# DC-DC Converter Short Form

## MPDRX312S (Ultra High Speed Response POL)

Ultra High Speed Response
Wide input range (3.0V to 5.5V),Output range ( 0.8V to 1.8V )
16A Output Current
Wide operational temperature ( -40ºC to +85ºC )
ON/OFF / Output voltage sense / Over current function /
P-good function / Variable Start-up Speed function
(by external capacitor)

## GENERAL SPECIFICATIONS (Ta=25ºC)

| Item | Symbol | Condition | | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| Input Voltage | Vin | | | 3.0 | - | 5.5 | V |
| Output Voltage Adjustable Range | Vout | F.T. pin = open | | 0.8 | - | 0.9 | V |
| | | F.T. pin = short to GND | | 0.9 | - | 1.8 | |
| Output Voltage tolerance | Vo tol | Over Io, Temperature range Vin=3.0~5.5V | Vo=0.8  0.9V | -3.0 | - | +3.0 | % |
| | | | Vo=0.9  1.8V | -2.5 | - | +2.5 | |
| Output Current | Iout | | | 0 | - | 16 | A |
| Ripple Voltage | Vrpl | Vin=3.3V, BW=20MHz, Cout=100µF | | - | 20 | - | mVpp |
| Efficiency | EFF | Vin=3.3V, Vout=1.8V, Iout=16A | | - | 86.5 | - | % |

## DIMENSIONS

15.4± 0.2

12      11

S Z

27.8± 0.2

22      1

4.2max.
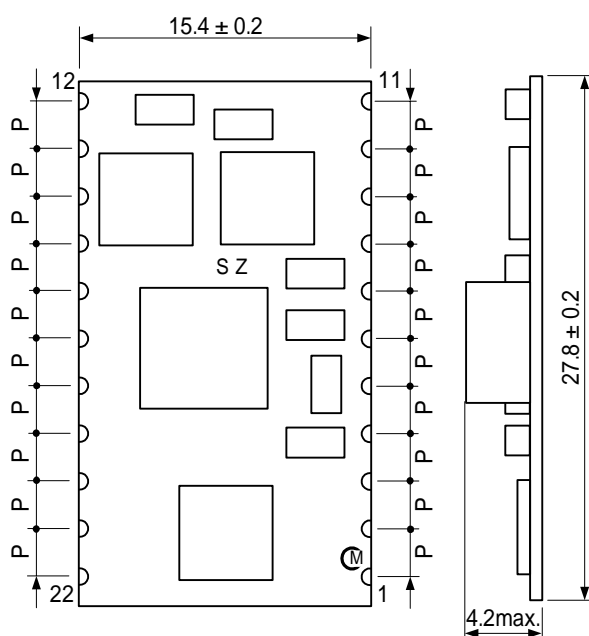
[unit   mm]

( )…reference value
P=2.54± 0.2mm
Tolerance is not accumulated

| Pin No. | Symbol | Function |
|---|---|---|
| 2 | SENSE | Output voltage sense |
| 3,4,5 | Vout | Output |
| 6,7,8,9, 16,17,18 | GND | GND |
| 10 | FT | Output trim |
| 11 | VAR | Output voltage adjustment |
| 12,13,14, 15 | Vin | Input |
| 1 | OVPOUT | Output Over-voltage Alarm |
| 19 | SS | Soft start |
| 20 | N.C. | Non connection |
| 21 | PWRGOOD | Power Good |
| 22 | ON/OFF | Remote ON/OFF |

## ⚠ Note:

1. This datasheet is downloaded from the website of Murata Manufacturing co., ltd. Therefore, it' s specifications are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering.

2. This datasheet has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

## OUTPUT VOLTAGE ADJUSTMENT

Internal Circuit

MPDRX312S

Vout

6.8 kΩ

1.8 kΩ

VAR pin

RVAR

FT pin

Error amp
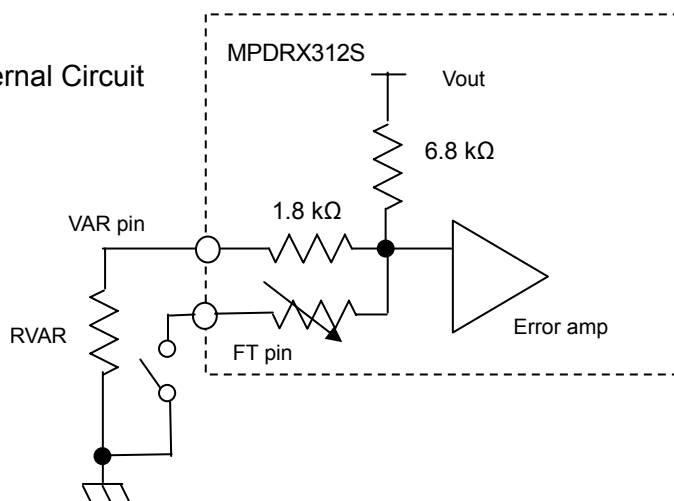
(a) 0.8V ≦ Vout ≦ 0.9V (F.T. : open)

$$RVAR = \frac{5440}{Voadj[V] - 0.8[V]} - 1800 \, [\Omega]$$

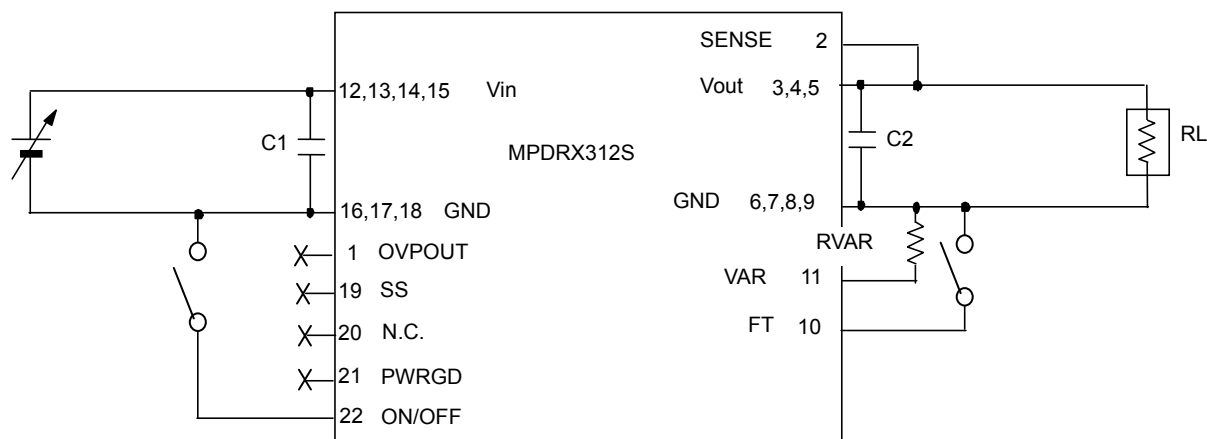(b) 0.9 ≦ Vout ≦ 1.8V (FT-pin SHORT to GND)

$$RVAR = \frac{5440}{Voadj[V] - 0.9[V]} - 1800 \, [\Omega]$$

### <RVAR CALCULATION EXAMPLE>

| Voadj [V] | Calculated RVAR [Ω] | RVAR Example [Ω] | F.T. pin |
|---|---|---|---|
| 1.8 | 4240 | 3.9k+330 | Short to GND |
| 1.5 | 7270 | 6.8k+470 | Short to GND |
| 1.2 | 16330 | 16k+330 | Short to GND |
| 1.0 | 52600 | 47k+5.6k | Short to GND |
| 0.9 | | Open | Short to GND |
| 0.8 | | Open | Open |

## TEST CIRCUIT

SENSE      2

12,13,14,15      Vin

Vout    3,4,5

C1

MPDRX312S

C2

RL

16,17,18   GND

GND     6,7,8,9

RVAR

1   OVPOUT

VAR    11

19   SS

FT    10

20   N.C.

21   PWRGD

22   ON/OFF
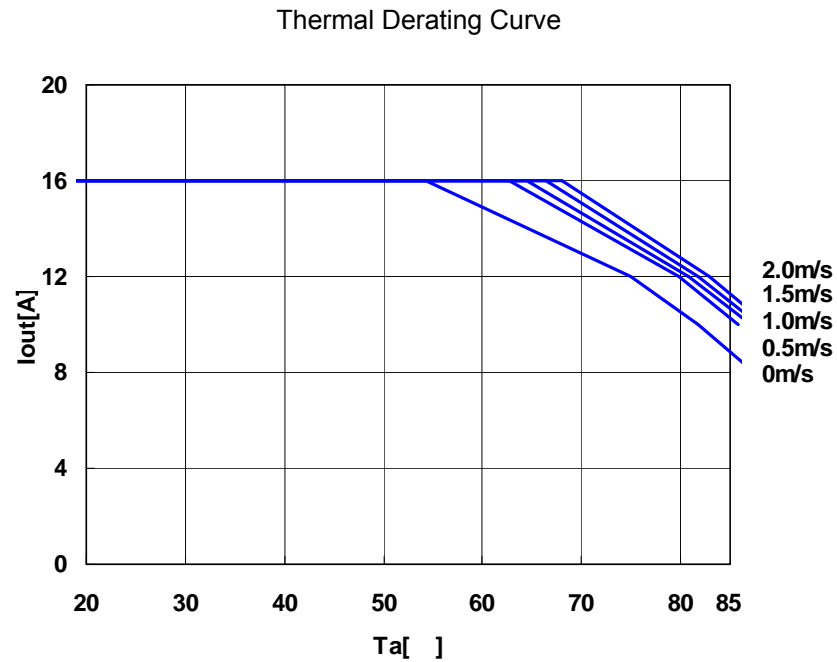
C1  100μF  10V    Ceramic Capacitor
C2  100μF  6.3V   Ceramic Capacitor
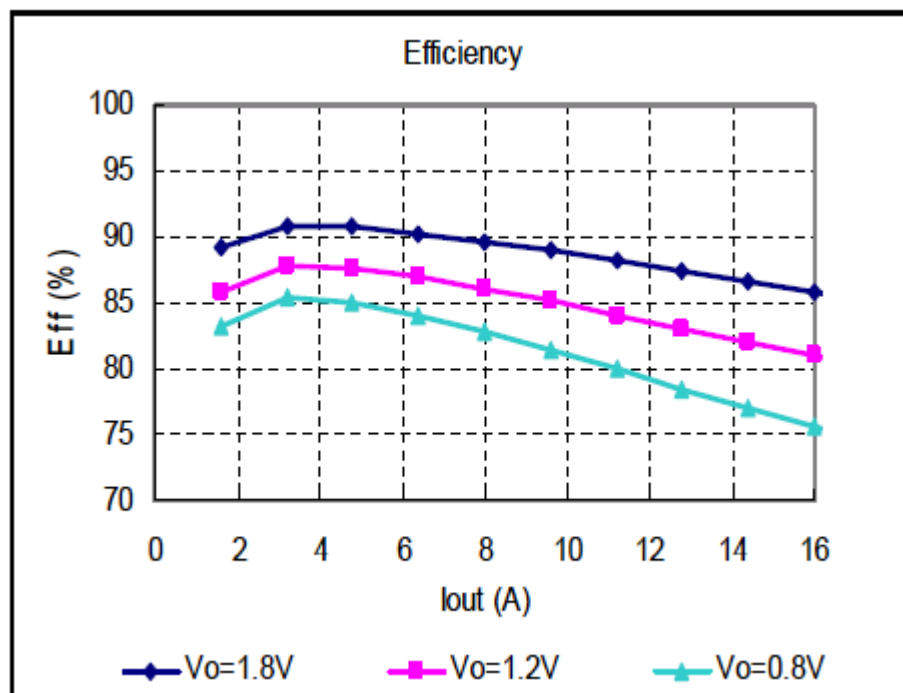Please make sure to place C1 and C2 nearby input and output terminal of DC-DC converter.

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## THERMAL DERATING

### Thermal Derating Curve



2.0m/s
1.5m/s
1.0m/s
0.5m/s
0m/s

## EFFICIENCY