



# 1.5µA IQ, 500mA Adjustable Low-Dropout Voltage Linear Regulator ICR0605N5

## General Description

The ICR0605N5 ultra-low quiescent current regulator features low dropout voltage and low current in the standby mode. With less than 1.5µA quiescent current at no load, the ICR0605N5 is ideally suited for standby micro-control-unit systems, especially for always-on applications like portable, and other battery-operated systems. The ICR0605N5 retains all the features that are common to low dropout regulators including a low dropout PMOS pass device, short circuit protection, and thermal shutdown.

The ICR0605N5 has a 6V maximum operating voltage limit, a -40 °C to 125 °C operating temperature range, and ±2% output voltage tolerance. The ICR0605N5 is available in SOT-23-5L package.

## Features

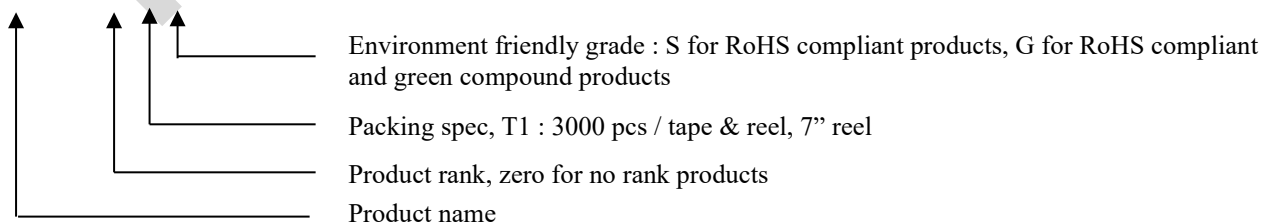
- Output Current of 500mA
- Output Voltage Tolerances of ±2%
- VIN range up to 6V
- Internal Short-Circuit Current Limit
- RoHS compliant, Pb-free package
- Dropout voltage : 800mV typ.@IOUT=500mA
- Ultra Low Quiescent Current : IQ=1.5µA typ.
- Internal Thermal Overload Protection
- Ceramic Capacitor Stable

## Applications

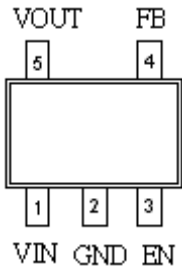
- Portable, Battery powered Equipment
- Ultra Low Power Microcontroller
- Notebook Computers

## Ordering Information

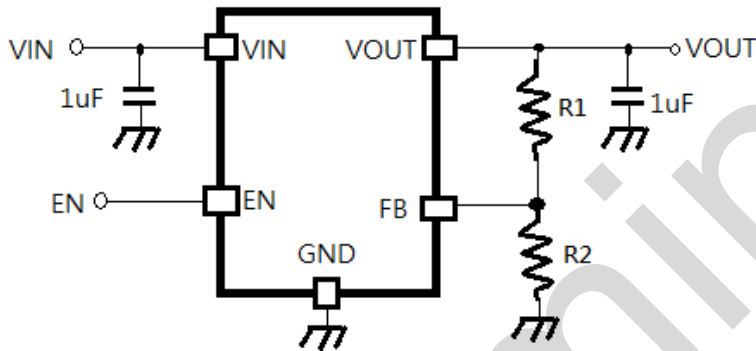
Part Number	Output Voltage	Marking	Package	Shipping
ICR0605N5-0-T1-G	Adjustable	0605	SOT-23-5L (RoHS compliant package)	3000 pcs / Tape & Reel



### Pin Configuration



### Typical Application Circuit



**Ceramic Capacitor Stable**

Vout	R1	R2
3.3	1162K	330K
3.0	1026K	330K
2.5	800K	330K
1.8	484K	330K

### Pin Assignment

Pin Name	Pin No.	Pin Function
VIN	1	Power Input
GND	2	Ground.
EN	3	ON/OFF Enable
FB	4	Feedback
VOUT	5	Output

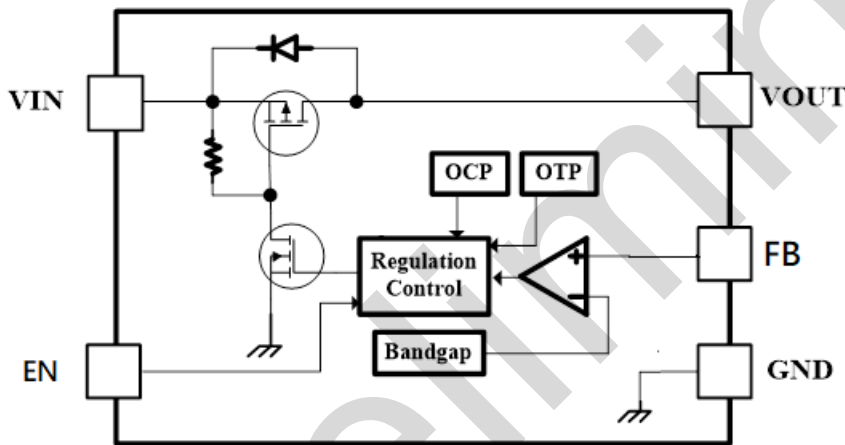
**Absolute Maximum Ratings**

Parameter	Symbol	Ratings	Units
Input Voltage	V <sub>IN</sub>	-0.3~+6.5	V
Junction Temperature	T <sub>j</sub>	150	°C
Lead Temperature(Soldering, 10 sec)	T <sub>s</sub>	300	°C
Continuous Total Power Dissipation	P <sub>D</sub>	250	mW
Storage Temperature Range	T <sub>stg</sub>	-65~+150	°C

**Recommended Operating Condition**

Parameter	Symbol	Ratings	Units
Input Voltage	V <sub>IN</sub>	+2.5~+5.5	V
Operating Junction Temperature Range	T <sub>j</sub>	-40~+125	°C

**Function Block Diagram**





### Electrical Characteristics

@  $T_J=25^{\circ}\text{C}$ ,  $V_{IN}=V_{EN}=V_{OUT}+1\text{V}$ ,  $I_{OUT}=1\text{mA}$ ,  $C_{IN}=C_{OUT}=1\mu\text{F}$ , unless otherwise specified

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Feedback Voltage Accuracy	$V_{FB}$		0.715	0.73	0.745	mV
Line Regulation	$\Delta V_{Line}$	$V_{IN}=V_{OUT}+1\text{V}$ to 5.5V	-	0.6	1.5	%
Load Regulation	$\Delta V_{Load}$	$I_{OUT}=1\text{mA}$ to 250mA	-	-	1	%
		$I_{OUT}=1\text{mA}$ to 500mA	-	-	3	
Dropout Voltage	$V_{DROP}$	$I_{OUT}=100\text{mA}$ , $V_{OUT}=3.3\text{V}$	-	130	-	mV
		$I_{OUT}=500\text{mA}$ , $V_{OUT}=3.3\text{V}$	-	800	-	mV
Quiescent Current	$I_Q$		-	1.5	3	$\mu\text{A}$
Current Limit	$I_{CL}$		510	610		mA
Enable High Level	$V_{ENHI}$		0.7			V
Enable Low Level	$V_{ENLO}$		-	-	0.2	V
Power Supply Rejection Ratio	PSRR	$f=1\text{kHz}$	-	60	-	dB
Thermal Shutdown	$T_{SD}$		-	150	-	$^{\circ}\text{C}$
Thermal Shutdown Hysteresis	$T_{SDHY}$		-	20	-	$^{\circ}\text{C}$

**Typical Characteristics**

Fig 1. Start Up from EN

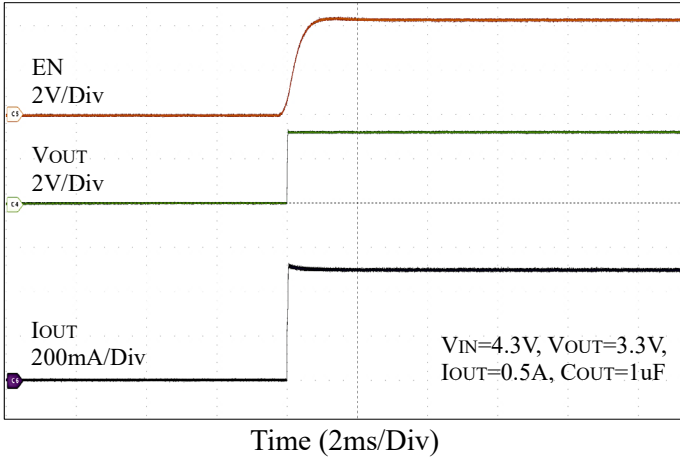


Fig 2. Start Up from VIN

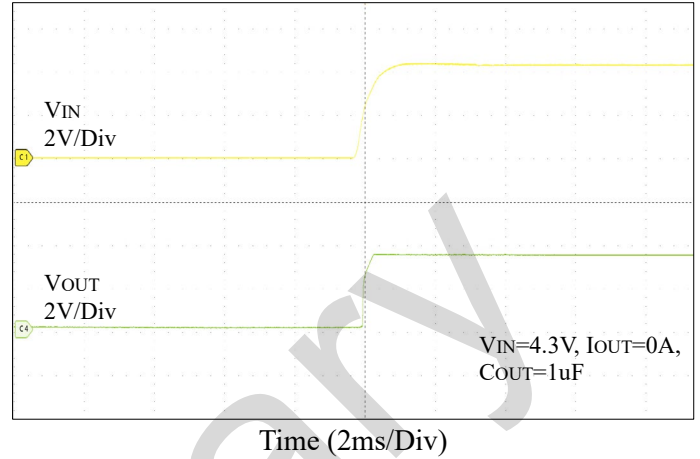


Fig 3. Load Transient

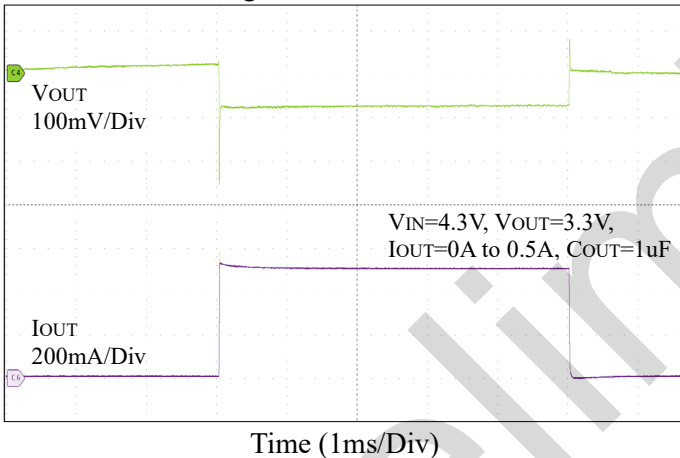


Fig 4. Heavy load OTP

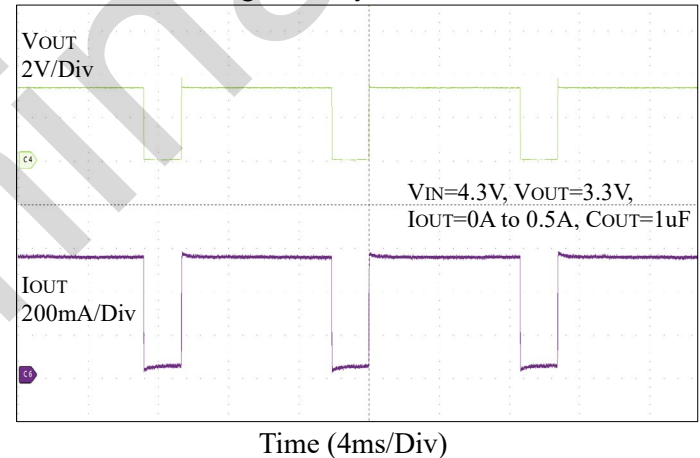


Fig 5. Vdrop vs Load Current

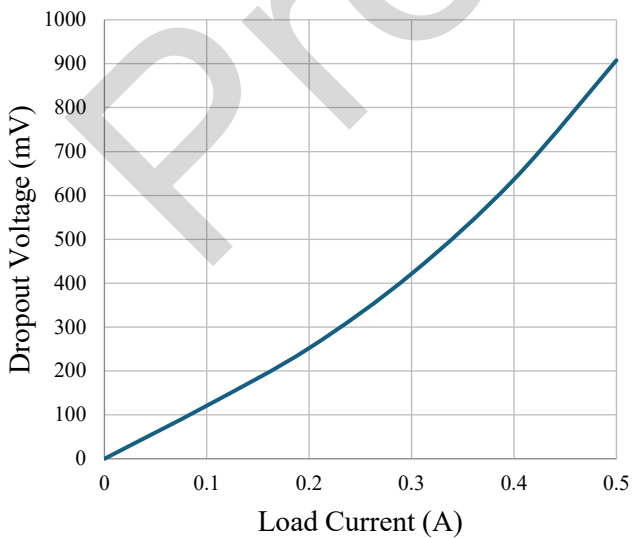
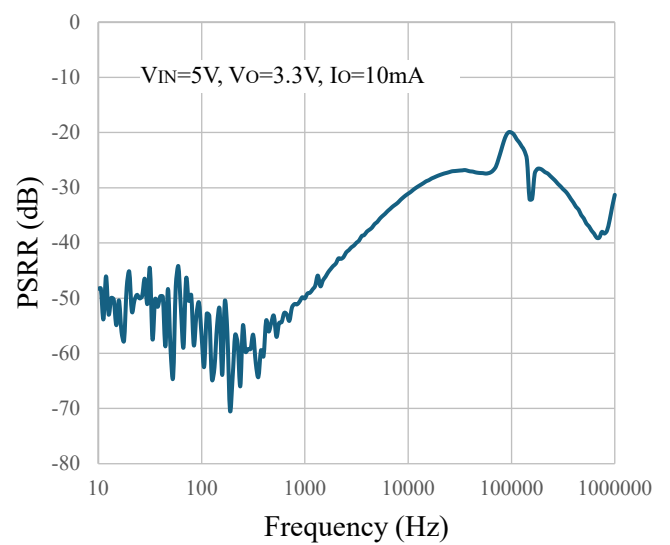
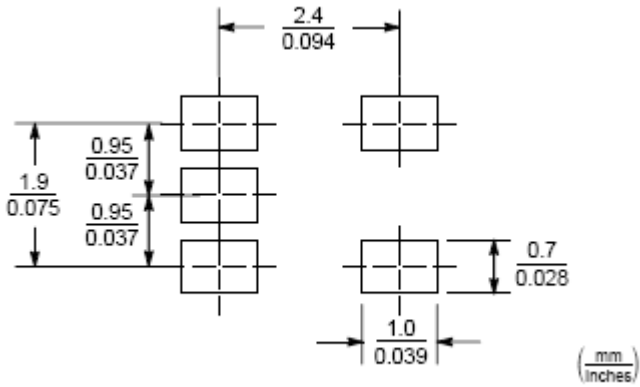


Fig 6. PSRR

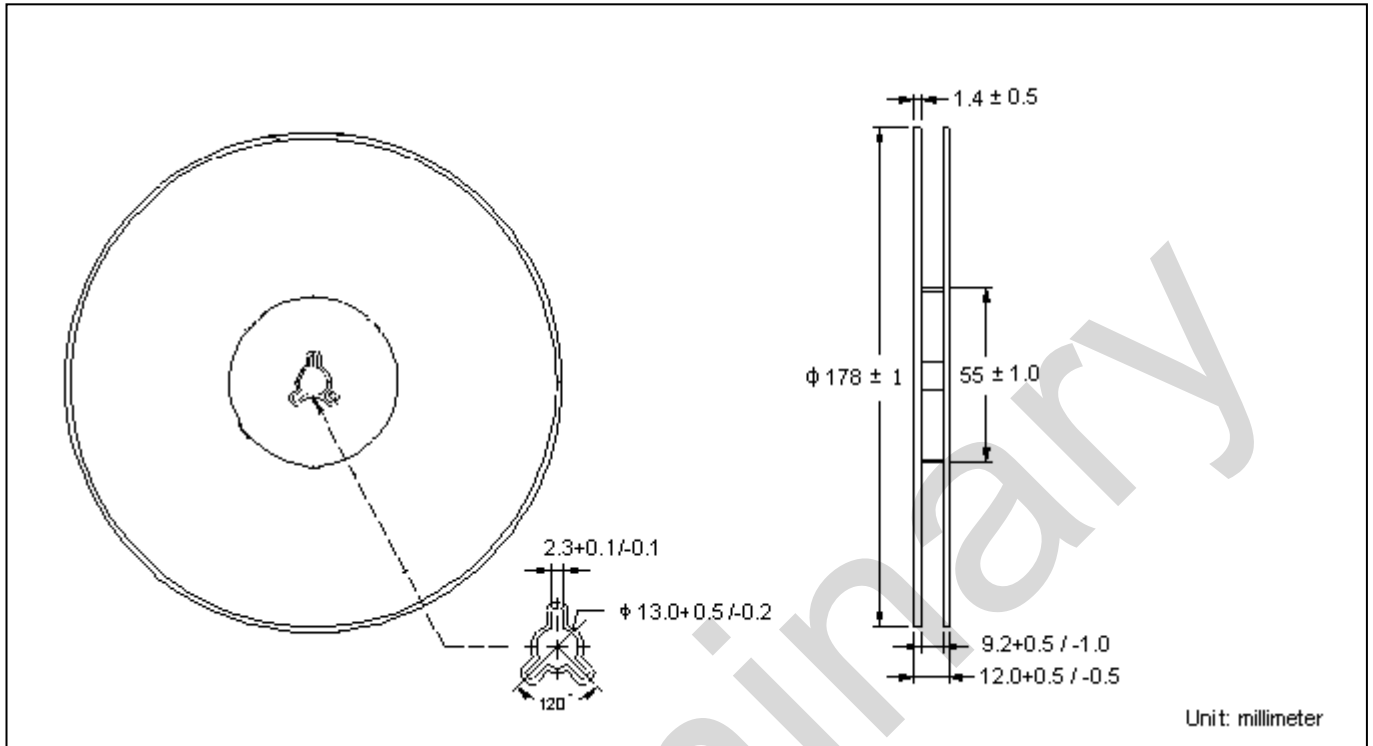


### Recommended Soldering Footprint

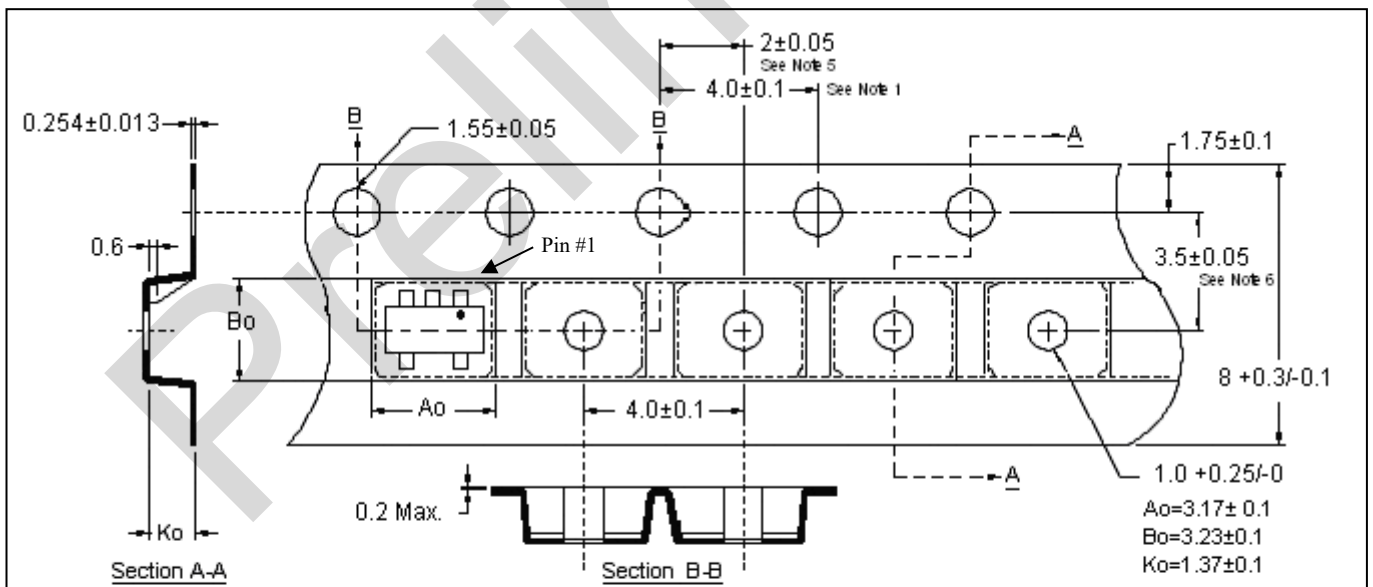


Preliminary

**Reel Dimension**



**Carrier Tape Dimension**



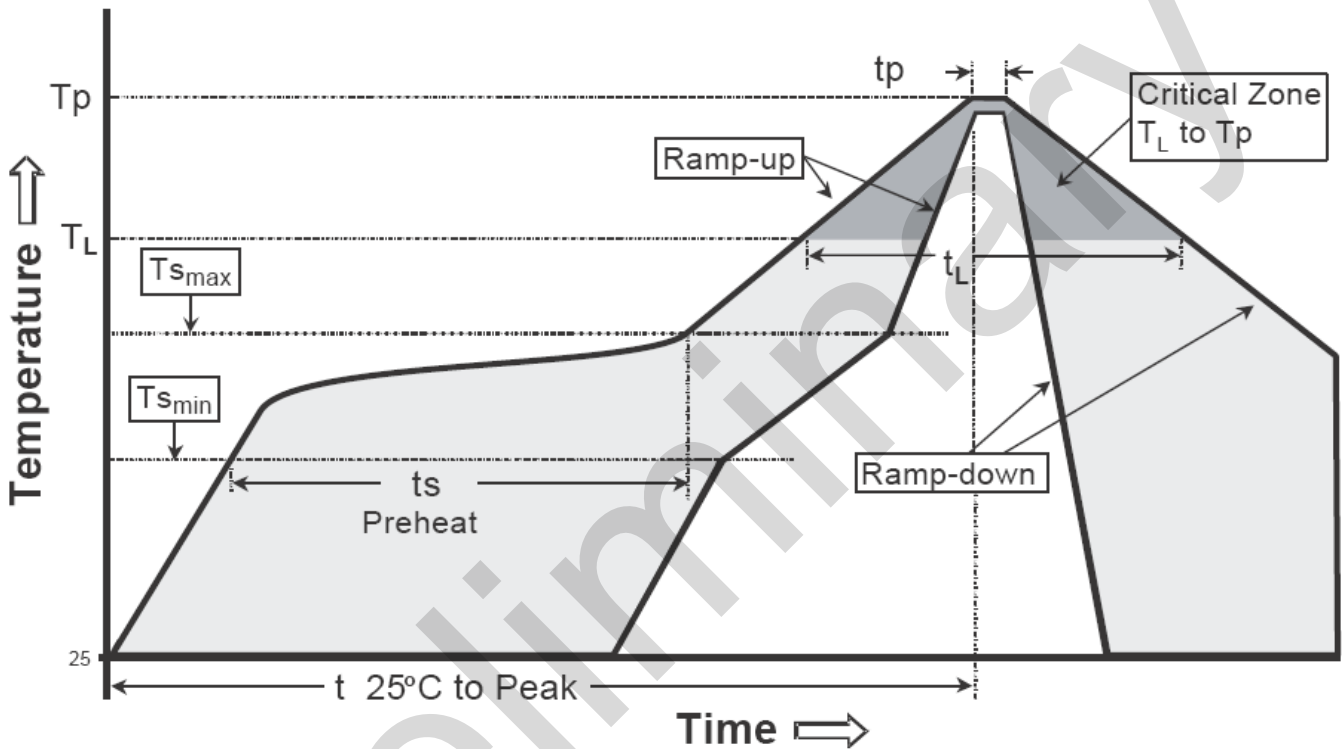
- Notes :
1. 10 sprocket hole pitch cumulative tolerance  $\pm 0.2$ .
  2. Camber not to exceed 1mm in 100mm.
  3. Material : Conductive Black Polystyrene.
  4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
  5. Ko measured from a plane on the inside bottom of the pocket to the top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

Unit : 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**

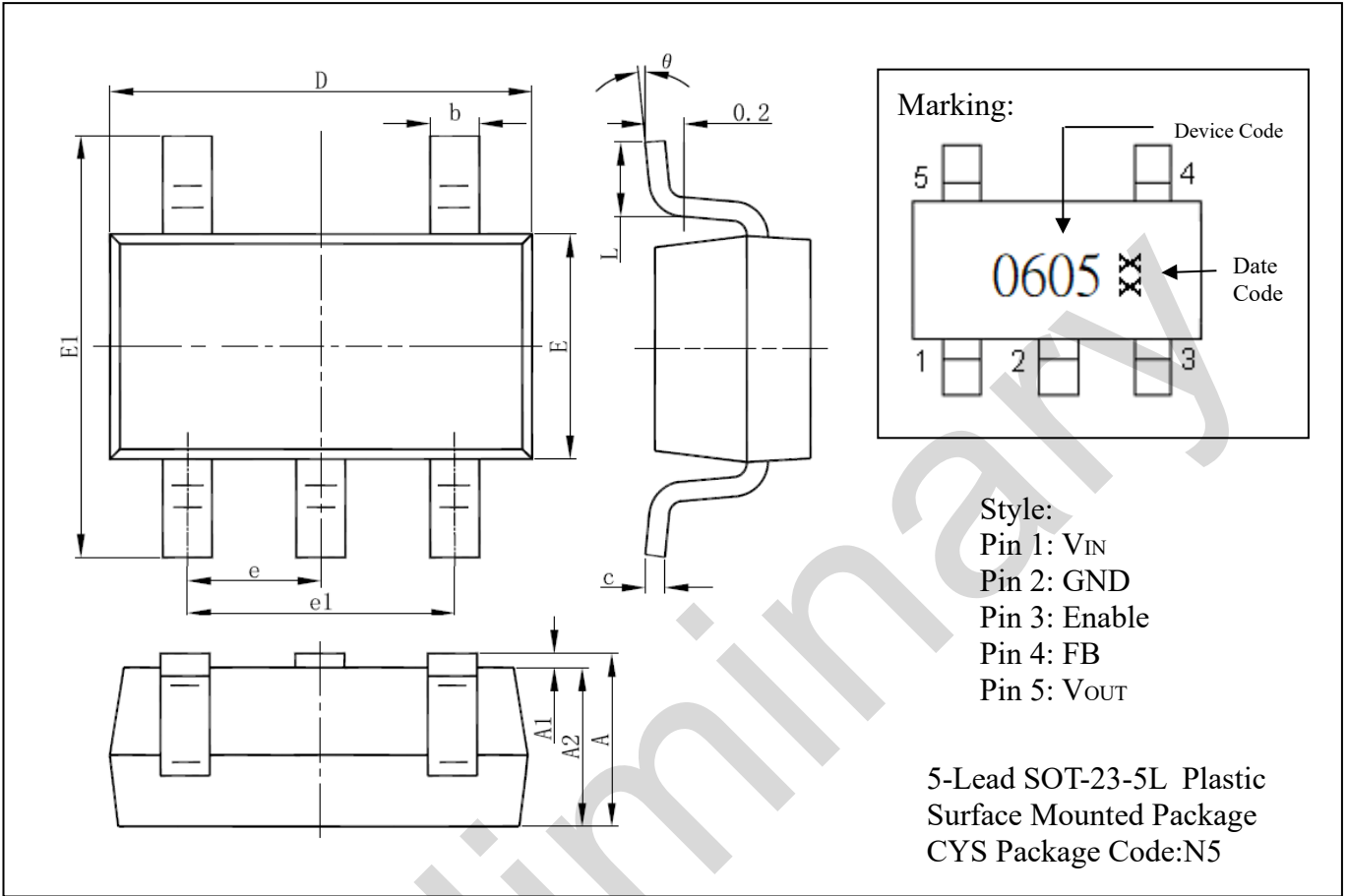


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> )	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T <sub>s min</sub> )	100°C	150°C
-Temperature Max(T <sub>s max</sub> )	150°C	200°C
-Time(t <sub>s min</sub> to t <sub>s max</sub> )	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-23-5L Dimension**



DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049	E	1.500	1.700	0.059	0.067
A1	0.000	0.100	0.000	0.004	E1	2.650	2.950	0.104	0.116
A2	1.050	1.150	0.041	0.045	e	0.950	(BSC)	0.037	(BSC)
b	0.300	0.500	0.012	0.020	e1	1.800	2.000	0.071	0.079
c	0.100	0.200	0.004	0.008	L	0.300	0.600	0.012	0.024
D	2.820	3.020	0.111	0.119	θ	0°	8°	0°	8°

**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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