CRMKTU0208A

N-Channel 20V, 6mΩ Typ. Power MOSFET

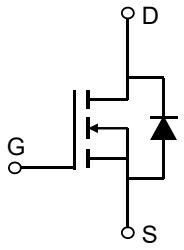
Description

Features

- 20V, 50A

  $R_{DS(ON)}$ Typ = 6mΩ @ V_{GS} = 4.5V

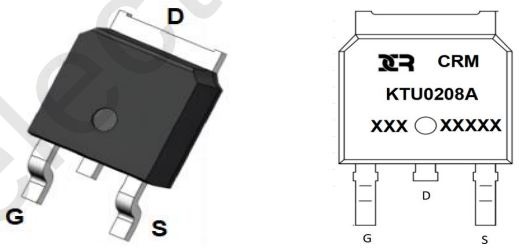
  $R_{DS(ON)}$ Typ = 7.6mΩ @ V_{GS} = 2.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- 100% UIS TESTED!
- 100% ΔVds TESTED!



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)
CRMKTU0208A	CRMKTU0208A	TO-252-3L	TAPING	13"	2500	25000

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	50	A
		T_C = 100°C	30	A
I_{DM}	Pulsed Drain Current (1)		200	A
E_{AS}	Single Pulsed Avalanche Energy (2)		42.5	mJ
P_D	Power Dissipation	T_C = 25°C	33.2	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		3.7	°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	-	6.0	7.8	mΩ
		V_{GS} = 2.5V, I_D = 10A	-	7.6	9.9	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 10V, f = 1MHz	-	1480	-	pF
C_{oss}	Output Capacitance		-	170	-	pF
C_{rss}	Reverse Transfer Capacitance		-	146	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 4.5V, V_{DS} = 10V, I_D = 4A	-	16	-	nC
Q_{gs}	Gate Source Charge		-	3	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	5.5	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 4.5V, V_{DD} = 10V, I_D= 4A, R_{GEN} = 3Ω	-	10	-	ns
t_r	Turn-On Rise Time		-	30	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	40	-	ns
t_f	Turn-Off Fall Time		-	16	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	50	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	200	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 = 5A, di/dt = 100A/us	-	7.5	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	1.6	-	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}=13A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Test Circuit

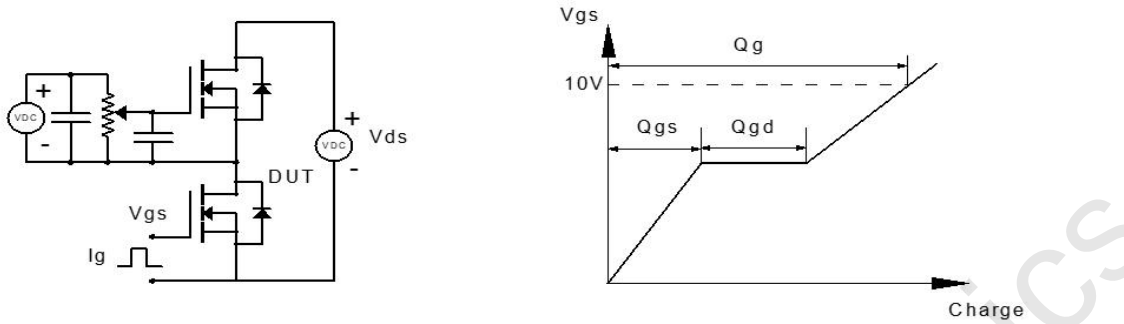


Figure 1: Gate Charge Test Circuit & Waveform

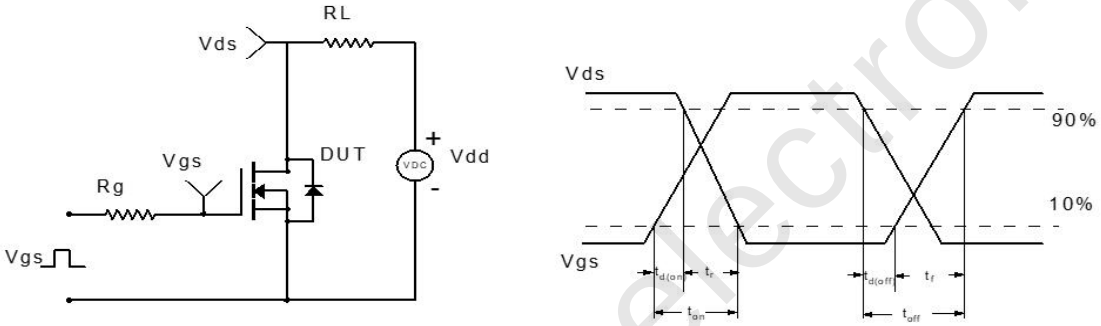


Figure 2: Resistive Switching Test Circuit & Waveform

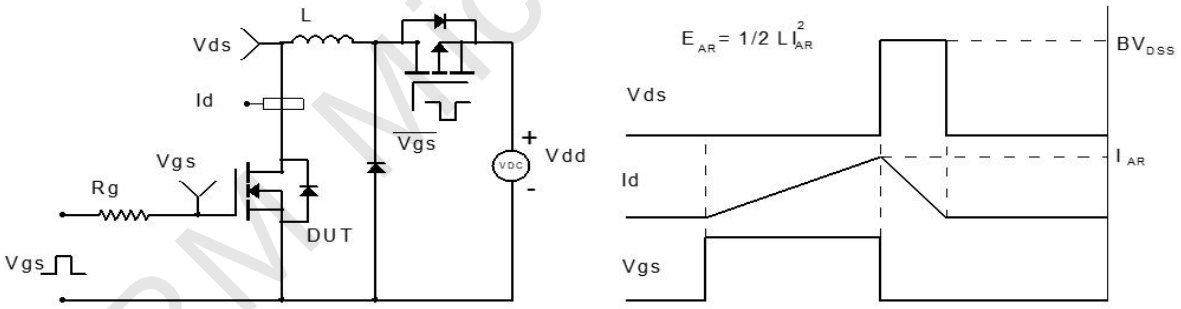


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

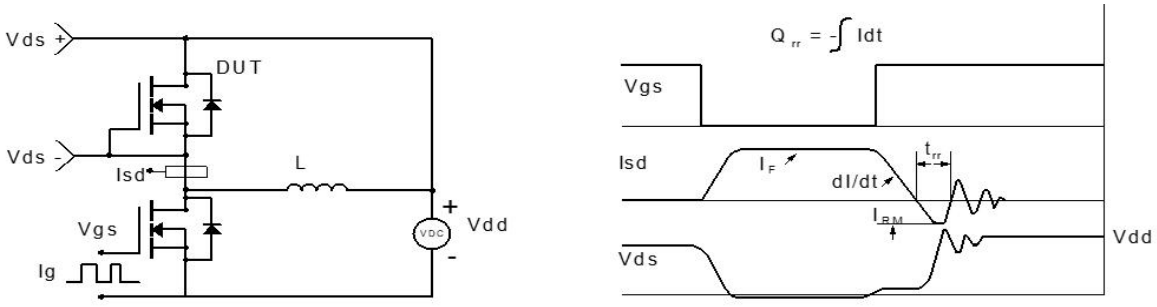
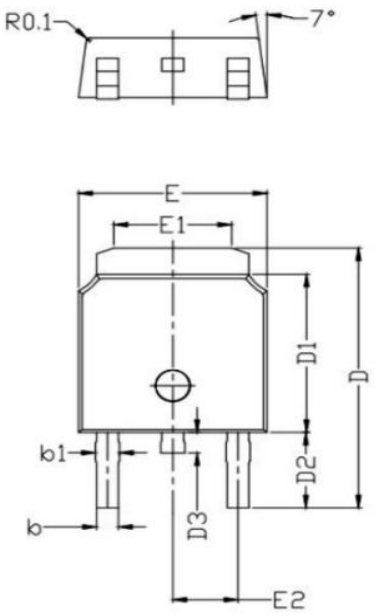
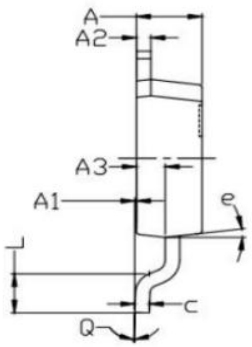


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(TO-252-3L)





COMMON DIMENSION(MM)			
PKG	TO-252-3L		
Symbot	MIN	MON	MAX
A	2.250	2.300	2.400
A1	0.010	0.060	0.150
A2	0.500	0.508	0.550
A3	0.960	1.010	1.060
b	0.740	0.760	0.800
b1	0.880	0.900	0.950
c	0.500	0.508	0.550
D	9.800	10.025	10.350
D1	6.050	6.100	6.180
D2	2.850	2.900	2.950
D3	0.700	0.800	2.900
E	6.550	6.600	6.700
E1	4.050	4.130	4.200
E2	2.250	2.286	2.300
L	1.400	1.500	1.600
e	7.000		
Q	0°	2°	5°

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Contact information

For more information, please visit: http://www.crm-semi.tech
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