Features

- DIL package
- 4:1 wide input voltage
- Single & dual output
- Efficiency ≤85%
- Operating temperature of -40°C to +82°C
- Low leakage <2μA
- EMI EN 55011+ A1 Class A & EMS EN 60601-1-2 medically approved
- No-load input current 4~7mA typ.
- Warranty: 3 years

4168DW10-M Series

10W Encapsulated DC/DC DIL PCB Mount Power Supply

The 4168DW10-M DC-DC Switching Medical Series is a compact and reliable isolated DC-DC converter. Designed for medical, ITE and industrial applications, it features a DIL package, single and dual output, and a 4:1 input voltage range.

Model Number Information					
4168DW10-M	X	X	X	R	M
Series Name	Input Voltage	S: Single Output D: Dual Output	Output Voltage	Regulated	Medical Application

Models

Model Number	Input Range (V DC)	Typical Input Current (mA)	Output Voltage (V DC)	Output Current (mA)	Efficiency (%)	Max Capacitive Load (µF)	Ripple & Noise (mVp-p)
4168DW10-24S03RM	9~36	7 ~ 414	3.3	2500	83	4700	100
4168DW10-24S05RM	9~36	7 ~ 496	5.0	2000	84	2500	100
4168DW10-24S12RM	9~36	7 ~ 496	12	834	84	430	100
4168DW10-24S15RM	9~36	7 ~ 499	15	670	84	270	100
4168DW10-24S24RM	9~36	7 ~ 499	24	417	84	430	240
4168DW10-24D05RM	9~36	7 ~ 496	±5.0	±1000	84	±1250	100
4168DW10-24D12RM	9~36	7 ~ 494	±12	±417	85	±220	100
4168DW10-24D15RM	9~36	7 ~ 500	±15	±335	85	±135	100
4168DW10-48S03RM	18~75	4 ~ 207	3.3	2500	83	4700	100
4168DW10-48S05RM	18~75	4 ~ 248	5.0	2000	84	2500	100
4168DW10-48S12RM	18~75	4 ~ 248	12	834	84	430	100
4168DW10-48S15RM	18~75	4 ~ 249	15	670	84	270	100
4168DW10-48S24RM	18~75	4 ~ 249	24	417	84	430	240
4168DW10-48D05RM	18~75	4 ~ 248	±5.0	±1000	84	±1250	100
4168DW10-48D12RM	18~75	4 ~ 247	±12	±417	85	±220	100
4168DW10-48D15RM	18~75	4 ~ 250	±15	±335	85	±135	100

Note: Ripple & Noise: BW=DC to 20MHz)

Input Specifications

	Conditions	Min	Typical	Max	Units
Voltage Types	–	–	–	4:1	–
Filter	–	–	Pi Network	–	–
Protection	Fuse Recommended	–	–	–	–
Turn-on Time	Constant Resistive Load	–	15	–	mS
Remote On/Off	DC-DC On (referred to -Vin pin)	0.0	Open	1.2	V DC
	DC-DC Off	2.2	–	1.2	V DC

Output Specifications

	Conditions	Min	Typical	Max	Units
Voltage Tolerance	–	–	–	±2.0	%
Short Circuit Protection (SCP)	Hiccup, automatic recovery	–	–	–	–
Line Regulation	–	–	–	±0.5	%
Load Regulation	Single	–	–	±0.5	%
	Dual (Balance)	–	–	±0.5	%
Cross Regulation	Dual (25~100% load)	–	–	±5.0	%
Transient Response Setting Time	25% load step change	–	350	–	µS
External Trim Adjustment Range	–	–	–	+10	%

Reliability Requirements

	Conditions	Min	Typical	Max	Units
MTBF	MIL HDBK 217F @ 25℃	900,000	–	–	Hours
Burn-in	100% of units	–	–	–	–

**Specifications typical at TA=25°C, nominal input voltage and rated output current unless otherwise specified*

Environmental Characteristics

	Conditions	Min	Typical	Max	Units
Operating Temperature		-40	–	+82	℃
Storage Temperature		-55	–	+125	℃
Switching Frequency		–	300	–	KHZ
Temperature Coefficient	100% load	–	–	±0.03	%/℃
Relative Humidity	Non-condensing	5	–	95	%
Cooling	Natural convection (20LFM)	–	–	–	–
Case Temperature	–	–	–	95	%

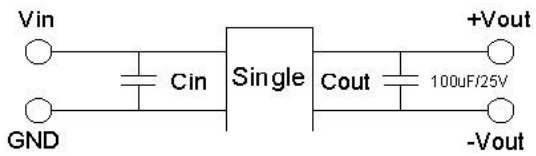
Safety & Certification

Safety Standards	ANSI/AAMI ES 60601-1 + A1 + A2, CAN/CSA-C22.2 No. 60601-1:14, IEC 60601-1 + A1 + A2
Certifications	CE, RoHS & REACH
EMC Standards	EMI – EN 55011 + A1 Class A EMS – EN 60601-1-2
Isolation Voltage	≤5000V AC RMS Input~Output reinforced insulation for 250V AC working voltage, 60 seconds, leakage ≤1mA
Isolation Resistance	≥1000MΩ @ 500V DC
Leakage Current	<2μA

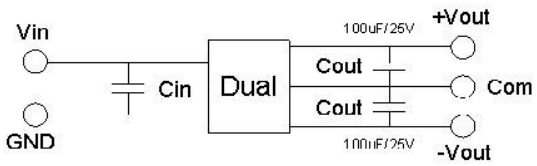
Dimensions & Weight

Case Material	Plastic
Dimensions	31.6 x 20.1 x 10.0mm
Weight	13.5g

Recommended Test Circuits



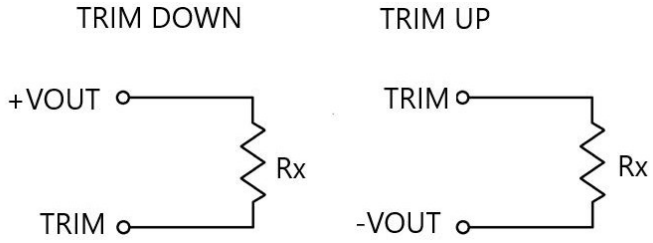
24V&40V:Cin 10uF,100V



24V & 48V :Cin 10uF,100V

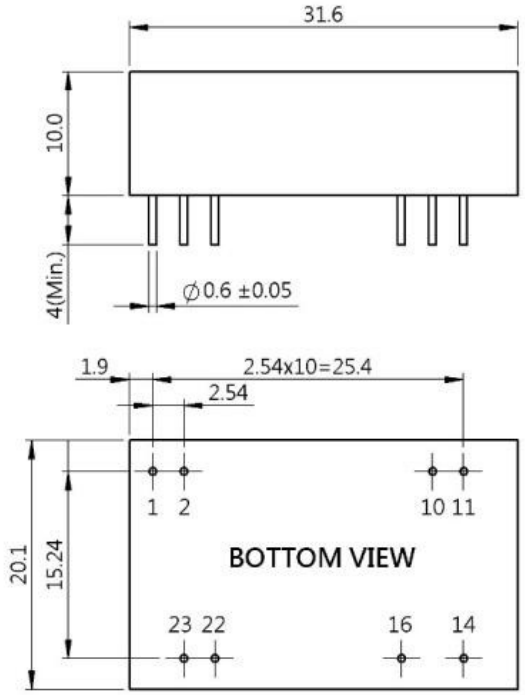
External Output Trimming

Output can be externally trimmed by using the method shown below:



**Specifications typical at TA=25°C, nominal input voltage and rated output current unless otherwise specified*

Mechanical Drawing

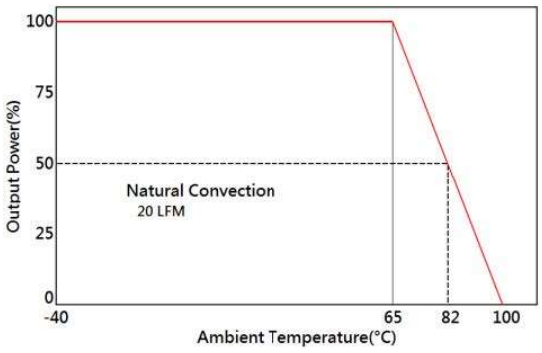


Unit：mm
Tolerance：XX.X ±0.5，XX.XX ±0.25

PIN Assignment								
PIN	1	2	10	11	14	16	22	23
Single	Remote on/off	-Vin	Trim	No PIN	+Vout	-Vout	+Vin	+Vin
Dual	Remote on/off	-Vin	Trim	-Vout	+Vout	Com	+Vin	+Vin

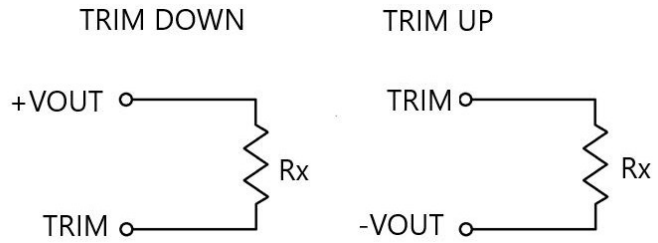
Engineering Data

Derating Curve:



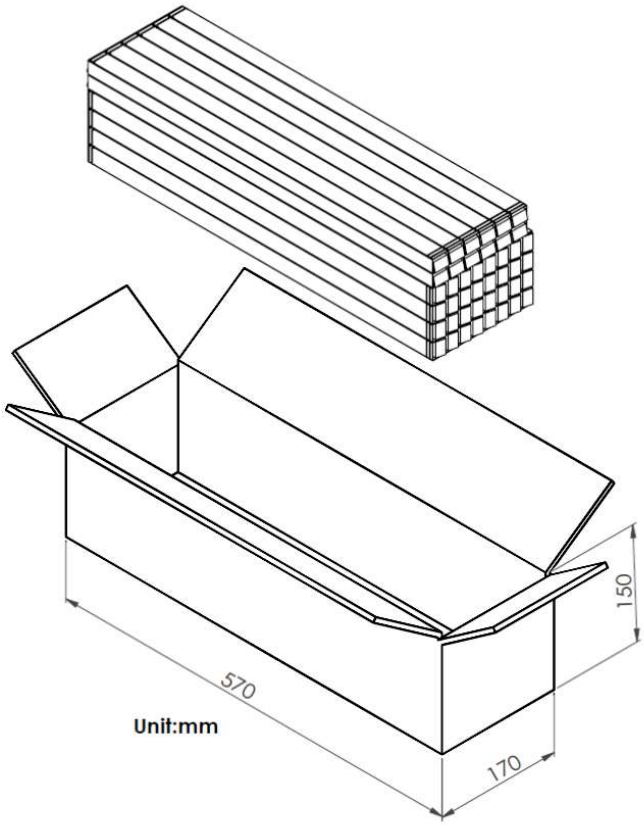
External Output Trimming

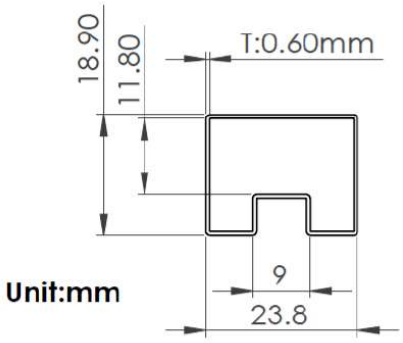
Output can be externally trimmed by using the method shown below:

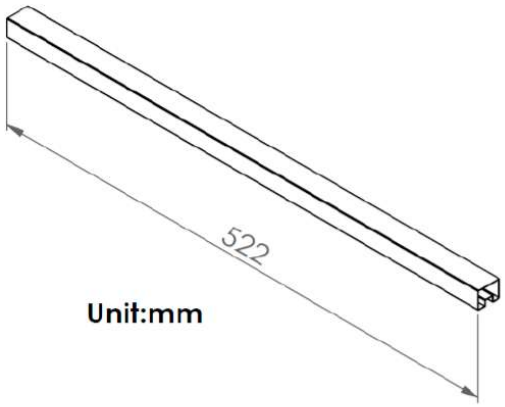


68DW10-XXS03RM											
Trim Down	**Vout**	**Vo**×99%	**Vo**×98%	**Vo**×97%	**Vo**×96%	**Vo**×95%	**Vo**×94%	**Vo**×93%	**Vo**×92%	**Vo**×91%	**Vo**×90%
	Rx(kΩ)	152.44	70.36	43.01	29.33	21.12	15.65	11.74	8.808	6.53	4.7
Trim Up	**Vout**	**Vo**×101%	**Vo**×102%	**Vo**×103%	**Vo**×104%	**Vo**×105%	**Vo**×106%	**Vo**×107%	**Vo**×108%	**Vo**×109%	**Vo**×110%
	Rx(kΩ)	87.75	39.33	23.18	15.11	10.27	7.04	4.74	3.007	1.66	0.59
68DW10-XXS05RM											
Trim Down	**Vout**	**Vo**×99%	**Vo**×98%	**Vo**×97%	**Vo**×96%	**Vo**×95%	**Vo**×94%	**Vo**×93%	**Vo**×92%	**Vo**×91%	**Vo**×90%
	Rx(kΩ)	229.9	102.4	59.9	38.65	25.9	17.4	11.33	6.775	3.23	0.4
Trim Up	**Vout**	**Vo**×101%	**Vo**×102%	**Vo**×103%	**Vo**×104%	**Vo**×105%	**Vo**×106%	**Vo**×107%	**Vo**×108%	**Vo**×109%	**Vo**×110%
	Rx(kΩ)	235	107.5	65	43.75	31	22.5	16.43	11.875	8.33	5.5
68DW10-XXS12RM											
Trim Down	**Vout**	**Vo**×99%	**Vo**×98%	**Vo**×97%	**Vo**×96%	**Vo**×95%	**Vo**×94%	**Vo**×93%	**Vo**×92%	**Vo**×91%	**Vo**×90%
	Rx(kΩ)	946.72	455.16	291.31	209.38	160.22	127.45	104.05	86.49	72.84	61.91
Trim Up	**Vout**	**Vo**×101%	**Vo**×102%	**Vo**×103%	**Vo**×104%	**Vo**×105%	**Vo**×106%	**Vo**×107%	**Vo**×108%	**Vo**×109%	**Vo**×110%
	Rx(kΩ)	232.88	104.44	61.63	40.22	27.38	18.81	12.7	8.11	4.54	1.69
68DW10-XXS15RM											
Trim Down	**Vout**	**Vo**×99%	**Vo**×98%	**Vo**×97%	**Vo**×96%	**Vo**×95%	**Vo**×94%	**Vo**×93%	**Vo**×92%	**Vo**×91%	**Vo**×90%
	Rx(kΩ)	1332.4	644.9	415.73	301.15	232.4	186.57	153.83	129.275	110.18	94.9
Trim Up	**Vout**	**Vo**×101%	**Vo**×102%	**Vo**×103%	**Vo**×104%	**Vo**×105%	**Vo**×106%	**Vo**×107%	**Vo**×108%	**Vo**×109%	**Vo**×110%
	Rx(kΩ)	248.9	111.4	65.57	42.65	28.9	19.73	13.19	8.275	4.46	1.4
68DW10-XXD05RM											
Trim Down	**Vout**	**Vo**×99%	**Vo**×98%	**Vo**×97%	**Vo**×96%	**Vo**×95%	**Vo**×94%	**Vo**×93%	**Vo**×92%	**Vo**×91%	**Vo**×90%
	Rx(kΩ)	1483.13	722.55	469.04	342.28	266.23	215.52	179.3	152.14	131.01	114.11
Trim Up	**Vout**	**Vo**×101%	**Vo**×102%	**Vo**×103%	**Vo**×104%	**Vo**×105%	**Vo**×106%	**Vo**×107%	**Vo**×108%	**Vo**×109%	**Vo**×110%
	Rx(kΩ)	258.87	119.44	72.96	49.72	35.77	26.48	19.84	14.86	10.99	7.89
68DW10-XXD12RM											
Trim Down	**Vout**	**Vo**×99%	**Vo**×98%	**Vo**×97%	**Vo**×96%	**Vo**×95%	**Vo**×94%	**Vo**×93%	**Vo**×92%	**Vo**×91%	**Vo**×90%
	Rx(kΩ)	1146.29	514.29	303.63	198.3	135.1	92.96	62.87	40.3	22.74	8.7
Trim Up	**Vout**	**Vo**×101%	**Vo**×102%	**Vo**×103%	**Vo**×104%	**Vo**×105%	**Vo**×106%	**Vo**×107%	**Vo**×108%	**Vo**×109%	**Vo**×110%
	Rx(kΩ)	1315.01	612.01	377.67	260.5	190.2	143.34	109.86	84.75	65.22	49.6
68DW10-XXD15RM											
Trim Down	**Vout**	**Vo**×99%	**Vo**×98%	**Vo**×97%	**Vo**×96%	**Vo**×95%	**Vo**×94%	**Vo**×93%	**Vo**×92%	**Vo**×91%	**Vo**×90%
	Rx(kΩ)	1354.11	605.56	356.04	231.28	156.42	106.52	70.87	44.14	23.35	6.71
Trim Up	**Vout**	**Vo**×101%	**Vo**×102%	**Vo**×103%	**Vo**×104%	**Vo**×105%	**Vo**×106%	**Vo**×107%	**Vo**×108%	**Vo**×109%	**Vo**×110%
	Rx(kΩ)	1692.89	791.44	490.96	340.72	250.58	190.48	147.56	115.36	90.32	70.29

Packaging







Tube	15 pcs (max)
BOX	660 pcs (max)
Weight	13.5 grams/pcs
Total Weight	12.03 KG/BOX (max)