

## Description

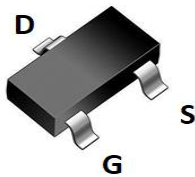
### N-channel Enhancement Mode Power MOSFET

#### Features

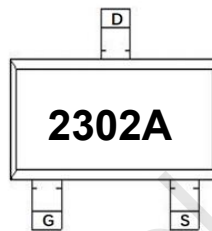
- 20V, 4.3A  
 $R_{DS(ON)}$  Typ= 20m $\Omega$  @  $V_{GS} = 4.5V$   
 $R_{DS(ON)}$  Typ= 27m $\Omega$  @  $V_{GS} = 2.5V$
- Advanced Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead Free

#### Applications

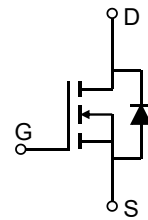
- Load Switch
- PWM Application
- Power Management



SOT-23 Top



Marking and Pin Assignment



Schematic Diagram

### Package Marking and Ordering Information

Device Marking	Device	Outline	Package	Reel Size	Reel(pcs)	Per Carton (pcs)
2302A	CRMLTU2302A	TAPING	SOT-23	7"	3000	120000

### Absolute Maximum Ratings (@ $T_J = 25^\circ C$ unless otherwise specified)

Symbol	Parameter	Value	Units
$V_{DS}$	Drain-to-Source Voltage	20	V
$V_{GS}$	Gate-to-Source Voltage	$\pm 10$	V
$I_D$	Continuous Drain Current	$T_A = 25^\circ C$	A
		$T_A = 100^\circ C$	
$I_{DM}$	Pulsed Drain Current <sup>(1)</sup>	17.2	A
$P_D$	Power Dissipation	$T_A = 25^\circ C$	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient <sup>(2)</sup>	90.5	$^\circ C/W$
$T_J, T_{STG}$	Junction & Storage Temperature Range	-55 to 150	$^\circ C$

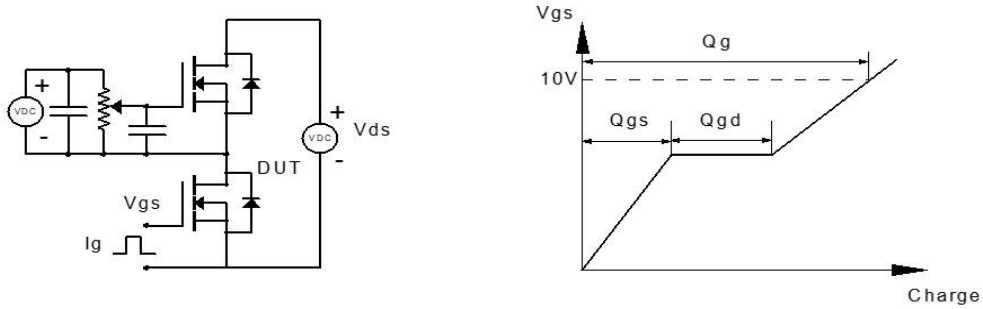


## Electrical Characteristics (T<sub>J</sub> = 25°C unless otherwise specified)

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	20	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 20V, 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> = ±10V	-	-	±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	0.4	0.70	1.0	V
R <sub>DS(ON)</sub>	Static Drain-Source ON-Resistance <sup>(3)</sup>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 4.3A	-	20.0	27.0	mΩ
		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 3A	-	27.0	36.0	mΩ
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 10V, f = 1MHz	-	354	-	pF
C <sub>oss</sub>	Output Capacitance		-	71	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	67	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> = 0 to 10V V <sub>DS</sub> = 5V, I <sub>D</sub> = 4.3A	-	4	-	nC
Q <sub>gs</sub>	Gate Source Charge		-	0.6	-	nC
Q <sub>gd</sub>	Gate Drain("Miller") Charge		-	1.9	-	nC
Switching Characteristics						
t <sub>d(on)</sub>	Turn-On DelayTime	V <sub>GS</sub> = 5V, V <sub>DD</sub> = 10V I <sub>D</sub> = 4.3A, R <sub>GEN</sub> = 6Ω	-	5.2	-	ns
t <sub>r</sub>	Turn-On Rise Time		-	37	-	ns
t <sub>d(off)</sub>	Turn-Off DelayTime		-	15	-	ns
t <sub>f</sub>	Turn-Off Fall Time		-	5.7	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	4.3	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	17.2	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> = 0V, I <sub>S</sub> = 4.3A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I <sub>F</sub> = 2A, di/dt = 60A/us	-	6	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	0.8	-	nC

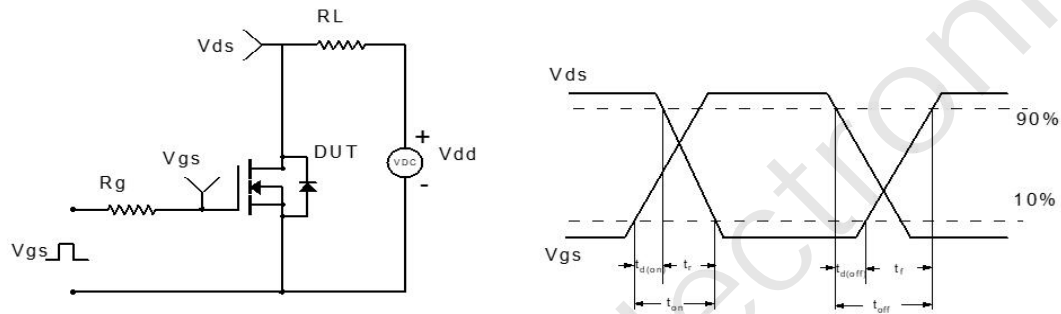
- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
  2. R<sub>θJA</sub> is measured with the device mounted on a 1inch<sup>2</sup> pad of 2oz copper FR4 PCB
  3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 0.5%.

## Test Circuit

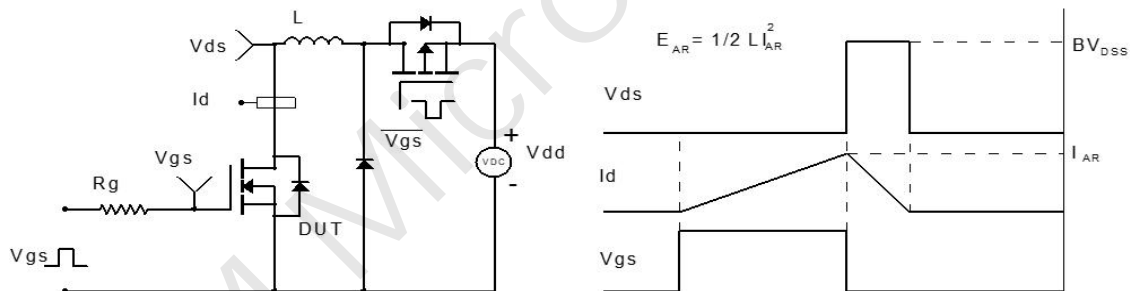


**Figure 1: Gate Charge Test Circuit & Waveform**

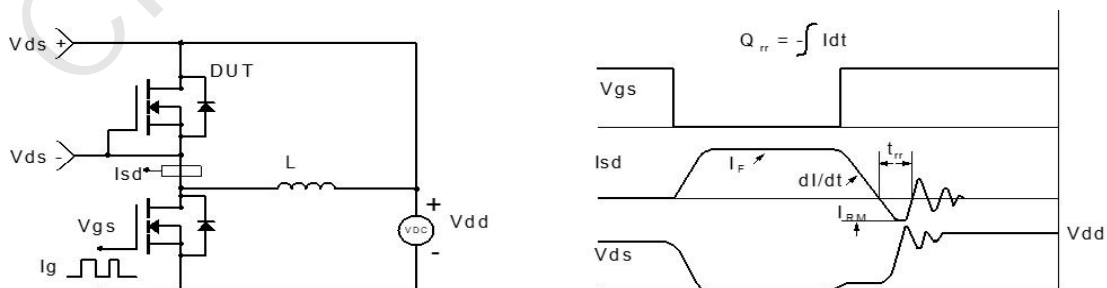
Static Drain-Source ON-Resistance<sup>(3)</sup>



**Figure 2: Resistive Switching Test Circuit & Waveform**

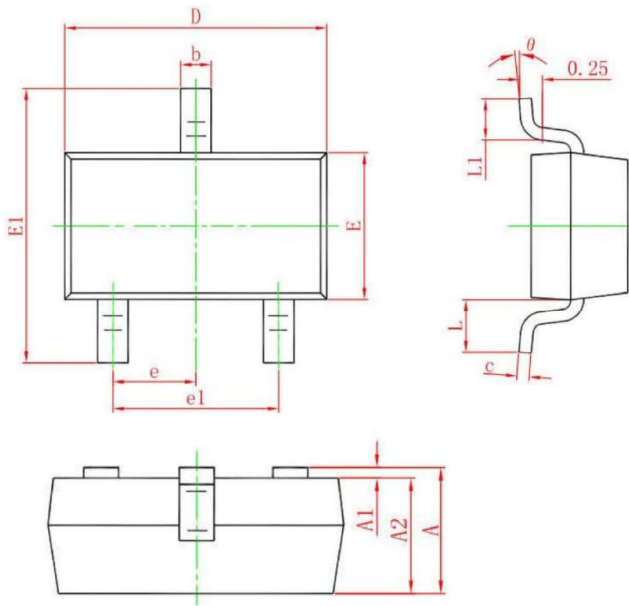


**Figure 3: Unclamped Inductive Switching Test Circuit& Waveform**



**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°

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