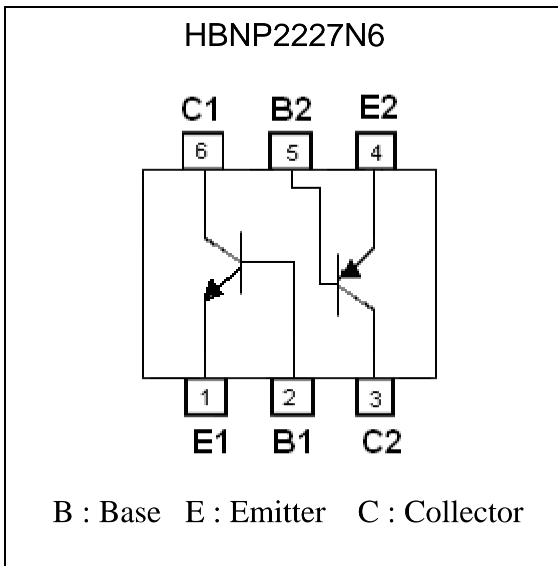
NPN AND PNP Dual Epitaxial Planar Transistors

HBNP2227N6

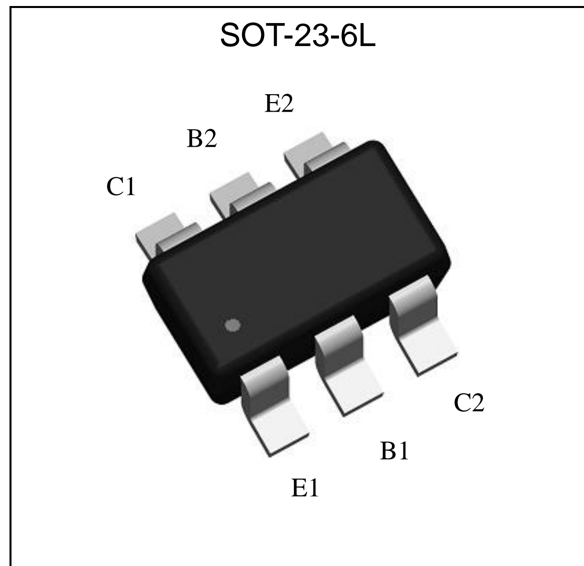
Features

- Includes a PN2222A chip and PN2907A chip in a SOT-23-6L package.
- Mounting possible with SOT-23 automatic mounting machines.
- Transistor elements are independent, eliminating interference.
- Mounting cost and area can be cut in half.
- Pb-free lead plating package.

Equivalent Circuit

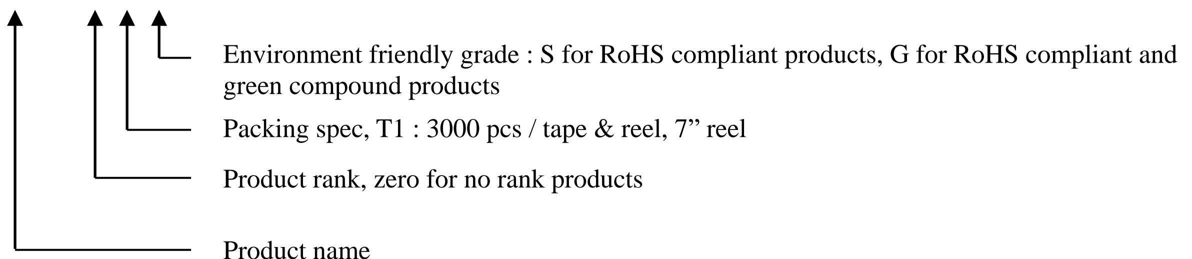


Outline



Ordering Information

Device	Package	Shipping
HBNP2227N6-0-T1-G	SOT-23-6L (Pb-free lead plating and halogen-free package)	3000 pcs / tape & reel



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits		Unit
		NPN	PNP	
Collector-Base Voltage	V_{CBO}	75	-60	V
Collector-Emitter Voltage	V_{CEO}	50	-60	V
Emitter-Base Voltage	V_{EBO}	6	-6	V
Collector Current(DC) (Note 1)	I_C	600	-600	mA
Peak Collector Current (Note 2)	I_{CP}	1.2	-1.2	A
Peak Base Current (Note 2)	I_{BP}	100	-100	mA
Total Power Dissipation (Note 1)	P_D	1.14		W
Linear Derating Factor		0.01		W / °C
Operating Junction and Storage Temperature	Tj, Tstg	-55~+150		°C
Thermal Resistance, Junction-to-Ambient (Note 1)	Rth,ja	110		°C/W

Note : 1.Surface mounted on 1 in² copper pad of FR-4 board, t≤5 sec; 180°C/W when mounted on minimum copper pad
2.Pulse width limited by maximum junction temperature

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	75	-	-	V	I_C=10μA
BV_{CEO}	50	-	-	V	I_C=10mA
BV_{EBO}	6	-	-	V	I_E=10μA
I_{CBO}	-	-	10	nA	V_{CB}=60V
I_{CEX}	-	-	10	nA	V_{CE}=60V, V_{EB}=3V
I_{EBO}	-	-	100	nA	V_{EB}=6V
*$V_{CE(sat)}$	-	-	0.3	V	I_C=150mA, I_B=15mA
*$V_{CE(sat)}$	-	-	0.5	V	I_C=500mA, I_B=50mA
*$V_{BE(sat)}$	-	-	1.2	V	I_C=150mA, I_B=15mA
*$V_{BE(sat)}$	-	-	1.5	V	I_C=500mA, I_B=50mA
h_{FE}	35	-	-	-	V_{CE}=10V, I_C=100μA
h_{FE}	50	-	-	-	V_{CE}=10V, I_C=1mA
h_{FE}	75	-	-	-	V_{CE}=10V, I_C=10mA
*h_{FE}	100	-	300	-	V_{CE}=10V, I_C=150mA
*h_{FE}	35	-	-	-	V_{CE}=1V, I_C=150mA
*h_{FE}	40	-	-	-	V_{CE}=10V, I_C=500mA
f_T	300	-	-	MHz	V_{CE}=20V, I_C=20mA, f=100MHz
Cob	-	-	8	pF	V_{CB}=10V, f=1MHz

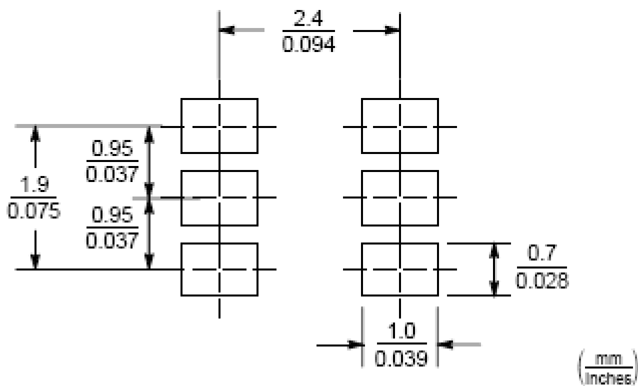
*Pulse Test: Pulse Width ≤380μs, Duty Cycle≤2%

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

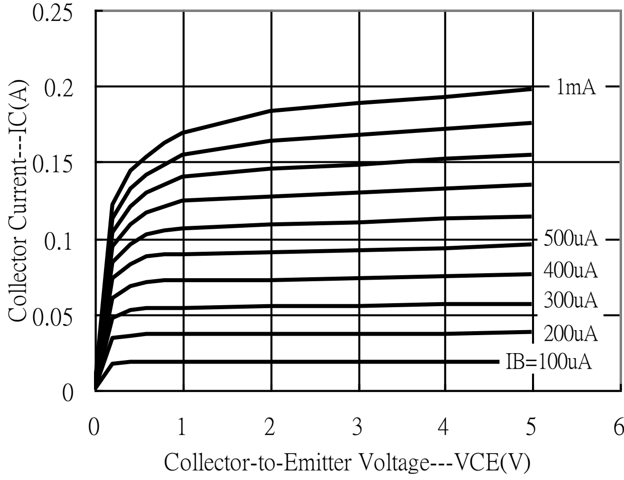
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	-60	-	-	V	I_C=-10μA
BV_{CEO}	-60	-	-	V	I_C=-10mA
BV_{EBO}	-6	-	-	V	I_E=-10μA
I_{CBO}	-	-	-10	nA	V_{CB}=-50V
I_{CEX}	-	-	-50	nA	V_{CE}=-30V, V_{EB}=-0.5V
I_{EBO}	-	-	-100	nA	V_{EB}=-6V
*$V_{CE(sat)}$	-	-	-0.4	V	I_C=-150mA, I_B=-15mA
*$V_{CE(sat)}$	-	-	-1	V	I_C=-500mA, I_B=-50mA
*$V_{BE(sat)}$	-	-	-1.2	V	I_C=-150mA, I_B=-15mA
*$V_{BE(sat)}$	-	-	-1.5	V	I_C=-500mA, I_B=-50mA
h_{FE}	75	-	-	-	V_{CE}=-10V, I_C=-100μA
h_{FE}	100	-	-	-	V_{CE}=-10V, I_C=-1mA
h_{FE}	100	-	-	-	V_{CE}=-10V, I_C=-10mA
*h_{FE}	100	-	300	-	V_{CE}=-10V, I_C=-150mA
*h_{FE}	50	-	-	-	V_{CE}=-10V, I_C=-500mA
f_T	200	-	-	MHz	V_{CE}=-20V, I_C=-50mA, f=100MHz
Cob	-	-	8	pF	V_{CB}=-10V, f=1MHz

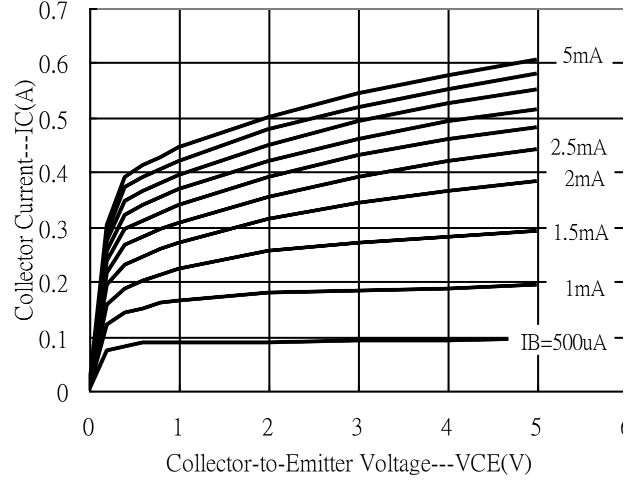
*Pulse Test: Pulse Width ≤380μs, Duty Cycle≤2%

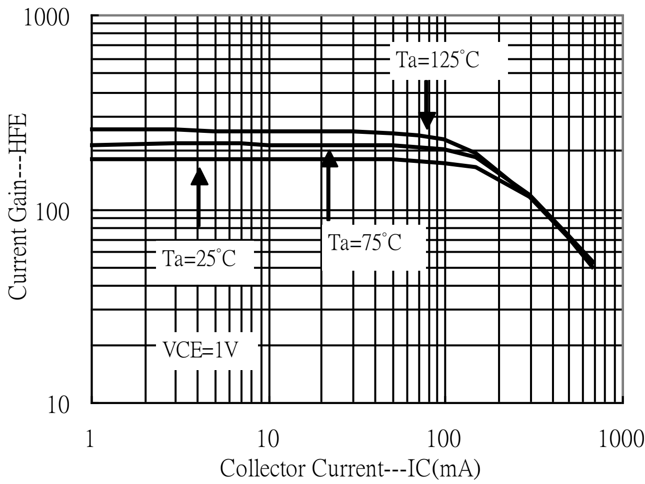
Recommended Soldering Footprint

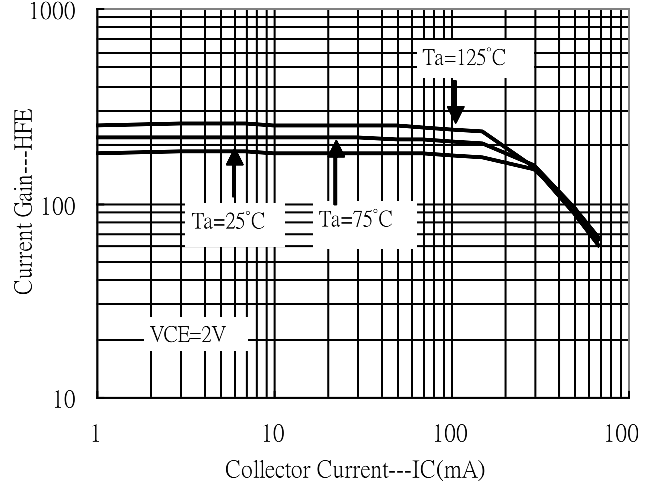


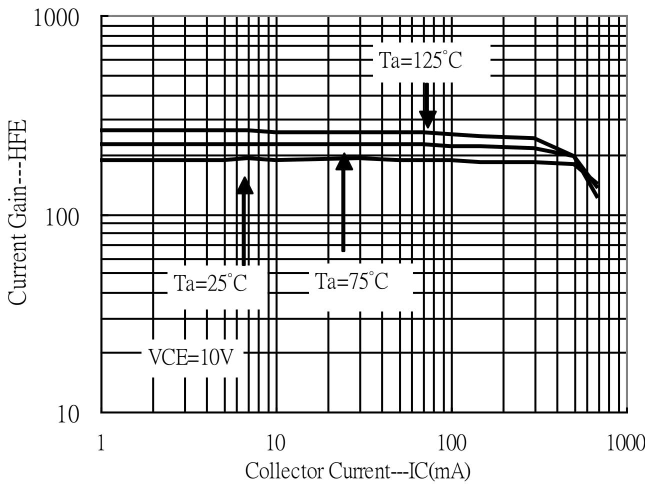
Q1, NPN Typical Characteristics

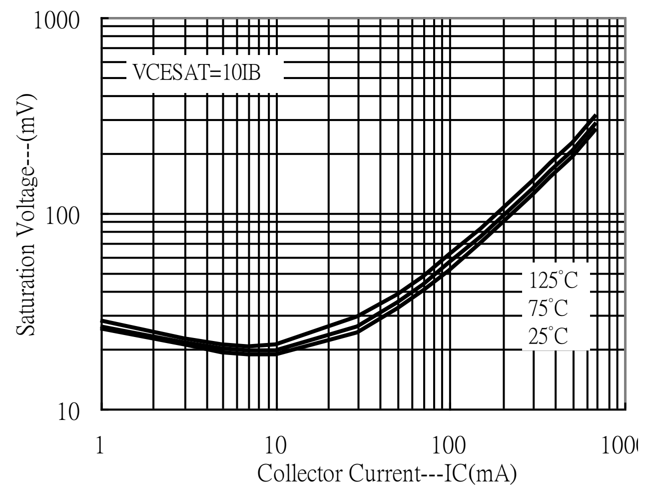












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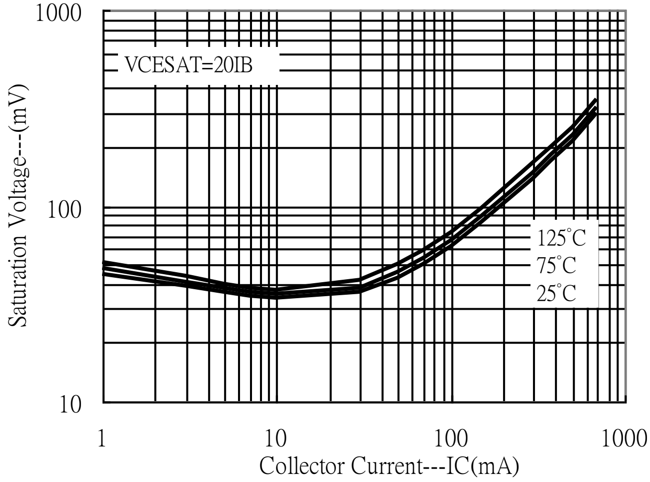
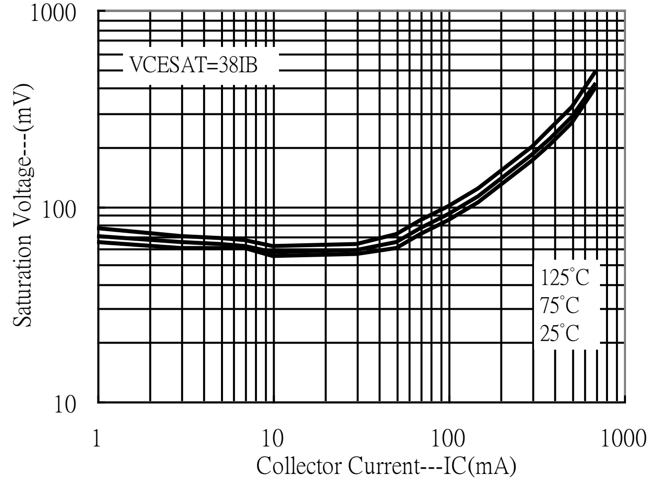
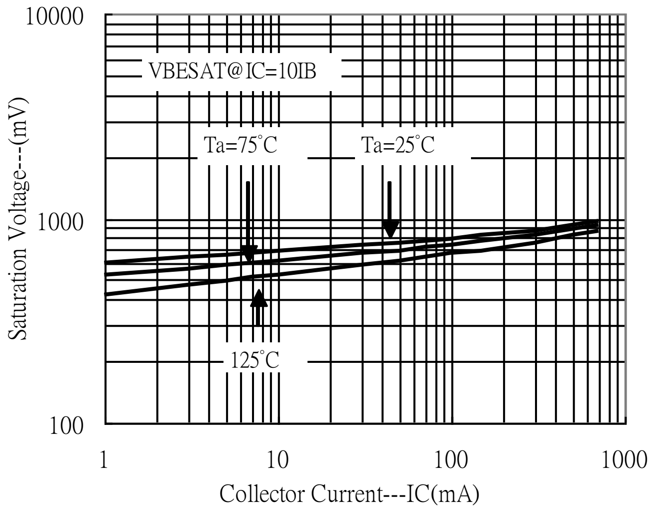
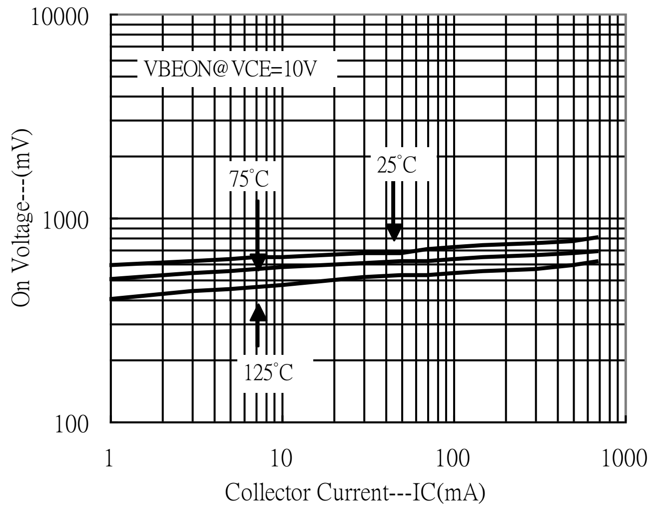
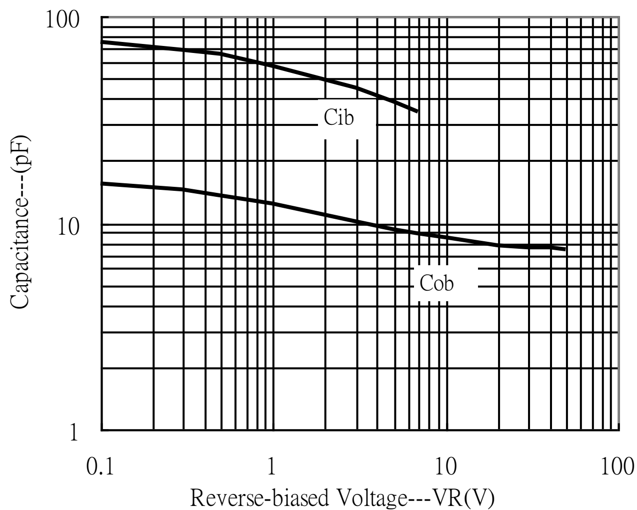
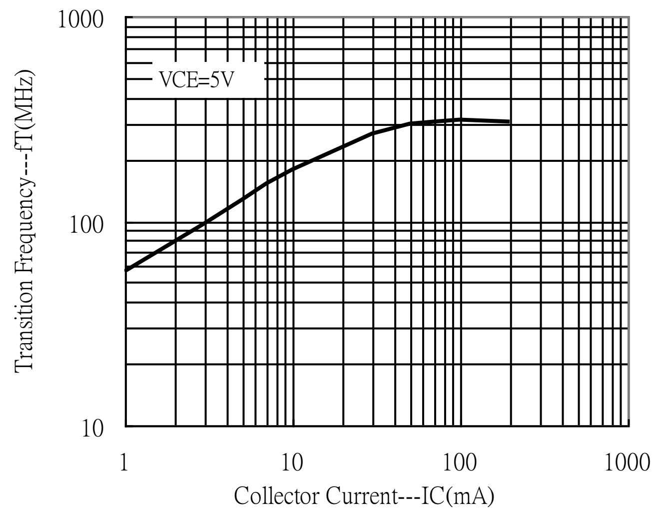




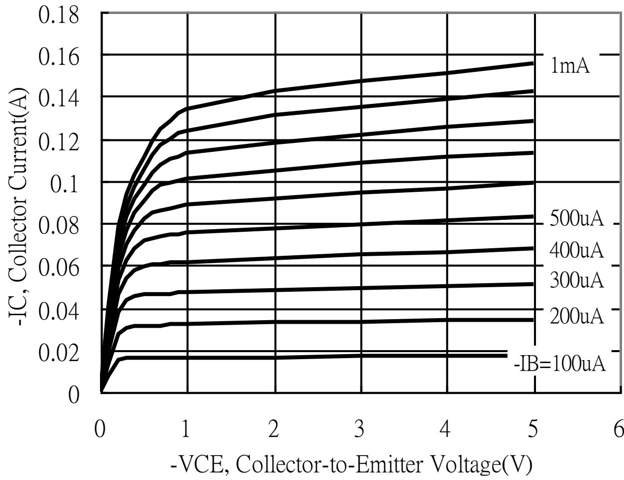


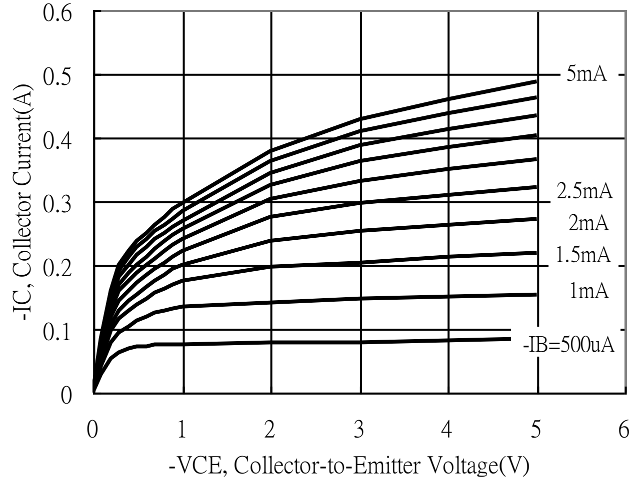


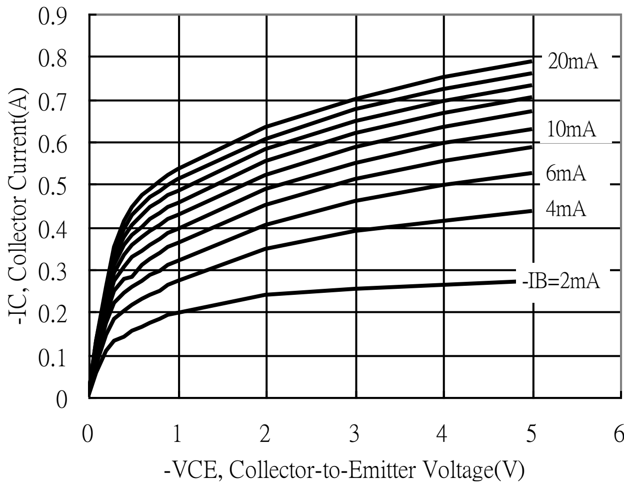


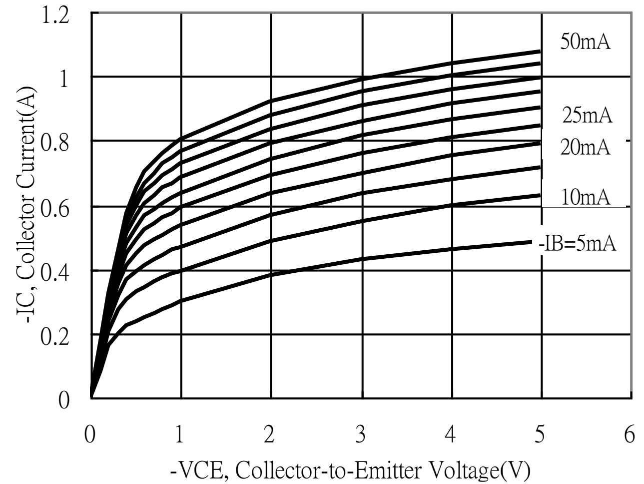


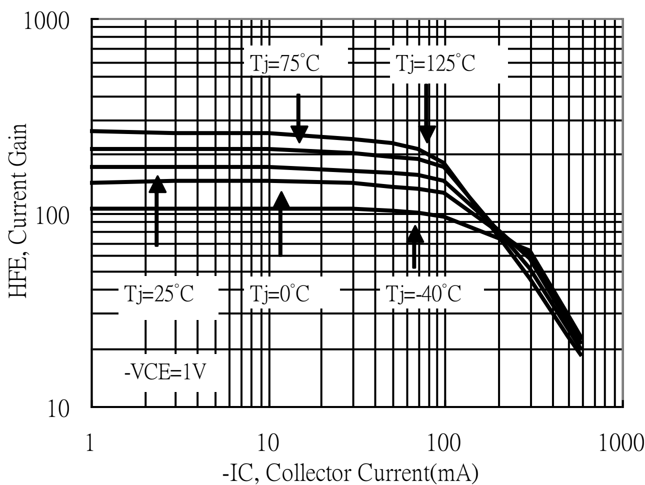
Q2, PNP Typical Characteristics

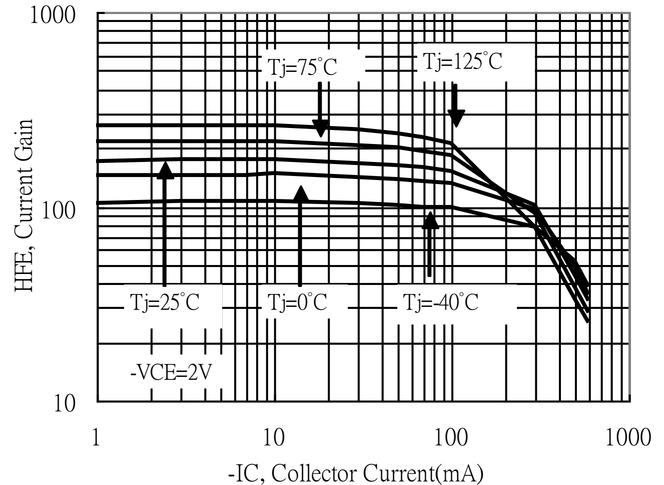












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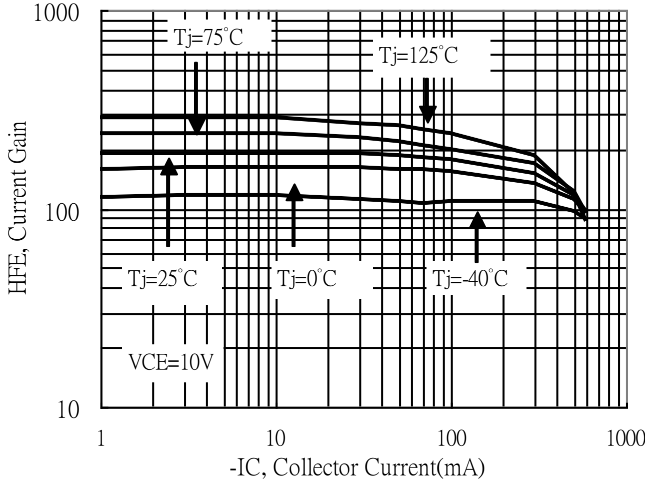
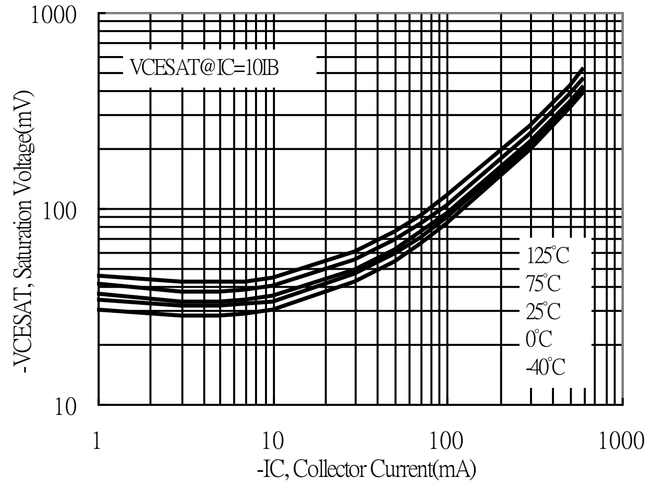
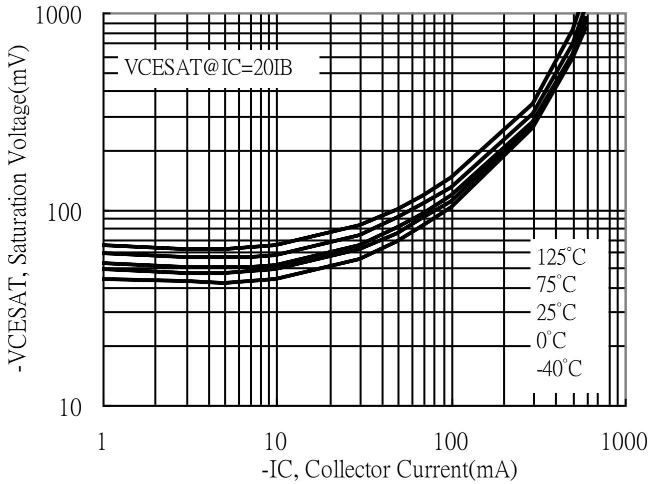
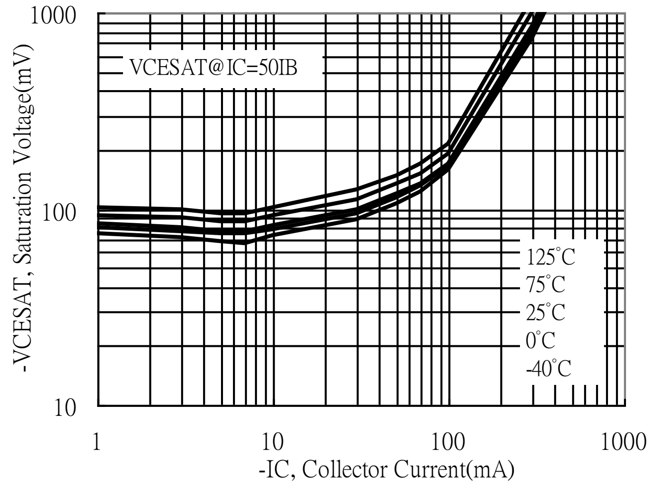
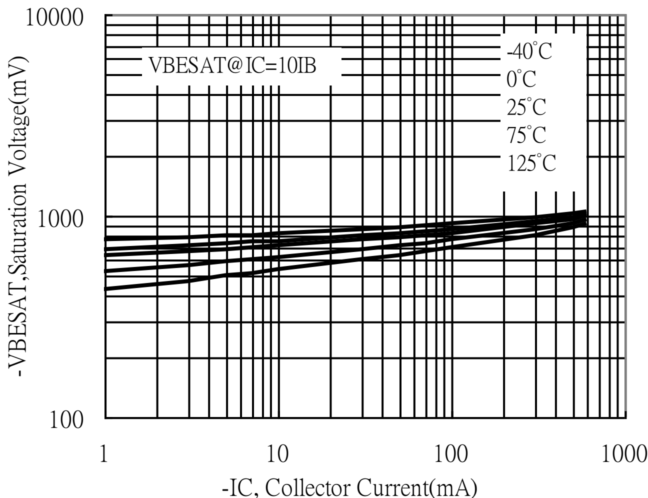
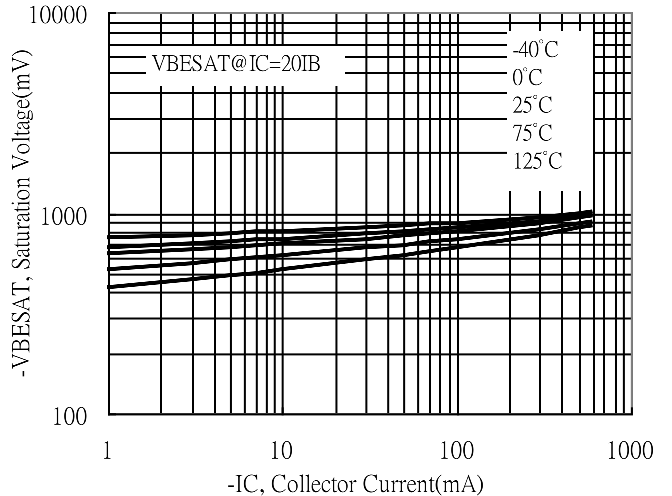




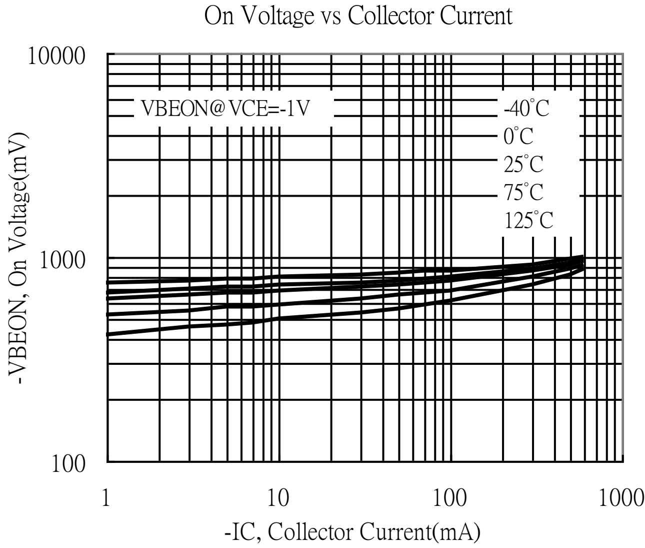


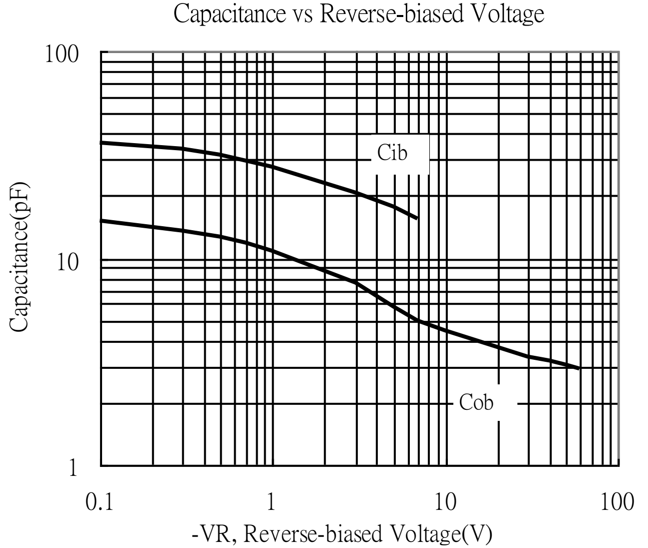


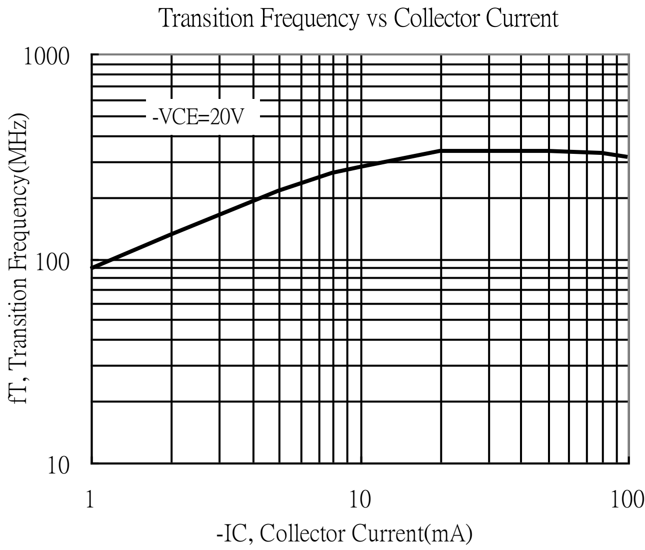


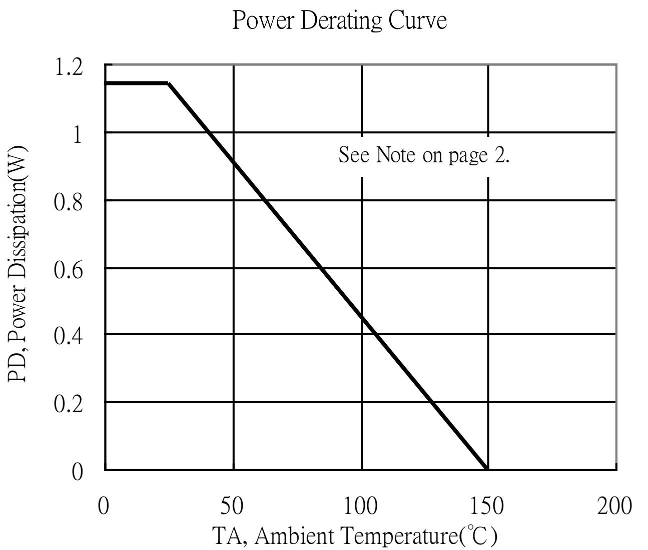


Q2, PNP Typical Characteristics (Cont.)









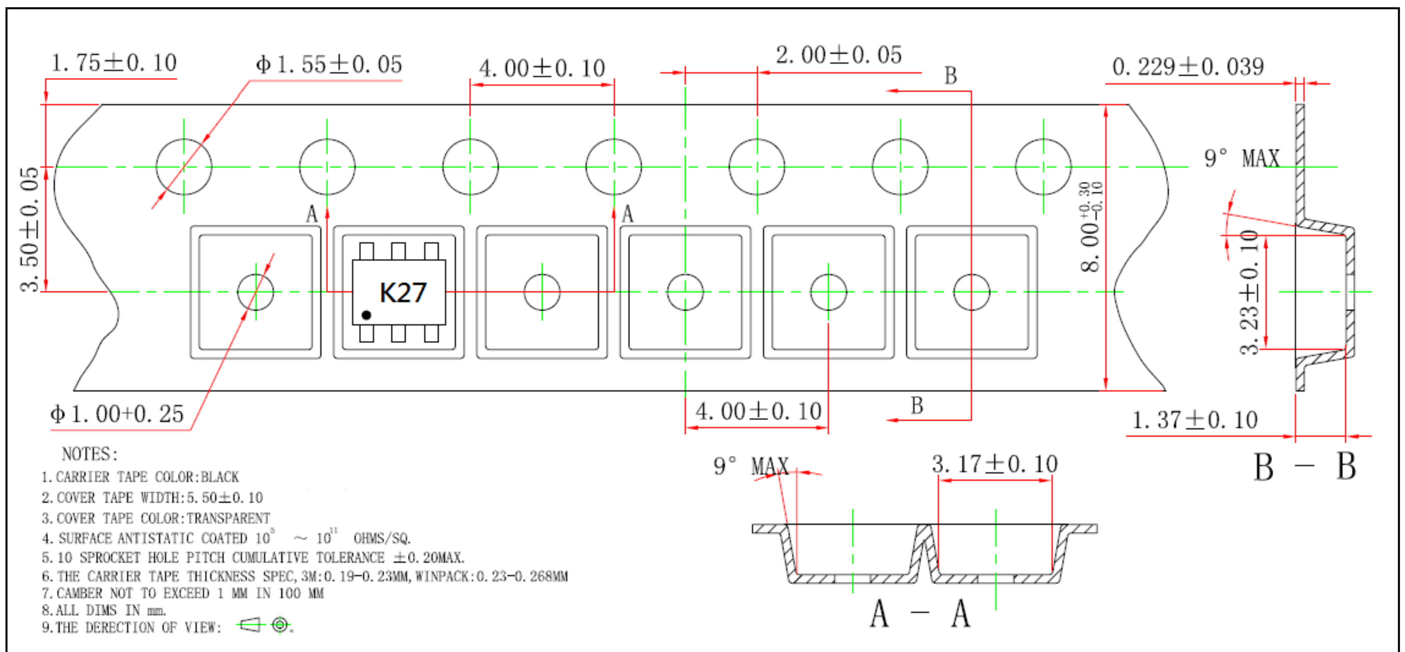
Reel Dimension

A=9.0±0.05
Ao=12.0±0.05
B=1.5±0.3
ΦC=60 +1/-0

UNLESS OTHERWISE SPECIFIED
.X ±0.3 .XXX ±0.02
.XX ±0.10 .XXXX ±0.005
ANGLE SPECIFIED
.X° ±0.5°
ALL DIEMNSIONS IN MILLIMETER

NOTE : **1.Material : Anti-static polystyrene.**
2.Surface resistity : 10^9ohm/square

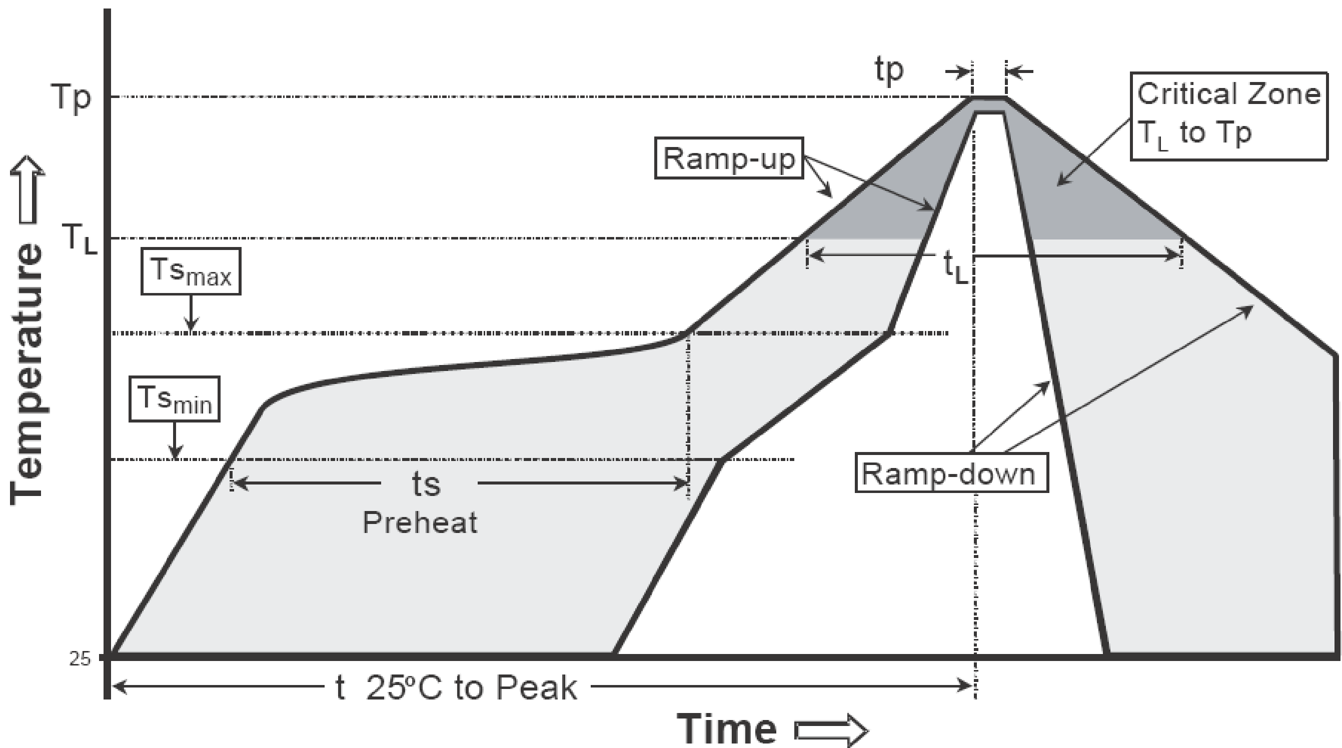
Carrier Tape Dimension



Recommended wave soldering condition

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

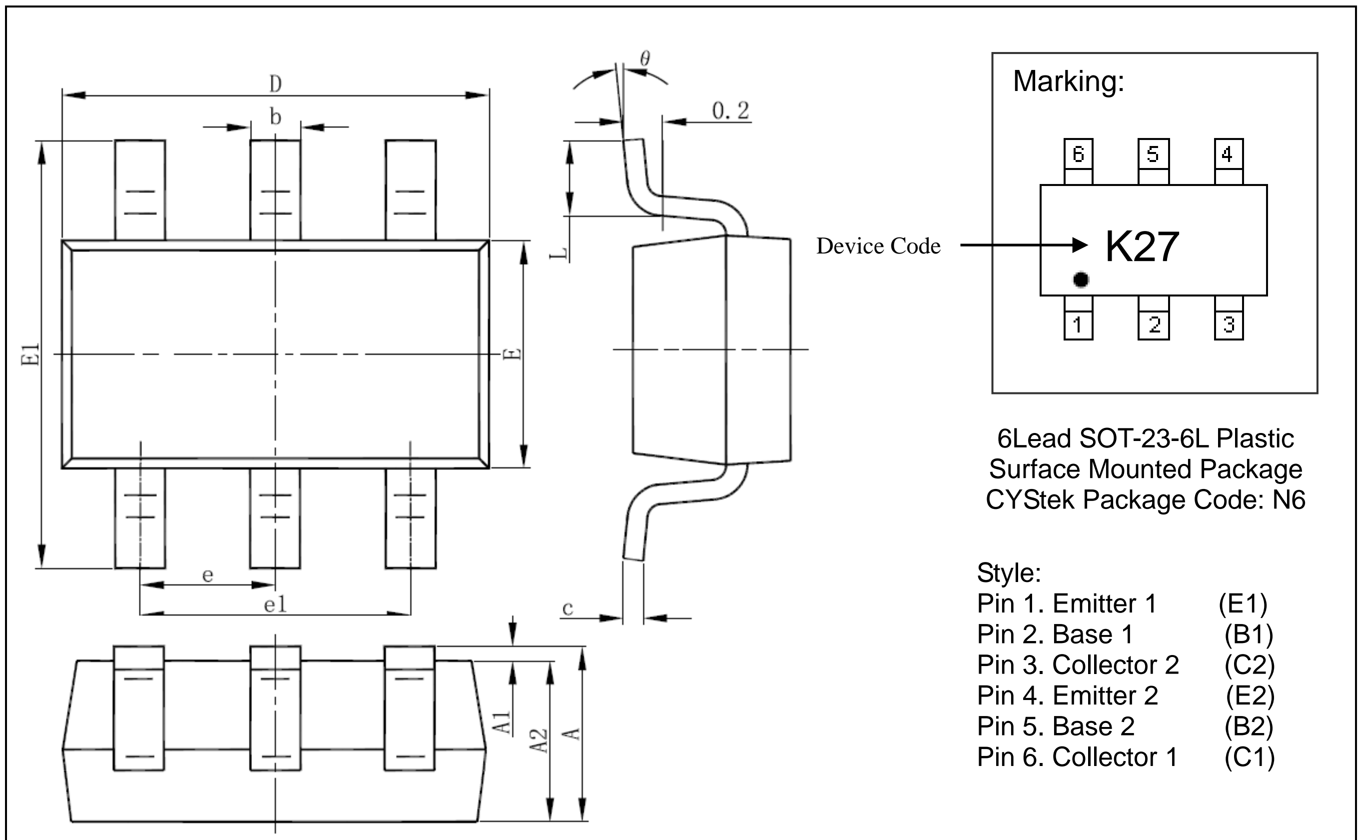
Recommended temperature profile for IR reflow



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.

SOT-23-6L Dimension



6Lead SOT-23-6L Plastic
Surface Mounted Package
CYStek Package Code: N6

Style:
Pin 1. Emitter 1 (E1)
Pin 2. Base 1 (B1)
Pin 3. Collector 2 (C2)
Pin 4. Emitter 2 (E2)
Pin 5. Base 2 (B2)
Pin 6. Collector 1 (C1)

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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