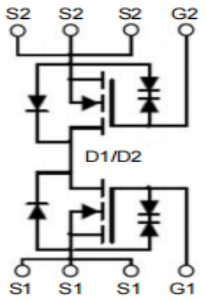
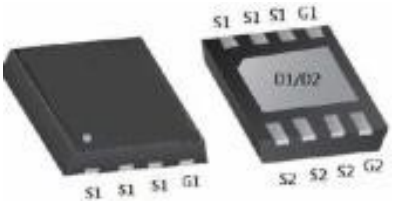
Feature



- 20V,10A
  $R_{DS(ON)}$ <7.8mΩ @V_{GS}=4.5V (TYP:6.3mΩ)
  $R_{DS(ON)}$ <12mΩ @V_{GS}=2.5V (TYP:8.0mΩ)
- Advanced Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- ESD>2KV

Application



- PWM applications
- Load Switch
- Power management

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
17N20EQD	AP17N20EQD	PDFN3X3-D	13 inch	-	5000

ABSOLUTE MAXIMUM RATINGS (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±10	V
Continuous Drain Current (T_c =25℃)	I_D	10	A
Pulsed Drain Current (1)	I_{DM}	40	A
Single Pulsed Avalanche Energy (2)	E_{AS}	6.25	mJ
Power Dissipation	P_D	50	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	2.5	℃/W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	50	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_J=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	20	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =20V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±10V, V_{DS} = 0V	-	-	±10	μA
Gate threshold voltage(3)	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	0.5	0.7	0.9	V
Drain-source on-resistance(3)	$R_{DS(on)}$	V_{GS} =4.5V, I_D =3A	-	6.3	7.8	mΩ
		V_{GS} =2.5V, I_D =2A	-	8.0	12	
Gate Resistance	R_g	V_{DS} =V_{GS} =0V, f =1MHz	-	3.6	-	Ω
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =20V, V_{GS} =0V, f =1MHz	-	823	-	pF
Output Capacitance	C_{oss}		-	159	-	
Reverse Transfer Capacitance	C_{rss}		-	145	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=20V, I_D=20A, V_{GS}=10V, R_G=10Ω	-	0.740	-	us
Turn-on rise time	t_r		-	0.448	-	
Turn-off delay time	$t_{d(off)}$		-	0.578	-	
Turn-off fall time	t_f		-	0.232	-	
Total Gate Charge	Qg	VDS=20V, ID=7A, VGS=4.5V	-	14.4	-	nC
Gate-Source Charge	Qgs		-	2.16	-	
Gate-Drain Charge	Qgd		-	4.4	-	
Reverse Recovery Chrage	Qrr	I_F=7A,di/dt=100A/us		5.8		nC
Reverse Recovery Time	Trr	I_F=7A,di/dt=100A/us		18		ns
Source-Drain Diode characteristics						
Diode Forward voltage(3)	V_{DS}	V_{GS} =0V, I_S=3A	-	-	1.2	V
Diode Forward current(4)	I_S		-	-	10	A

Notes:

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:T_J=25℃,V_{DD}=10V,R_G=25Ω,L=0.5mH
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board,t≤10 sec

Test Circuit

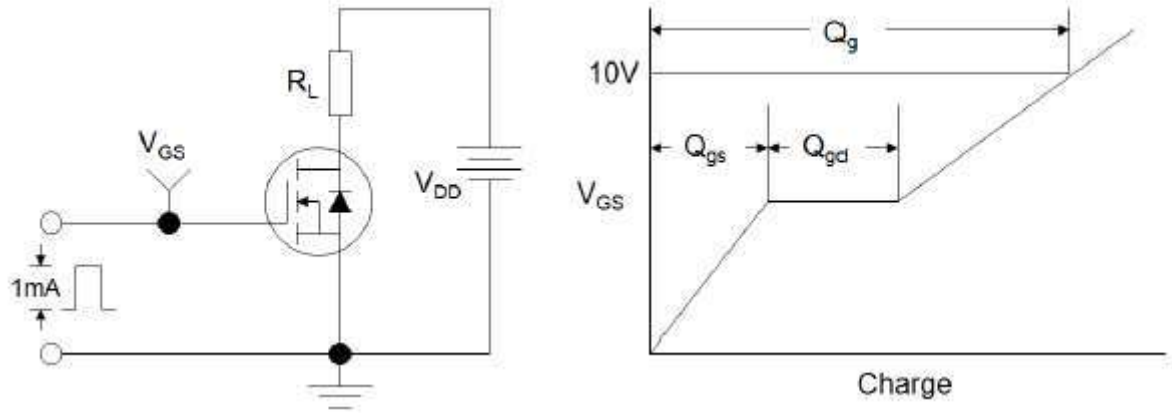


Figure1:Gate Charge Test Circuit & Waveform

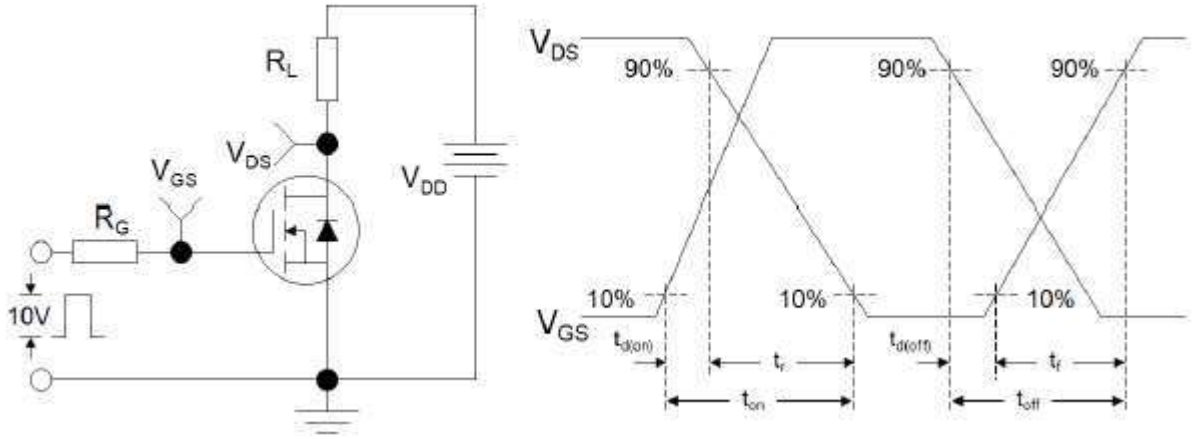


Figure 2: Resistive Switching Test Circuit & Waveforms

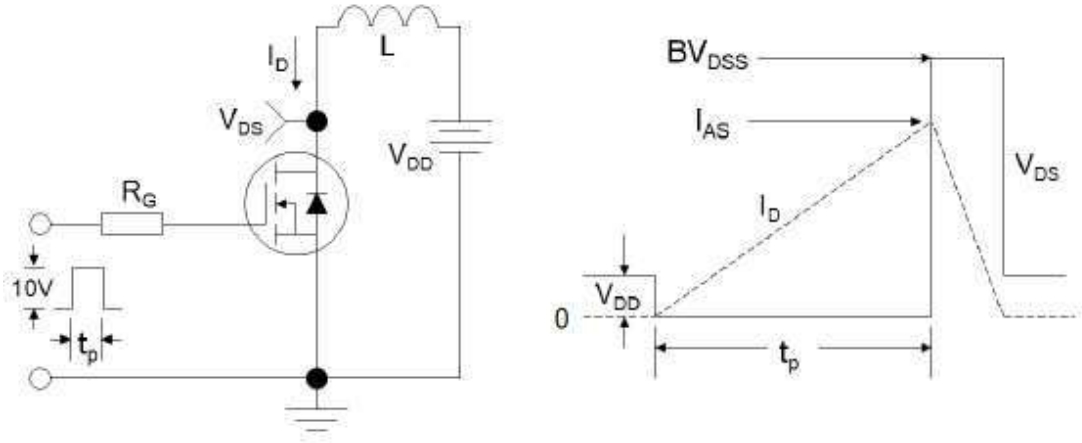


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

Electrical Characteristics Diagrams

Figure 1: Output Characteristics

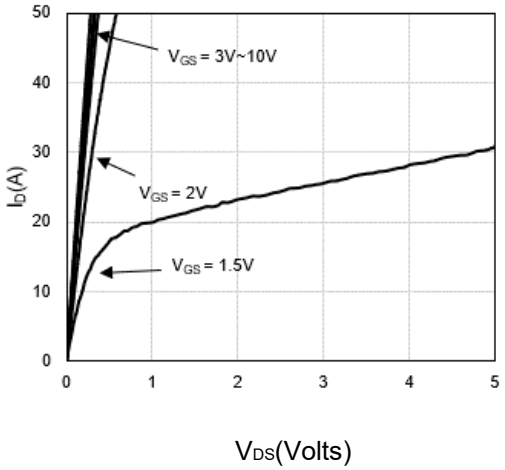


Figure 2: Transfer Characteristics

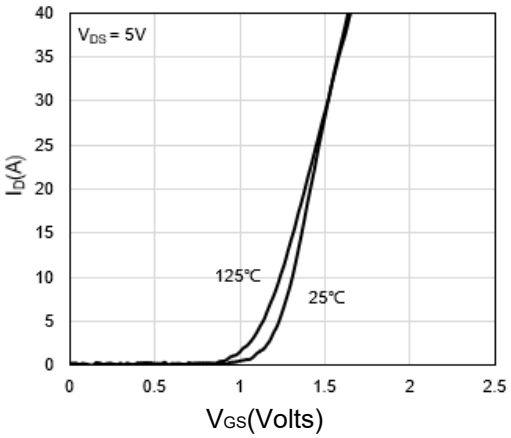


Figure 3: On-Resistance Variation vs. Drain Current

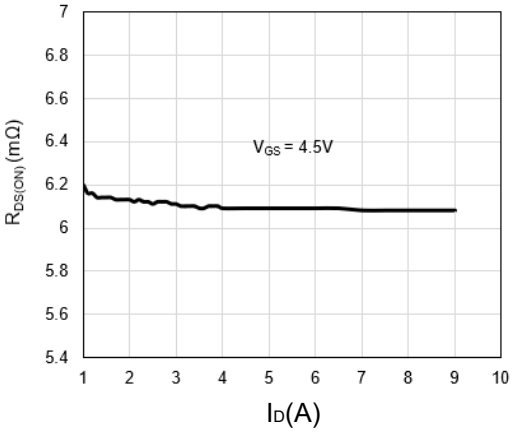


Figure 4: On-Resistance vs. Gate to Source Voltage

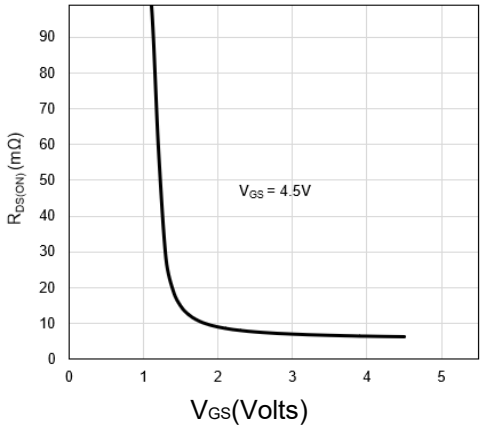


Figure 5: Capacitance Characteristics

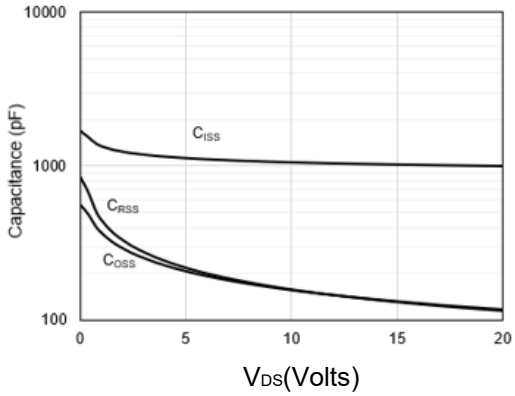
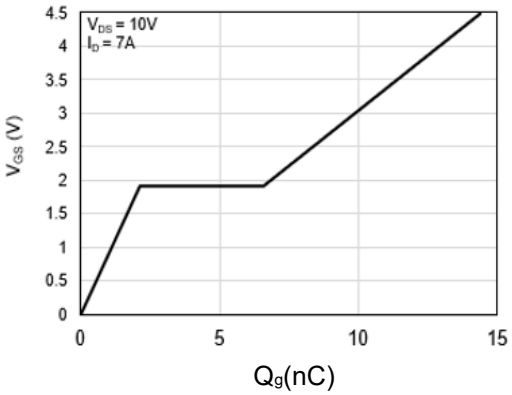


Figure 6: Gate Charge Characteristics



Electrical Characteristics Diagrams

Figure.7: Body-Diode Characteristics

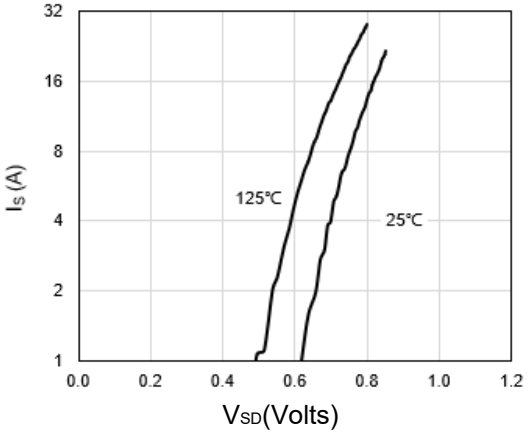


Figure.8: On-Resistance Variation vs Temperature

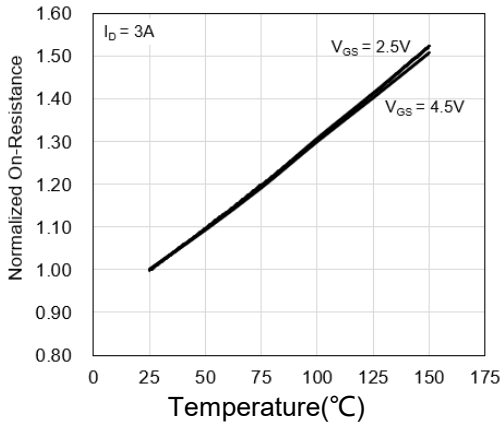


Figure.9: Power Dissipation

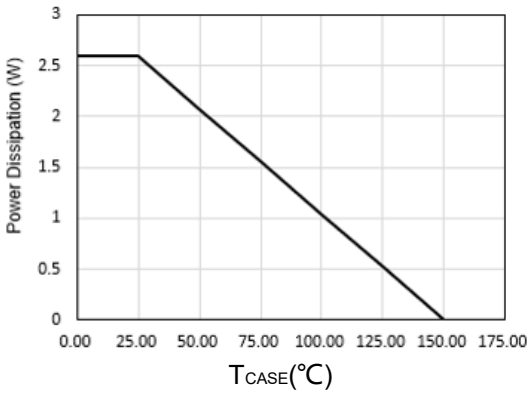
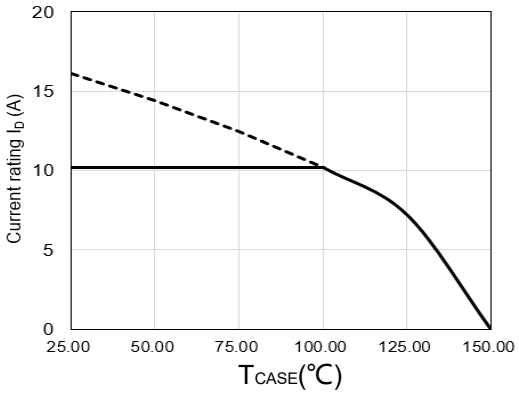


Figure.10: Drain Current Derating



Electrical Characteristics Diagrams

Fig.13 Safe Operating Area

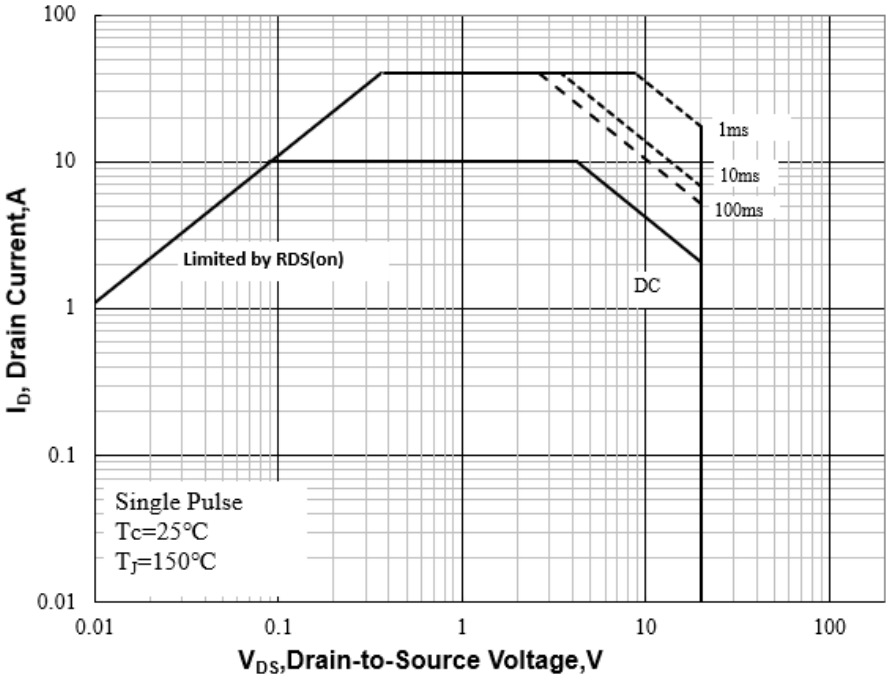
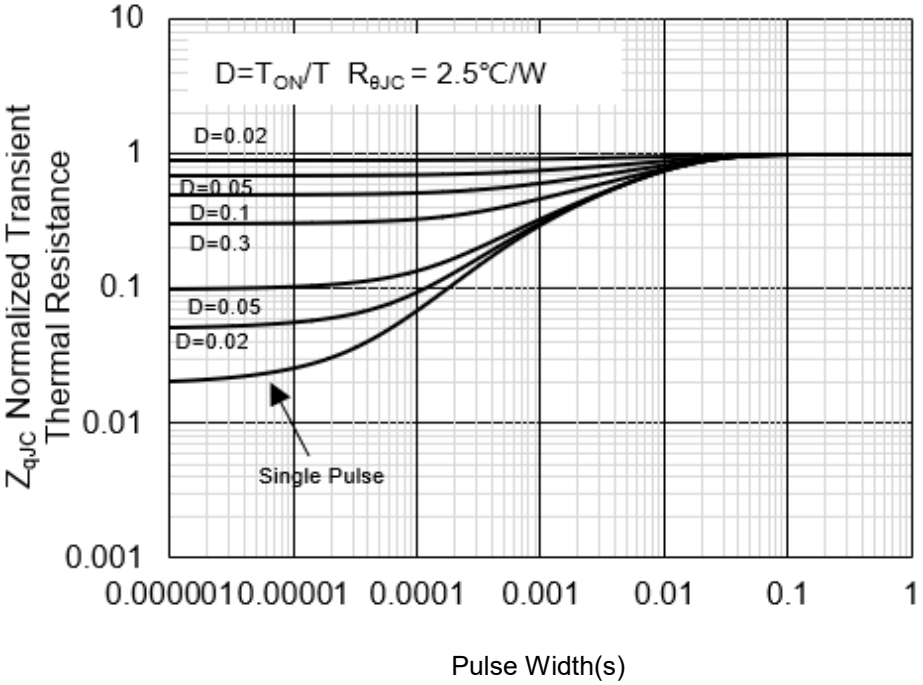
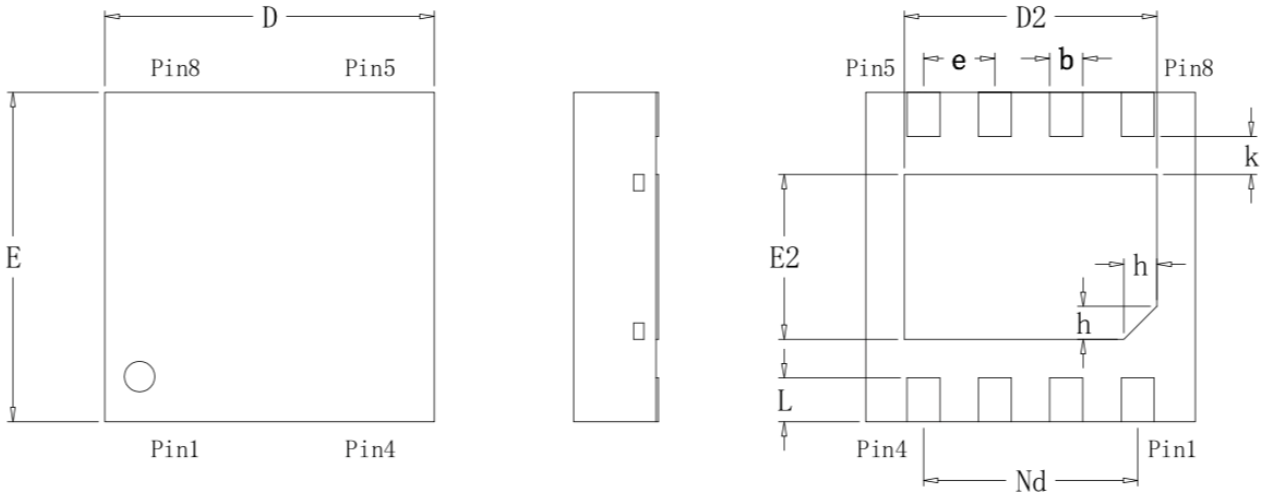


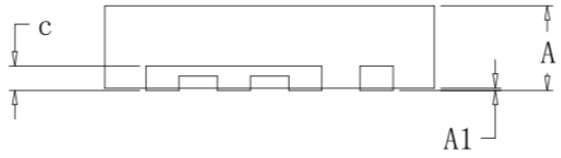
Fig. 14 Transient Thermal Response Curve



Package Information



Top View　　Side View　　Bottom View



Side View

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	--	0.02	0.05
b	0.25	0.30	0.35
c	0.203 REF		
D	2.90	3.00	3.10
D2	2.20	2.30	2.40
Nd	1.95 BSC		
e	0.65 BSC		
E	2.90	3.00	3.10
E2	1.40	1.50	1.60
h	0.25	0.30	0.35
k	0.30	0.35	0.40
L	0.35	0.40	0.45

Revision History

Revision	Release	Remark
V1.0	2023/12/20	Initial Release
V1.1	2024/08/20	Update ESD Value

Disclaimer

The information given in this document describes the independent performance of the product,but similar performance is not guaranteed under other working conditions,and cannot be guaranteed when installed with other products or equipment.To achieve the required performance of the product in actual scenarios,the customer should conduct a complete application test to assess the functionality of the product.

Allpower assumes no responsibility for equipment failures result from using products at values that exceed the ratings,operating conditions,or other parameters listed in the product specifications.

The product described in this specification is not applicable for aerospace or other applications which requires high reliability.Customers using or selling these products for use in medical,life-saving,or life-sustaining applications do so at their own risk and agree to fully indemnify.

Due to product or technical improvements,the information described or contained herein may be changed without prior notice.