

Differential Comparator

LM391CN5

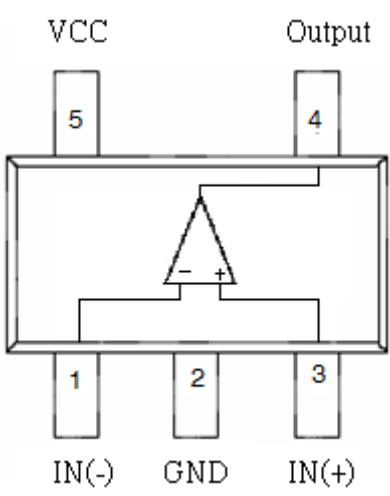
Description

The LM391CN5 consists of one voltage comparators, designed specifically to operate from a single power over a wide voltage range.

Features

- Single or dual supply operation
- Wide operating supply range($V_{CC}=2V\sim 36V$ or $\pm 1V$ to $\pm 18V$)
- Input common-mode voltage includes ground
- Low supply current drain $I_{CC}=0.8mA$ (typical)
- Low input bias current $I_{bias}=25nA$ (typical)
- Output compatible with TTL, DTL and CMOS logic system

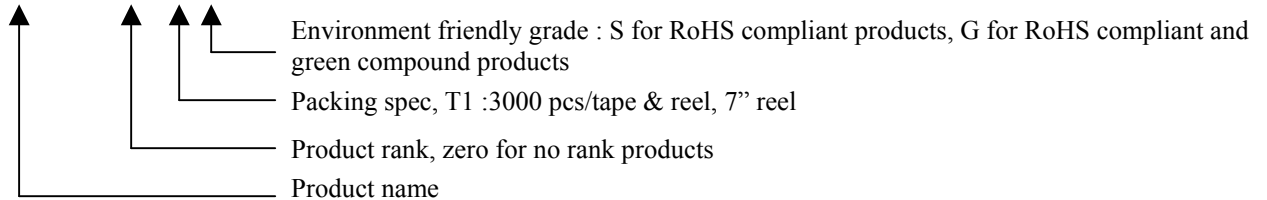
Pin Configurations

	Pin1: IN (-)
	Pin2: Gnd
	Pin3: IN (+)
	Pin4: OUT
	Pin5: VCC



Ordering Information

Part Number	Package	Shipping
LM391CN5-0-T1-G	SOT-23-5L (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel



Absolute Maximum Rating (@ $T_A=25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC}	± 18 or 36	V
Differential Input Voltage	V_{IDiff}	36	V
Input Voltage	V_I	-0.3 ~ 36	V
Power Dissipation	P_D	570 (Note)	mW
Operating Temperature	T_{opr}	-40 ~ +125	$^\circ\text{C}$
Storage Temperature	T_{stg}	-65 ~ +150	$^\circ\text{C}$

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{th,j-c}$	80	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-ambient, max	$R_{th,j-a}$	175 (Note)	

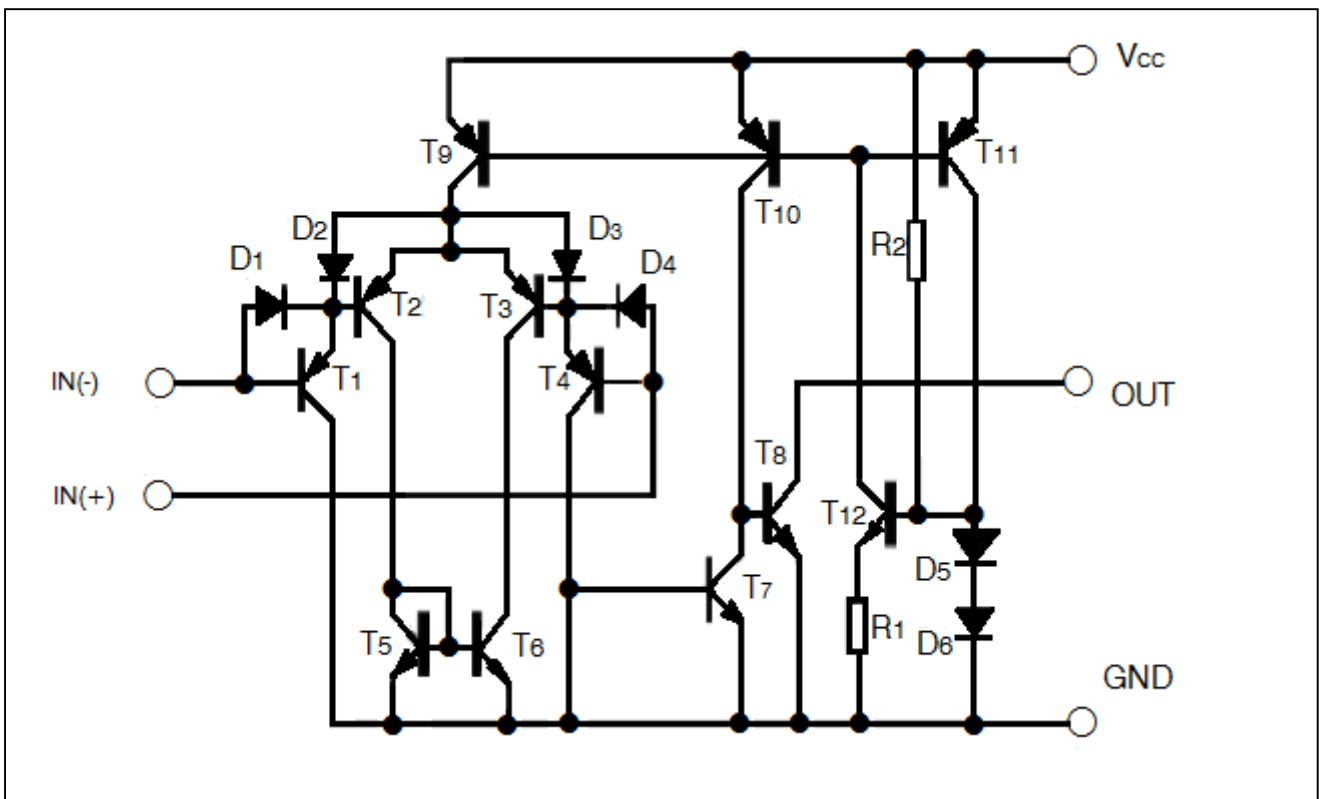
Note : Surface mounted on 1 in² pad of 2 oz copper, $t \leq 10s$.

Electrical Characteristics ($V_{CC}=5V, T_a=25^\circ\text{C}, R_T=10k$, all voltage referenced to ground unless otherwise specified.)

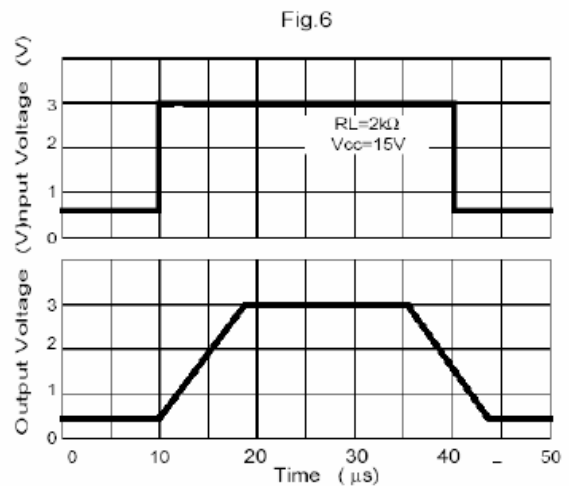
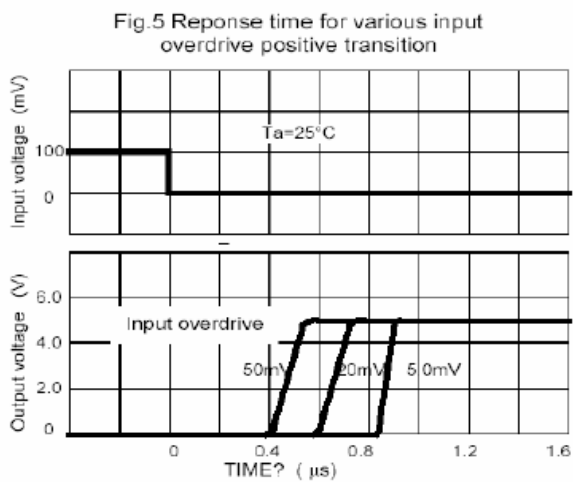
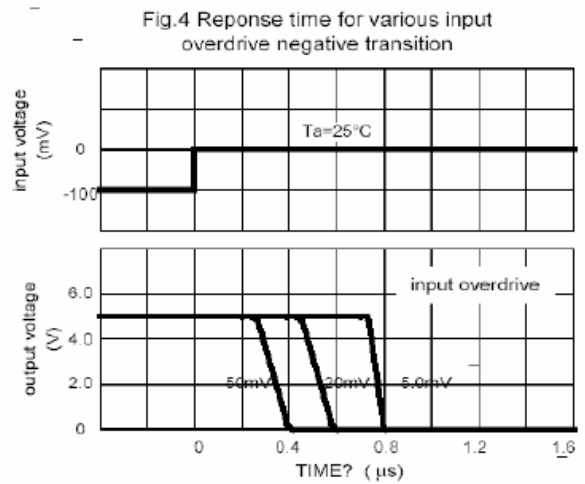
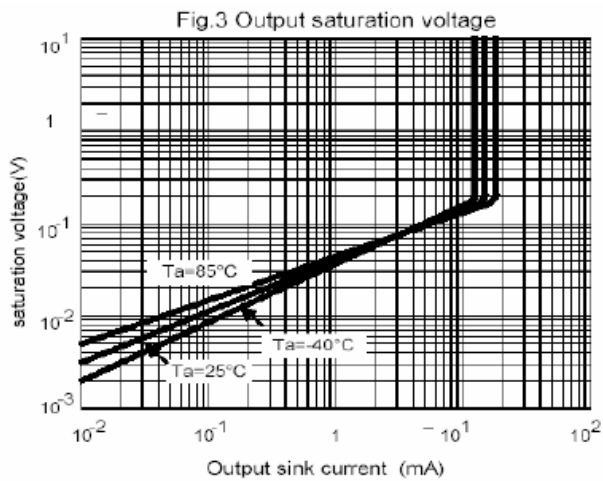
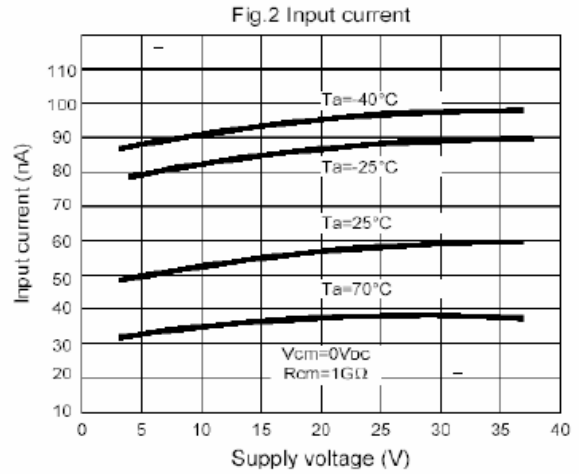
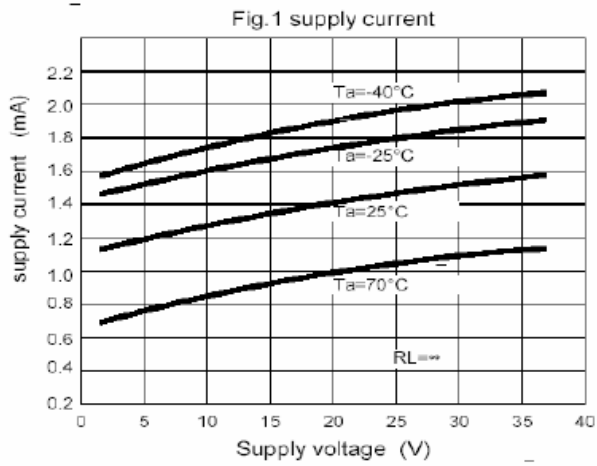
Parameter	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Input Offset Voltage	$V_{CM}=0$ to $V_{CC}-1.5$ $V_{O(p)}=1.4V, R_s=0$	V_{IO}	-	± 1	± 5	mV
Input Offset Current		I_{IO}	-	± 5	± 50	nA
Input Bias Current		I_b	-	65	250	nA
Input Common-Mode Voltage Range		$V_{I(R)}$	0	-	$V_{CC}-1.5$	V
Supply Current	$R_L=\infty$	I_{CC}	-	0.6	1.0	mA
	$R_L=\infty, V_{CC}=30V$		-	0.8	2.5	mA
Large Signal Voltage Gain	$V_{CC}=15V, R_L > 15k\Omega$	G_v	50	200	-	V/mV
Large Signal Response Time	$V_i=TTL$ logic wing $V_{ref}=1.4V, V_{RL}=5V$ $R_L=5.1k\Omega$	t_{res}	-	350	-	ns
Response Time	$V_{RL}=5V, R_L=5.1k\Omega$	t_{res}	-	1400	-	ns

Output Sink Current	$V_i(-) > 1V, V_i(+)=0V, V_o(p) < 1.5V$	I_{sink}	6	18	-	mA
Output Saturation Voltage	$V_i(-) > 1V, V_i(+)=0V, I_{sink}=4mA$	V_{sat}	-	160	400	mV
Output Leakage Current	$V_i(+)=1V, V_i(-)=0, V_o(p)=5V, V_o(p)=30V$	$I_{leakage}$	-	0.1	-	nA
			-	-	1.0	μA

Block Diagram



Typical Characteristics



Typical Characteristics(Cont.)

Fig.7 voltage Follower pulse response (small signal)

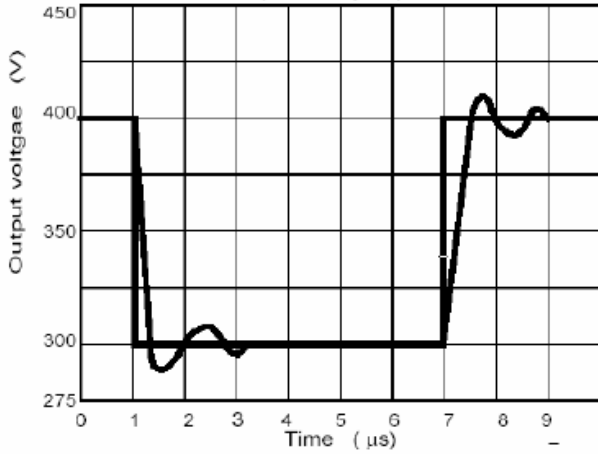


Fig.8 Large signal Frequency Response

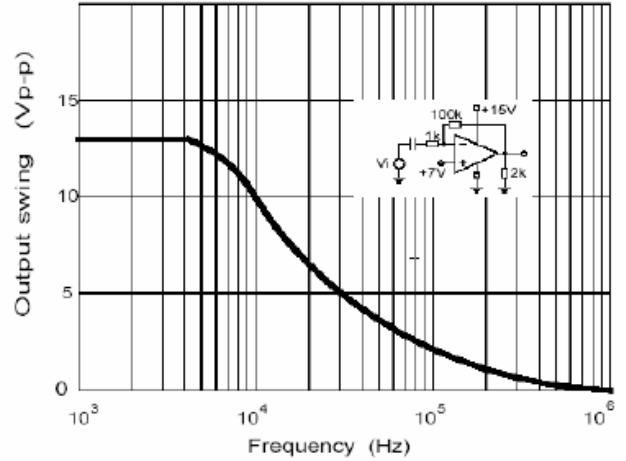


Fig.9 Output Characteristics current sourcing

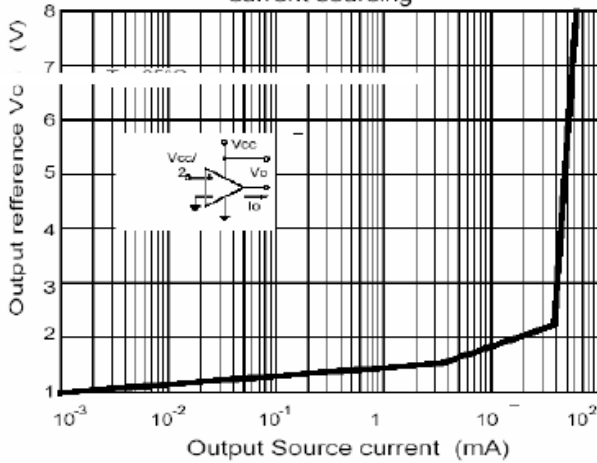


Fig.10 Output Characteristics Current sinking

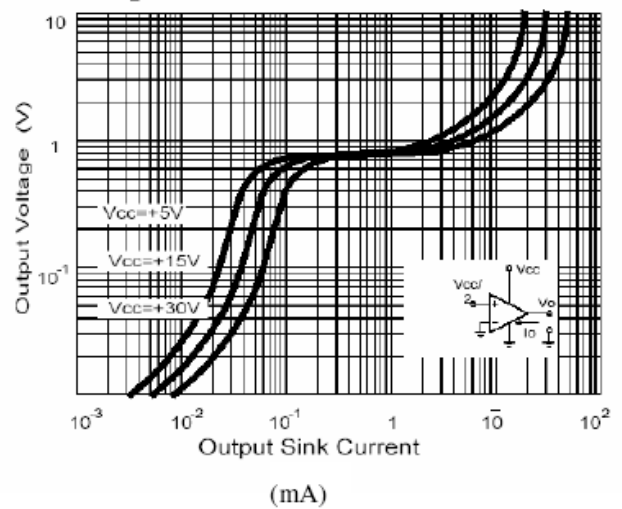
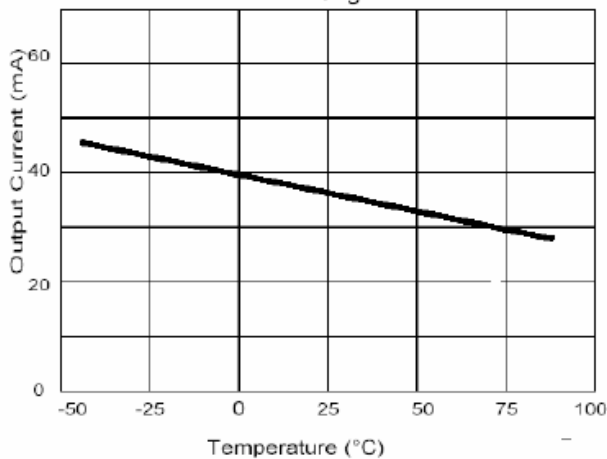
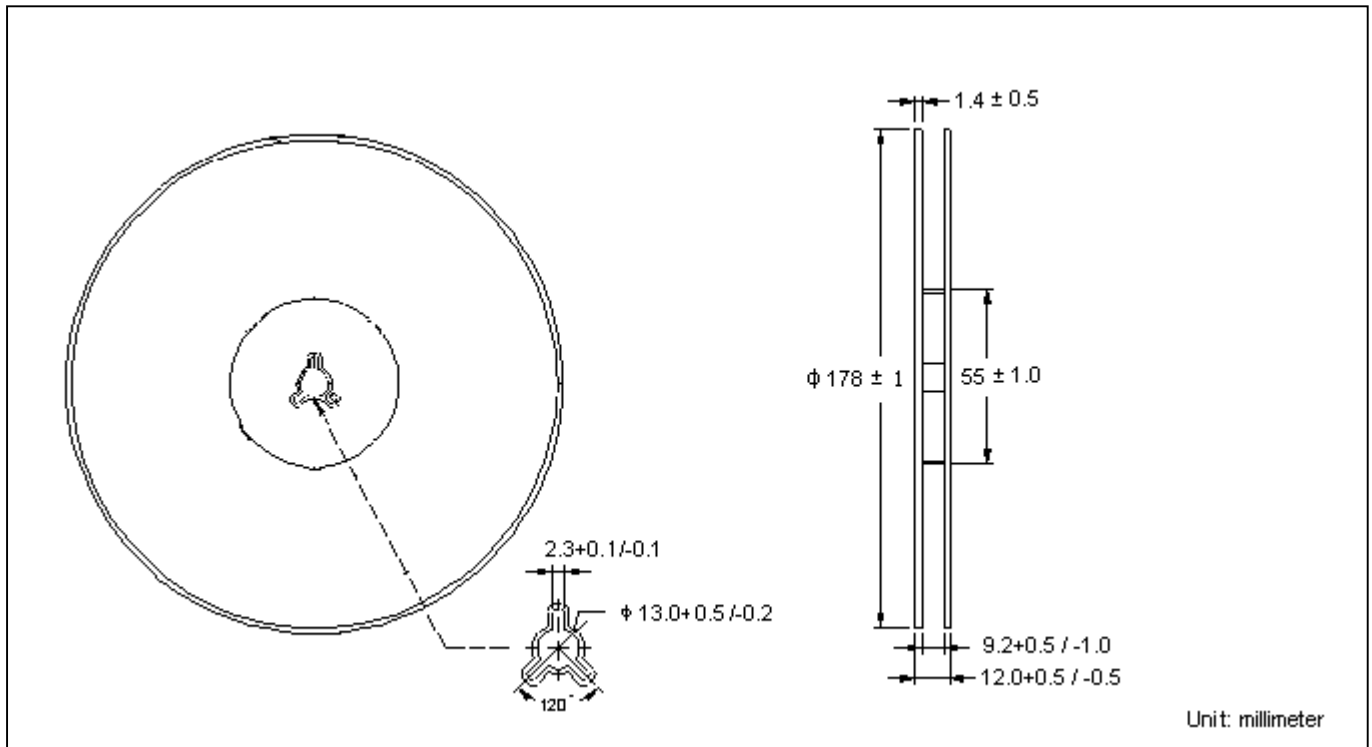


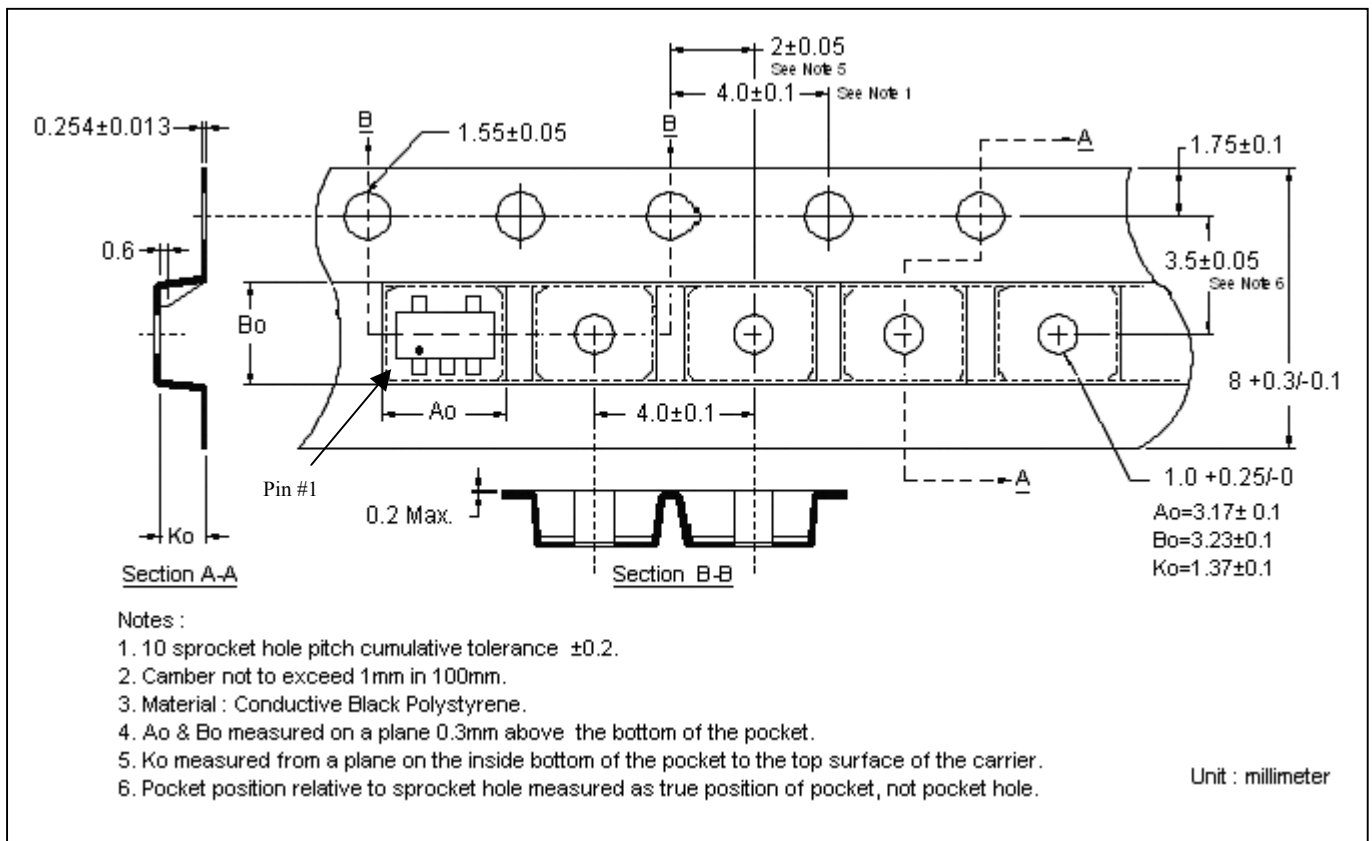
Fig.11 Current Limiting



Reel Dimension



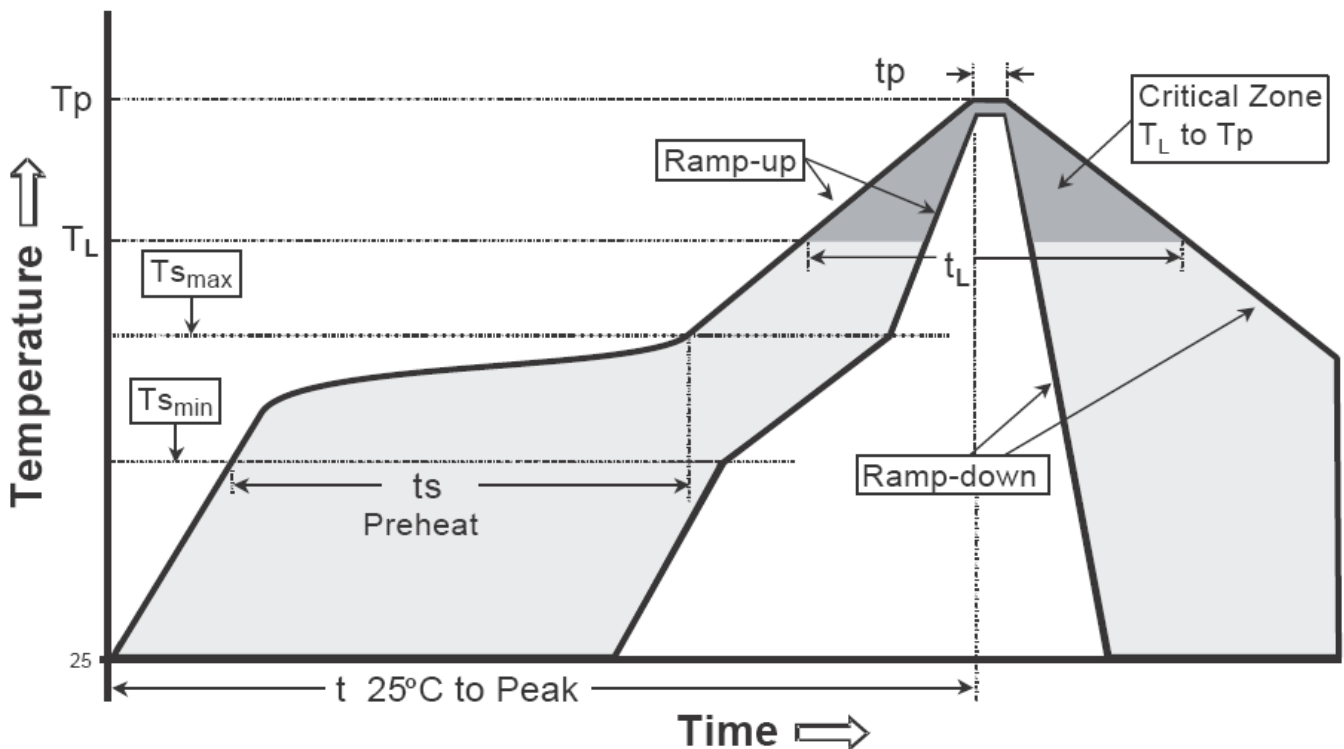
Carrier Tape Dimension



Recommended wave soldering condition

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

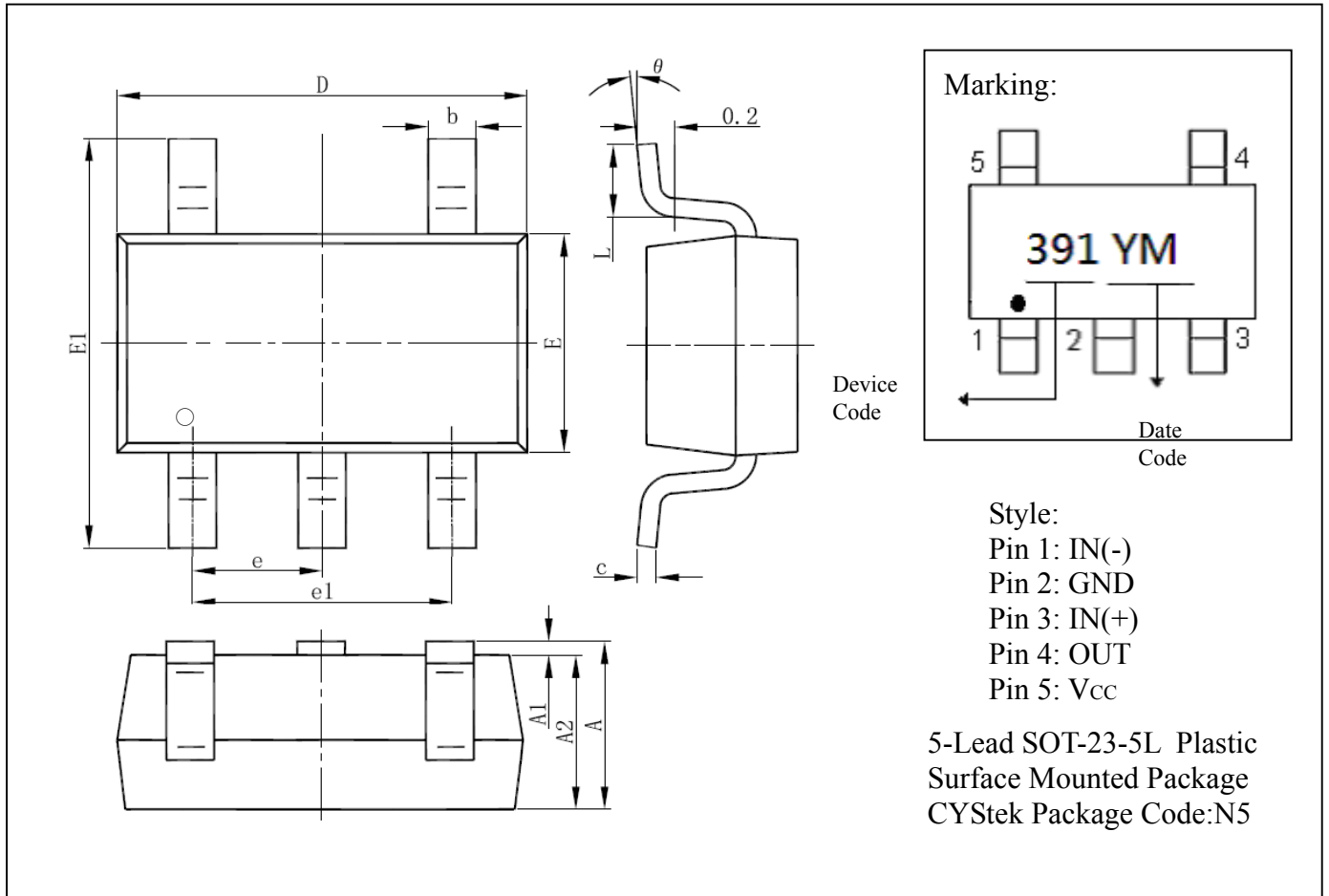
Recommended temperature profile for IR reflow



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-25 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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