Product Specification

QN4485

40V P-Channel MOSFET

FEATURES

- -40V, -20A

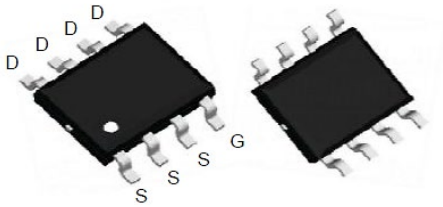
  $R_{DS(ON)}$ < 14.3mΩ @ V_{GS} = -10V

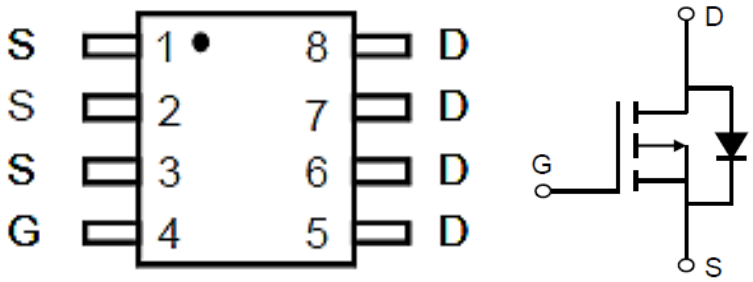
  $R_{DS(ON)}$ < 22mΩ @ V_{GS} = -4.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free

Applications

- Load Switch
- PWM Application
- Power Management

Pin Description





NO.	Symbol	Description
1	S	SOURCE
2	S	SOURCE
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		-40	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(1)		-60	A
P_D	Power Dissipation	T_A = 25℃	3.5	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		36	℃/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	-40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-40V, V_{GS}=0V	-	-	-1	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	-1.0	-1.7	-2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance(2)	V_{GS}=-10V, I_D=-12A	-	8	14.3	mΩ
		V_{GS}=-4.5V, I_D=-10A	-	11	22	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-20V, V_{GS}=0V,f=1.0MHz	-	3800	-	pF
C_{oss}	Output Capacitance		-	329	-	pF
C_{rss}	Reverse Transfer Capacitance		-	289	-	pF
Q_g	Total Gate Charge	V_{DS}=-20V, I_D=-12A,V_{GS}=-10V	-	42	-	nC
Q_{gs}	Gate-Source Charge		-	7.3	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	8.5	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}= -20V,I_D= -12A, V_{GS}=-10V,R_{GEN}=2.5Ω	-	10	-	ns
t_r	Turn-on Rise Time		-	21	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	53	-	ns
t_f	Turn-off Fall Time		-	29	-	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		-	-	-60	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V,I_S= -12A	-	-0.8	-1.2	V
trr	Reverse Recovery Time	V_{GS}=0V, I_S= -12A, di/dt=100A/us	-	39	-	ns
Qrr	Reverse Recovery Charge		-	42	-	nC

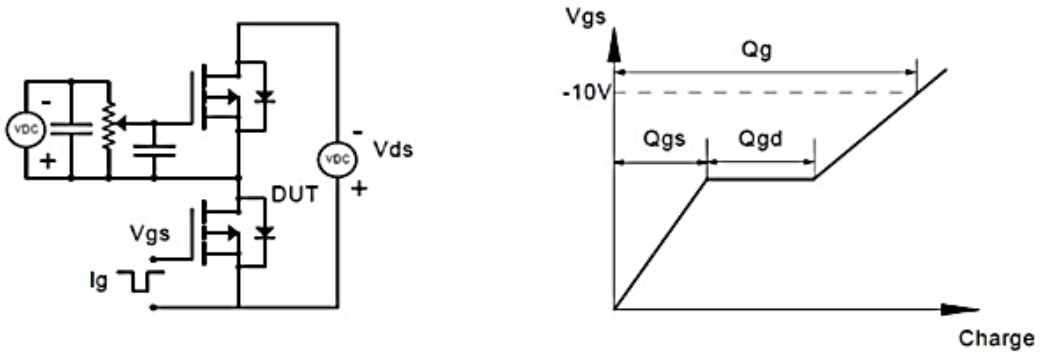
Notes:

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

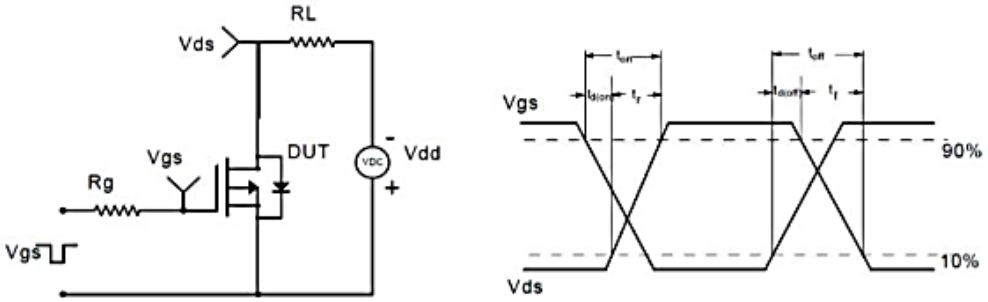
2. Pulse Test: Pulse Width≤300us, Duty Cycle≤2%

Test Circuit

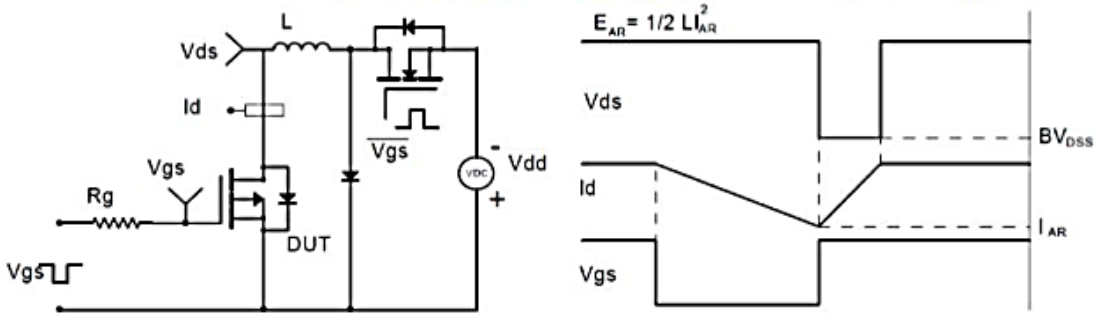
Gate Charge Test Circuit & Waveform



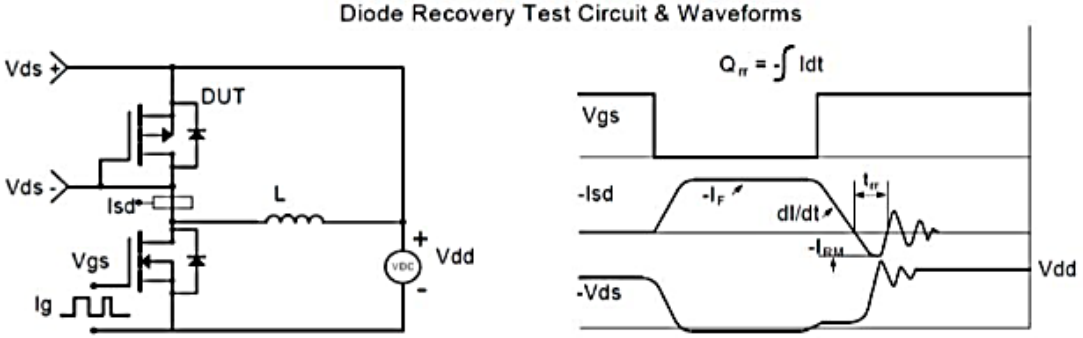
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

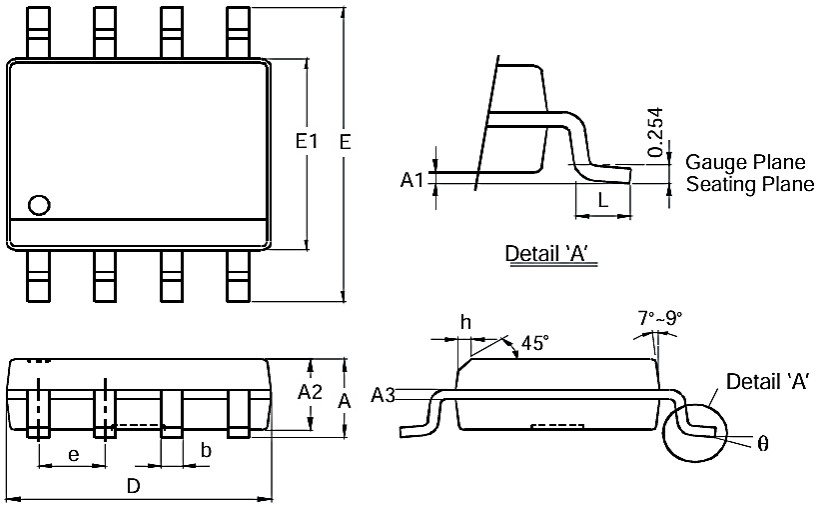


Diode Recovery Test Circuit & Waveforms



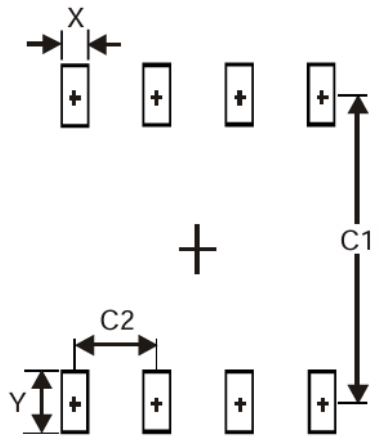
Package Mechanical Data

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)	
QN4485	SOP-8	-40	-20	V_{GS}=-10V	< 14.3
				V_{GS}=-4.5V	< 22