

## Description

### N-channel Enhancement Mode Power MOSFET

#### Features

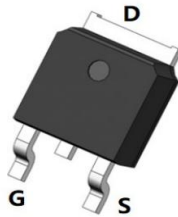
- 60V, 58A  
 $R_{DS(ON)}$  Typ= 7m $\Omega$  @  $V_{GS}$  = 10V  
 $R_{DS(ON)}$  Typ= 8.5m $\Omega$  @  $V_{GS}$  = 4.5V
- Advanced Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge

#### Applications

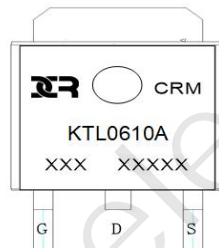
- Load Switch
- PWM Application
- Power Management



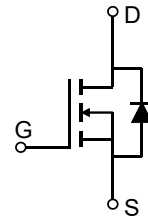
*100% UIS TESTED!*  
*100%  $\Delta V_{ds}$  TESTED!*



TO-252-3L



Marking and Pin Assignment



Schematic Diagram

### Package Marking and Ordering Information

Device Marking	Device	Outline	Package	Reel Size	Reel(pcs)	Per Carton (pcs)
CRMKTL0610A	CRMKTL0610A	TAPING	TO-252-3L	13"	2500	25000

### Absolute Maximum Ratings (@ $T_J$ = 25°C unless otherwise specified)

Symbol	Parameter	Value	Units
$V_{DS}$	Drain-to-Source Voltage	60	V
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current	$T_C = 25^\circ\text{C}$	A
		$T_C = 100^\circ\text{C}$	
$I_{DM}$	Pulsed Drain Current <sup>(1)</sup>	232	A
$E_{AS}$	Single Pulsed Avalanche Energy <sup>(2)</sup>	121	mJ
$P_D$	Power Dissipation	$T_C = 25^\circ\text{C}$	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.14	$^\circ\text{C/W}$
$T_J, T_{STG}$	Junction & Storage Temperature Range	-55 to 150	$^\circ\text{C}$



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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V	60	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V	-	-	1.0	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V	-	-	±100	nA
On Characteristics						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.2	1.6	2.2	V
R <sub>DS(ON)</sub>	Static Drain-Source ON-Resistance <sup>(3)</sup>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A	-	7.0	9.1	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 10A	-	8.5	11.1	mΩ
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 25V, f = 1MHz	-	2876	-	pF
C <sub>oss</sub>	Output Capacitance		-	201	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	180	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> = 0 to 10V V <sub>DS</sub> = 30V, I <sub>D</sub> = 30A	-	77	-	nC
Q <sub>gs</sub>	Gate Source Charge		-	14	-	nC
Q <sub>gd</sub>	Gate Drain("Miller") Charge		-	15	-	nC
Switching Characteristics						
t <sub>d(on)</sub>	Turn-On DelayTime	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 30V I <sub>D</sub> = 30A, R <sub>GEN</sub> = 1.8Ω	-	13	-	ns
t <sub>r</sub>	Turn-On Rise Time		-	77	-	ns
t <sub>d(off)</sub>	Turn-Off DelayTime		-	50	-	ns
t <sub>f</sub>	Turn-Off Fall Time		-	106	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	58	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	232	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> = 0V, I <sub>S</sub> = 30A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I <sub>F</sub> = 30A, di/dt = 100A/us	-	25	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	30	-	nC

- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
  2. E<sub>AS</sub> condition: Starting T<sub>J</sub>=25C, V<sub>DD</sub>=30V, V<sub>G</sub>=10V, R<sub>G</sub>=25ohm, L=0.5mH, I<sub>AS</sub>=22A
  3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

## Test Circuit

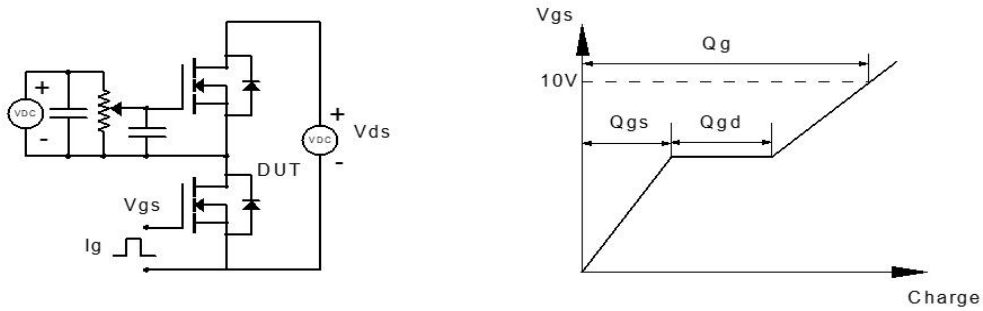


Figure 1: Gate Charge Test Circuit & Waveform

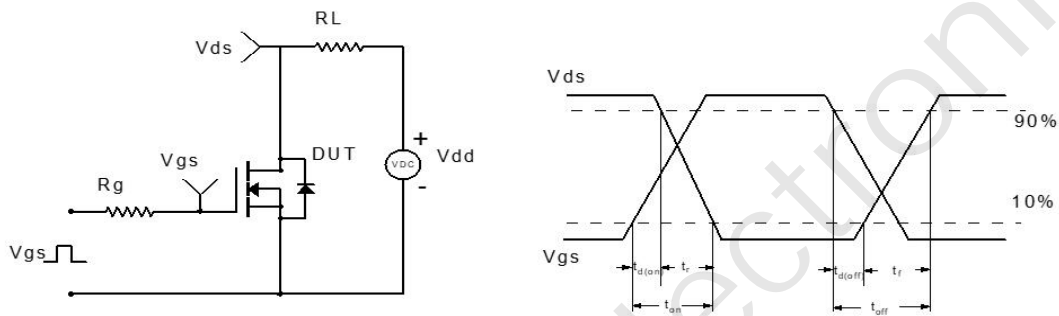


Figure 2: Resistive Switching Test Circuit & Waveform

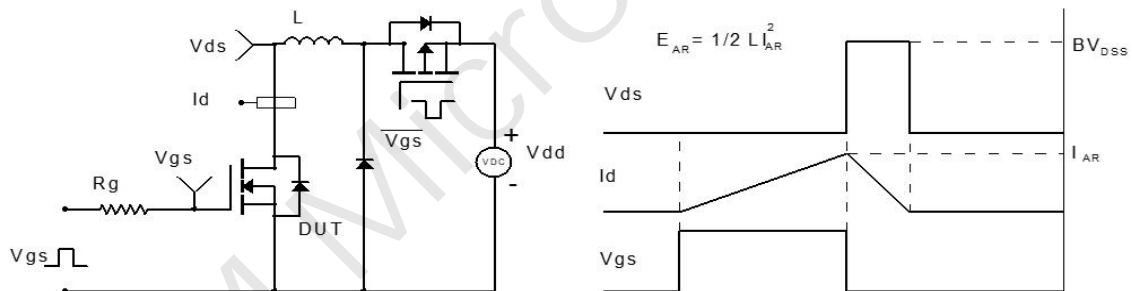


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

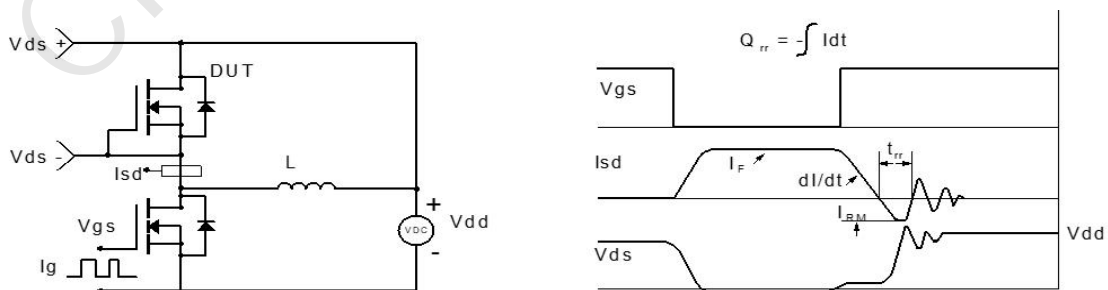
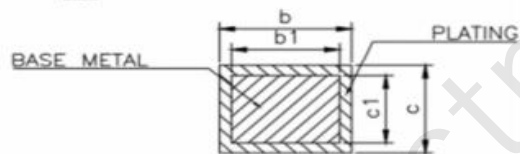
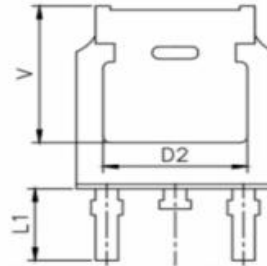
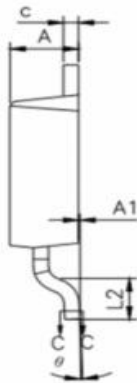
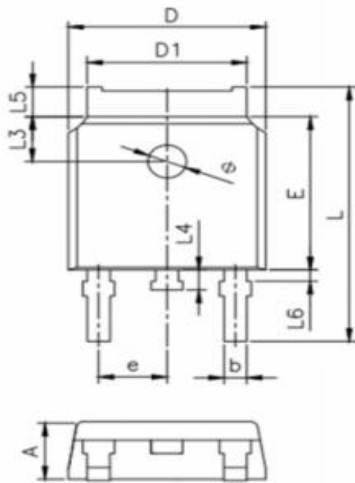


Figure 4: Diode Recovery Test Circuit & Waveform

## Package Mechanical Data(TO-252-3L)



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	2.20	2.30	2.40
A1	0.00	--	0.127
b	0.66	--	0.86
b1	0.65	0.76	0.81
D	6.50	6.60	6.70
D1	5.10	5.33	5.46
c	0.47	--	0.60
c1	0.46	0.51	0.56
D2	4.83 REF.		
E	6.00	6.10	6.20
e	2.186	2.286	2.386
L	9.80	10.10	10.40
L1	2.90 REF.		
L2	1.40	1.50	1.60
L3	1.80 REF.		
L4	0.60	0.80	1.00
L5	0.90	--	1.25
L6	0.15	--	0.75
Φ	1.10	--	1.30
θ	0°	--	8°
V	5.40 REF.		

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