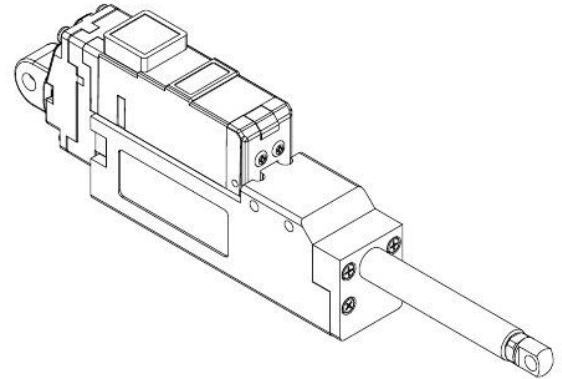


Features / 주요 특징점

- Micro size / 마이크로 사이즈
- Precise position control/ 정밀위치제어
- Strong force comparing to the size /체적대비 강한 힘
- Built-in Drive Circuitry / 드라이브 회로 내장
- RS-485 통신 (TTL/PWM통신은 L12-XXPT-4모델참고)
- Parameter programmable on the Manager software / 매니저 소프트웨어를 통한 파라미터설정가능



Common Specifications / 공통 사양

- Stroke / 스트로크 :41mm
- Force / 정격 힘 : 17N~78N according to gear ratio(See appendix.) / 기어비에 따라 17~78N(별첨 참조)
- Micro controller : 32 bit ARM Core, 4960 resolution (A/D converter)
- Input Voltage / 입력전압: 12.0V(Rated/정격), 7V~13V(Operating)
- Motor Type / Watt: coreless DC Motor / 26W
- Recommended duty cycle / 권장 듀티사이클 :under 50% (50% 이하)
- Current consumption / 소모전류 :30mA(Idle), 380mA(Rated), 2.3A(Stall)
- Position accuracy / 위치정밀도 :less than 0.05mm(50um)
- Position sensor / 위치센서 : 10k Ω linearity potentiometer
- Size / Weight /크기,무게:86.9(L)x36(W)x18(H)mm /96~99g (to be varied according to gear ratio)
- Communication/ 통신 :RS-485
- Operating Temperatures / 동작온도 :-10 $^{\circ}$ C ~ 60 $^{\circ}$ C
- Ingress protection / 방수방진 : IP-54
- Mechanical Backlash / 기구백래쉬: 0.03mm(30um)
- Audible Noise / 가청소음 : Approx. 50db at 1m
- Gear ratio / 기어비 :10:1(20F,30F) /30:1(50F) /50:1(80F)
- Gear type / 기어타입:Engineering plastic gears(20F,30F)
4metal & 2engineering plastic gears(64F,100F)
(Alluminum and stainless steel combination)
- Rod type / Rod 타입 :Stainless steel rod / 스테인레스 스틸
- Standard Accessory / 표준악세서리 :1xHinge base, 1x Hinge, 1xHinge shaft, 1xRod end tip, 2x M3 NUT, 3 x M2.5x6 screws, 1x Molex wire harness (200mm), 3xSocket head M3x8 mounting bolts
- Wire Harness :Molex(50-37-5033) to Molex(50-37-5033)/ 200mm / 0.08x60(22AWG)

Data Sheet_L12-XXF-4_R.1.2

| Parameter | Symbol 심볼 | Limit Values / 한계값 | | | Unit 단위 | Remarks 비고 |
|-----------|--------------|--------------------|------|------|------------|---------------|
| | | Min. | Typ. | Max. | | |

Voltages / 전압

| | | | | | | |
|------------------------------|---|------|------|------|---|--------|
| Supply voltage / 공급전압 | V | 7.0 | 12.0 | 13.0 | V | |
| Logic input voltage / 로직인가전압 | V | -7.0 | - | 12.0 | V | RS-485 |

Currents / 전류

| | | | | | | |
|---------------------------------|---|-----|-----|-----|----|--------------|
| Maximum peak Current / 최대 피크 전류 | I | 2.1 | 2.2 | 2.3 | A | StallCurrent |
| No Load Current / 무부하전류 | I | 180 | 200 | 220 | mA | No Load |
| Full Load Current / 정격 부하 전류 | I | 380 | 400 | 420 | mA | Full Load |
| Idle Current | I | 25 | 30 | 35 | mA | |

Temperatures / 온도

| | | | | | | |
|------------------------|---|-----|---|----|---|--|
| Storage Temp. / 보관온도 | T | -20 | - | 70 | ℃ | |
| Operating Temp. / 동작온도 | T | -10 | - | 60 | ℃ | |

Strokes / 스트로크

| | | | | | | |
|-----------------------|---|---|------|---|----|--|
| MIN Position / 최소수축위치 | L | - | 2.5 | - | mm | |
| MAX Position / 최대확장위치 | L | - | 43.5 | - | mm | |
| Stroke length / 스트로크 | L | - | 41.0 | - | mm | |

No Load Speed / 무부하 속도

| | | | | | | |
|--|---|------|------|------|------|-----------|
| Maximum Speed at 12.0V 최대 속도 at 12.0V | S | 79.5 | 80.0 | 80.5 | mm/s | L12-20F-4 |
| | S | 27.5 | 28.0 | 28.5 | mm/s | L12-30F-4 |
| | S | 10.0 | 10.5 | 11.0 | mm/s | L12-50F-4 |
| | S | 7.3 | 7.7 | 8.1 | mm/s | L12-80F-4 |

Data Sheet_L12-XXF-4_R.1.2

Force / 힘

| Parameter | Symbol 심볼 | Limit Values / 한계값 | | | Unit 단위 | Remarks 비고 |
|-----------|--------------|--------------------|------|------|------------|---------------|
| | | Min. | Typ. | Max. | | |

Rated Force / 정격 힘

| | | | | | | |
|---------------------------------------|---|-------|-------|-------|-----|-----------|
| Rated Force at 12.0V 정격 힘 at 12.0V | F | 16.5 | 17.0 | 17.5 | N | L12-20F-4 |
| | | 3.70 | 3.82 | 3.93 | lbf | |
| | | 1.68 | 1.73 | 1.78 | kgf | |
| | F | 30.0 | 31.0 | 32.0 | N | L12-30F-4 |
| | | 6.74 | 6.96 | 7.19 | lbf | |
| | | 3.05 | 3.16 | 3.26 | kgf | |
| | F | 48.0 | 50.0 | 52.0 | N | L12-50F-4 |
| | | 10.79 | 11.24 | 11.69 | lbf | |
| | | 4.89 | 5.09 | 5.30 | kgf | |
| | F | 76.0 | 78.0 | 80.0 | N | L12-80F-4 |
| | | 17.08 | 17.53 | 17.98 | lbf | |
| | | 7.74 | 7.95 | 8.15 | kgf | |

* 1 kgf = 9.8N , 1lbf = 4.45N

Self Lock Force / 셀프-락 포스

| | | | | | | |
|--|----|---|------|---|---|-----------|
| | Fl | - | 7.0 | - | N | L12-20F-4 |
| | Fl | - | 31.0 | - | N | L12-30F-4 |
| | Fl | - | 50.0 | - | N | L12-50F-4 |
| | Fl | - | 78.0 | - | N | L12-80F-4 |

- Self-lock force :The force which actuator maintains its position by mechanical friction without motor power.
- 셀프-락포스 :액츄에이터가 전원을 통한 모터의 힘 없이, 기구마찰력만으로 위치를 고수할 수 있는 힘

Z Axis Force / Z축 포스

| | | | | | | |
|--|----|---|------|---|---|-----------|
| | Fz | - | 7.0 | - | N | L12-20F-4 |
| | Fz | - | 23.0 | - | N | L12-30F-4 |
| | Fz | - | 37.5 | - | N | L12-50F-4 |
| | Fz | - | 58.5 | - | N | L12-80F-4 |

- Z axis force :Actuator force when it is installed vertically.
- Z축 포스 : 수직 중력방향 설치 시 액츄에이터의힘

Figure 1.

Figure1-1 . CURRENT VS FORCE (12 VDC)

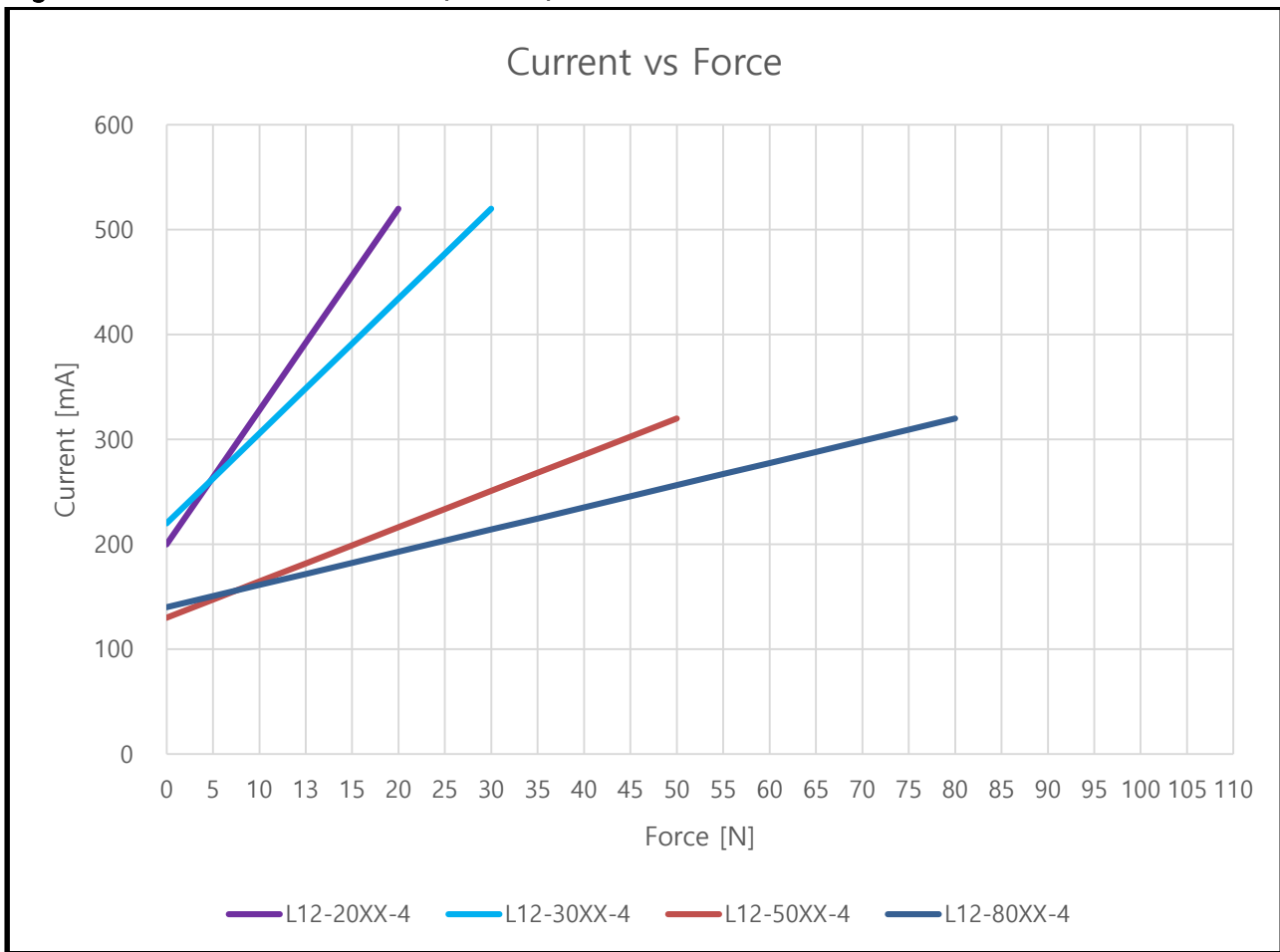


Figure1-2 . SPEED VS LOAD (12 VDC)

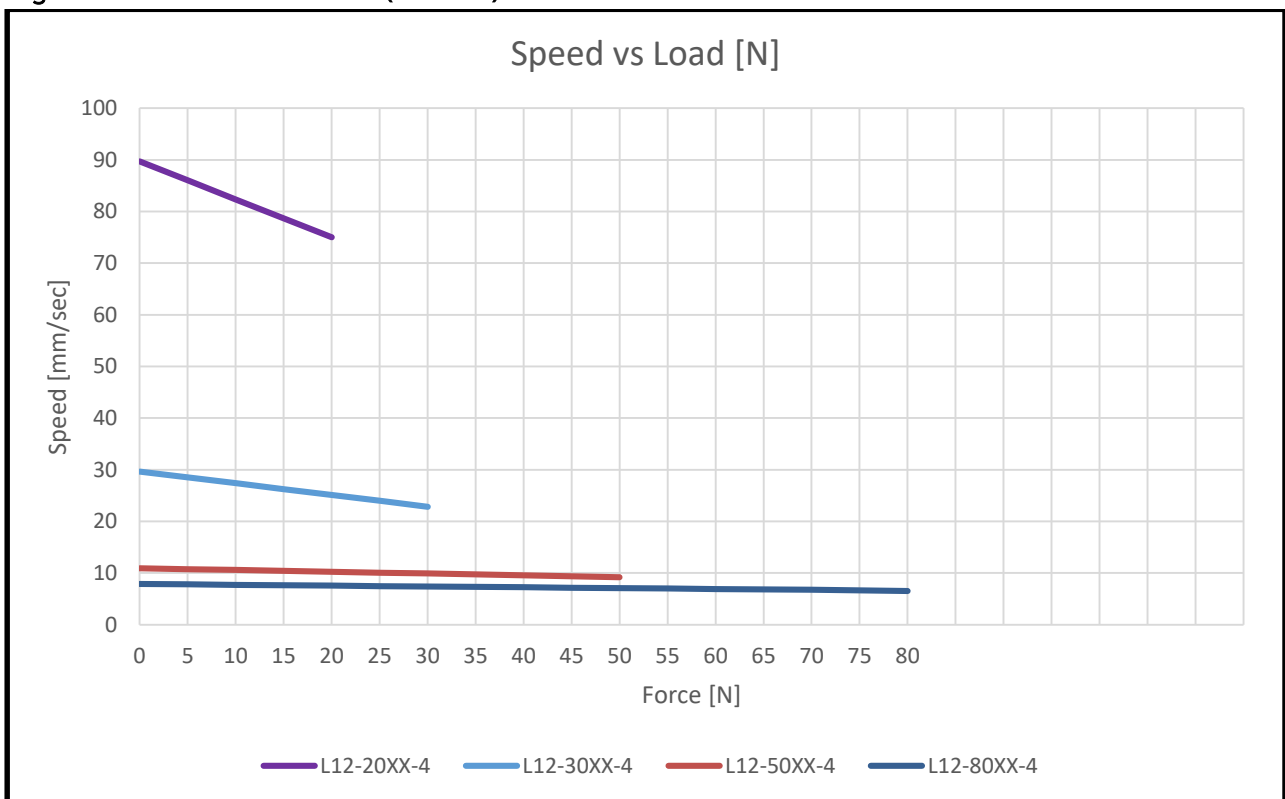


Figure 2.

Figure2-1 . Voltage /Speed[m/s] (12V / 41mm Products)

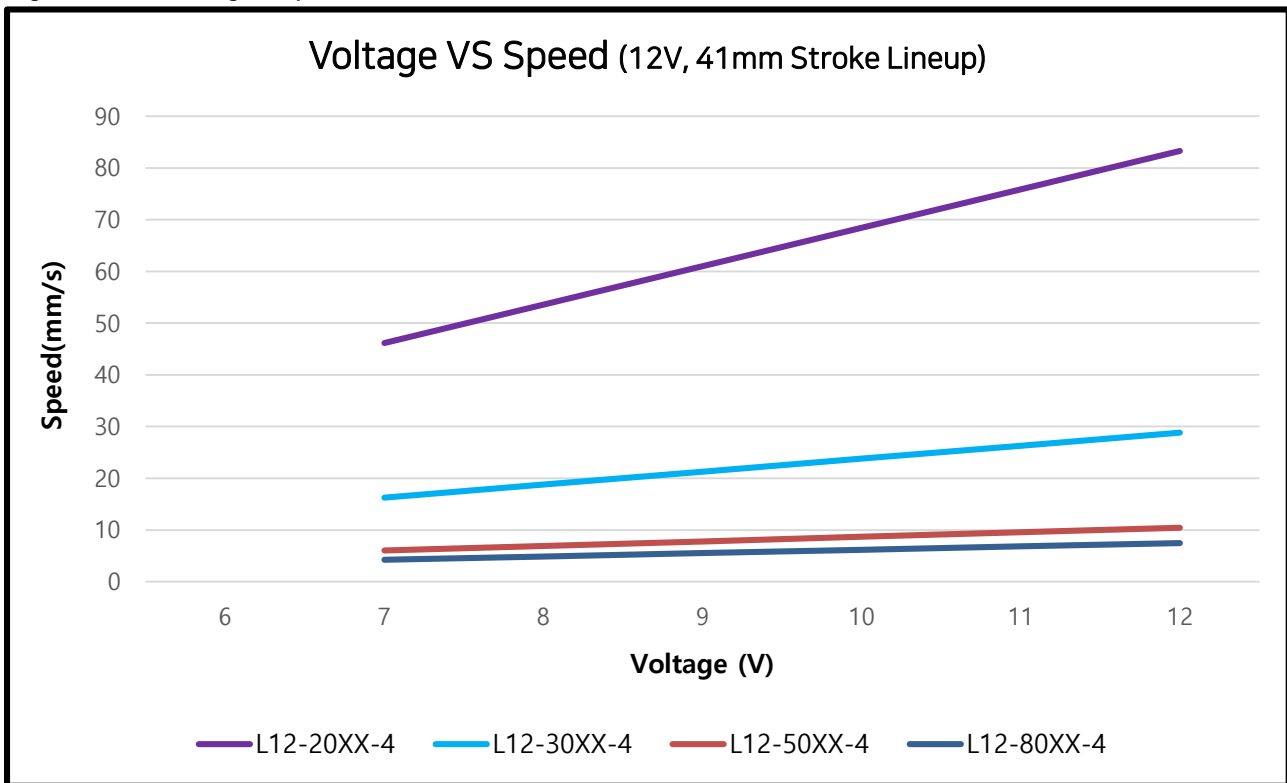
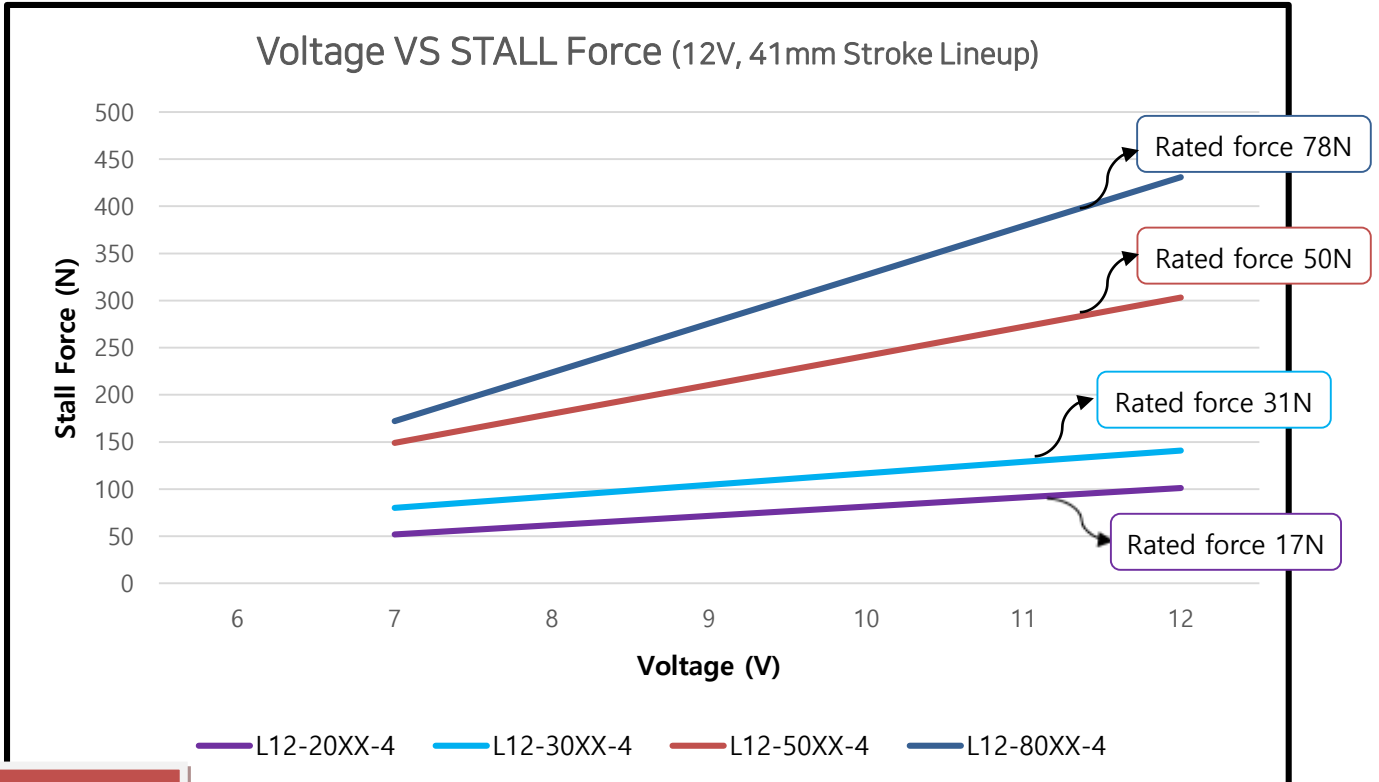


Figure2-2 . Voltage /Stall Force[N] (12V / 41mm Products)



CAUTION (주의)

- Stall force는 참고용으로, 제품의 파손을 방지하기 위해 실제 application에서의 사용시에는 Rated force에 맞추어 사용하여 주십시오.
- Stall force is for reference only. In order to prevent damage of the product, please use it according to the Rated force when using in actual application.

Figure 3.

Figure3-1 . Speed/Motor Operating Rate[mm/sec]

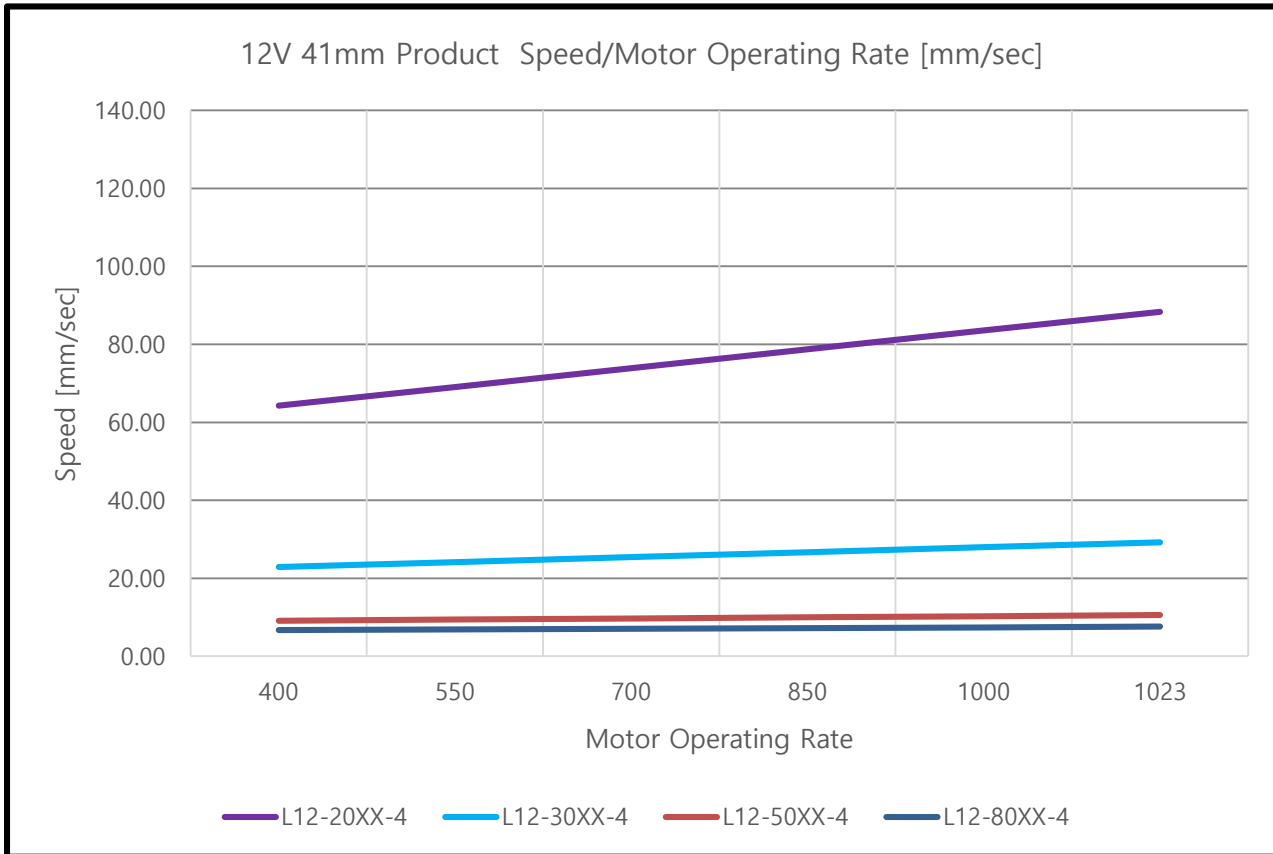


Figure 4.PIN Map

| PIN NUMBER(COLOR) | PIN NAME | FUNCTION |
|-------------------|----------|----------|
| 1(YELLOW) | D- | RS-485- |
| 2(WHITE) | D+ | RS-485+ |
| 3(RED) | VCC | Power + |
| 4(BLACK) | GND | Power - |

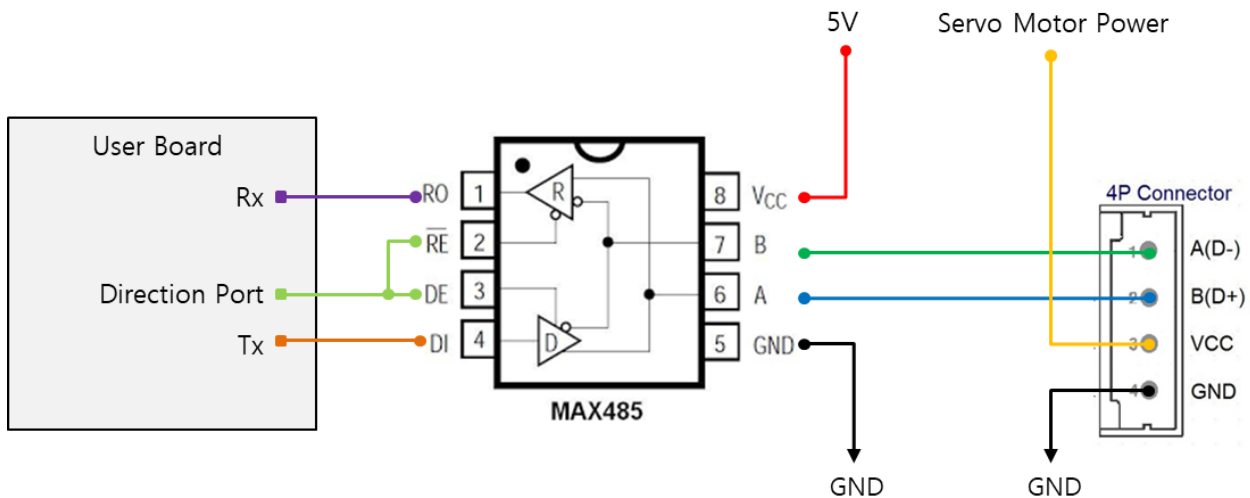


Figure 5. Dimension

