

Description

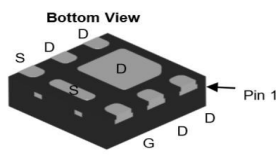
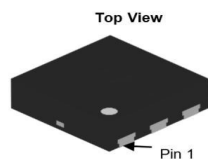
N-channel Enhancement Mode Power MOSFET

Features

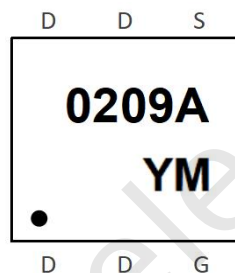
- 20V, 20A
 $R_{DS(ON)}$ Typ= 8.2m Ω @ V_{GS} = 4.5V
 $R_{DS(ON)}$ Typ= 11.1m Ω @ V_{GS} = 2.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free

Applications

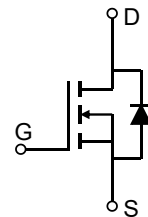
- Load Switch
- PWM Application
- Power Management



DFN2020-6L



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	$T_C = 25^\circ\text{C}$	A
		$T_C = 100^\circ\text{C}$	
I_{DM}	Pulsed Drain Current ⁽¹⁾	80	A
P_D	Power Dissipation	$T_C = 25^\circ\text{C}$	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	18	$^\circ\text{C/W}$
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 _{(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 $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$.

Test Circuit

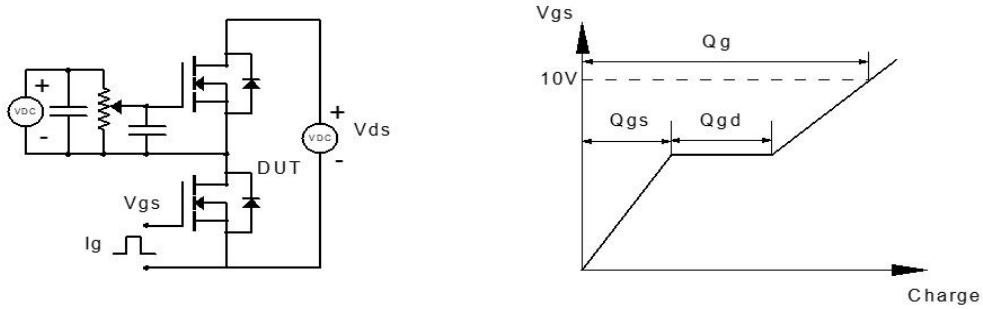


Figure 1: Gate Charge Test Circuit & Waveform

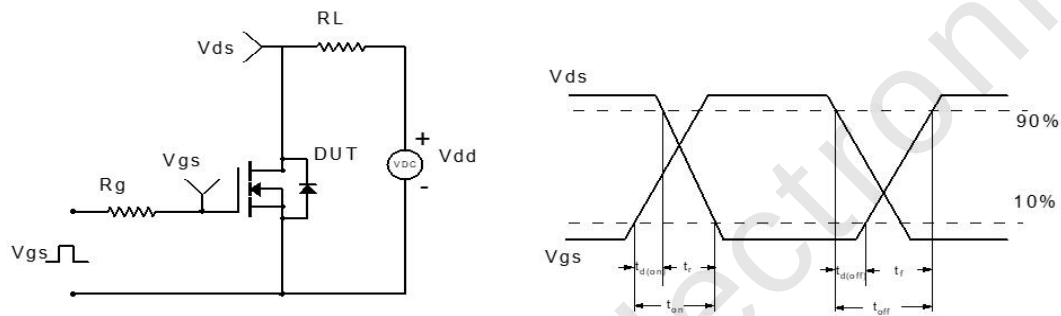


Figure 2: Resistive Switching Test Circuit & Waveform

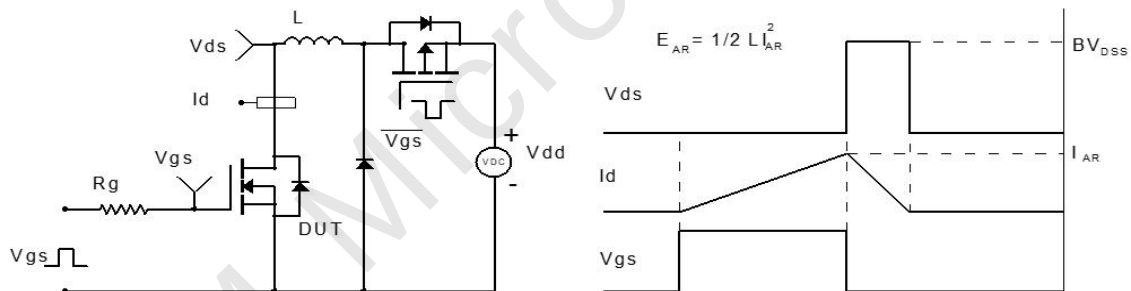


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

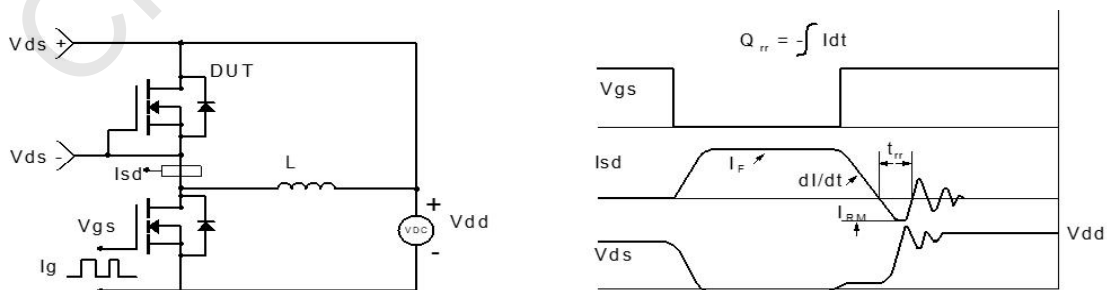
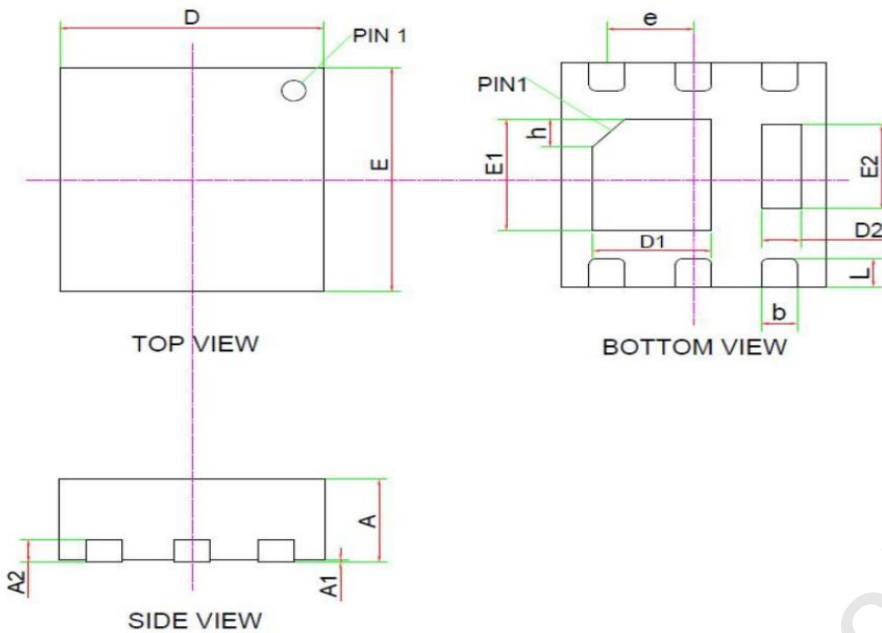


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(DFN2020-6L)



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		

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