Wuxi Unigroup Microelectronics Co.,Ltd

800V N-Channel MOSFET

Description

800V N-Channel MOSFET

VDMOSFET is a double-diffusion device which the current flows is vertically, and is a voltage-controlled device. Under the control of the appropriate gate voltage, the semiconductor surface is inverted, forming a conductive channel and an appropriate amount of current flows between Drain and Source. Compared with bipolar transistor, its switching speed and switching loss are small. High input impedance, low driving power, good frequency characteristics, In particular, it has a negative temperature coefficient.

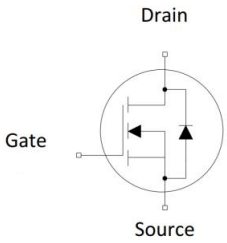
Features

- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

Applications

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction(PFC)

TO-220F



RoHS

Device Marking and Package Information

Device	Package	Marking
TMA7N80H	TO-220F	A7N80H

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted			
Parameter	**Symbol**	**Values**	**Unit**
Drain-Source Voltage (V_{GS} = 0V)	V_{DSS}	800	V
Continuous Drain Current	I_D	7	A
Pulsed Drain Current (note1)	I_{DM}	28	A
Gate-Source Voltage	V_{GSS}	±30	V
Single Pulse Avalanche Energy (note2)	E_{AS}	156.8	mJ
Avalanche Current (note1)	I_{AR}	5.6	A
Repetitive Avalanche Energy (note1)	E_{AR}	147	mJ
Power Dissipation For TO-220F	P_D	25	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	ºC

Thermal Resistance For TO-220F			
Parameter	**Symbol**	**Value**	**Unit**
Thermal Resistance, Junction-to-Case	R_{thJC}	5	ºC/W
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62.5	

Electrical Characteristics T_J = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	800	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 800V, V_{GS} = 0V, T_J = 25ºC	--	--	1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS} = ±30V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	3.0	--	4.0	V
Drain-SourceOn-State-Resistance (Note3)	$R_{DS(on)}$	V_{GS} = 10V, I_D = 3.5A	--	1.35	1.6	Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1.0MHz	--	950	--	pF
Output Capacitance	C_{oss}		--	190	--	
Reverse Transfer Capacitance	C_{rss}		--	27	--	
Total Gate Charge	Q_g	V_{DD} = 640V, I_D = 7A, V_{GS} = 10V	--	49	--	nC
Gate-Source Charge	Q_{gs}		--	6	--	
Gate-Drain Charge	Q_{gd}		--	26	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 400V, I_D = 7A, R_G = 25 Ω	--	43	--	ns
Turn-on Rise Time	t_r		--	28	--	
Turn-off Delay Time	$t_{d(off)}$		--	244	--	
Turn-off Fall Time	t_f		--	54	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25 ºC	--	--	7	A
Pulsed Diode Forward Current	I_{SM}		--	--	28	
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 3.5A, V_{GS} = 0V	--	--	1.4	V
Reverse Recovery Time	t_{rr}	V_{GS} = 0V, I_S = 7A, di_F/dt = 100A /μs	--	1090	--	ns
Reverse Recovery Charge	Q_{rr}		--	1.7	--	μC

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. L=10mH, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C
3. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

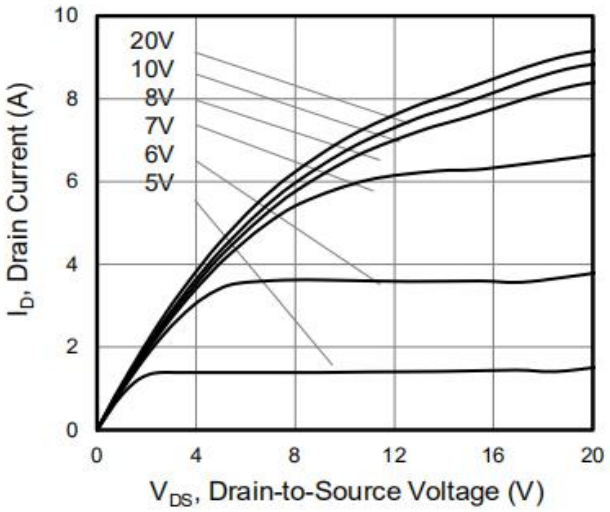


Figure 2. Body Diode Forward Voltage

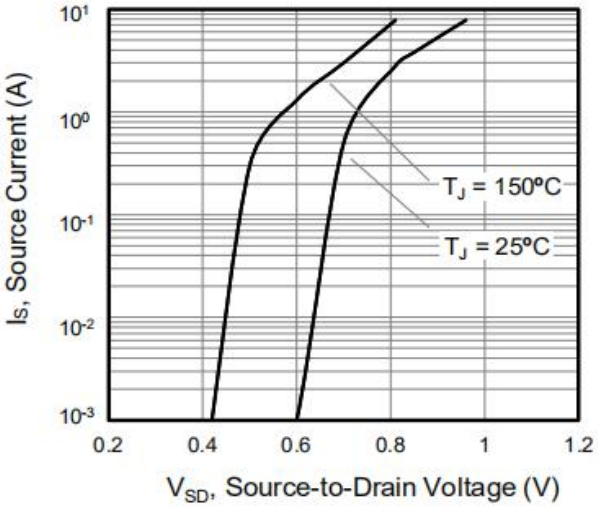


Figure 3. Drain Current vs. Temperature

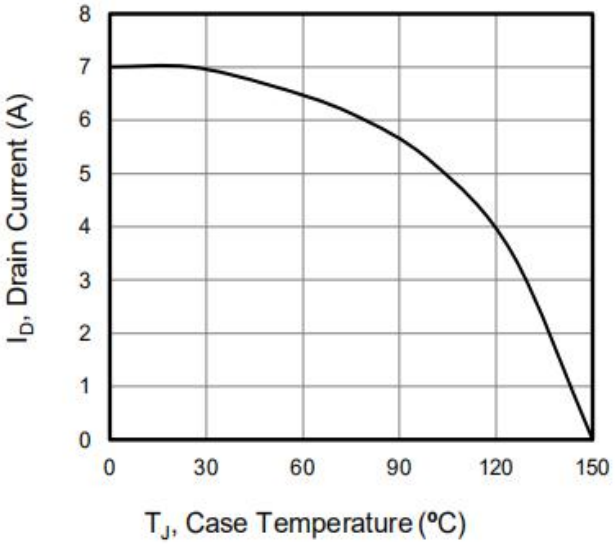


Figure 4. BV_{DSS} Variation vs. Temperature

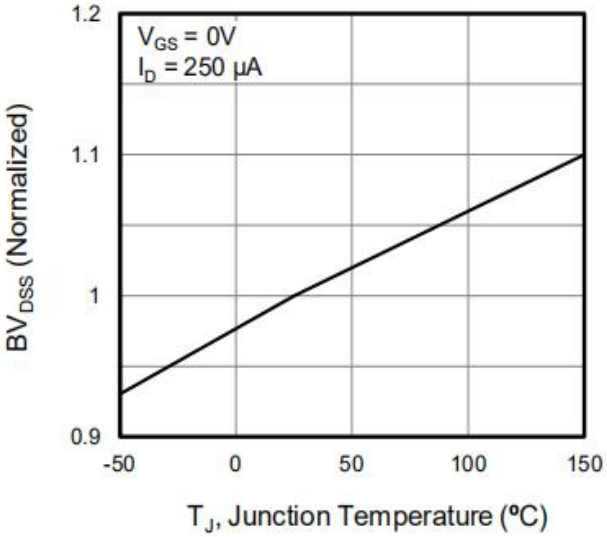


Figure 5. Transfer Characteristics

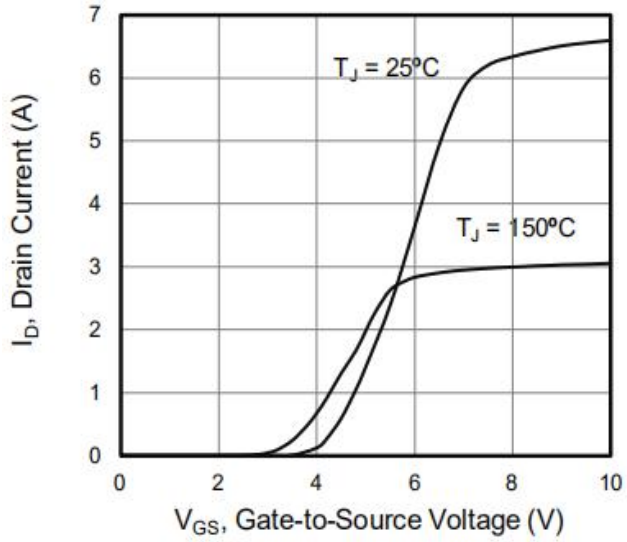
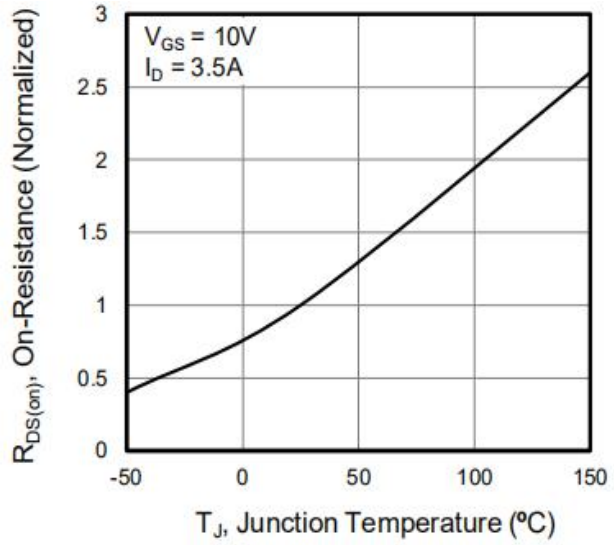


Figure 6. On-Resistance vs. Temperature



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Capacitance

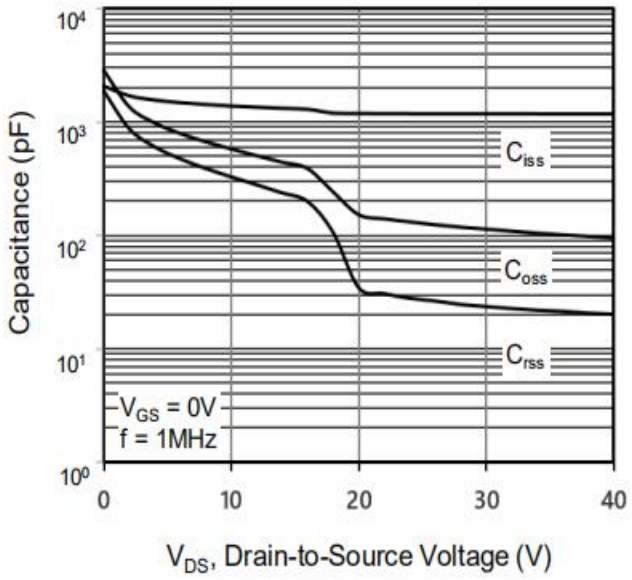


Figure 8. Gate Charge

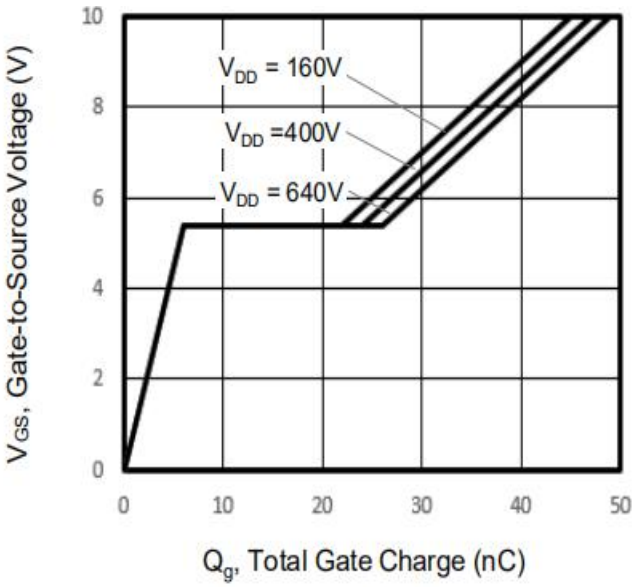


Figure A：Gate Charge Test Circuit and Waveform

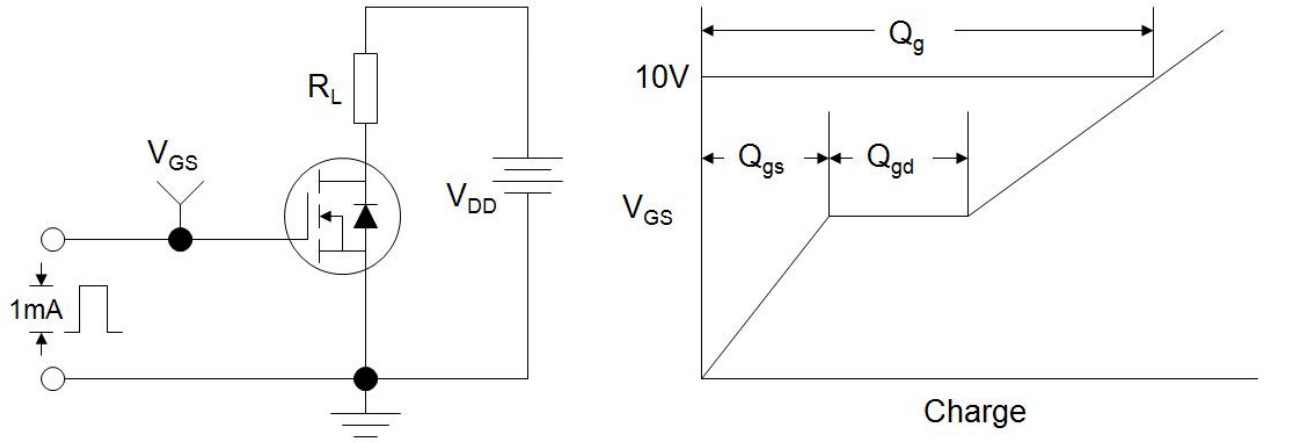


Figure B：Resistive Switching Test Circuit and Waveform

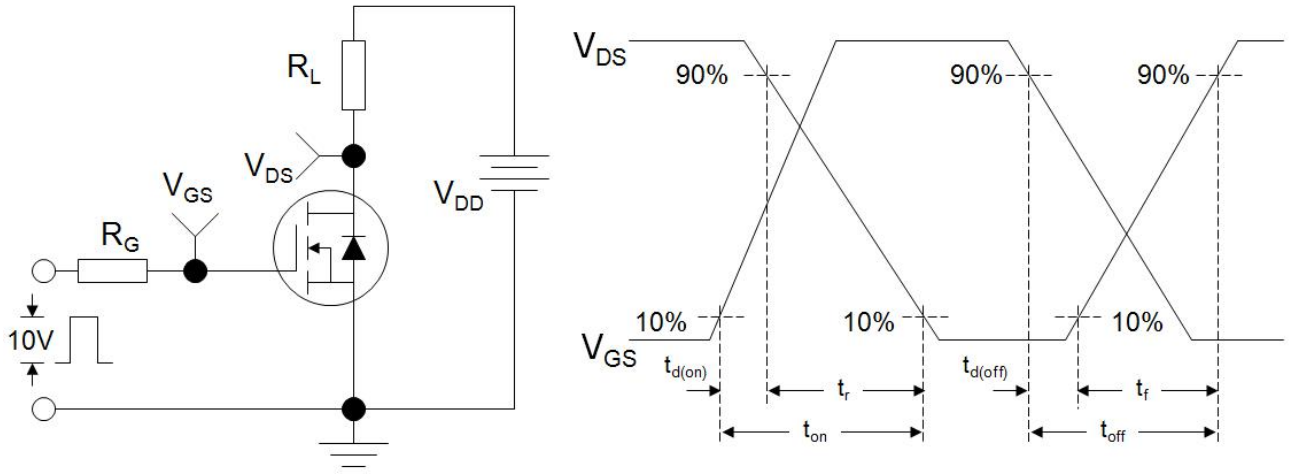
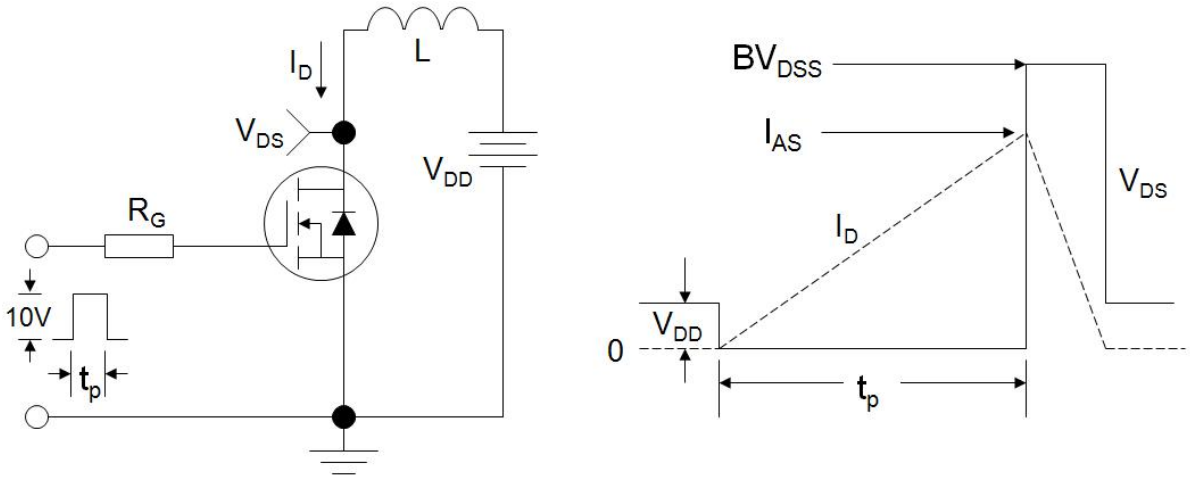
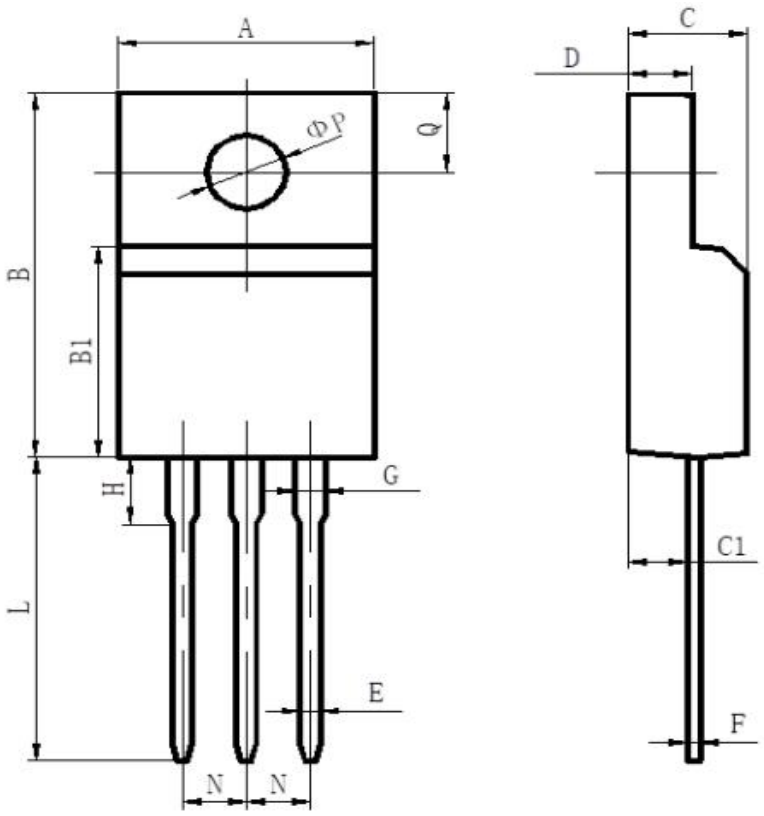


Figure C：Unclamped Inductive Switching Test Circuit and Waveform



TO-220F



项目	规范(mm)	
	MIN	MAX
A	9.70	10.30
B	15.50	16.10
B1	8.99	9.39
C	4.40	4.80
C1	2.15	2.55
D	2.50	2.90
E	0.70	0.90
F	0.40	0.60
G	1.12	1.42
H	3.40	3.80
L	12.6	13.6
N	2.34	2.74
Q	3.15	3.55
Φ P	3.00	3.30

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