300mA Low-Dropout Voltage Linear Regulator

ICR0603N5

General Description

The ICR0603N5 ultra-low quiescent current regulator series features low dropout voltage and low current in the standby mode. With less than 500nA quiescent current at no load, the ICR0603N5 is ideally suited for standby micro-control-unit systems, especially for always-on applications like portable, and other battery-operated systems. The ICR0603N5 series 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 ICR0603N5 series has a 6V maximum operating voltage limit, a -40 °C to 125 °C operating temperature range, and ±2% output voltage tolerance. The ICR0603N5 series is available in SOT-23-5L package.

Features

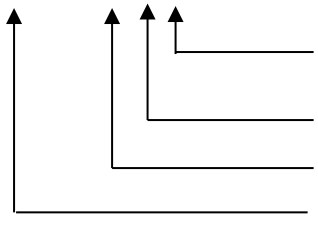
- Output Current of 300mA
- Output Voltage Tolerances of ±2%
- V_{IN} range up to 6V
- Internal Short-Circuit Current Limit
- RoHS compliant, Pb-free package
- Dropout voltage : 400mV@I_{OUT}=300mA
- Ultra Low Quiescent Current : I_Q=500nA typ.
- Internal Thermal Overload Protection
- Ceramic Capacitor Stable

Applications

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

Ordering Information

Part Number	Output Voltage	Marking	Package	Shipping
ICR0603N5-0-T1-G	3.3V	0603	SOT-23-5L (RoHS compliant package)	3000 pcs / Tape & Reel
ICR0603N5-A-T1-G	2.8V	603A		
ICR0603N5-B-T1-G	2.5V	603B		
ICR0603N5-C-T1-G	1.8V	603C		



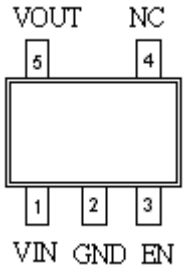
Environment friendly grade : S for RoHS compliant products, G for RoHS compliant and green compound products

Packing spec, T1 : 3000 pcs / tape & reel, 7” reel

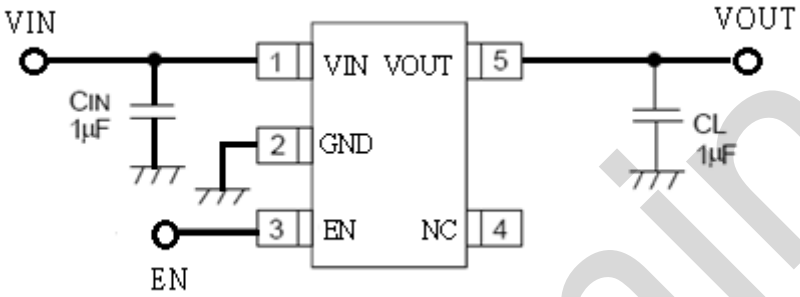
Product rank

Product name

Pin Configuration



Typical Application Circuit



Pin Assignment

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

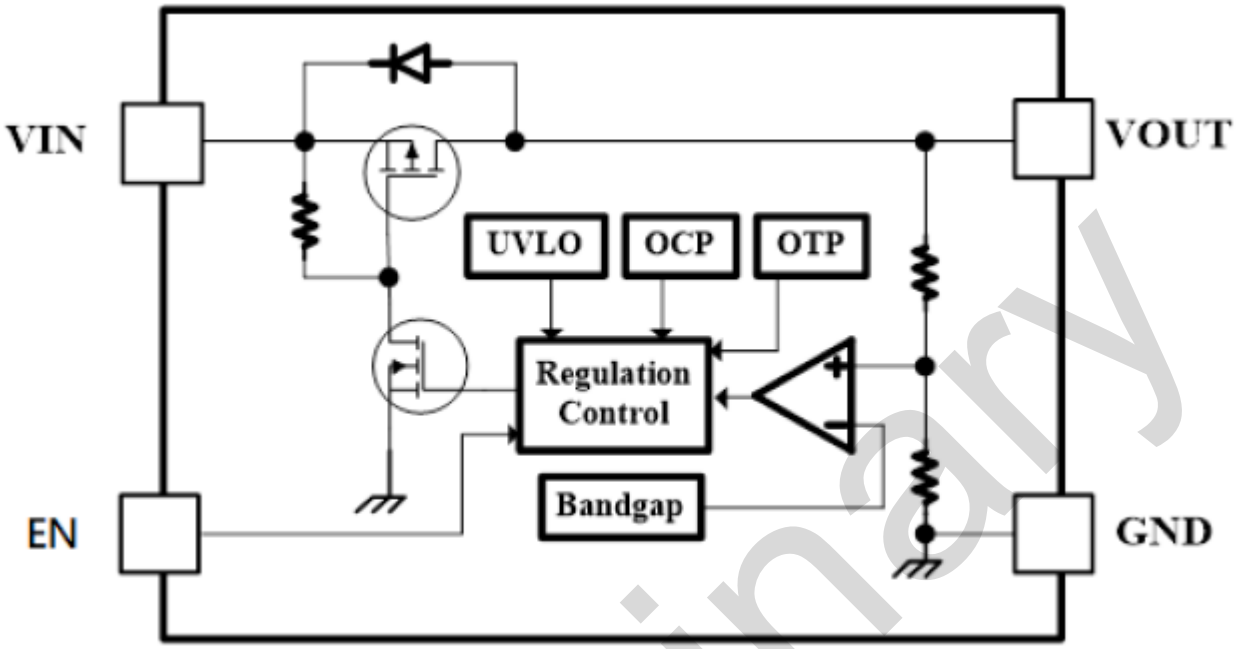
Absolute Maximum Ratings

Parameter	Symbol	Ratings	Units
Input Voltage	V_{IN}	-0.3~+6.5	V
Output Current	I_{OUT}	300	mA
Lead Temperature(Soldering, 10 sec)	Ts	300	°C
Continuous Total Power Dissipation	P_D	250	mW
Storage Temperature Range	Tstg	-65～+150	°C

Recommended Operating Condition

Parameter	Symbol	Ratings	Units
Input Voltage	V_{IN}	+2.5~+5.5	V
Junction Temperature Range	Tj	-40～+125	°C

Function Block Diagram



Electrical Characteristics

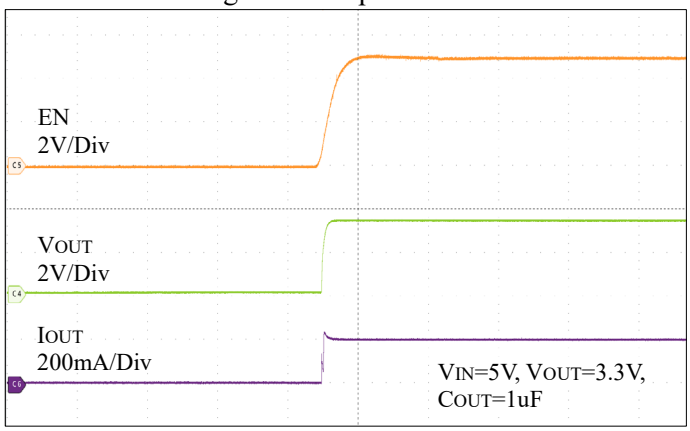
@ T_J=25°C, V_{IN}=V_{EN}=V_{OUT}+1V, I_{OUT}=1mA, C_{IN}=C_{OUT}=1μF, unless otherwise specified

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Output Voltage Accuracy	V_{OUT}		-2%	-	2%	V
Line Regulation	ΔV_{Line}	V_{IN}=V_{OUT}+1V to 5.5V	-	0.6	1.5	%
Load Regulation	ΔV_{Load}	I_{OUT}=1mA to 150mA	-	-	1	%
		I_{OUT}=1mA to 300mA	-	-	3	
Dropout Voltage	V_{DROP}	I_{OUT}=100mA, V_{OUT}=3.3V	-	130	-	mV
		I_{OUT}=300mA, V_{OUT}=3.3V	-	400	-	mV
Quiescent Current	I_Q		-	0.5	1	μA
Current Limit	I_{CL}		360	560		mA
Enable High Level	V_{ENHI}		0.6			V
Enable Low Level	V_{ENLO}		-	-	0.2	V
Thermal Shutdown	T_{SD}		-	150	-	°C
Thermal Shutdown Hysteresis	T_{SDHY}		-	20	-	°C

Typical Characteristics

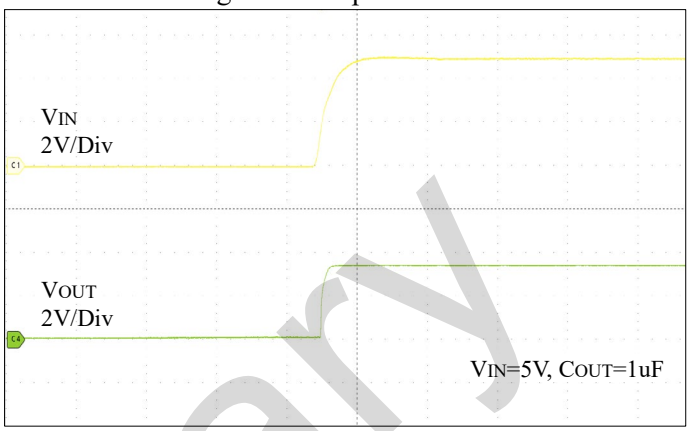
ICR0603N5 (3.3V)

Fig 1. Start Up from EN



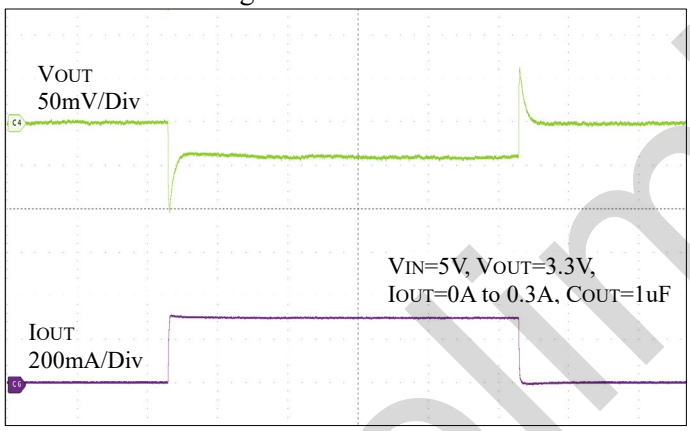
Time (2ms/Div)

Fig 2. Start Up from VIN



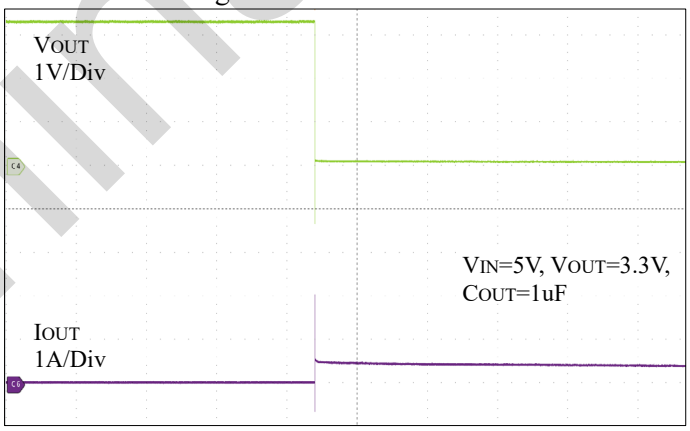
Time (2ms/Div)

Fig 3. Load Transient



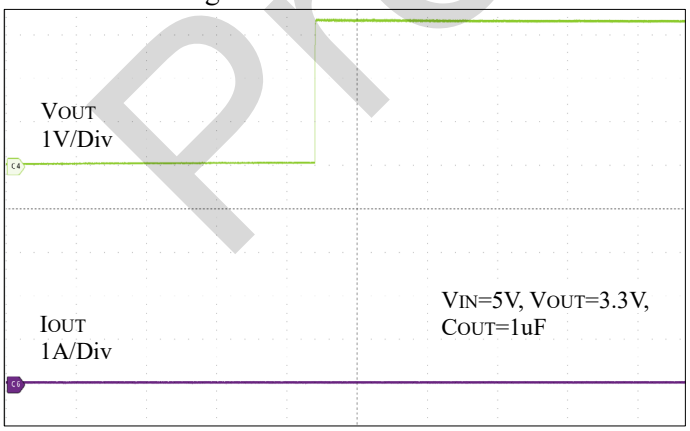
Time (1ms/Div)

Fig 4. VOUT Short-GND



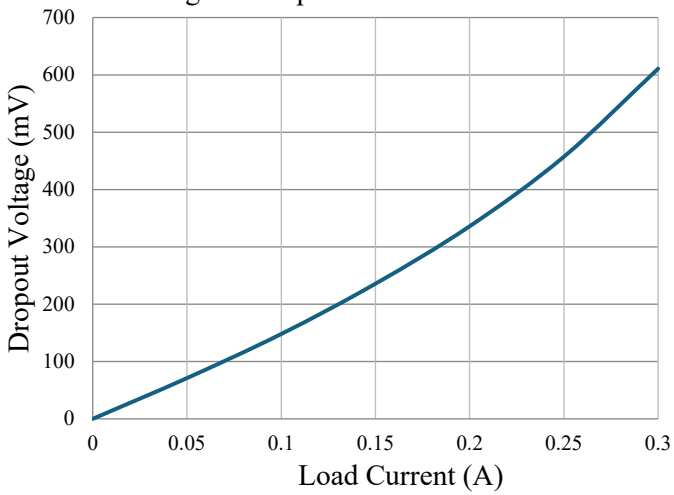
Time (20ms/Div)

Fig 5. VOUT Short-Release



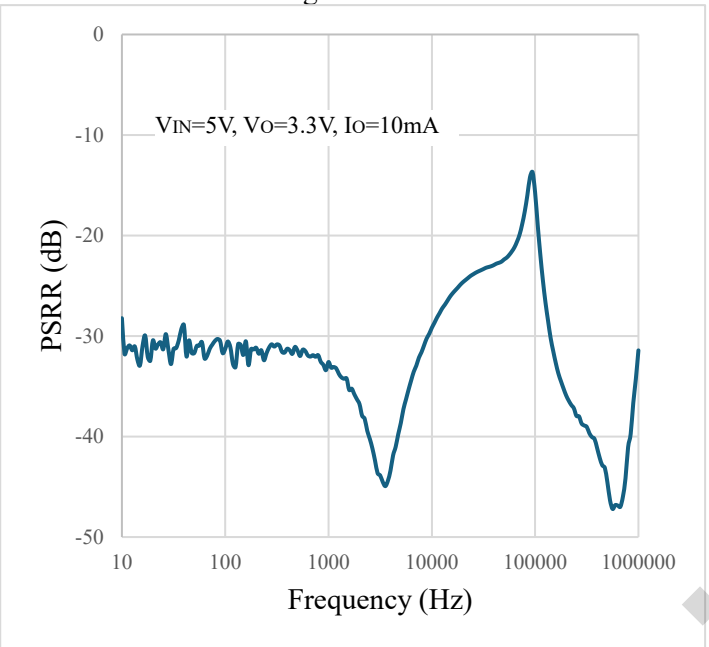
Time (20ms/Div)

Fig 6. Vdrop vs Load Current

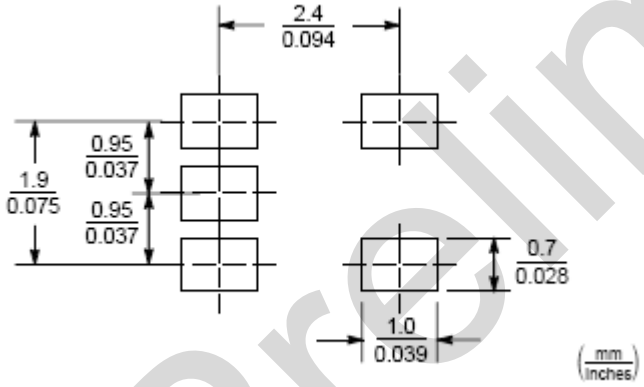


Typical Characteristics

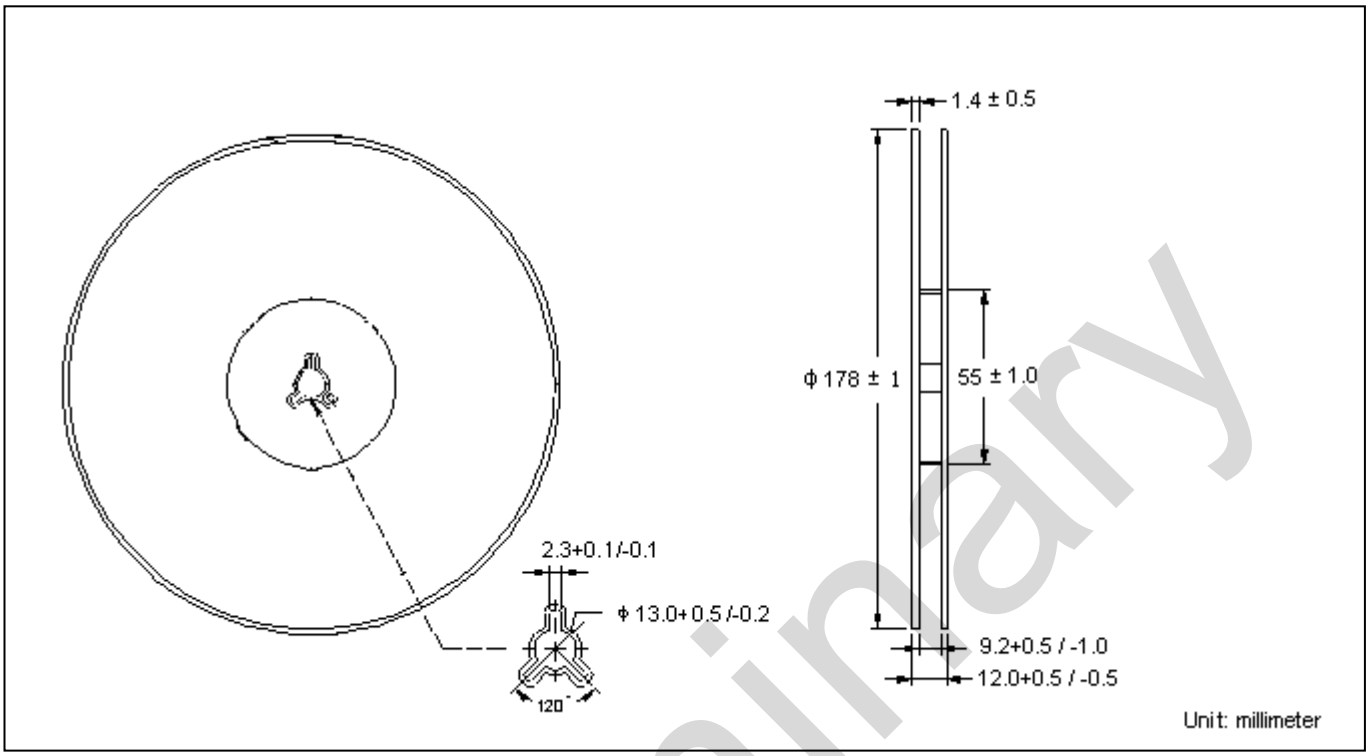
Fig 7. PSRR



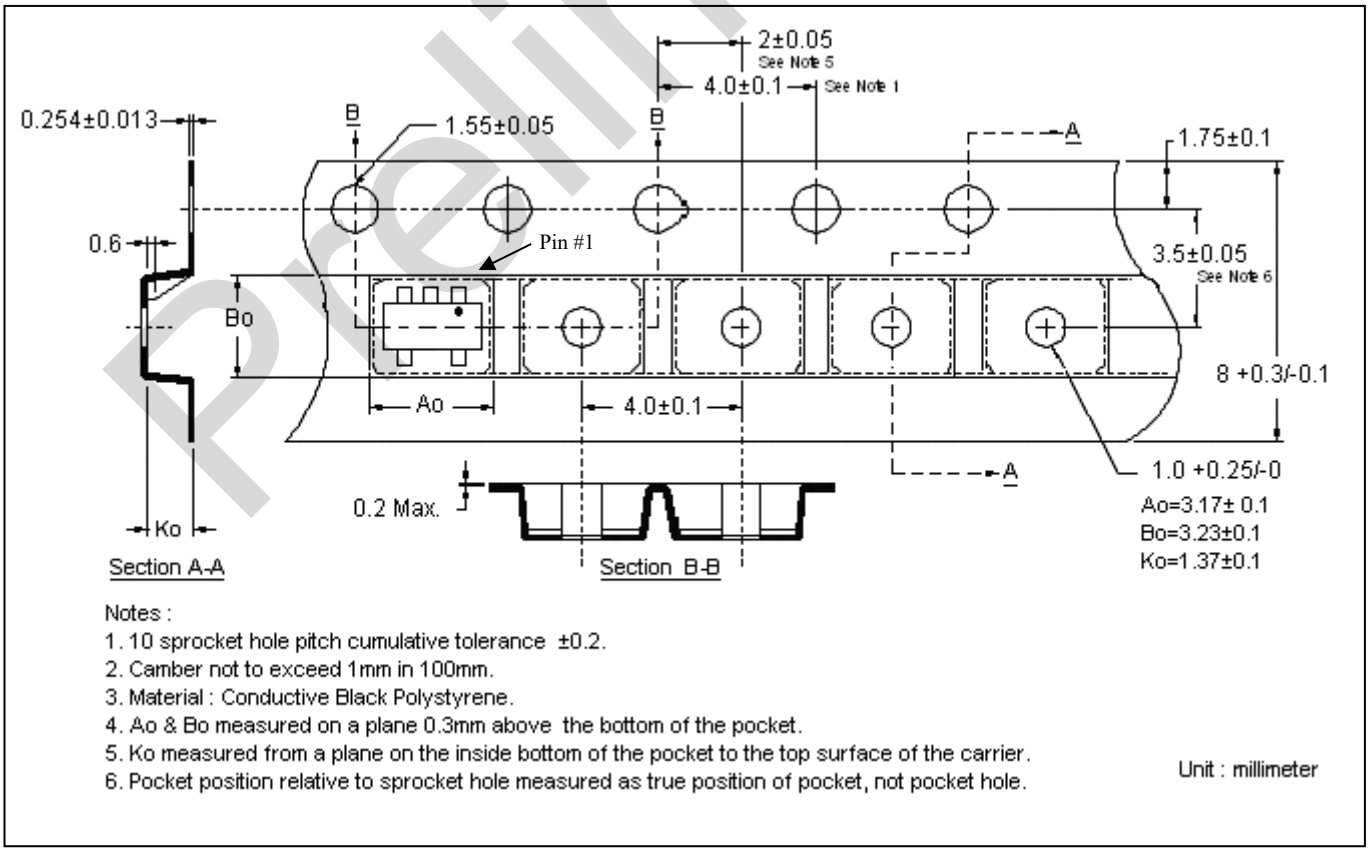
Recommended Soldering Footprint



Reel Dimension



Carrier Tape Dimension



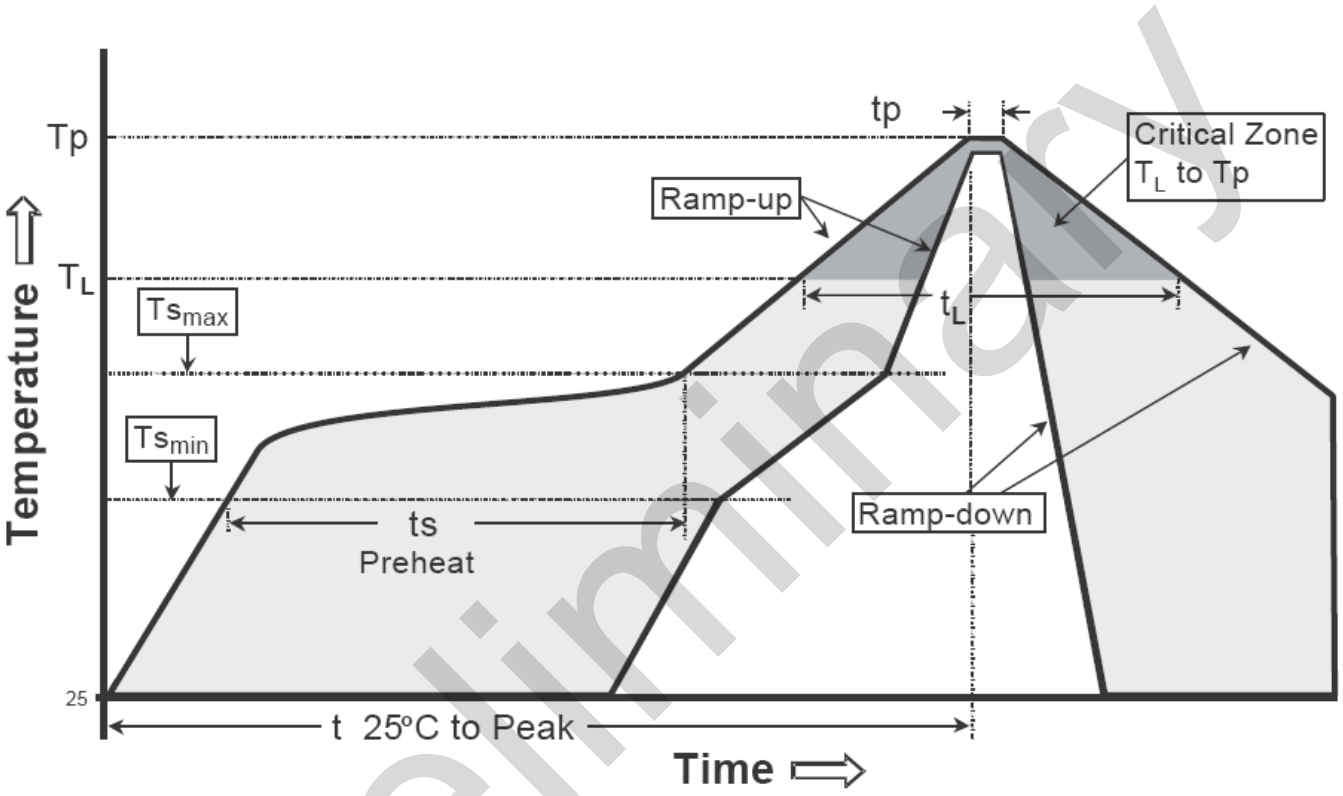
Notes :
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material : Conductive Black Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the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

Unit : millimeter

Recommended wave soldering condition

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

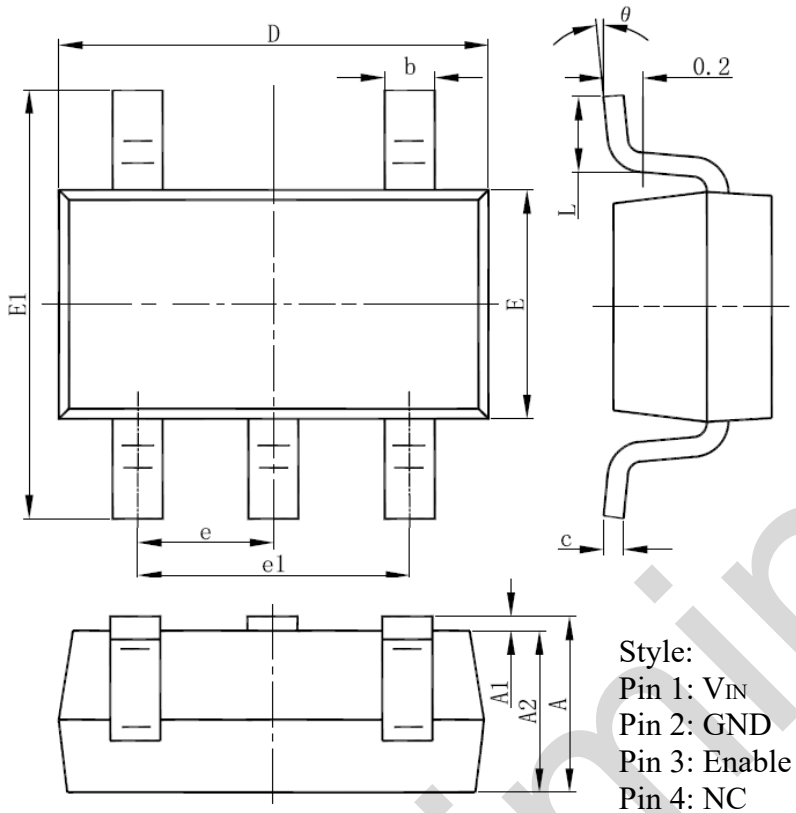
Recommended temperature profile for IR reflow



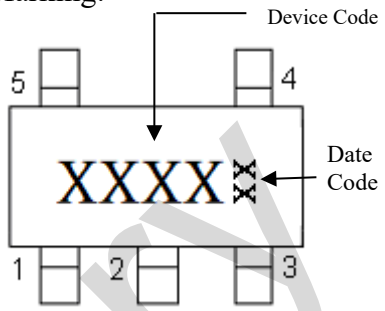
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(Ts min) −Temperature Max(Ts max) −Time(ts min to ts max)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (TL) − Time (tL)	 183°C 60-150 seconds	 217°C 60-150 seconds
Peak Temperature(TP)	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



Marking:



Device code :

Output Voltage	Device Code
3.3V	0603
2.8V	603A
2.5V	603B
1.8V	603C

Style:
Pin 1: VIN
Pin 2: GND
Pin 3: Enable
Pin 4: NC
Pin 5: VOUT

5-Lead SOT-23-5L Plastic Surface Mounted Package
CYS Package Code : N5

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.