



K78XXT-1000 Series

**WIDE INPUT, NON-ISOLATED & REGULATED
SMD PACKAGE SINGLE OUTPUT**

Patent Protection RoHS

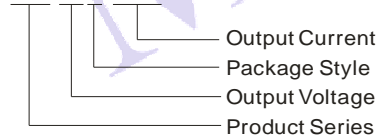
FEATURES

- Efficiency up to 92%
- No heatsink required
- 1.0AMP SMD package
- Super low ripple and noise
- Adjustable output voltage
- Remote ON/OFF control
- Short circuit protection
- Low control current
- Operating temperature: -40°C ~ +85°C

APPLICATIONS

The K78XXT-1000 series with high efficiency switching regulators are ideally supply for space constrained mobile applications. there is no need for any heatsinks. The additional features include remote ON/OFF control and adjustable output voltage. Super low ripple and noise of typically only 20mV and Low control current.

MODEL SELECTION



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PRODUCT PROGRAM

Part Number	Input Voltage (V)		Input Current (mA)	Output Voltage (V)		Output Current (mA)	Efficiency (%) (typ.)	
	Nominal	Range		Normal	Adjust Range		Vin (min.)	Vin (max.)
K7801T-1000*	12	5.0-18	165	1.5	fixed	1000	76	73
K78X2T-1000*	12	5.0-18	190	1.8	1.5-3.6	1000	78	75
K7802T-1000*	12	5.0-18	245	2.5	1.5-3.9	1000	82	82
K7803T-1000	12	5.0-18	320	3.3	1.8-5.5	1000	84	84
K7805T-1000	12	7.0-18	460	5.0	2.5-6.5	1000	90	88
K78X6T-1000*	12	8.5-18	580	6.5	fixed	1000	92	91

Note: To adjust the output voltage must be met $V_{in}-V_o > 2V$. *Designing. Input Current measured at nominal input voltage and rated output load.

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Units
Input Filter					Capacitor (10 μ F)
Start Current(RMS)			0.95	1.1	A

OUTPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy	Input voltage range at full load		± 2	± 3	%
Line Regulation			± 0.2	± 0.5	
Load Regulation	Nominal input, 10% to 100% load		± 0.4	± 1.0	mVp-p
Ripple and Noise*	20MHz bandwidth		20	35	
	20MHz bandwidth (refer to Figure 6)		10	15	
Short Circuit Protection Mode	Hiccup Mode				
Short Circuit Protection	Continuous, automatic recovery				
Inside Wasted				0.5	W
Thermal Shutdown	Internal IC junction		150		$^{\circ}$ C
Output current limit			1.8		A
Switching Frequency	PWM type		1.4		MHz
Transient peak deviation	Input voltage range, 10% to		± 75	± 100	mV
Transient recovery time	100% load			100	μ S
Quiescent current			1	3	mA
Temperature Coefficient	-40 $^{\circ}$ C ~ +85 $^{\circ}$ C ambient			± 0.02	%/ $^{\circ}$ C
Max Capacitance Load				1000	μ F
Remote ON/OFF	ON			Open or $1.2 < V_c < 6V$	
	OFF			$V_c < 0.6V$	
ON/OFF Control Current	ON: Open or $1.2 < V_c \leq 6V$ OFF: GND or $V_c < 0.4V$		100	200	μ A
Shutdown Input Current			120	200	

*Test ripple and noise by "parallel cable" method.

COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Units
Storage humidity Range				95	%
Operating Temperature Range	Power derating (above 71 $^{\circ}$ C)	-40		+85	$^{\circ}$ C
Storage Temperature Range		-55		+125	
Operating Case Temperature				+100	
Lead Temperature	1.5mm from case for 10 seconds			260	
Cooling				Free Air Convection	

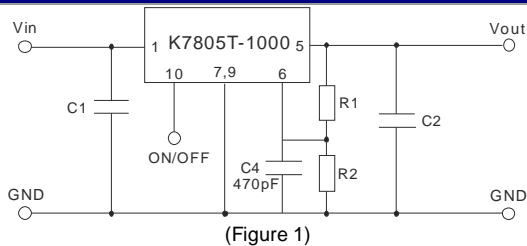
COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Units
Case Material		Plastic (UL94-V0)			
MTBF	(MIL-HDBK-217F,+25°C)	1000			k hours
Hop swap		Not supported			
Thermal resistance				90	°C/W
Weight			2.3		g

EMC SPECIFICATIONS

CE	EN55022, CLASS A(without external circuit)				
	EN55022, CLASS B(refer to Figure 4)				
RE	EN55022, CLASS A(refer to Figure 5)				
ESD	IEC/EN61000-4-2	Air ±8KV / Contact ±6KV	perf. Criteria B		
EFT	IEC/EN61000-4-4	±2KV	perf. Criteria B		
Surge	IEC/EN61000-4-5	±2KV	perf. Criteria B(refer to Figure 4)		

TYPICAL APPLICATION CIRCUIT



(Figure 1)

1. C1, C2 is required for best performance and should be fitted close to the converter pins.
2. The capacitance of C1, C2 sees external capacitor table, it can be increased properly if required, and tantalum or low ESR electrolytic capacitors may also suffice.
3. No parallel connection or plug and play.

EXTERNAL CAPACITOR TABLE

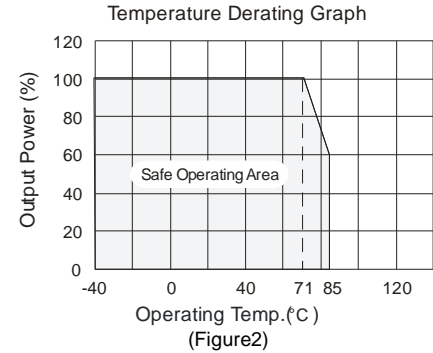
Part Number	C1 (Ceramic Capacitor)	C2 (Ceramic Capacitor)
K7803T-1000	10µF/25V	22µF/16V
K7805T-1000	10µF/25V	22µF/16V

ADJUSTMENT RESISTOR VALUES

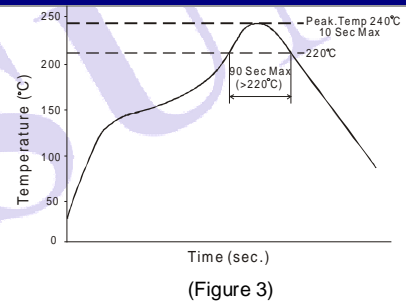
Part Number	K7803T-1000		K7805T-1000	
	Vo (nominal)			
Vo (nominal)	3.3(V)		5.0(V)	
Vadj(V)	R1(KΩ)	R2(KΩ)	R1(KΩ)	R2(KΩ)
1.8	15.4	-	-	-
2.5	87	-	9.7	-
3.0	339	-	30.5	-
3.3	-	-	48.8	-
3.6	-	121	75	-
3.9	-	51.0	115	-
4.5	-	16.6	338	-
4.9	-	8.0	1835	-
5.0	-	6.5	-	-
5.1	-	5.2	-	426
5.5	-	1.1	-	58.7
6.0	-	-	-	16.9
6.5	-	-	-	3.2

The R1, R2 in the above table are used to set the output voltage. If no need to adjust the output voltage, connect a ceramic capacitor to GND with 470pF typical value for increase immunity. Insure the output voltage is in the adjust range or else may cause permanent damage to the device. Fine-tune output voltage must appease $V_{in}-V_o > 2V$.

TYPICAL TEMPERATURE CURVE

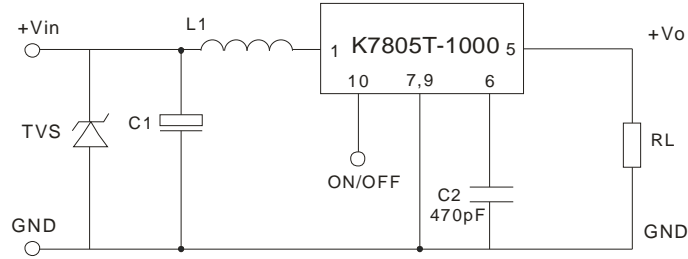


RECOMMENDED REFLOW SOLDERING PROFILE



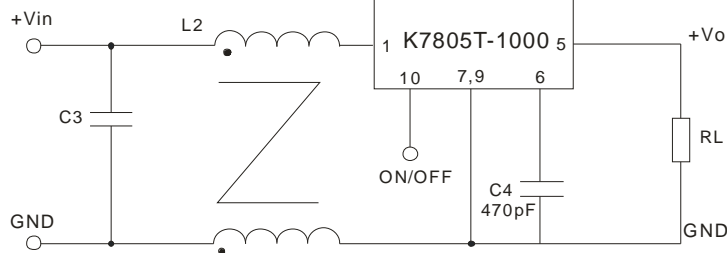
(Figure 3)

EMC RECOMMENDED CIRCUIT



(Figure 4)

Specifications: TVS: SMCJ18A,1500W; L1: 68 μ H; C1: 680 μ F/50V electrolytic capacitors.

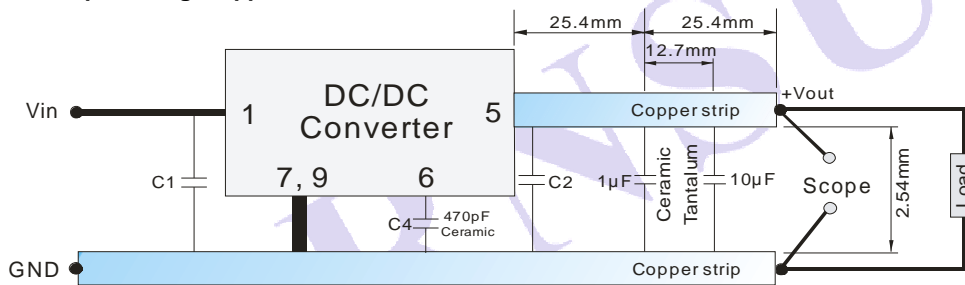


(Figure 5)

Specifications: L2: 516 μ H; C3: 1 μ F/50V ceramic capacitor.

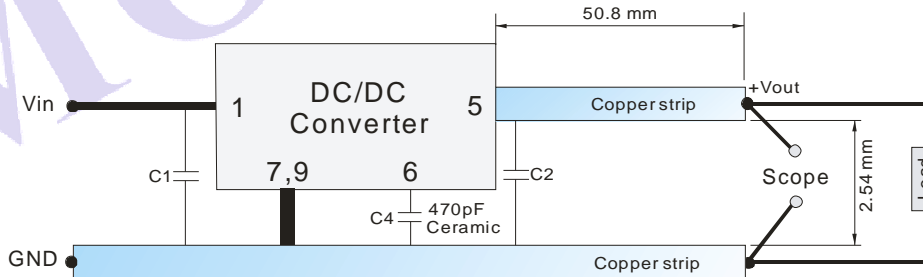
TEST CONFIGURATIONS (TA=25°C)

1 Efficiency and Output Voltage Ripple Test



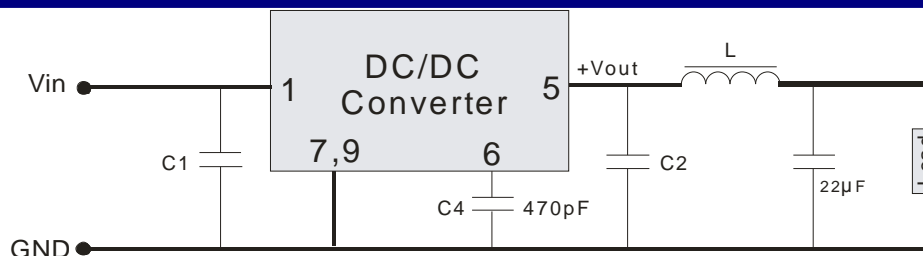
(Figure 6)

2 Start-up and Load Transient Response Test



(Figure 7)

APPLICATION EXAMPLE



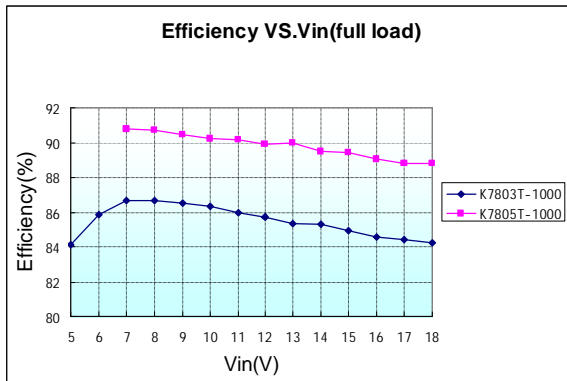
(Figure 8)

To reduce output ripple, it is recommended to add a LC filter to output port.

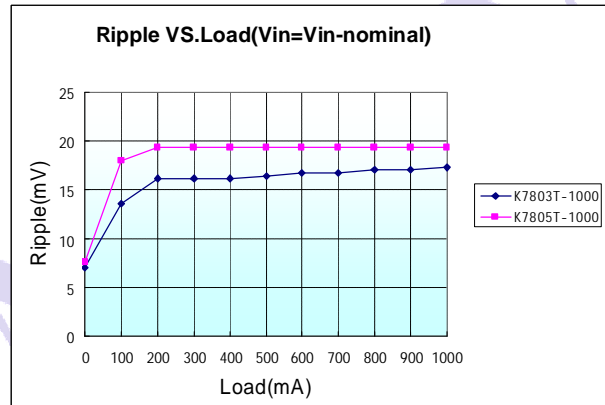
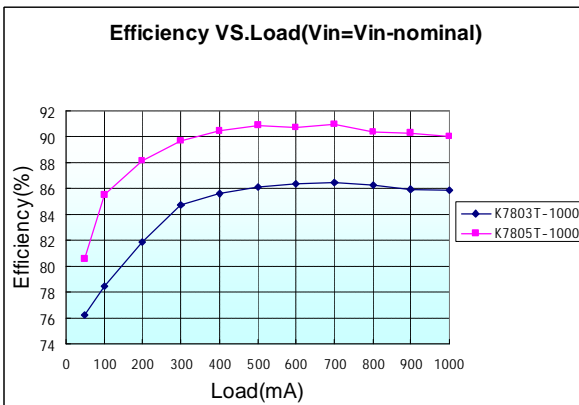
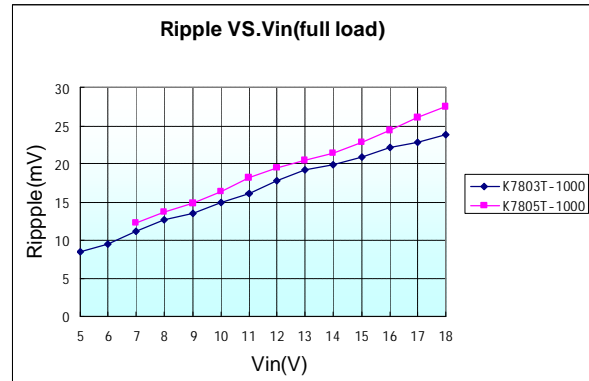
L: Recommended parameter 10 μ H ~ 47 μ H.

CHARACTERISTIC CURVE

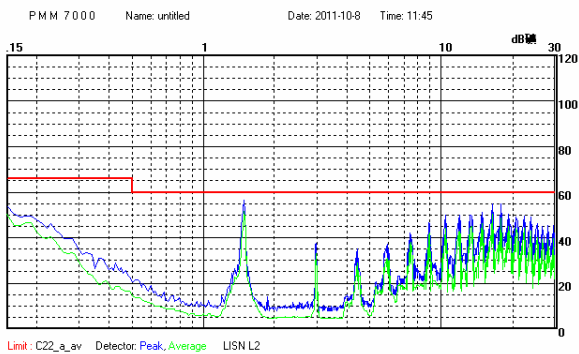
Efficiency



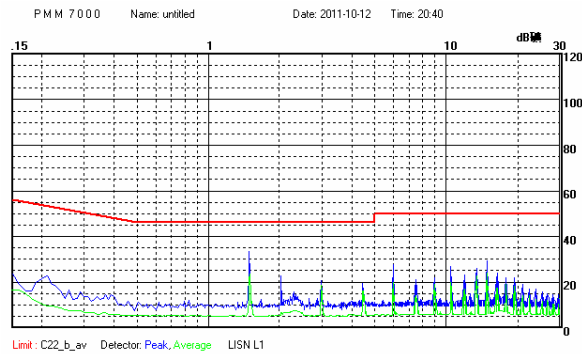
Ripple



EMC TESTING WAVE SHAPE



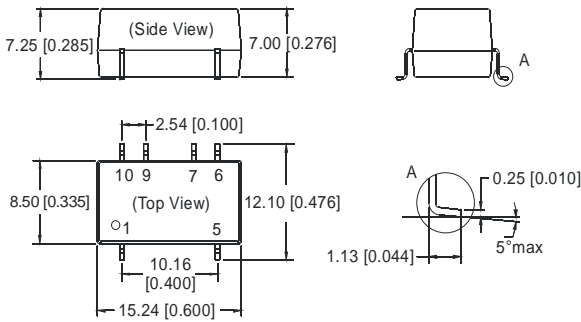
CE(without external circuit)



CE(refer to Figure 4)

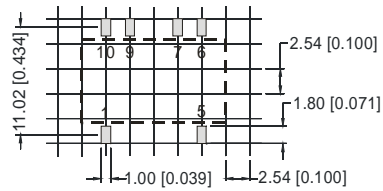
OUTLINE DIMENSIONS & RECOMMENDED FOOTPRINT & PACKAGING

MECHANICAL DIMENSIONS



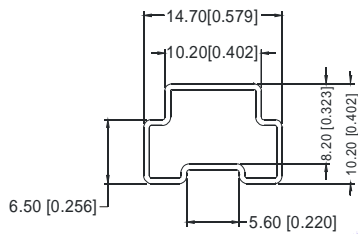
Note:
 Unit:mm[inch]
 Pin tolerances:±0.10mm[±0.004inch]
 General tolerances:±0.25mm[±0.010inch]

RECOMMENDED FOOTPRINT



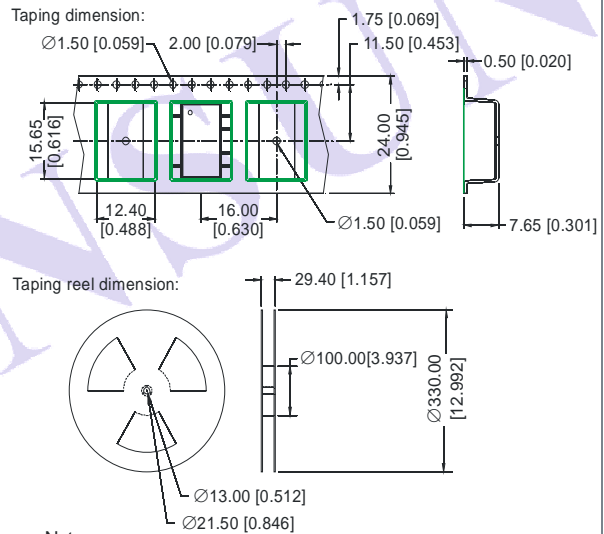
FOOTPRINT DETAILS	
Pin	Function
1	Vin
7,9	GND
5	Vout
6	Vadj
10	ON/OFF

TUBE OUTLINE DIMENSIONS



Note:
 Unit :mm[inch]
 General tolerances: ±0.50mm[±0.020inch]
 L=530mm[20.866inch] Devices per tube quantity: 33pcs
 L=220mm[8.661inch] Devices per tube quantity: 13pcs
 Short tube inner packaging dimensions: L*W*H=255*170*80mm;
 Short tube outer packaging dimensions(with six inner packaging boxes):
 L*W*H=375*280*270mm;
 Long tube inner packaging dimensions: L*W*H=580*200*100mm;
 Long tube outer packaging dimensions(with two inner packaging boxes):
 L*W*H=600*215*220mm;
 Long tube outer packaging dimensions(with three inner packaging boxes):
 L*W*H=600*215*325mm.

TAPING REEL DIMENSIONS



Note:
 Unit :mm[inch]
 General tolerances: ±0.50mm[±0.020inch]
 Devices per reel quantity:500pcs
 Inner packaging dimensions: L*W*H=365*350*105mm;
 Devices per tube quantity: 2000pcs
 Outer packaging dimensions: L*W*H=390*360*245mm.
 Devices per tube quantity: 4000pcs

Note:

1. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
2. In this datasheet, all the test methods of indications are based on corporate standards.