Description

N-channel Enhancement Mode Power MOSFET

Features

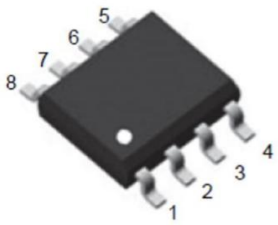
- 40V, 10A
  $R_{DS(ON)}$ Typ= 10.5mΩ @ V_{GS} = 10V
  $R_{DS(ON)}$ Typ= 13.5mΩ @ V_{GS} = 4.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free

Applications

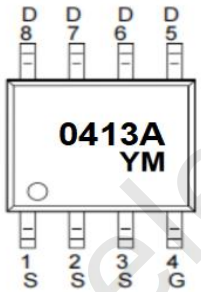
- Load Switch
- PWM Application
- Power Management

100% UIS TESTED!

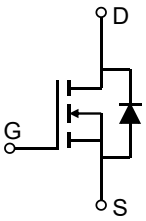
RoHS



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)
0413A	CRMPTL0413A	TAPING	SOP-8	13"	4000	40000

Absolute Maximum Ratings (@ T_C = 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_C = 25°C	10	A
		T_C = 100°C	6.5	
I_{DM}	Pulsed Drain Current (1)		40	A
E_{AS}	Single Pulsed Avalanche Energy (2)		36	mJ
P_D	Power Dissipation	T_C = 25°C	2.4	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient(3)		52	°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	1.3	1.8	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(4)	V_{GS} = 10V, I_D = 10A	-	10.5	14	mΩ
		V_{GS} = 4.5V, I_D = 5A	-	13.5	18	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 20V, f = 1MHz	-	1172	-	pF
C_{oss}	Output Capacitance		-	104	-	pF
C_{rss}	Reverse Transfer Capacitance		-	84	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V, V_{DS} = 20V, I_D = 10A	-	26	-	nC
Q_{gs}	Gate Source Charge		-	6	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	5	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 20V, I_D= 10A, R_{GEN} = 3Ω	-	7	-	ns
t_r	Turn-On Rise Time		-	11	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	26	-	ns
t_f	Turn-Off Fall Time		-	5	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	10	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	40	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = 10A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 10A, di/dt = 100A/us	-	10	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	6	-	nC

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

2. E_{AS} condition: Starting T_J=25C, V_{DD}=20V, V_G=10V, R_G=25ohm, L=0.5mH, I_{AS}=12A

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

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

Test Circuit

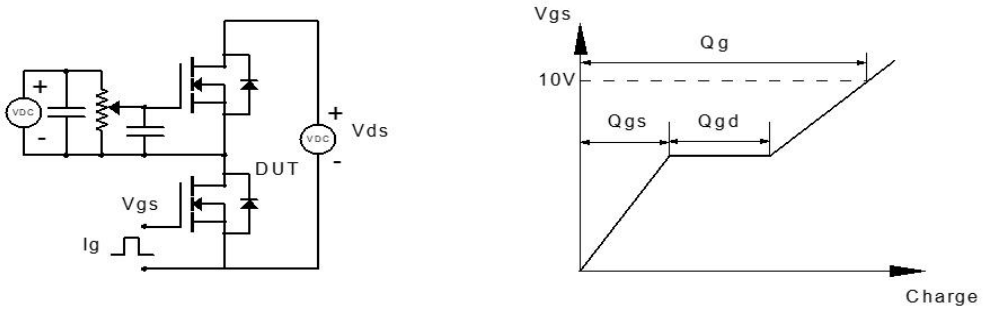


Figure 1: Gate Charge Test Circuit & Waveform

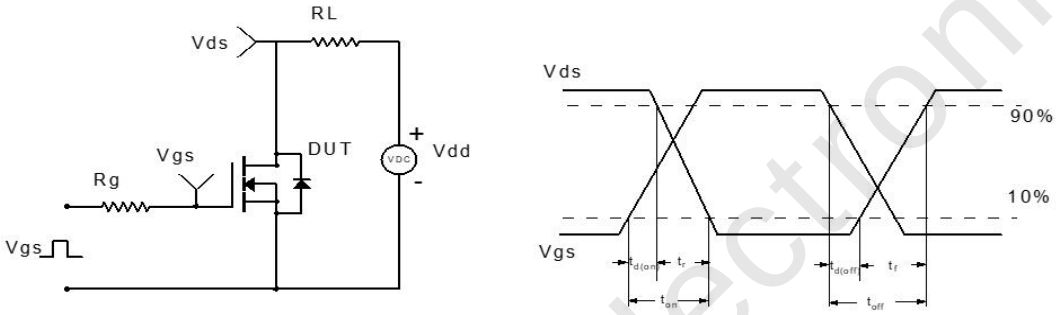


Figure 2: Resistive Switching Test Circuit & Waveform

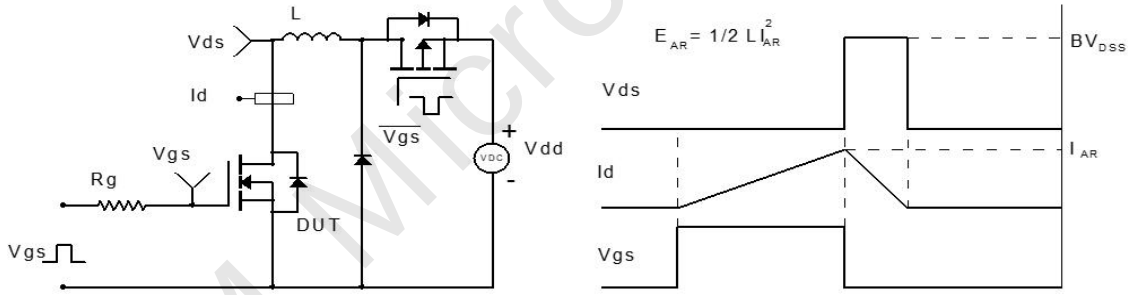


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

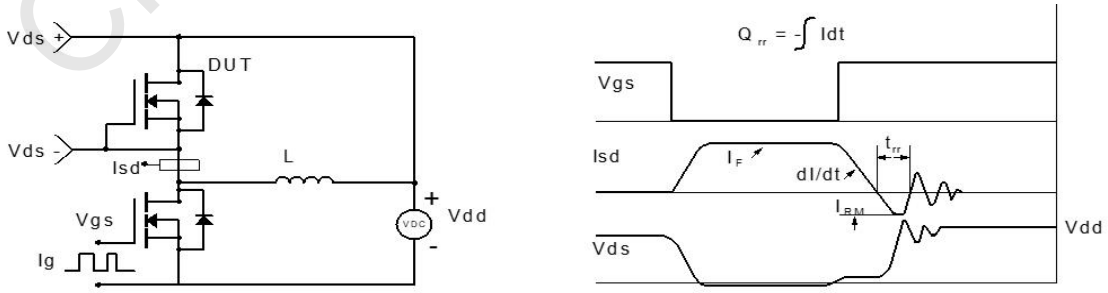
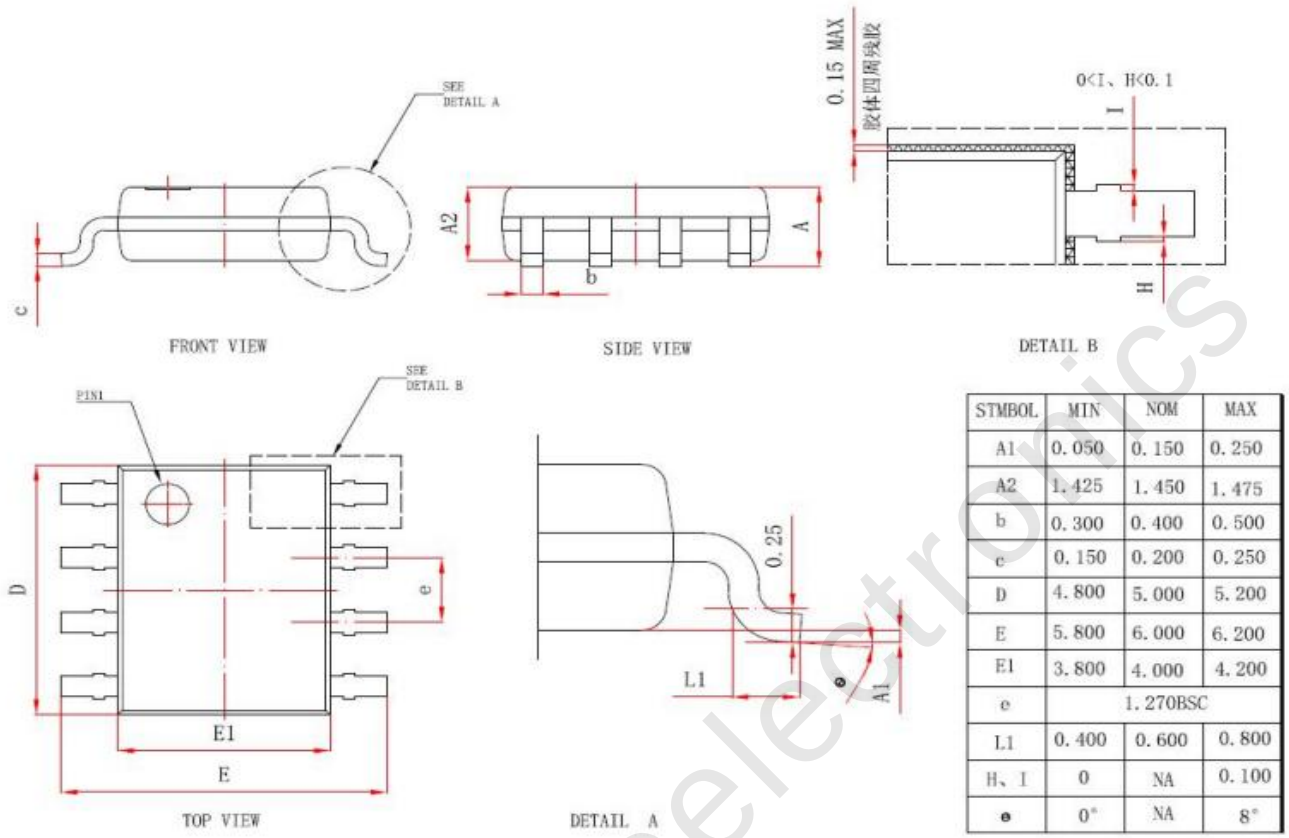


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(SOP-8)



STMBOL	MIN	NOM	MAX
A1	0.050	0.150	0.250
A2	1.425	1.450	1.475
b	0.300	0.400	0.500
c	0.150	0.200	0.250
D	4.800	5.000	5.200
E	5.800	6.000	6.200
E1	3.800	4.000	4.200
e	1.270BSC		
L1	0.400	0.600	0.800
H、I	0	NA	0.100
θ	0°	NA	8°