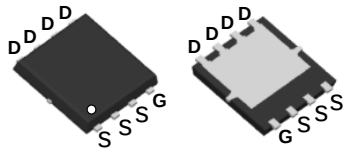
# WMB340N20HG2

## 200V N-Channel Enhancement Mode Power MOSFET

## Description

WMB340N20HG2 uses Wayon's 2nd generation power trench MOSFET technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance. This device is well suited for high efficiency fast switching applications.

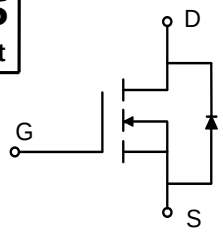



PDFN5060-8L

## Features

- $V_{DS}$ = 200V, $I_D$ = 40A
  $R_{DS(on)}$ < 34mΩ @ $V_{GS}$ = 10V
- High Speed Power Switching
- 100% EAS Guaranteed
- Low Gate Charge

RoHS compliant




## Applications

- Synchronous Rectification in SMPS
- Hard Switching and High Speed Circuit
- UPS
- Motor Control
- Power Tools

### Absolute Maximum Ratings（$T_A$ = 25°C, unless otherwise noted）

| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 200 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current | $T_C$=25°C | $I_D$ | 40 | A |
| | $T_C$=100°C | | 25 | |
| Pulsed Drain Current[1] | | $I_{DM}$ | 160 | A |
| Single Pulse Avalanche Energy[2] | | EAS | 96.8 | mJ |
| Total Power Dissipation | $T_C$=25°C | $P_D$ | 108.6 | W |
| Operating Junction and Storage Temperature Range | | $T_J$ , $T_{STG}$ | -55 to 150 | °C |

### Thermal Characteristics

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Thermal Resistance from Junction-to-Ambient[3] | $R_{\theta JA}$ | 56 | °C/W |
| Thermal Resistance from Junction-to-Case | $R_{\theta JC}$ | 1.15 | °C/W |

## Electrical Characteristics （$T_J$ = 25°C, unless otherwise noted）

| Parameter | | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | | |
| Drain-Source Breakdown Voltage | | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ = 250μA | 200 | - | - | V |
| Gate-Body Leakage Current | | $I_{GSS}$ | $V_{DS}$ = 0V, $V_{GS}$ = ±20V | - | - | ±100 | nA |
| Zero Gate Voltage Drain Current | $T_J$=25°C | $I_{DSS}$ | $V_{DS}$ = 200V, $V_{GS}$ = 0V | - | - | 1 | μA |
| | $T_J$=100°C | | | - | - | 100 | |
| Gate-Threshold Voltage | | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | 2 | 3 | 4 | V |
| Drain-Source on-Resistance[4] | | $R_{DS(on)}$ | $V_{GS}$ = 10V, $I_D$ = 8A | - | 27 | 34 | mΩ |
| Forward Transconductance[4] | | $g_{fs}$ | $V_{DS}$ = 5V, $I_D$ = 10A | - | 32 | - | S |
| **Dynamic Characteristics[5]** | | | | | | | |
| Input Capacitance | | $C_{iss}$ | $V_{DS}$ = 100V, $V_{GS}$ =0V, f =1MHz | - | 1702 | - | pF |
| Output Capacitance | | $C_{oss}$ | | - | 141 | - | |
| Reverse Transfer Capacitance | | $C_{rss}$ | | - | 8.5 | - | |
| Gate Resistance | | $R_G$ | f =1MHz | - | 3.5 | - | Ω |
| **Switching Characteristics[5]** | | | | | | | |
| Total Gate Charge | | $Q_g$ | $V_{GS}$ = 10V, $V_{DS}$ = 100V, $I_D$= 10A | - | 23 | - | nC |
| Gate-Source Charge | | $Q_{gs}$ | | - | 8.2 | - | |
| Gate-Drain Charge | | $Q_{gd}$ | | - | 2.4 | - | |
| Turn-on Delay Time | | $t_{d(on)}$ | $V_{GS}$ =10V, $V_{DD}$= 100V, $R_G$ = 10Ω, $I_D$= 10A | - | 14.5 | - | ns |
| Rise Time | | $t_r$ | | - | 20 | - | |
| Turn-off Delay Time | | $t_{d(off)}$ | | - | 26 | - | |
| Fall Time | | $t_f$ | | - | 12.5 | - | |
| Body Diode Reverse Recovery Time | | $t_{rr}$ | $I_F$ = 10A, dI/dt = 100A/μs | - | 85 | - | ns |
| Body Diode Reverse Recovery Charge | | $Q_{rr}$ | | - | 300 | - | nC |
| **Drain-Source Body Diode Characteristics** | | | | | | | |
| Diode Forward Voltage[4] | | $V_{SD}$ | $I_S$ = 1A, $V_{GS}$ = 0V | - | - | 1.2 | V |
| Continuous Source Current | $T_C$=25°C | $I_S$ | - | - | - | 40 | A |

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
2. The EAS data shows Max. rating . The test condition is $V_{DD}$=25V, $V_{GS}$=10V, L=0.4mH, $I_{AS}$=22A
3. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper,The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.

## Typical Characteristics

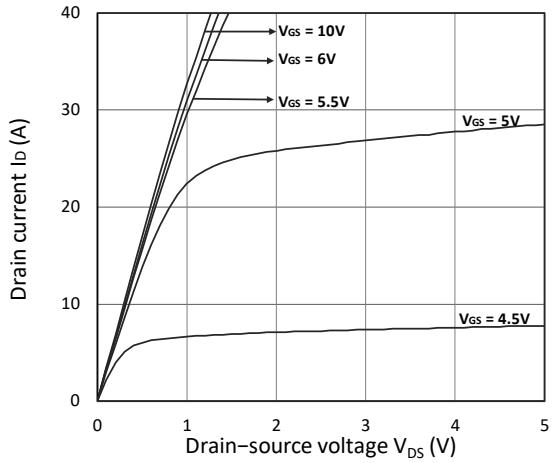



Figure 1. Output Characteristics

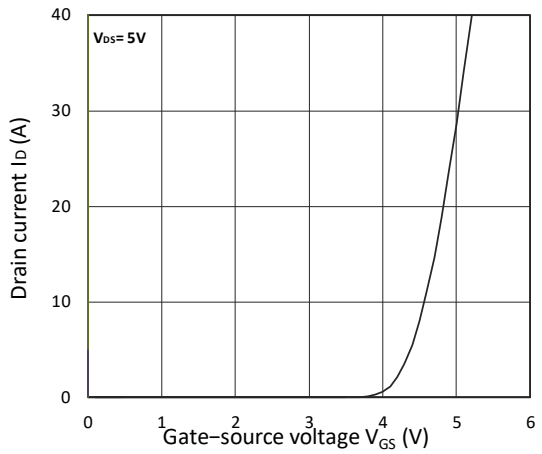



Figure 2. Transfer Characteristics

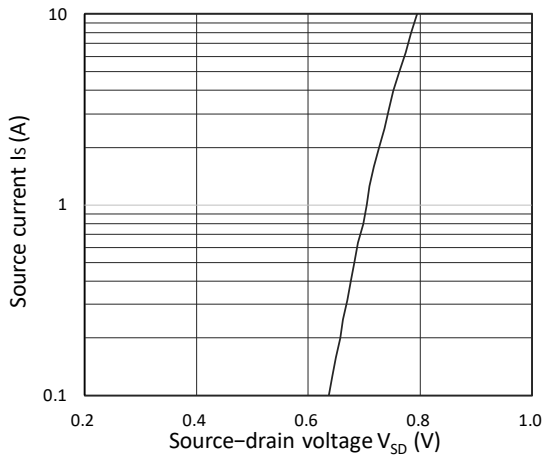



Figure 3. Forward Characteristics of Reverse

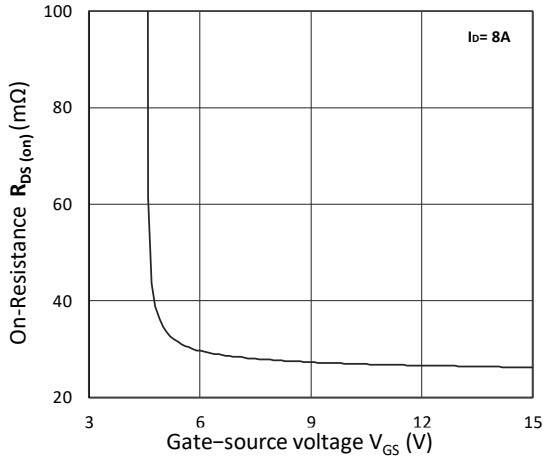



Figure 4. $R_{DS(ON)}$ vs. $V_{GS}$

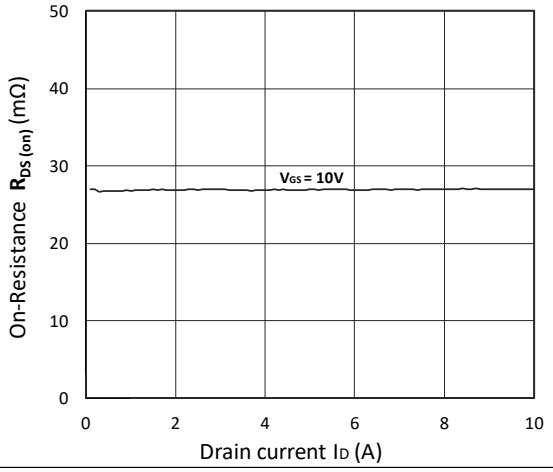



Figure 5. $R_{DS(ON)}$ vs. $I_D$

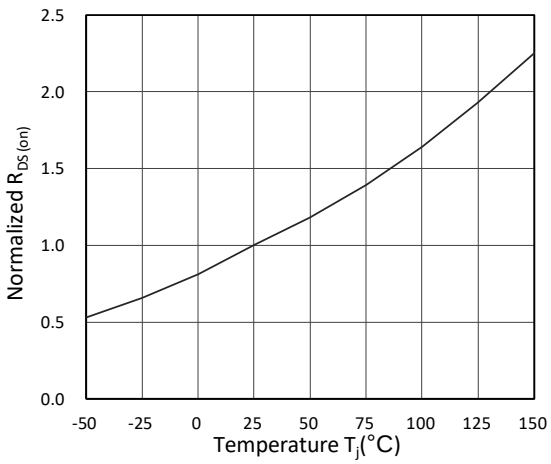



Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

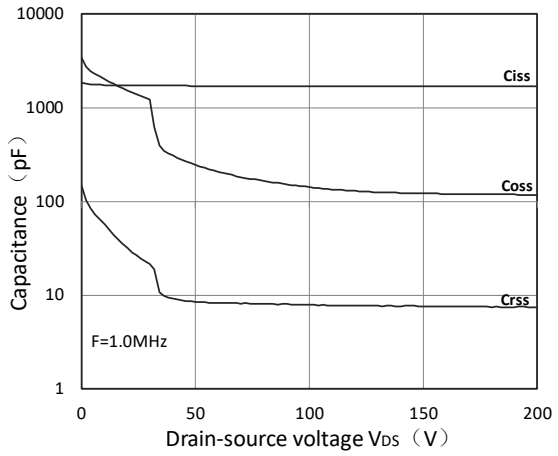



Figure 7. Capacitance Characteristics

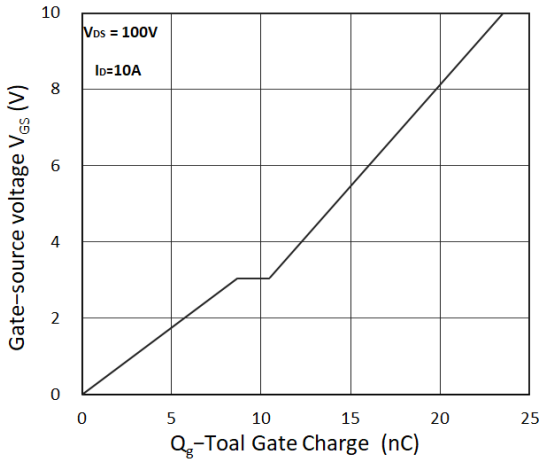



Figure 8. Gate Charge Characteristics

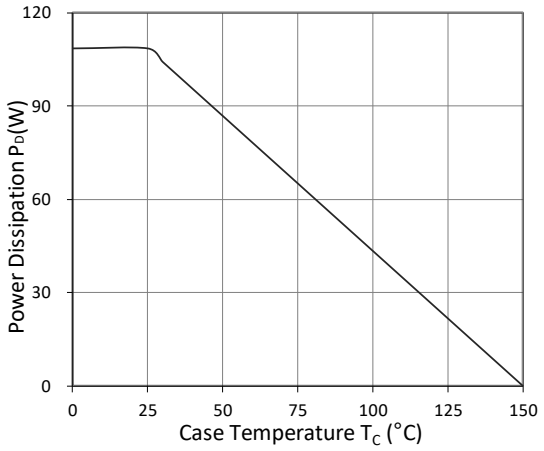



Figure 9. Power Dissipation

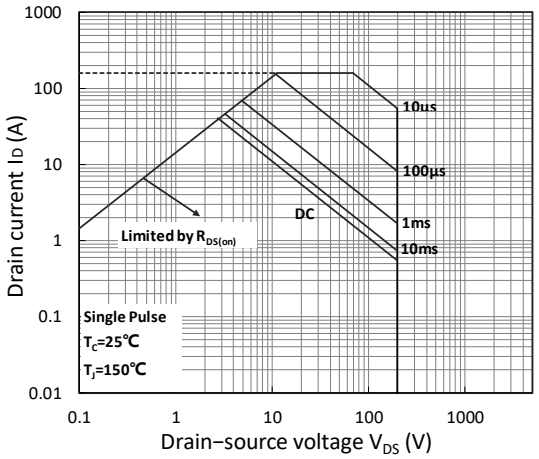



Figure10. Safe Operating Area

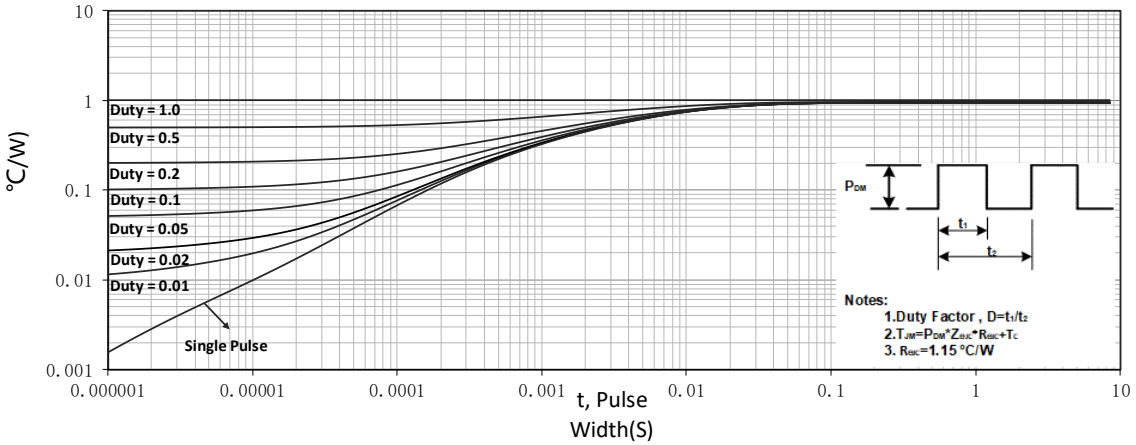



Figure 11. Normalized Maximum Transient Thermal Impedance

## Test Circuit

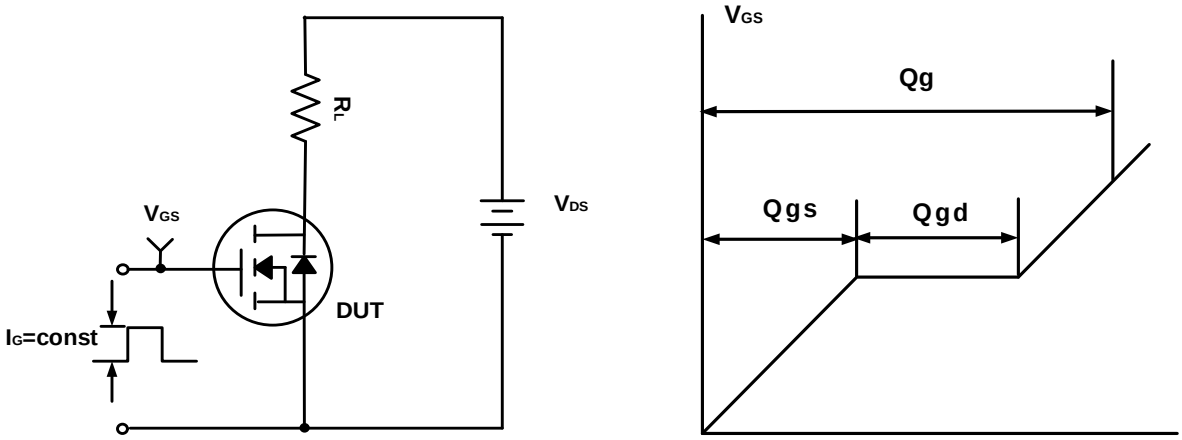



**Figure A. Gate Charge Test Circuit & Waveforms**

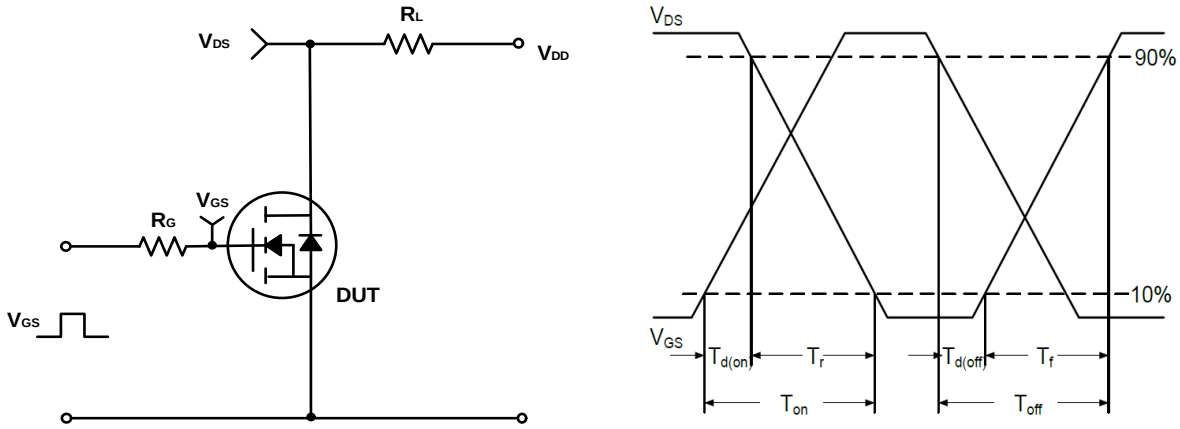



**Figure B. Switching Test Circuit & Waveforms**

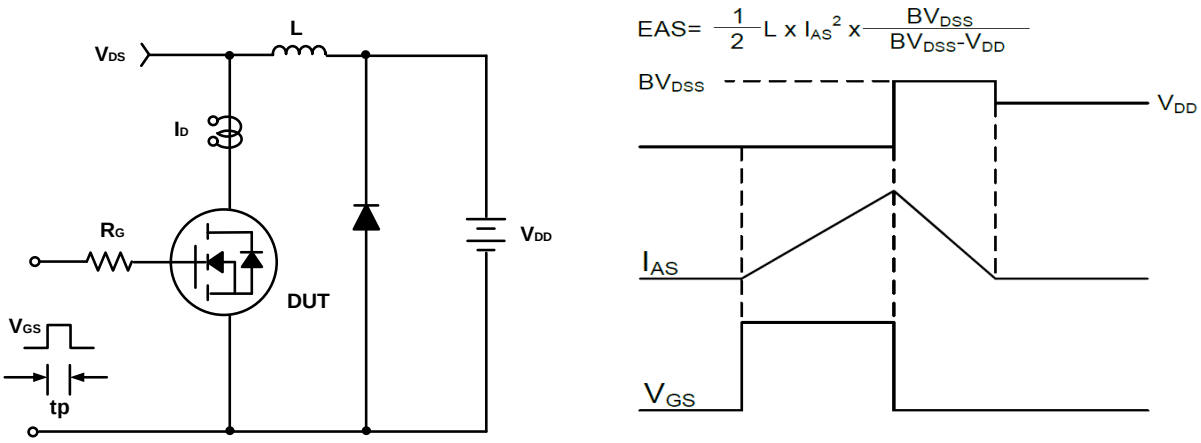
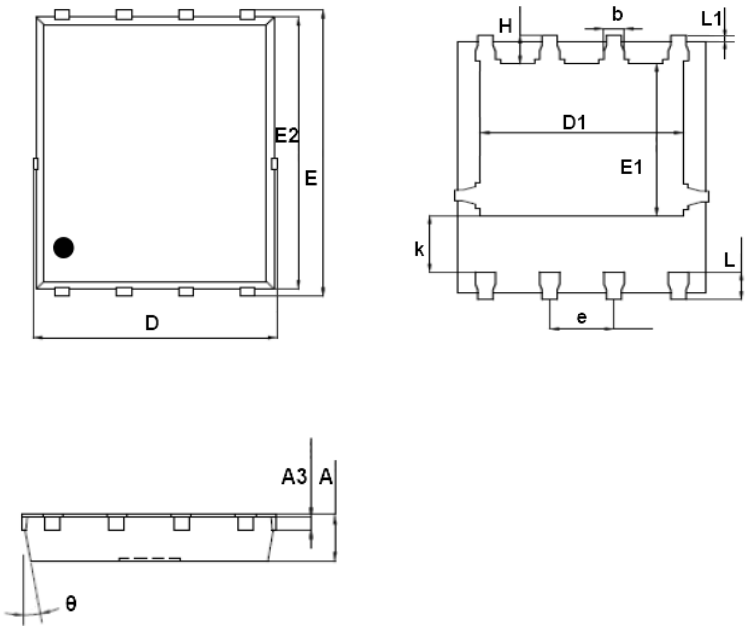



**Figure C. Unclamped Inductive Switching Circuit & Waveforms**

**Mechanical Dimensions for PDFN5060-8L**



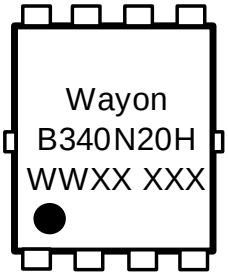

COMMON DIMENSIONS

| SYMBOL | MM | |
|---|---|---|
| | MIN | MAX |
| A | 0.90 | 1.20 |
| A3 | 0.15 | 0.35 |
| D | 4.80 | 5.40 |
| E | 5.90 | 6.35 |
| D1 | 3.61 | 4.31 |
| E1 | 3.30 | 3.92 |
| E2 | 5.50 | 6.06 |
| k | 1.10 | - |
| b | 0.30 | 0.51 |
| e | 1.27BSC | |
| L | 0.38 | 0.71 |
| L1 | 0.05 | 0.36 |
| H | 0.38 | 0.71 |
| θ | 0° | 12° |

## Ordering Information

| Part | Package | Marking | Packing method |
|---|---|---|---|
| WMB340N20HG2 | PDFN5060-8L | B340N20H | Tape and Reel |

## Marking Information




B340N20H = Device code

WWXX XXX= Date code

## Contact Information

No.1001, Shiwan(7) Road, Pudong District, Shanghai, P.R.China.201207
Tel: 86-21-50310888 Fax: 86-21-50757680 Email: market@way-on.com
WAYON website: **http://www.way-on.com**
For additional information, please contact your local Sales Representative.

WAYON ® is registered trademarks of Wayon Corporation.

## Disclaimer

WAYON reserves the right to make changes without further notice to any Products herein to improve reliability, function, or design. The Products are not designed for use in hostile environments, including, without limitation, aircraft, nuclear power generation, medical appliances, and devices or systems in which malfunction of any Product can reasonably be expected to result in a personal injury. The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. WAYON does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of Products or technical information described in this document.