General Purpose NPN / PNP Epitaxial Planar Transistors (quadruple transistors)

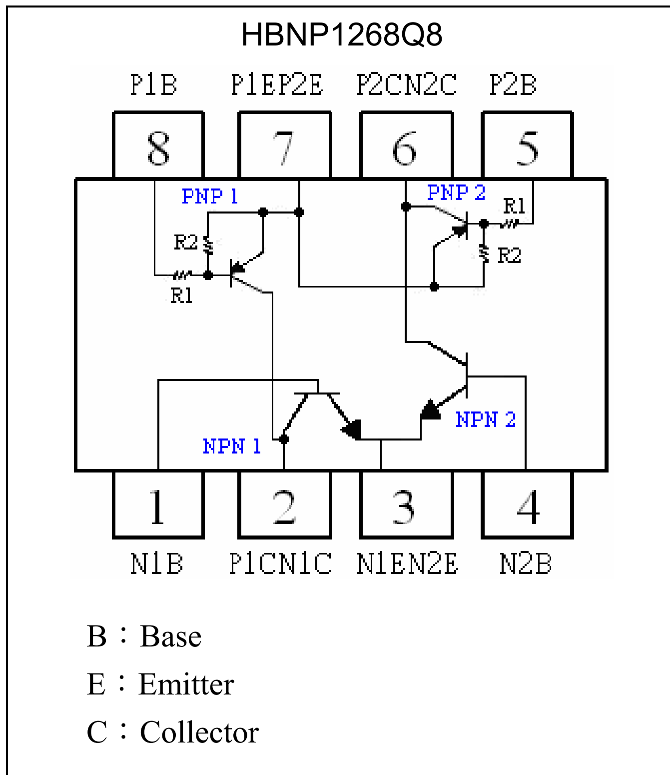
HBNP1268Q8

	NPN	PNP
BV_{CEO}	50V	-30V
I_C	4A	-5A
$R_{CE(SAT)(TYP)}$	125mΩ	180mΩ

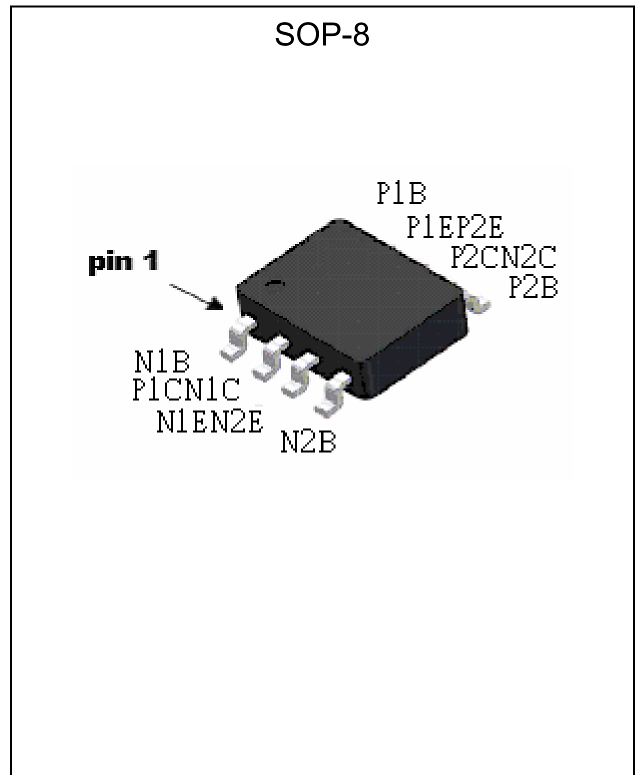
Features

- Includes two NPN chips and two PNP chips in a SOP-8 package.
- Pb-free lead plating package

Equivalent Circuit



Outline



Absolute Maximum Ratings (Each transistor, Ta=25°C)

Parameter	Symbol	Limits		Unit
		NPN	PNP	
Collector-Base Voltage	V_{CBO}	80	-30	V
Collector-Emitter Voltage	V_{CEO}	50	-30	V
Emitter-Base Voltage	V_{EBO}	6	-5	V
Collector Current (DC)	I_C	4	-5	A
Collector Current (Pulse) (Note 1)	I_{CM}	7	-7	A
Total Power Dissipation (Note 2)	Pd	1.38		W
Linear Derating Factor		0.01		W / °C
Operating Junction and Storage Temperature Range	Tj ; Tstg	-55~+150		°C
Thermal Resistance, Junction-to-Ambient (Note 2)	Rth,ja	90		°C/W

Note : 1. Pulse width≤300μs, duty cycle≤2%.
2. Surface mounted on 1 in² copper pad of FR-4 board; 135°C/W when mounted on minimum copper pad.

Characteristics (Tj=25°C, unless otherwise specified)

NPN 1 & NPN 2

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	80	-	-	V	I_C=100μA, I_E=0
BV_{CEO}	50	-	-	V	I_C=1mA, I_B=0
BV_{EBO}	6	-	-	V	I_E=50μA, I_C=0
I_{CBO}	-	-	100	nA	V_{CB}=80V, I_E=0
I_{CEO}	-	-	1	μA	V_{CE}=50V, I_B=0
I_{EBO}	-	-	100	nA	V_{EB}=6V, I_C=0
*$V_{CE(SAT)}$	-	-	100	mV	I_C=400mA, I_B=20mA
*$V_{CE(SAT)}$	-	-	0.25	V	I_C=1A, I_B=10mA
*$V_{CE(SAT)}$	-	0.25	0.5	V	I_C=2A, I_B=100mA
*$R_{CE(SAT)}$	-	0.125	0.25	Ω	I_C=2A, I_B=100mA
*$V_{BE(SAT)}$	-	-	1.5	V	I_C=2A, I_B=200mA
*$h_{FE}1$	250	-	-	-	V_{CE}=2V, I_C=100mA
*$h_{FE}2$	280	-	600	-	V_{CE}=2V, I_C=500mA
*$h_{FE}3$	100	-	-	-	V_{CE}=2V, I_C=1A
f_T	-	90	-	MHz	V_{CE}=5V, I_C=0.1A, f=100MHz
Cob	-	13	-	pF	V_{CB}=10V, f=1MHz

PNP 1 & PNP 2

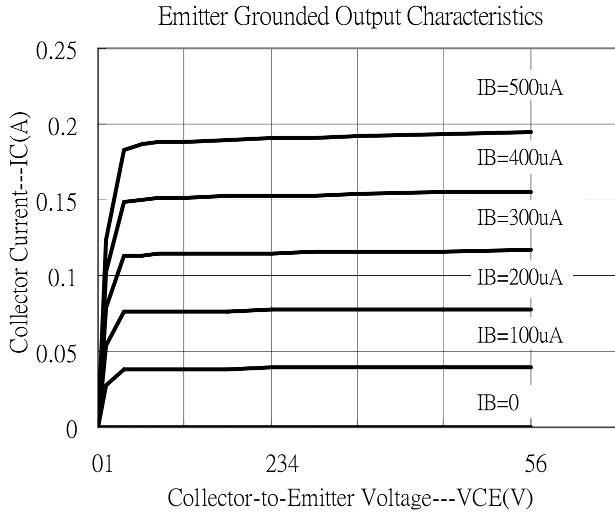
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
I_{CBO}	-	-	-100	nA	V_{CB}=-30V, I_E=0A
I_{CEO}	-	-	-100	nA	V_{CE}=-30V, I_B=0A
I_{EBO}	-	-	-2	mA	V_{EB}=-5V
*H_{FE}	120	-	-	-	V_{CE}=-2V, I_C=-100mA
	140	-	-	-	V_{CE}=-2V, I_C=-1A
	100	-	-	-	V_{CE}=-2V, I_C=-4A
*$V_{CE(SAT)}$	-	-0.25	-0.4	V	I_C=-1A, I_B=-5mA
	-	-0.34	-0.45	V	I_C=-2A, I_B=-20mA
	-	-0.53	-0.6	V	I_C=-3A, I_B=-30mA
*$R_{CE(SAT)}$	-	-0.18	-0.2	Ω	I_C=-3A, I_B=-30mA
R_1	280	400	520	Ω	-
R_2	7	10	13	kΩ	-
f_T	100	-	-	MHz	V_{CE}=-10V, I_E=-500mA, f=100MHz

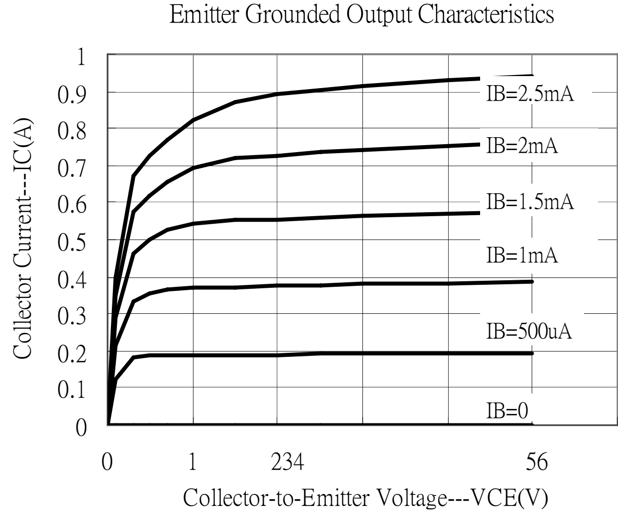
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

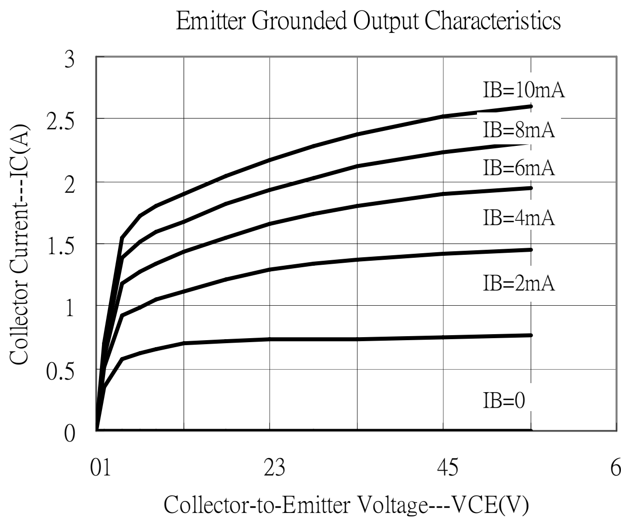
Ordering Information

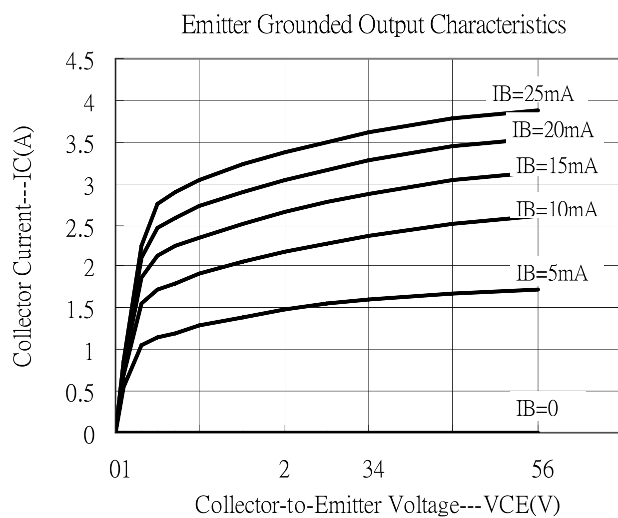
Device	Package	Shipping
HBNP1268Q8	SOP-8 (Pb-free lead plating package)	3000 pcs / Tape & Reel

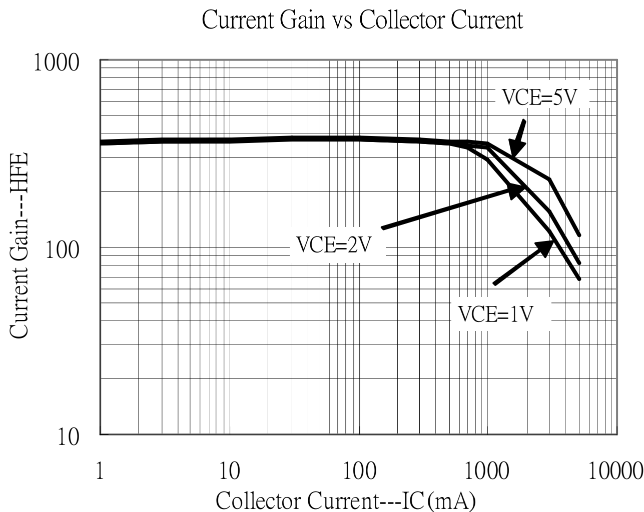
Typical Characteristics
NPN 1 & NPN 2

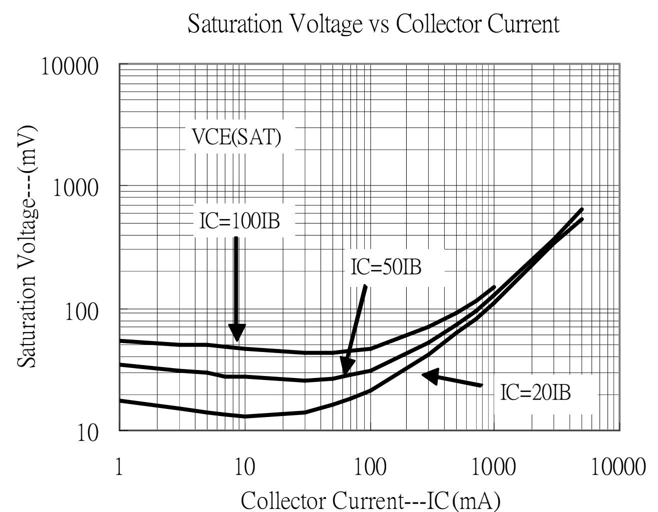


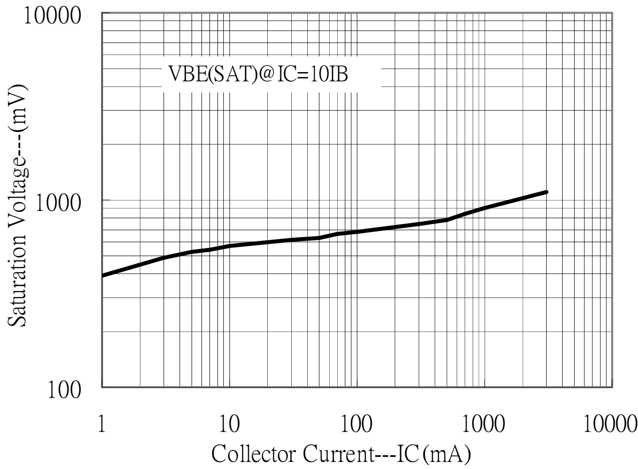


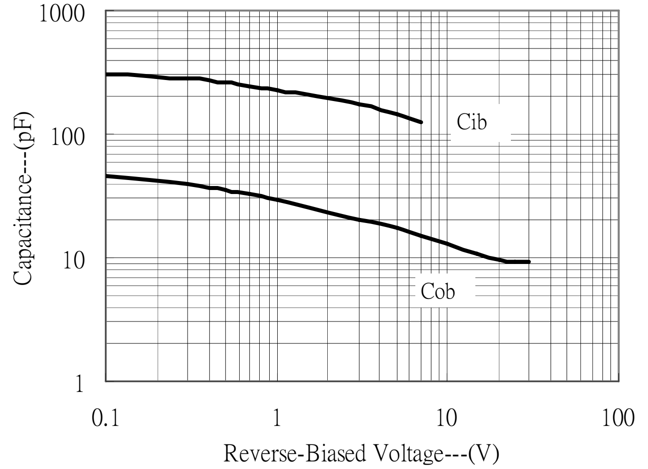




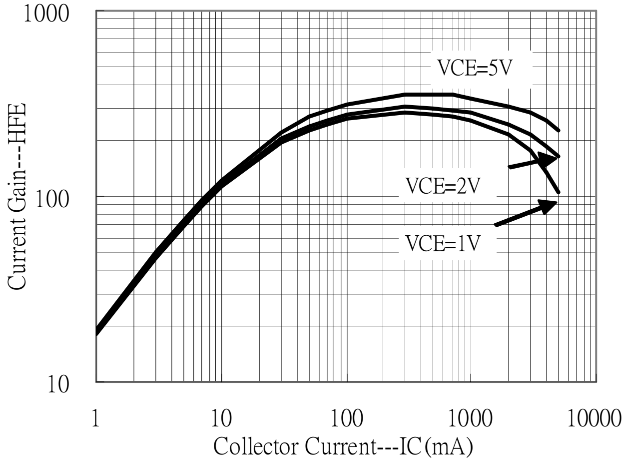


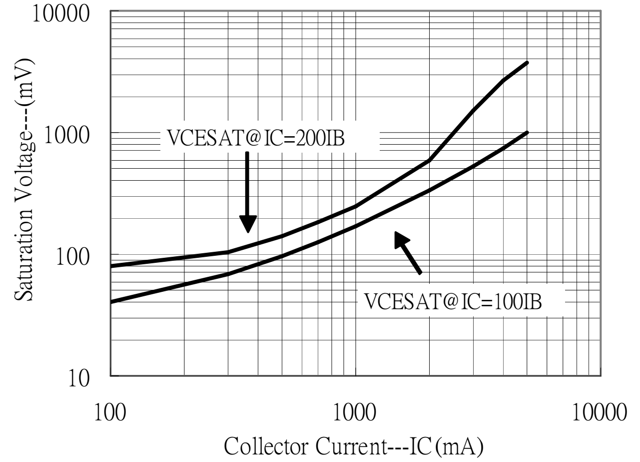


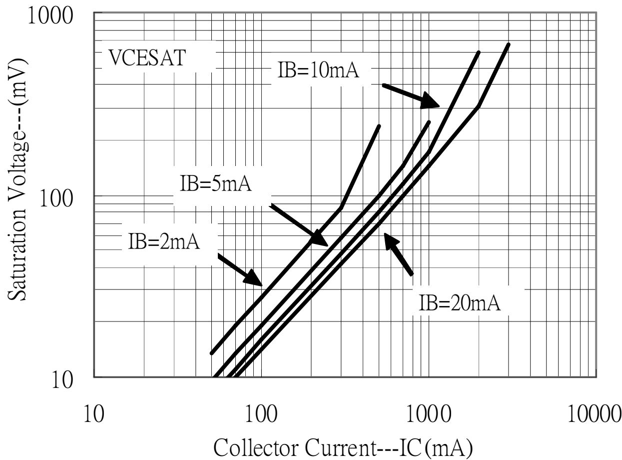


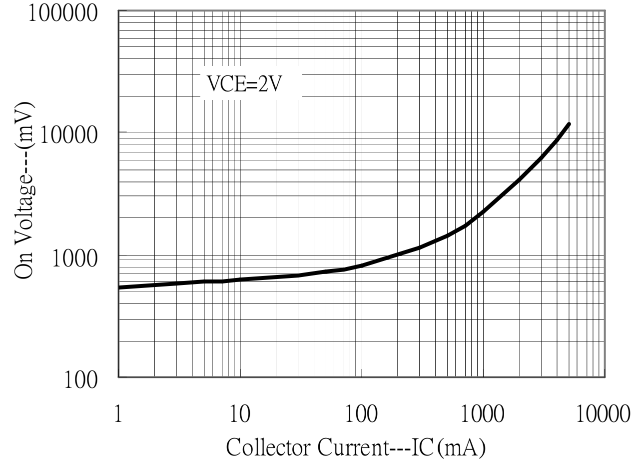


PNP 1 & PNP 2

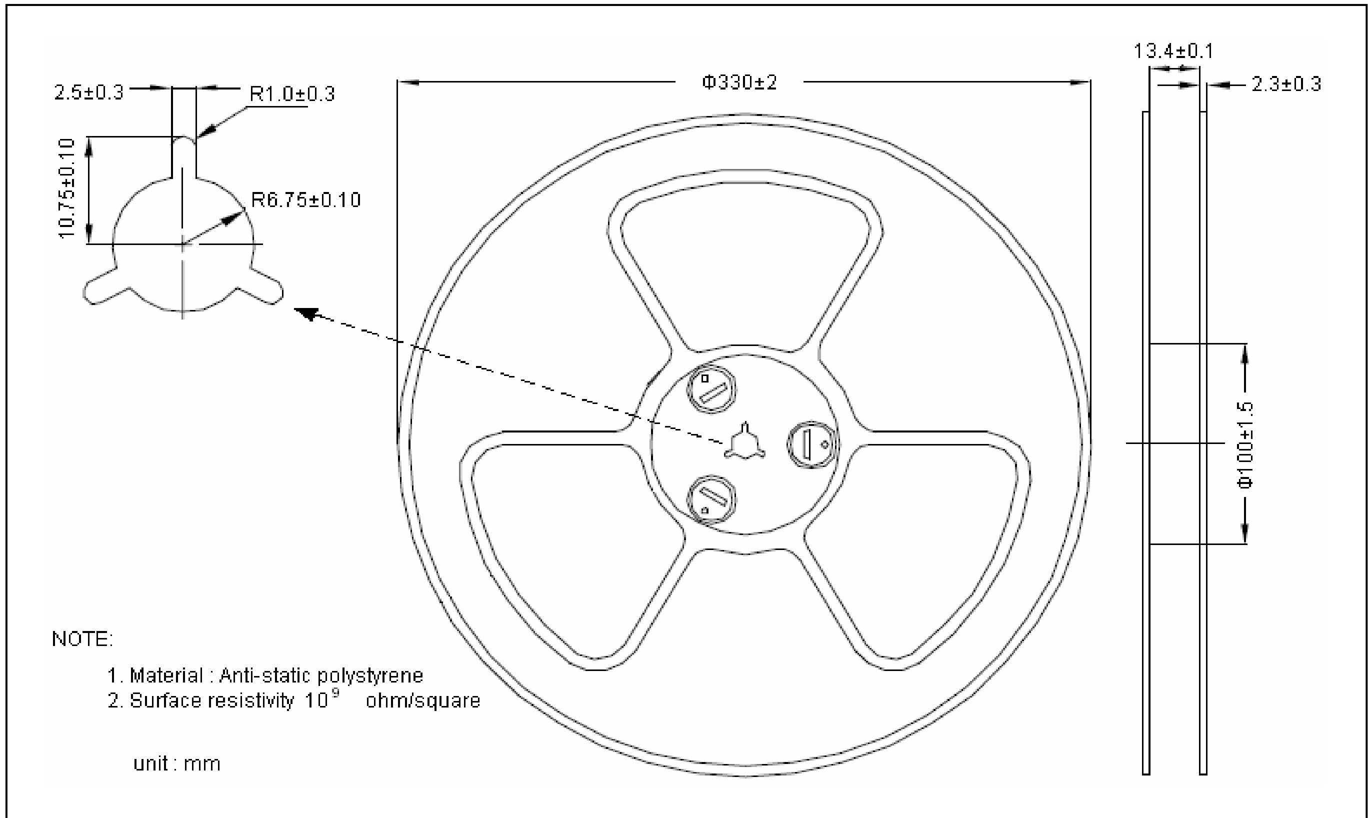




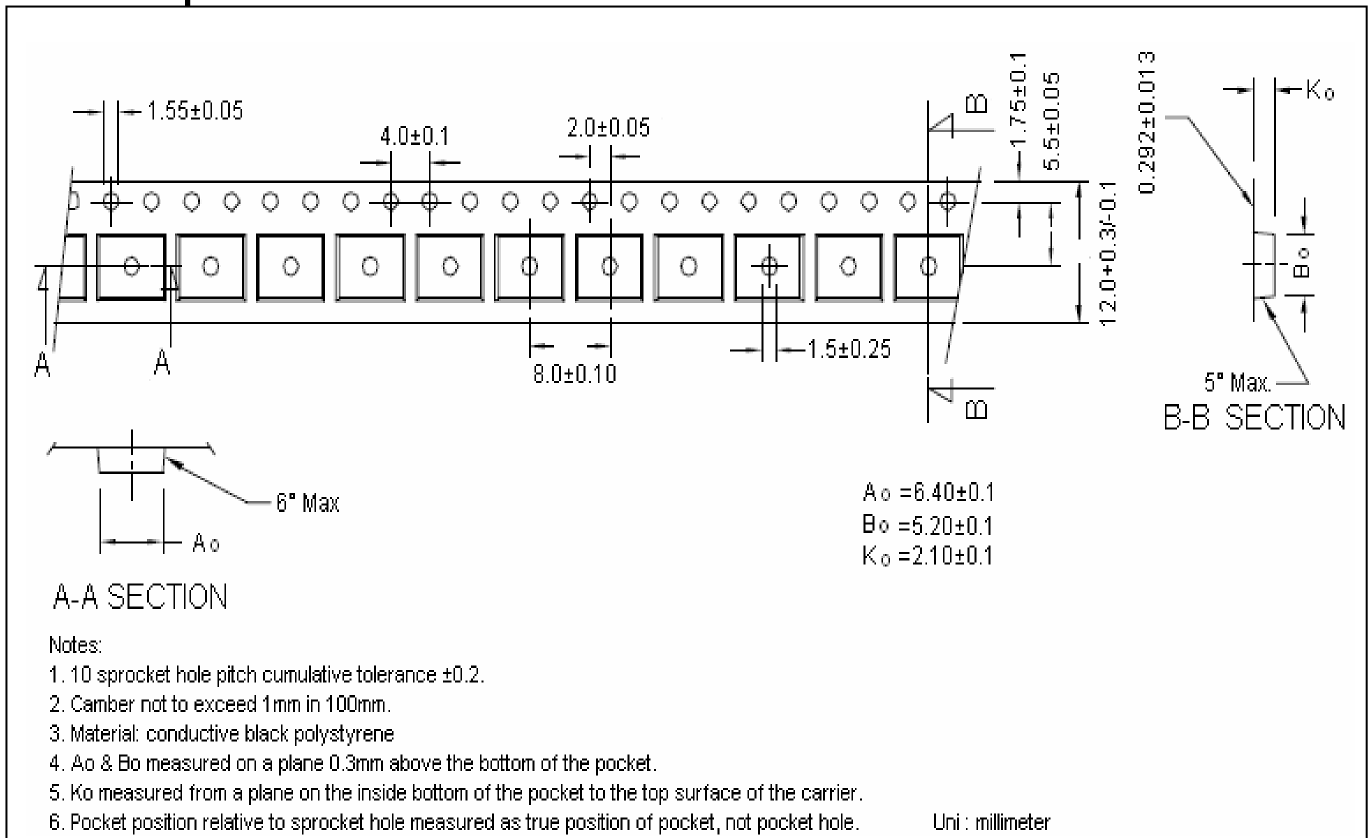




Reel Dimension



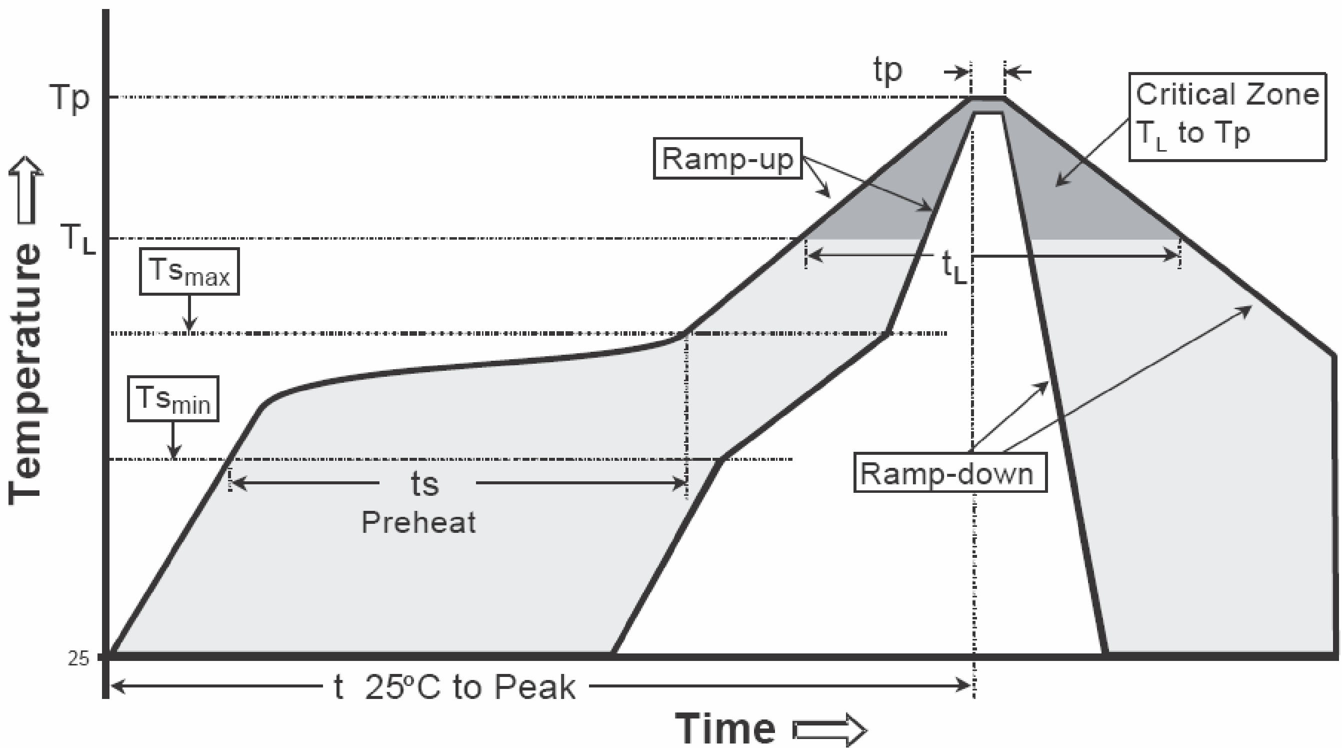
Carrier Tape Dimension



Recommended wave soldering condition

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

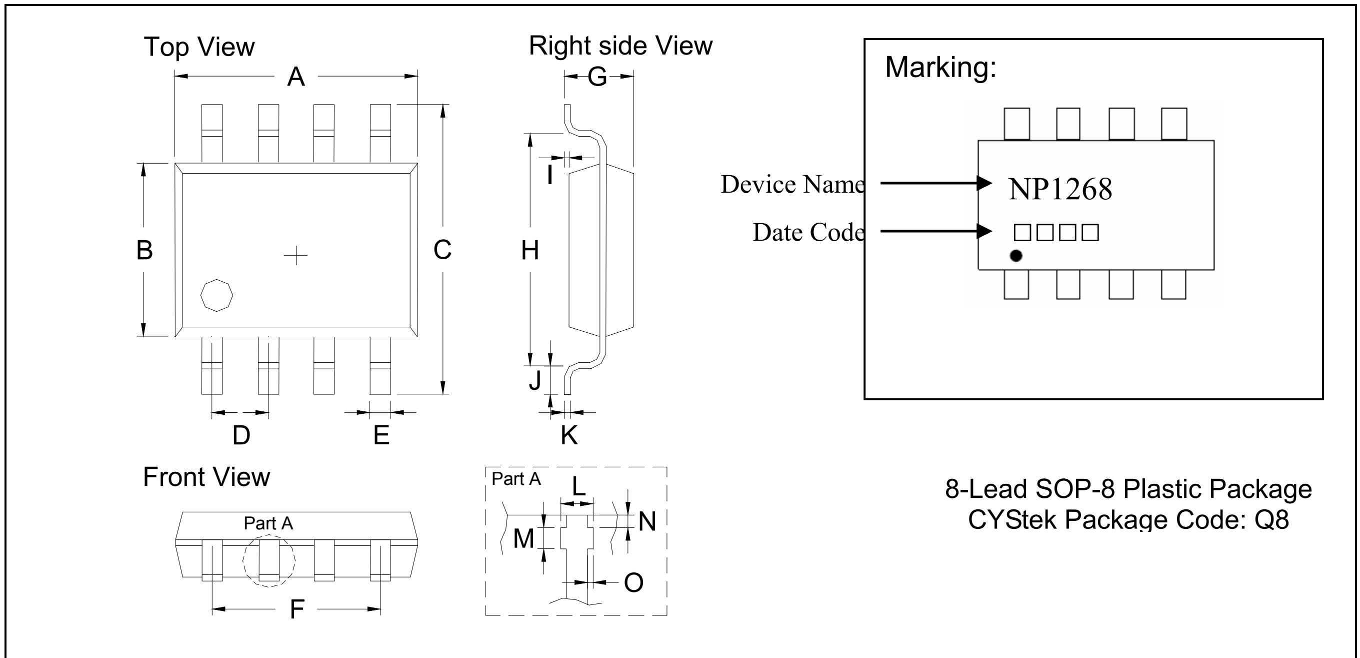
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S 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 (T_L) − Time (t_L)	183°C 60-150 seconds	217°C 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.

SOP-8 Dimension



*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1909	0.2007	4.85	5.10	I	0.0019	0.0078	0.05	0.20
B	0.1515	0.1555	3.85	3.95	J	0.0118	0.0275	0.30	0.70
C	0.2283	0.2441	5.80	6.20	K	0.0074	0.0098	0.19	0.25
D	0.0480	0.0519	1.22	1.32	L	0.0145	0.0204	0.37	0.52
E	0.0145	0.0185	0.37	0.47	M	0.0118	0.0197	0.30	0.50
F	0.1472	0.1527	3.74	3.88	N	0.0031	0.0051	0.08	0.13
G	0.0570	0.0649	1.45	1.65	O	0.0000	0.0059	0.00	0.15
H	0.1889	0.2007	4.80	5.10					

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:
• Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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