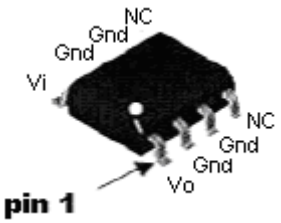
Medium Current Positive Voltage Regulator

LM78L05AQ8

SOP-8



Description

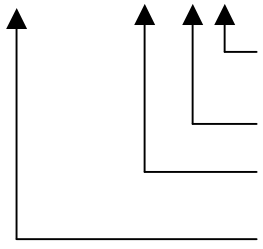
The LM78L05AQ8 series of positive regulators are available in the SOP-8 package and with 5V fixed output voltage. These regulators can provide local on-card regulation, eliminating the distribution problems associated with single point regulation. Each type employs internal current limiting, thermal shut-down and safe operating area protection, making it essentially indestructible. If adequate heat sinking is provided, they can deliver over 500mA output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents. LM78L05AQ8 is characterized for operation from 0℃ to 150℃.

Features:

- Internal Short-Circuit Current Limiting
- Internal Thermal Overload Protection
- No External Components Required
- Output Transistor Safe Operating Area Protection
- Pb-free lead plating and halogen-free package

Ordering Information

Device	Output Voltage Tolerance	Package	Shipping
LM78L05AQ8-A-T3-G	±3%	SOP-8 (Pb-free lead plating and halogen-free package)	2500 pcs / Tape & Reel
LM78L05AQ8-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

Absolute Maximum Ratings

Parameter	Ratings	Unit
Input Voltage	35	V
Output Current	500	mA
Operating Junction Temperature Range	0 ~ 150	°C
Storage Temperature Range	-65 ~ 150	°C
Power Dissipation	750 (Note)	mW

Note : When tested in free air condition, without heat sinking.

Recommended Operating Condition

Parameter	Symbol	Min	Max	Unit
Input Voltage	V_I	7	25	V
Output Current	I_O	-	500	mA
Operating Junction Temperature Range	T_J	0	125	°C

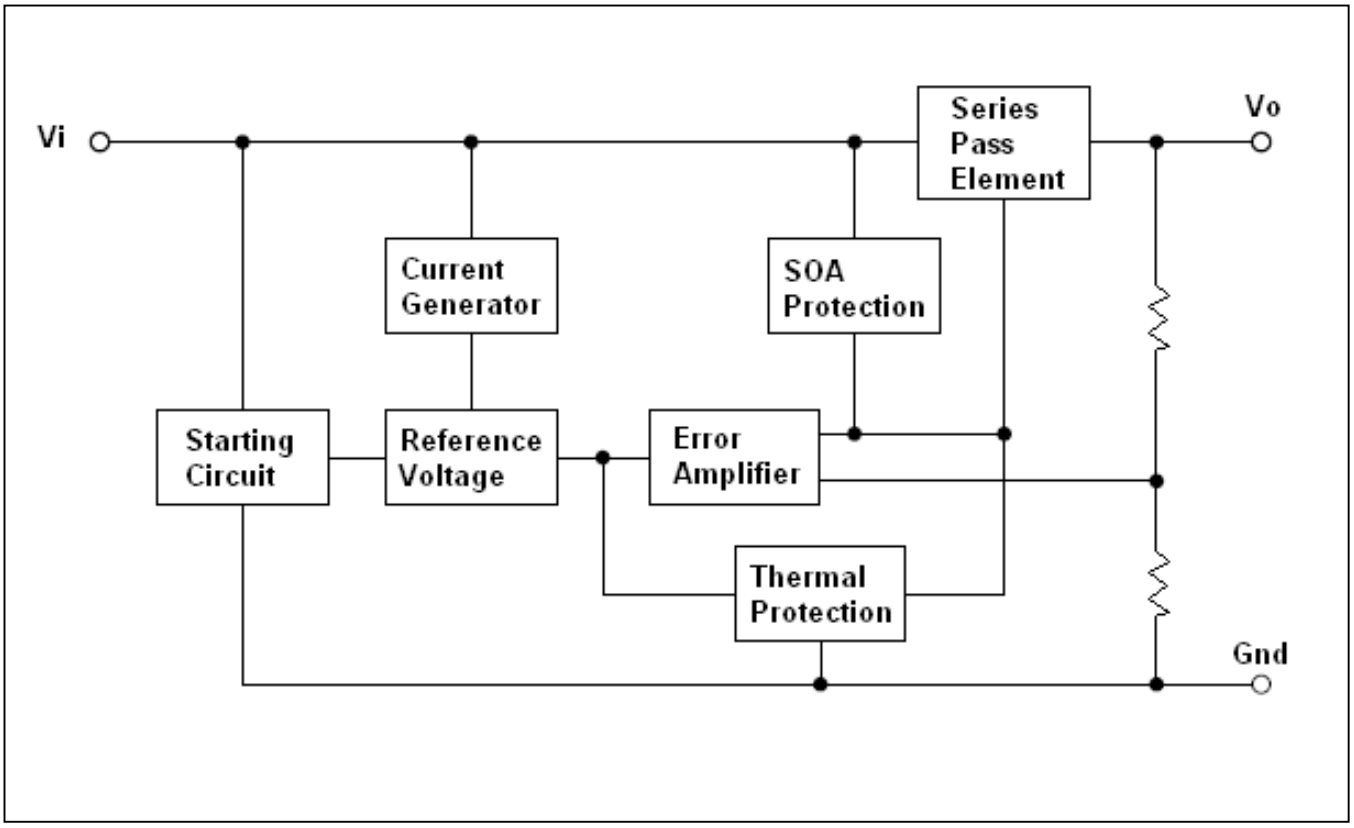
Electrical Characteristics

(Ta=25°C, Vin=10V, Io=350mA, Cin=0.33uF, Cout=0.1uF, unless otherwise noted)

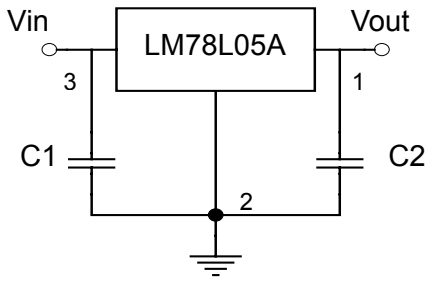
Symbol	Parameter	Conditions	LM78M05			Units
			Min	Typ	Max	
Vo	Output Voltage		4.80	5.0	5.20	V
		5mA≤Io≤350mA 7V≤Vin≤20V	4.75	5.0	5.25	
ΔVo	Line Regulation	I_O=200mA, 7V≤Vin≤25V	-	3	100	mV
		I_O=200mA, 8V≤Vin≤25V	-	1	50	
ΔVo	Load Regulation	5mA≤Io≤500mA	-	30	100	mV
		5mA≤Io≤200mA	-	12	50	
IQ	Quiescent Current		-	4.8	8	mA
ΔIQ	Quiescent Current Change	5mA≤Io≤350mA	-	-	0.5	mA
		7V≤Vin≤25V	-	-	1.0	
Vn	Output Noise Voltage	10Hz≤f≤100KHz	-	40	-	μV
RR	Ripple Rejection	8V≤Vin≤18V, f=120Hz, e_{IN}=1Vrms	62	80	-	dB
VD	Dropout Voltage		-	2	-	V

Note : 1. The maximum steady state usable output current is dependent on input voltage, heat sinking, lead length of the package and copper of PCB. The data above represent pulse test conditions with junction temperatures as close to the ambient temperature as possible. Thermal effects must be taken into account separately.
2. Power dissipation<0.75W

Block Diagram



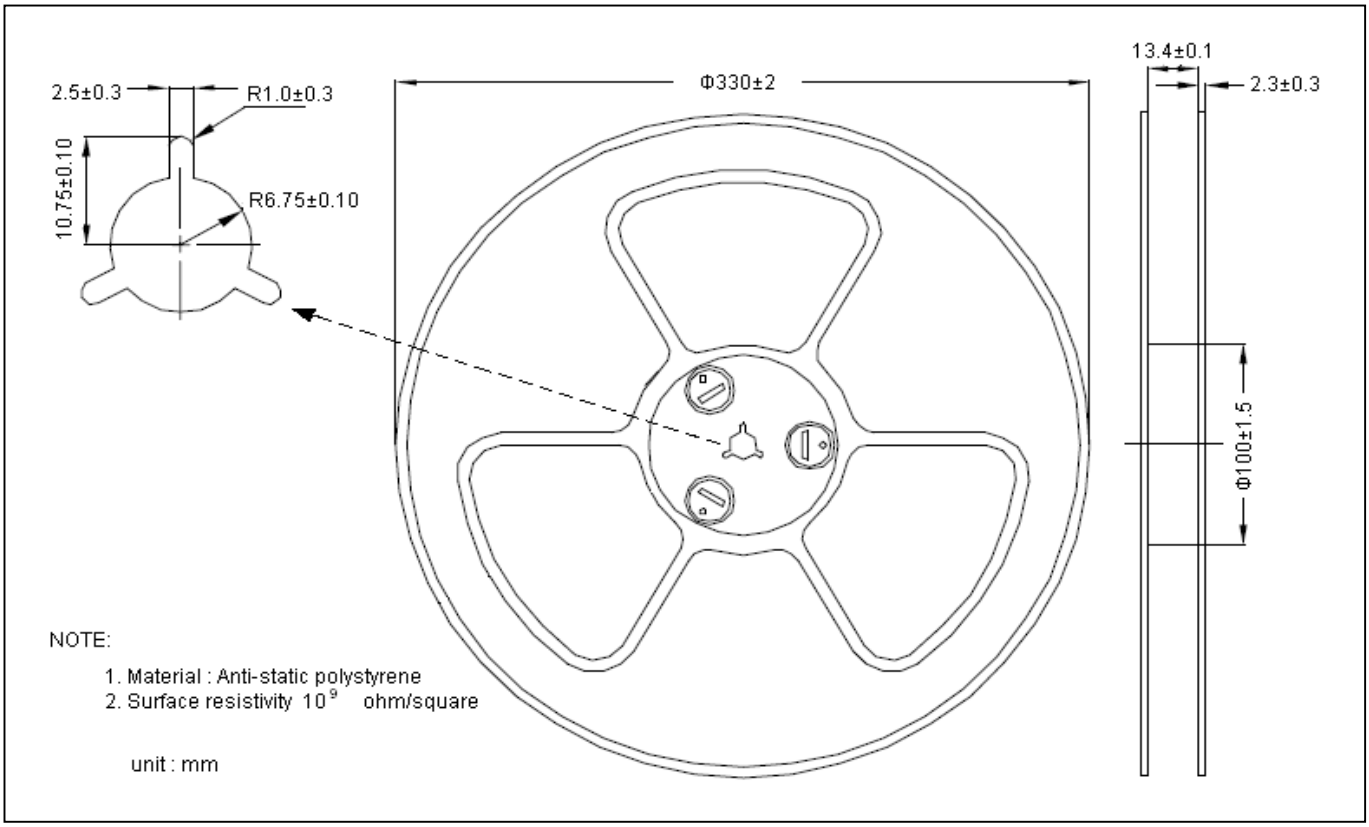
Typical Application



A common ground is required between the input and the output voltages. The input voltage must remain typically 2.0V above the output voltage even during the low point on the input ripple voltage.

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

Reel Dimension

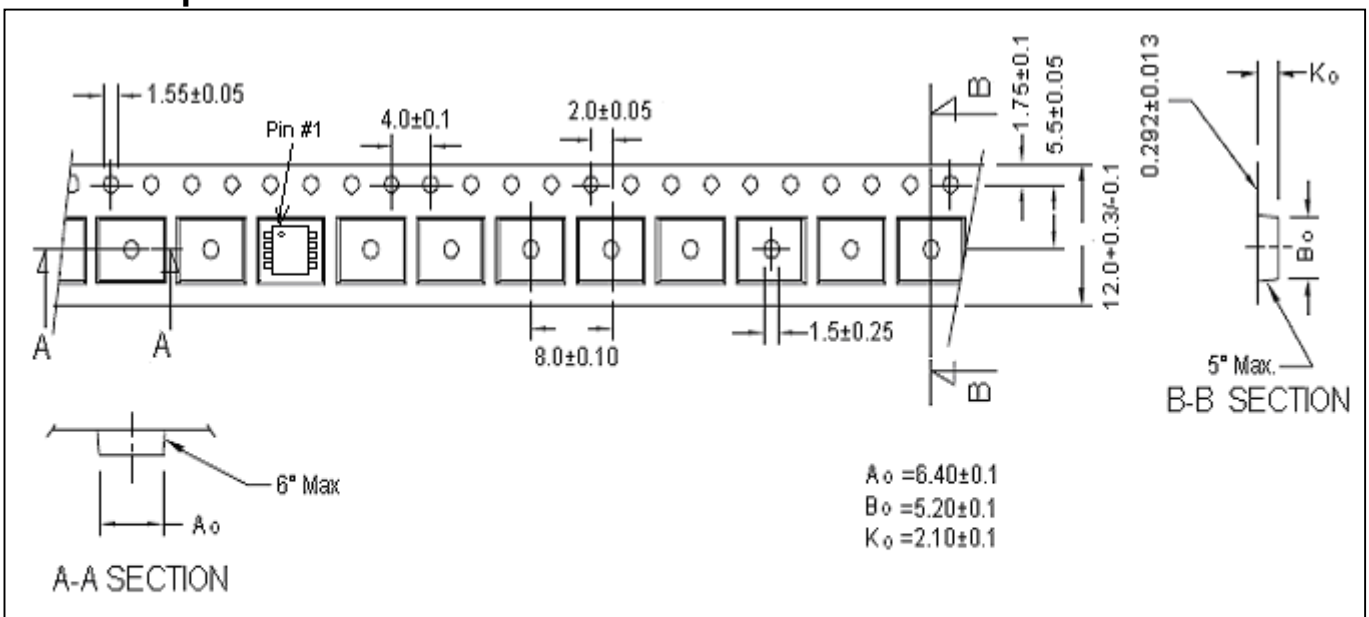


NOTE:

1. Material : Anti-static polystyrene
2. Surface resistivity 10^9 ohm/square

unit : mm

Carrier Tape Dimension



Ao =6.40±0.1
Bo =5.20±0.1
Ko =2.10±0.1

Notes:

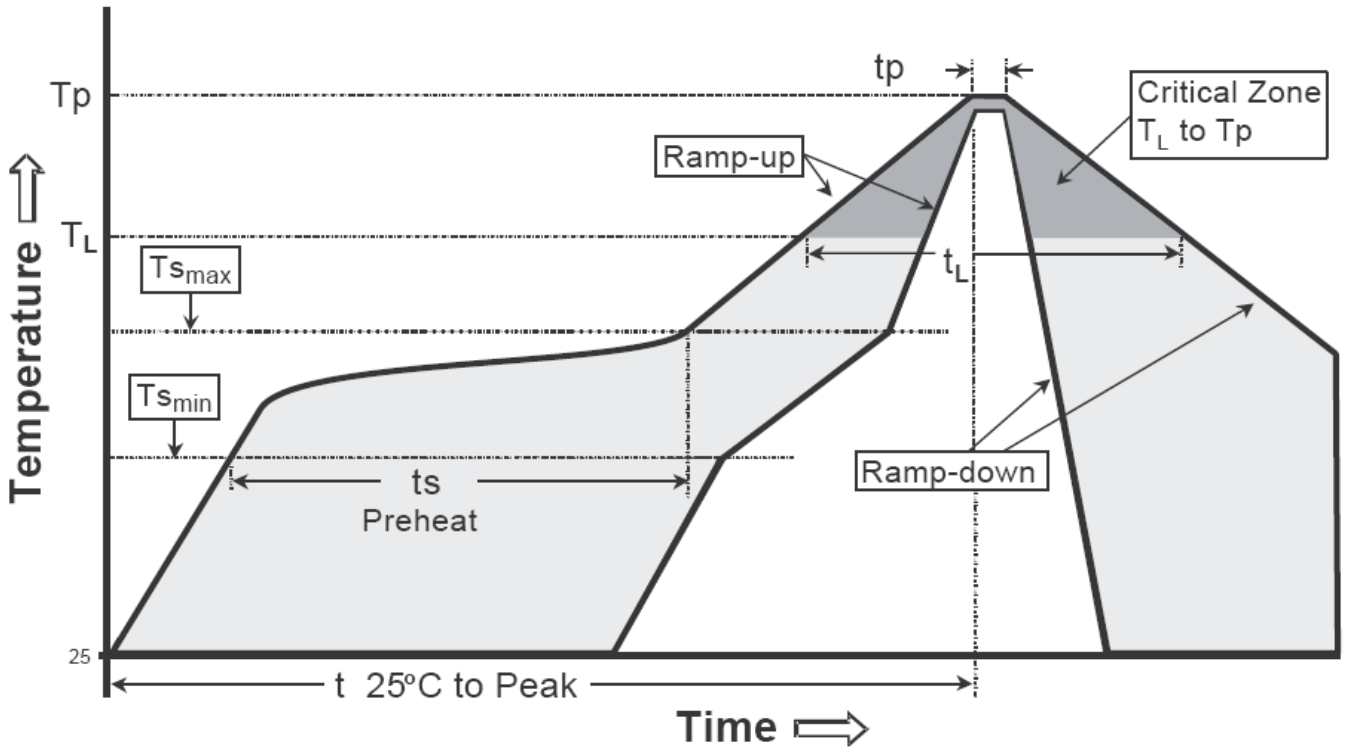
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: conductive black polystyrene
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Uni : millimeter

Recommended wave soldering condition

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

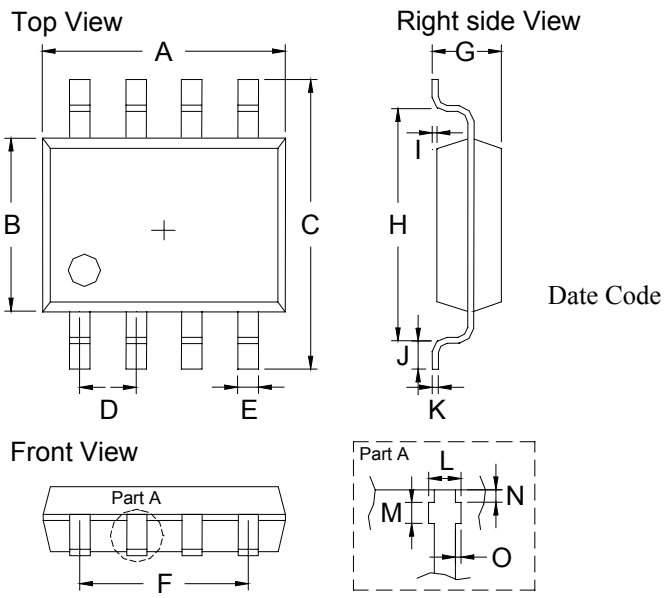
Recommended temperature profile for IR reflow

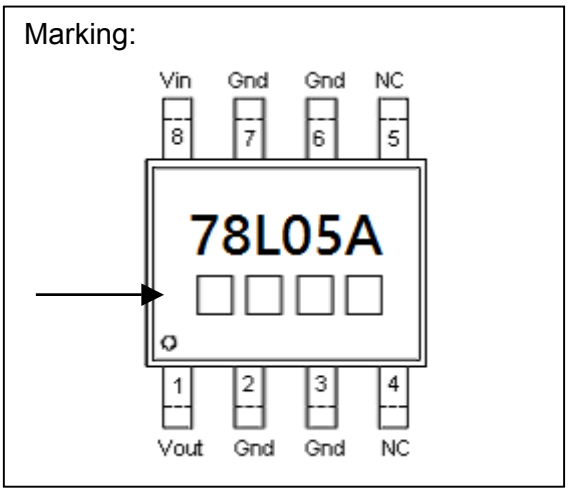


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\ min}$ to $t_{s\ max}$)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature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

SOP-8 Dimension





8-Lead SOP-8 Plastic Package
CYStek Package Code: Q8

*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1909	0.2007	4.85	5.10	I	0.0019	0.0078	0.05	0.20
B	0.1515	0.1555	3.85	3.95	J	0.0118	0.0275	0.30	0.70
C	0.2283	0.2441	5.80	6.20	K	0.0074	0.0098	0.19	0.25
D	0.0480	0.0519	1.22	1.32	L	0.0145	0.0204	0.37	0.52
E	0.0145	0.0185	0.37	0.47	M	0.0118	0.0197	0.30	0.50
F	0.1472	0.1527	3.74	3.88	N	0.0031	0.0051	0.08	0.13
G	0.0570	0.0649	1.45	1.65	O	0.0000	0.0059	0.00	0.15
H	0.1889	0.2007	4.80	5.10					

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.