# CRMCTL1032A

## **Description**

### **N-channel Enhancement Mode Power MOSFET**

#### **Features**

• 100V, 30A

 $R_{DS(ON)} < 32m\Omega @ V_{GS} = 10V$  $R_{DS(ON)} < 34m\Omega @ V_{GS} = 4.5V$ 

- Advanced Trench Technology
- Excellent R<sub>DS(ON)</sub> and Low Gate Charge

#### **Applications**

- Load Switch
- PWM Application
- Power Management

100% UIS TESTED! 100% ΔVds TESTED!

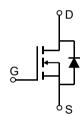








Marking and Pin Assignment



**Schematic Diagram** 

#### Package Marking and Ordering Information

Device Marking	Device	Outline	Package	TUBE (pcs)	Inner Box (pcs)	Per Carton (pcs)
CRMCTL1032A	CRMCTL1032A	TUBE	TO-220C-3L	50	1000	5000

#### Absolute Maximum Ratings (@ T<sub>C</sub> = 25°C unless otherwise specified)

Symbol	Parameter		Value	Units	
V <sub>DS</sub>	Drain-to-Source Voltage	Drain-to-Source Voltage		V	
$V_{GS}$	Gate-to-Source Voltage		±20	V	
1	Continuous Drain Current	T <sub>C</sub> = 25°C	30	^	
I <sub>D</sub>	Continuous Diain Current	T <sub>C</sub> = 100°C	18	A	
I <sub>DM</sub>	Pulsed Drain Current (1)		120	Α	
E <sub>AS</sub>	Single Pulsed Avalanche Ene	rgy <sup>(2)</sup>	64	mJ	
$P_{D}$	Power Dissipation	T <sub>C</sub> = 25°C	83	W	
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.5	°C/W	
$T_J$ , $T_{STG}$	Junction & Storage Temperature	Range	-55 to 150	°C	

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#### **Electrical Characteristics** (T<sub>J</sub> = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
Off Cha	aracteristics					
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	$I_D = 250 \mu A, V_{GS} = 0 V$	100	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V	-	-	1.0	μΑ
$I_{GSS}$	Gate-Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	±100	nA
On Cha	aracteristics					
V <sub>GS(th)</sub>	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	1	1.7	2.5	V
	O. (1) D. (2) O. (3)	V <sub>GS</sub> = 10V, I <sub>D</sub> = 15A	-	24	32	mΩ
$R_{DS(ON)}$	Static Drain-Source ON-Resistance <sup>(3)</sup>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 10A	-	26	34	mΩ
Dynami	ic Characteristics					
C <sub>iss</sub>	Input Capacitance		-	3033	-	pF
C <sub>oss</sub>	Output Capacitance	$V_{GS} = 0V$ , $V_{DS} = 25V$ , $f = 1MHz$		130	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	I – IIVIMZ	X - \	113	-	pF
Q <sub>g</sub>	Total Gate Charge			66	-	nC
$Q_{gs}$	Gate Source Charge	$V_{GS} = 0 \text{ to } 10V$ $V_{DS} = 30V, I_D = 15A$	<u></u>	10	-	nC
$Q_{gd}$	Gate Drain("Miller") Charge	V <sub>DS</sub> = 30V, I <sub>D</sub> = 13A	-	14	-	nC
Switchi	ing Characteristics					
t <sub>d(on)</sub>	Turn-On DelayTime		-	11	-	ns
t <sub>r</sub>	Turn-On Rise Time	$V_{GS} = 10V, V_{DD} = 30V$	-	45	-	ns
$t_{d(off)}$	Turn-Off DelayTime	$I_{D}$ = 15A, $R_{GEN}$ = 1.8 $\Omega$	-	67	-	ns
t <sub>f</sub>	Turn-Off Fall Time	<i>)</i> `	-	48	-	ns
Drain-S	Source Diode Characteristics and M	ax Ratings				
I <sub>S</sub>	Maximum Continuous Drain to Source Diode	Forward Current	-	-	30	А
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode For	ward Current	-	-	120	Α
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_{S} = 30A$	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	L = 20A di/dt = 100A/v.c		28		ns
Qrr	Body Diode Reverse Recovery Charge	$I_F = 30A$ , di/dt = 100A/us	-	40	-	nC

Notes:

<sup>1.</sup> Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

<sup>2.</sup>  $E_{AS}$  condition: Starting  $T_J$ =25C,  $V_{DD}$ =30V,  $V_G$ =10V,  $R_G$ =25ohm, L=0.5mH,  $I_{AS}$ =16A

<sup>3.</sup> Pulse Test: Pulse Width  $\leq$  300  $\mu$ s, Duty Cycle  $\leq$  0.5%.



## **Test Circuit**

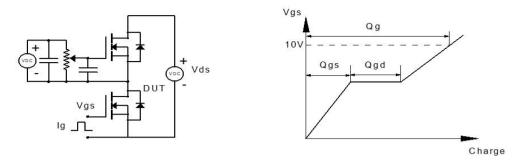


Figure 1: Gate Charge Test Circuit & Waveform

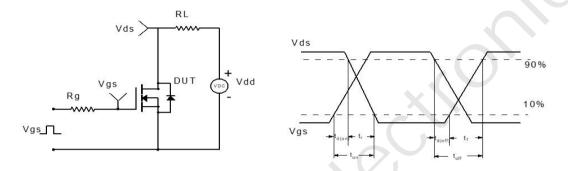


Figure 2: Resistive Switching Test Circuit & Waveform

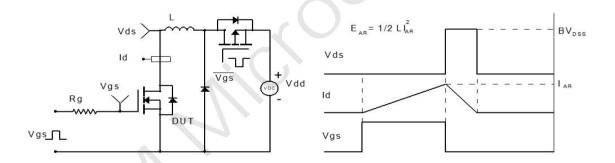


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

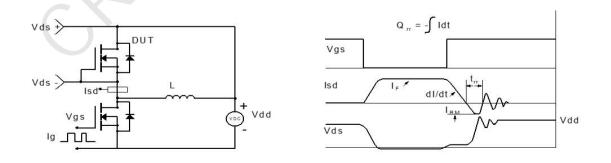
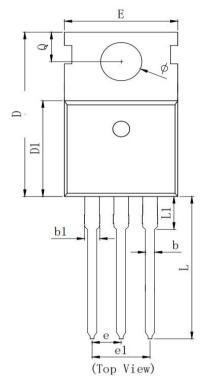


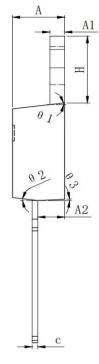
Figure 4: Diode Recovery Test Circuit & Waveform

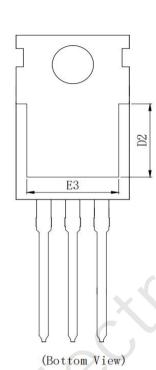


# CRMCTL1032A

# Package Mechanical Data(TO-220C-3L)







SYMBOL	MILLIMETER				
SIMBUL	MIN	Typ.	MAX		
A	4. 370	4.570	4. 700		
A1	1. 250	1.300	1.400		
A2	2. 150	2.350	2.550		
b	0. 700	0.800	0.950		
b1	1. 170	1.270	1.470		
С	0.450	0.500	0.600		
D	15.100	15.600	16. 100		
D1	8. 800	9.100	9.400		
D2	5. 500	6. 300 REF			
Е	9. 700	10.000	10. 300		
E3	7. 000	7. 600 REF			
е	2. 540 BSC				
el	5. 080 BSC				
L	13. 200	13. 500	13.800		
L1		3.100	3.400		
Н	6. 250	6. 500	6. 750		
ф	3. 400	3.600	3. 800		
Q	2. 600	2.800	3. 000		
θ 1	7° TYP				
θ2	7° TYP				
03	3° TYP				

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