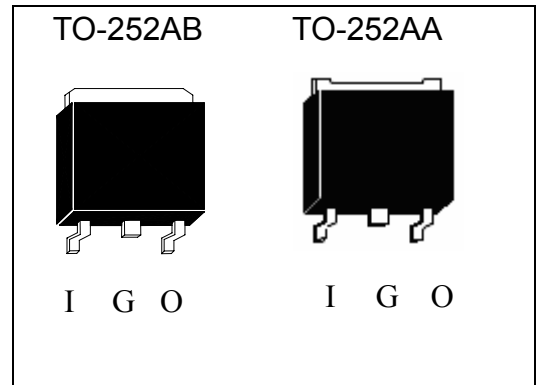


## Three Terminal Positive Voltage Regulators

# LM78XXJ3



### Description

The LM78XXJ3 series of fixed voltage monolithic integrated circuit voltage regulators is designed for a wide range of applications. These applications include on-card regulation for elimination of noise and distribution problems associated with single point regulation. Each of these regulators can deliver up to 1A of output current. The internal current limiting and thermal shutdown features of these regulators make them essentially immune to overload.

### Features:

- 5V, 6V, 8V, 9V, 10V, 12V, 15V, 18V, 24V output voltage available
- Internal Short-Circuit Current Limiting
- High Power Dissipation Capability
- Internal Thermal Overload Protection
- No External Components Required
- Output Transistor Safe Area Compensation
- RoHS compliant package

### Absolute Maximum Ratings (Ta=25°C)

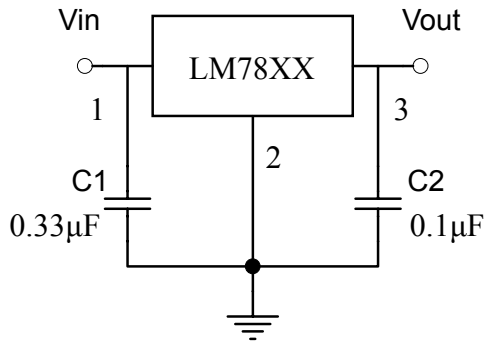
Parameter		Ratings	Unit
Input Voltage	LM7805~LM7818	35	V
	LM7824	40	
Output Current		1	A
Operating Junction Temperature Range		-40 ~ +125	°C
Storage Temperature Range		-55 ~ +125	°C
Thermal Resistance, Junction to Ambient (R <sub>θJA</sub> )		125	°C/W
Thermal Resistance, Junction to Case (R <sub>θJC</sub> )		12.5	°C/W



### Ordering Information

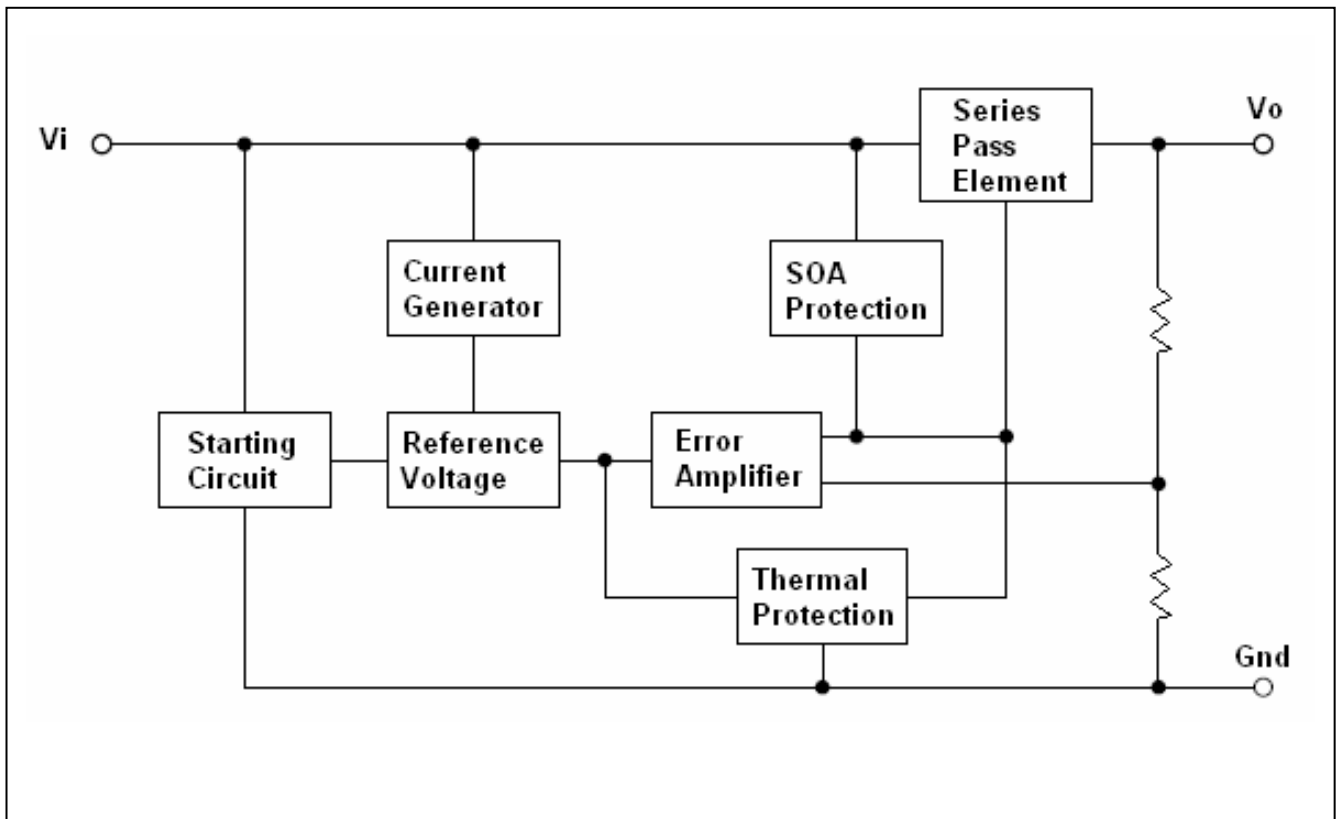
Device	Output Voltage Tolerance	Package	Shipping	Marking
LM7805J3 A-rank	±3%	TO-252 (Pb-free)	2500 pcs / Tape & Reel	7805
LM7805J3 B-rank	±5%	TO-252 (Pb-free)	2500 pcs / Tape & Reel	7805
LM7806J3 A-rank	±3%	TO-252 (Pb-free)	2500 pcs / Tape & Reel	7806
LM7806J3 B-rank	±5%	TO-252 (Pb-free)	2500 pcs / Tape & Reel	7806
LM7808J3 A-rank	±3%	TO-252 (Pb-free)	2500 pcs / Tape & Reel	7808
LM7808J3 B-rank	±5%	TO-252 (Pb-free)	2500 pcs / Tape & Reel	7808
LM7809J3 A-rank	±3%	TO-252 (Pb-free)	2500 pcs / Tape & Reel	7809
LM7809J3 B-rank	±5%	TO-252 (Pb-free)	2500 pcs / Tape & Reel	7809
LM7810J3 A-rank	±3%	TO-252 (Pb-free)	2500 pcs / Tape & Reel	7810
LM7810J3 B-rank	±5%	TO-252 (Pb-free)	2500 pcs / Tape & Reel	7810
LM7812J3 A-rank	±3%	TO-252 (Pb-free)	2500 pcs / Tape & Reel	7812
LM7812J3 B-rank	±5%	TO-252 (Pb-free)	2500 pcs / Tape & Reel	7812
LM7815J3 A-rank	±3%	TO-252 (Pb-free)	2500 pcs / Tape & Reel	7815
LM7815J3 B-rank	±5%	TO-252 (Pb-free)	2500 pcs / Tape & Reel	7815
LM7818J3 A-rank	±3%	TO-252 (Pb-free)	2500 pcs / Tape & Reel	7818
LM7818J3 B-rank	±5%	TO-252 (Pb-free)	2500 pcs / Tape & Reel	7818
LM7824J3 A-rank	±3%	TO-252 (Pb-free)	2500 pcs / Tape & Reel	7824
LM7824J3 B-rank	±5%	TO-252 (Pb-free)	2500 pcs / Tape & Reel	7824

### Typical Application Circuit



Note:  
 C1 and C2 are required if regulator is located far from power supply filter and load, or oscillation may induced on the loop.

### Block Diagram





**Electrical Characteristics**

**LM7805** ( $T_j=0\sim 125^{\circ}\text{C}$ ,  $V_{in}=10\text{V}$ ,  $I_o=500\text{mA}$ ,  $C_{in}=0.33\mu\text{F}$ ,  $C_{out}=0.1\mu\text{F}$ , unless otherwise noted)

Symbol	Parameter	Min	Typ	Max	Conditions	Units
$V_o$	Output Voltage	4.85	5.0	5.15	$V_{in}=10\text{V}$ , $I_o=500\text{mA}$ , $T_j=25^{\circ}\text{C}$ $7.5\text{V}\leq V_{in}\leq 20\text{V}$ , $5\text{mA}\leq I_o\leq 1\text{A}$ , $PD\leq 15\text{W}$	V
		4.75	-	5.25		
$\Delta V_o$	Line Regulation	-	3	50	$7\text{V}\leq V_{in}\leq 25\text{V}$ , $T_j=25^{\circ}\text{C}$	mV
		-	1	25	$8\text{V}\leq V_{in}\leq 12\text{V}$ , $T_j=25^{\circ}\text{C}$	
$\Delta V_o$	Load Regulation	-	-	100	$5\text{mA}\leq I_o\leq 1\text{A}$ , $T_j=25^{\circ}\text{C}$	mV
		-	-	50	$250\text{mA}\leq I_o\leq 750\text{mA}$ , $T_j=25^{\circ}\text{C}$	
$I_Q$	Quiescent Current	-	-	8	$V_{in}=10\text{V}$ , $I_o=500\text{mA}$ , $T_j=25^{\circ}\text{C}$	mA
$\Delta I_Q$	Quiescent Current Change	-	-	0.5	$5\text{mA}\leq I_o\leq 1\text{A}$	mA
		-	-	1.3	$7\text{V}\leq V_{in}\leq 25\text{V}$	
$V_n$	Output Noise Voltage	-	40	-	$10\text{Hz}\leq f\leq 100\text{KHz}$ , $T_j=25^{\circ}\text{C}$	$\mu\text{V}$
$RR$	Ripple Rejection	-	80	-	$8\text{V}\leq V_{in}\leq 18\text{V}$ , $f=120\text{Hz}$ , $T_j=25^{\circ}\text{C}$	dB
$VD$	Dropout Voltage	-	2	-	$I_o=1\text{A}$ , $T_j=25^{\circ}\text{C}$	V
$ISC$	Output Short Circuit Current	-	250	-	$V_{in}=35\text{V}$ , $T_j=25^{\circ}\text{C}$	mA
$IPK$	Peak Output Current	-	1.8	-	$T_j=25^{\circ}\text{C}$	A
$\Delta V_o/\Delta T_j$	Temperature Stability	-	-0.6	-	$I_o=5\text{mA}$ , $0^{\circ}\text{C}\leq T_j\leq 125^{\circ}\text{C}$	$\text{mV}/^{\circ}\text{C}$

**LM7806** ( $T_j=0\sim 125^{\circ}\text{C}$ ,  $V_{in}=11\text{V}$ ,  $I_o=500\text{mA}$ ,  $C_{in}=0.33\mu\text{F}$ ,  $C_{out}=0.1\mu\text{F}$ , unless otherwise noted)

Symbol	Parameter	Min	Typ	Max	Conditions	Units
$V_o$	Output Voltage	5.82	6.0	6.18	$V_{in}=11\text{V}$ , $I_o=500\text{mA}$ , $T_j=25^{\circ}\text{C}$ $8\text{V}\leq V_{in}\leq 21\text{V}$ , $5\text{mA}\leq I_o\leq 1\text{A}$ , $PD\leq 15\text{W}$	V
		5.70	-	6.30		
$\Delta V_o$	Line Regulation	-	3	60	$8\text{V}\leq V_{in}\leq 25\text{V}$ , $T_j=25^{\circ}\text{C}$	mV
		-	1	25	$9\text{V}\leq V_{in}\leq 13\text{V}$ , $T_j=25^{\circ}\text{C}$	
$\Delta V_o$	Load Regulation	-	-	100	$5\text{mA}\leq I_o\leq 1\text{A}$ , $T_j=25^{\circ}\text{C}$	mV
		-	-	50	$250\text{mA}\leq I_o\leq 750\text{mA}$ , $T_j=25^{\circ}\text{C}$	
$I_Q$	Quiescent Current	-	-	8	$V_{in}=11\text{V}$ , $I_o=500\text{mA}$ , $T_j=25^{\circ}\text{C}$	mA
$\Delta I_Q$	Quiescent Current Change	-	-	0.5	$5\text{mA}\leq I_o\leq 1\text{A}$	mA
		-	-	1.3	$8\text{V}\leq V_{in}\leq 25\text{V}$	
$V_n$	Output Noise Voltage	-	45	-	$10\text{Hz}\leq f\leq 100\text{KHz}$ , $T_j=25^{\circ}\text{C}$	$\mu\text{V}$
$RR$	Ripple Rejection	-	75	-	$9\text{V}\leq V_{in}\leq 19\text{V}$ , $f=120\text{Hz}$ , $T_j=25^{\circ}\text{C}$	dB
$VD$	Dropout Voltage	-	2	-	$I_o=1\text{A}$ , $T_j=25^{\circ}\text{C}$	V
$ISC$	Output Short Circuit Current	-	250	-	$V_{in}=35\text{V}$ , $T_j=25^{\circ}\text{C}$	mA
$IPK$	Peak Output Current	-	1.8	-	$T_j=25^{\circ}\text{C}$	A
$\Delta V_o/\Delta T_j$	Temperature Stability	-	-0.7	-	$I_o=5\text{mA}$ , $0^{\circ}\text{C}\leq T_j\leq 125^{\circ}\text{C}$	$\text{mV}/^{\circ}\text{C}$



**LM7808** ( $T_j=0\sim 125^{\circ}\text{C}$ ,  $V_{in}=14\text{V}$ ,  $I_o=500\text{mA}$ ,  $C_{in}=0.33\mu\text{F}$ ,  $C_{out}=0.1\mu\text{F}$ , unless otherwise noted)

Symbol	Parameter	Min	Typ	Max	Conditions	Units	
$V_o$	A-rank(3%)	Output Voltage	7.76	8.0	8.24	$V_{in}=14\text{V}$ , $I_o=500\text{mA}$ , $T_j=25^{\circ}\text{C}$ $10.5\text{V}\leq V_{in}\leq 23\text{V}$ , $5\text{mA}\leq I_o\leq 1\text{A}$ , $PD\leq 15\text{W}$	V
	B-rank(5%)		7.60	-	8.40		
$\Delta V_o$	Line Regulation	-	3	80	$10.5\text{V}\leq V_{in}\leq 25\text{V}$ , $T_j=25^{\circ}\text{C}$	mV	
		-	1	40	$11\text{V}\leq V_{in}\leq 17\text{V}$ , $T_j=25^{\circ}\text{C}$		
$\Delta V_o$	Load Regulation	-	-	100	$5\text{mA}\leq I_o\leq 1\text{A}$ , $T_j=25^{\circ}\text{C}$	mV	
		-	-	50	$250\text{mA}\leq I_o\leq 750\text{mA}$ , $T_j=25^{\circ}\text{C}$		
$I_Q$	Quiescent Current	-	-	8	$V_{in}=14\text{V}$ , $I_o=500\text{mA}$ , $T_j=25^{\circ}\text{C}$	mA	
$\Delta I_Q$	Quiescent Current Change	-	-	0.5	$5\text{mA}\leq I_o\leq 1\text{A}$	mA	
		-	-	1.3	$10.5\text{V}\leq V_{in}\leq 25\text{V}$		
$V_n$	Output Noise Voltage	-	58	-	$10\text{Hz}\leq f\leq 100\text{KHz}$ , $T_j=25^{\circ}\text{C}$	$\mu\text{V}$	
$RR$	Ripple Rejection	-	72	-	$11.5\text{V}\leq V_{in}\leq 21.5\text{V}$ , $f=120\text{Hz}$ , $T_j=25^{\circ}\text{C}$	dB	
$VD$	Dropout Voltage	-	2	-	$I_o=1\text{A}$ , $T_j=25^{\circ}\text{C}$	V	
$ISC$	Output Short Circuit Current	-	250	-	$V_{in}=35\text{V}$ , $T_j=25^{\circ}\text{C}$	mA	
$IPK$	Peak Output Current	-	1.8	-	$T_j=25^{\circ}\text{C}$	A	
$\Delta V_o/\Delta T_j$	Temperature Stability	-	-0.9	-	$I_o=5\text{mA}$ , $0^{\circ}\text{C}\leq T_j\leq 125^{\circ}\text{C}$	$\text{mV}/^{\circ}\text{C}$	

**LM7809** ( $T_j=0\sim 125^{\circ}\text{C}$ ,  $V_{in}=15\text{V}$ ,  $I_o=500\text{mA}$ ,  $C_{in}=0.33\mu\text{F}$ ,  $C_{out}=0.1\mu\text{F}$ , unless otherwise noted)

Symbol	Parameter	Min	Typ	Max	Conditions	Units	
$V_o$	A-rank(3%)	Output Voltage	8.73	9.0	9.27	$V_{in}=15\text{V}$ , $I_o=500\text{mA}$ , $T_j=25^{\circ}\text{C}$ $11.5\text{V}\leq V_{in}\leq 24\text{V}$ , $5\text{mA}\leq I_o\leq 1\text{A}$ , $PD\leq 15\text{W}$	V
	B-rank(5%)		8.55	-	9.45		
$\Delta V_o$	Line Regulation	-	5	90	$11.5\text{V}\leq V_{in}\leq 25\text{V}$ , $T_j=25^{\circ}\text{C}$	mV	
		-	3	45	$13\text{V}\leq V_{in}\leq 19\text{V}$ , $T_j=25^{\circ}\text{C}$		
$\Delta V_o$	Load Regulation	-	-	100	$5\text{mA}\leq I_o\leq 1\text{A}$ , $T_j=25^{\circ}\text{C}$	mV	
		-	-	50	$250\text{mA}\leq I_o\leq 750\text{mA}$ , $T_j=25^{\circ}\text{C}$		
$I_Q$	Quiescent Current	-	-	8	$V_{in}=15\text{V}$ , $I_o=500\text{mA}$ , $T_j=25^{\circ}\text{C}$	mA	
$\Delta I_Q$	Quiescent Current Change	-	-	0.5	$5\text{mA}\leq I_o\leq 1\text{A}$	mA	
		-	-	1.3	$11.5\text{V}\leq V_{in}\leq 26\text{V}$		
$V_n$	Output Noise Voltage	-	58	-	$10\text{Hz}\leq f\leq 100\text{KHz}$ , $T_j=25^{\circ}\text{C}$	$\mu\text{V}$	
$RR$	Ripple Rejection	-	72	-	$12.5\text{V}\leq V_{in}\leq 22.5\text{V}$ , $f=120\text{Hz}$ , $T_j=25^{\circ}\text{C}$	dB	
$VD$	Dropout Voltage	-	2	-	$I_o=1\text{A}$ , $T_j=25^{\circ}\text{C}$	V	
$ISC$	Output Short Circuit Current	-	250	-	$V_{in}=35\text{V}$ , $T_j=25^{\circ}\text{C}$	mA	
$IPK$	Peak Output Current	-	1.8	-	$T_j=25^{\circ}\text{C}$	A	
$\Delta V_o/\Delta T_j$	Temperature Stability	-	-1.1	-	$I_o=5\text{mA}$ , $0^{\circ}\text{C}\leq T_j\leq 125^{\circ}\text{C}$	$\text{mV}/^{\circ}\text{C}$	



**LM7810** ( $T_j=0\sim 125^\circ\text{C}$ ,  $V_{in}=16\text{V}$ ,  $I_o=500\text{mA}$ ,  $C_{in}=0.33\mu\text{F}$ ,  $C_{out}=0.1\mu\text{F}$ , unless otherwise noted)

Symbol	Parameter	Min	Typ	Max	Conditions	Units	
$V_o$	A-rank(3%)	Output Voltage	9.70	10.0	10.30	$V_{in}=16\text{V}$ , $I_o=500\text{mA}$ , $T_j=25^\circ\text{C}$ $12.5\text{V}\leq V_{in}\leq 25\text{V}$ , $5\text{mA}\leq I_o\leq 1\text{A}$ , $PD\leq 15\text{W}$	V
	B-rank(5%)		9.50	-	10.50		
$\Delta V_o$	Line Regulation	-	-	100	$13\text{V}\leq V_{in}\leq 25\text{V}$ , $T_j=25^\circ\text{C}$	mV	
		-	-	50	$14\text{V}\leq V_{in}\leq 20\text{V}$ , $T_j=25^\circ\text{C}$		
$\Delta V_o$	Load Regulation	-	-	100	$5\text{mA}\leq I_o\leq 1\text{A}$ , $T_j=25^\circ\text{C}$	mV	
		-	-	50	$250\text{mA}\leq I_o\leq 750\text{mA}$ , $T_j=25^\circ\text{C}$		
$I_Q$	Quiescent Current	-	-	8	$V_{in}=16\text{V}$ , $I_o=500\text{mA}$ , $T_j=25^\circ\text{C}$	mA	
$\Delta I_Q$	Quiescent Current Change	-	-	0.5	$5\text{mA}\leq I_o\leq 1\text{A}$	mA	
		-	-	1.0	$12.5\text{V}\leq V_{in}\leq 25\text{V}$		
$V_n$	Output Noise Voltage	-	58	-	$10\text{Hz}\leq f\leq 100\text{KHz}$ , $T_j=25^\circ\text{C}$	$\mu\text{V}$	
$RR$	Ripple Rejection	-	72	-	$13\text{V}\leq V_{in}\leq 23\text{V}$ , $f=120\text{Hz}$ , $T_j=25^\circ\text{C}$	dB	
$VD$	Dropout Voltage	-	2	-	$I_o=1\text{A}$ , $T_j=25^\circ\text{C}$	V	
$ISC$	Output Short Circuit Current	-	250	-	$V_{in}=35\text{V}$ , $T_j=25^\circ\text{C}$	mA	
$IPK$	Peak Output Current	-	1.8	-	$T_j=25^\circ\text{C}$	A	
$\Delta V_o/\Delta T_j$	Temperature Stability	-	-1.1	-	$I_o=5\text{mA}$ , $0^\circ\text{C}\leq T_j\leq 125^\circ\text{C}$	$\text{mV}/^\circ\text{C}$	

**LM7812** ( $T_j=0\sim 125^\circ\text{C}$ ,  $V_{in}=19\text{V}$ ,  $I_o=500\text{mA}$ ,  $C_{in}=0.33\mu\text{F}$ ,  $C_{out}=0.1\mu\text{F}$ , unless otherwise noted)

Symbol	Parameter	Min	Typ	Max	Conditions	Units	
$V_o$	A-rank(3%)	Output Voltage	11.64	12.0	12.36	$V_{in}=19\text{V}$ , $I_o=500\text{mA}$ , $T_j=25^\circ\text{C}$ $14.5\text{V}\leq V_{in}\leq 27\text{V}$ , $5\text{mA}\leq I_o\leq 1\text{A}$ , $PD\leq 15\text{W}$	V
	B-rank(5%)		11.40	-	12.60		
$\Delta V_o$	Line Regulation	-	10	120	$14.5\text{V}\leq V_{in}\leq 30\text{V}$ , $T_j=25^\circ\text{C}$	mV	
		-	3	60	$16\text{V}\leq V_{in}\leq 22\text{V}$ , $T_j=25^\circ\text{C}$		
$\Delta V_o$	Load Regulation	-	-	100	$5\text{mA}\leq I_o\leq 1\text{A}$ , $T_j=25^\circ\text{C}$	mV	
		-	-	60	$250\text{mA}\leq I_o\leq 750\text{mA}$ , $T_j=25^\circ\text{C}$		
$I_Q$	Quiescent Current	-	-	8	$V_{in}=19\text{V}$ , $I_o=500\text{mA}$ , $T_j=25^\circ\text{C}$	mA	
$\Delta I_Q$	Quiescent Current Change	-	-	0.5	$5\text{mA}\leq I_o\leq 1\text{A}$	mA	
		-	-	1.3	$14.5\text{V}\leq V_{in}\leq 30\text{V}$		
$V_n$	Output Noise Voltage	-	75	-	$10\text{Hz}\leq f\leq 100\text{KHz}$ , $T_j=25^\circ\text{C}$	$\mu\text{V}$	
$RR$	Ripple Rejection	-	72	-	$15\text{V}\leq V_{in}\leq 25\text{V}$ , $f=120\text{Hz}$ , $T_j=25^\circ\text{C}$	dB	
$VD$	Dropout Voltage	-	2	-	$I_o=1\text{A}$ , $T_j=25^\circ\text{C}$	V	
$ISC$	Output Short Circuit Current	-	250	-	$V_{in}=35\text{V}$ , $T_j=25^\circ\text{C}$	mA	
$IPK$	Peak Output Current	-	1.8	-	$T_j=25^\circ\text{C}$	A	
$\Delta V_o/\Delta T_j$	Temperature Stability	-	-1.5	-	$I_o=5\text{mA}$ , $0^\circ\text{C}\leq T_j\leq 125^\circ\text{C}$	$\text{mV}/^\circ\text{C}$	



**LM7815** ( $T_j=0\sim 125^\circ\text{C}$ ,  $V_{in}=23\text{V}$ ,  $I_o=500\text{mA}$ ,  $C_{in}=0.33\mu\text{F}$ ,  $C_{out}=0.1\mu\text{F}$ , unless otherwise noted)

Symbol	Parameter	Min	Typ	Max	Conditions	Units	
$V_o$	A-rank(3%)	Output Voltage	14.55	15.0	15.45	$V_{in}=23\text{V}$ , $I_o=500\text{mA}$ , $T_j=25^\circ\text{C}$ $17.5\text{V}\leq V_{in}\leq 30\text{V}$ , $5\text{mA}\leq I_o\leq 1\text{A}$ , $PD\leq 15\text{W}$	V
	B-rank(5%)		14.25	-	15.75		
$\Delta V_o$	Line Regulation	-	-	150	$17.5\text{V}\leq V_{in}\leq 30\text{V}$ , $T_j=25^\circ\text{C}$	mV	
		-	-	75	$18.5\text{V}\leq V_{in}\leq 30\text{V}$ , $T_j=25^\circ\text{C}$		
$\Delta V_o$	Load Regulation	-	-	150	$5\text{mA}\leq I_o\leq 1\text{A}$ , $T_j=25^\circ\text{C}$	mV	
		-	-	75	$250\text{mA}\leq I_o\leq 750\text{mA}$ , $T_j=25^\circ\text{C}$		
$I_Q$	Quiescent Current	-	-	8	$V_{in}=23\text{V}$ , $I_o=500\text{mA}$ , $T_j=25^\circ\text{C}$	mA	
$\Delta I_Q$	Quiescent Current Change	-	-	0.5	$5\text{mA}\leq I_o\leq 1\text{A}$	mA	
		-	-	1.3	$17.5\text{V}\leq V_{in}\leq 30\text{V}$		
$V_n$	Output Noise Voltage	-	90	-	$10\text{Hz}\leq f\leq 100\text{KHz}$ , $T_j=25^\circ\text{C}$	$\mu\text{V}$	
$RR$	Ripple Rejection	-	70	-	$18.5\text{V}\leq V_{in}\leq 28.5\text{V}$ , $f=120\text{Hz}$ , $T_j=25^\circ\text{C}$	dB	
$VD$	Dropout Voltage	-	2	-	$I_o=1\text{A}$ , $T_j=25^\circ\text{C}$	V	
$ISC$	Output Short Circuit Current	-	250	-	$V_{in}=35\text{V}$ , $T_j=25^\circ\text{C}$	mA	
$IPK$	Peak Output Current	-	1.8	-	$T_j=25^\circ\text{C}$	A	
$\Delta V_o/\Delta T_j$	Temperature Stability	-	-1.8	-	$I_o=5\text{mA}$ , $0^\circ\text{C}\leq T_j\leq 125^\circ\text{C}$	$\text{mV}/^\circ\text{C}$	

**LM7818** ( $T_j=0\sim 125^\circ\text{C}$ ,  $V_{in}=27\text{V}$ ,  $I_o=500\text{mA}$ ,  $C_{in}=0.33\mu\text{F}$ ,  $C_{out}=0.1\mu\text{F}$ , unless otherwise noted)

Symbol	Parameter	Min	Typ	Max	Conditions	Units	
$V_o$	A-rank(3%)	Output Voltage	17.46	18.0	18.54	$V_{in}=27\text{V}$ , $I_o=500\text{mA}$ , $T_j=25^\circ\text{C}$ $21\text{V}\leq V_{in}\leq 33\text{V}$ , $5\text{mA}\leq I_o\leq 1\text{A}$ , $PD\leq 15\text{W}$	V
	B-rank(5%)		17.10	-	18.90		
$\Delta V_o$	Line Regulation	-	-	180	$21\text{V}\leq V_{in}\leq 33\text{V}$ , $T_j=25^\circ\text{C}$	mV	
		-	-	90	$24\text{V}\leq V_{in}\leq 30\text{V}$ , $T_j=25^\circ\text{C}$		
$\Delta V_o$	Load Regulation	-	-	180	$5\text{mA}\leq I_o\leq 1\text{A}$ , $T_j=25^\circ\text{C}$	mV	
		-	-	90	$250\text{mA}\leq I_o\leq 750\text{mA}$ , $T_j=25^\circ\text{C}$		
$I_Q$	Quiescent Current	-	-	8	$V_{in}=27\text{V}$ , $I_o=500\text{mA}$ , $T_j=25^\circ\text{C}$	mA	
$\Delta I_Q$	Quiescent Current Change	-	-	0.5	$5\text{mA}\leq I_o\leq 1\text{A}$	mA	
		-	-	1.0	$21\text{V}\leq V_{in}\leq 33\text{V}$		
$V_n$	Output Noise Voltage	-	110	-	$10\text{Hz}\leq f\leq 100\text{KHz}$ , $T_j=25^\circ\text{C}$	$\mu\text{V}$	
$RR$	Ripple Rejection	-	69	-	$22\text{V}\leq V_{in}\leq 32\text{V}$ , $f=120\text{Hz}$ , $T_j=25^\circ\text{C}$	dB	
$VD$	Dropout Voltage	-	2	-	$I_o=1\text{A}$ , $T_j=25^\circ\text{C}$	V	
$ISC$	Output Short Circuit Current	-	250	-	$V_{in}=35\text{V}$ , $T_j=25^\circ\text{C}$	mA	
$IPK$	Peak Output Current	-	1.8	-	$T_j=25^\circ\text{C}$	A	
$\Delta V_o/\Delta T_j$	Temperature Stability	-	-2.2	-	$I_o=5\text{mA}$ , $0^\circ\text{C}\leq T_j\leq 125^\circ\text{C}$	$\text{mV}/^\circ\text{C}$	

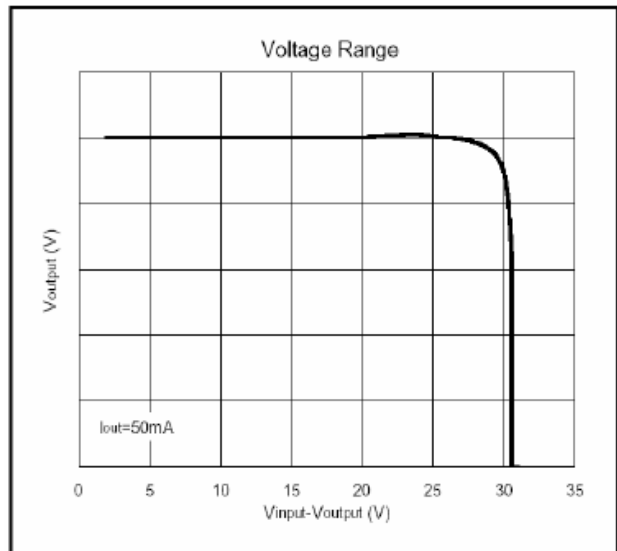
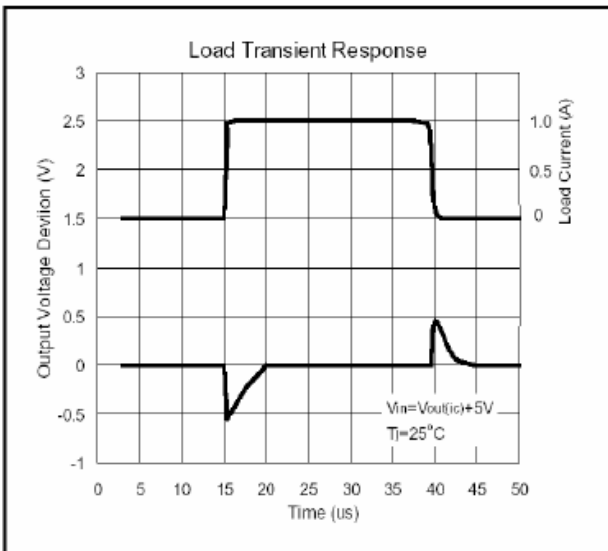
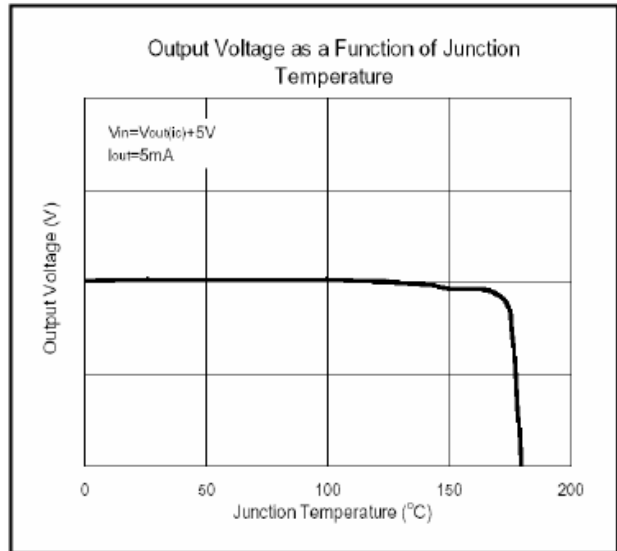
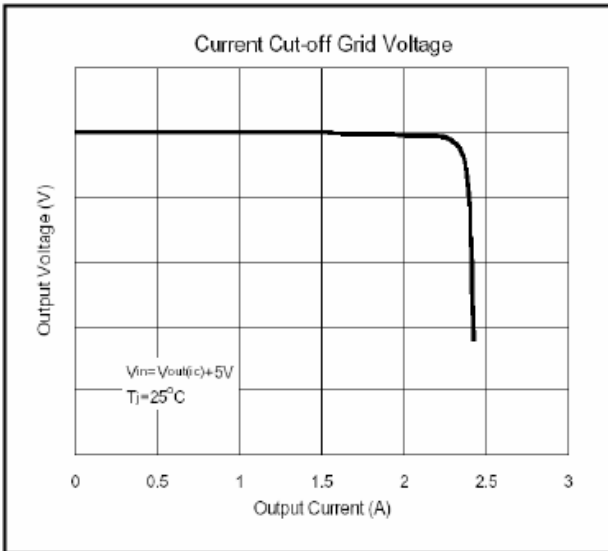


**LM7824** (Tj=0~125°C, Vin=33V, Io=500mA, Cin=0.33uF, Cout=0.1uF, unless otherwise noted)

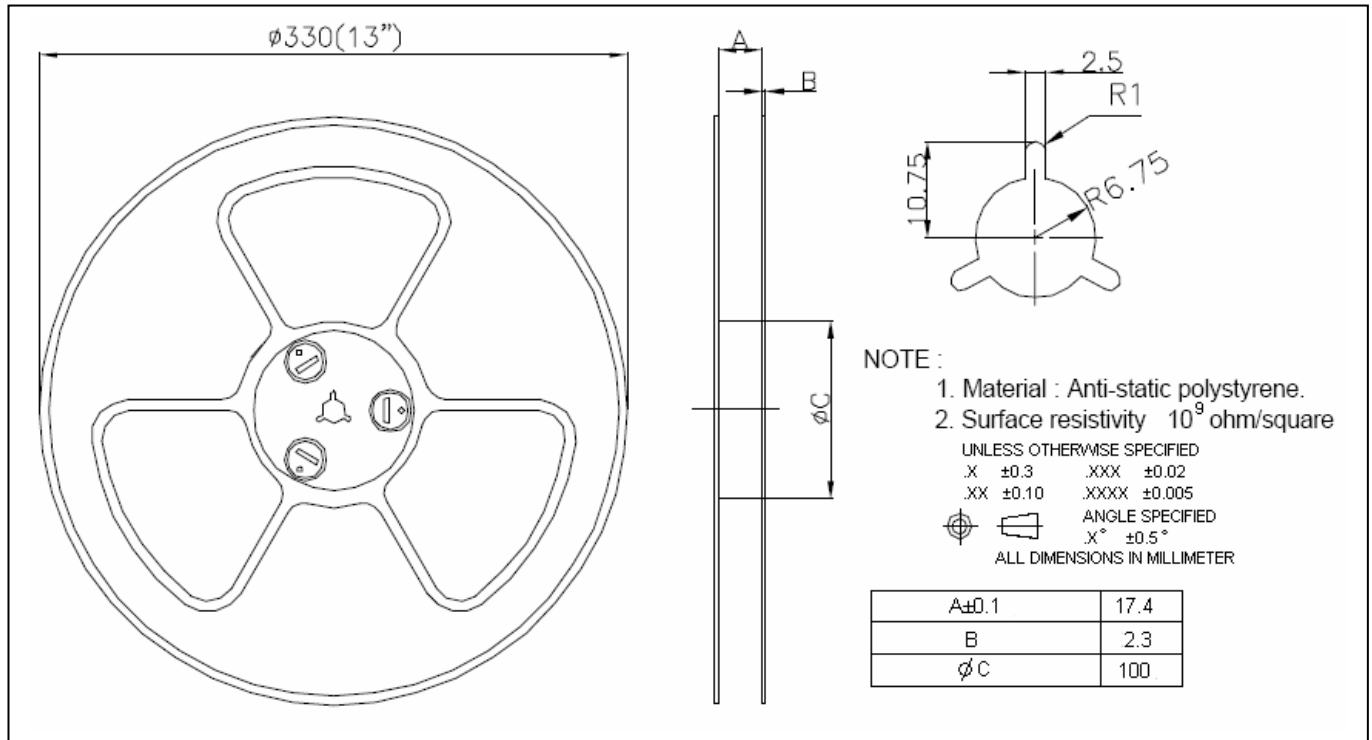
Symbol	Parameter	Min	Typ	Max	Conditions	Units
Vo	A-rank(3%)	23.28	24.0	24.72	Vin=33V, Io=500mA, Tj=25°C 27V≤Vin≤38V, 5mA≤Io≤1A, PD≤15W	V
	B-rank(5%)					
ΔVo	Line Regulation	-	-	240	27V≤Vin≤38V, Tj=25°C	mV
		-	-	120	30V≤Vin≤36V, Tj=25°C	
ΔVo	Load Regulation	-	-	240	5mA≤Io≤1A, Tj=25°C	mV
		-	-	120	250mA≤Io≤750mA, Tj=25°C	
IQ	Quiescent Current	-	-	8	Vin=33V, Io=500mA, Tj=25°C	mA
ΔIQ	Quiescent Current Change	-	-	0.5	5mA≤Io≤1A	mA
		-	-	1.0	28V≤Vin≤38V	
Vn	Output Noise Voltage	-	170	-	10Hz≤f≤100KHz, Tj=25°C	μV
RR	Ripple Rejection	-	66	-	28V≤Vin≤38V, f=120Hz, Tj=25°C	dB
VD	Dropout Voltage	-	2	-	Io=1A, Tj=25°C	V
ISC	Output Short Circuit Current	-	250	-	Vin=35V, Tj=25°C	mA
IPK	Peak Output Current	-	1.8	-	Tj=25°C	A
ΔVo/ΔTj	Temperature Stability	-	-2.8	-	Io=5mA, 0°C ≤Tj≤125°C	mV/°C



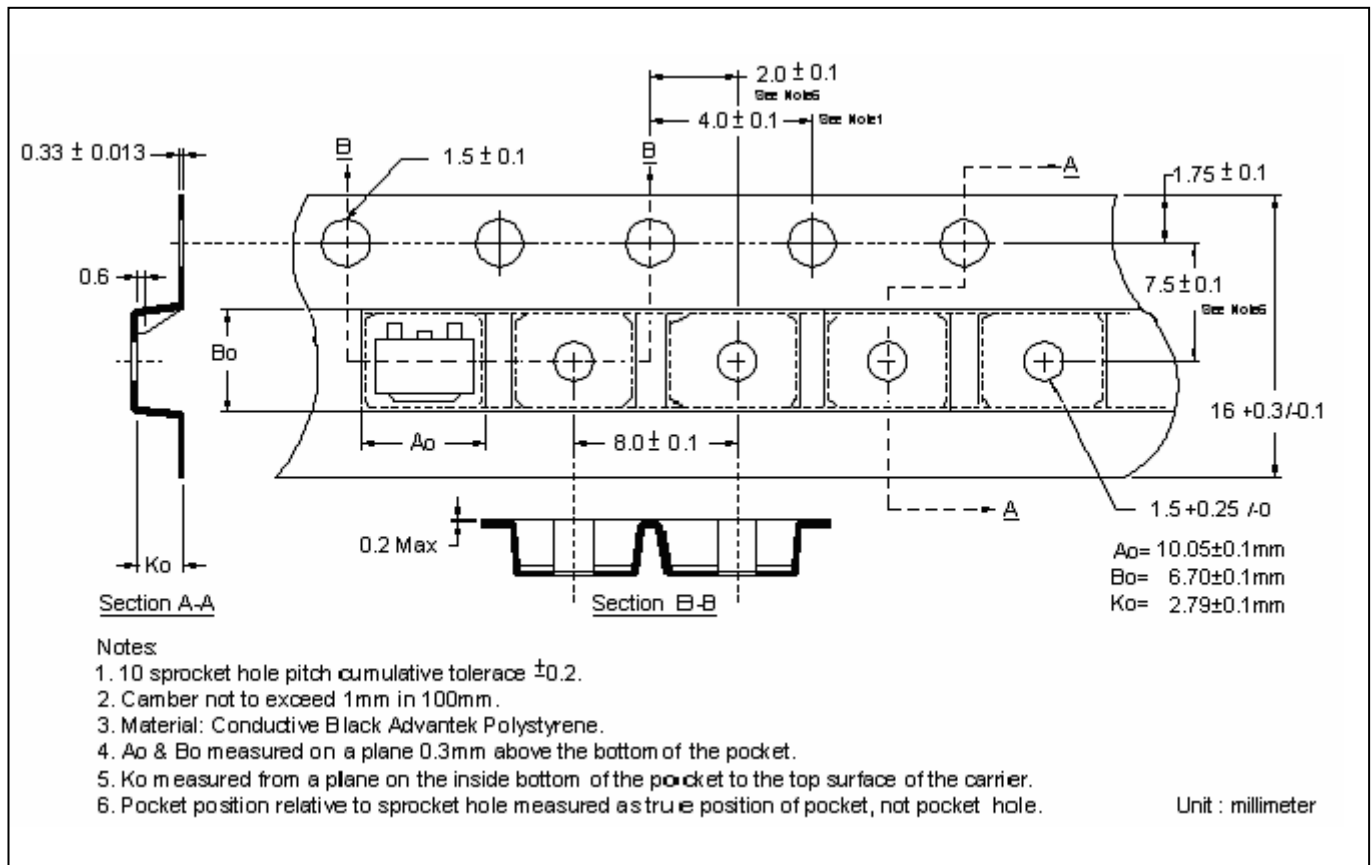
**Characteristic Curves**



**Reel Dimension**



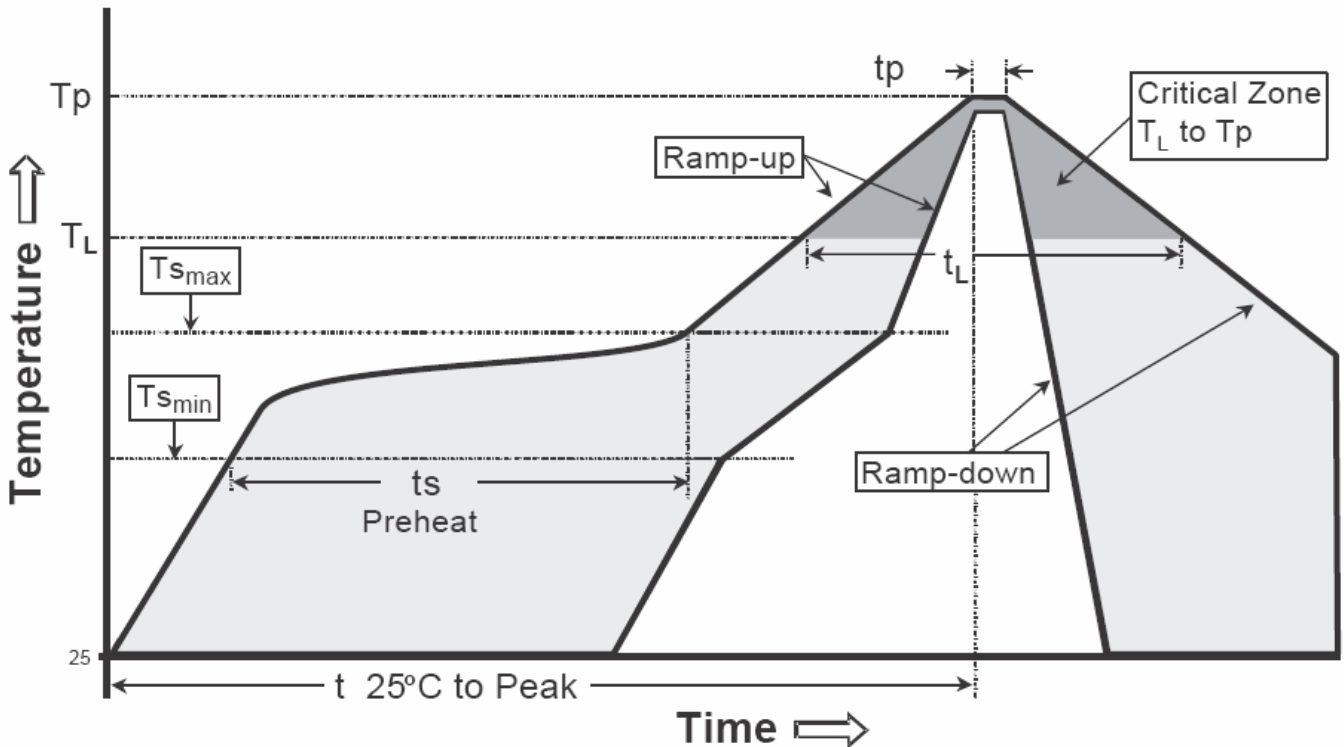
**Carrier Tape Dimension**



**Recommended wave soldering condition**

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

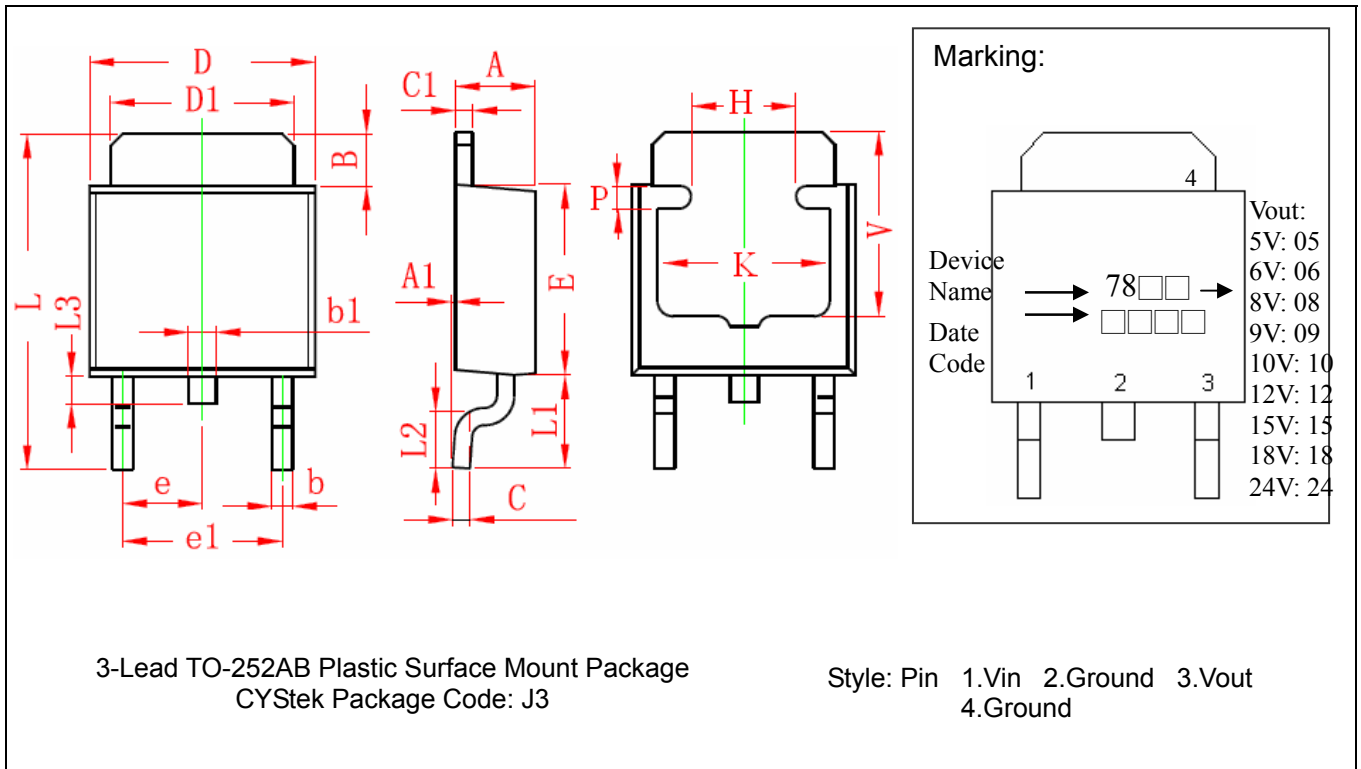
**Recommended temperature profile for IR reflow**



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> )	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T <sub>s min</sub> )	100°C	150°C
-Temperature Max(T <sub>s max</sub> )	150°C	200°C
-Time(t <sub>s min</sub> to t <sub>s max</sub> )	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T <sub>L</sub> )	183°C	217°C
- Time (t <sub>L</sub> )	60-150 seconds	60-150 seconds
Peak Temperature(T <sub>P</sub> )	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

**TO-252AB Dimension**



\*: Typical

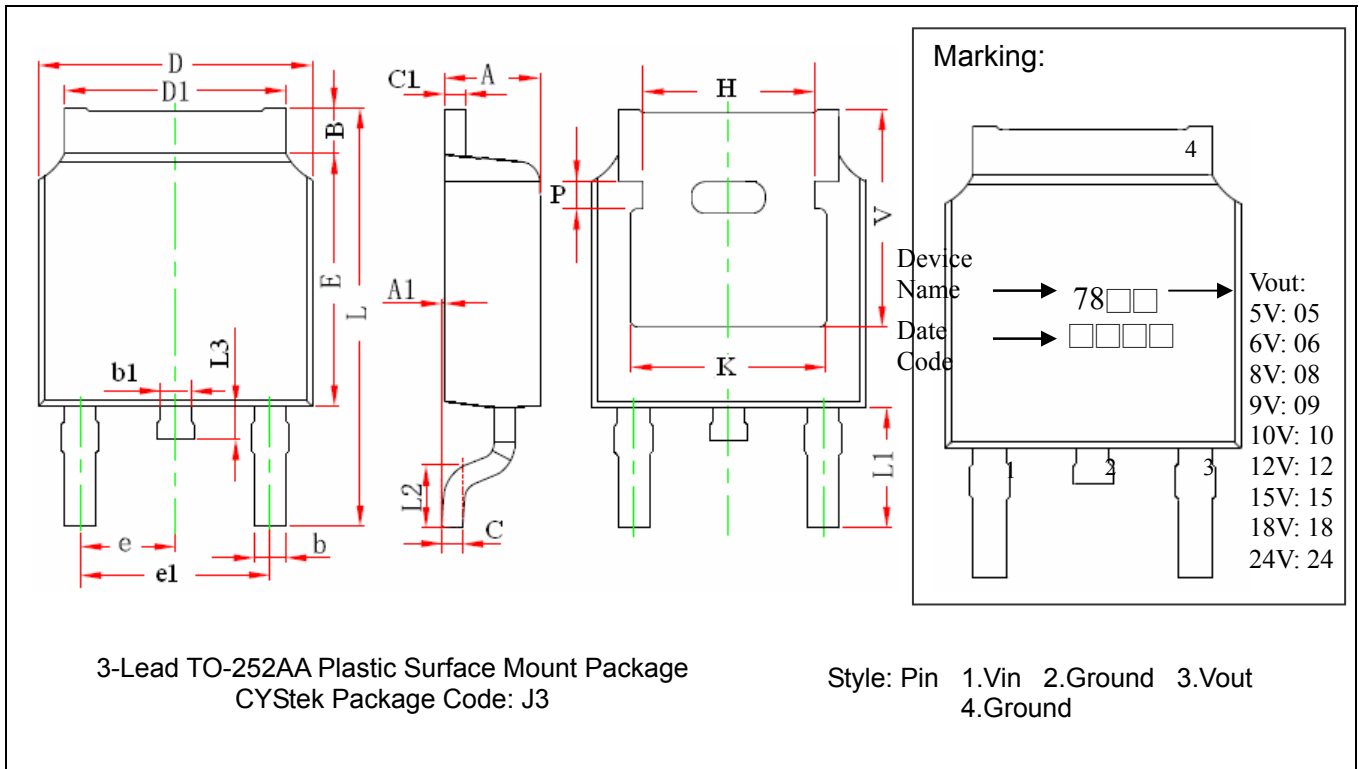
DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.087	0.094	2.200	2.400	e	*0.091		*2.300	
A1	0.000	0.005	0.000	0.127	e1	0.177	0.185	4.500	4.700
B	0.053	0.065	1.350	1.650	H	0.118	REF	3.000	REF
b	0.020	0.028	0.500	0.700	K	0.197	REF	5.000	REF
b1	0.028	0.035	0.700	0.900	L	0.374	0.390	9.500	9.900
C	0.017	0.023	0.430	0.580	L1	0.100	0.114	2.550	2.900
C1	0.017	0.023	0.430	0.580	L2	0.055	0.070	1.400	1.780
D	0.250	0.262	6.350	6.650	L3	0.024	0.035	0.600	0.900
D1	0.205	0.213	5.200	5.400	P	0.028	REF	0.700	REF
E	0.213	0.224	5.400	5.700	V	0.209	REF	5.300	REF

Notes: 1.Controlling dimension: millimeters.  
 2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.  
 3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

**Material:**

- Lead : Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.

**TO-252AA Dimension**



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.087	0.094	2.200	2.400	e	0.086	0.094	2.186	2.386
A1	0.000	0.005	0.000	0.127	e1	0.172	0.188	4.372	4.772
B	0.039	0.048	0.990	1.210	H	0.163	REF	4.140	REF
b	0.026	0.034	0.660	0.860	K	0.190	REF	4.830	REF
b1	0.026	0.034	0.660	0.860	L	0.386	0.409	9.800	10.400
C	0.018	0.023	0.460	0.580	L1	0.114	REF	2.900	REF
C1	0.018	0.023	0.460	0.580	L2	0.055	0.067	1.400	1.700
D	0.256	0.264	6.500	6.700	L3	0.024	0.039	0.600	1.000
D1	0.201	0.215	5.100	5.460	P	0.026	REF	0.650	REF
E	0.236	0.244	6.000	6.200	V	0.211	REF	5.350	REF

**Notes:** 1.Controlling dimension: millimeters.  
 2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.  
 3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

**Material:**

- Lead : Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.

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