Product Specification

QND50N06AX

60V N-Channel MOSFET

FEATURES

- 60V, 50A

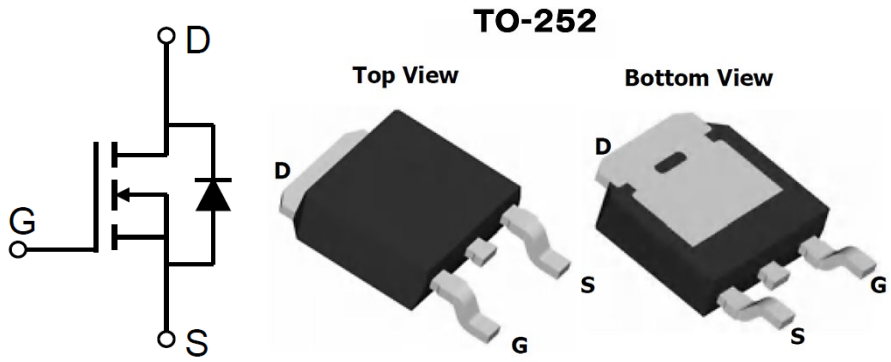
  $R_{DS(ON)}$ Typ = 12.5mΩ @ V_{GS} = 10V

  $R_{DS(ON)}$ Typ = 15.5mΩ @ V_{GS} = 4.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge

Applications

- Load Switch
- PWM Application
- Power Management

Pin Description



NO.	Symbol	Description
1	G	GATE
2	D	DRAIN
3	S	SOURCE

Absolute Maximum Ratings

(@ T_A = 25℃ unless otherwise specified)

Symbol	Parameter		Value	Units
V_{DS}	Drain-to-Source Voltage		60	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_A=25℃	50	A
		T_A=100℃	30	
I_{DM}	Pulsed Drain Current (1)		200	A
E_{AS}	Single Pulsed Avalanche Energy (2)		56	mJ
P_D	Power Dissipation	T_A = 25℃	73.5	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.7	℃/W
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150	℃

Electrical Characteristics

(T_J = 25℃ unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D=250uA,V_{GS}=0V	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V,V_{GS}=0V	-	-	1.0	uA
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=250uA	1	1.4	2	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(4)	V_{GS}=10V,I_D=20A	-	12.5	19.4	mΩ
		V_{GS}=4.5V,I_D=10A	-	15.5	25.0	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=25V, f=1MHz	-	1492	-	pF
C_{oss}	Output Capacitance		-	90	-	pF
C_{rss}	Reverse Transfer Capacitance		-	82	-	pF
Q_g	Total Gate Charge	V_{GS}=0~10V V_{DS}=30V, I_D =30A	-	38	-	nC
Q_{gs}	Gate Source Charge		-	7	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	10	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS}=10V, V_{DD}=30V I_D=30A , R_{GEN}=1.8Ω	-	10	-	ns
t_r	Turn-On Rise Time		-	66	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	28	-	ns
t_f	Turn-Off Fall Time		-	90	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	50	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	200	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=20 A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F=30A, di/dt=100A/us	-	13	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	9	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. E_{AS} condition: Starting T_J=25℃, V_{DD}=30V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=15A
3. Pulse Test: Pulse Width≤300us, Duty Cycle≤0.5%.

Test Circuit

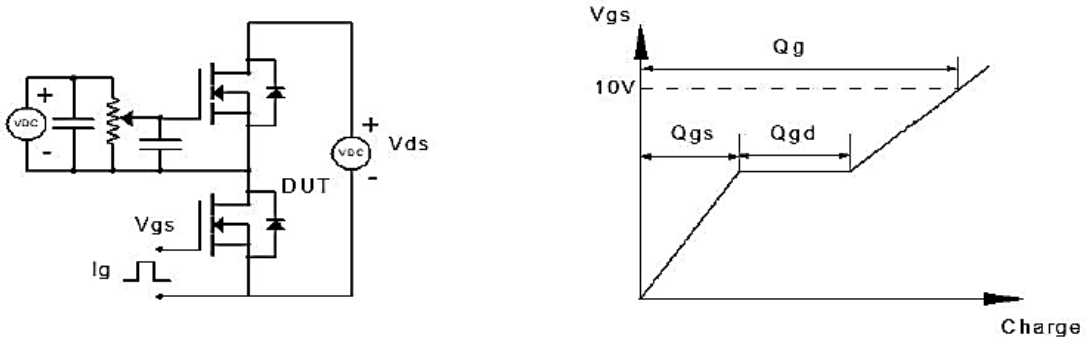


Figure 1: Gate Charge Test Circuit & Waveform

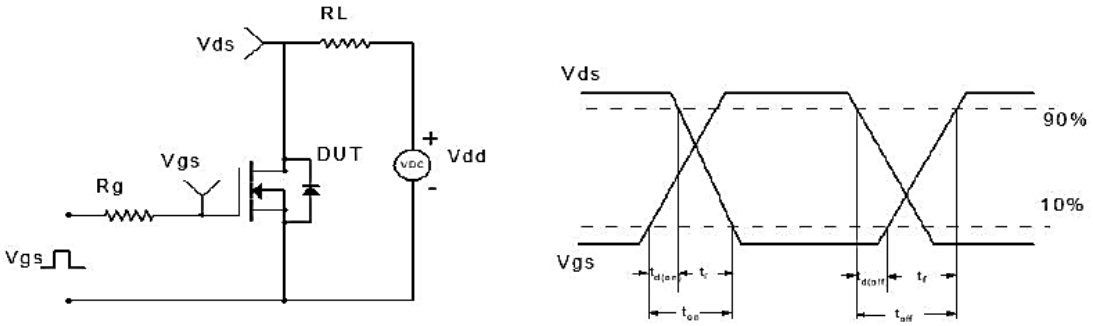


Figure 2: Resistive Switching Test Circuit & Waveform

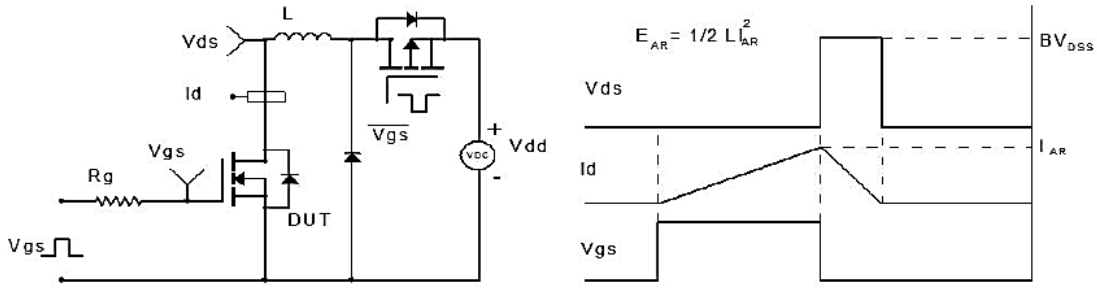


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

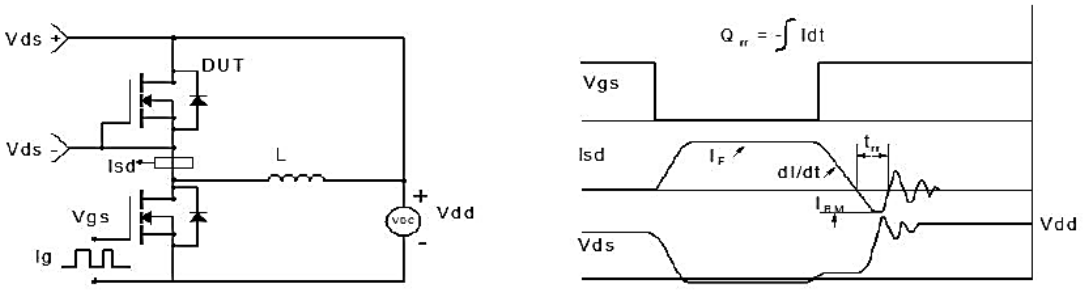
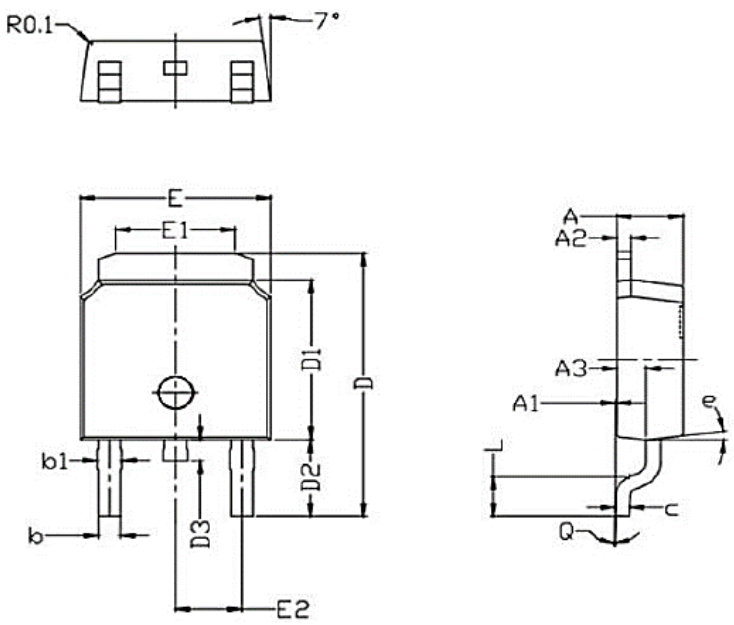


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(TO-252-3L)



COMMON DIMENSION(MM)			
PKG	TO-252-3L		
Symbot	MIN	MON	MAX
A	2.250	2.300	2.400
A1	0.010	0.060	0.150
A2	0.500	0.508	0.550
A3	0.960	1.010	1.060
b	0.740	0.760	0.800
b1	0.880	0.900	0.950
c	0.500	0.508	0.550
D	9.800	10.025	10.350
D1	6.050	6.100	6.180
D2	2.850	2.900	2.950
D3	0.700	0.800	2.900
E	6.550	6.600	6.700
E1	4.050	4.130	4.200
E2	2.250	2.286	2.300
L	1.400	1.500	1.600
e		7.000	
Q	0°	2°	5°

Ordering information

Order Code	Package	V_{DS}(V)	I_D(A)	$R_{DS(ON)}$(m Ω)	
QND50N06AX	TO-252	60	50	V_{GS}=10V	12.5
				V_{GS}=4.5V	15.5