



SPECIFICATION FOR APPROVAL

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KEC-1K6A-05MC

MEDICAL ATX POWER SUPPLY

MEDICAL ATX POWER SUPPLY

KEC-1K6A-05MC Manufacturer Part No.: KS260216



Customer Name _____

Customer Part NO. _____

Project Modify List

Item	Description	Rev.	Date	Prepared by	Checked by
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MEDICAL ATX POWER SUPPLY

KEC-1K6A-05MC Manufacturer Part No.: KS260216



1.	INPUT REQUIREMENTS.....	4
1.1	Highlight & Features.....	4
1.2	Chemical Substance Control Laws	4
1.3	Input Conditions	4
1.4	Inrush Current	4
1.5	Power Factor	4
1.6	Warm Start Performance.....	4
1.7	Continuous Output Power	4
2.	OUTPUT REQUIREMENTS	5
3.	MECHANICAL	6
3.1	Enclosure And Layout	6
4.	Power Excursion	7
5.	INTERFACE SIGNALS.....	8
6.	REGULATORY COMPLIANCE.....	9
6.1	EMC Specifications.....	9
6.1.1	Radiated And Conducted Emission	9
6.2	Immunity.....	9
6.2.1	Electrostatic Discharge Immunity.....	9
6.2.2	Radiated Field Immunity	9
6.2.3	Fast Transient Immunity	9
6.2.4	Surge Immunity	9
6.3	Safety Requirements and Certification.....	10
6.3.1	Regulatory Standard	10
6.3.2	Additional Safety Requirements	10
7.	ENVIRONMENTAL REQUIREMENTS	10
8.	APPEARANCE DRAWING: (UNIT: MM).....	11
9.	NAMEPLATE (UNIT: MM)	12
10.	DIMENSION OF OUTPUT PLUG & DC CORD (UNIT: MM).....	13
11.	PACKING (UNIT: MM).....	14

MEDICAL ATX POWER SUPPLY

KEC-1K6A-05MC Manufacturer Part No.: KS260216



1. INPUT REQUIREMENTS

1.1 Highlight & Features

- Designed for medical and industrial applications.
- Medical and industrial grade design.
- Compliance with medical safety standards (IEC 60601-1, 2 MOPP).
- ATX Form Factor
- MTBF: 100,000 hours minimum (Telcordia SR-332).
- Forced-air cooling.

1.2 Chemical Substance Control Laws

Fully compliant with standard environmental regulations: RoHS, REACH, PAHs, 6P, and NP.

1.3 Input Conditions

The power supply shall operate within the following input conditions:

Parameter	Specification
Rated Input Voltage	100-240 Vac
Operating Input Range	90-264 Vac
Input Frequency	50/60 Hz
Maximum Input Current	15 A
Input Protection	Internal AC line fuse

1.4 Inrush Current

- < 20A at 115Vac / 60Hz , cold start at 25°C
- < 40A at 230Vac / 50Hz , cold start at 25°C

1.5 Power Factor

Power Factor (PF) ≥ 0.90 at 115 Vac / 230 Vac input, 50/60 Hz, under full-load conditions.

1.6 Warm Start Performance

After full-load burn-in at 25°C ambient temperature, the power supply shall restart normally when AC input is reapplied after a 1-second interruption under full-load conditions. No component damage shall occur.

1.7 Continuous Output Power

The power supply delivers 1600 W of continuous output power at 25°C ambient temperature.

(Note: Full 1600 W output requires an input voltage ≥ 127 Vac.)

MEDICAL ATX POWER SUPPLY

KEC-1K6A-05MC Manufacturer Part No.: KS260216



2. OUTPUT REQUIREMENTS

2.1	Output Regulation								
	Output Voltage	Regulation	MIN	Nominal	MAX	Units			
	+3.3V	±5%	+3.135	+3.3	+3.465	Volts			
	+5V	±5%	+4.75	+5.00	+5.25	Volts			
	+12V	±5%	+11.4	+12.00	+12.6	Volts			
	-12V	±5%	-11.4	-12.00	-12.6	Volts			
	+5Vsb	±5%	+4.75	+5.00	+5.25	Volts			
2.2	Minimum Load Current		0.01A for all rails.						
2.3	Ripple and Noise								
	VOLTAGE	+3.3V	+5V	12V	-12V	+5Vsb			
	Ripple & Noise	30mV	50 mV	120mV	120mV	50mV			
Note: Measured with a 20MHz bandwidth oscilloscope, using a 10μF electrolytic capacitor and a 0.1μF ceramic capacitor.									
2.4	Rating load current								
	VOLTAGE	+3.3V	+5V	12V	-12V	+5Vsb	TOTAL(W)		
	Full load	20A	20A	133.5A	0.3A	4A	1600W		
Note: When the input voltage ≥ 127Vac, the output power is 1600W.									
2.5	Cross Regulation								
	The cross-load regulation is defined in the matrix below. (UNIT: A)								
	Item	LOAD Name	+3.3V	+5V	+12V	-12V	+5Vsb		Total Watt
	1	+5V MAX	2A	15A	10A	0.1A	1A		
	2	+3.3V MAX	16A	5A	4A	0.1A	1A		
	3	+12V MAX	0.5A	10A	74.433A	0.3A	1A		
4	OPP	Trigger Range: 1200-1800W (depending on base load configuration)							
2.6	Turn on delay time		500 ms maximum at nominal AC input voltage and full load.						
2.7	Rise time		The start-up rise time shall be less than 20 ms for all DC outputs to reach and remain within regulation limits.						
2.8	+5V Rise time		The +5V output rise time shall be between 2 ms and 17 ms from 10% to 95% of the nominal output voltage.						

MEDICAL ATX POWER SUPPLY

KEC-1K6A-05MC Manufacturer Part No.: KS260216



2.9	Hold up time	17 ms minimum at nominal AC input voltage and full load.	
2.10	Output overshoot	Less than 7% of the nominal output voltage.	
2.11	LED indication function	/	
2.12	Protection function		
	Over-voltage protection	SENSE LEVEL	OVER VOLTAGE
		+12V	13.8~15.6Vmax
		+3.3V	3.7~4.3 Vmax
		+5V	5.7~6.8 Vmax
	Short-circuit protection	All output to GND	
PROTECTION		The power supply will latch off upon activation of OVP, OCP, or SCP. The power supply enters latch-off mode after protection is triggered. Recovery requires AC recycle or remote ON/OFF reset.	

3. MECHANICAL

3.1 Enclosure And Layout

Weight	TBD g (Typ.)
Dimensions	210 mm (L) × 148 mm (W) × 85 mm (H)

MEDICAL ATX POWER SUPPLY

KEC-1K6A-05MC Manufacturer Part No.: KS260216

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4. Power Excursion

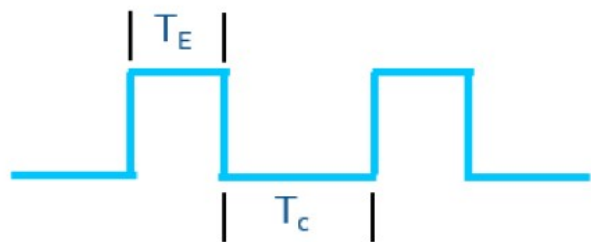
The power supply shall meet the following efficiency requirements at 127 Vac / 60 Hz input:

20% Load: ≥ 87%, 50% Load: ≥ 90%, 100% Load: ≥ 87%

The load conditions are as follows :(Unit: A)

Item	Load name	+12V	+5V	+3.3V	-12V	+5Vsb	Total Power
1	2% Load	1.489	0.217	0.231	0.005	0.045	20
2	20% Load	14.887	2.168	2.313	0.054	0.448	200
3	50% Load	37.216	5.421	5.782	0.135	1.121	500
4	100% Load	74.433	10.842	11.564	0.269	2.242	1000

Dynamically test the load conditions:



PSU Output Rails	100us Peak Test		1ms Peak Test		10ms Peak Test		100ms Peak Test	
	Tc (A)	Te (A)	Tc (A)	Te (A)	Tc (A)	Te (A)	Tc (A)	Te (A)
5 V	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67
3.3 V	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25
-12V	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5 VSB	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
12V1	44.1	121.3	42.4	104.7	41.1	88.0	44.6	67.7
12V2	26.0	39.0	26.0	39.0	26.0	39.0	26.0	26.0
Check Power	917.7	2000.0	897.3	1800.0	881.6	1600.0	923.8	1200.0
PCIe* AIC Dynamic with 12VHPWR	Low Load Load 1	2.2	0.1	0.0	0.0	7.4	0.00	5.0
	Low Load Load 2	2.2	0.1	0.0	0.0	7.4	0.00	50.0
	High Load Load 1	2.2	2.3	0.1	0.4	14.9	0.0	50.0
	High Load Load 2	2.2	2.3	0.1	0.4	14.9	0.0	150.0

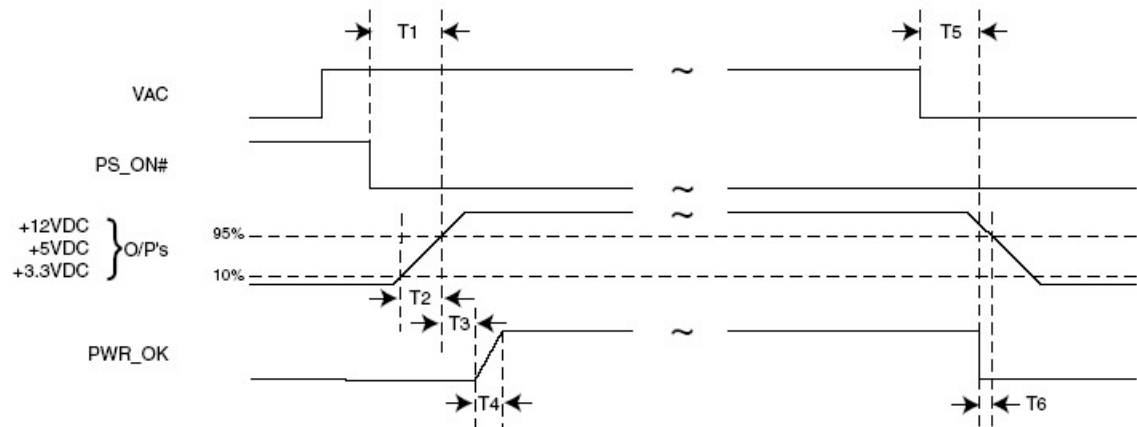
MEDICAL ATX POWER SUPPLY

KEC-1K6A-05MC Manufacturer Part No.: KS260216



5. INTERFACE SIGNALS

The electrical and timing characteristics of the PWR_OK signal are shown in the table below.



Signal Type	+5 V TTL compatible
Rise time	$0.1\text{ ms} \leq T2 \leq 20\text{ ms}$
PWR_OK delay	$100\text{ ms} < T3 < 250\text{ ms}$
PWR_OK rise-time	$T4 \leq 10\text{ ms}$
AC loss to PWR_OK hold-up time	$T5 \geq 17\text{ ms}$
Power-down warning	$T6 \geq 1\text{ ms}$

MEDICAL ATX POWER SUPPLY

KEC-1K6A-05MC Manufacturer Part No.: KS260216



6. REGULATORY COMPLIANCE

6.1 EMC Specifications

The power supply meets all EMC compliance thresholds below. System-level validation is required within the final medical device enclosure.

6.1.1 Radiated And Conducted Emissions

FCC part 15 /EN 55032 Class B.

EN60601-1-2 Class B.

6.2 Immunity

6.2.1 Electrostatic Discharge Immunity

EN 55035, EN 61000-4-2

Air Discharge: ± 15 kv

Contact Discharge: ± 8 kv

Performance Criteria B

Electrostatic-discharge test by contact or air should be conducted with Static-discharge tester (energy storage capacitance of 150pF and discharge resistance of 330 Ω) 15kv air discharge, 8kv contact discharge.

6.2.2 Radiated Field Immunity

EN 55035, EN 61000-4-3

Frequency Range: 80-1000MHz, Additional test frequencies: 1800MHz, 2600MHz, 3500MHz, 5000MHz

Field Strength: 9-28V/m with 80% amplitude modulation of 1kHz

Performance Criteria A

Radio-frequency electromagnetic field susceptibility test, RS 80-1000MHz, 9-28V/m, 80%AM(1KHz).

6.2.3 Fast Transient Immunity

EN 55035, EN 61000-4-4

Power line: ± 2 kv

Signal line: ± 0.5 kv

Performance Criteria B

6.2.4 Surge Immunity

EN 55035, EN 61000-4-5

- Line to line: ± 1 kv

- Line to earth: ± 2 kv

- + 90°/ -270°

MEDICAL ATX POWER SUPPLY

KEC-1K6A-05MC Manufacturer Part No.: KS260216



Lightning surge voltage of differential and common modes shall be applied across AC input lines and across input and frame ground.

6.3 Safety Requirements and Certification

6.3.1 Regulatory Standard

The power supply shall comply with the following international regulatory standards:

for short	Country or Region	Certified Status	Standard
CE	Europe	/	Declared& CE Mark EN60601-1

6.3.2 Additional Safety Requirements

- Input-to-Output Isolation: 4000 Vac, 2 MOPP
- Input-to-Ground Isolation: 1500 Vac, 1 MOPP
- Output-to-Ground Isolation: 1500 Vac
- Insulation Resistance: ≥ 20 MΩ at 500 Vdc
- Earth Continuity: ≤ 100 mΩ at 32 A
- Leakage Current: ≤ 400 μA at 264 Vac, 63 Hz
- Touch Current: ≤ 100 μA at 264 Vac, 63 Hz

7. ENVIRONMENTAL REQUIREMENTS

- Operating Temperature: +5°C to +40°C
- Storage Temperature: -40°C to +55°C
- Operating Humidity: 20% to 85% RH, non-condensing
- Storage Humidity: 10% to 95% RH, non-condensing
- Operating Altitude: 0 to 2000 m above sea level

MEDICAL ATX POWER SUPPLY

KEC-1K6A-05MC Manufacturer Part No.: KS260216



8. APPEARANCE DRAWING: (UNIT: MM)

TBD

NOTE:

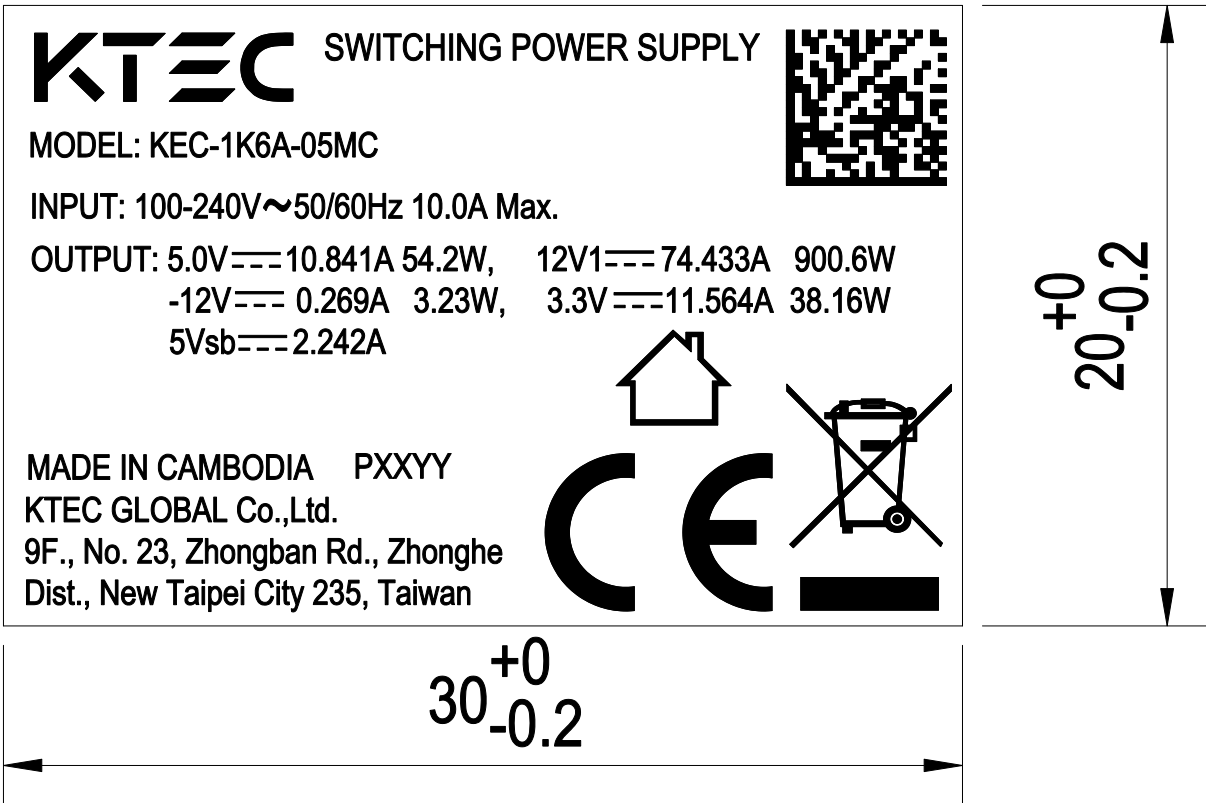
1. PAHS 6P NP REACH ROHS

MEDICAL ATX POWER SUPPLY

KEC-1K6A-05MC Manufacturer Part No.: KS260216



9. NAMEPLATE (UNIT: MM)



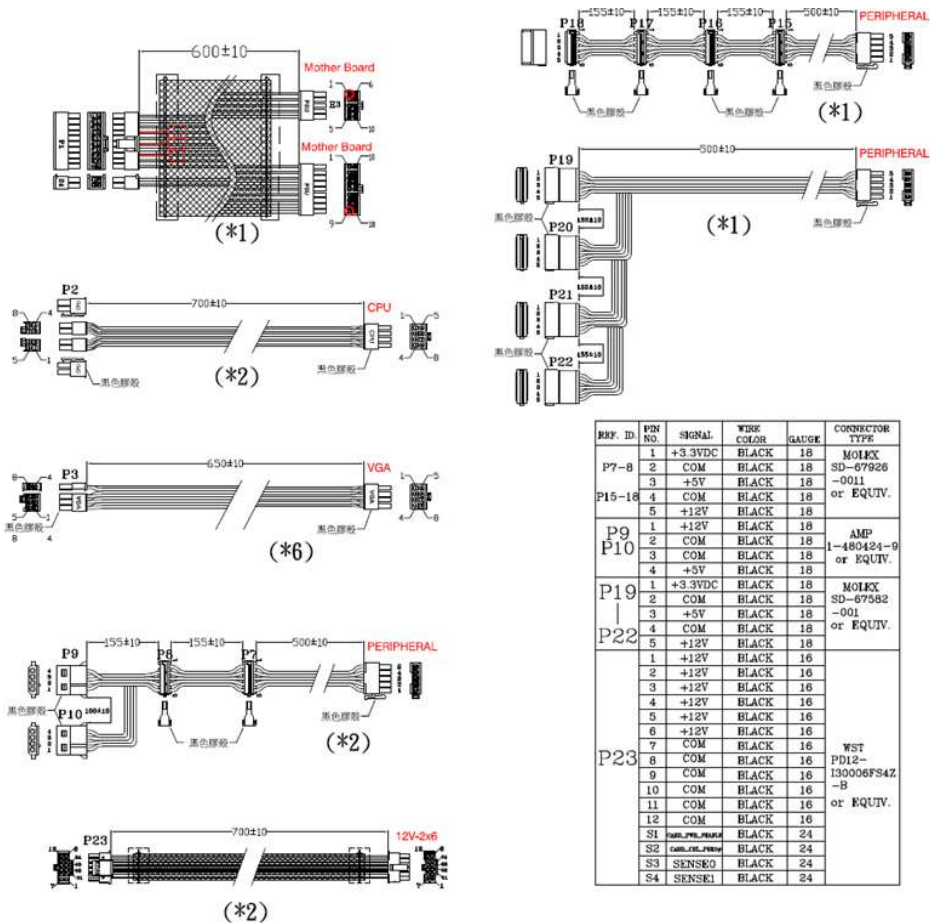
- Note: 1.  MATERIAL: Silver Polyester（消银龙）; Thickness: 0.08(+/-0.01)mm
- Black characters silver background
- PAHS REACH ROHS
- PXXYY(P=PAHS,6P,NP, XX=WEEK YY=YEAR) 按实际生产日期制作
- SN (Data Matrix Code, Size: 5 x 5mm
- First code G(Ktec) + Production part number (Product code) + 10 digital of flow code SSSSSSSSSS
- (Decimal) Total 19 codes
- Example: GKS2602160000000001, GKS2602160000000002...GKS2602169999999999
2. Attach to transformer HS2

MEDICAL ATX POWER SUPPLY

KEC-1K6A-05MC Manufacturer Part No.: KS260216

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10. DIMENSION OF OUTPUT PLUG & DC CORD (UNIT: MM)



REF. ID	PN NO.	SIGNAL	WIRE COLOR	GAUGE	CONNECTOR TYPE
P1	1	+3.3VDC	BLACK	16	WST
	2	+3.3VDC	BLACK	16	P20-
	3	COM	BLACK	16	I42002K11D-B
	4	+5V	BLACK	16	+ P4-
	5	COM	BLACK	16	I42002K11D-B
	6	+5V	BLACK	16	or EQUIV.
	7	+5V Sense	BLACK	22	
	8	COM	BLACK	16	
	9	COM Sense	BLACK	22	
	10	PW-OK	BLACK	22	
	11	+5Vsb	BLACK	16	
	12	+12V	BLACK	16	
	13	+12V Sense	BLACK	22	
	14	+12V	BLACK	16	
	15	+3.3VDC	BLACK	16	
	16	+3.3V Sense	BLACK	22	
	17	-12VDC	BLACK	22	
	18	COM	BLACK	16	
	19	PS-ON	BLACK	22	
	20	COM	BLACK	16	
	21	COM	BLACK	16	
	22	COM	BLACK	16	
	23	COM	BLACK	16	
	24	COM	BLACK	16	
P2	1	COM	BLACK	16	WST
	2	COM	BLACK	16	P4-
	3	COM	BLACK	16	I42002K3B-B4
	4	COM	BLACK	16	+ P4-
	5	+12V	BLACK	16	I42002K4B-B4
	6	+12V	BLACK	16	or EQUIV.
	7	+12V	BLACK	16	
	8	+12V	BLACK	16	
P3	1	+12V	BLACK	16	WST
	2	+12V	BLACK	16	P8-
	3	+12V	BLACK	16	I42002K21-B6
	4	COM	BLACK	16	+P2-
	5	COM	BLACK	16	I42002K13B-B
	6	COM	BLACK	16	or EQUIV.
	7	COM	BLACK	16	
	8	COM	BLACK	16	

REF. ID	PN NO.	SIGNAL	WIRE COLOR	GAUGE	CONNECTOR TYPE
P7-8	1	+3.3VDC	BLACK	18	NOIKX
	2	COM	BLACK	18	SD-67926
	3	+5V	BLACK	18	-0011
	4	COM	BLACK	18	or EQUIV.
P15-18	1	+12V	BLACK	18	
	2	COM	BLACK	18	AMP
	3	COM	BLACK	18	I-480424-9
	4	+5V	BLACK	18	or EQUIV.
P9	1	+3.3VDC	BLACK	18	NOIKX
	2	COM	BLACK	18	SD-67982
	3	+5V	BLACK	18	-001
	4	COM	BLACK	18	or EQUIV.
P19	1	+12V	BLACK	18	
	2	+12V	BLACK	16	
	3	+12V	BLACK	16	
	4	+12V	BLACK	16	
P22	1	+12V	BLACK	16	
	2	+12V	BLACK	16	
	3	+12V	BLACK	16	
	4	+12V	BLACK	16	
P23	1	COM	BLACK	16	WST
	2	COM	BLACK	16	PD12-
	3	COM	BLACK	16	I30006FS4Z
	4	COM	BLACK	16	-B
	5	COM	BLACK	16	or EQUIV.
	6	COM	BLACK	16	
	7	COM	BLACK	16	
	8	COM	BLACK	16	
	9	COM	BLACK	16	
	10	COM	BLACK	16	
	11	COM	BLACK	16	
	12	COM	BLACK	16	
S1	S1	TEMP_FAN_1	BLACK	24	
	S2	TEMP_FAN_2	BLACK	24	
	S3	SENSE0	BLACK	24	
	S4	SENSE1	BLACK	24	

MEDICAL ATX POWER SUPPLY

KEC-1K6A-05MC Manufacturer Part No.: KS260216



11. PACKING (UNIT: MM)

TBD