

## Description

### N-channel Enhancement Mode Power MOSFET

#### Features

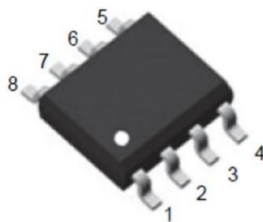
- 30V, 20A  
 $R_{DS(ON)} < 13m\Omega @ V_{GS} = 10V$   
 $R_{DS(ON)} < 22.5m\Omega @ V_{GS} = 4.5V$
- Advanced Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead Free

#### Applications

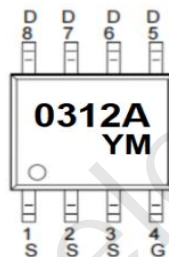
- Load Switch
- PWM Application
- Power Management



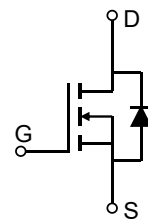
100% UIS TESTED!



SOP-8



Marking and Pin Assignment



Schematic Diagram

### Package Marking and Ordering Information

Device Marking	Device	Outline	Package	Reel Size	Reel(pcs)	Per Carton (pcs)
0312A	CRMPTL0312A	TAPING	SOP-8	13"	4000	40000

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

Symbol	Parameter	Value	Units
$V_{DS}$	Drain-to-Source Voltage	30	V
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current	$T_C = 25^\circ C$	A
		$T_C = 100^\circ C$	
$I_{DM}$	Pulsed Drain Current <sup>(1)</sup>	80	A
$E_{AS}$	Single Pulsed Avalanche Energy <sup>(2)</sup>	25	mJ
$P_D$	Power Dissipation	$T_C = 25^\circ C$	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient <sup>(3)</sup>	55	$^\circ C/W$
$T_J, T_{STG}$	Junction & Storage Temperature Range	-55 to 150	$^\circ C$

**Electrical Characteristics** ( $T_J = 25^\circ\text{C}$  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	30	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 30V, 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> = ±20V	-	-	±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	1.1	1.6	2.1	V
R <sub>DS(ON)</sub>	Static Drain-Source ON-Resistance <sup>(4)</sup>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 15A	-	10.0	13.0	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 10A	-	17.0	22.5	mΩ
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 15V, f = 1MHz	-	805	-	pF
C <sub>oss</sub>	Output Capacitance		-	103	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	82	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> = 0 to 10V V <sub>DS</sub> = 15V, I <sub>D</sub> = 15A	-	16	-	nC
Q <sub>gs</sub>	Gate Source Charge		-	3.6	-	nC
Q <sub>gd</sub>	Gate Drain("Miller") Charge		-	3.4	-	nC
Switching Characteristics						
t <sub>d(on)</sub>	Turn-On DelayTime	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 15V I <sub>D</sub> = 15A, R <sub>GEN</sub> = 3Ω	-	6	-	ns
t <sub>r</sub>	Turn-On Rise Time		-	16	-	ns
t <sub>d(off)</sub>	Turn-Off DelayTime		-	17	-	ns
t <sub>f</sub>	Turn-Off Fall Time		-	5	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	20	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	80	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> = 0V, I <sub>S</sub> = 10A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I <sub>F</sub> = 13A, di/dt = 100A/us	-	9.4	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	3.3	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2.  $E_{AS}$  condition: Starting  $T_J=25^\circ\text{C}$ ,  $V_{DD}=15\text{V}$ ,  $V_G=10\text{V}$ ,  $R_G=25\text{ohm}$ ,  $L=0.5\text{mH}$ ,  $I_{AS}=10\text{A}$
3.  $R_{\theta JA}$  is measured with the device mounted on a  $1\text{inch}^2$  pad of 2oz copper FR4 PCB
4. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 0.5\%$ .

## Test Circuit

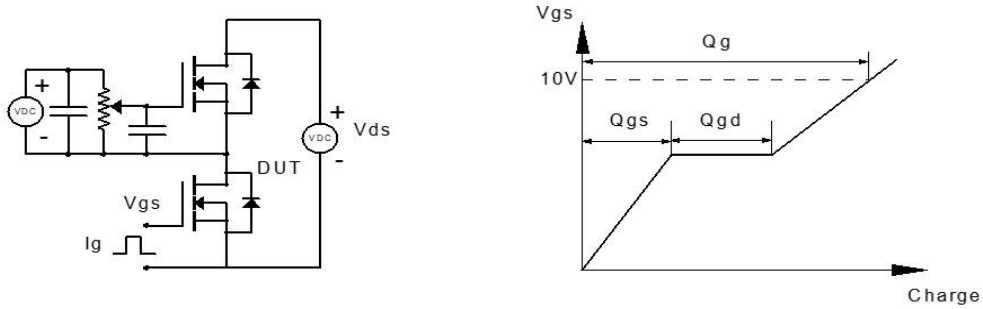


Figure 1: Gate Charge Test Circuit & Waveform

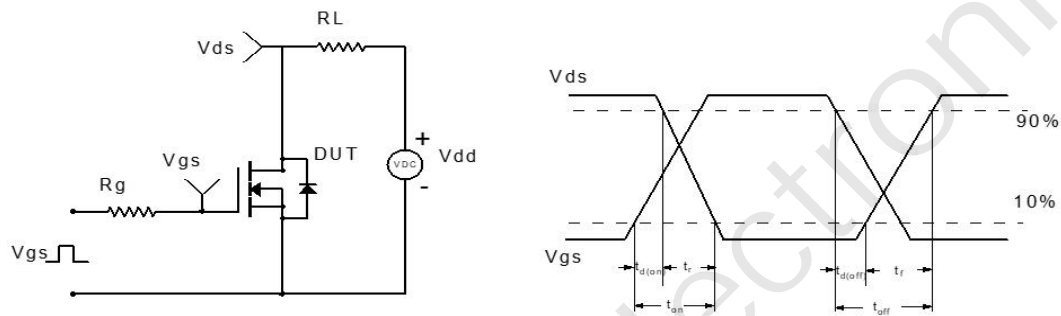


Figure 2: Resistive Switching Test Circuit & Waveform

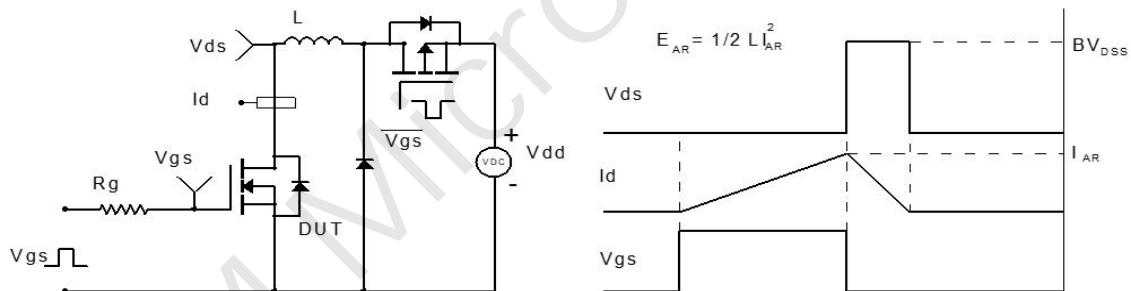


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

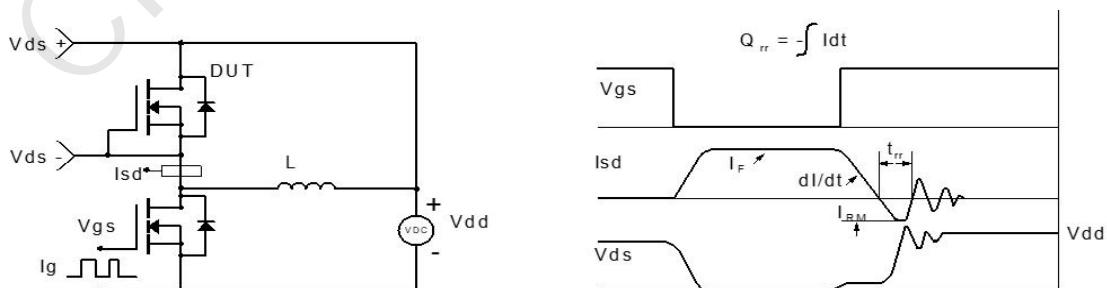
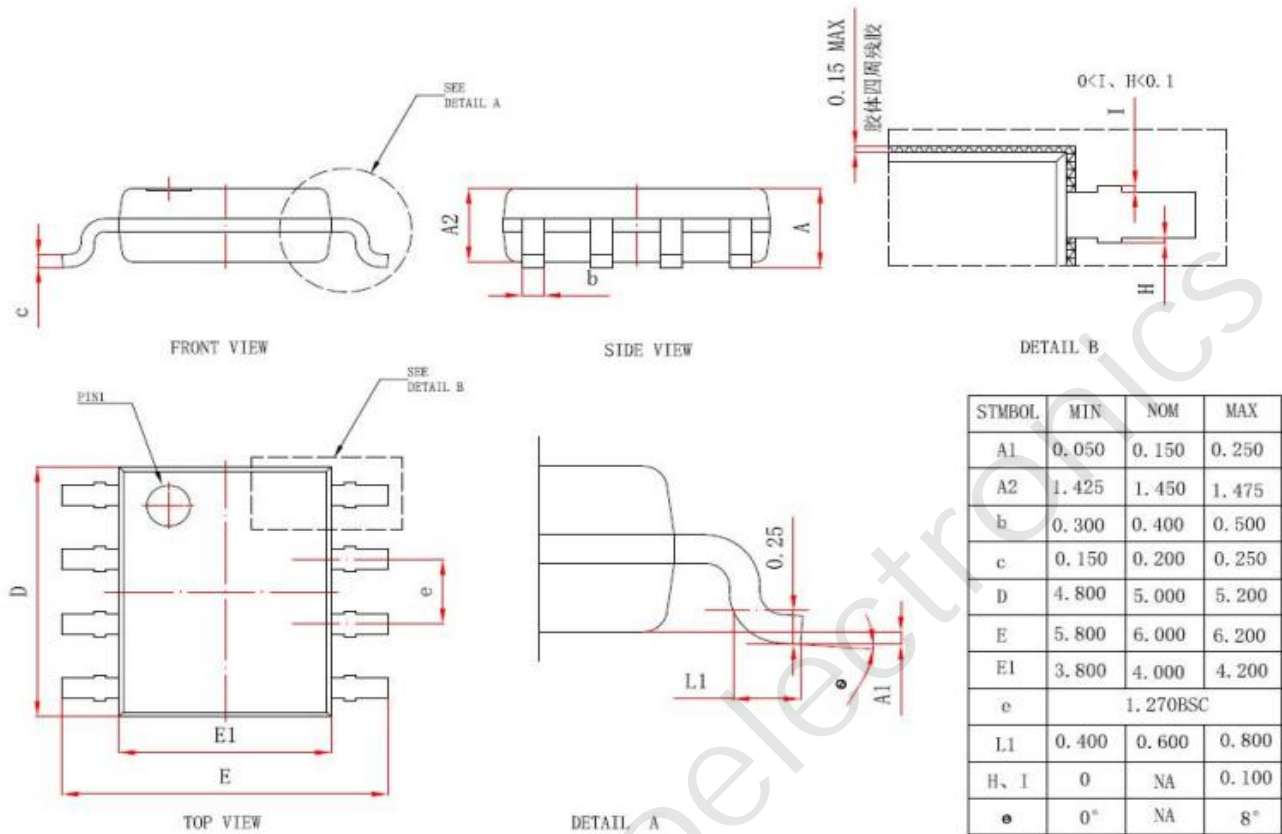


Figure 4: Diode Recovery Test Circuit & Waveform

## Package Mechanical Data(SOP-8)



UNIT: mm

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