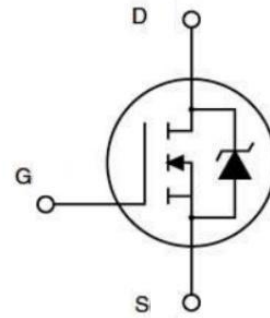


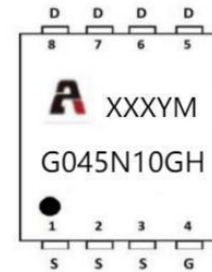
## Features

- 100V,120A  
 $R_{DS(on)} < 4.5m\Omega @ V_{GS}=10V$  TYP:3.8m $\Omega$
- Split Gate Trench Technology
- Extremely low switching loss
- Excellent stability and uniformity



## Applications

- High Frequency Switching
- Synchronous Rectification



**Marking and pin Assignment**

## Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
G045N10GH	APG045N10GH	PDFN5X6	-	-	5000

## ABSOLUTE MAXIMUM RATINGS ( $T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $T_c=25^\circ\text{C}$ ) <sup>(1)</sup>	$I_D$	120	A
Continuous Drain Current ( $T_c=100^\circ\text{C}$ )	$I_D$	76	A
Pulsed Drain Current <sup>(2,3)</sup>	$I_{DM}$	480	A
Drain Power Dissipation <sup>(1)</sup>	$P_D$	123	W
Single Pulsed Avalanche Energy ( $V_{DS}=50V, L=0.5mH$ )	$E_{AS}$	598	mJ
Thermal Resistance from Junction to Case <sup>(1)</sup>	$R_{\theta JC}$	1.02	$^\circ\text{C/W}$
Thermal Resistance from Junction to Ambient <sup>(1)</sup>	$R_{\theta JA}$	62	$^\circ\text{C/W}$
Junction Temperature	$T_J$	-55~ +150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55~ +150	$^\circ\text{C}$

**MOSFET ELECTRICAL CHARACTERISTICS(T<sub>J</sub>=25°C unless otherwise noted)**

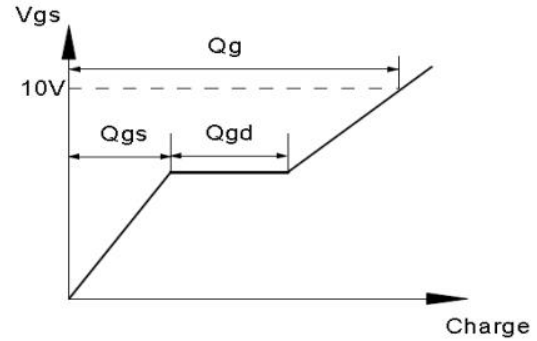
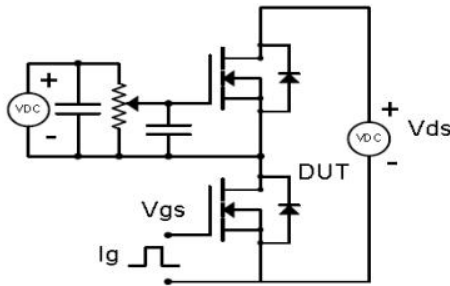
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	100	-	-	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> = 0V	-	-	1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> = 0V	-	-	±100	nA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2	3	4	V
Drain-source on-resistance <sup>(4)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =50A	-	3.8	4.5	mΩ
Forward transconductance	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =10A	-	31	-	S
<b>Dynamic characteristics<sup>(5)</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz	-	3310	-	pF
Output Capacitance	C <sub>oss</sub>		-	1001	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	18	-	
<b>Switching characteristics<sup>(5)</sup></b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =50V, I <sub>D</sub> =20A, R <sub>G</sub> =3Ω, V <sub>GS</sub> =10V	-	13.5	-	nS
Turn-on rise time	t <sub>r</sub>		-	15.7	-	
Turn-off delay time	t <sub>d(off)</sub>		-	28	-	
Turn-off fall time	t <sub>f</sub>		-	13.8	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =50V, I <sub>D</sub> =20A, V <sub>GS</sub> =10V	-	55	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	16.4	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	16.4	-	
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage <sup>(4)</sup>	V <sub>SD</sub>	T <sub>J</sub> =25°C, V <sub>GS</sub> =0V, I <sub>S</sub> =50A	-	-	1.2	V
Diode Forward current	I <sub>S</sub>	T <sub>C</sub> =25°C	-	-	120	A
Body Diode Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> =25°C, I <sub>F</sub> =20A, di/dt=100A/us	-	54.8	-	nS
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>		-	61.6	-	nC

**Notes:**

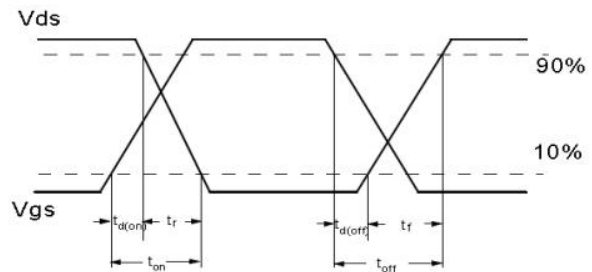
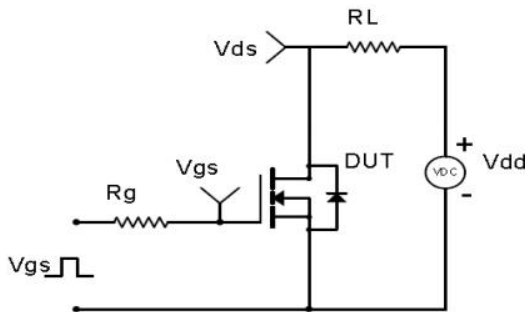
- 1) Surface Mounted on 1 in<sup>2</sup> pad area, t ≤ 10 sec
- 2) Pulse width ≤ 10μs, duty cycle ≤ 1 %
- 3) Limited by bonding wire
- 4) Pulse width ≤ 300 μs, duty cycle ≤ 2%
- 5) Guaranteed by design, not subject to production testing

**Test Circuit & Waveform**

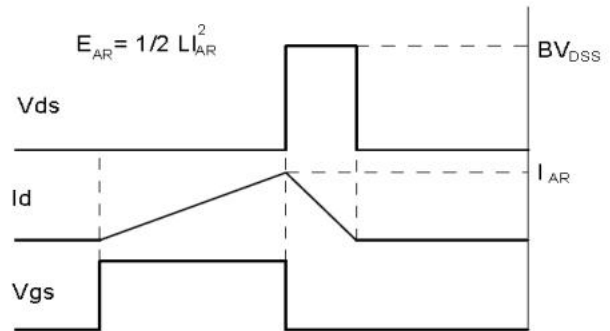
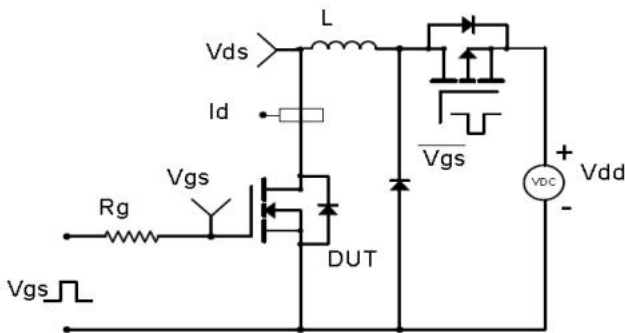
Gate Charge Test Circuit & Waveform



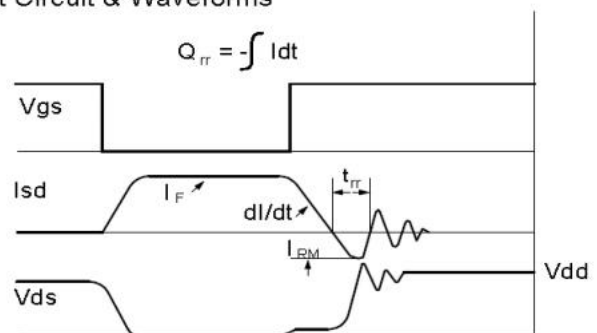
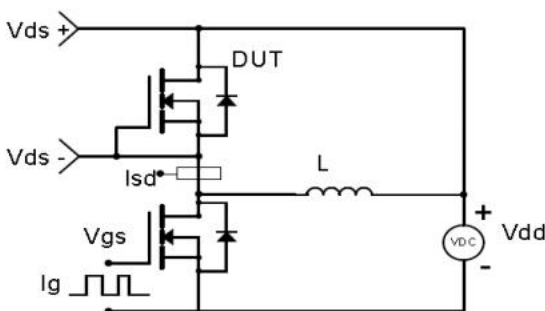
Resistive Switching Test Circuit & Waveforms



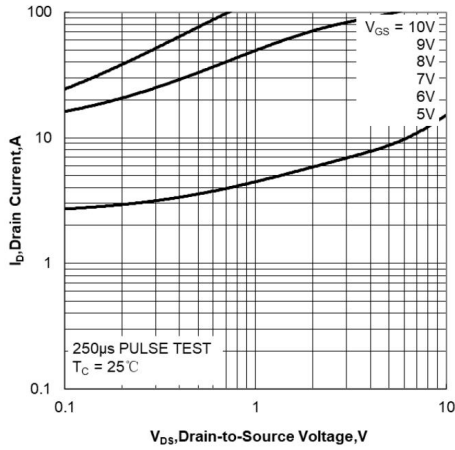
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



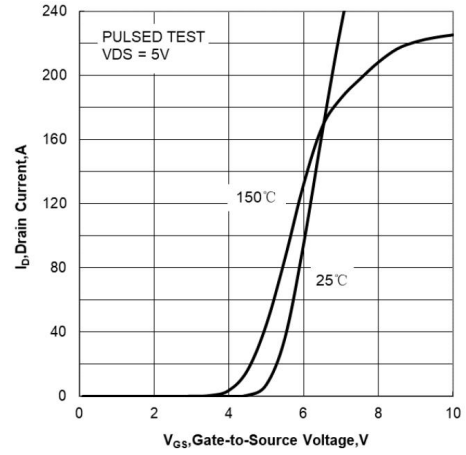
Diode Recovery Test Circuit & Waveforms



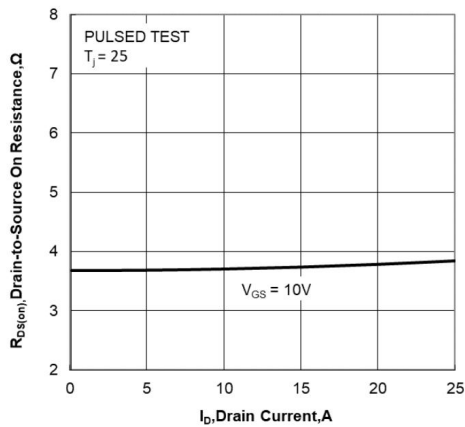
## Typical Characteristics



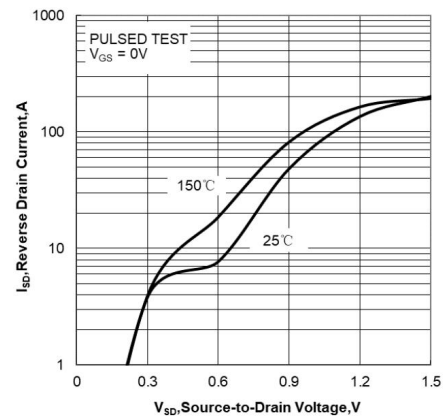
**Figure 1. Output Characteristics**



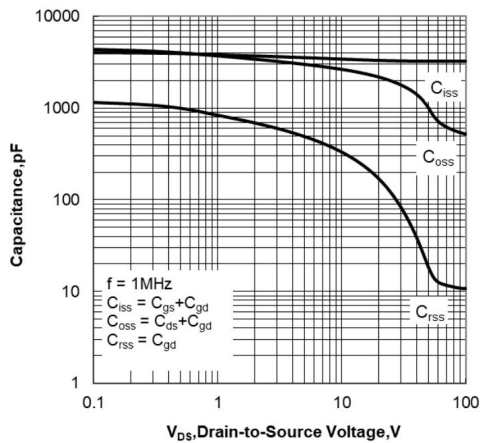
**Figure 2. Transfer Characteristics**



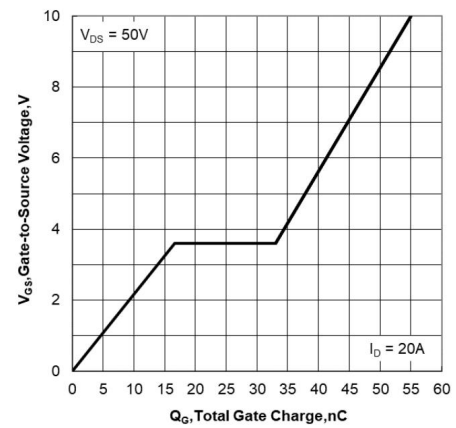
**Figure 3. Drain-to-Source On Resistance vs Drain Current**



**Figure 4. Body Diode Forward Voltage vs Source Current and Temperature**



**Figure 5. Capacitance Characteristics**



**Figure 6. Gate Charge Characteristics**

## Typical Characteristics

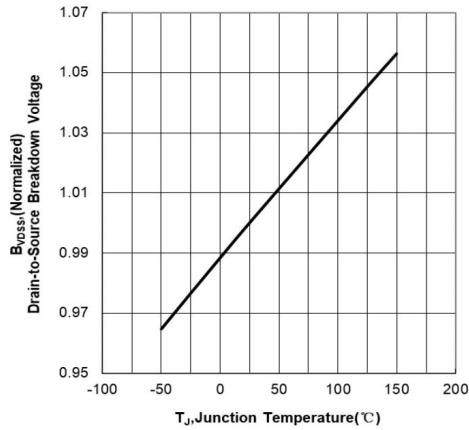


Figure 7. Normalized Breakdown Voltage vs Junction Temperature

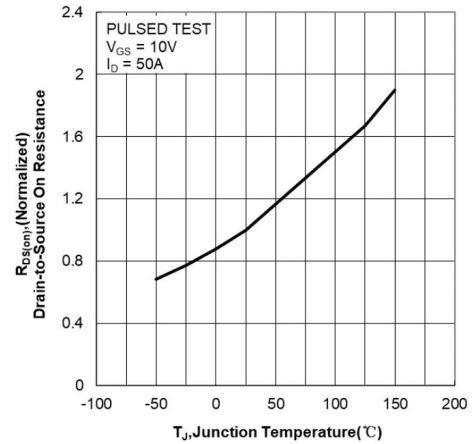


Figure 8. Normalized On Resistance vs Junction Temperature

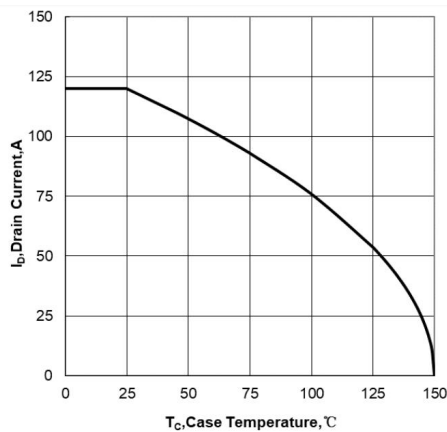


Figure 9. Maximum Continuous Drain Current vs Case Temperature

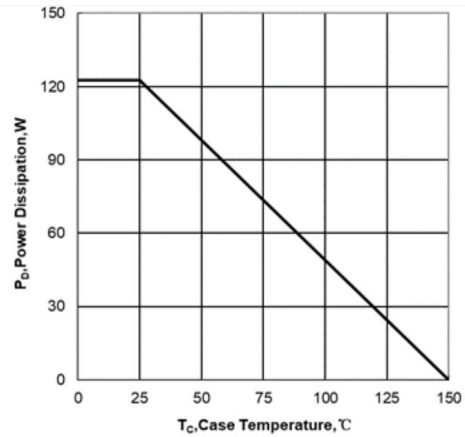


Figure 10. Maximum Power Dissipation vs Case Temperature

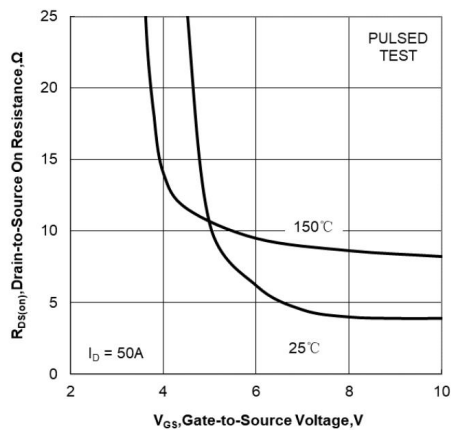


Figure 11. Drain-to-Source On Resistance vs Gate Voltage and Drain Current

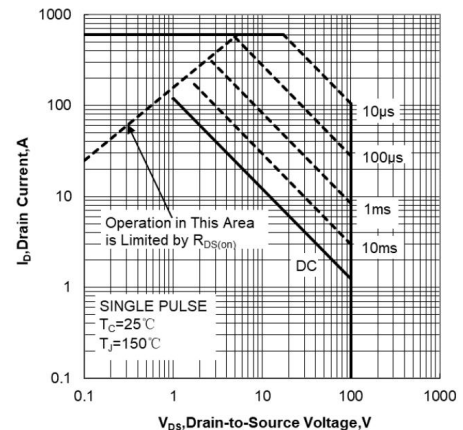


Figure 12. Maximum Safe Operating Area

## Typical Characteristics

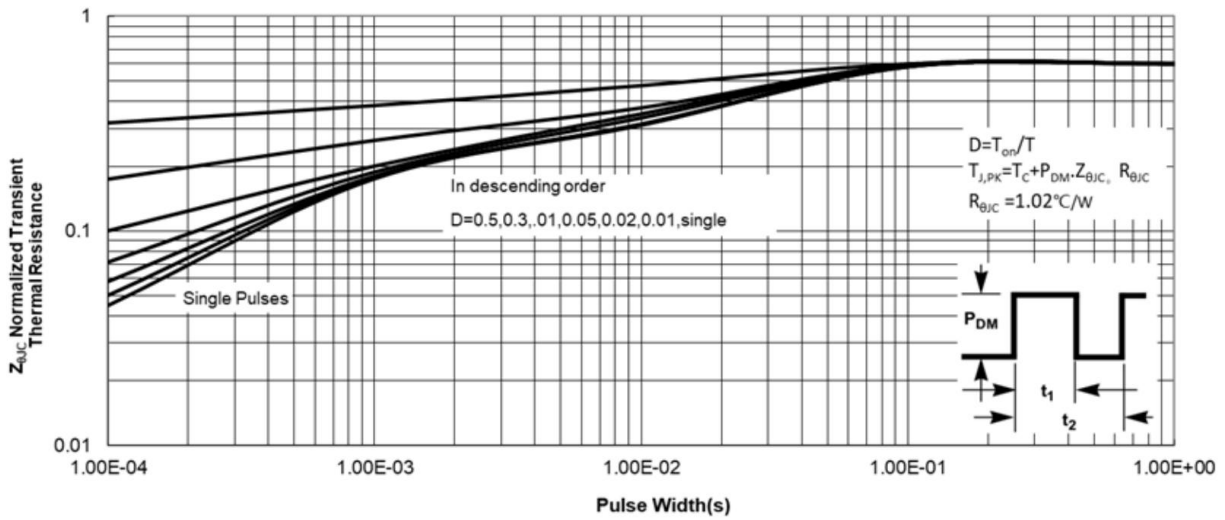
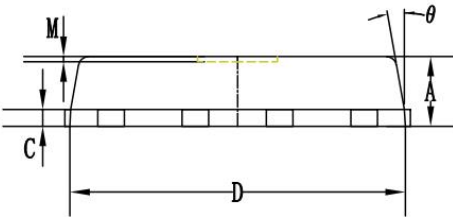
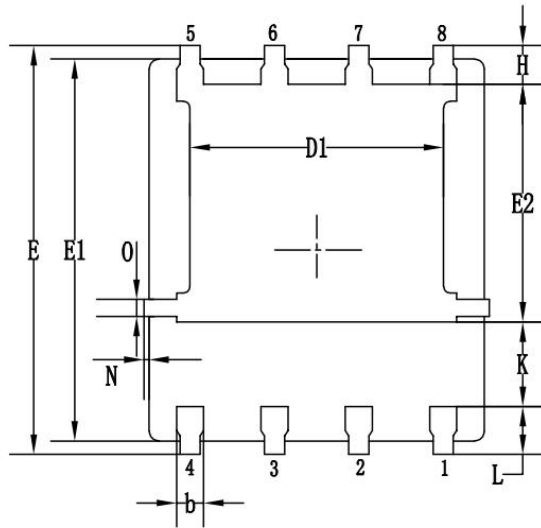
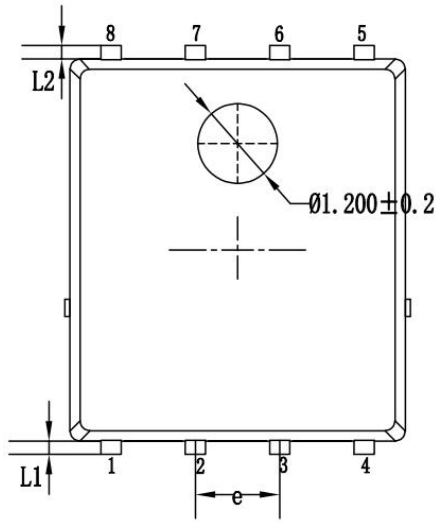


Figure 13. Maximum Effective Transient Thermal Impedance, Junction-to-Case

**PDFN5X6 Package Information**



Symbols	Millimeters		
	MIN.	NOM.	MAX.
A	0.90	1.05	1.20
b	0.34	0.40	0.50
C	0.20	0.25	0.35
D	4.80	5.05	5.20
D1	3.72	3.82	3.92
E	5.95	6.15	6.30
E1	5.60	5.75	5.90
E2	3.47	3.57	3.67
e	1.27 BSC.		
H	0.48	0.58	0.68
K	1.17	1.27	1.37
L	0.64	0.74	0.84
L1/L2	0.20 REF.		
$\theta$	8°	10°	12°
M	0.08 REF.		
N	0	-	0.15
O	0.25 REF.		

## Revision History

Revision	Release	Remark
V1.0	2024/04/10	Initial Release

## 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.