CRMKTL0301A

N-Channel 30V, 1.7mΩ Typ. Power MOSFET

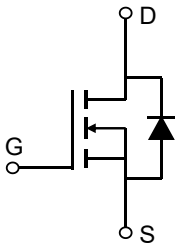
Description

Features

- 30V, 183A

  $R_{DS(ON)}$ Typ = 1.7mΩ @ V_{GS} = 10V

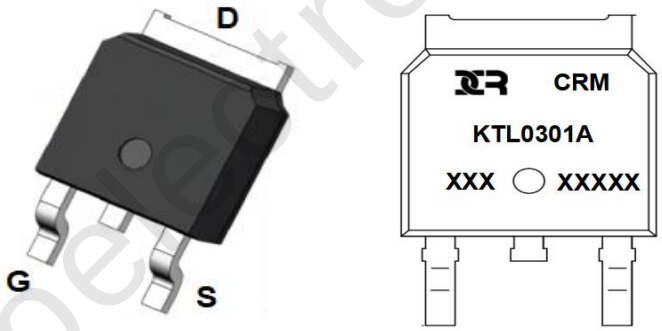
  $R_{DS(ON)}$ Typ = 2.55mΩ @ V_{GS} = 4.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- 100% UIS TESTED!
- 100% ΔVds TESTED!



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)
CRMKTL0301A	CRMKTL0301A	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		30	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25°C	183	A
		T_C = 100°C	109.8	A
I_{DM}	Pulsed Drain Current (1)		732	A
E_{AS}	Single Pulsed Avalanche Energy (2)		484	mJ
P_D	Power Dissipation	T_C = 25°C	125	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1	°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	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 30V, V_{GS} = 0V	-	-	1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1.2	1.8	2.4	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(3)	V_{GS} = 10V, I_D = 20A	-	1.7	2.2	mΩ
		V_{GS} = 4.5V, I_D = 15A	-	2.55	3.3	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz	-	6424	-	pF
C_{oss}	Output Capacitance		-	841	-	pF
C_{rss}	Reverse Transfer Capacitance		-	445	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V V_{DS} = 15V, I_D = 30A	-	108	-	nC
Q_{gs}	Gate Source Charge		-	20	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	20	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 15V I_D= 30A, R_{GEN} = 3Ω	-	13	-	ns
t_r	Turn-On Rise Time		-	29	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	85	-	ns
t_f	Turn-Off Fall Time		-	50	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	183	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	732	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 = 20A, di/dt = 100A/us	-	28	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	16	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. E_{AS} condition: Starting T_J=25°C, V_{DD}=15V, V_G=10V, R_G=25ohm, L=0.5mH, I_{AS}=44A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Test Circuit

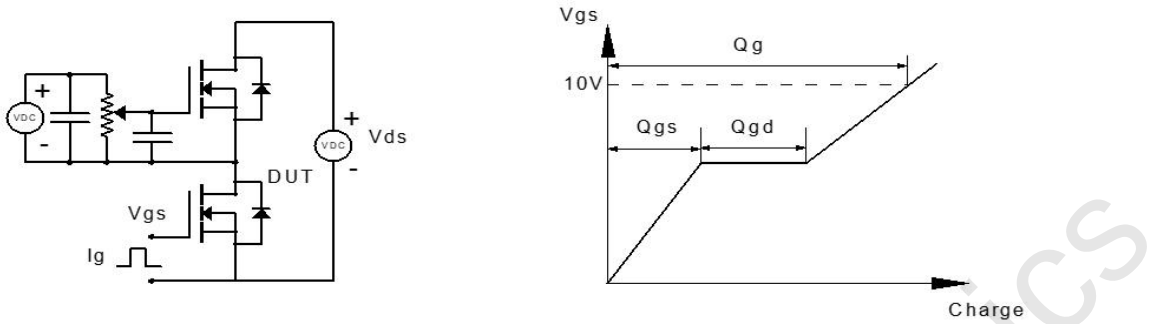


Figure 1: Gate Charge Test Circuit & Waveform

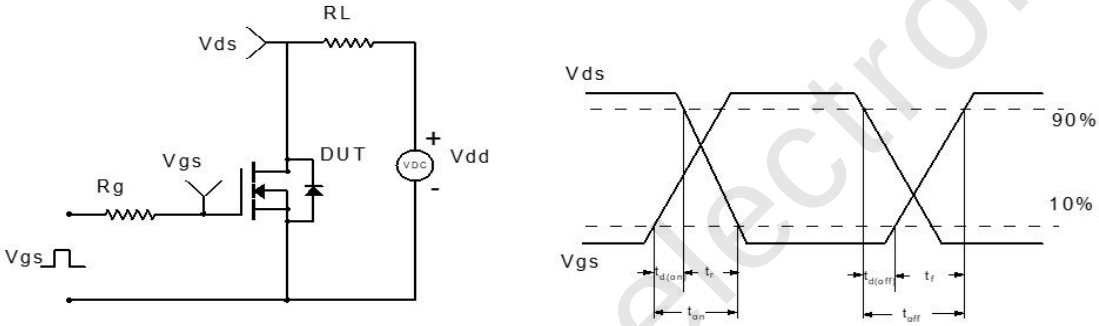


Figure 2: Resistive Switching Test Circuit & Waveform

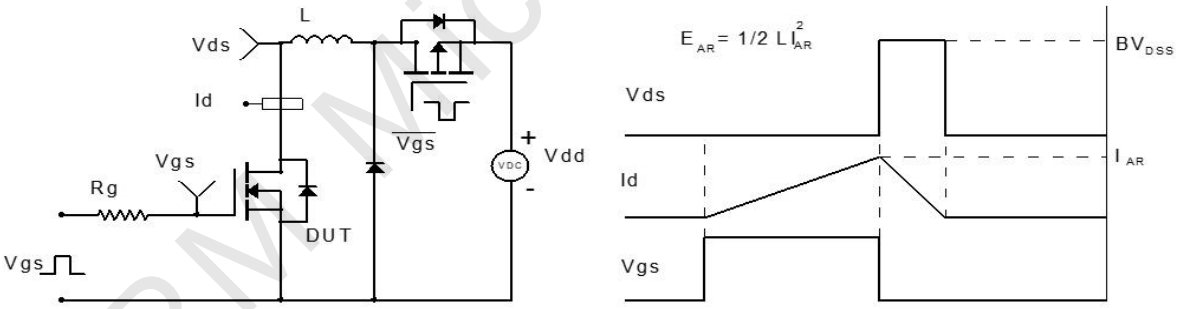


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

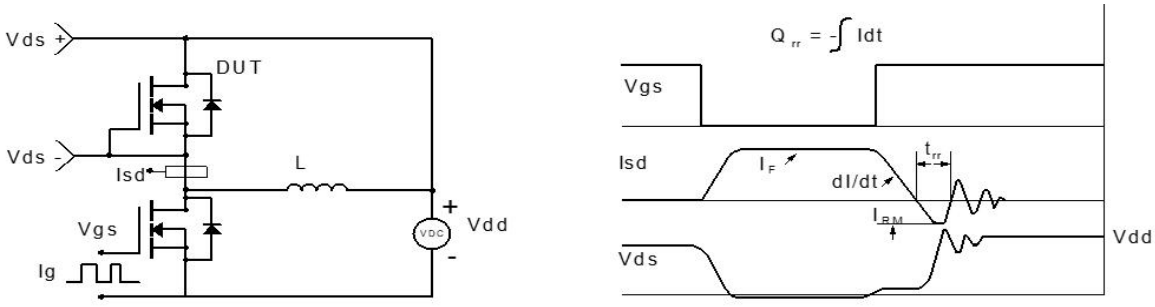
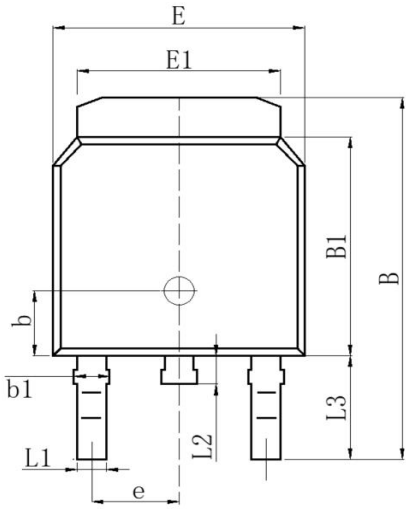
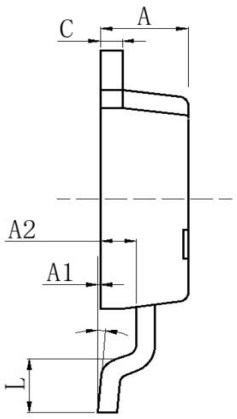


Figure 4: Diode Recovery Test Circuit & Waveform

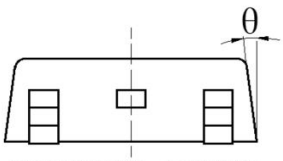
Package Mechanical Data(TO-252-3L)



FRONT VIEW



SIDE VIEW



BOTTOM VIEW

SYMBOL	MIN	NOM	MAX
A	2.20	2.30	2.40
A1	0.00	–	0.10
A2	0.95	1.00	1.05
C		0.508REF	
L	1.40	1.50	1.60
E	6.50	6.60	6.70
E1	5.20	5.30	5.40
B	9.90	10.10	10.30
B1	6.00	6.10	6.20
b	1.70	1.80	1.90
b1		1.00MAX	
L1	0.60	0.75	0.90
L2	0.70	0.90	
L3		2.95REF	
e		2.286BSC	
θ		7°	

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