CRMLTL0436A

Description

N-channel Enhancement Mode Power MOSFET

Features

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

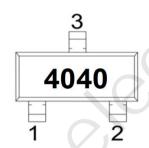
Applications

- Load Switch
- PWM Application
- Power Management

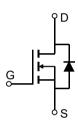








Marking and Pin Assignment



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
	Continuous Drain Current	T _A = 25°C	5	Δ.
I _D	Continuous Drain Current	T _A = 100°C	3	А
I _{DM}	Pulsed Drain Current (1)		20	Α
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 R	ange	-55 to 150	°C



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Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
Off Cha	aracteristics					
V _{(BR)DSS}	Drain-Source Breakdown Voltage	$I_D = 250 \mu A, V_{GS} = 0 V$	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 40V, V _{GS} = 0V	-	-	1.0	μА
I _{GSS}	Gate-Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	±100	nA
On Cha	racteristics					
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	1.0	1.5	2.2	V
	Static Drain-Source ON-Resistance (3)	V _{GS} = 10V, I _D = 4A	-	28.0	36.5	mΩ
$R_{DS(ON)}$		$V_{GS} = 4.5V, I_D = 3A$	-	37.0	48.0	mΩ
Dynami	ic Characteristics					
C _{iss}	Input Capacitance		- (528	-	pF
C _{oss}	Output Capacitance	$V_{GS} = 0V, V_{DS} = 20V,$		35	-	pF
C _{rss}	Reverse Transfer Capacitance	f = 1MHz	-	30	-	pF
Q_g	Total Gate Charge			11	-	nC
Q_{gs}	Gate Source Charge	$V_{GS} = 0 \text{ to } 10V$ $V_{DS} = 20V, I_{D} = 3A$	U -	2	-	nC
Q_{gd}	Gate Drain("Miller") Charge	V _{DS} - 20V, I _D - 3A	-	2	-	nC
Switchi	ing Characteristics					
t _{d(on)}	Turn-On DelayTime		-	4	-	ns
t _r	Turn-On Rise Time	$V_{GS} = 10V, V_{DD} = 20V$	-	2	-	ns
$t_{d(off)}$	Turn-Off DelayTime	$I_D = 3A$, $R_{GEN} = 3\Omega$	-	15	-	ns
t _f	Turn-Off Fall Time	$\overline{\mathcal{V}}$	-	2	-	ns
Drain-S	Source Diode Characteristics and M	Max Ratings				
I _s	Maximum Continuous Drain to Source Diode Forward Current			-	5	Α
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current			-	10	А
V _{SD}	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_{S} = 5A$	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	1 04 11/14 4004/	-	9	-	ns
Qrr	Body Diode Reverse Recovery Charge	$I_F = 3A$, di/dt = 100A/us	-	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 1inch² pad of 2oz copper FR4 PCB
- 3. Pulse Test: Pulse Width≤300µs, Duty Cycle≤0.5%.



Test Circuit

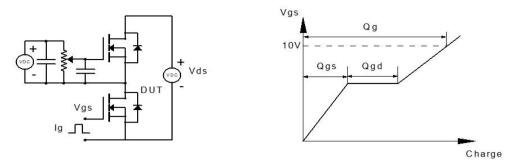


Figure 1: Gate Charge Test Circuit & Waveform

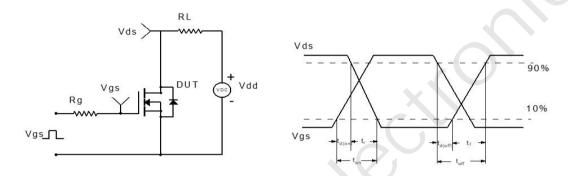


Figure 2: Resistive Switching Test Circuit & Waveform

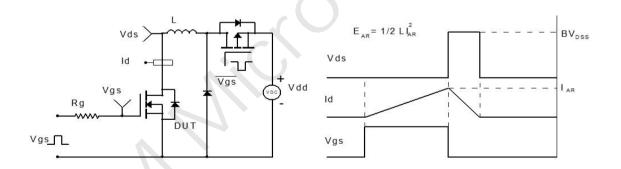


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

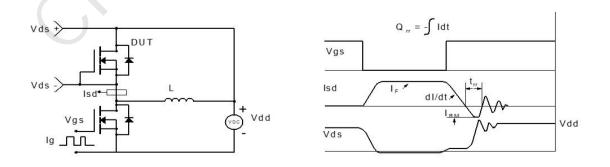
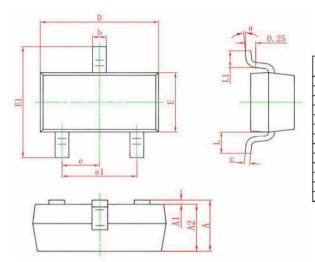


Figure 4: Diode Recovery Test Circuit & Waveform





Package Mechanical Data(SOT-23)



Symbol	Dimensions In Millimeters		Dimensions In Inches		
	Min.	Max.	Min.	Max.	
Α	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	
С	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	
е	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°	

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