Three Terminal Positive Voltage Regulators

LM78D05L3

SOT-223

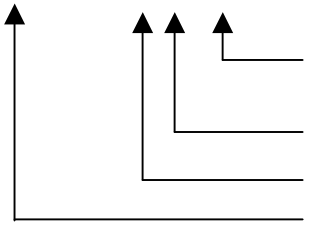
These voltage regulators are monolithic integrated circuits designed as fixed voltage regulators for a wide variety of applications including local, on-card regulation. These regulators employ internal current limiting, thermal shutdown, and safe-area compensation. With adequate heatsinking they can deliver output currents in excess of 1.0A. Although designed primarily as fixed voltage regulator, these devices can be used with external components to obtain adjustable voltages and currents.

Maximum Ratings

Rating	Symbol	Value	Unit
Input Voltage	V_{IN}	35	V
Output Current	Io	1	A
Power Dissipation	P_D	Internally Limited	W
Operating Junction Temperature Range	T_J	-40 to +125	°C
Storage Temperature Range	Tstg	-65 to +150	℃

Ordering Information

Device	Output Voltage Tolerance	Package	Shipping
LM78D05L3-A-T3-G	± 3%	SOT-223 (Pb-free lead plating and halogen-free package)	2500 pcs/Tape & Reel
LM78D05L3-B-T3-G	± 5%		



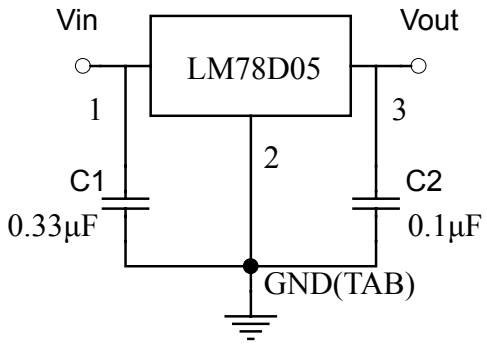
Environment friendly grade : S for RoHS compliant products, G for RoHS compliant and green compound products

Packing spec, T3 : 2500 pcs / tape & reel, 13” reel

Product rank, zero for no rank products

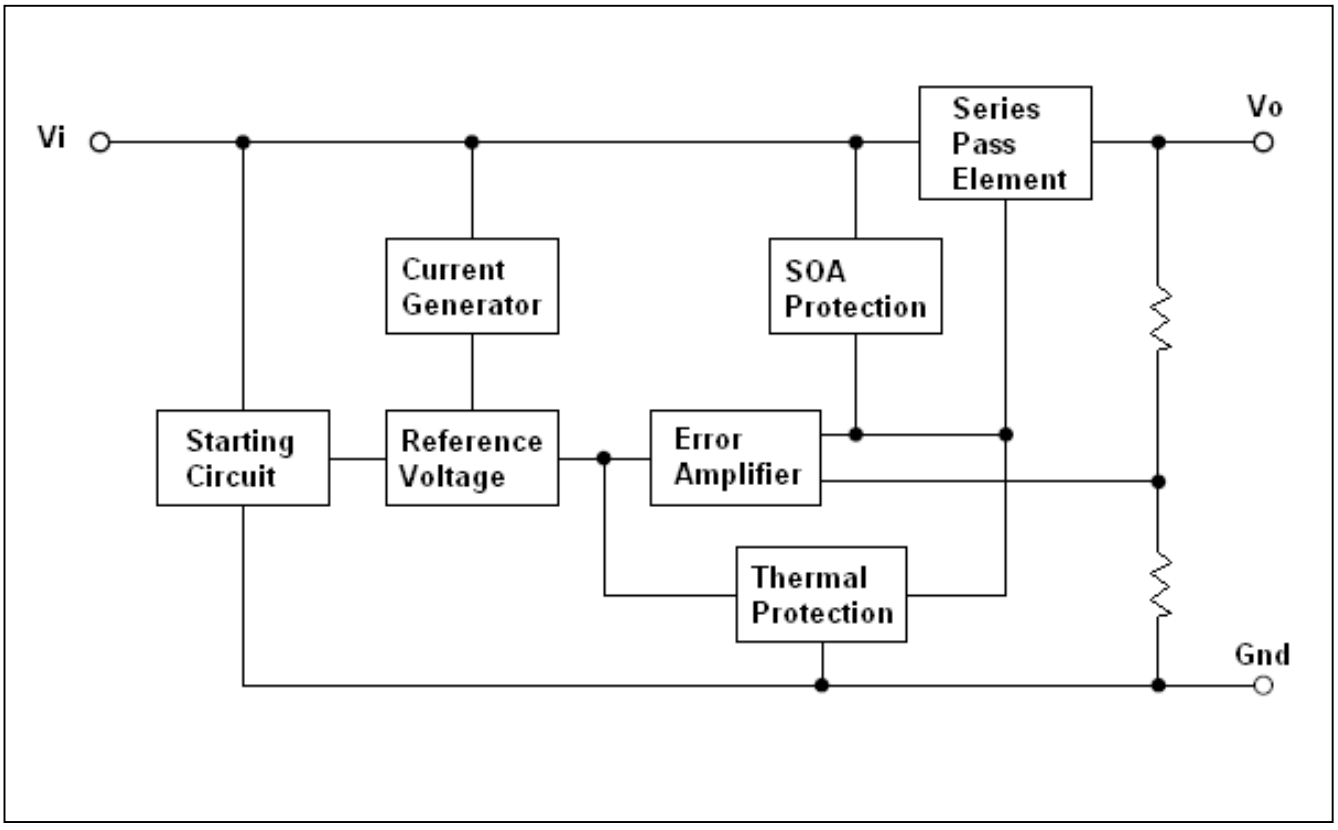
Product name

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

V_{IN}=10V, I_{OUT}=500mA, T_J=25℃, C_{IN}=0.33μF, C_{OUT}=0.1μF, unless otherwise specified

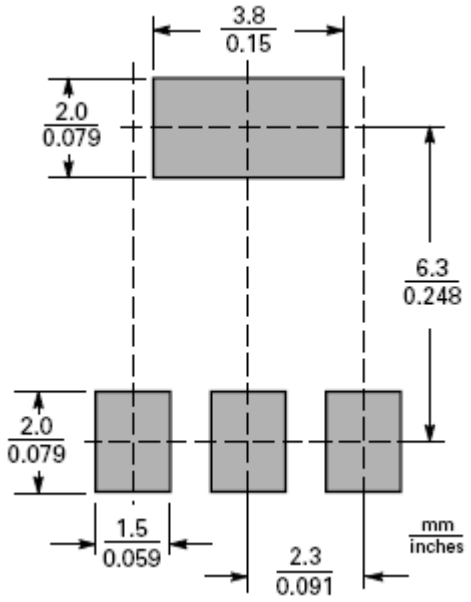
Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Output Voltage LM78D05L3 A-rank LM78D05L3 B-rank	Vo		 4.85 4.75	 5.0 5.0	 5.15 5.25	V
Output Voltage LM78D05L3 A-rank LM78D05L3 B-rank	Vo	5.0mA≤I_{OUT}≤1.0A,P_D≤15W	 4.85 4.75	 5.0 5.0	 5.15 5.25	V
Line Regulation	ΔVo	7V≤V_{IN}≤25V 8V≤V_{IN}≤25V	- -	- -	50 25	mV
Load Regulation	ΔVo	5.0mA≤I_{OUT}≤1.5A 250mA≤I_{OUT}≤750mA	- -	- -	100 50	mV
Quiescent Current	I_Q	I_{OUT}≤1.0A	-	-	8	mA
Quiescent Current Change	ΔI_Q	5.0mA≤I_{OUT}≤1.5A 7V≤V_{IN}≤25V	- -	- -	0.5 1.3	mA
Dropout Voltage	V_D	I_{OUT}=1.0A	-	2	-	V
Peak Output Current	I_{PK}		1.7	-	-	A

Thermal Data

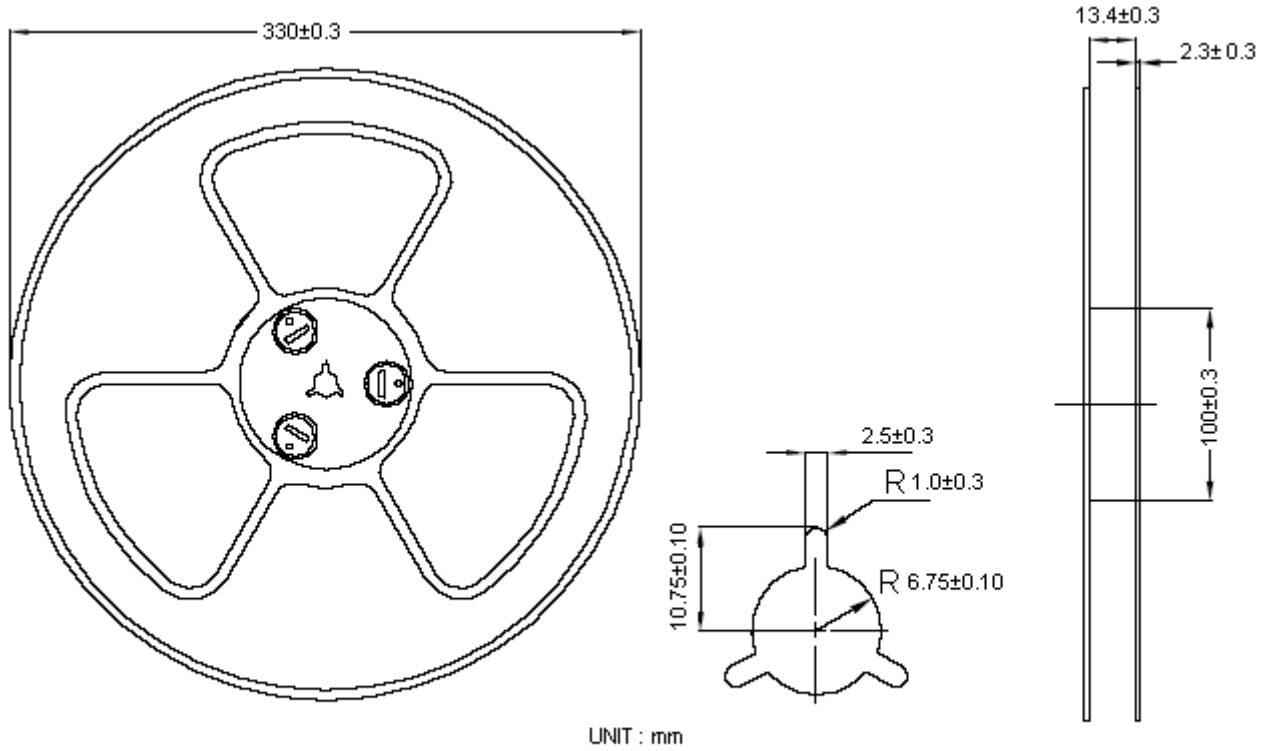
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{th,j-c}$	15	°C/W
Thermal Resistance, Junction-to-ambient, max	$R_{th,j-a}$	80 (Note)	°C/W

Note : Surface mounted on a 1 in^2 pad of 2 oz. copper, t≤10s; 120°C/W when mounted on minimum copper pad.

Recommended soldering footprint



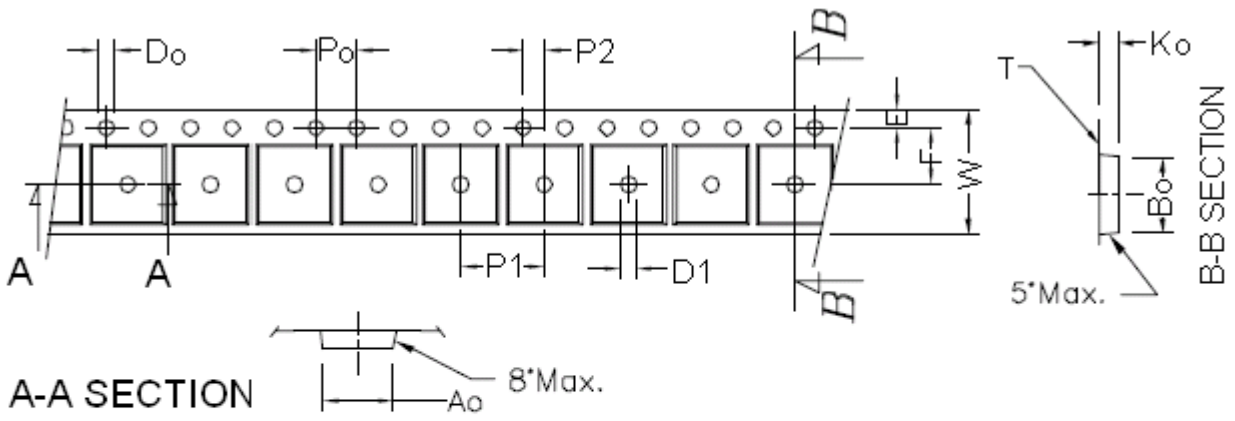
Reel Dimension



UNIT : mm

NOTE : 1. Material : Anti-static polystyrene
2. Surface resistivity 10^9 Ω/sq

Carrier Tape Dimension



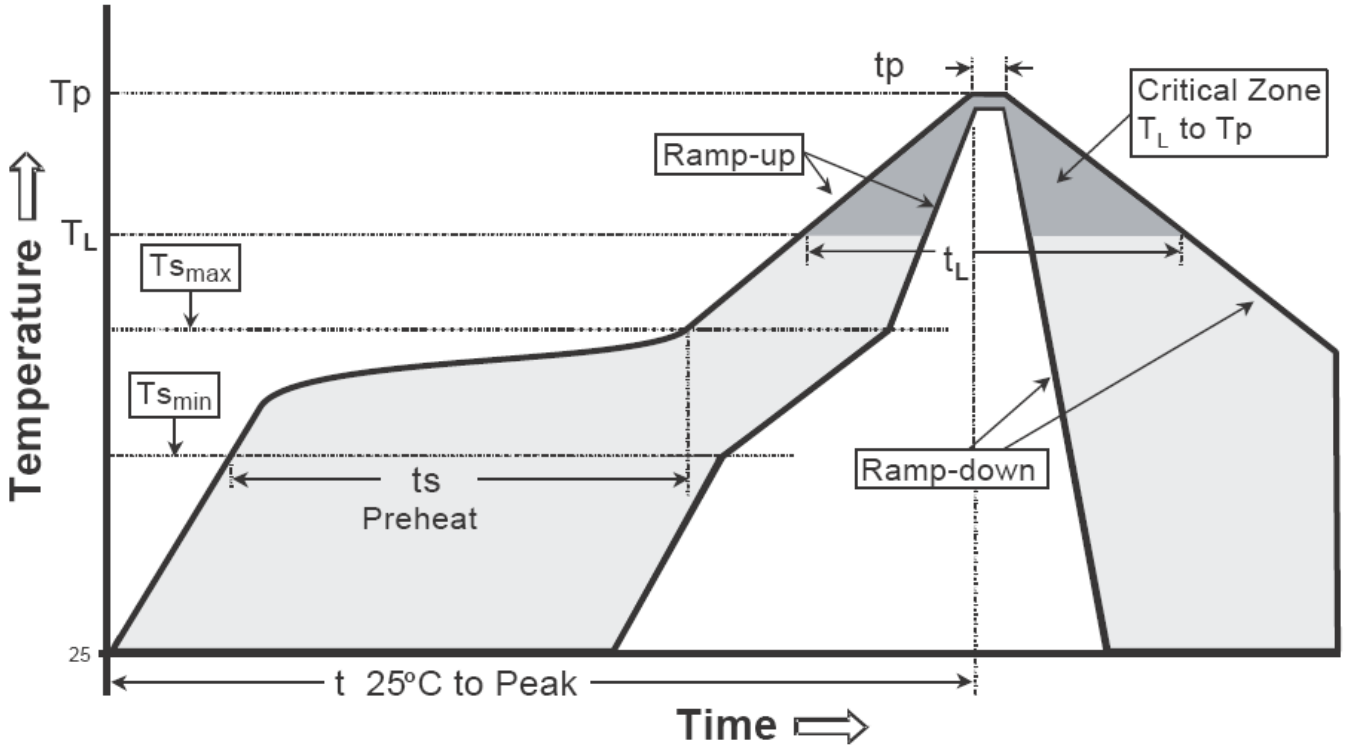
Symbol	Ao	Bo	Ko	Po	P1	P2	T
Spec	6.83±0.1	7.42±0.1	1.88±0.1	4.0±0.1	8.0±0.10	2.0±0.05	0.292±0.02
Symbol	E	F	Do	D1	W	10Po	
Spec	1.75±0.1	5.5±0.05	1.60±0.1	1.5±0.25	$12^{+0.3}_{-0.1}$	40.0±0.2	

Unit : mm

Recommended wave soldering condition

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

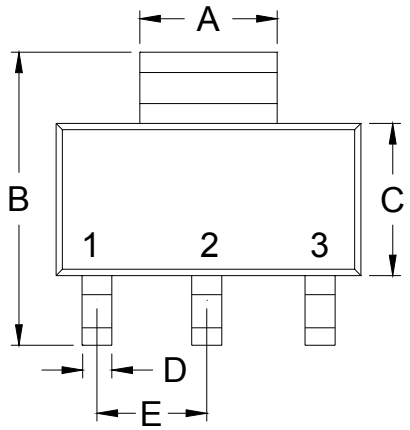
Recommended temperature profile for IR reflow

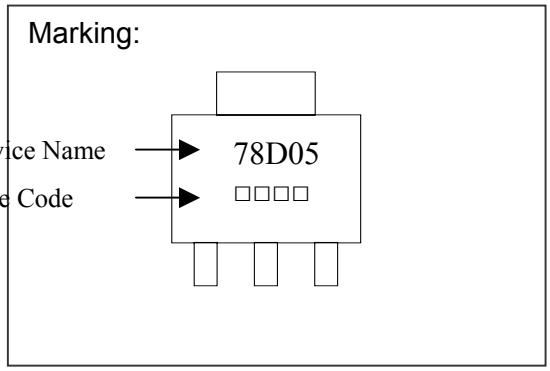


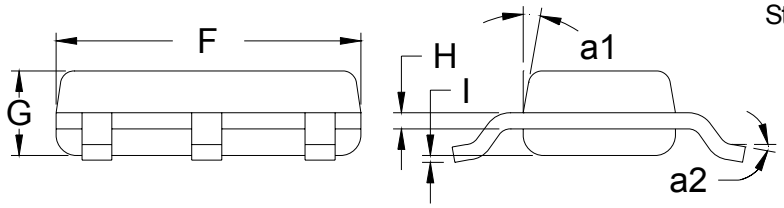
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\ min}$ to $t_{s\ max}$)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (T_L) − Time (t_L)	 183°C 60-150 seconds	 217°C 60-150 seconds
Peak Temperature(T_P)	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.

SOT-223 Dimension







Style: Pin 1.Input 2.GND 3.Output

3-Lead SOT-223 Plastic
Surface Mounted Package
CYStek Package Code: L3

*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1142	0.1220	2.90	3.10	G	0.0551	0.0709	1.40	1.80
B	0.2638	0.2874	6.70	7.30	H	0.0098	0.0138	0.25	0.35
C	0.1299	0.1457	3.30	3.70	I	0.0008	0.0039	0.02	0.10
D	0.0236	0.0315	0.60	0.80	a1	*13°	-	*13°	-
E	*0.0906	-	*2.30	-	a2	0°	10°	0°	10°
F	0.2480	0.2638	6.30	6.70					

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.