Description

N-channel Enhancement Mode Power MOSFET

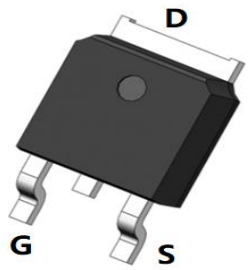
Features

- 60V, 20A
  $R_{DS(ON)}$ Typ= 26mΩ @ V_{GS} = 10V
  $R_{DS(ON)}$ Typ= 33mΩ @ V_{GS} = 4.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge

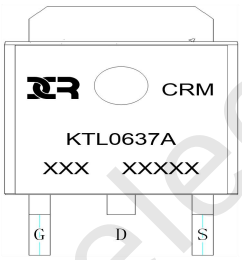
Applications

- Load Switch
- PWM Application
- Power Management

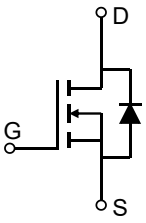
100% UIS TESTED!
100% ΔVds TESTED!



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)
CRMKTL0637A	CRMKTL0637A	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		±20	V
I_D	Continuous Drain Current	T_C = 25°C	20	A
		T_C = 100°C	13	
I_{DM}	Pulsed Drain Current (1)		80	A
E_{AS}	Single Pulsed Avalanche Energy (2)		27	mJ
P_D	Power Dissipation	T_C = 25°C	23	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		5.4	°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	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 60V, 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	1.0	1.6	2.5	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(3)	V_{GS} = 10V, I_D = 10A	-	26	33	mΩ
		V_{GS} = 4.5V, I_D = 5A	-	33	45	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz	-	860	-	pF
C_{oss}	Output Capacitance		-	62	-	pF
C_{rss}	Reverse Transfer Capacitance		-	51	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V, V_{DS} = 30V, I_D = 10A	-	20.3	-	nC
Q_{gs}	Gate Source Charge		-	3.7	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	5.3	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 30V, I_D= 20A, R_{GEN} =1.8Ω	-	7.6	-	ns
t_r	Turn-On Rise Time		-	20	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	15	-	ns
t_f	Turn-Off Fall Time		-	24	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	20	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	80	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = 15A	-	-	1.2	V

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. E_{AS} condition: Starting T_J=25C, V_{DD}=30V, V_G=10V, R_G=25ohm, L=0.5mH, I_{AS}=10.5A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Typical Performance Characteristics

Figure 1: Output Characteristics

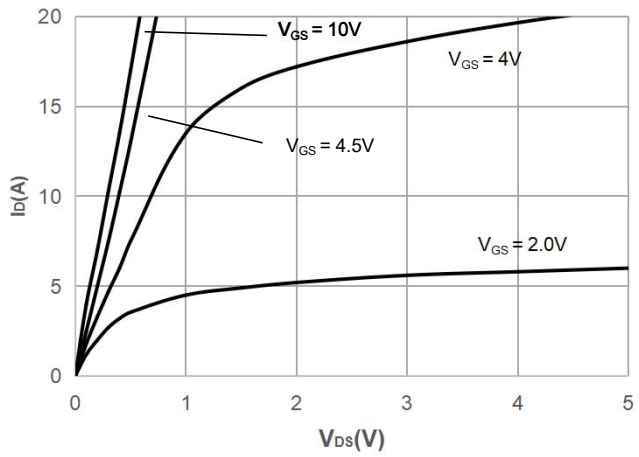


Figure 2: Typical Transfer Characteristics

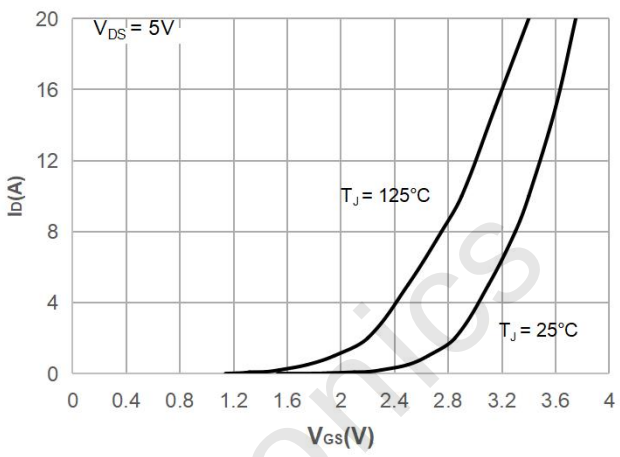


Figure 3: On-resistance vs. Drain Current

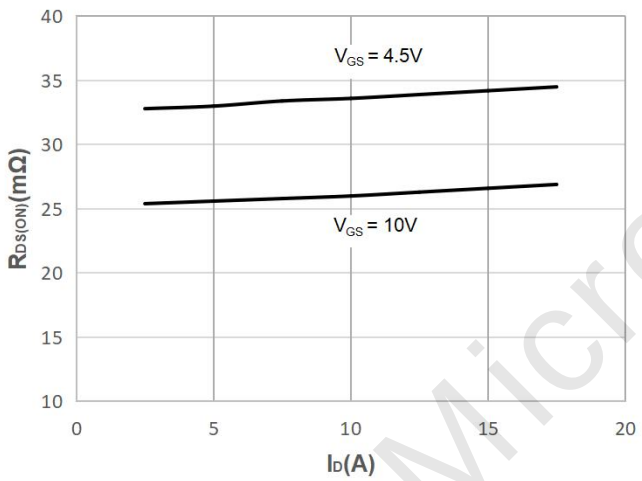


Figure 4: Body Diode Characteristics

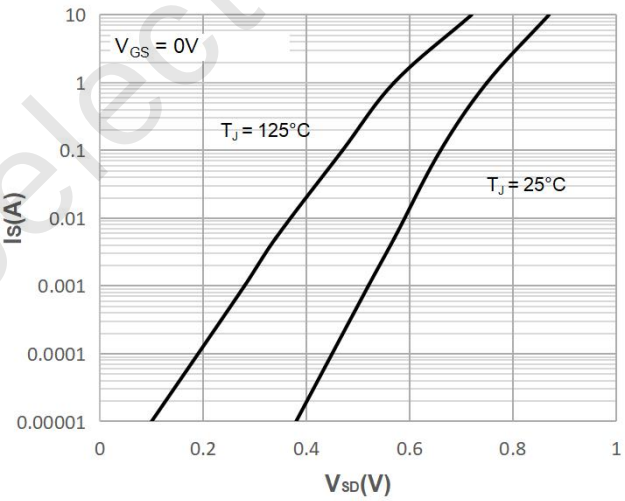


Figure 5: Gate Charge Characteristics

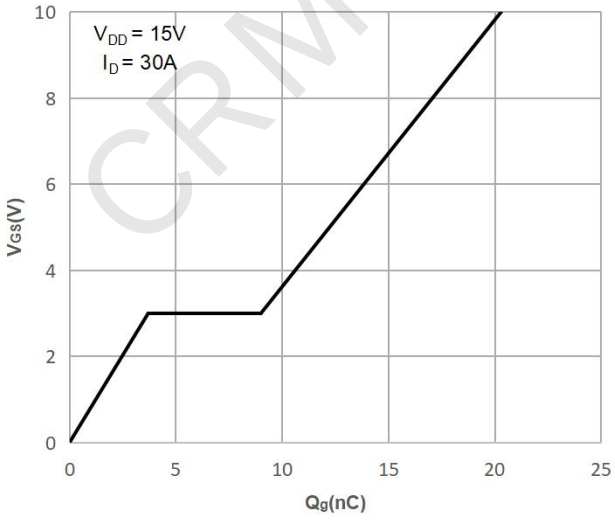
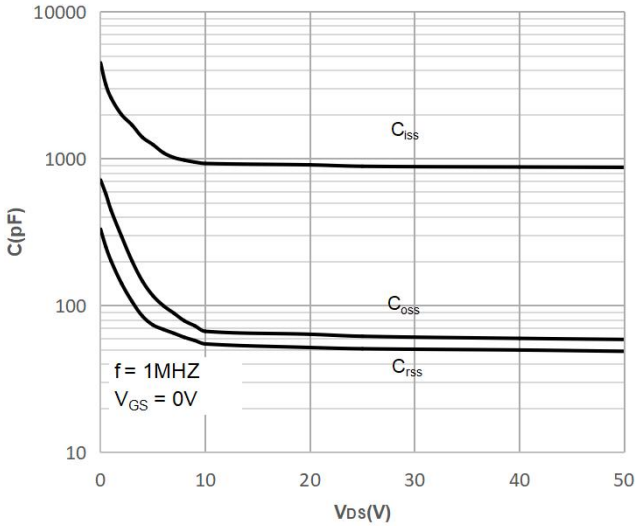


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

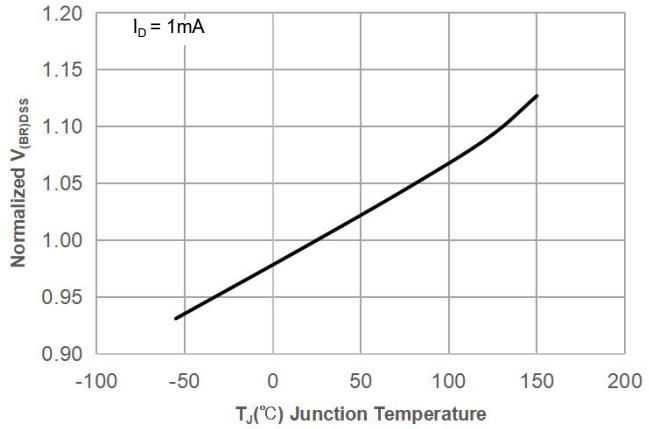


Figure 8: Normalized on Resistance vs. Junction Temperature

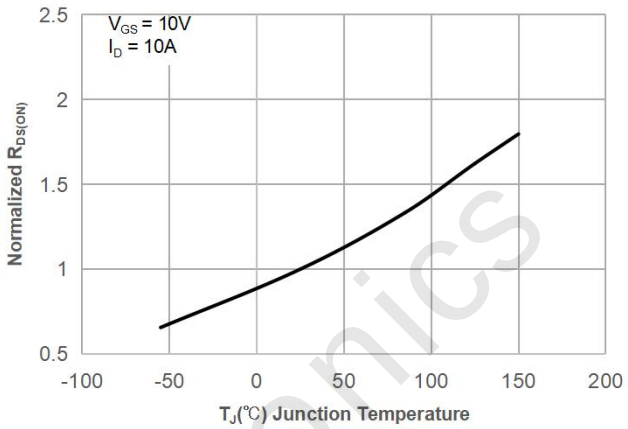


Figure 9: Maximum Safe Operating Area

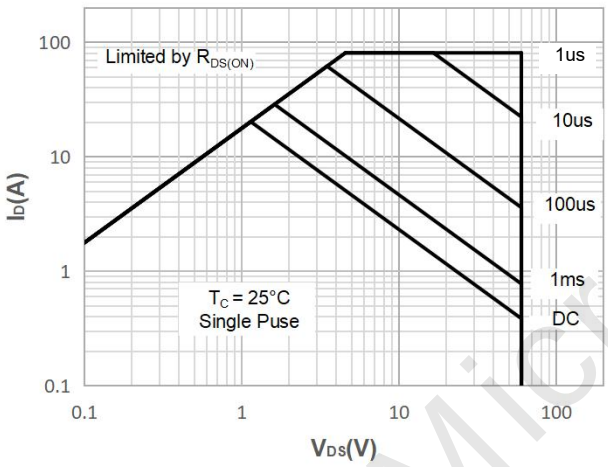


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

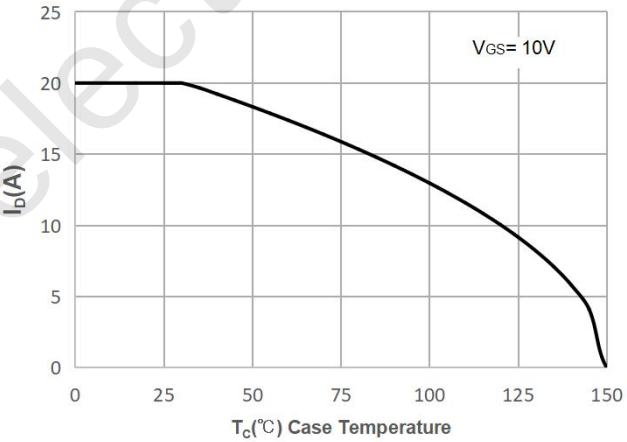


Figure 11: Normalized Maximum Transient Thermal Impedance

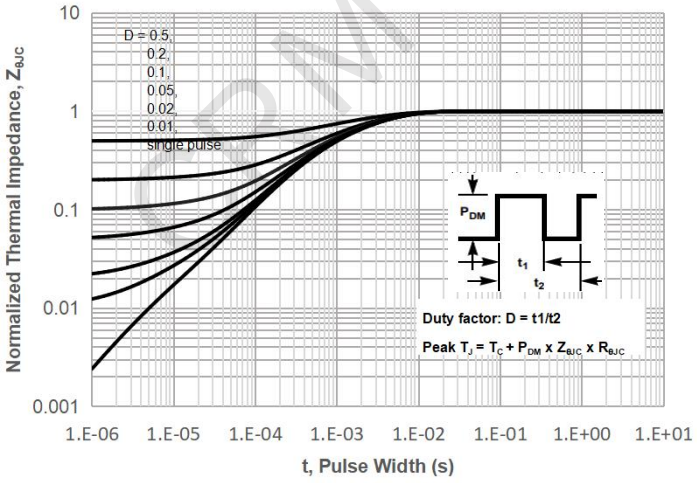
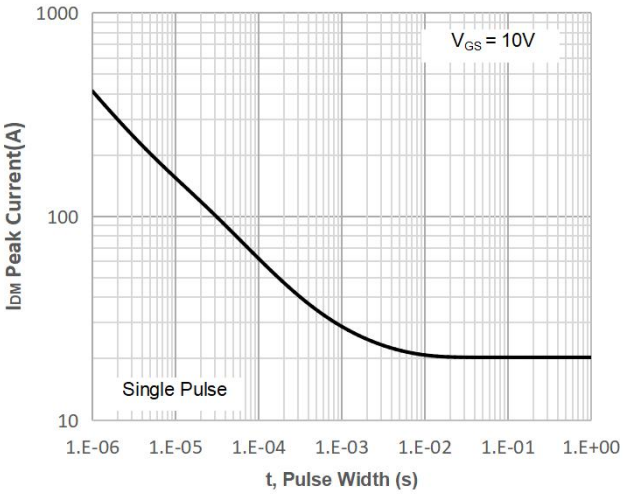


Figure 12: Peak Current Capacity



Test Circuit

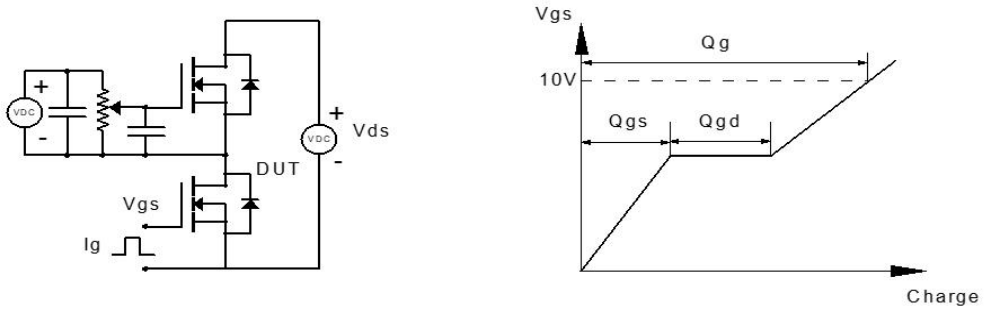


Figure 1: Gate Charge Test Circuit & Waveform

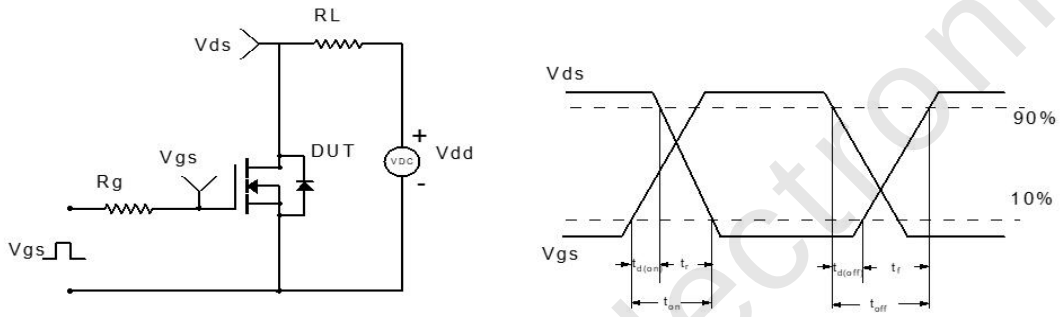


Figure 2: Resistive Switching Test Circuit & Waveform

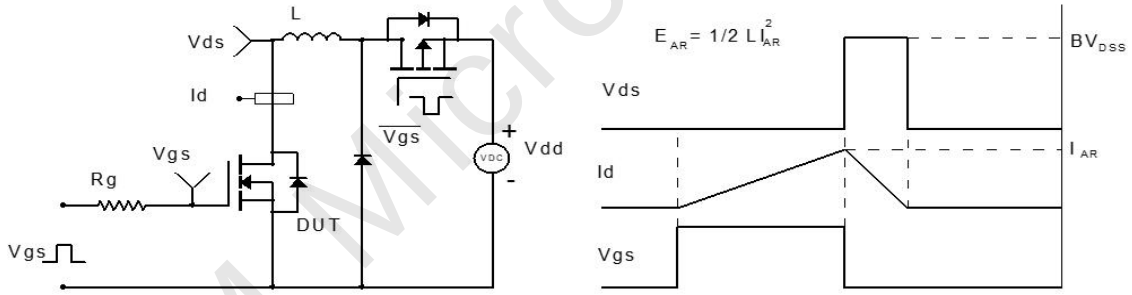


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

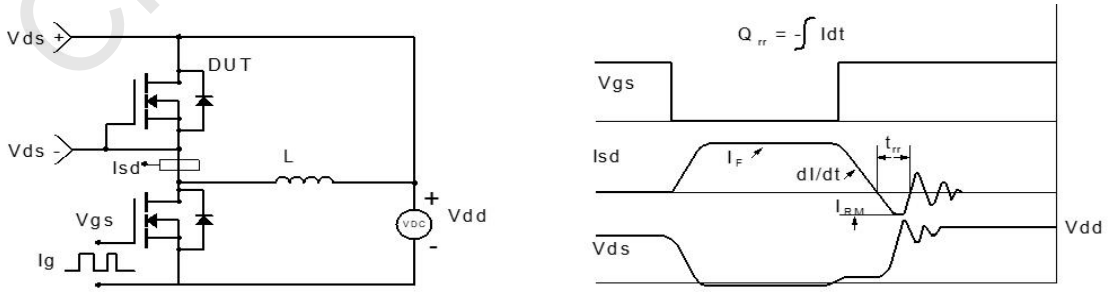
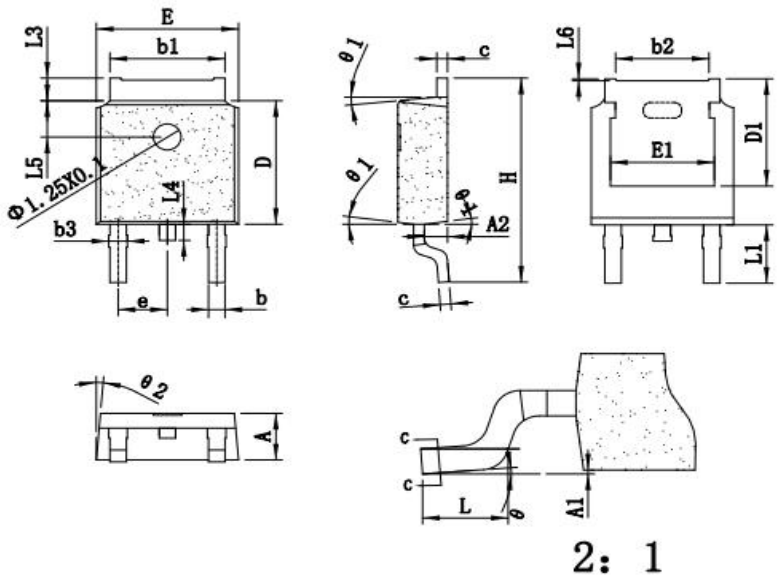


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(TO-252-3L)



SYMBOL	mm		
	MIN	NOM	MAX
*A	2.20	2.30	2.38
*A1	0.00	—	0.15
*A2	0.90	1.00	1.10
*b	0.72	0.78	0.85
b1	5.23	5.33	5.46
b2	4.05	4.20	4.35
*b3	0.78	0.85	0.90
*c	0.47	0.52	0.55
*D	6.00	6.10	6.20
D1	5.40REF		
*E	6.50	6.60	6.70
E1	4.70	4.83	4.92
*e	2.286BSC		
*H	9.90	10.10	10.20
*L	1.40	1.55	1.70
L1	2.90REF		
L3	0.90	—	1.20
L4	0.75	0.85	0.95
L5	1.70	1.80	1.90
L6	0.00	0.06	0.12
*θ	0°	—	5°
θ1	5°	7°	9°
θ2	5°	7°	9°