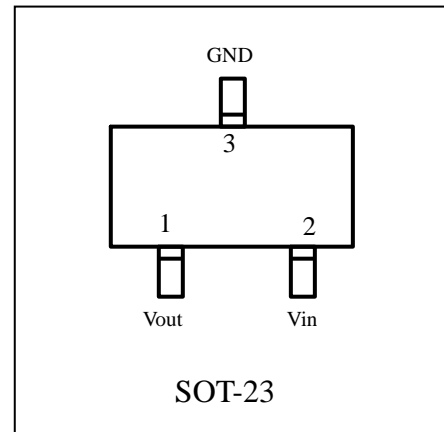


**Low Current Positive Voltage Regulator**

# LM7605N3



**Description**

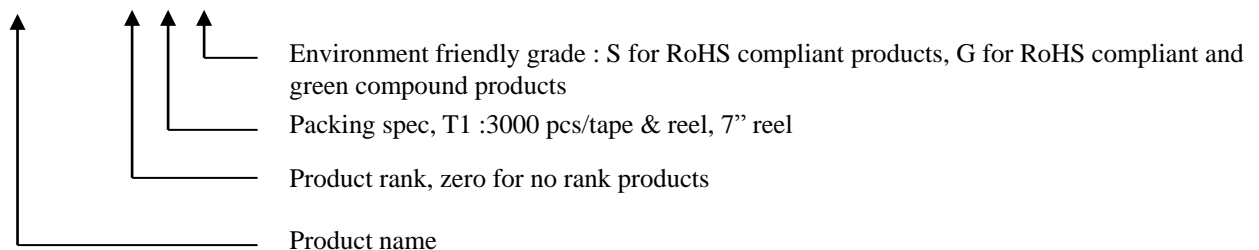
The LM7605N3 is positive regulators available in the SOT-23 package. This regulator can provide local on-card regulation, eliminating the distribution problems associated with single point regulation. It employs internal current limiting, thermal shut-down and safe operating area protection, making it essentially indestructible. If adequate heat sinking is provided, it can deliver over 100mA output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents. LM7605N3 is characterized for operation from 0°C to 125°C.

**Features:**

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

**Ordering Information**

Device	Package	Shipping
LM7605N3-X-T1-G	SOT-23 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel





### Absolute Maximum Ratings

Parameter	Ratings	Unit
Input Voltage	30	V
Output Current (Note 1)	200	mA
Continuous Output Current @ $V_{IN}=12V$ (Note 2)	42.8	mA
Continuous Output Current @ $V_{IN}=12V$ (Note 3)	179	mA
Operating Junction Temperature Range	-40 ~ +150	°C
Storage Temperature Range	-65 ~ +150	°C
Power Dissipation (Note 2)	300	mW
Power Dissipation (Note 3)	1.25	W

### Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient, max (Note 2)	R <sub>θJA</sub>	417	°C/W
Thermal Resistance, Junction-to-Ambient, max (Note 3)		100	°C/W

- Note : 1. Pulse time  $\leq 300\mu s$   
 2. When tested in free air condition, without heat sinking.  
 3. Surface mounted on 1 in<sup>2</sup> copper pad of FR-4 board,  $t \leq 5s$

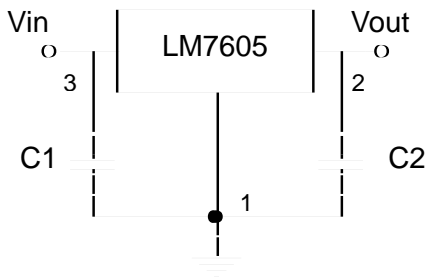
### Electrical Characteristics

( $V_{in}=10V$ ,  $I_o=80mA$ ,  $T_j=25^\circ C$ ,  $C_{in}=0.33\mu F$ ,  $C_{out}=0.1\mu F$ , unless otherwise noted) (Note 1)

Symbol	Parameter	Min	Typ	Max	Conditions	Units
V <sub>o</sub>	Output Voltage	4.85	5	5.15	$V_{in}=10V$ , $I_o=80mA$ , $T_j=25^\circ C$ $7V \leq V_{in} \leq 20V$ , $1mA \leq I_o \leq 80mA$	V
		4.75	-	5.25	$V_{in}=10V$ , $1mA \leq I_o \leq 140mA$ (Note 2)	
$\Delta V_o$	Line Regulation	-	32	150	$7V \leq V_{in} \leq 20V$	mV
		-	26	100	$8V \leq V_{in} \leq 20V$	
$\Delta V_o$	Load Regulation	-	15	60	$1mA \leq I_o \leq 200mA$	mV
		-	8	30	$1mA \leq I_o \leq 80mA$	
I <sub>Q</sub>	Quiescent Current	-	2.6	6	$T_j=25^\circ C$ , $V_{in}=10V$ , $I_o=80mA$	mA
$\Delta I_Q$	Quiescent Current Change	-	-	1.5	$8V \leq V_{in} \leq 20V$	mA
		-	-	0.1	$1mA \leq I_o \leq 80mA$	
V <sub>n</sub>	Output Noise Voltage	-	42	-	$10Hz \leq f \leq 100KHz$	$\mu V$
$\Delta V_{in} / \Delta V_{out}$	Ripple Rejection	41	49	-	$8V \leq V_{in} \leq 18V$ , $f=120Hz$	dB
$\Delta V_o / \Delta T_j$	Temperature Stability	-	-0.65	-	$I_o=5mA$ , $0^\circ C \leq T_j \leq 125^\circ C$	mV/°C
VD	Dropout Voltage	-	1.7	-	$I_o=80mA$	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 specified at the initial of test.  
 2. Power dissipation < 0.24W

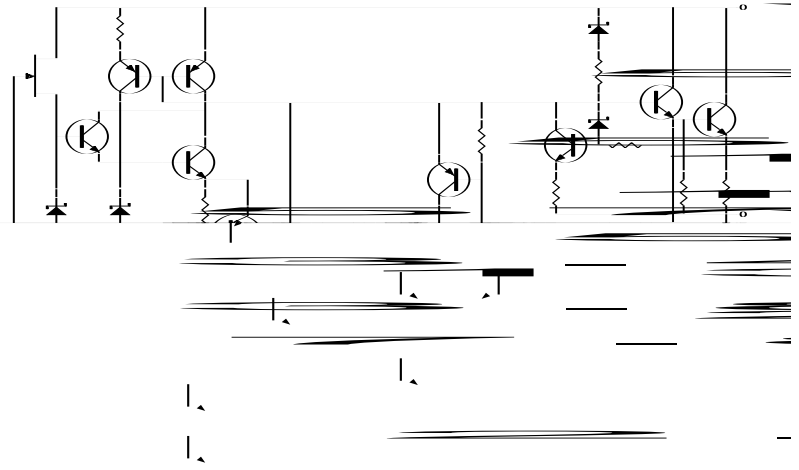
**Typical Application**



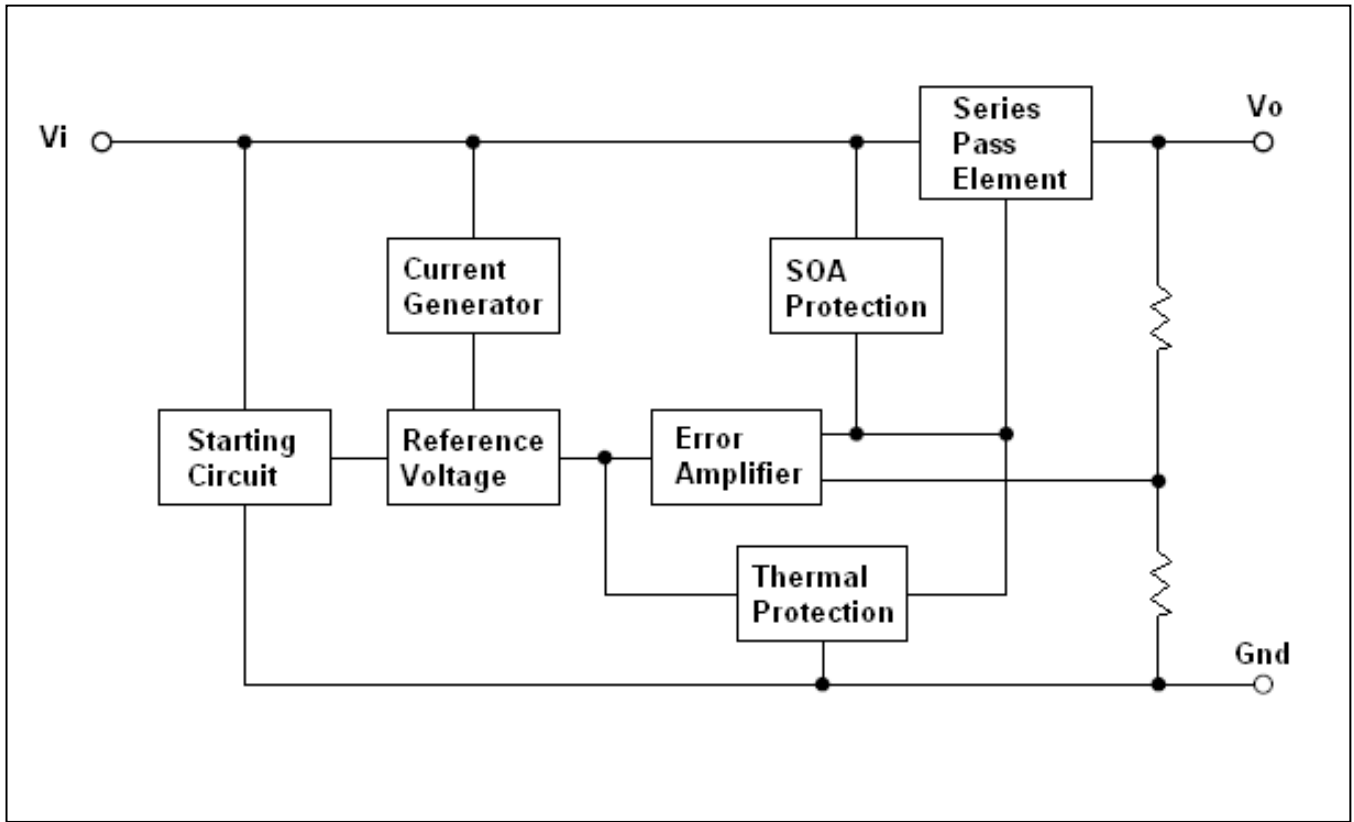
A common ground is required between the input and the output voltages. The input voltage must remain typically 2.0V above the output voltage even during the low point on the input ripple voltage.

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

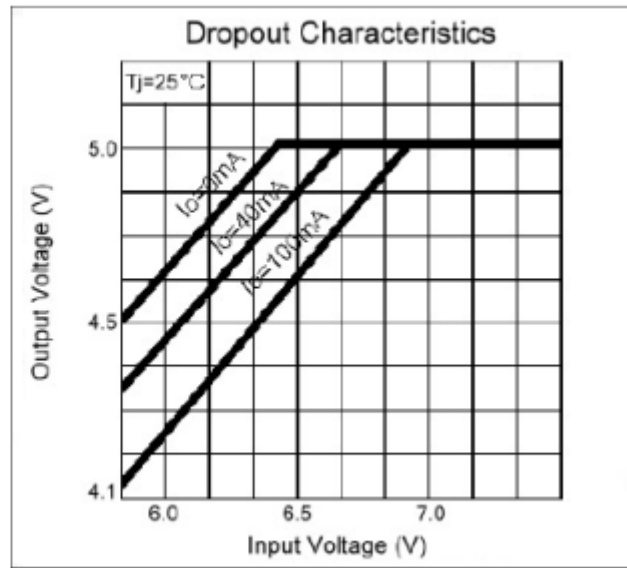
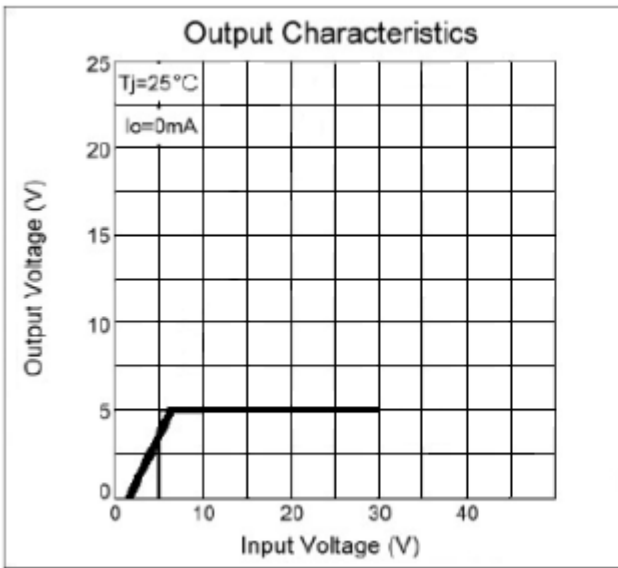
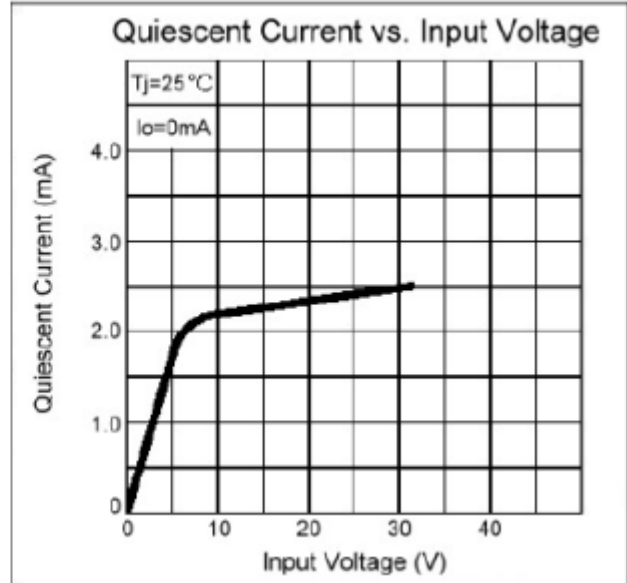
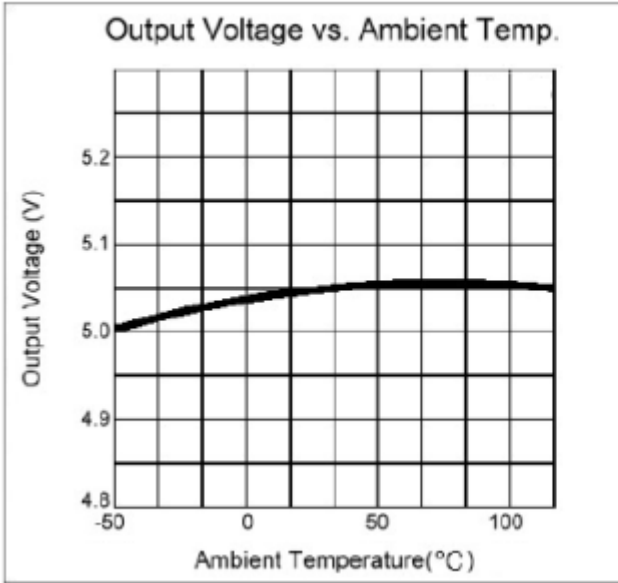
**Schematic Diagram**



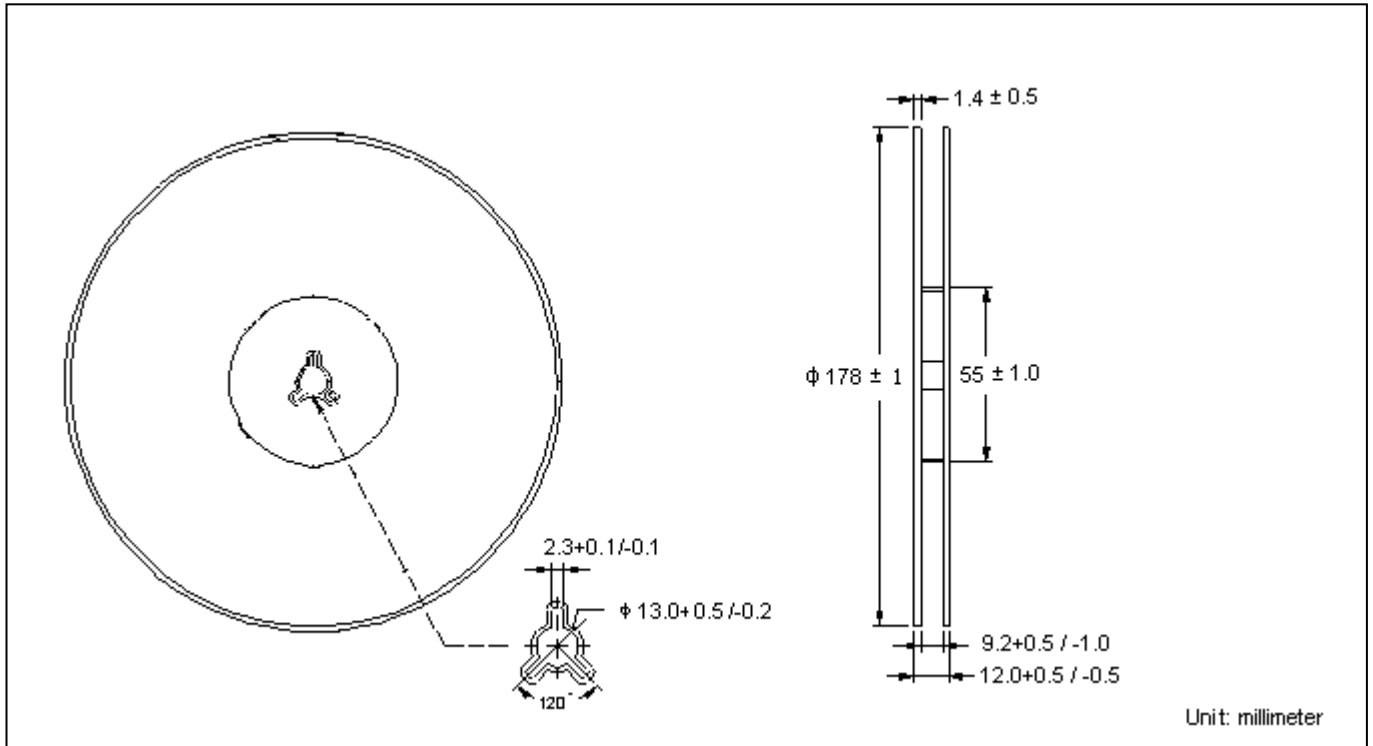
### Block Diagram



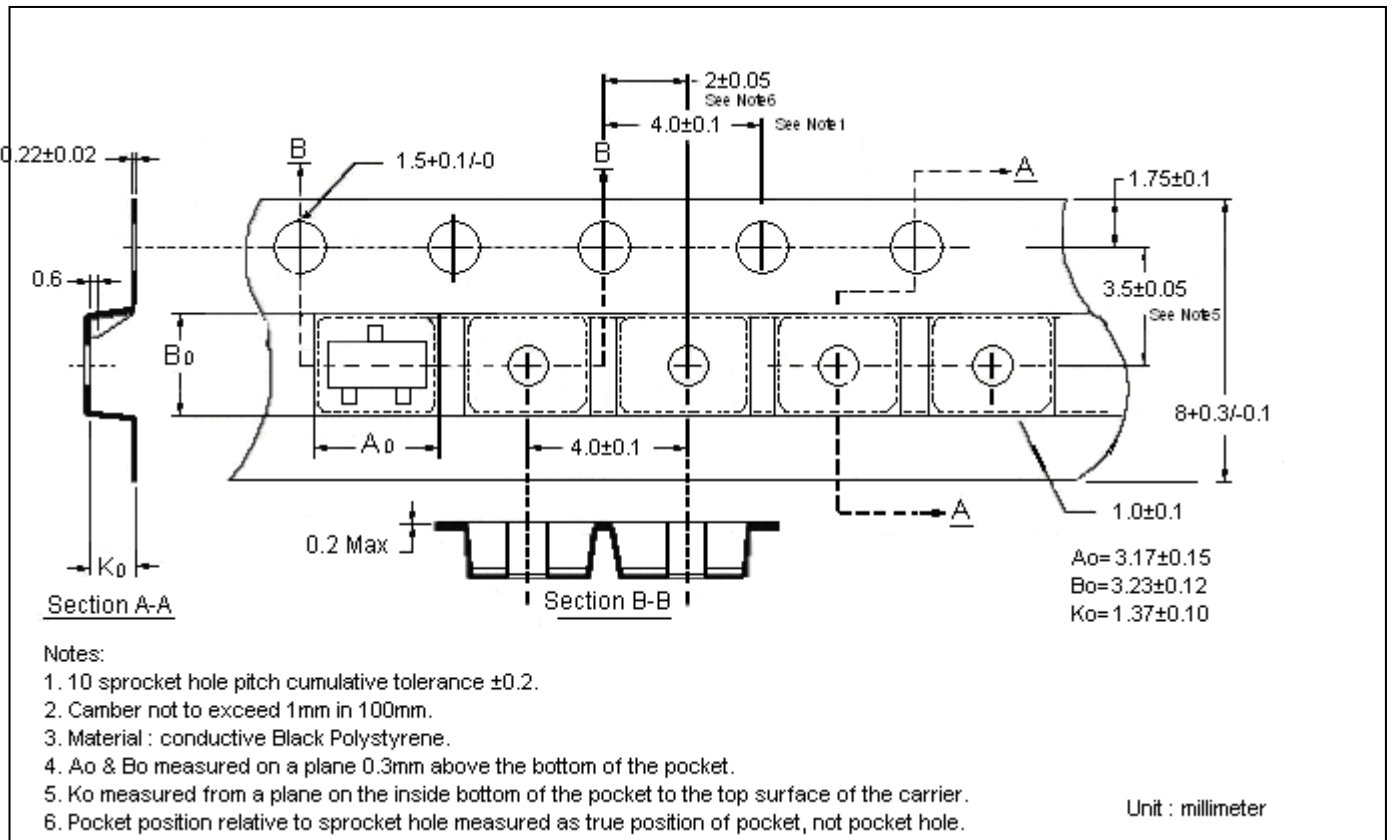
**Typical Characteristics**



**SOT-23 Reel Dimension**



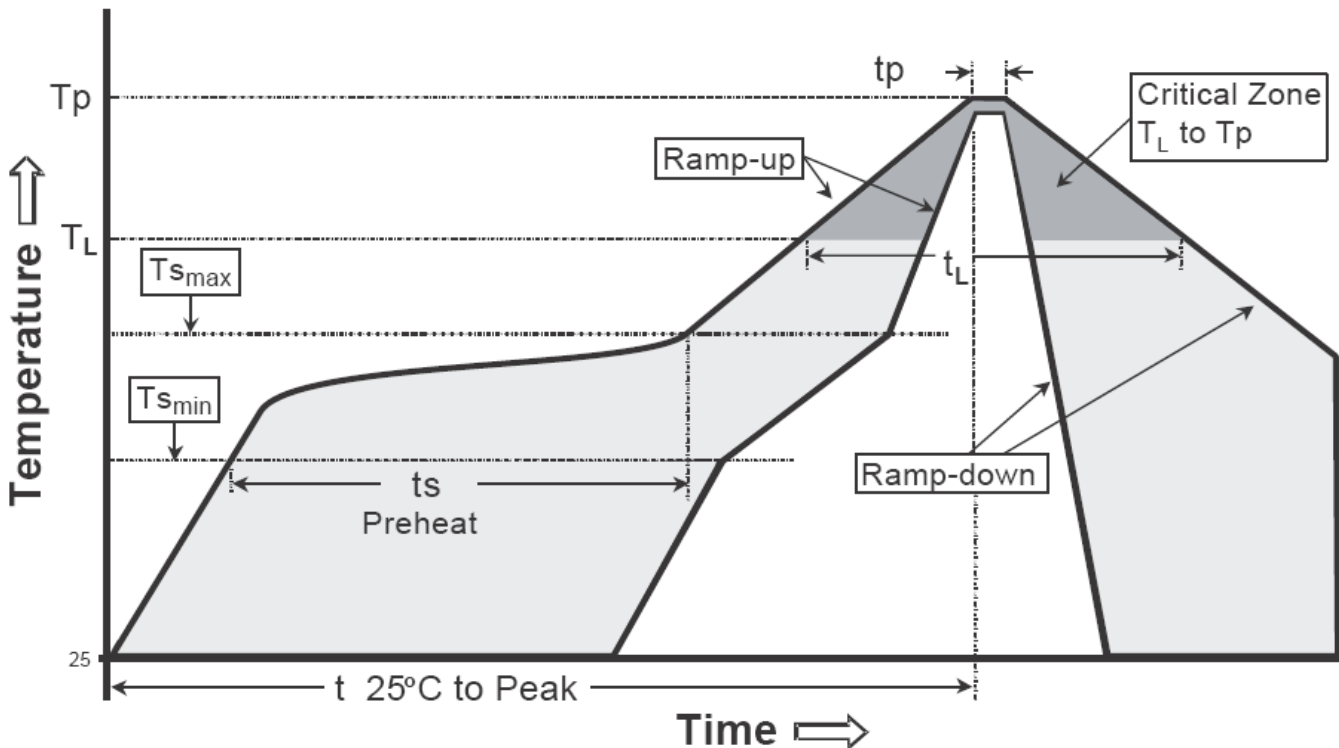
**Carrier Tape Dimension**



**Recommended wave soldering condition**

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

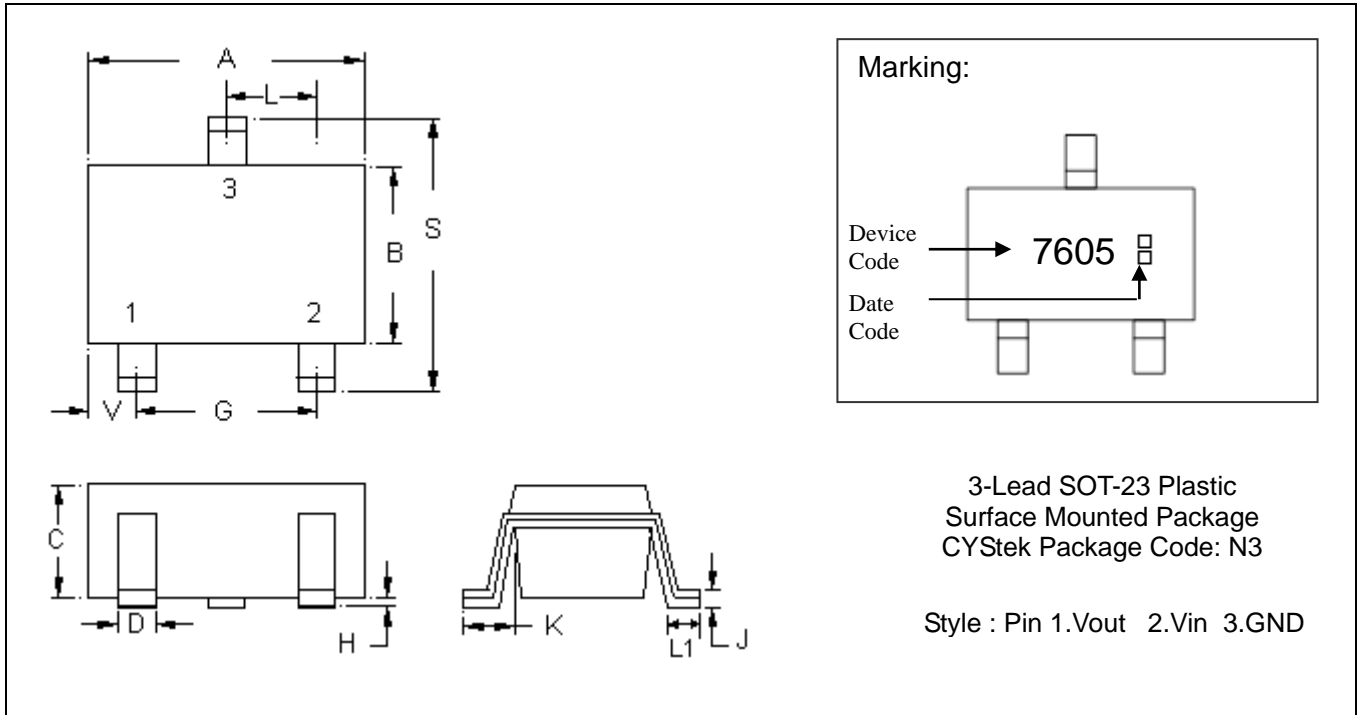
**Recommended temperature profile for IR reflow**



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.

**SOT-23 Dimension**



**Marking:**

Device Code → 7605  
 Date Code →

3-Lead SOT-23 Plastic Surface Mounted Package  
 CYStek Package Code: N3

Style : Pin 1.Vout 2.Vin 3.GND

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1102	0.1204	2.80	3.04	J	0.0032	0.0079	0.08	0.20
B	0.0472	0.0669	1.20	1.70	K	0.0118	0.0266	0.30	0.67
C	0.0335	0.0512	0.89	1.30	L	0.0335	0.0453	0.85	1.15
D	0.0118	0.0197	0.30	0.50	S	0.0830	0.1161	2.10	2.95
G	0.0669	0.0910	1.70	2.30	V	0.0098	0.0256	0.25	0.65
H	0.0000	0.0040	0.00	0.10	L1	0.0118	0.0197	0.30	0.50

**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 : Tin plated.
- Mold Compound : Epoxy resin family, flammability solid burning class:UL94V-0.

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