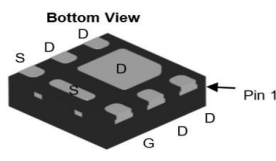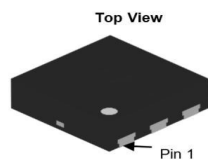# CRMVTU0209A

Description

N-channel Enhancement Mode Power MOSFET
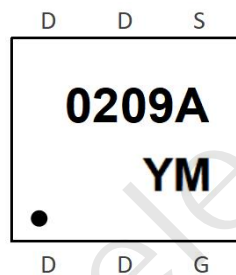
Features

- 20V, 20A
  $R_{DS(ON)}$ Typ= 8.2mΩ @ V_{GS} = 4.5V
  $R_{DS(ON)}$ Typ= 11.1mΩ @ V_{GS} = 2.5V
- Advanced Trench Technology
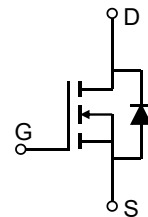- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free

Applications

- Load Switch
- PWM Application
- Power Management

RoHS

DFN2020-6L

0209A
YM

Marking and Pin Assignment

Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	Outline	Package	Reel Size	Reel(pcs)	Per Carton (pcs)
0209A	CRMVTU0209A	TAPING	DFN2020-6L	7"	3000	120000

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	20	A
		T_C = 100°C	12	
I_{DM}	Pulsed Drain Current [1]		80	A
P_D	Power Dissipation	T_C = 25°C	6.9	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		18	°C/W
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150	°C

CRMVTU0209A

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	1.0	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance[2]	V_{GS} = 4.5V, I_D = 8A	-	8.2	10.7	mΩ
		V_{GS} = 2.5V, I_D = 5A	-	11.1	14.4	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 10V, f = 1MHz	-	1055	-	pF
C_{oss}	Output Capacitance		-	160	-	pF
C_{rss}	Reverse Transfer Capacitance		-	140	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 4.5V, V_{DS} = 10V, I_D = 15A	-	13	-	nC
Q_{gs}	Gate Source Charge		-	2.5	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	3.5	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 4.5V, V_{DD} = 10V, I_D = 15A, R_{GEN} = 3Ω	-	8	-	ns
t_r	Turn-On Rise Time		-	19	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	30	-	ns
t_f	Turn-Off Fall Time		-	11	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	20	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	80	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 = 15A, di/dt = 100A/us	-	7.5	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	1.5	-	nC

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

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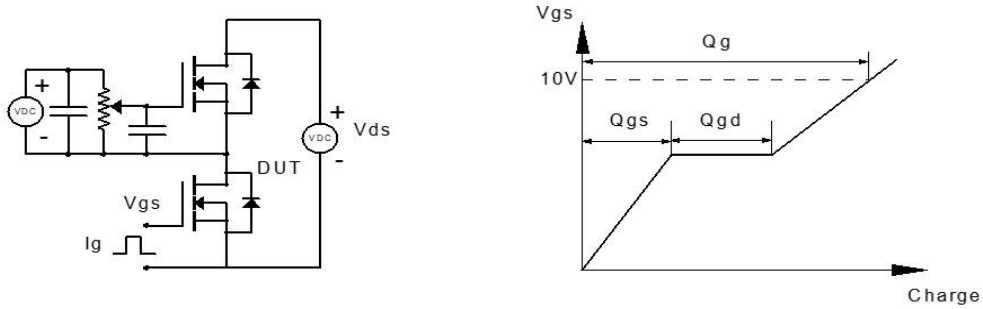
Test Circuit

Figure 1: Gate Charge Test Circuit & Waveform
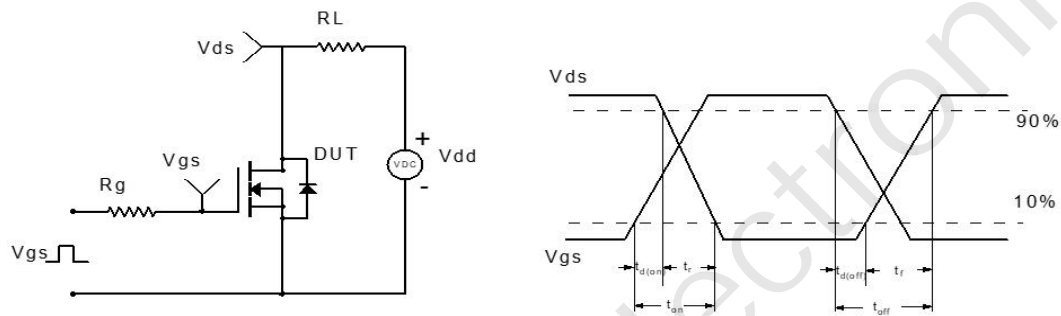

Figure 2: Resistive Switching Test Circuit & Waveform
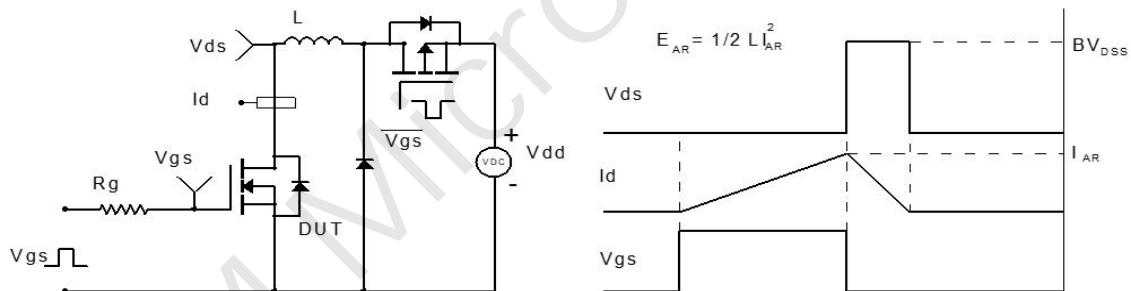

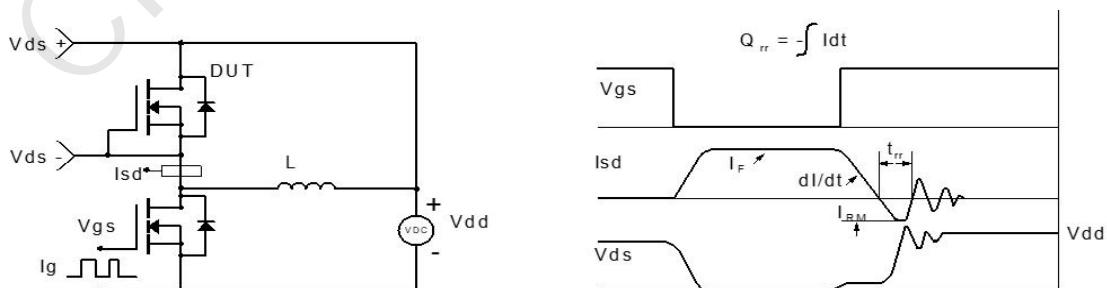**Figure 3: Unclamped Inductive Switching Test Circuit& Waveform**

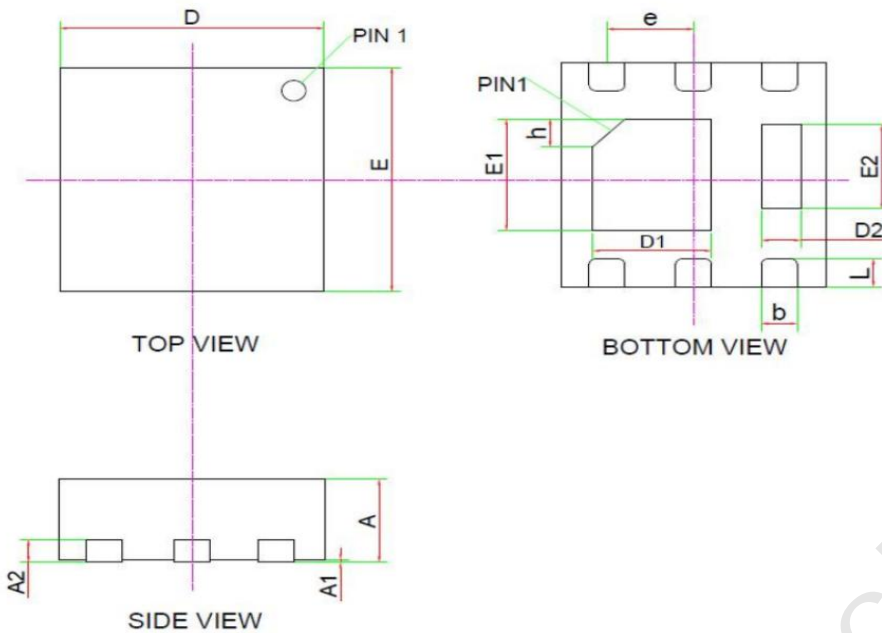**Figure 4: Diode Recovery Test Circuit & Waveform**

Package Mechanical Data(DFN2020-6L)

TOP VIEW

BOTTOM VIEW

SIDE VIEW

SYMBOL	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	NA	0.02	0.05
A2	0.18	0.20	0.25
b	0.20	0.27	0.34
D	1.95	2.00	2.05
E	1.95	2.00	2.05
D1	0.80	0.90	1.00
E1	0.90	1.00	1.10
D2	0.20	0.30	0.40
E2	0.65	0.75	0.85
L	0.20	0.25	0.35
h	0.20	0.25	0.30
e	0.65 BSC		

Information furnished in this document is believed to be accurate and reliable. However, CRM Microelectronics Co. , Ltd assumes no responsibility for the consequences of use without consideration for such information nor use beyond it.

Information mentioned in this document is subject to change without notice, apart from that when an agreement is signed, CRM complies with the agreement.

Products and information provided in this document have no infringement of patents. CRM assumes no responsibility for any infringement of other rights of third parties which may result from the use of such products and information.