HSK51500 Series weapon DC-DC converter

1.1 Absolute maximum rated of weapon DC-DC converter

Pulse input voltage V_{INP}

(Positive pulse width 100ms, positive duty cycle 1%)…-20V～+60V;

Input voltage V_{IN} …… 26V;

Output current limit ……5.0A;

Storage temperature T_{stg}…… -65℃～150℃;

Lead welding temperature (10s) T_h……300℃;

Junction temperature T_j ……175℃;

Thermal resistance $R_{(th)J-C}$ …… 3.5℃/W;

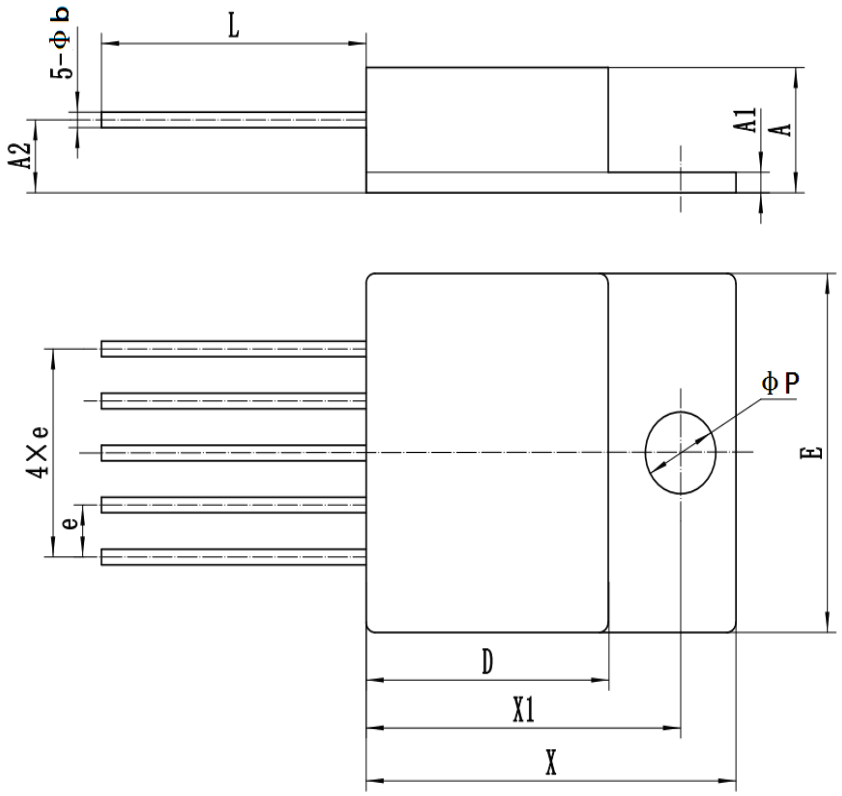
Power consumption P_D (Without heat sink) ……1W.

1.2 Recommended operating conditions of weapon DC-DC converter

Input voltage V_{IN}…… (V_{OUT}+1)V;

Operating temperature T_C ……-55℃～125℃.

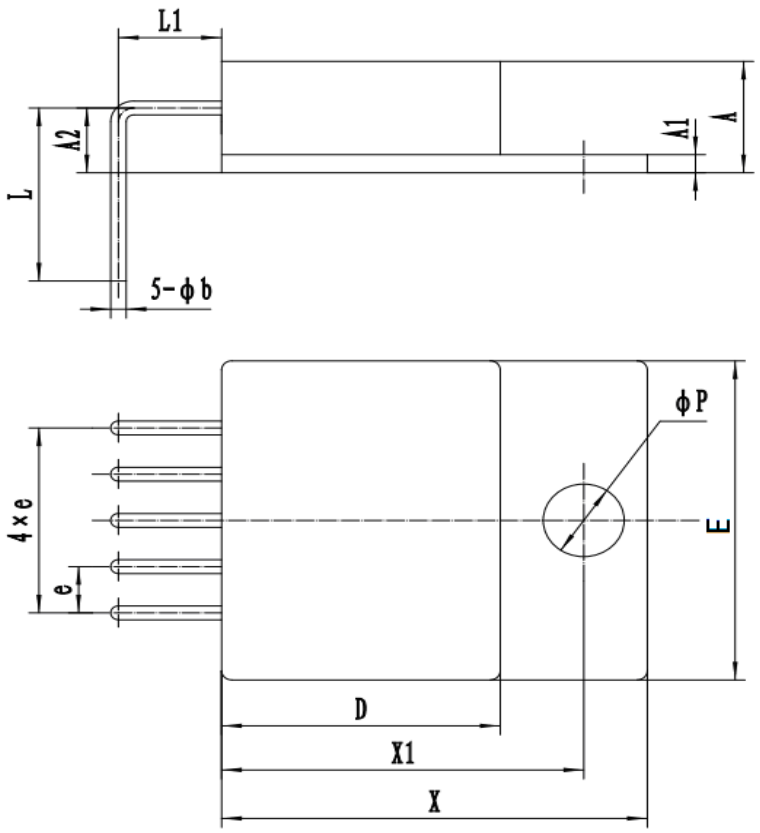
1. 3 Package Specifications of weapon DC-DC converter



Unit:mm

Symbols	Data		
	Minimum	Typical	Maxim
A	–	-	6. 70
A1	0. 70	-	1. 30
A2	3. 20	-	3. 80
D	–	-	14. 22
E	–	–	18. 03
X	–	–	21. 30
X1	17. 33	–	18. 33
L	12. 0	–	–
e	–	2. 54	–
φ *b*	0. 63	–	0. 89
φ *P*	3. 70	–	4. 30

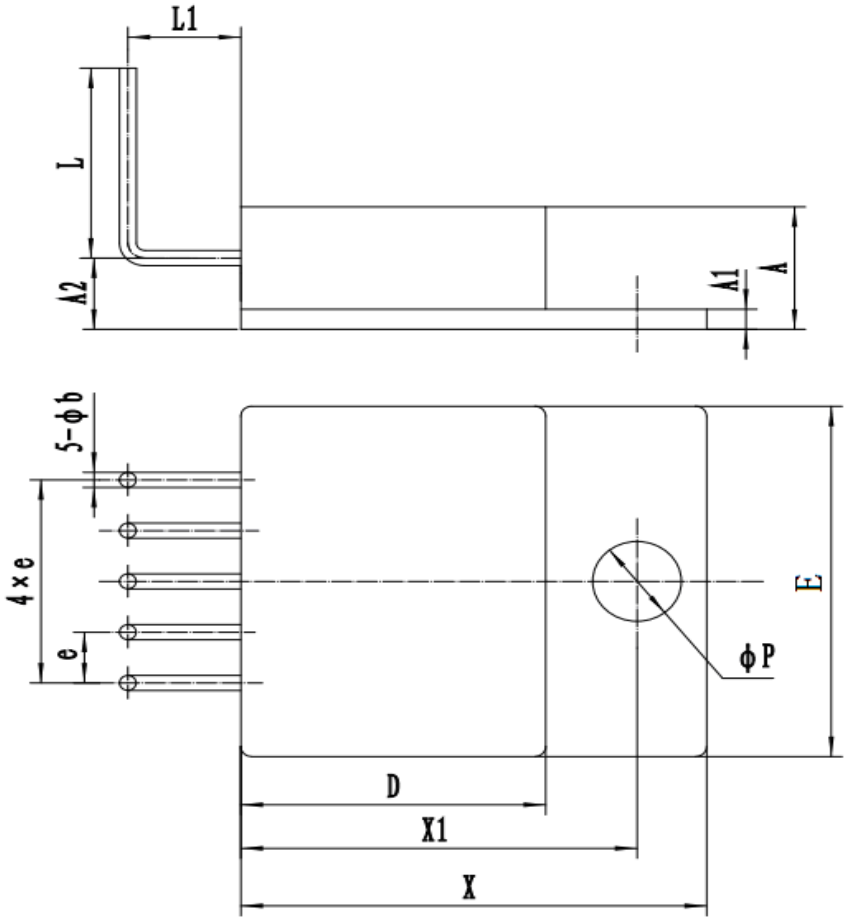
Fig 16a TS Package outline drawing



Unit:mm

Symbols	Data		
	Minimum	Typical	Maxim
A	–	-	6.70
A1	0.70	-	1.30
A2	3.20	-	3.80
D	–	-	14.22
E	–	–	18.03
X	–	–	21.30
X1	17.33	–	18.33
L	9.0	–	–
L1	4.58	–	5.58
e	–	2.54	–
φ *b*	0.63	–	0.89
φ *P*	3.70	–	4.30

Fig 16b TD Package outline drawing

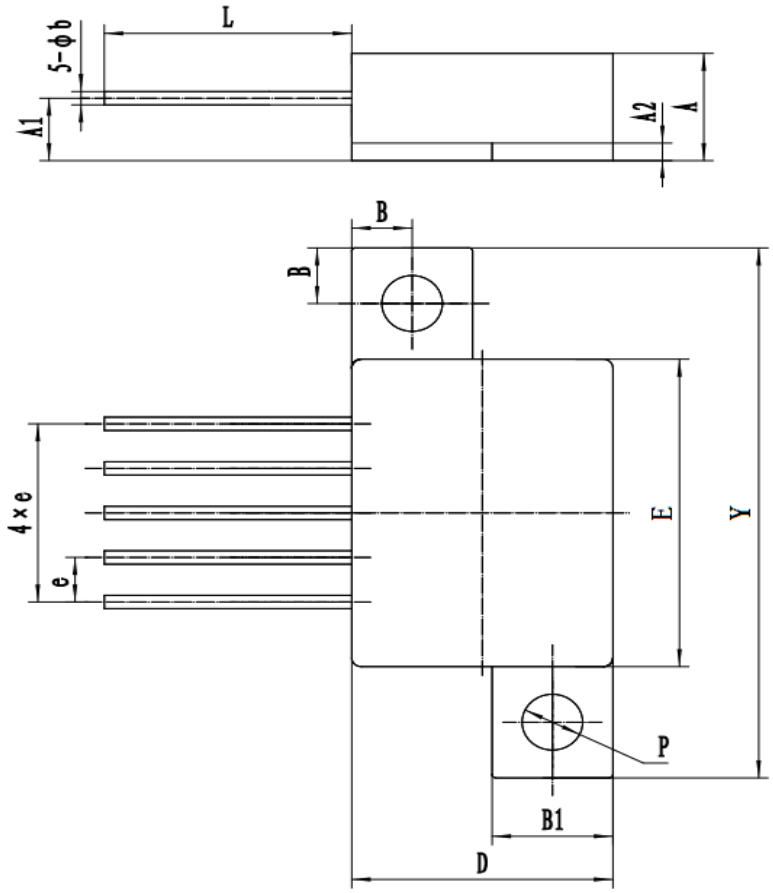


Unit:mm

Symbols	Data		
	Minimum	Typical	Maxim
A	–	-	6.70
A1	0.70	-	1.30
A2	3.20	-	3.80
D	–	-	14.22
E	–	–	18.03
X	–	–	21.30
X1	17.33	–	18.33
L	9.0	–	–
L1	4.58	–	5.58
e	–	2.54	–
φ b	0.63	–	0.89

φ *P*	3. 70	–	4. 30

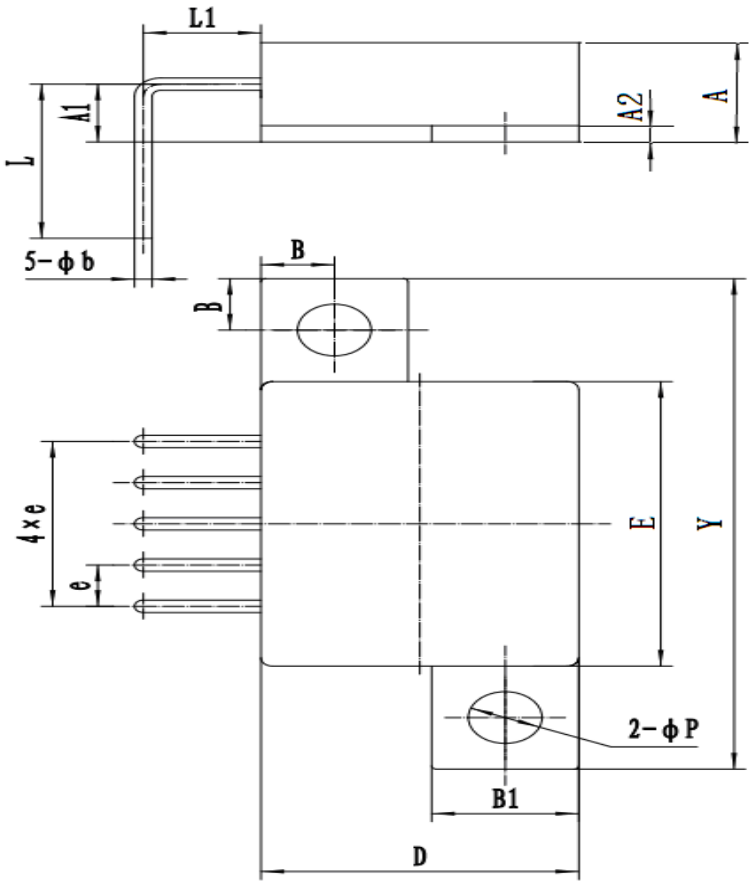
Fig 16c TU Package outline drawing



Unit:mm

Symbols	Data		
	Minimum	Typical	Maxim
A	–	-	6. 70
A1	3. 20	-	3. 80
A2	0. 70	-	1. 30
B	2. 87	-	3. 48
B1	6. 05	-	6. 65
D	–	-	14. 22
E	–	–	18. 03
Y	–	–	30. 72
L	12. 0	–	–
e	–	2. 54	–
φ *b*	0. 63	–	0. 89
φ *P*	2. 90	–	3. 50

Fig 16d ZS Package outline drawing

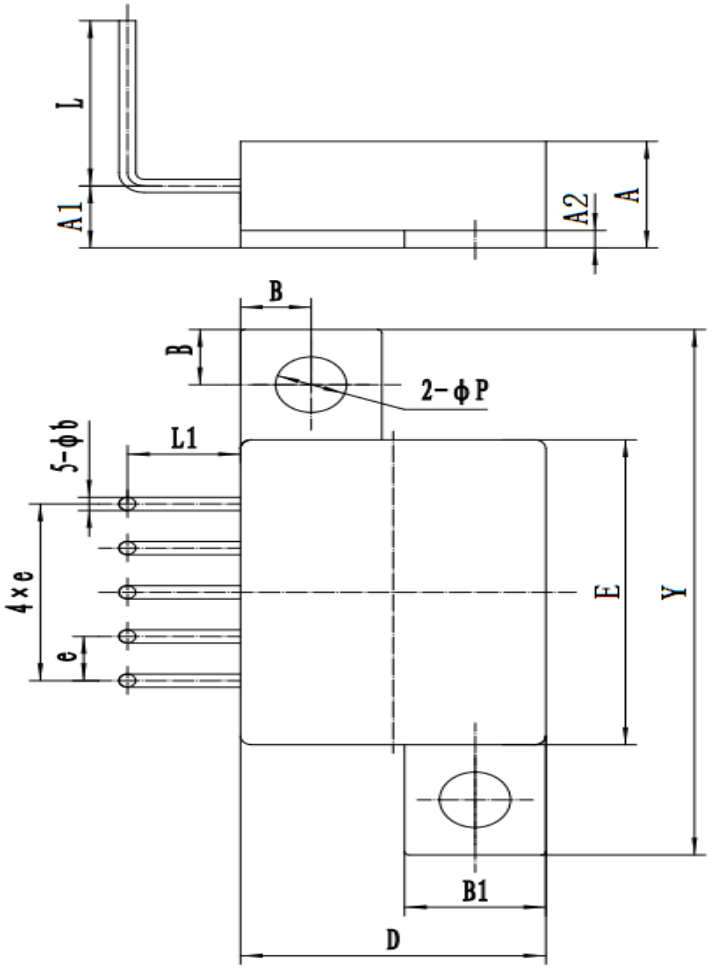


Unit:mm

Symbols	Data		
	Minimum	Typical	Maxim
A	–	-	6.70
A1	3.20	-	3.80
A2	0.70	-	1.30
B	2.87	-	3.48
B1	6.05	-	6.65
D	–	-	14.22
E	–	–	18.03
Y	–	–	30.72
L	9.0	–	–
L1	4.58	–	5.58
e	–	2.54	–

φ *b*	0.63	–	0.89
φ *P*	2.90	–	3.50

Fig 16e ZD Package outline drawing



Unit: mm

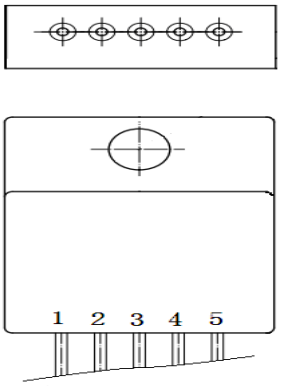
Symbols	Data		
	Minimum	Typical	Maxim
A	–	-	6.70
A1	3.20	-	3.80
A2	0.70	-	1.30
B	2.87	-	3.48
B1	6.05	-	6.65
D	–	-	14.22
E	–	–	18.03
Y	–	–	30.72
L	9.0	–	–

L1	4.58	–	5.58
e	–	2.54	–
φ *b*	0.63	–	0.89
φ *P*	2.90	–	3.50

Fig 16f ZU Package outline drawing

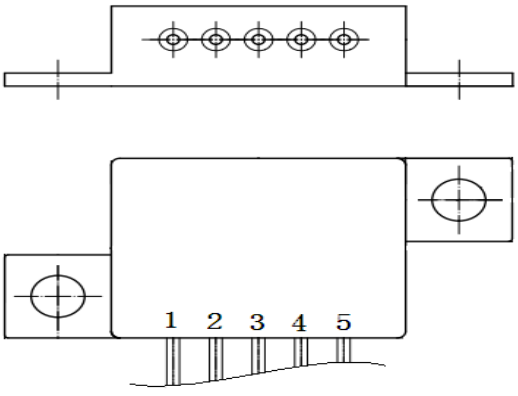
1.4 Pin Designations of weapon DC-DC converter

The leading end arrangement shall be as specified in Fig 17. Fig 17a shows the product leading ends in the form of TS, TD, TU package type. Fig 17b shows the product leading ends in the form of ZS, ZD, ZU package type.



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

Fig 17a HSK5150-00 Pin Designations (Apply for TS, TD, TU package type)



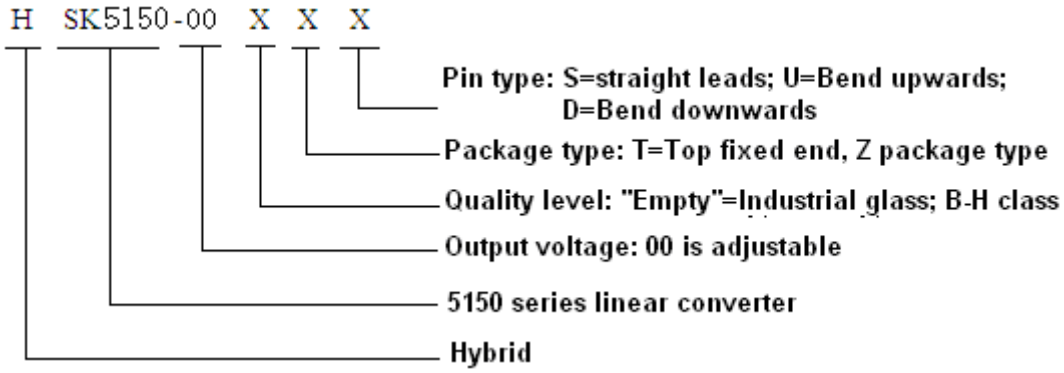
Pin	Symbol	Designation

1	En	Enable
2	V_{IN}	Input
3	GND	GND
4	V_{OUT}	Output
5	ADJ	Adjustment voltage

Fig 17b HSK5150-00 Pin Designations (Apply for ZS, ZD, ZU package type)

1.5 Ordering Information of weapon 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 weapon DC-DC converter

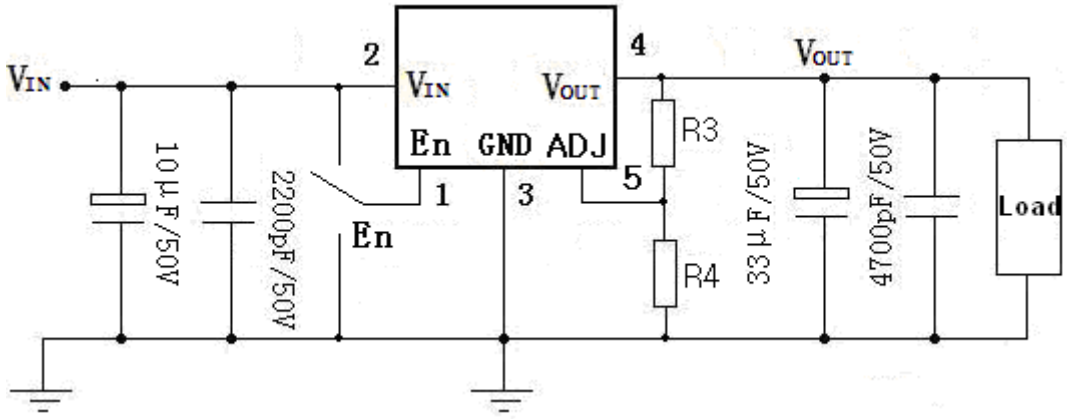
Table 6a HSK5150-00 Electrical characteristics

Items	Symbol	Condition (Unless otherwise specified, $-55℃ \leqslant T_A \leqslant 125℃$)	A Group	Limited value		Unit
				Min	Max	
Input and output voltage difference	V_{DO}	T_A=25℃; $\triangle V_{OUT}$=-1%; I_{OUT}=250mA	1	—	800	mV
		T_A=25℃; $\triangle V_{OUT}$=-1%; I_{OUT}=5.0A		—	1200	
Static (ground) current	I_Q	T_A=25℃; V_{IN}=4.3V, I_{OUT}=2.5A	1	—	70	mA
		T_A=25℃; V_{IN}=4.3V, I_{OUT}=5.0A		—	200	
Load regulation	S_I	I_{OUT}=10mA→4.5A, V_{IN}=4.3V	1, 2, 3	—	2	%
Voltage regulation	S_V	V_{IN}=4.3V→26V, I_{OUT} =10mA	1, 2, 3	—	1	%
Output noise voltage	V_N	T_A=25℃; C_L=33μ F; f≤300KHz	4	—	700	μ V
Output current limit	I_{LIM}	T_A=25℃; V_{IN}=4.3V; duty cycle =70%	1	—	15	A
Thermal shutoff temperature	T_{SD}	T_A=25℃; V_{IN}=5.3V; I_{OUT}=5.0A	4	—	165	℃

Table 6b HSK5150-00 function form

Items	Condition	Group	Function representation
Output voltage adjustable function	TA=25℃, Shows in fig 7, R3 adjust during 0～3kΩ	7	The output voltage can be adjustable from 1.5V～12V
Enable function	T_A=25℃, V_{IN}=V_{OUT}+1V, I_{OUT}=1A , E_n=0V	7	Output voltage off
	T_A=25℃, V_{IN}=V_{OUT}+1V, I_{OUT}=1A , E_n=V_{IN}		Output voltage on

1.7 Typical Connection Diagram of weapon DC-DC converter



VOUT=1.240V × [1+(R3/R4)]

Fig 18 HSK5150-00 Electrical test line connection diagram

1.8 Application Notes weapon DC-DC converter

☆ The electronic inspecton 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.