

NH75xx Series
Low Dropout Regulator



Description

There Are Several Fixed Output Voltage Values With An Output Range Of 1.8V ~ 5.0V. Input Voltage 30V, Static Current 1.6uA, Maximum Output Current 200mA Has Fast Response To Input Voltage Transients And Load Current Transients. With No Overshoot Voltage During Startup And Short-Circuit Recovery.

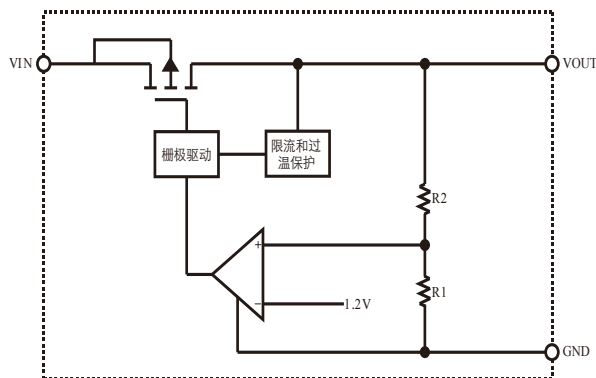
Features

- Static Current: 1.6uA
- Maximum Output Current: 200mA
- Maximum Operating Voltage: 30V
- Low Pressure Difference: 500mV@100mA
- Wide Input Voltage Range: 3V~30V
- Static Current 1.6uA
- Output Voltage Accuracy: $\pm 1\%$ or $\pm 2\%$ or $\pm 3\%$
- Over Current Protection(OCP)
- Over Temperature Protection(OTP)
- Short Circuit Protection(SCP)

Application

- Various Types Of Power Equipment
- Communication Equipment
- Application Of Microcontrollers
- Household Appliances

Block Diagram

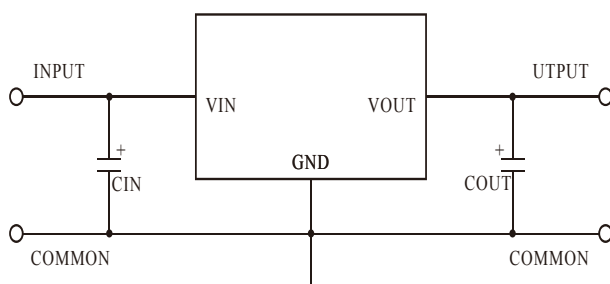


Order Information

NH75①②③④⑤⑥

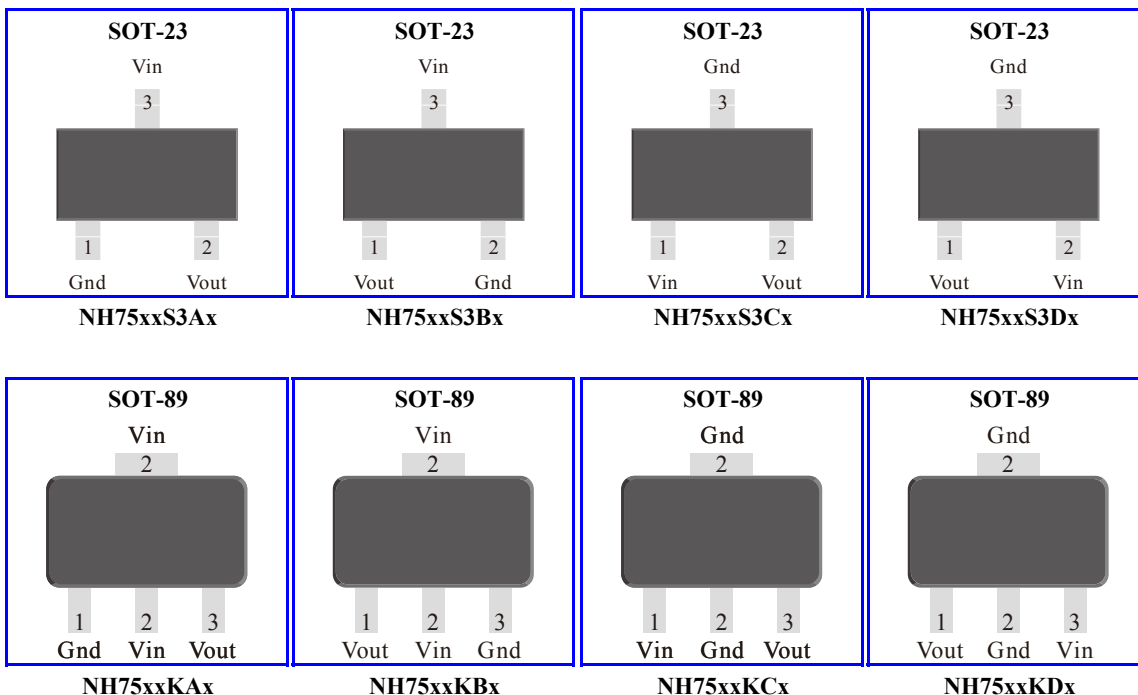
Designator	Description	Symbol	Value
①②	Output Voltage	18	1.8V
		25	2.5V
		28	2.5V
		30	3.0V
		33	3.3V
		36	3.6V
		40	4.0V
		42	4.2V
③④	Package	S3	SOT-23
		K	SOT-89
⑤	Pin Definition	A	
		B	
		C	
		D	
⑥	Tolerance	A	$\pm 1\%$
		B	$\pm 2\%$
		C	$\pm 3\%$

Block Diagram



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Function	SOT-23	SOT-23	SOT-23	SOT-23	Pin Name
	NH75xxS3Ax	NH75xxS3Bx	NH75xxS3Cx	NH75xxS3Dx	
Ground	1	2	3	3	Gnd
Output	2	1	2	1	Vout
Power input	3	3	1	2	Vin

Function	SOT-89	SOT-89	SOT-89	SOT-89	Pin Name
	NH75xxKAx	NH75xxKBx	NH75xxKCx	NH75xxKDx	
Ground	1	3	2	2	Gnd
Output	3	1	3	1	Vout
Power input	2	2	1	3	Vin

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Absolute Maximum Ratings(Operating temperature range applies unless otherwise specified)

Parameter	Test Condition	Symbol	Ratings			Unit
Absolute Maximum Voltage		V _{IN to G_{ND}}	-0.3	~	36	V
		V _{OUT to G_{ND}}	-0.3	~	7	
		V _{IN to V_{OUT}}	-0.3	~	31	
Power Dissipation	SOT-89	P _D	900			mW
	SOT-23		600			
Electrostatic Discharge Capability	Human Body Mode (HBM)	E _{SD}	4			kV
	Charging Device Mode (CDM)		200			V

Electrical Characteristics (Ta=25°C Unless Otherwise Noted, $C_{IN}=1\mu F$, $V_{IN}=V_{OUTNOM}+1V$, $C_{OUT}=10\mu F$)

Characteristic	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Input Voltage		V_{IN}	3	-	30	V
Output Voltage	$V_{IN}=12V, I_{OUT}=10mA$	V_{OUT}	1.8	-	5.0	V
Quiescent Current	$V_{IN}=12V, I_{OUT}=0mA$	I_{GND}	-	1.6	3.0	uA
Max. Output Current		I_{OUT_MAX}	-	200	-	mA
DC Output Accuracy	$V_{IN}=12V, I_{OUT}=10mA$		-1	-	1	%
			-2	-	2	
			-3	-	3	
Dropout Voltage (NH7550xxxB)	$I_{OUT}=100mA$ $V_{IN}=V_{OUTNOM}-0.1V$ $I_{OUT}=150mA$ $V_{IN}=V_{OUTNOM}-0.1V$	V_{DROP}	-	500	-	mV
	$I_{OUT}=100mA$ $V_{IN}=V_{OUTNOM}-0.1V$ $I_{OUT}=150mA$ $V_{IN}=V_{OUTNOM}-0.1V$		-	700	-	
Dropout Voltage (NH7533xxxB)	$I_{OUT}=100mA$ $V_{IN}=V_{OUTNOM}-0.1V$ $I_{OUT}=150mA$ $V_{IN}=V_{OUTNOM}-0.1V$		-	500	-	mV
	$I_{OUT}=100mA$ $V_{IN}=V_{OUTNOM}-0.1V$ $I_{OUT}=150mA$ $V_{IN}=V_{OUTNOM}-0.1V$		-	800	-	
Load Regulation	$V_{IN}=7V, 1mA \leq I_{OUT} \leq 150mA$	ΔV_{OUT}	-	0.1	-	mV/mA
Line Regulation	$I_{OUT}=1mA$, $V_{OUTNOM}+2V \leq V_{IN} \leq 24V$	$\frac{\Delta V_{OUT}}{V_{OUT} \cdot \Delta V_{IN}}$	-	0.1	-	mV/V
Current Limit Value	$V_{IN}=V_{OUTNOM}+2V$	I_{LIMIT}	-	350	-	mA
Short-Circuit Current	$V_{OUT}=0V$	I_{SHORT}	-	120	-	mA
Over-Temperature Protection	OTP Threshold Upper Limit	T_{SHDN}	-	154	-	°C
	OTP Threshold Low Limit		-	125	-	

Thermal Characteristics

Parameter	Test Condition	Symbol	Ratings			Unit
Operating Junction Temperature		T _J	-40	to	125	℃
Storage temperature range		T _{STG}	-40	to	150	
Thermal Resistance Junction-Case	SOT-89	R _{θJC}	130			℃/W
	SOT-23		200			

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Typical Characteristics Curves

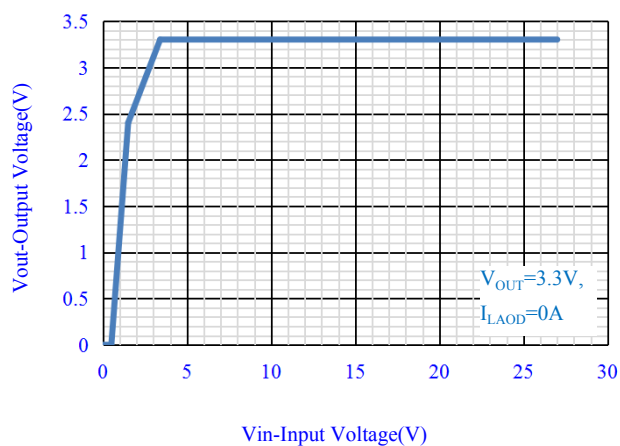


Fig.1-Output Voltage Vs Input Voltage

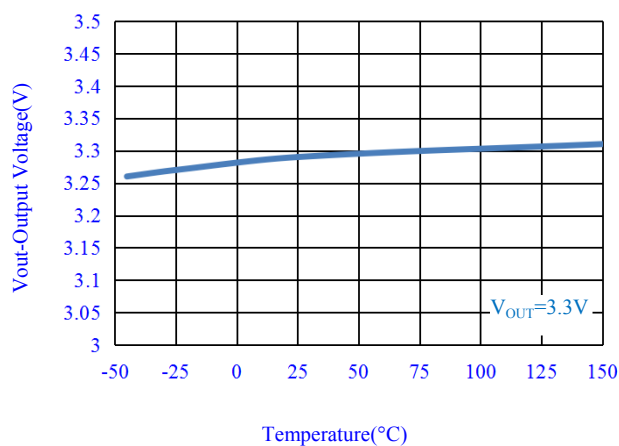


Fig.2-Output Voltage VS Temperature

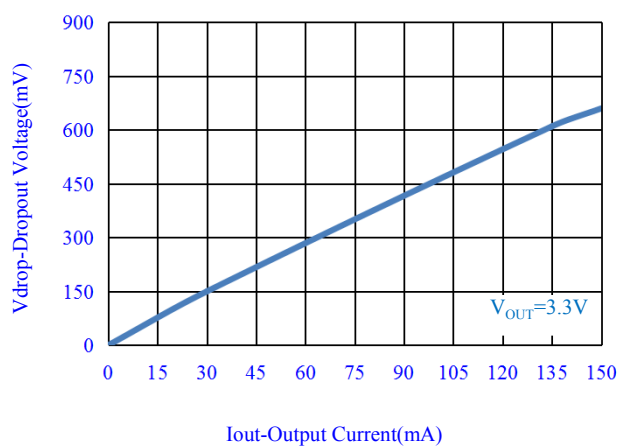


Fig.3-Dropout Voltage VS Output Current

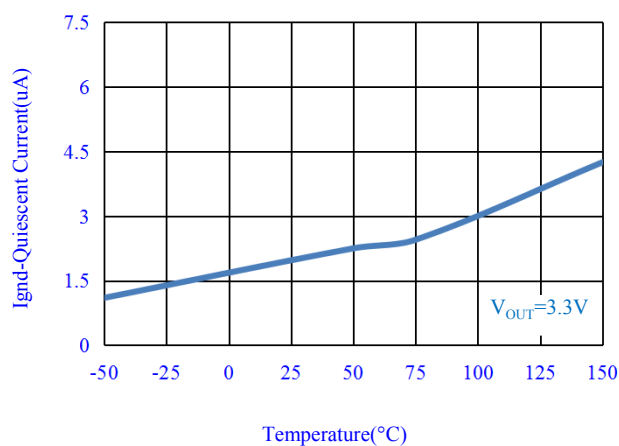


Fig.4-Quiescent Current VS Temperature

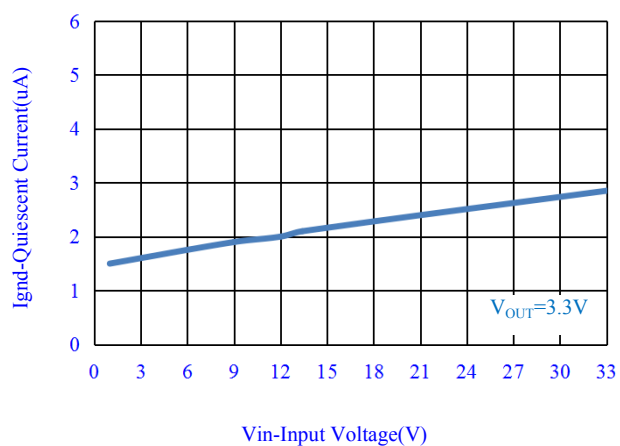


Fig.5-Quiescent Current VS Input Voltage

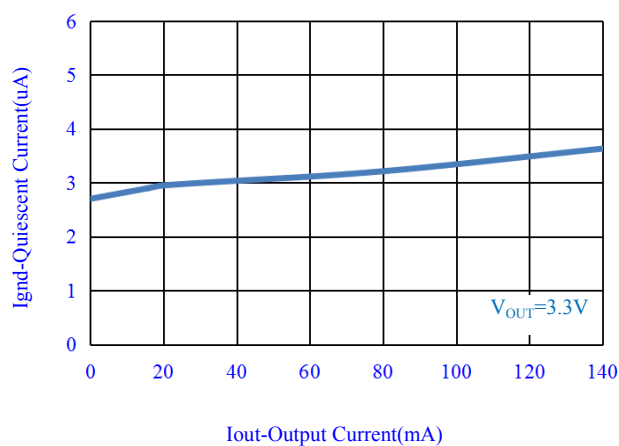
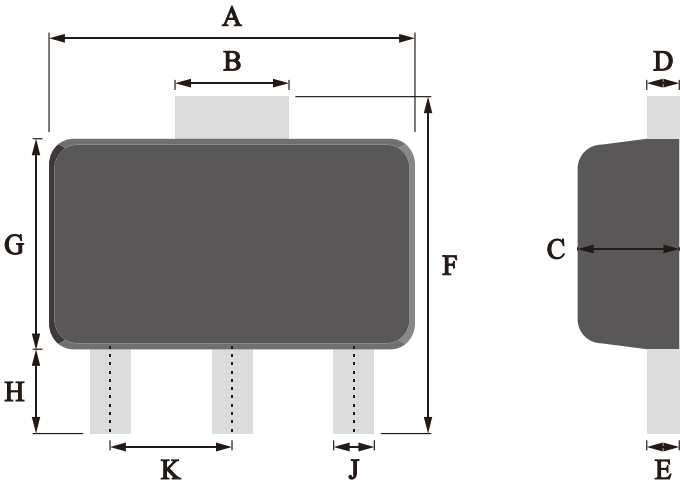


Fig.6-Quiescent Current VS Output Current

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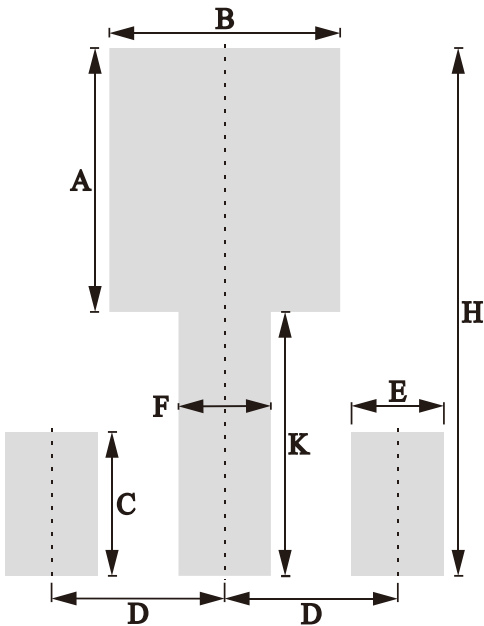
OUTLINE DRAWINGS



SOT-89

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.00	-	5.00	0.1575	-	0.1969
B	1.40	-	1.80	0.0551	-	0.0709
C	1.25	-	1.75	0.0492	-	0.0689
D	0.20	-	0.60	0.0079	-	0.0236
E	0.20	-	0.60	0.0079	-	0.0236
F	3.60	-	4.40	0.1417	-	0.1732
G	2.20	-	2.80	0.0866	-	0.1102
H	0.80	-	1.20	0.0315	-	0.0472
J	0.30	-	0.70	0.0118	-	0.0276
K	1.25	-	1.75	0.0492	-	0.0689

COMPONENT PITCH DIMENSION DIAGRAM



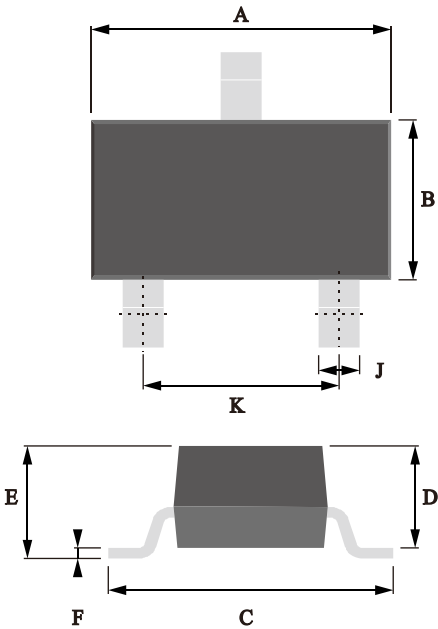
SOT-89

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	-	2.20	-	-	0.0866	-
B	-	2.00	-	-	0.0787	-
C	-	1.20	-	-	0.0472	-
D	-	1.50	-	-	0.0591	-
E	-	0.80	-	-	0.0315	-
F	-	0.80	-	-	0.0315	-
H	-	47.00	-	-	1.8504	-
K	-	2.20	-	-	0.0866	-

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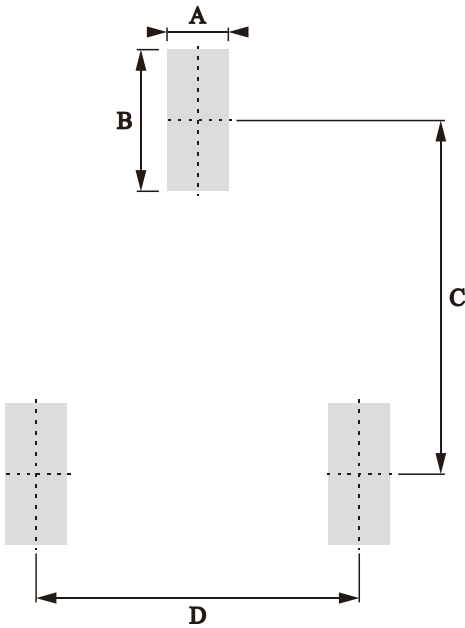
OUTLINE DRAWINGS



SOT-23

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.80	-	3.20	0.1102	-	0.1260
B	1.15	-	1.45	0.0453	-	0.0571
C	2.25	-	2.65	0.0886	-	0.1043
D	0.85	-	1.15	0.0335	-	0.0453
E	0.90	-	1.20	0.0354	-	0.0472
F	0.08	-	0.18	0.0031	-	0.0071
J	0.30	-	0.50	0.0118	-	0.0197
K	1.70	-	2.10	0.0669	-	0.0827

COMPONENT PITCH DIMENSION DIAGRAM



SOT-23

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	-	0.60	-	-	0.0000	-
B	-	0.80	-	-	0.0315	-
C	-	2.00	-	-	0.0787	-
D	-	1.90	-	-	0.0748	-

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PACKAGE TYPE :SOT-89 MARKING



MARKING INSTRUCTION

M52LxxT=Make
M=SOT-89
52L=Product Number,Unchange
xx=Output Voltage, Please Refer Order Information
T=Tolerance, Please Refer Order Information
YYWW=Date Code,According To Actual Changes
R=Internal Code

PACKAGE TYPE :SOT-23 MARKING



MARKING INSTRUCTION

52LxxT=Make
52L=Product Number,Unchange
xx=Output Voltage, Please Refer Order Information
T=Tolerance, Please Refer Order Information
YYWW=Date Code,According To Actual Changes
R=Internal Code

PACKING INFORMATION

Package Type	Package Code	Product Weight Approx(g/Pcs)	Package Method	Quantity (Pcs/Min. Pack.)	Quantity (Pcs/Inner Box)	Quantity (Pcs/Carton)
SOT-89	P1	0.055	7" Reel	3000	45000	180000
SOT-23	P1	0.008	7" Reel	1000	10000	40000

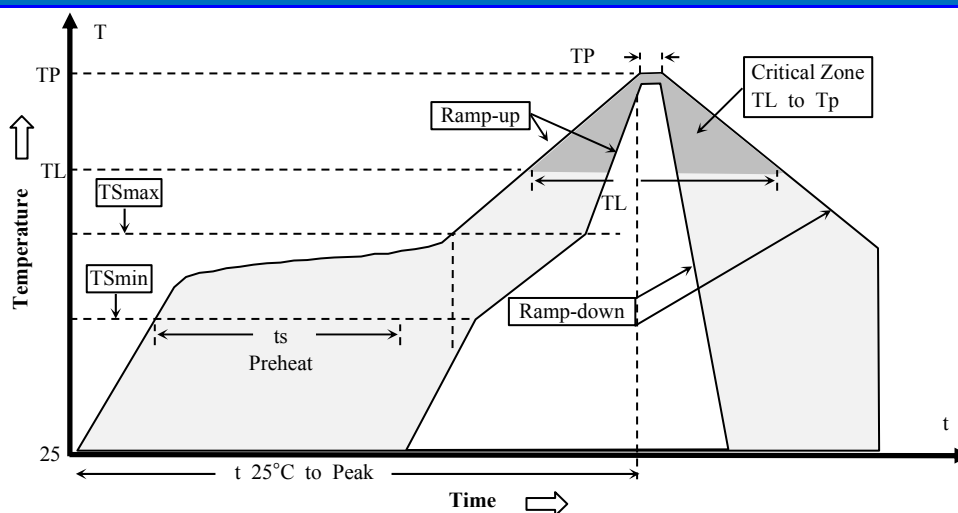
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Recommended wave soldering condition

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(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.

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