CRMLTL0436A

Description

N-channel Enhancement Mode Power MOSFET

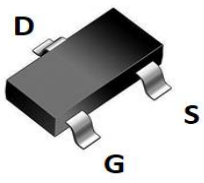
Features

- 40V, 5A
  $R_{DS(ON)}$ Typ= 28mΩ @ V_{GS} = 10V
  $R_{DS(ON)}$ Typ= 37mΩ @ V_{GS} = 4.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free

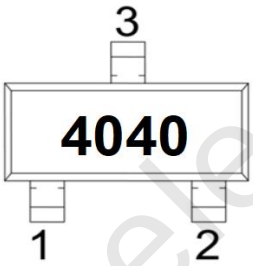
Applications

- Load Switch
- PWM Application
- Power Management

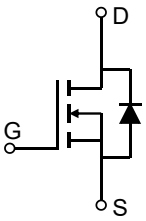
RoHS



SOT-23



Marking and Pin Assignment



Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	Outline	Package	Reel Size	Reel(pcs)	Per Carton (pcs)
4040	CRMLTL0436A	TAPING	SOT-23	7"	3000	120000

Absolute Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Symbol	Parameter		Value	Units
V_{DS}	Drain-to-Source Voltage		40	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_A = 25°C	5	A
		T_A = 100°C	3	
I_{DM}	Pulsed Drain Current (1)		20	A
P_D	Power Dissipation	T_A = 25°C	1.3	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (2)		95	°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	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 40V, 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	1.5	2.2	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance (3)	V_{GS} = 10V, I_D = 4A	-	28.0	36.5	mΩ
		V_{GS} = 4.5V, I_D = 3A	-	37.0	48.0	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 20V, f = 1MHz	-	528	-	pF
C_{oss}	Output Capacitance		-	35	-	pF
C_{rss}	Reverse Transfer Capacitance		-	30	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V, V_{DS} = 20V, I_D = 3A	-	11	-	nC
Q_{gs}	Gate Source Charge		-	2	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	2	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 20V, I_D= 3A, R_{GEN} = 3Ω	-	4	-	ns
t_r	Turn-On Rise Time		-	2	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	15	-	ns
t_f	Turn-Off Fall Time		-	2	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	5	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	10	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = 5A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 3A, di/dt = 100A/us	-	9	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	4	-	nC

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

2. $R_{\theta JA}$ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB

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

Test Circuit

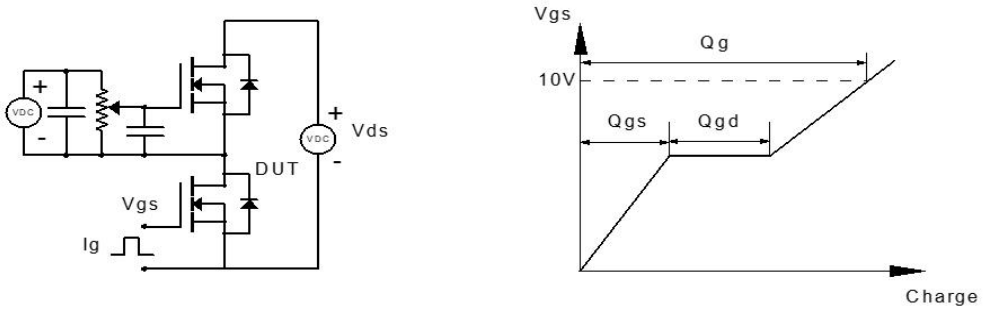


Figure 1: Gate Charge Test Circuit & Waveform

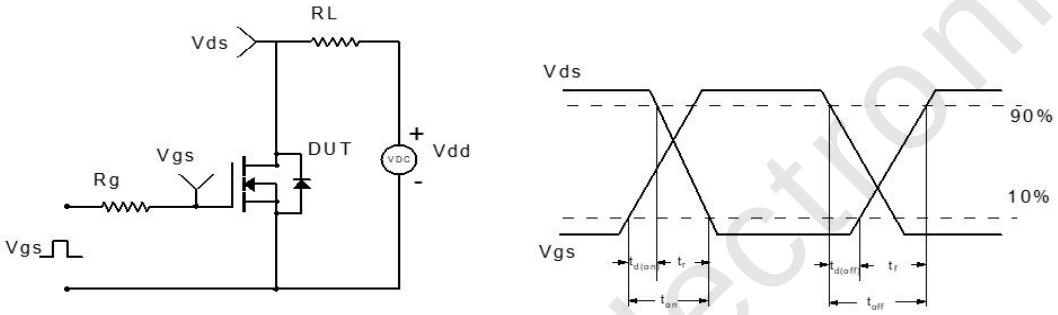


Figure 2: Resistive Switching Test Circuit & Waveform

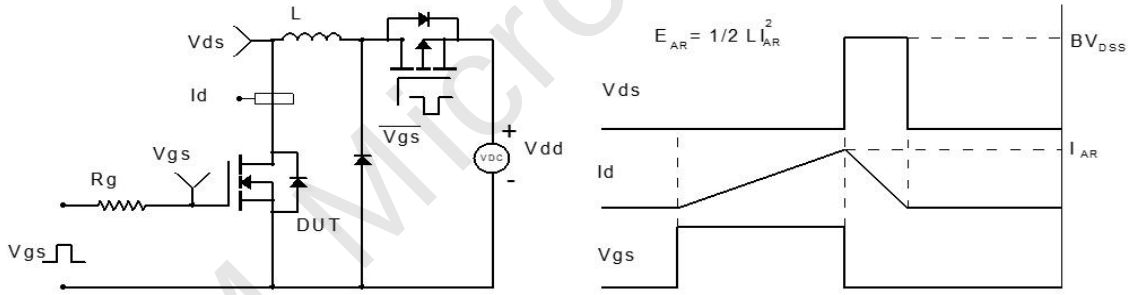


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

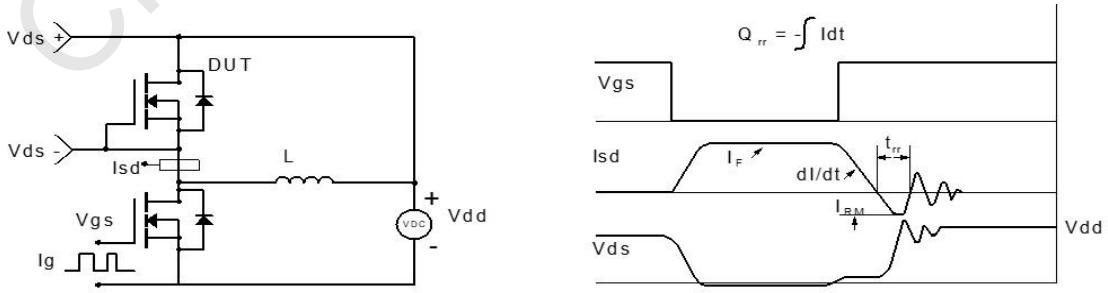
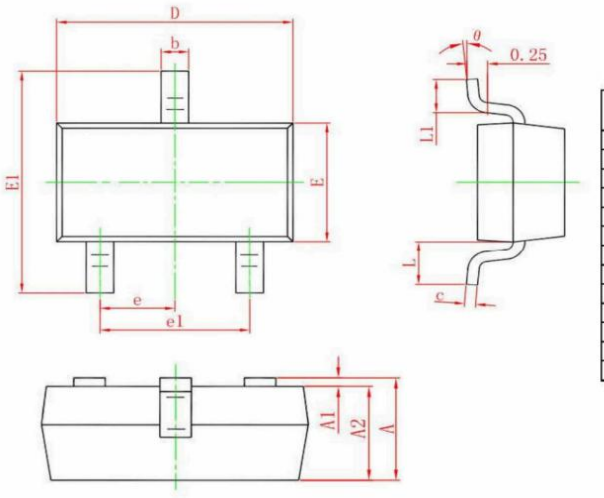


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(SOT-23)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°