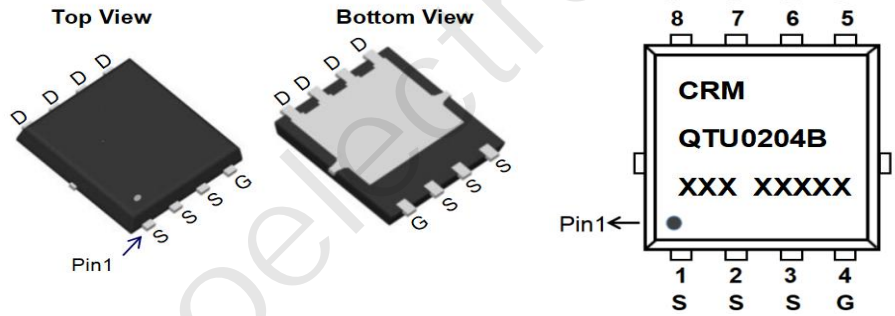CRM Microelectronics

Description

Features

- 20V, 70A

  $R_{DS(ON)}$ Typ = 3mΩ @ V_{GS} = 4.5V

  $R_{DS(ON)}$ Typ = 4mΩ @ V_{GS} = 2.5V

- Advanced Trench Technology

- Excellent $R_{DS(ON)}$ and Low Gate Charge

- 100% UIS TESTED!

- 100% ΔVds 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)
CRMQTU0204B	CRMQTU0204B	PDFN3.3x3.3-8L	TAPING	13"	5000	50000

Absolute Maximum Ratings (@ T_J = 25°C unless otherwise specified)

Symbol	Parameter		Value	Units
V_{DS}	Drain-to-Source Voltage		±20	V
V_{GS}	Gate-to-Source Voltage		±12	V
I_D	Continuous Drain Current	T_C = 25°C	70	A
		T_C = 100°C	42	A
I_{DM}	Pulsed Drain Current [1]		280	A
E_{AS}	Single Pulsed Avalanche Energy [2]		90	mJ
P_D	Power Dissipation	T_C = 25°C	27	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		4.6	°C/W
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150	°C

Electrical Characteristics (T$_J$ = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
V$_{(BR)DSS}$	Drain-Source Breakdown Voltage	I$_D$ = 250µA, V$_{GS}$ = 0V	20	-	-	V
I$_{DSS}$	Zero Gate Voltage Drain Current	V$_{DS}$ = 20V, V$_{GS}$ = 0V	-	-	1.0	µA
I$_{GSS}$	Gate-Body Leakage Current	V$_{DS}$ = 0V, V$_{GS}$ = ±12V	-	-	±100	nA
On Characteristics						
V$_{GS(th)}$	Gate Threshold Voltage	V$_{DS}$ = V$_{GS}$, I$_D$ = 250µA	0.4	0.7	1.2	V
R$_{DS(ON)}$	Static Drain-Source ON-Resistance[3]	V$_{GS}$ = 4.5V, I$_D$ = 20A	-	3	3.9	mΩ
		V$_{GS}$ = 2.5V, I$_D$ = 10A	-	4	5.2	mΩ
Dynamic Characteristics						
C$_{iss}$	Input Capacitance	V$_{GS}$ = 0V, V$_{DS}$ = 10V, f = 1MHz	-	3266	-	pF
C$_{oss}$	Output Capacitance		-	402	-	pF
C$_{rss}$	Reverse Transfer Capacitance		-	367	-	pF
Q$_g$	Total Gate Charge	V$_{GS}$ = 0 to 10V, V$_{DS}$ = 10V, I$_D$ = 30A	-	60	-	nC
Q$_{gs}$	Gate Source Charge		-	7	-	nC
Q$_{gd}$	Gate Drain("Miller") Charge		-	11	-	nC
Switching Characteristics						
t$_{d(on)}$	Turn-On DelayTime	V$_{GS}$ = 10V, V$_{DD}$ = 10V, I$_D$ = 30A, R$_{GEN}$ = 3Ω	-	7	-	ns
t$_r$	Turn-On Rise Time		-	17	-	ns
t$_{d(off)}$	Turn-Off DelayTime		-	67	-	ns
t$_f$	Turn-Off Fall Time		-	73	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I$_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	70	A
I$_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	280	A
V$_{SD}$	Drain to Source Diode Forward Voltage	V$_{GS}$ = 0V, I$_S$ = 20A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I$_F$ = 20A, di/dt = 100A/us	-	15	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	5.5	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. E$_{AS}$ condition: Starting T$_J$=25°C, V$_{DD}$=10V, V$_G$=10V, R$_G$=25ohm, L=0.5mH, I$_{AS}$=19A

3. Pulse Test: Pulse Width≤300µs, Duty Cycle≤0.5%.

Test Circuit

Figure 1: Gate Charge Test Circuit & Waveform

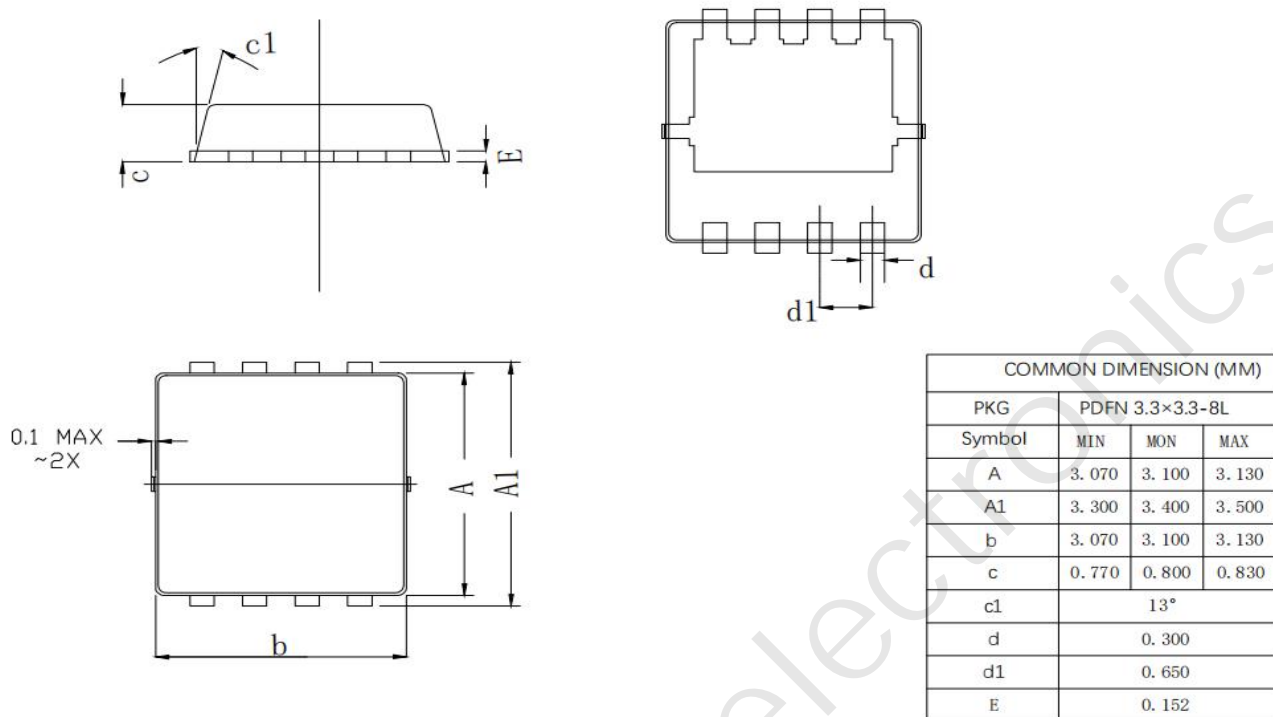**Figure 2: Resistive Switching Test Circuit & Waveform**

Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

Figure 4: Diode Recovery Test Circuit & Waveform

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

COMMON DIMENSION (MM)			
PKG	PDFN 3.3×3.3-8L		
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		

Important Notice

The information presented in datasheets is for reference only. CRM reserves the right to make changes at any time to any products or information herein, without notice.

Customers are responsible for the design and applications, including compliance with all laws, regulations and safety requirements or standards.

"Typical" parameters which provided in datasheets can vary in different applications and actual performance may vary over time. Customers are responsible for doing all necessary testing to minimize the risks associated with their applications and products.

Contact information

For more information, please visit: http://www.crm-semi.tech
For sales information, please send an email to: sales@crm-semi.com