

General Description

The D30N20 uses advanced technology and design to provide excellent $R_{DS(on)}$. It can be used in a wide variety of applications.

Features

- Low on-resistance
- Low reverse transfer capacitance
- 100% avalanche tested

Mechanical Data

- Case:TO-220 Package

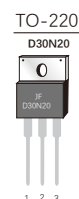
Application

- Power switching application
- Adapter and charger

Ordering Information

Part No.	Package Type	Package	Quality(box)
D30N20	TO-220	Tube	1000

Product Summary			
V_{DS}	$R_{DS(on)}$ Typ.	I_D	Q_g (Typ)
200V	0.082 Ω @ 10V,15A	30A	41nc



Block Diagram

Pin Definition:

1. Gate
2. Drain
3. Source

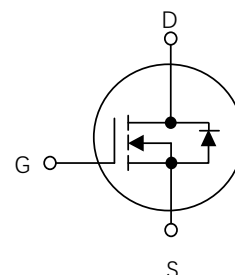


Table1 Absolute Maximum Ratings (Tc=25°C, unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current Tc=25°C	I_D	30	A
Pulsed Drain Current (Note 1)	I_{DM}	120	A
Single Pulse Avalanche Energy(Note 2)	E_{AS}	160	mJ
Power Dissipation Tc=25°C	P_D	140	W
Operating Junction and Storage Temperature	T_J/T_{STG}	-55~+175	°C

Table 2. Thermal Characteristics

Parameter	Symbol	Typ.	Unit
Thermal resistance Junction to Case	$R_{\theta JC}$	1.07	$^{\circ}\text{C/W}$

Table 3. Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

Parameter		Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V ,I _b =250μA	200	-	-	V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =200V ,V _{GS} =0V	-	-	1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =30V ,V _{DS} =0V	-	-	100	nA
	Reverse		V _{GS} = -30V ,V _{DS} =0V	-	-	-100	nA
On Characteristics(Note 3)							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} ,I _D =250μA	2.0	-	4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V ,I _D =15A	-	0.082	0.095	Ω
Dynamic Characteristics(Note 4)							
Input Capacitance		C _{ISS}	V _{DS} =25V ,V _{GS} =0V ,f=1MHz	-	2200	-	pF
Output Capacitance		C _{OSS}		-	275	-	pF
Reverse Transfer Capacitance		C _{RSS}		-	16	-	pF
Switching Characteristics (Note 4)							
Turn-On Delay Time		td(on)	V _{DD} =100V ,I _D =30A R _G =6.2Ω ,R _L =3.2Ω	-		-	ns
Turn-On Rise Time		t _r		-		-	ns
Turn-Off Delay Time		td(off)		-		-	ns
Turn-Off Fall Time		t _f		-		-	ns
Total Gate Charge		Q _G	V _{DS} =160V ,I _D =15A, V _{GS} =10V	-	-	41	nC
Gate-Source Charge		Q _{GS}		-	-	10	nC
Gate-Drain Charge		Q _{GD}		-	-	12	nC
Drain-Source Diode Characteristics and Maximum Ratings							
Drain-Source Diode Forward Voltage		V _{SD}	V _{GS} =0V , I _S =30A	-	-	1.25	V
Maximum Continuous Drain-Source Diode Forward Current		I _S		-	-	30	A
Reverse Recovery Time		t _{rr}	V _{GS} =0V , I _F =30A	-	170	-	ns
Reverse Recovery Charge		Q _{RR}	dI _F /dt=100A/μs(Note 4)	-	1.1	-	μC

Notes: 1 Repetitive Rating:Pulse width limited by maximum junction temperature

2 $V_{DS}=50V$, starting $T_J=25^{\circ}\text{C}$, $L=0.5\text{mH}$, $R_G=25\Omega$, $I_{AS}=25A$ 3 Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

4 Guaranteed by design, not subject to production

Typical Characteristics Diagrams

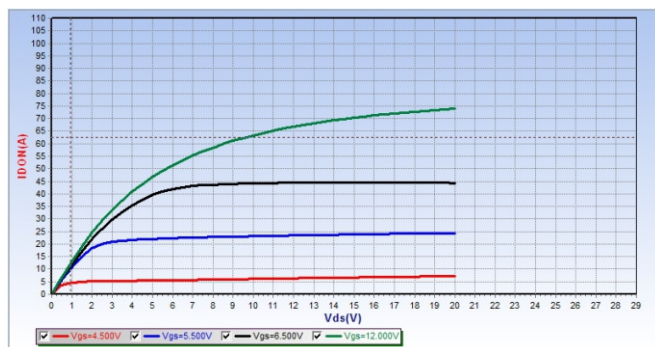


Fig1. Output Characteristics

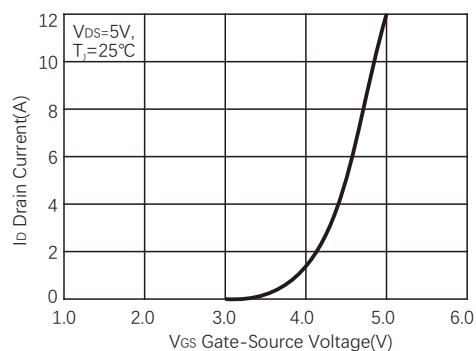


Fig2. Transfer Characteristics

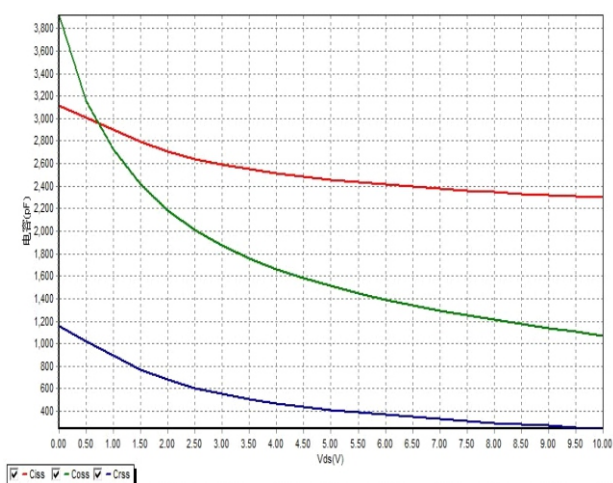


Fig3. Capacitance Characteristics

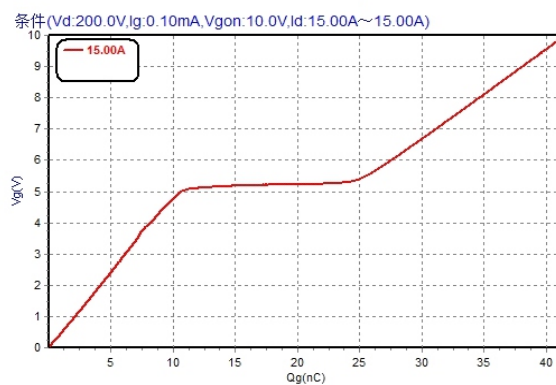


Fig4. Gate Charge

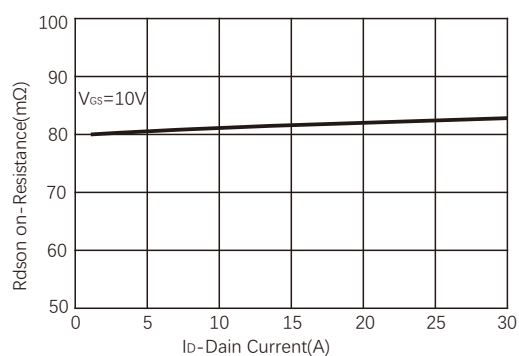


Fig5. Drain-Source on Resistance

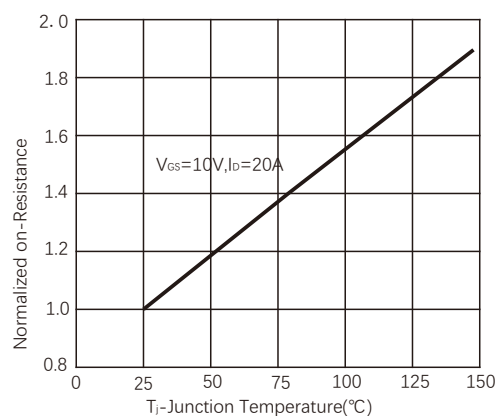


Fig6. Drain-Source on Resistance

Typical Characteristics Diagrams

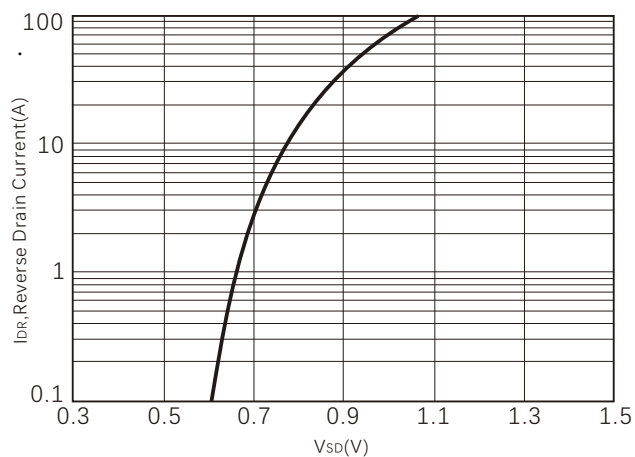


Fig 7.Source-Drain Diode Forward Voltage

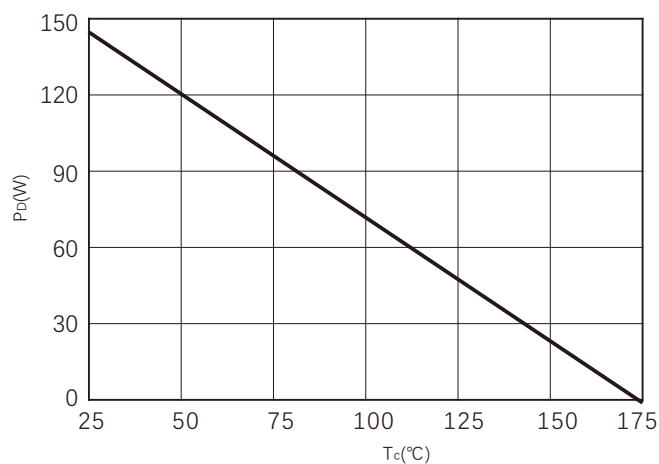


Fig.8 Power dissipation

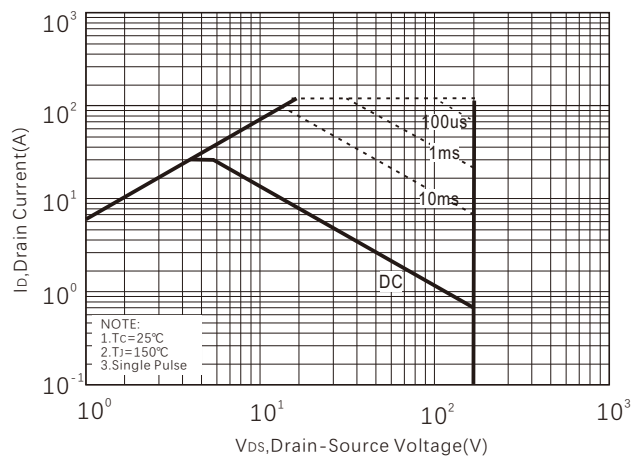


Fig9. Safe operating area

Fig10.Normalized Maximum Transient Thermal Impedance

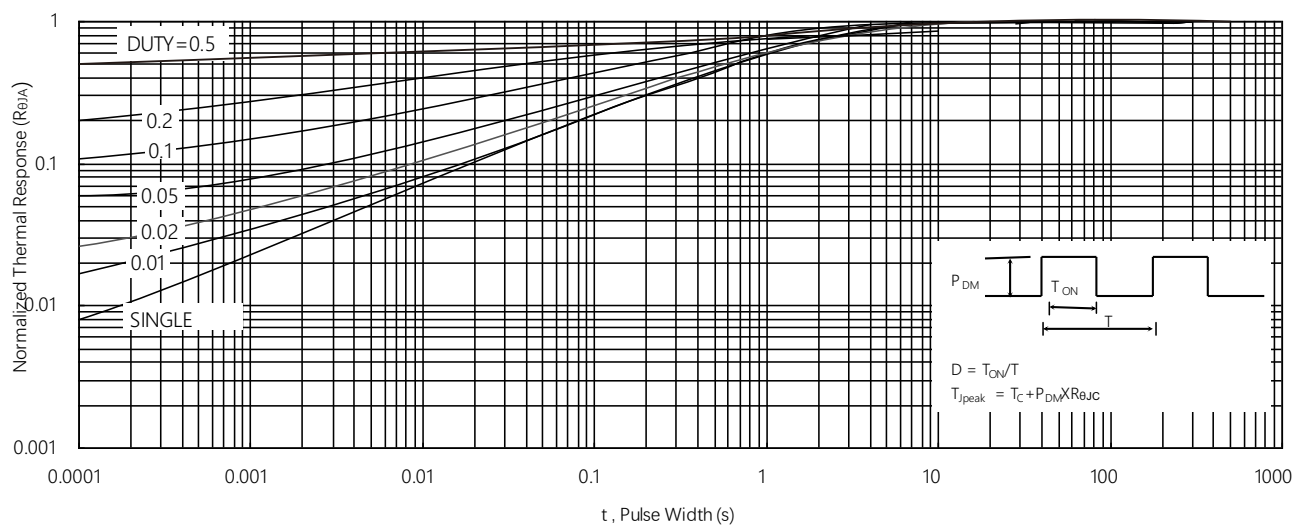
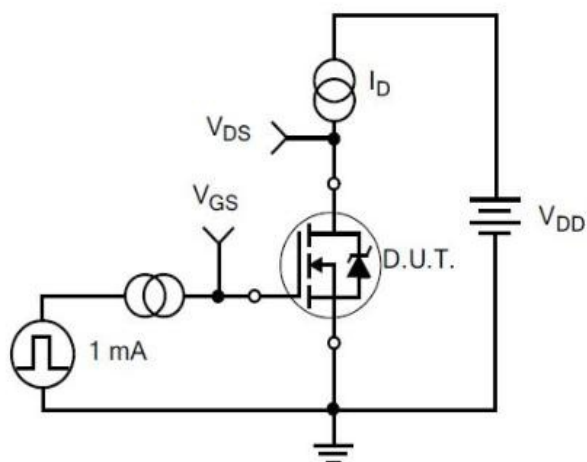
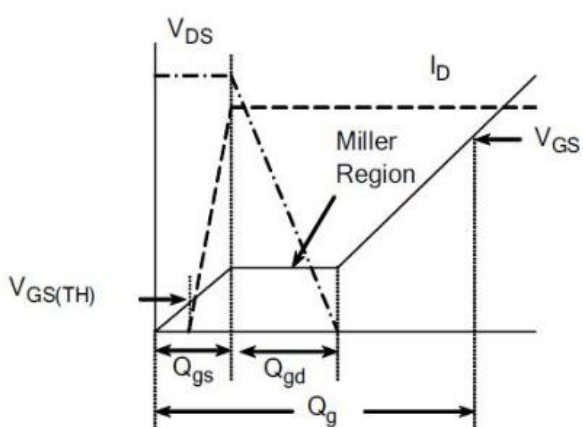


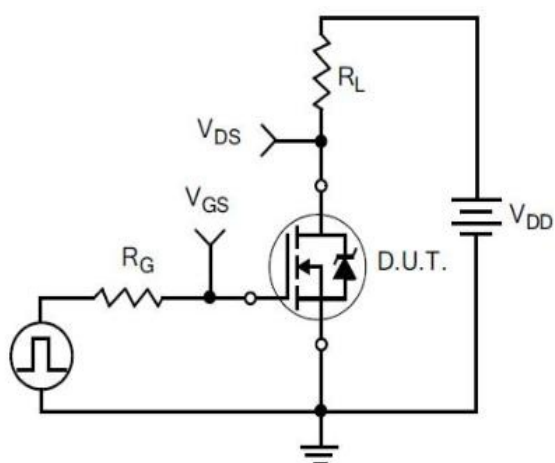
Fig.11 Typical Test Circuit



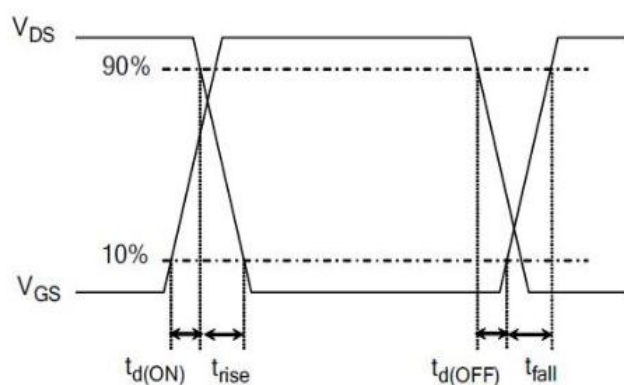
1) Gate Charge Test Circuit



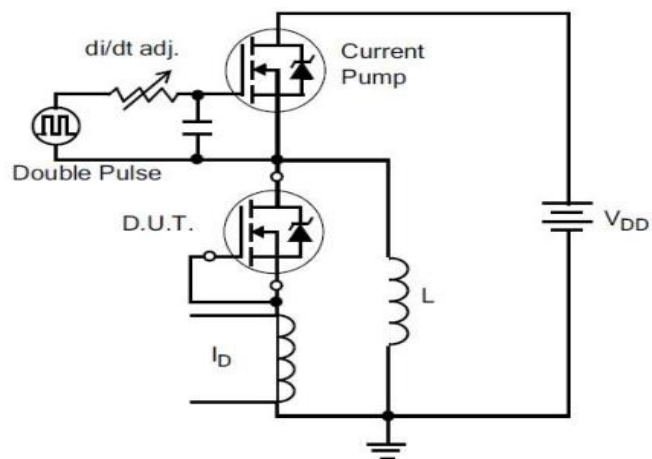
2) Gate Charge Waveform



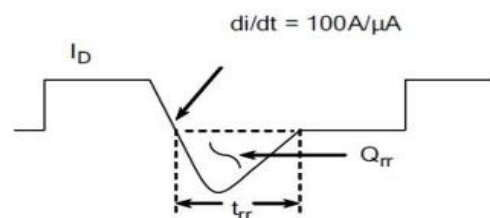
3) Resistive Switching Test Circuit



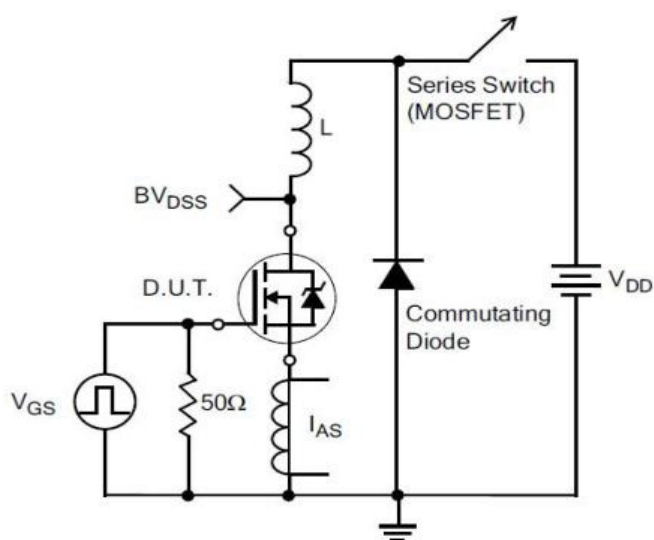
4) Resistive Switching Waveforms



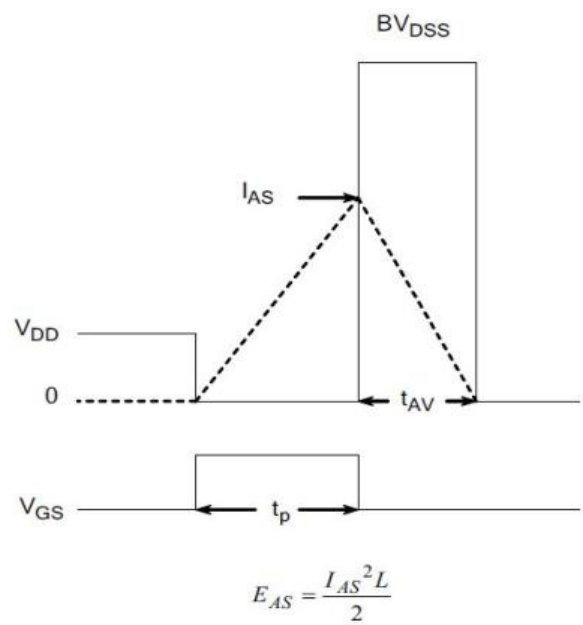
5) Diode Reverse Recovery Test Circuit



6) Diode Reverse Recovery Waveform



7) . Unclamped Inductive Switching Test Circuit



8) Unclamped Inductive Switching Waveforms

Product Names Rules

XXXNEXXX-XXX

Process Type:
VDMOS:default
Super junction:SJ
Low Voltage trench:D

Rdson Code
2Ω :2D0
9.5mΩ :9M5

Rated Current Code
With 1-2 Digital,
For Ex ample:
4A:4,
10A:10,
0.8A:08

Package Code
TO-220:Default
ITO-220:F
TO-262:E
TO-263:D
TO-252:M
TO-251:N
TO-263-7L:D7

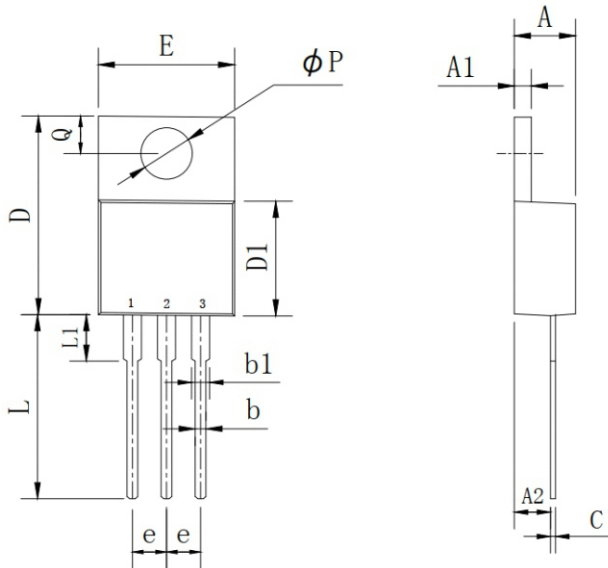
Channel Code
N channel:N
P channel:P

Rated Voltage Code
With 2 Digital,For Example:
600V:60
60V:06

Special Function Code
G-S ESD Protection:E
No Protection:Default

Dimensions

TO-220



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	4.25	4.87	0.167	0.192
A1	1.07	1.47	0.042	0.058
A2	2.03	2.92	0.080	0.115
b	0.51	1.11	0.020	0.044
b1	0.97	1.6	0.038	0.063
C	0.3	0.7	0.012	0.028
D	14.6	15.9	0.575	0.626
D1	8.04	9.3	0.317	0.366
E	9.57	10.57	0.377	0.416
e	2.34	2.74	0.092	0.108
L	12.58	14.3	0.495	0.563
L1	2.8	4.2	0.110	0.165
P	3.4	4.14	0.134	0.163
Q	2.45	3	0.096	0.118

Friendship Reminder

- JiNan JingHeng (hereinafter referred to as JH) reserves the right to make changes to this document and its products and specifications at anytime without notice.
- Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.
- JH makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does JH assume any liability for application assistance or customer product design.
- JH does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application.
- No license is granted by implication or otherwise under any intellectual property rights of JH.
- JH's products are not authorized for use as critical components in life support devices or systems without express written approval of JH.