祥瑞微 CRM Microelectronics

CRMDTU3136K

N-Channel 20V, 246mΩ Typ. Power MOSFET

Description

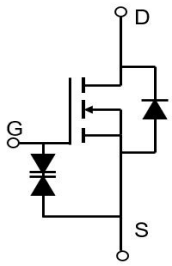
Features

- 20V, 0.5A

  $R_{DS(ON)}$ Typ = 246mΩ @ V_{GS} = 4.5V

  $R_{DS(ON)}$ Typ = 368mΩ @ V_{GS} = 2.5V

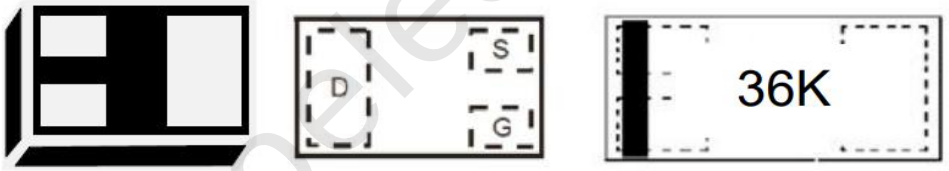
  $R_{DS(ON)}$ Typ = 619mΩ @ V_{GS} = 1.8V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free
- ESD Protected: 2KV



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)
CRMDTU3136K	36K	DFN1006-3L	TAPING	7"	10000	400000

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		±10	V
I_D	Continuous Drain Current	T_A = 25°C	0.5	A
		T_A= 100°C	0.3	A
I_{DM}	Pulsed Drain Current [1]		2	A
P_D	Power Dissipation	T_A = 25°C	0.125	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient[2]		1000	°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} = ±10V	-	-	±10	μA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	0.4	0.65	0.9	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(3)	V_{GS} = 4.5V, I_D = 0.5A	-	246	295	mΩ
		V_{GS} = 2.5V, I_D = 0.3A	-	368	441	mΩ
		V_{GS} = 1.8V, I_D = 0.1A	-	619	743	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 10V, f = 1MHz	-	23	-	pF
C_{oss}	Output Capacitance		-	6	-	pF
C_{rss}	Reverse Transfer Capacitance		-	4	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 4.5V, V_{DS} = 10V, I_D = 0.5A	-	0.4	-	nC
Q_{gs}	Gate Source Charge		-	0.04	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	0.1	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 4.5V, V_{DD} = 10V, I_D= 0.5A, R_{GEN} = 6Ω	-	0.8	-	ns
t_r	Turn-On Rise Time		-	1.5	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	2.2	-	ns
t_f	Turn-Off Fall Time		-	1.7	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	0.5	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	2	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = 0.5A	-	-	1.2	V

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. $R_{\theta JA}$ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Test Circuit

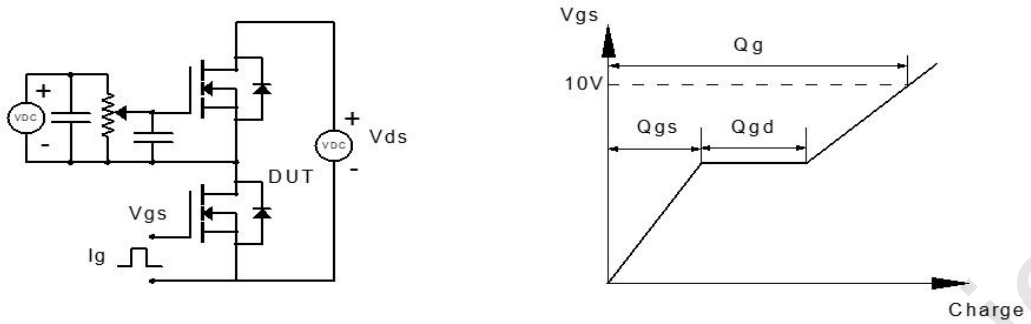


Figure 1: Gate Charge Test Circuit & Waveform

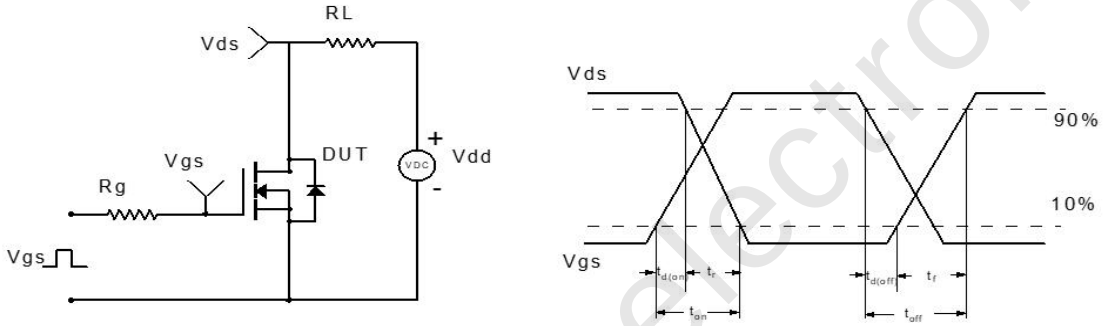


Figure 2: Resistive Switching Test Circuit & Waveform

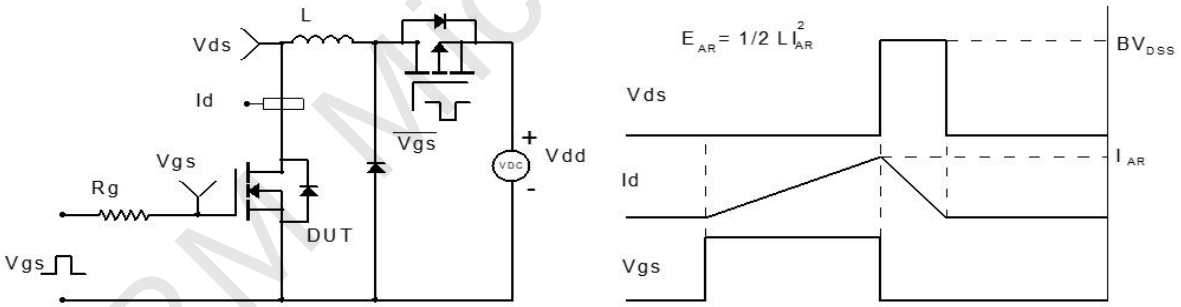


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

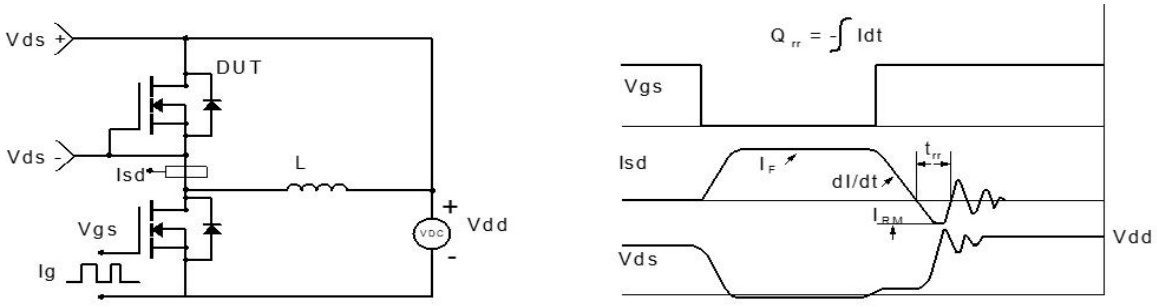
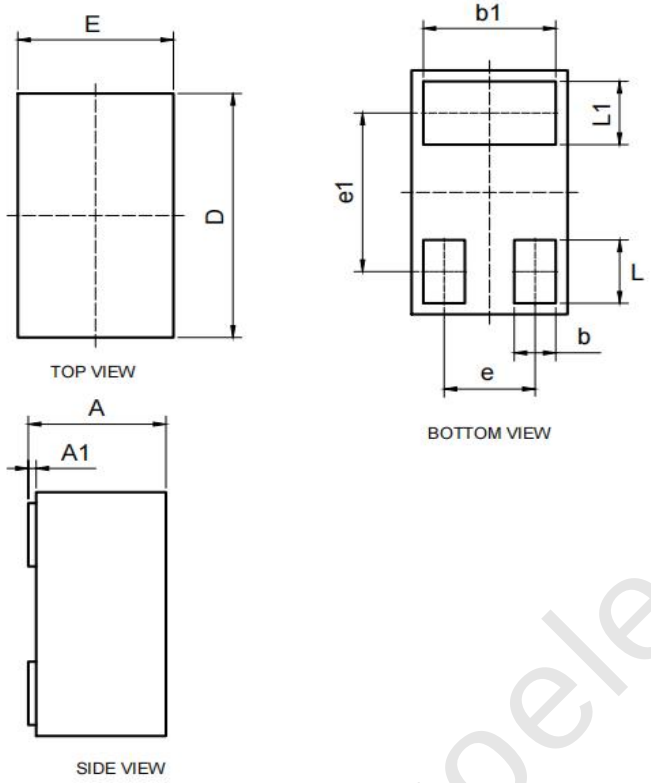


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(DFN1006-3L)



SYMBOL	MIN	NOM	MAX
A	0.45	0.50	0.55
A1	0.00	NA	0.03
L	0.22	0.26	0.30
b	0.12	0.16	0.20
D	0.95	1.00	1.05
E	0.55	0.60	0.65
L1	0.22	0.26	0.30
b1	0.47	0.51	0.55
e	0.35 BSC		
e1	0.65 BSC		

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