

HSK5176 Series Mil-spec DC-DC converter

1.1 Absolute maximum rated of Mil-spec DC-DC converter

Pulse input voltage V_{INP}

(Positive pulse width 100ms, positive duty cycle 1%) $\cdots -20V \sim +60V$;

Input voltage V_{IN} $\cdots \cdots \cdots 26V$;

Output current limit $\cdots \cdots \cdots 7.5A$;

Storage temperature T_{stg} $\cdots \cdots \cdots -65^{\circ}C \sim 150^{\circ}C$;

Lead welding temperature (10s) T_h $\cdots \cdots \cdots 300^{\circ}C$;

Junction temperature T_j $\cdots \cdots \cdots 175^{\circ}C$;

Thermal resistance $R_{(th)J-C}$ $\cdots \cdots \cdots 3.5^{\circ}C/W$;

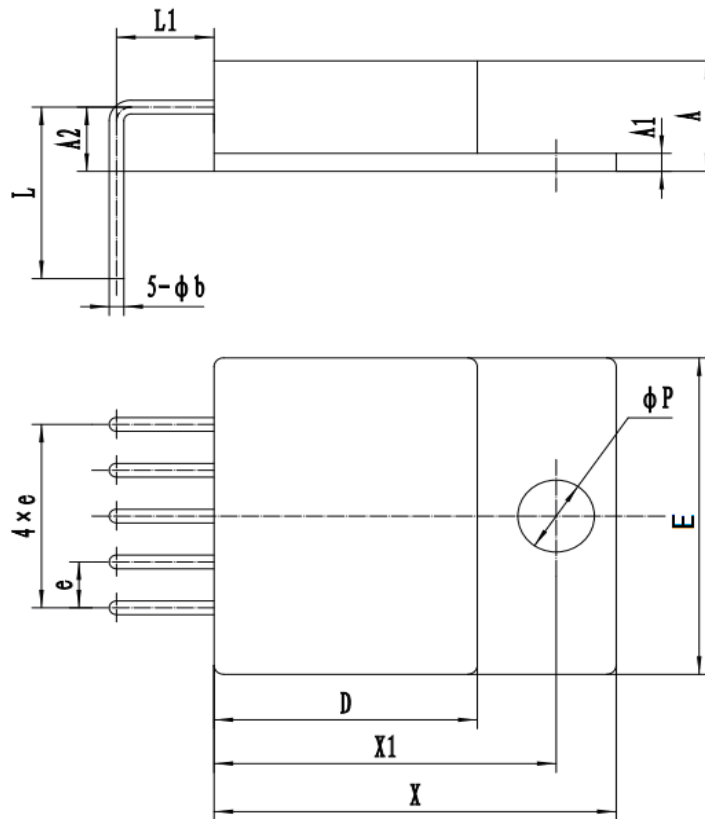
Power consumption P_b (Without heat sink) $\cdots \cdots \cdots 1W$.

1.2 Recommended operating conditions of Mil-spec DC-DC converter

Input voltage V_{IN} $\cdots \cdots \cdots (V_{OUT}+1)V$;

Operating temperature T_c $\cdots \cdots \cdots -55^{\circ}C \sim 125^{\circ}C$.

1.3 Package Specifications of Mil-spec DC-DC converter

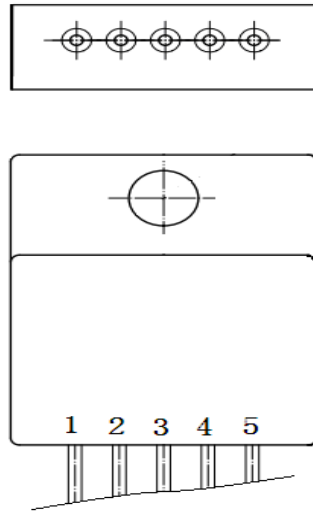


Unit:mm

Symbols	Data		
	Minimum	Typical	Maxim
<i>A</i>	-	-	6.70
<i>A1</i>	0.70	-	1.30
<i>A2</i>	3.20	-	3.80
<i>D</i>	-	-	14.22
<i>E</i>	-	-	18.03
<i>X</i>	-	-	21.30
<i>X1</i>	17.33	-	18.33
<i>L</i>	9.0	-	-
<i>L1</i>	4.58	-	5.58
<i>e</i>	-	2.54	-
φb	0.63	-	0.89
φP	3.70	-	4.30

Fig 19 HSK5176-1.5HTD Package outline drawing

1.4 Pin Designations of Mil-spec DC-DC converter

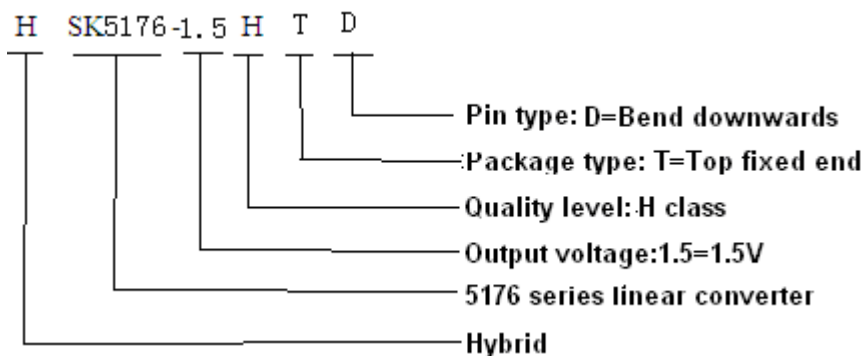


Pin	Symbol	Designation
1	En	Enable
2	V_{IN}	Input
3	GND	GND
4	V_{OUT}	Output
5	NC	NC

Fig 20 HSK5176-1.5HTD Pin Designations

1.5 Ordering Information of Mil-spec DC-DC converter

Part number contains the use of the production process, serial number, output voltage, quality level and other information. As shown below:



1.6 Technical Specifications of Mil-spec DC-DC converter

Table 7 HSK5176-1.5 Electrical characteristics

Items	Symbol	Condition (Unless otherwise specified, $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$)	A Group	Limited value		Unit
				Min	Max	
Output voltage	V_{OUT}	$I_{OUT}=10\text{mA}$, $V_{IN}=2.5\text{V}$	1, 2, 3	1.47	1.53	V
Input and output voltage difference	V_{DO}	$T_A=25^{\circ}\text{C}$; $\Delta V_{OUT}=-1\%$; $I_{OUT}=250\text{mA}$	1	—	800	mV
		$T_A=25^{\circ}\text{C}$; $\Delta V_{OUT}=-1\%$; $I_{OUT}=7.5\text{A}$		—	1200	
Static (ground) current	I_Q	$T_A=25^{\circ}\text{C}$; $V_{IN}=3.5\text{V}$, $I_{OUT}=4\text{A}$	1	—	100	mA
		$T_A=25^{\circ}\text{C}$; $V_{IN}=3.5\text{V}$, $I_{OUT}=7.5\text{A}$		—	200	
Load regulation	S_I	$I_{OUT}=10\text{mA} \rightarrow 7.0\text{A}$, $V_{IN}=3.0\text{V}$	1, 2, 3	—	2	%
Voltage regulation	S_V	$V_{IN}=2.5\text{V} \rightarrow 26\text{V}$, $I_{OUT}=10\text{mA}$	1, 2, 3	—	1	%
Output noise voltage	V_N	$T_A=25^{\circ}\text{C}$; $C_L=33\mu\text{F}$; $f \leq 300\text{KHz}$	4	—	700	μV
Output current limit	I_{LIM}	$T_A=25^{\circ}\text{C}$; $V_{IN}=2.5\text{V}$; duty cycle=70%	1	—	20	A
Thermal shutoff temperature	T_{SD}	$T_A=25^{\circ}\text{C}$; $V_{IN}=3.5\text{V}$; $I_{OUT}=5\text{A}$	4	—	165	$^{\circ}\text{C}$

1.7 Typical Connection Diagram of Mil-spec DC-DC converter

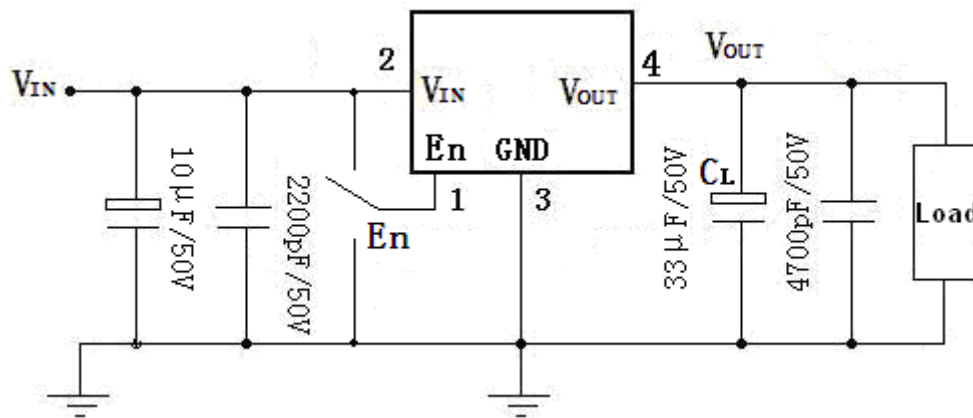


Fig 21 HSK5176-1.5HTD Electrical test line connection diagram

1.8 Application Notes of Mil-spec DC-DC converter

- ☆ The electronic inspection point should be kept as close as possible at the root of the pin;
- ☆ It is strictly forbidden to bend the pins;
- ☆ To prevent the application of two or more absolute maximum ratings on the device at the same time;
- ☆ To prevent the device from falling off;
- ☆ To prevent the output and ground short circuit;

- ☆ To prevent the device from being reversed or dislocated;
- ☆ During assembly, the bottom of the product should be attached as close as possible to the circuit board to avoid damage to the pin, take shockproof measures for necessary ;
- ☆ Focus on device power consumption, the power consumption $P_D = I_O(V_{IN} - V_{OUT})$, When the input/output voltage difference ($V_{IN}-V_{OUT}$) is large, output current I_O should be smaller; When the input/output voltage difference ($V_{IN}-V_{OUT}$) is small , output current I_O should be larger; When the device power consumption is large, be sure to configure the appropriate heat sink to prevent the device damaged due to overheating or into the overheating protection status;
- ☆ Both positive and negative terminals of power supply shall be correctly connected when power is applied so as to avoid permanent damage to the device.;
- ☆ Anti-static measures should be taken during storage and transportation.