



**DESCRIPTION**

The AM022NS20HT is available in the TO-220 Package.

BVDSS	RDS(ON)	ID
200V	22mΩ	60A

**APPLICATIONS**

- Load Switch
- PWM Application
- Power Management

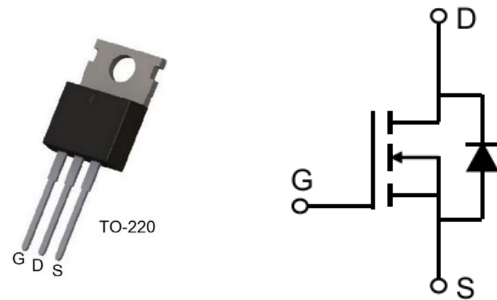
**ORDERING INFORMATION**

Package Type	Part Number	
TO-220 SPQ: 50pcs /Tube	T3	AM022NS20HT3VU
Note	V: Halogen free Package U: Tube Package	
AiT provides all RoHS products		

**FEATURES**

- 200V, 60A
- $R_{DS(ON)Typ.} = 22m\Omega @ V_{GS} = 10V$
- Advanced Split Gate Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge

**PIN DESCRIPTION**



Pin#	Symbol	Function
1	G	Gate
2	D	Drain
3	S	Source

**ABSOLUTE MAXIMUM RATINGS**

T<sub>J</sub>=25°C, unless otherwise Noted

V <sub>DS</sub> , Drain-to-Source Voltage	200V	
V <sub>GS</sub> , Gate-to-Source Voltage	±20V	
I <sub>D</sub> , Continuous Drain Current	T <sub>C</sub> = 25°C	60A
	T <sub>C</sub> = 100°C	36A
I <sub>DM</sub> , Pulsed Drain Current <sup>(1)</sup>	240A	
E <sub>AS</sub> , Single Pulse Avalanche Energy <sup>(2)</sup>	605mJ	
P <sub>D</sub> , Power Dissipation	T <sub>C</sub> = 25°C	176W
R <sub>θJC</sub> , Thermal Resistance, Junction to Case	0.71°C/W	
T <sub>STG</sub> , Storage Temperature Range	-55°C ~ +150°C	
T <sub>J</sub> , Junction Temperature Range	-55°C ~ +150°C	

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

(1) Repetitive Rating: pulse width limited by maximum junction temperature.

(2) E<sub>AS</sub> condition: Starting T<sub>J</sub>=25°C, V<sub>DD</sub>=20V, V<sub>G</sub>=10V, R<sub>G</sub>=25ohm, L=0.5mH, I<sub>AS</sub>=17A

**ELECTRICAL CHARACTERISTICS**T<sub>C</sub> = 25°C, unless otherwise Noted

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	200	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =200V, V <sub>GS</sub> =0V	-	-	1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>On Characteristics</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	2.5	3.1	3.5	V
Static Drain-Source ON-Resistance *	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 30A	-	22	28.6	mΩ
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHZ	-	1293	-	pF
Output Capacitance	C <sub>oss</sub>		-	1890	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	50	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 100V , I <sub>D</sub> = 30V V <sub>GS</sub> =0V ~ 10V	-	45	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	15	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	13	-	
<b>Switching Characteristics</b>						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =100V, R <sub>GEN</sub> =3Ω, V <sub>GS</sub> =10V, I <sub>D</sub> = 20A	-	28	-	ns
Turn-On Rise Time	t <sub>r</sub>		-	23	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	35	-	
Turn-Off Fall Time	t <sub>f</sub>		-	24	-	
<b>Reverse Diode</b>						
Maximum Continuous Drain to Source Diode Forward Current	I <sub>S</sub>	-	-	-	60	A
Maximum Pulsed Drain to Source Diode Forward Current	I <sub>SM</sub>	-	-	-	240	A
Drain to Source Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =30A, V <sub>GS</sub> =0V	-	-	1.2	V
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 30A	-	120	-	ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	di/dt = 100A/us	-	400	-	nC

\* Pulse test: Pulse width ≤ 300μs, Duty Cycle ≤ 2%.



## TEST CIRCUIT

Fig 1. Gate Charge Test Circuit & Waveform

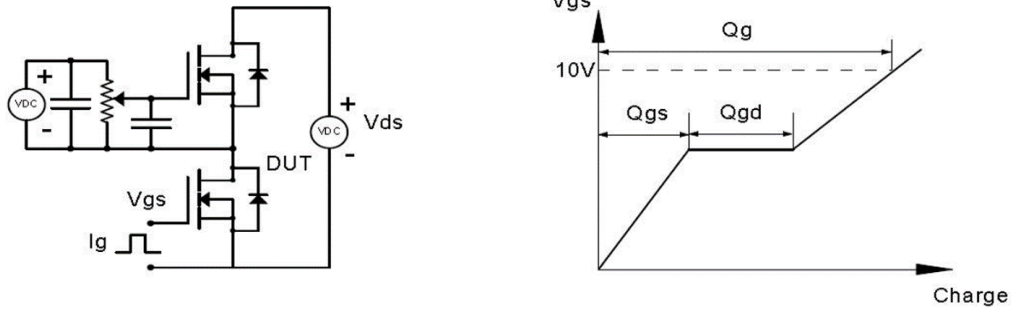


Fig 2. Resistive Switching Test Circuit & Waveforms

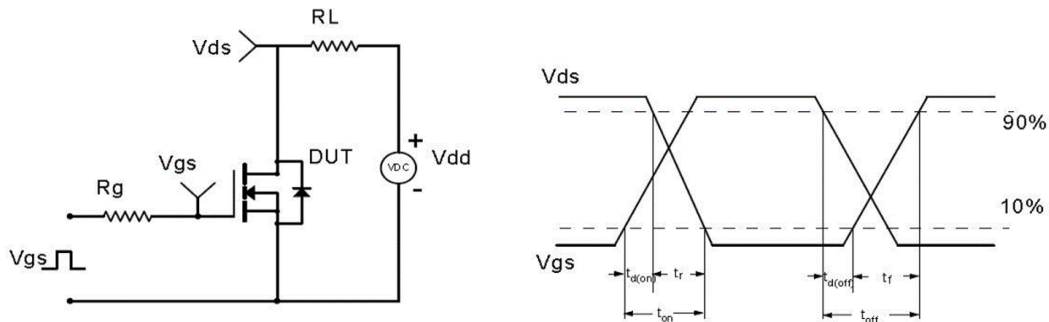


Fig 3. Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

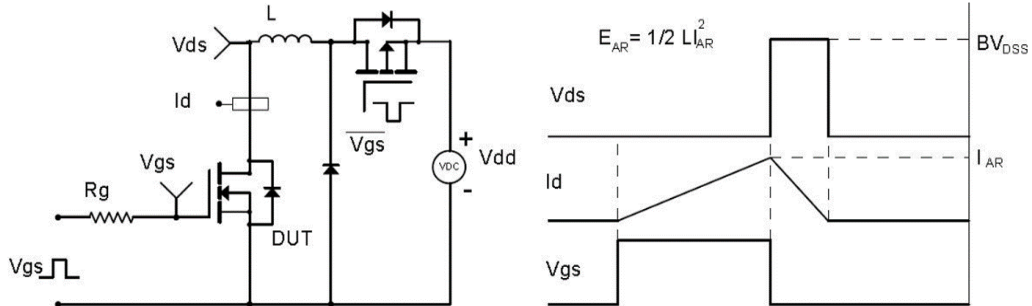
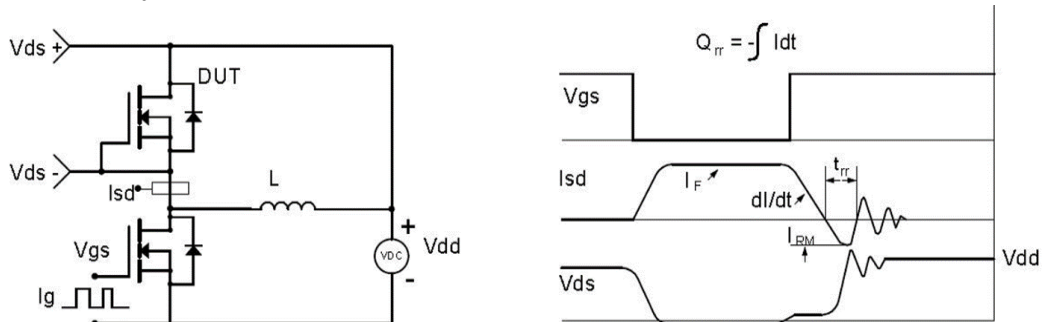


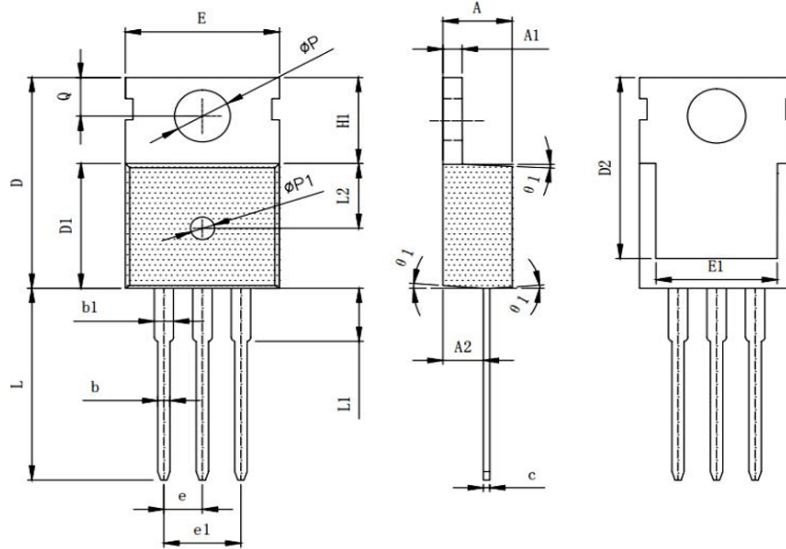
Fig 4. Diode Recovery Test Circuit & Waveforms





**PACKAGE INFORMATION**

Dimension in TO-220(Unit: mm)



Symbol	Millimeter	
	Min.	Max.
A	4.400	4.600
A1	1.250	1.350
A2	2.300	2.500
b	0.700	0.900
b1	1.250	1.450
c	0.400	0.600
D	15.500	16.100
D1	9.100	9.300
D2	12.730	12.930
e	2.540 BSC.	
e1	5.080 BSC.	
E	9.700	10.200
E1	7.600	8.400
H1	6.300	6.800
L	12.750	13.500
L1	-	3.100
L2	4.300	4.900
Q	2.700	2.900
φP	3.500	3.700
φP1	1.400	1.600
θ1	2°	6°



## **IMPORTANT NOTICE**

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