MAX. Power 6.0W Isolated DC-DC Converter

SDS6 Series Small Compact Size DC-DC Converter

Features

- Small Compact Size
- High Efficiency
- Isolated Input - Output
- Wide operating temperature range (-40℃ to 85℃)
- Long Life Design (Employ only Ceramic Capacitor)
- Built-in over current protection circuit
- Wide 2 :1 input range
- Adjustable output voltage (single output)
- Safety standard : NRTL, CE approved
- RoHS compatible design

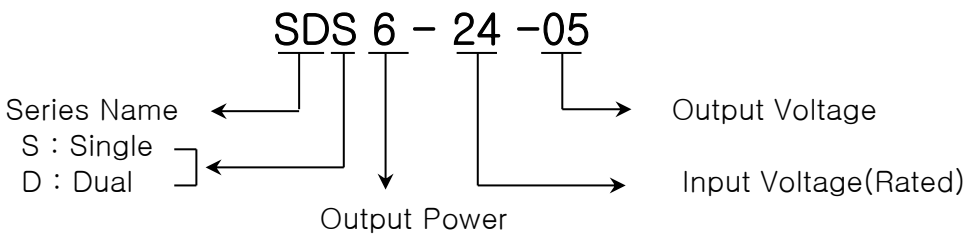
Applications

- Data and telecommunication
- FA control
- Datacommunication electronic equipments

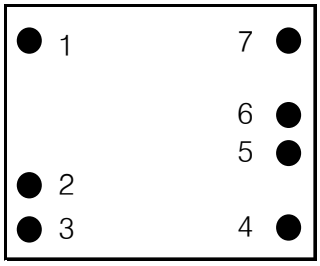
Environment

- Operating Temperature : -40℃ ~ 85℃
- Operating Humidity : 5% ~ 95% RH (Non condensing)
- Storage Temperature : -40℃ ~ 105℃
- Cooling : Free-Air Convection
- MTBF : 5.6 x 10^5 hrs

Model Name Structure



Pin assignments & Function



<Top View>

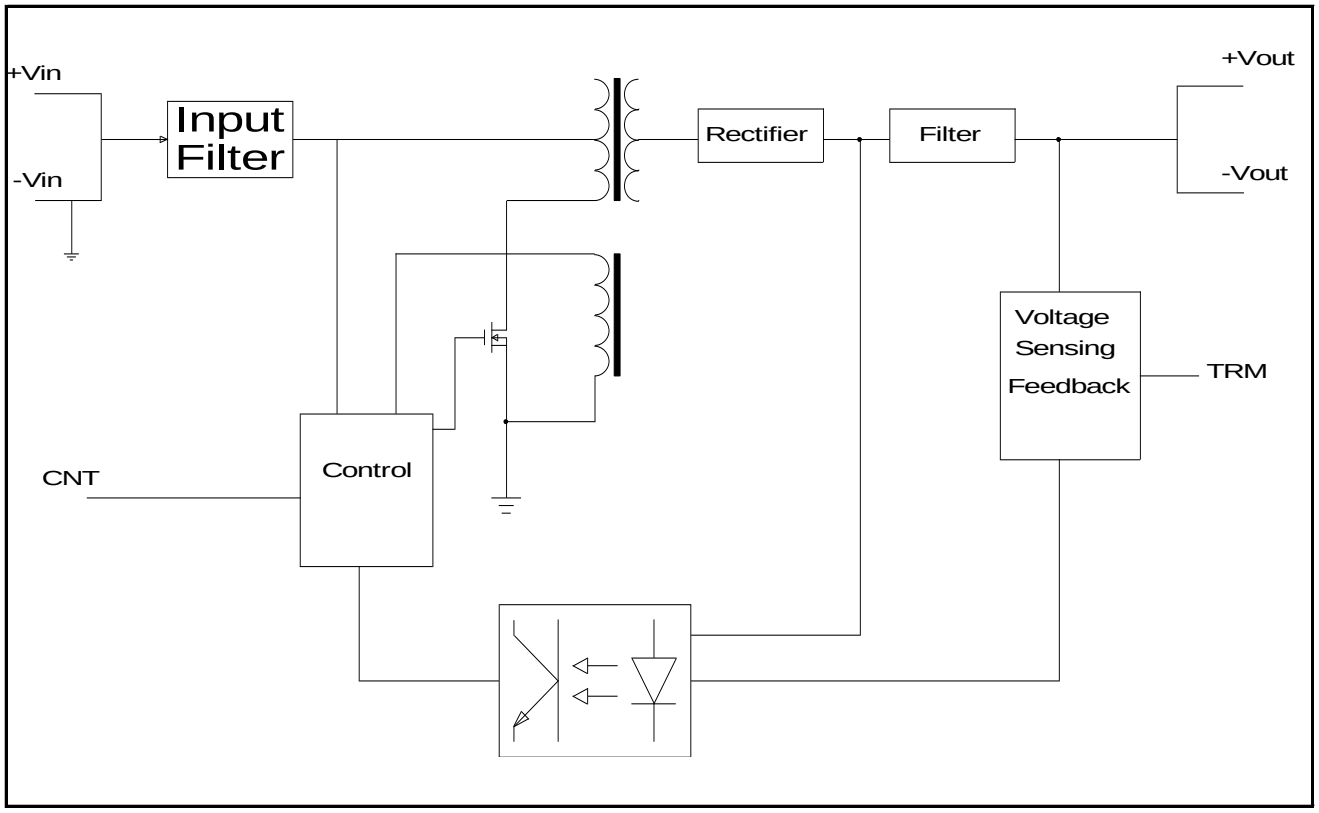
- Single Output Name & Function

PIN No.	NAME	FUNCTION
1	+Vin	Positive terminal for Vin
2	-Vin	Negative terminal for Vin
3	CNT	Remote on/off Control
4	TRM	Vout variation(±10%) by external parts
5	-Vout	Negative terminal for Vout
6	No Pin	
7	+Vout	Positive terminal for Vout

- Dual Output Name & Function

PIN No.	NAME	FUNCTION
1	+Vin	Positive terminal for Vin
2	-Vin	Negative terminal for Vin
3	CNT	Remote on/off Control
4	-Vout	Negative terminal for Vout
5	No Pin	
6	Com	The common ground of Vout
7	+Vout	Positive terminal for Vout

Internal Circuit Architecture



Maximum Ratings

Characteristics		Symbol	Min.	Typ.	Max.	Unit
Input Voltage Continuis	SDS6 - 05 - XX	Vin	4.5	-	9.0	VDC
	SDS6 - 12 - XX		9.0	-	18.0	
	SDS6 - 24 - XX		18.0	-	36.0	
	SDS6 - 48 - XX		36.0	-	76.0	
Operating Ambient Temperature		Ta	-40	-	85	℃
Storage Temperature		Tstg	-40	-	105	℃
Withstand Voltage			-	-	500	Vac

Electrical Characteristics

- Input Section

Ta : 25℃, Vin : Typical Input Voltage

Characteristics		Symbol	Min.	Typ.	Max.	Unit
Operating Voltage Range	SDS6 - 05 - XX	Vin	4.5	5.0	9.0	VDC
	SDS6 - 12 - XX		9.0	12.0	18.0	
	SDS6 - 24 - XX		18.0	24.0	36.0	
	SDS6 - 48 - XX		36.0	48.0	76.0	
Maximum Input Current (Vin : rated, Io : 100%)	SDS6 - 05 - XX	Iin		1.50		A
	SDS6 - 12 - XX			0.63		
	SDS6 - 24 - XX			0.31		
	SDS6 - 48 - XX			0.16		
Maximum No Load Input Current (Vin : rated)	SDS6 - 05 - XX			94		mA
	SDS6 - 12 - XX			43		
	SDS6 - 24 - XX			25		
	SDS6 - 48 - XX			10		

- Output Section

Ta : 25℃, Vin : Minimum, Typical, Maximum Input Voltage

Characteristics		Symbol	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		Vo	-	-	±2	%
Regulation	Line Regulation (From min. Vin to max. Vin, constant load)		-	-	±0.5	%
	Load Regulation (From no load to maximum load)		-	-	±1	%
Output Ripple and Noise (Vin : Rated, Io : Max., BW : 20MHz, use the external capacitor(1uF) between +Vo and -Vo)		mVp-p	-	-	1% of Vout	mV (peak to peak)

Characteristics		Symbol	Min.	Typ.	Max.	Unit
Output Current	SDS6 - XX - 3R3 (05)	Io	-	-	1.5 (1.2)	A
	SDS6 - XX - 05 (05)		-	-	1.2 (1.0)	
	SDS6 - XX - 12		-	-	0.5	
	SDS6 - XX - 15		-	-	0.4	
Output Current Limit (OCP : Over Current Protection, recovers automatically)			105	-	-	%
Dynamic Load Response (Vin : rated, Io : from 50% to 100%, from100% to 50%, BW : 20MHz, Freq. : 100Hz, Duty : 0.5, Tr/Tf : 100us use the external capacitor(1uF) between +Vo and -Vo)			-	-	3% of Vout	mV (peak to peak)
Start - Up Time		Tstart	-	-	10	ms
Turn - on Overshoot			-	-	5	%
Efficiency (Vin : Rated, Io : Max.)	SDS6 - 05 - 3R3		-	73	-	%
	SDS6 - 05 - 05		-	78	-	
	SDS6 - 05 - 12		-	81	-	
	SDS6 - 05 - 15		-	81	-	
	SDS6 - 12 - 3R3		-	77	-	%
	SDS6 - 12 - 05		-	82	-	
	SDS6 - 12 - 12		-	86	-	
	SDS6 - 12 - 15		-	87	-	
	SDS6 - 24 - 3R3		-	77	-	%
	SDS6 - 24 - 05		-	82	-	
	SDS6 - 24 - 12		-	85	-	
	SDS6 - 24 - 15		-	87	-	
	SDS6 - 48 - 3R3		-	75	-	%
	SDS6 - 48 - 05		-	81	-	
	SDS6 - 48 - 12		-	85	-	
	SDS6 - 48 - 15		-	85	-	

Isolation Characteristics

Characteristics		Symbol	Min.	Typ.	Max.	Unit
Withstand Voltage (AC500V, 1minute)	Input - Output		-	-	500	Vac
	Input - Case		-	-	500	Vac
	Output - Case		-	-	500	Vac
Isolation Resistance (DC500V at 25℃ and 70%RH)	Output - Case	Riso	100	-	-	MΩ

General Characteristics

Characteristics	Symbol	Min.	Typ.	Max.	Unit
Remote on / off control (CNT Pin, Negative Logic Module on : Logic Low or Short to -Vin Module off : Logic High or open)	CNT				
External Trim Adj. Range (TRM Pin, Vout variation by external parts)	TRM	-10	-	+10	%
Switching Frequency					kHz
MTBF (MIL-HDBK-217F)		5.6×10^5			hrs
Dimension (W x H x L)		27.5 x 9.1 x 20.0			mm
Weight		-	6.0	-	grams

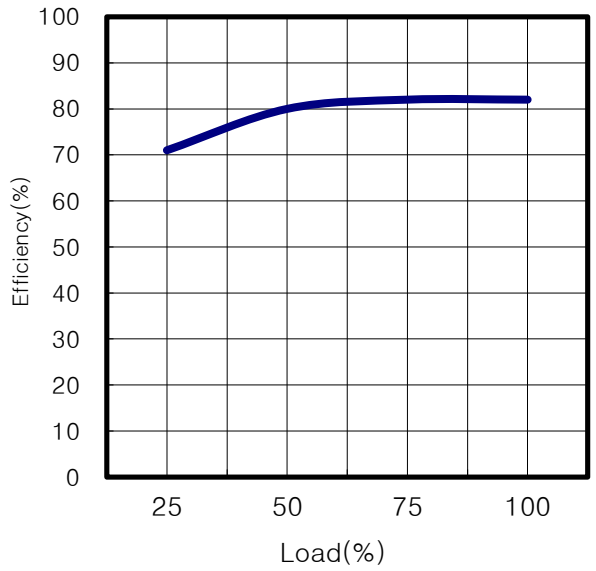
Environment

Characteristics	Symbol	Min.	Typ.	Max.	Unit
Operating Temperature Range	Ta	-40	-	85	℃
Operating Humidity (non Condensing)		5	-	95	%RH
Storage Temperature	Tstg	-40	-	105	℃

Characteristics Curves

Efficiency Curves

< SDS6 - 05 - 12 >



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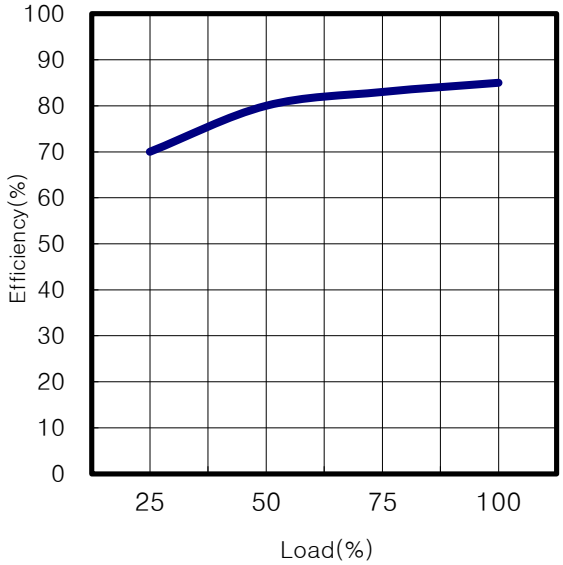

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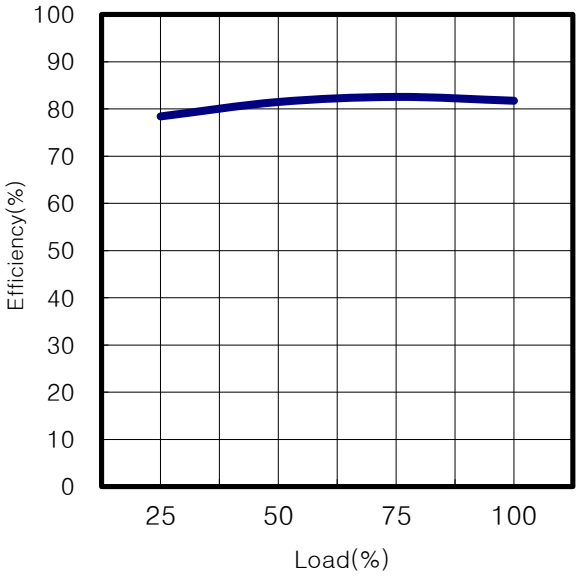

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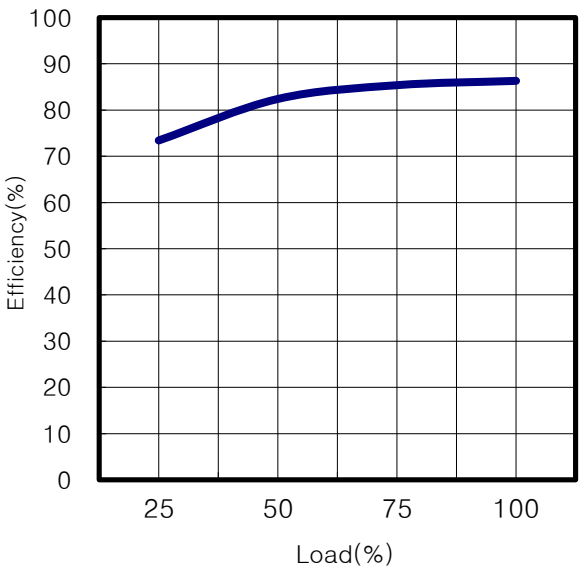
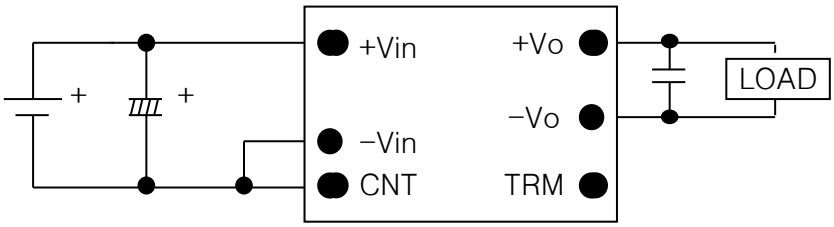


Application Sheet

Basic Connection



Input Section

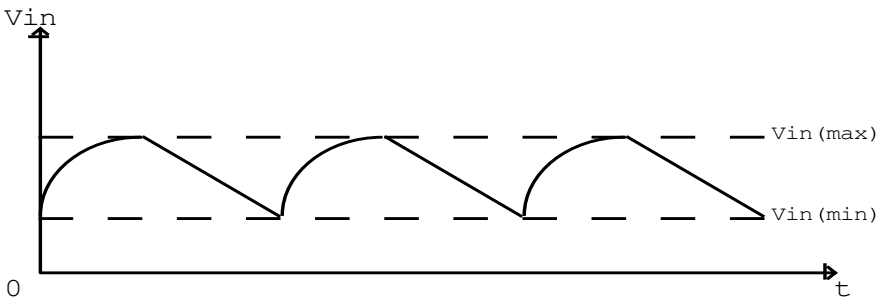
- Input fuse

In order to comply with safety requirements, SDS series has a fuse(Slow Blow Type) built in.

	SDS1R5 Series	SDS3 Series	SDS6 Series	SDS10 Series
5V	2A	3A	5A	6A
12V	1A	2.5A	2.5A	4A
24V	1A	1A	2A	2.5A
48V	1A	1A	1.5A	2A

- Unstable Input

Input voltage is comprised of both the DC voltage(average rectified voltage)and the peak to peak ripple voltage. Peak to peak ripple voltage should be minimized so that the input voltage is within the standard input voltage range as follows.



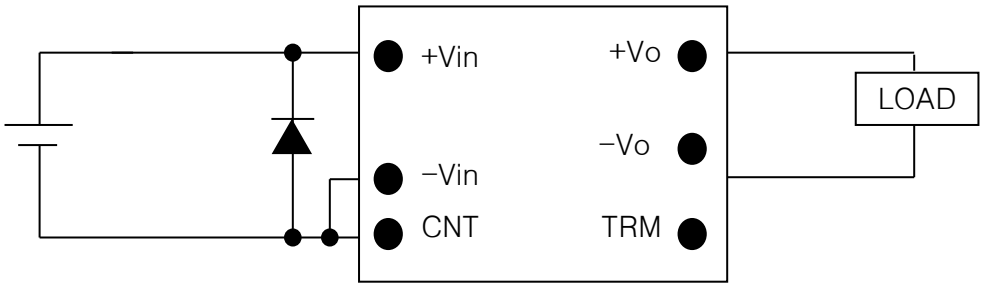
< Unstable Input >

- Battery Input

When using a battery as the input power supply, make sure that the maximum and minimum input voltage do not away out of the standard input voltage range.

- Input Reverse-polarity voltage protection

Accidentlly reversing the input connections could damage the module. Thus. If the connections may be accidentally reversed. Use a protective diode and an input fuse as shown below.



- Remote On/Off Control(CNT) (Except SDS1R5 Series)

Without switching the input on/off, the output can be enabled and disabled using this function. This function is useful for sequence control when building multiple output power supplies. This control circuit is on the input side using the CNT pin. Ground of CNT pin is the input -V terminal. When not using this function, short CNT to input -V terminal.

CNT level for -Vin		OUTPUT
Low level	Short to -Vin	ON
High level	Open	OFF

< Negative Logic on/off Control >

Output Section

- Output Ripple and Noise Measurement Method

The measurement for output ripple and noise are based on normal probe with 20㎒ bandwidth scope. Upon measurement of the ripple voltage, make sure that the scope probe leads are not too long. If a precise measurement can be made, the noise occurs from circumference must be reduced.

- Line Regulation

The line regulation means to the change in output voltage when the input voltage is varied within the input voltage range, at constant load and constant ambient temperature. The measurement point for the input and output voltage are ±Vin pins, ±Vout pins respectively.

- Load Regulation

The load regulation means to the change in output voltage when the load is changed from minimum load to maximum load, at constant input voltage and constant ambient temperature. The measurement point for the input and output voltage are ±Vin pins, ±Vout pins respectively.

- Output Voltage adjustment (TRM)

The output voltage can be varied within ±10% of the standard output voltage when use the external parts-resistors and variable resistor.

External Resistors :

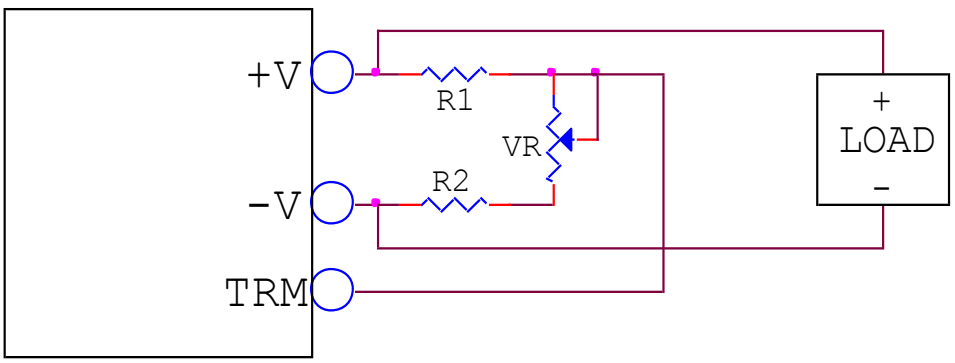
Resistance tolerance ±5%

Variable Resistor(VR) :

Total resistance toloatace ±20%

Remaining Resistance : Value less than 1%

Vo	R1	R2	VR
3.3V	150Ω	680Ω	1kΩ
5V	1kΩ	680Ω	1kΩ
12V	3.9kΩ	680Ω	1kΩ
15V	5.6kΩ	750Ω	1kΩ



< Trim Method >

- Over Current Protection

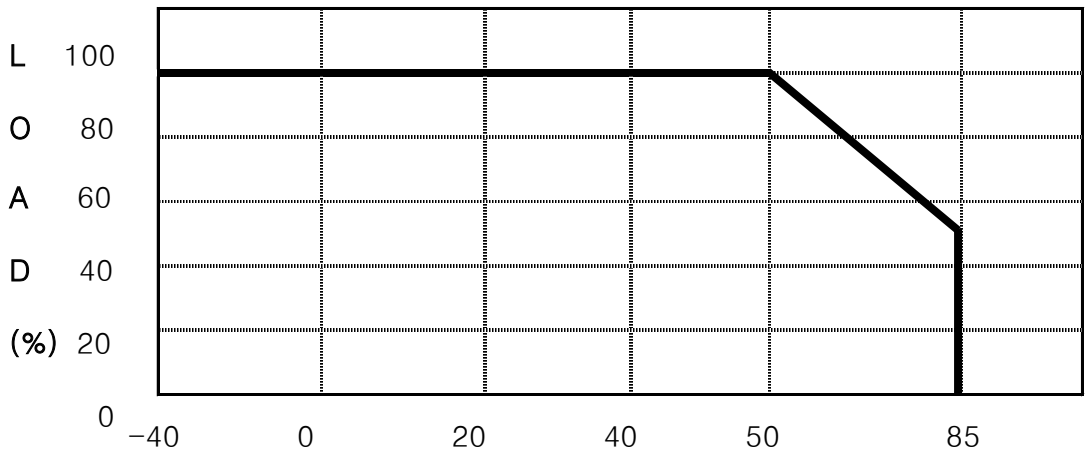
The SDS series is built into an OCP(Over Current Protection) circuit. When the OCP triggers, the output voltage will be fall. If overload condition is removed, the output will automatically recover.

Environment

- Temperature

Operation Temperature

The range of ambient temperature in ℃ over which a module can be operated safely at either rated or derated output power. Refer to derating curve as shown below.



※ Operating Temperature Range : From -40℃ to 85℃

< Derating Curve>

Storage Temperature

The range of ambient temperature in ℃ over which a module may be stored long term without damage. The storage temperature range is from -40℃ to 105℃.

- Humidity

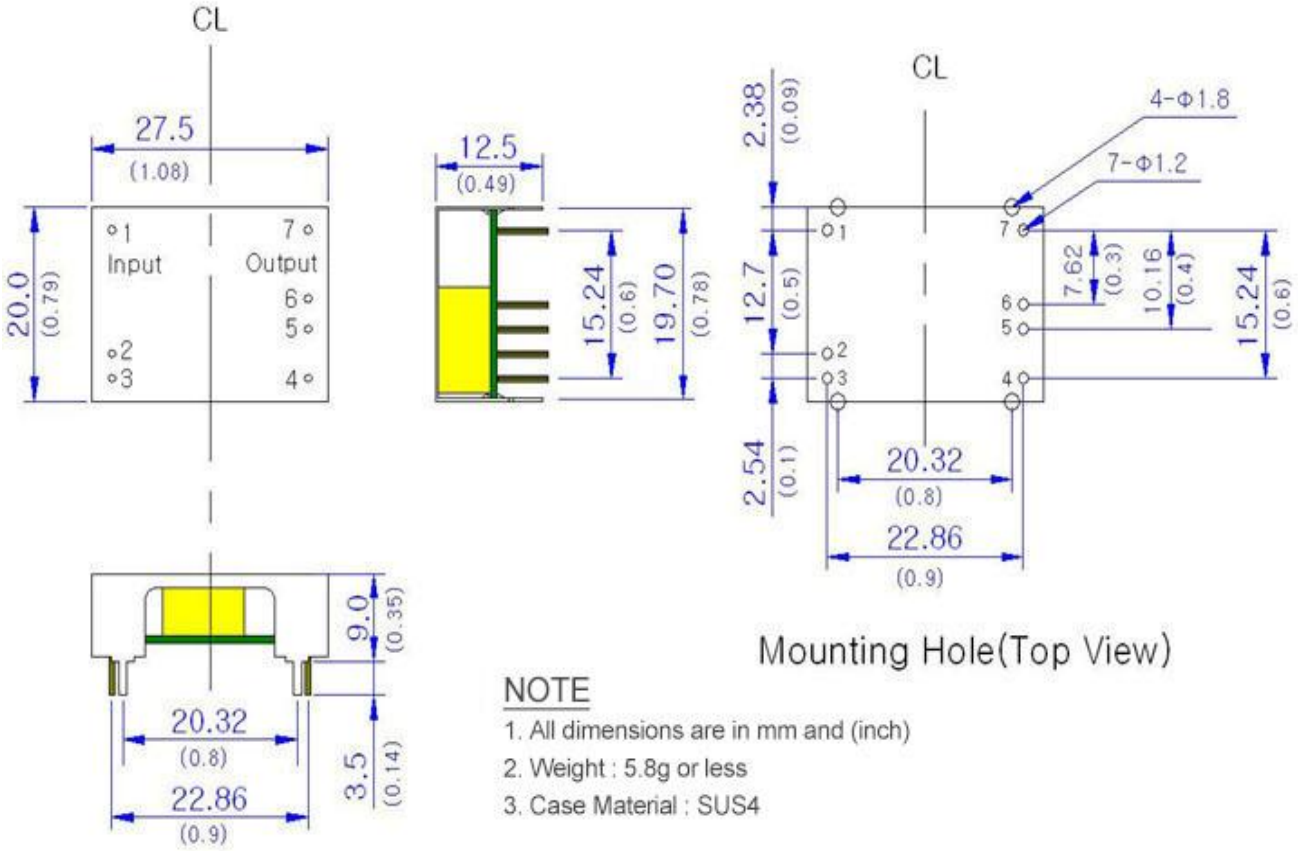
Operation Humidity

The range of ambient humidity in % over which a module can be operated safely at either rated or derated output power. Refer to derating curve as shown below. The operating humidity range is from 5% to 95%RH.

Storage Humidity

The range of ambient humidity in % over which a module may be stored long term without damage. The storage humidity range is from 5% to 95%RH.

Outline Dimensions : All dimensions are in inches and (mm)



NOTE

1. All dimensions are in mm and (inch)
2. Weight : 5.8g or less
3. Case Material : SUS4