Body Diode Reverse Recovery Time		-	11	-	ns
Qrr	Body Diode Reverse Recovery Charge		I <sub>F</sub> = 20A, di/dt = 100A/us	-	5	-

- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
  2.  $E_{AS}$  condition: Starting  $T_J = 25^\circ\text{C}$ ,  $V_{DD} = 20\text{V}$ ,  $V_G = 10\text{V}$ ,  $R_G = 25\Omega$ ,  $L = 0.5\text{mH}$ ,  $I_{AS} = 17.5\text{A}$
  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

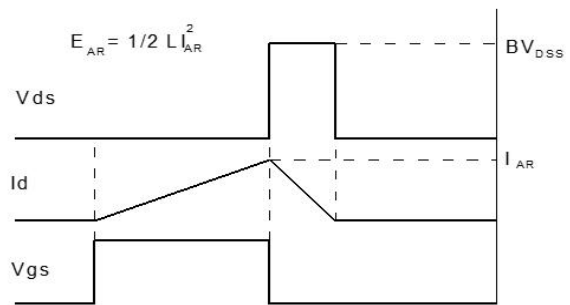
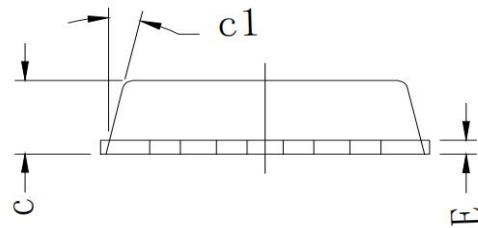
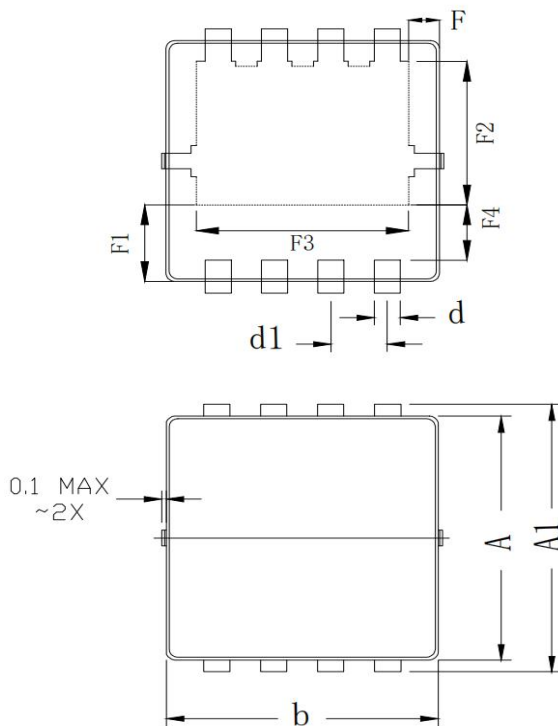


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform



Figure 4: Diode Recovery Test Circuit & Waveform

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




COMMON DIMENSION (MM)			
PKG	PDFN 3.3×3.3-8L		
SYMBOL	MIN	TYP	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	0.275	0.300	0.325
d1	0.625	0.650	0.675
E	0.144	0.152	0.160
F	0.300	0.325	0.350
F1	0.960	0.985	1.010
F2	1.775	1.800	1.825
F3	2.425	2.450	2.475
F4	0.660	0.685	0.710

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