

HSK5102 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%).....-20V~60V;

Input voltage V_{IN} 26V;

Storage temperature T_{stg} -65°C~150°C;

Lead welding temperature (10s) T_h 300°C;

Junction temperature T_j 175°C;

Thermal resistance $R_{(th)J-C}$ 5.7°C/W;

Power consumption P_D (without heat sink) 200mW.

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

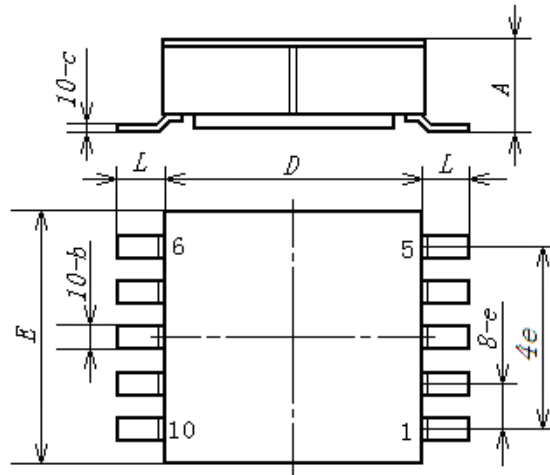
Input voltage V_{IN} $(V_{OUT}+1)V$;

Operating temperature T_c -55°C~125°C;

Enable input voltage high level $V_{En(H)}$ $\geq 2.4V$;

Enable input voltage low level $V_{En(L)}$ $\leq 0.8V$.

1.3 Package Specifications of mil-spec DC-DC converter

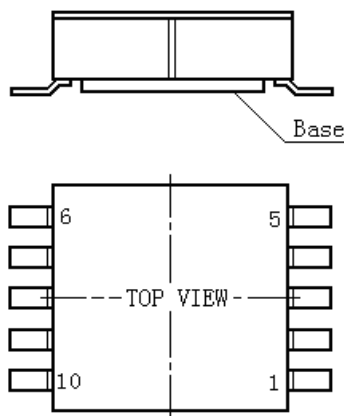


Unit:mm

Symbols	Data		
	Minimum	Typical	Maxim
<i>A</i>	-	-	3.0
<i>D</i>	-	-	6.8
<i>E</i>	-	-	6.8
<i>L</i>	1.0	-	-
<i>b</i>	0.30	0.4	0.5
<i>c</i>	-	0.15	0.25
<i>e</i>	-	1.27	-

Fig 4 HSK5102 Package outline drawing

1.4 Pin Designations of mil-spec DC-DC converter

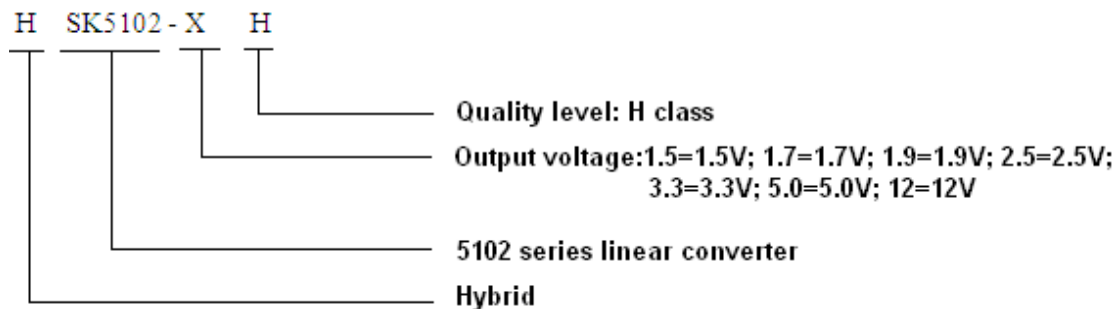


Pin	Symbol	Designation	Pin	Symbol	Designation
1	NC	NC	6	V _{OUT}	Output
2	E _N	Enable	7	V _{OUT}	Output
3	V _{IN}	Input	8	V _{OUT}	Output
4	V _{IN}	Input	9	NC	NC
5	NC	NC	10	NC	NC
			Base	GND	GND

Fig 5 HSK5102 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 2a HSK5102-3.3 Electrical characteristics

Items	Symbol	Condition (Unless otherwise specified, $V_{En(0)} \geq 2.4V$, $V_{En(L)} \leq 0.8V$, $-55^{\circ}C \leq T_c \leq 125^{\circ}C$)	A Group	Limited value		Unit
				Min	Max	
Output voltage	V _{OUT}	I _{OUT} =1A, V _{IN} =4.3V	1, 2, 3	3.234	3.366	V
Input and output voltage difference	V _{DO}	T _A =25°C; $\Delta V_{OUT} = -1\%$; I _{OUT} =100mA	1	—	200	mV
		T _A =25°C; $\Delta V_{OUT} = -1\%$; I _{OUT} =1.5A		—	600	
Static (ground) current	I _Q	T _A =25°C; V _{IN} =4.3V, I _{OUT} =0.75A	1	—	30	mA
		T _A =25°C; V _{IN} =4.3V, I _{OUT} =1.5A		—	40	
Load regulation	S _I	I _{OUT} =10mA → 1.25A, 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; C _L =22μ F ~ 30μ F; f ≤ 300KHz	4	—	250	μ V
Shutoff output current	I _{OSD}	T _A =25°C; E _r =0V	4	—	50	μ A
Output current limit	I _{LIM}	T _A =25°C; V _{IN} =4.3V	4	—	6.5	A
Thermal shutoff temperature	T _{SD}	T _A =25°C; V _{IN} =5.3V; I _{OUT} =2.0A	4	—	150	°C

Table 2b HSK5102-5.0 Electrical characteristics

Items	Symbol	Condition (Unless otherwise specified, $V_{En(0)} \geq 2.4V$, $V_{En(L)} \leq 0.8V$, $-55^{\circ}C \leq T_c \leq 125^{\circ}C$)	A Group	Limited value		Unit
				Min	Max	
Output voltage	V_{OUT}	$I_{OUT}=1A$, $V_{IN}=6.0V$	1, 2, 3	4.90	5.10	V
Input and output voltage difference	V_{DO}	$T_A=25^{\circ}C$; $\Delta V_{OUT}=-1\%$; $I_{OUT}=100mA$	1	—	250	mV
		$T_A=25^{\circ}C$; $\Delta V_{OUT}=-1\%$; $I_{OUT}=1.5A$		—	600	
Static (ground) current	I_0	$T_A=25^{\circ}C$; $V_{IN}=6.0V$, $I_{OUT}=0.75A$	1	—	30	mA
		$T_A=25^{\circ}C$; $V_{IN}=6.0V$, $I_{OUT}=1.5A$		—	40	
Load regulation	S_L	$I_{OUT}=10mA \rightarrow 1.25A$, $V_{IN}=6.0V$	1, 2, 3	—	2	%
Voltage regulation	S_V	$V_{IN}=6.0V \rightarrow 26V$, $I_{OUT}=10mA$	1, 2, 3	—	1	%
Output noise voltage	V_N	$T_A=25^{\circ}C$; $G=22\mu F \sim 30\mu F$; $f \leq 300KHz$	4	—	350	μV
Shutoff output current	I_{OSD}	$T_A=25^{\circ}C$; $E_n=0V$	4	—	50	μA
Output current limit	I_{LIM}	$T_A=25^{\circ}C$; $V_{IN}=6.0V$	4	—	6.5	A
Thermal shutoff temperature	T_{SD}	$T_A=25^{\circ}C$; $V_{IN}=7.0V$; $I_{OUT}=2.0A$	4	—	150	$^{\circ}C$

Table 2c HSK5102 series function table

Items	Condition	Group	Function representation
Enable function	$T_A=25^{\circ}C$, $V_{IN}=V_{OUT}+1V$, $I_{OUT}=1A$, $E_n=0V$	7	Output voltage off
	$T_A=25^{\circ}C$, $V_{IN}=V_{OUT}+1V$, $I_{OUT}=1A$, $E_n=V_{IN}$		Output voltage on

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

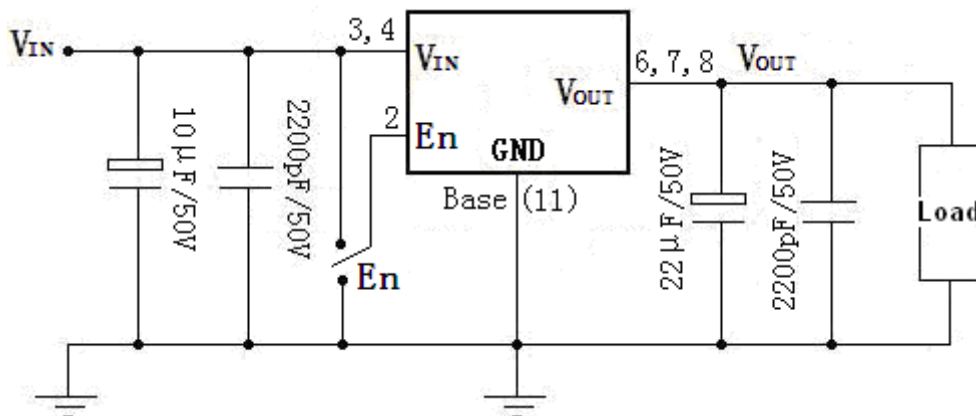


Fig 6 HSK5102 Electrical test line connection diagram

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.