CRMQBL0309A

P-Channel -30V, 5.7mΩ Typ. Power MOSFET

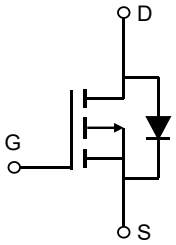
Description

Features

- -30V, -45A

  $R_{DS(ON)}$ Typ = 5.7mΩ @ V_{GS} = -10V

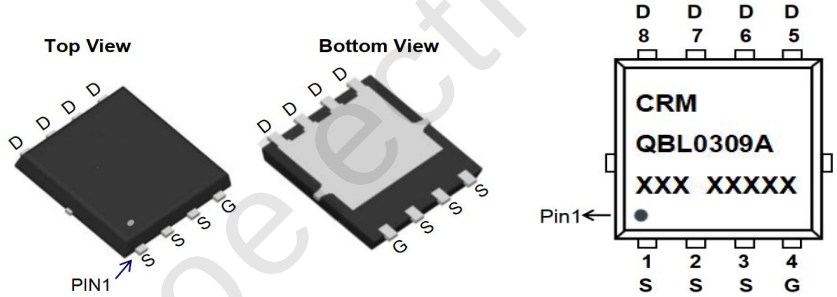
  $R_{DS(ON)}$ Typ = 9.7mΩ @ V_{GS} = -4.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free
- 100% UIS TESTED!
- 100% ΔVds TESTED!



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)
CRMQBL0309A	CRMQBL0309A	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		-30	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25°C	-45	A
		T_C = 100°C	-27	A
I_{DM}	Pulsed Drain Current (1)		-180	A
E_{AS}	Single Pulsed Avalanche Energy (2)		110	mJ
P_D	Power Dissipation	T_C = 25°C	26	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		4.8	°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	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -30V, V_{GS} = 0V	-	-	-1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	-1	-1.6	-2.2	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(3)	V_{GS} = -10V, I_D = -15A	-	5.7	7.4	mΩ
		V_{GS} = -4.5V, I_D = -10A	-	9.7	12.6	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = -15V, f = 1MHz	-	2127	-	pF
C_{oss}	Output Capacitance		-	396	-	pF
C_{rss}	Reverse Transfer Capacitance		-	329	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to -10V V_{DS} = -15V, I_D = -5A	-	58	-	nC
Q_{gs}	Gate Source Charge		-	10	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	11	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = -10V, V_{DD} = -15V I_D= -10A, R_{GEN} = 5Ω	-	10	-	ns
t_r	Turn-On Rise Time		-	60	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	65	-	ns
t_f	Turn-Off Fall Time		-	50	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-45	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-180	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = -10A	-	-	-1.2	V
trr	Body Diode Reverse Recovery Time	I_F = -10A, di/dt = 100A/us	-	17	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	8	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. E_{AS} condition: Starting T_J=25°C, V_{DD}=-15V, V_G=-10V, R_G=25ohm, L=0.5mH, I_{AS}=-21A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Test Circuit

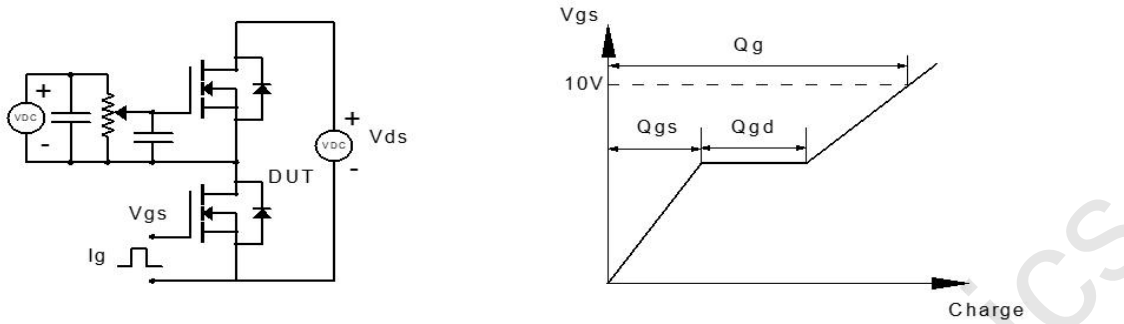


Figure 1: Gate Charge Test Circuit & Waveform

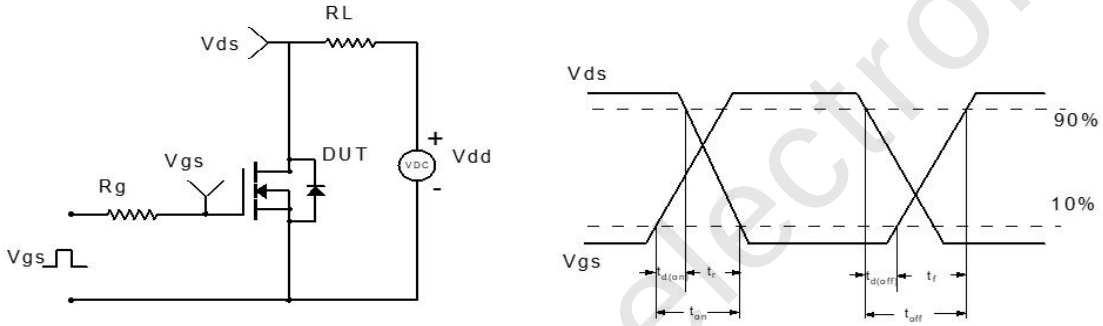


Figure 2: Resistive Switching Test Circuit & Waveform

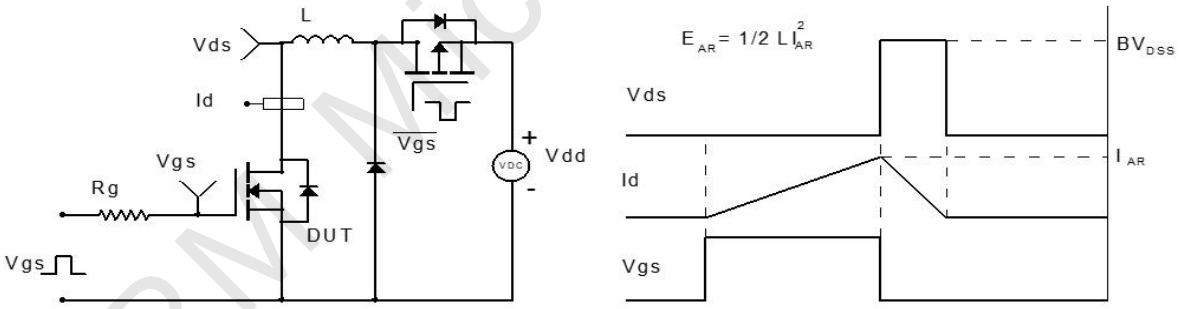


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

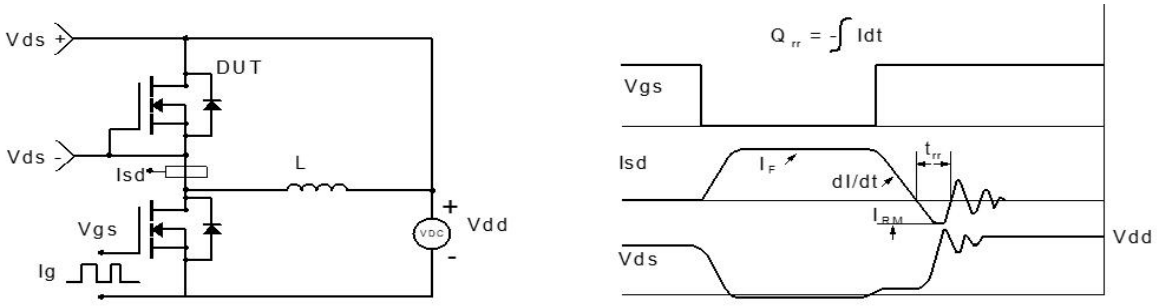
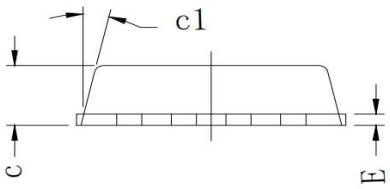
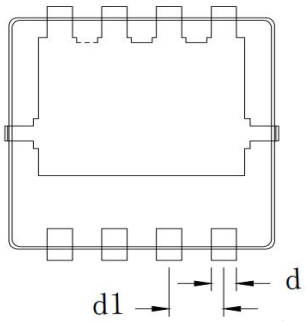
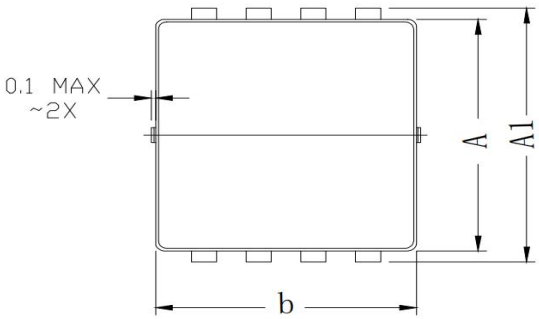


Figure 4: Diode Recovery Test Circuit & Waveform

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







COMMON DIMENSION (MM)			
PKG	PDFN 3×3		
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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