

1A Low Dropout Positive Voltage Regulator

LM78M05LL3

Features

- Output Current of 1A
- Low Dropout, 1.4V max at 1A Output Current
- Good Noise Rejection
- Output Current Limiting
- Built-in Thermal Shutdown
- Fast Transient Response
- Pb-free lead plating package
- Can operate using MLCCs in the capacitance range of 2μF to 10μF

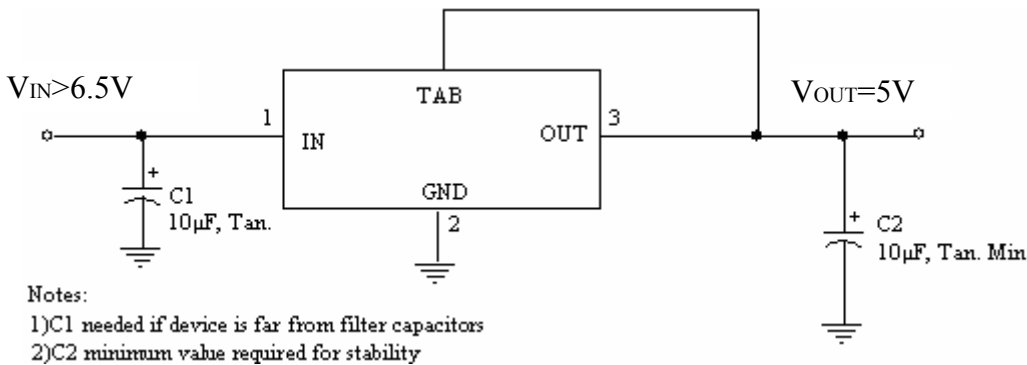
Description

The LM78M05LL3 positive voltage regulator is designed to provide 1A with high efficiency. All internal circuitry is designed to operate down to 1.4V input to output differential. On-chip trimming adjusts the reference voltage to 1%. Typical current limit value of 1.5A allows to minimize the stress on both the regulator and the power source circuitry under overload conditions.

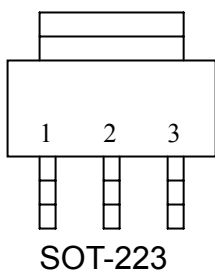
Applications

- High Efficiency Linear Regulators
- Post Regulators for Switching Supplies
- Adjustable Power Supply

Typical Application Data



Package Information



Pin	Name
1	INPUT
2	GND
3	OUTPUT

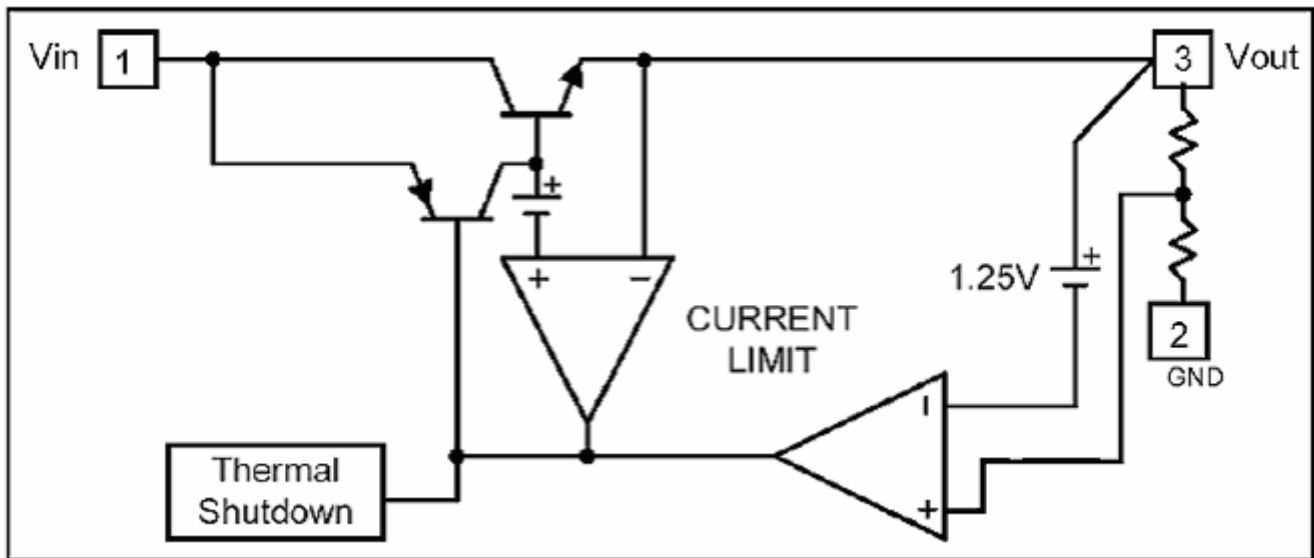
Absolute Maximum Ratings

Symbol	Parameter	Maximum	Units
P _D	Power Dissipation	Internally Limited	W
V _{IN}	Input Voltage	20	V
T _{OPR}	Operating Junction Temperature Range	-40 ~ +125	°C
T _{STG}	Storage Temperature	-65 ~ +150	°C
T _{MJ}	Maximum Junction Temperature	150	°C
V _{ESD}	Minimum ESD Rating (HBM)	3	kV

Ordering Information

Device	Output Voltage	Package	Shipping
LM78M05LL3-0-T3-G	5.0V	SOT-223 (pb-free lead plating and halogen-free package)	2500 pcs/ tape & reel

Block Diagram



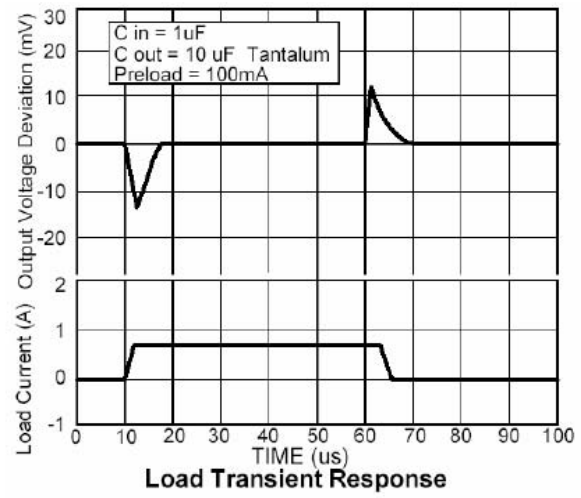
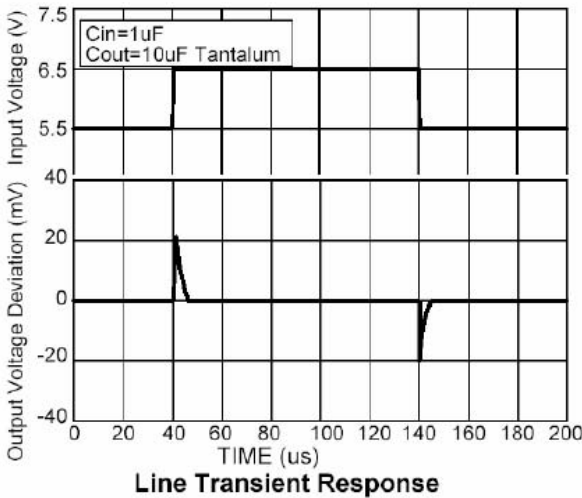
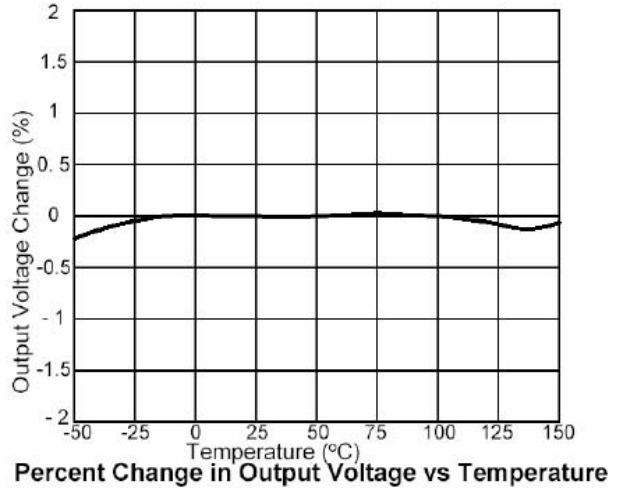
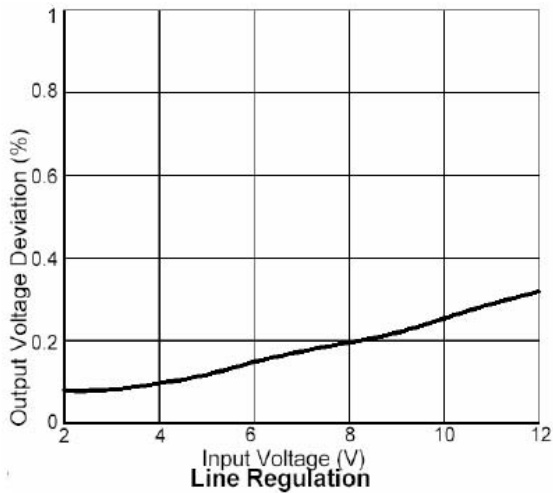
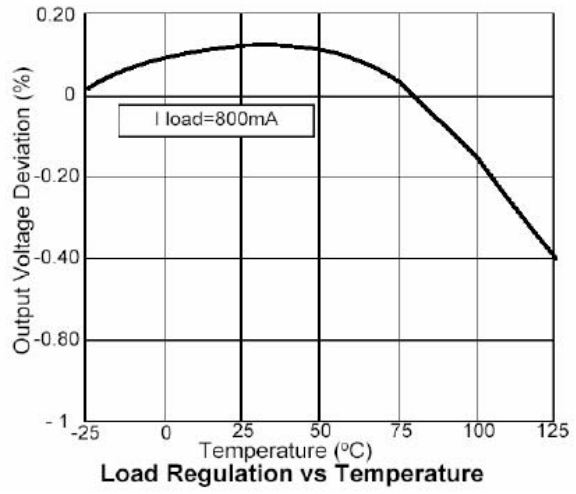
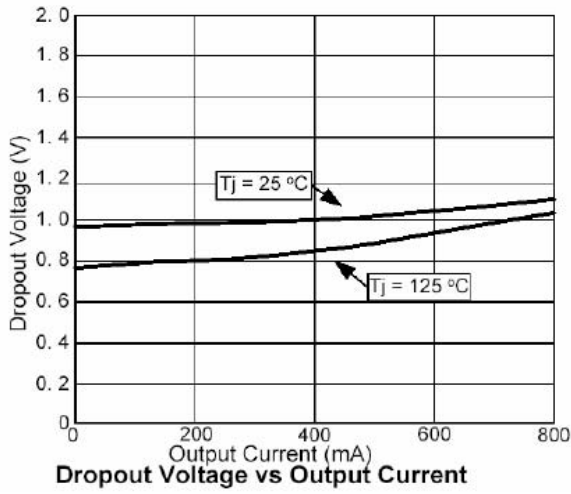


Electrical Characteristics @ $I_o=10mA, T_J=25^{\circ}C$, unless otherwise specified

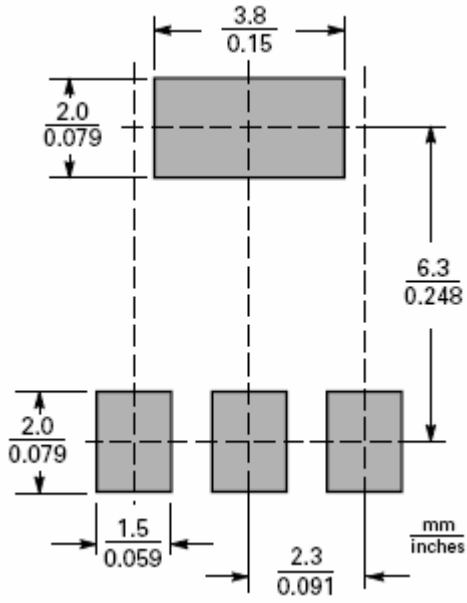
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Output Voltage	V_o	$6.5V \leq V_{IN} \leq 15V, 0mA \leq I_o \leq 1A$	4.900	5.000	5.100	V
Line Regulation	ΔV_o	$6.5V \leq V_{IN} \leq 15V$	-	-	0.2	%
Load Regulation (Note 1, 2)	ΔV_o	$V_{IN}=6.5V, 10mA \leq I_o \leq 1A$	-	10	20	mV
Dropout Voltage ($V_{IN}-V_{OUT}$)	V_D	$I_o=1A (\Delta V_{OUT}=1\%V_{OUT})$	-	1.2	1.4	V
Current Limit	I_{max}	$V_{IN}=6.5V$	1	1.5	2	A
Quiescent Current	I_Q	$V_{IN}=6.5V, 10mA \leq I_o \leq 1A$	-	3.5	10	mA
Ripple Rejection	RR	$f=120Hz, V_{IN}=7.5V, I_o=1A$	60	-	-	dB
Temperature Coefficient of Output Voltage	TCV_o	$V_{IN}=6.5V, I_o=10mA$	-	-	0.015	$\%/^{\circ}C$
Thermal Resistance, Junction to Ambient (No heat sink, no air flow)	θ_{JA}		-	117	-	$^{\circ}C/W$
Thermal Resistance, Junction to Case	θ_{JC}	Control Circuitry/ Power transistor	-	15	-	$^{\circ}C/W$

Note : 1. See thermal regulation specifications for changes in output voltage due to heating effects. Line and load regulation are measured at a constant junction temperature by low duty cycle pulse testing. Load regulation is measured at the output lead 1/18" from the package.
2. Line and load regulation are guaranteed up to the maximum power dissipation of 3W. Power dissipation is determined by the difference in input and output and the output current. Guaranteed maximum power dissipation will not be available over the full input/output range.

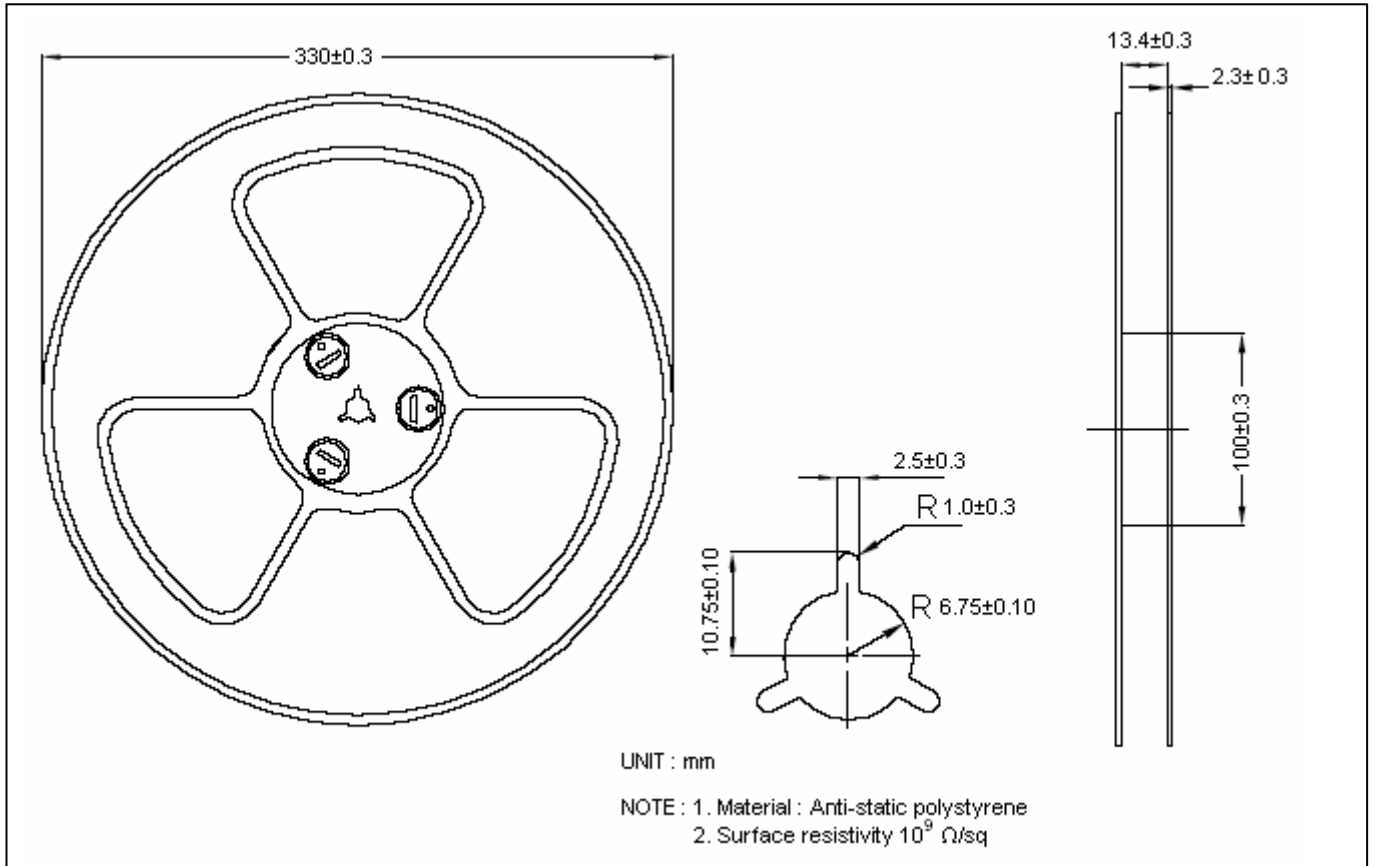
Characteristic Curves



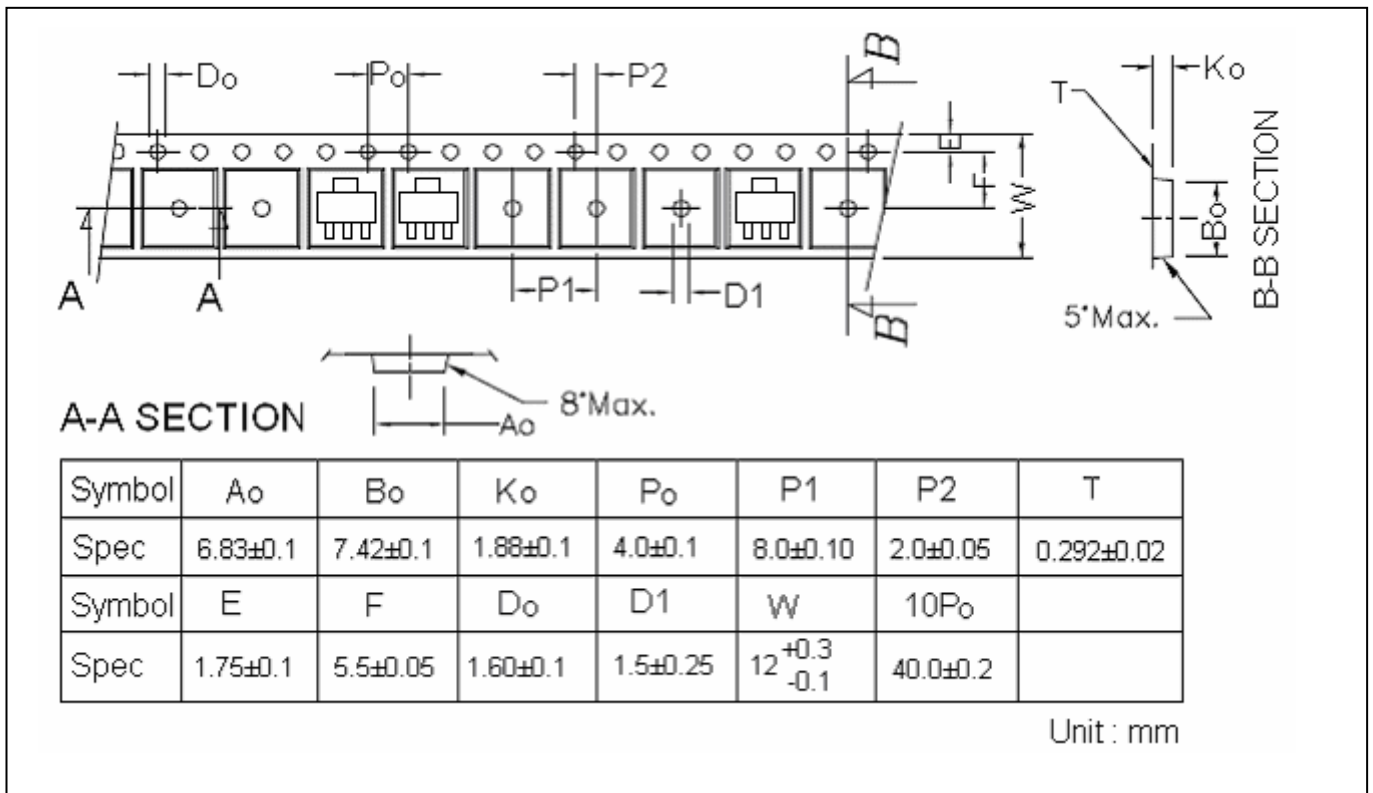
Recommended soldering footprint



Reel Dimension



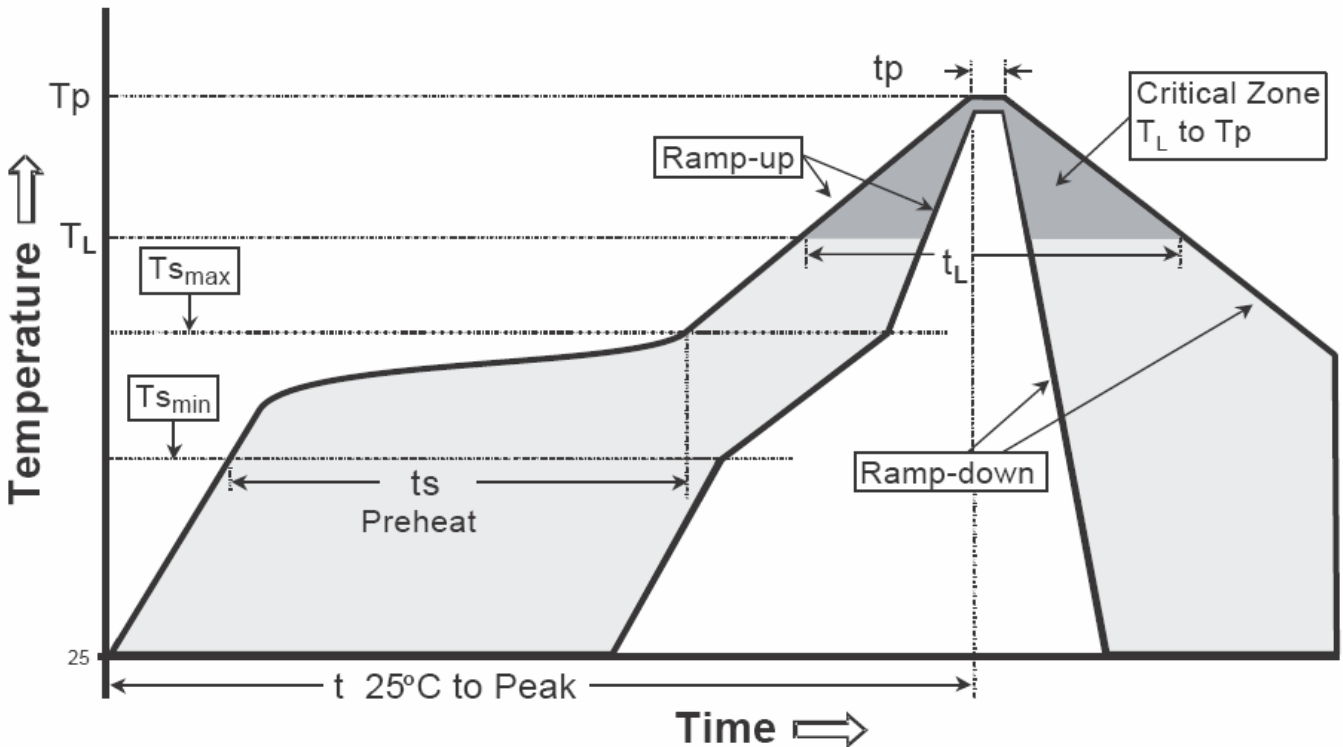
Carrier Tape Dimension



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 _{smax} to T _p)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T _{s min})	100°C	150°C
-Temperature Max(T _{s max})	150°C	200°C
-Time(t _{s min} to t _{s max})	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T _L)	183°C	217°C
- Time (t _L)	60-150 seconds	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

Marking:

Device Name: 78M05L

Date Code : (from left to right)
 1st code : year code, 1→2011, 2→2012, ...,etc.
 2nd code : month code, referring to the following table
 3rd and 4th codes : production lot serial number , 01, 02, 03, ... etc

Month code :

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	A	B	C	D	E	F	G	H	J	K	L	M

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.

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