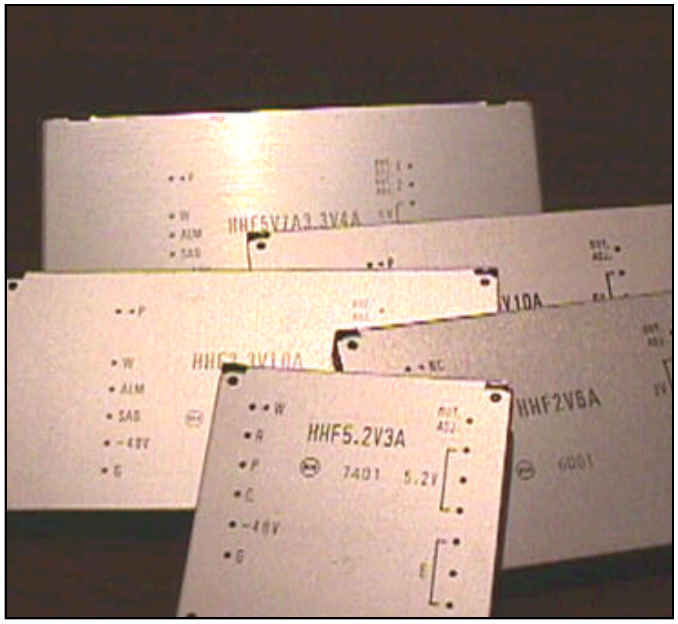
Outline

Although Shindengen has been marketing our HTG, HC and HCF series of DC-DC converters for communication equipment by taking advantage of the semiconductor device technology we have accumulated over many years, we have recently developed and released our HHF and HH series in order to meet the needs of our customers in terms of reduced size, higher performance and better cost performance.

The highly reliable DC-DC converters of the HHF and HH series introduced here are capable of converting an input of DC48V into voltages of 5, 5.2, 2 or 3.3V, and have been manufactured based on the assumption of 24-hour continuous operation in exchanges, transmission systems and other types of communication equipment.

The result is an outstanding product lineup aptly suited for effectively accommodating the rapid development of data communication networks in the current age of multimedia.



Features

1. High Reliability
2. High Efficiency
3. Low Profile
4. Miniature Size
5. Isolated Output
6. Heat Sink Not Required

Functions

1. Over Voltage Protection
2. Output Low Voltage Protection
3. Remote Off, Local Off Control
4. Inrush Current Limiting
5. Hot-line Insertion
6. Parallel Operation

Type Name

HH F □V □A

① ② ③ ④

① Model Name

② Developed Products No.

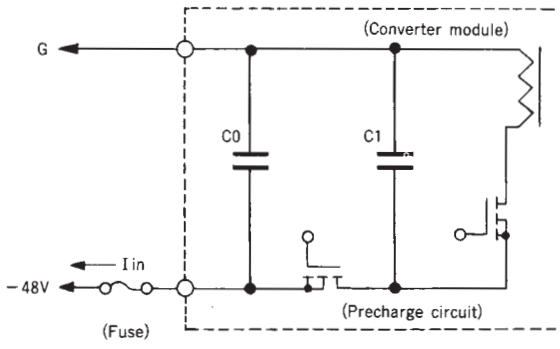
③ Output Voltage

④ Output Current

DC-DC Converters Selection Chart

	Input Voltage Range	Output Voltage	Output Current	Output Power
Model/Unit	V	V	A	W
HHF5V3A	−48	5	3	15
HHF5.2V3A		5.2	3	15.6
HHF2V6A		2	6	12
HHF5V6A		5	6	30
HHF3.3V10A		3.3	10	33
HHF5V10A		5	10	50
HHF2V6AA		2	6	12
HHF3.3V6A		3.3	6	19.8
HHF3.6V10A		3.6	10	36
HHF5.2V10A		5.2	10	52
HHF5V7A3.3V4A		5/3.3	7/4	48.2
HH2V4A		2.0	4	8
HH2.1V4A		2.1		8.4
HH3.3V4A		3.3		13.2

Precautions Concerning Input Fuse



This converter module does not contain a fuse. Install an external fuse for this converter module inside the electronic circuit package so that voltage fluctuations, such as the input falling below 48V due to overcurrent, do not continue for an extended period of time resulting in adverse effects on other adjacent packages.

Refer to the input current and input condenser capacity values for each model indicated in the table below when selecting the fuse capacity.

General Specification

HHF SERIES

Item \ Model	HHF5V3A	HHF5.2V3A	HHF2V6AA	HHF3.3V6A	HHF5V7A3.3V4A	Unit
Output Power	15	15.6	12	19.8	48.2	W
Input Characteristics						
Nominal Input Voltage	−48					V_{DC}
Input Voltage Range	−39～−59				−37～−62	V_{DC}
Conduction Noise (max)	−53					dBm
Output Characteristics						
Output Voltage	5	5.2	2	3.3	5/3.3	V
Nominal Output Current	3		6		7/4	A
Output Current Range	0～3		0～6		0～7/0～4	A
Output Voltage Tolerance	+5 −3.5					%
Over Current Protection (max)	4.5		9		10.5/8	A
Over Voltage Protection (max)	6.5	6.7	2.8	4.2	5.4～6.0/3.5～4.0	V
Output Low Voltage Protection (max)	4.0	4.2	1.6	2.5	4.0/2.6	V
Efficiency (typ)	84		76	84	85	%
Output Ripple Noise (max)	100					mV_{p-p}
Operating Temperature	4～70				0～65	℃
Cooling Method	Forced air cooling (1.5m/s min)					
Parallel Operation	Possible (50W min)					
Change Frequency	500					kHz
Isolation	500					V

General Specification

HHF SERIES

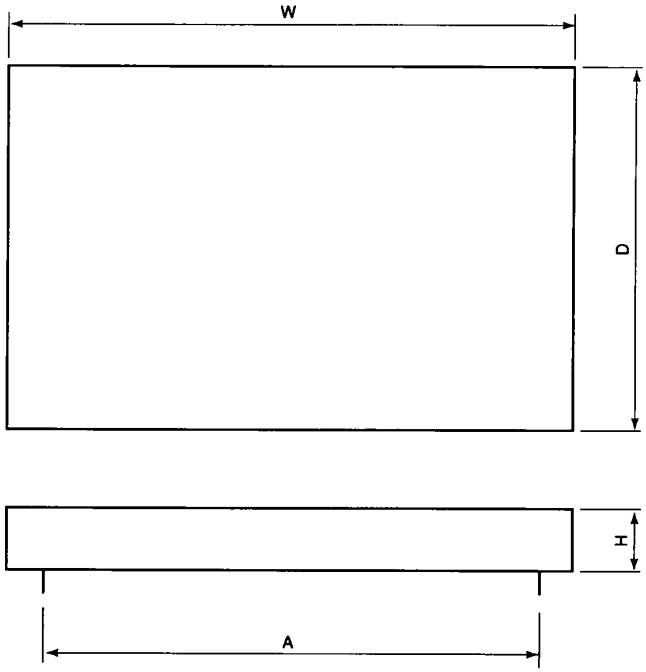
Item \ Model	HHF2V6A	HHF5V6A	HHF5.2V6A	HHF3.3V10A	HHF3.6V10A	HHF5V10A	Unit
Output Power	12	30	31.2	33	36	50	W
Input Characteristics							
Nominal Input Voltage	−48						V_{DC}
Input Voltage Range	−37～−62						V_{DC}
Conduction Noise (max)	−53						dBm
Output Characteristics							
Output Voltage	2	5	5.2	3.3	3.6	5	V
Nominal Output Current	6			10			A
Output Current Range	0～6			0～10			A
Output Voltage Tolerance	+5 −3.5						%
Over Current Protection (max)	9			15			A
Over Voltage Protection (max)	2.4～3.0	5.4～6.0	5.6～6.2	3.5～3.8	4.0～4.5	5.4～6.0	V
Output Low Voltage Protection (max)	1.6	4.0		2.6		4.0	V
Efficiency (typ)	76	87	86	85	86	87	%
Output Ripple Noise (max)	100						mV_{p-p}
Operating Temperature	Ta＝0～65、T(baseplate)＝100						℃
Cooling Method	Forced air cooling (1.5m/s min)						
Parallel Operation	Possible (50W min)						
Change Frequency	400～500						kHz
Isolation	500						V

General Specification

HH SERIES

Item \ Model	HH2V4A	HH2.1V4A	HH3.3V4A	Unit
Output Power	8	8.4	13.2	W
Input Characteristics				
Nominal Input Voltage	−48			V_{DC}
Input Voltage Range	−40～−58			V_{DC}
Conduction Noise (max)	−53			dBm
Output Characteristics				
Output Voltage	2.0	2.1	3.3	V
Nominal Output Current	4			A
Output Current Range	0～4			A
Output Voltage Tolerance	+5 −3.5			%
Over Current Protection (max)	6			A
Over Voltage Protection (max)	2.8		4.2	V
Output Low Voltage Protection (max)	1.6		2.5	V
Efficiency (typ)	75		84	%
Output Ripple Noise (max)	100			mV_{p-p}
Operating Temperature	Ta＝5～70、T (baseplate)＝100			℃
Cooling Method				
Parallel Operation	Possible (50W min)			
Change Frequency	500			kHz
Isolation	500			V

Mechanical Dimension



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Model	W	D	H	A
HHF5V3A HHF5.2V3A	45.72 max	45.72 max	8.5 max	40.64±0.5
HHF2V6A HHF2V6AA HHF5V6A HHF3.3V6A	66.04 max			60.96±0.5
HHF3.3V10A HHF3.6V10A HHF5V10A HHF5.2V10A	86.36 max			81.28±0.5
HHF5V7A3.3V4A	98.0 max	62.0 max		86.36±0.5
HH2V4A HH2.1V4A HH3.3V4A	66.04	45.72		60.96±0.5