Product Specification

QN4430

30V N-Channel MOSFET

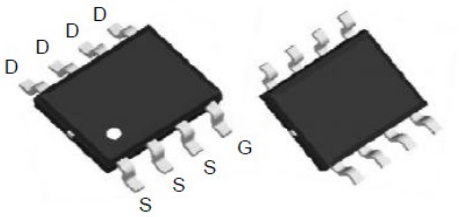
FEATURES

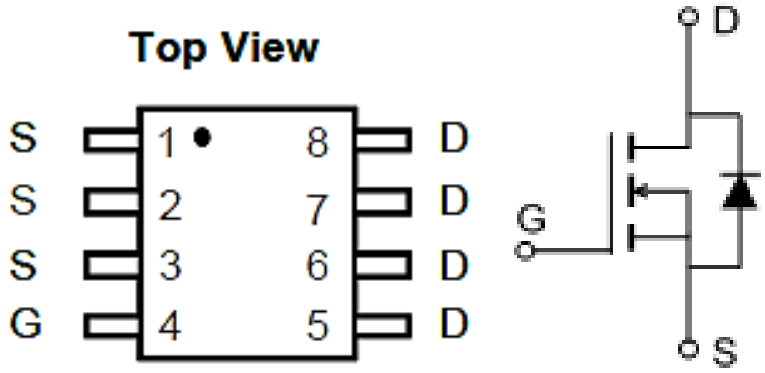
- 30V, 20A
- $R_{DS(ON)}$<6mΩ @ V_{GS} =10V
- $R_{DS(ON)}$<8.6mΩ @ V_{GS} =4.5V
- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

Applications

- Load Switch
- PWM Application
- Power Management

Pin Description





NO.	Symbol	Description
1	S	SOURCE
2	S	GATE
3	S	SOURCE
4	G	GATE
5	D	DRAIN
6	D	DRAIN
7	D	DRAIN
8	D	DRAIN

Absolute Maximum Ratings

(@ T_A = 25℃ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_A=25℃	20	A
		T_A=100℃	13	A
I_{DM}	Pulsed Drain Current note1		80	A
E_{AS}	Single Pulsed Avalanche Energy(2)		100	mJ
P_D	Power Dissipation	T_A = 25℃	4	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		31.3	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

Electrical Characteristics

(T_J = 25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V,	-	-	1.0	uA
I_{GSS}	Gate to 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=250uA	0.7	1.0	1.7	V
$R_{DS(on)}$	Static Drain-Source on-Resistance(3)	V_{GS}=10V, I_D=20A	-	5.0	6	mΩ
		V_{GS}=4.5V, I_D=10A	-	7.5	8.6	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1.0MHz	-	1984	-	pF
C_{oss}	Output Capacitance		-	216	-	pF
C_{rss}	Reverse Transfer Capacitance		-	181	-	pF
Q_g	Total Gate Charge	V_{DS}=15V, I_D=10A, V_{GS}=10V	-	45	-	nC
Q_{gs}	Gate-Source Charge		-	3	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	15	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=15V, I_D=20A, R_{GEN}=3Ω, V_{GS}=10V	-	21	-	ns
t_r	Turn-on Rise Time		-	32	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	59	-	ns
t_f	Turn-off Fall Time		-	34	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	20	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	80	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=20A	-	-	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	I_F=20A,d_I/d_t=100A/μs	-	15	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	4	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T_J=25℃, V_{GS}=15V, R_G=25Ω, L=0.5mH, I_{AS}=20A
3. Pulse Test: Pulse Width≤300us, Duty Cycle≤0.5%

Test Circuit

Figure 1: Gate Charge Test Circuit & Waveform

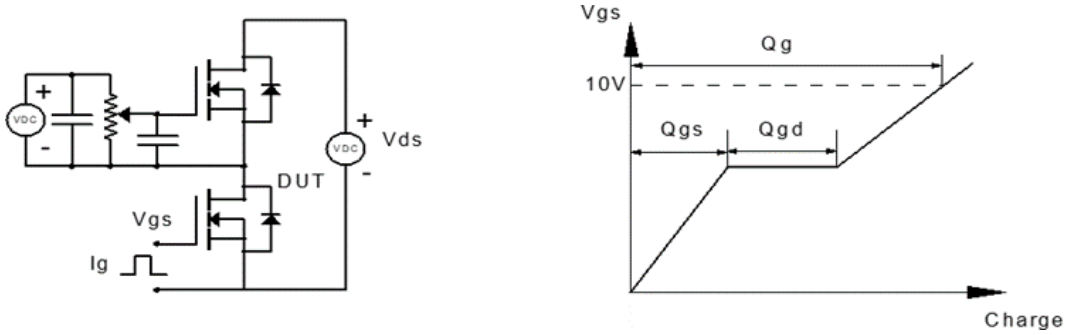


Figure 2: Resistive Switching Test Circuit & Waveform

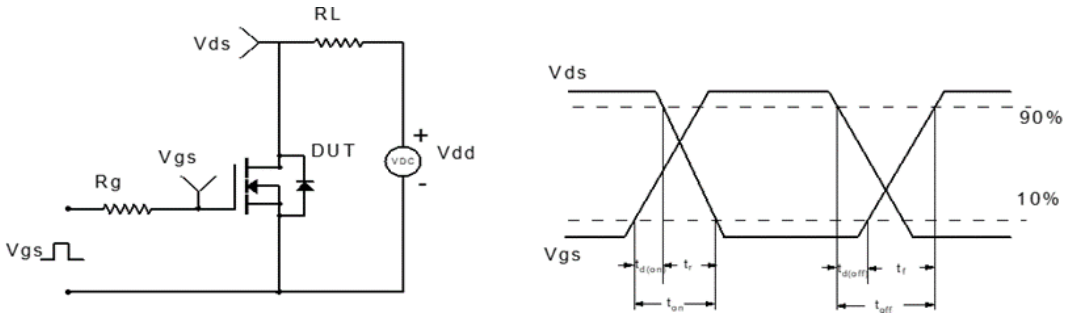


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

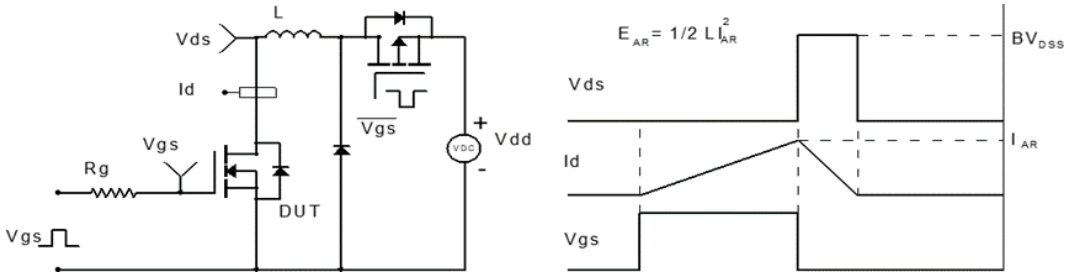
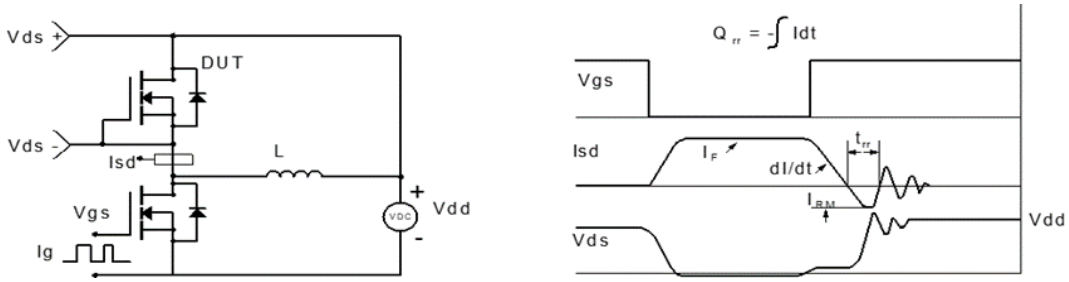
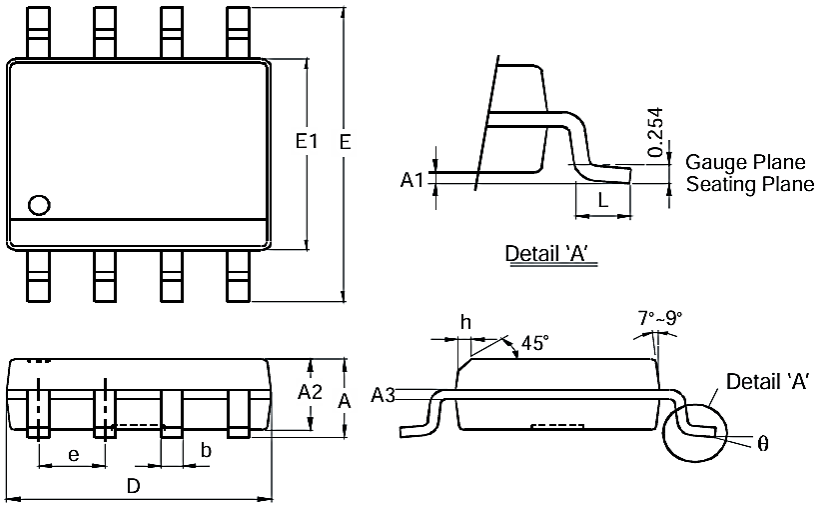


Figure 4: Diode Recovery Test Circuit & Waveform



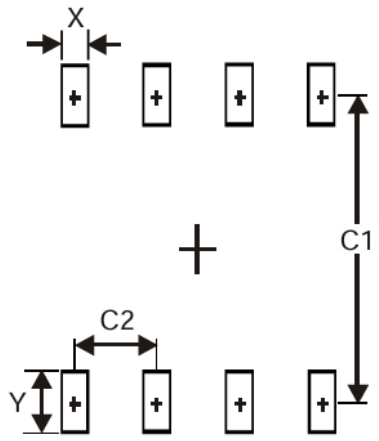
Package Mechanical Data

SOP-8



Dim	Min(mm)	Max(mm)
A	-	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	-	0.35
L	0.62	0.82
θ	0°	8°

suggested Pad Layout



Dimensions	Value(mm)
X	0.60
Y	1.55
C1	5.4
C2	1.27

Ordering information

Order Code	Package	V_{DS}(V)	I_D(A)	$R_{DS(ON)}$(mΩ)	
QN4430	SOP-8	30	20	V_{GS}=10V	<6
				V_{GS}=4.5V	<8.6