Low Vcesat NPN Epitaxial Planar Transistor

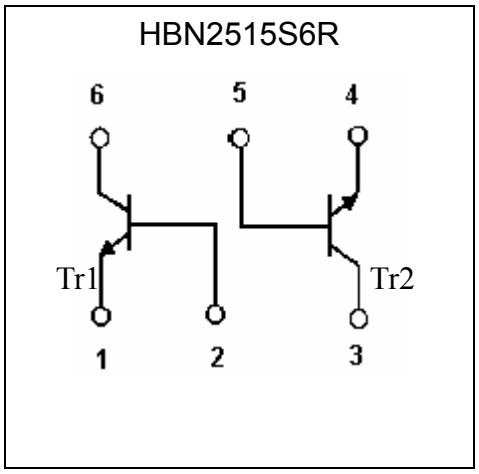
HBN2515S6R

(Dual Transistors)

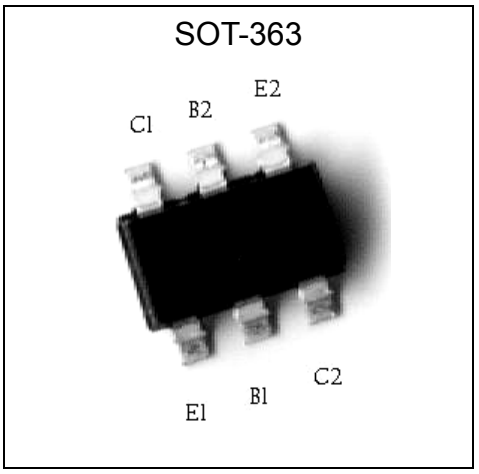
Features

- Two BTD2515 chips in a SOT-363 package.
- Mounting possible with SOT-323 automatic mounting machines.
- Transistor elements are independent, eliminating interference.
- Mounting cost and area can be cut in half.
- Low V_{CE}(sat), V_{CE}(sat)=25mV (max), at I_C / I_B = 10mA / 0.5mA.
- Weight : 9.1mg, approximately.
- Pb-free package.

Equivalent Circuit



Outline



The following characteristics apply to both Tr1 and Tr2

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V_{CBO}	20	V
Collector-Emitter Voltage	V_{CEO}	15	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current (DC)	I_C	800	mA
Collector Current (Pulse)	I_{CP}	1.5 (Note 1)	A
Power Dissipation	Pd	200 (total) (Note 2)	mW
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-55~+150	°C

Note : 1.Single pulse, Pw=10ms
2.150mW per element must not be exceeded.

Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	20	-	-	V	I_C=100μA, I_E=0
BV_{CEO}	15	-	-	V	I_C=2mA, I_B=0
BV_{EBO}	6	-	-	V	I_E=100μA, I_C=0
I_{CBO}	-	-	100	nA	V_{CB}=15V, I_E=0
I_{EBO}	-	-	100	nA	V_{EB}=6V, I_C=0
*$V_{CE(sat)}$1	-	-	25	mV	I_C=10mA, I_B=0.5mA
*$V_{CE(sat)}$2	-	-	150	mV	I_C=200mA, I_B=10mA
*$V_{CE(sat)}$3	-	-	250	mV	I_C=500mA, I_B=50mA
*$R_{CE(sat)}$	-	-	500	mΩ	I_C=500mA, I_B=50mA
*$V_{BE(sat)}$	-	-	1.1	V	I_C=500mA, I_B=50mA
*$V_{BE(on)}$	-	-	0.9	V	V_{CE}=2V, I_C=100mA
*h_{FE}1	160	-	-	-	V_{CE}=1V, I_C=10mA
*h_{FE}2	180	-	560	-	V_{CE}=1V, I_C=100mA
*h_{FE}3	150	-	-	-	V_{CE}=1V, I_C=500mA
f_T	100	300	-	MHz	V_{CE}=10V, I_C=50mA, f=100MHz
Cob	-	6.5	-	pF	V_{CB}=10V, f=1MHz

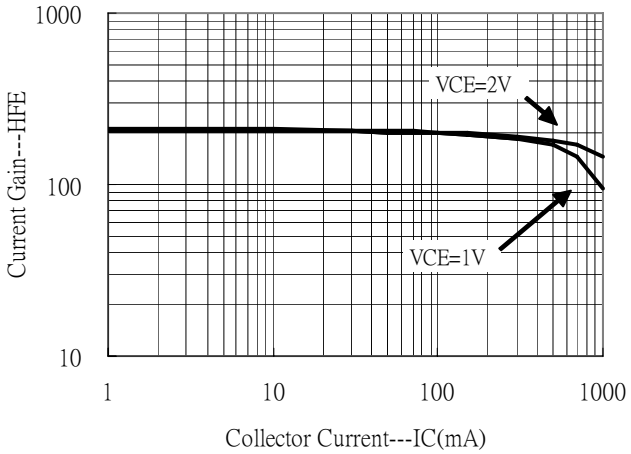
*Pulse Test : Pulse Width ≤380μs, Duty Cycle≤2%

Ordering Information

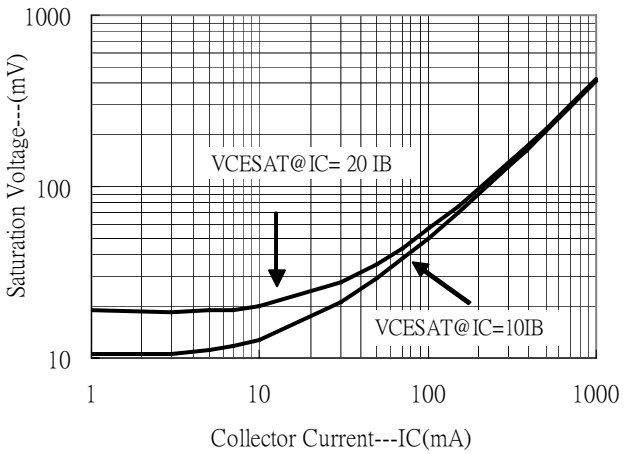
Device	Package	Shipping	Marking
HBN2515S6R	SOT-363 (Pb-free)	3000 pcs / Tape & Reel	BS

Characteristic Curves

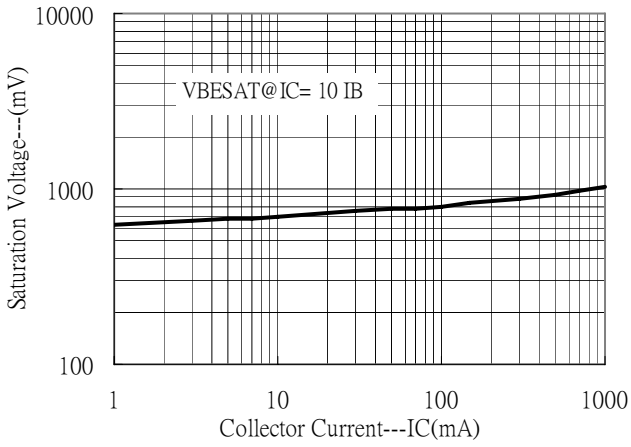
Current Gain vs Collector Current



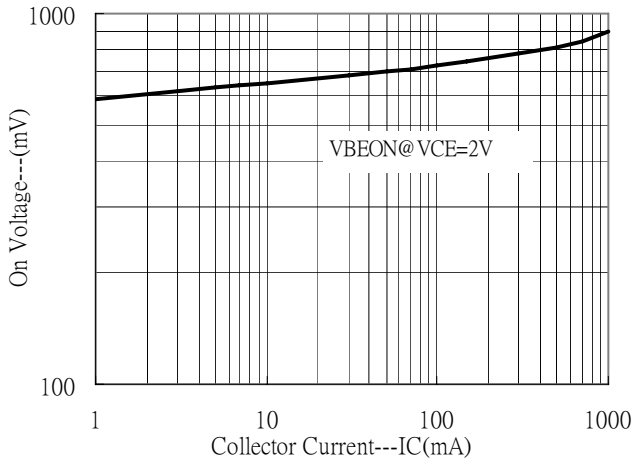
Saturation Voltage vs Collector Current



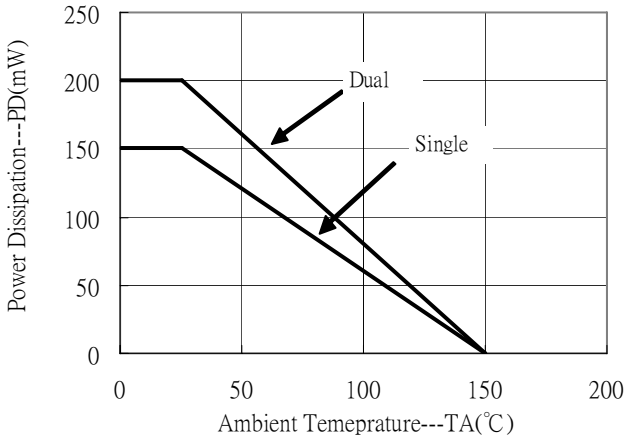
Saturation Voltage vs Collector Current



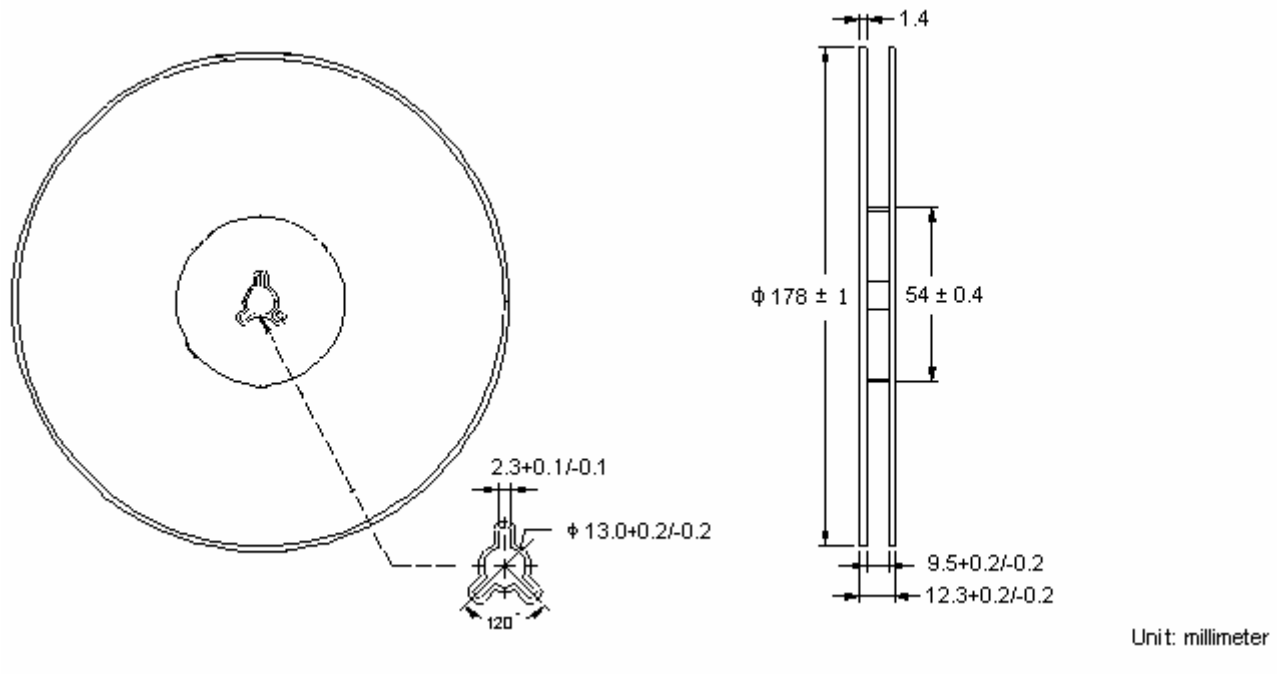
On Voltage vs Collector Current



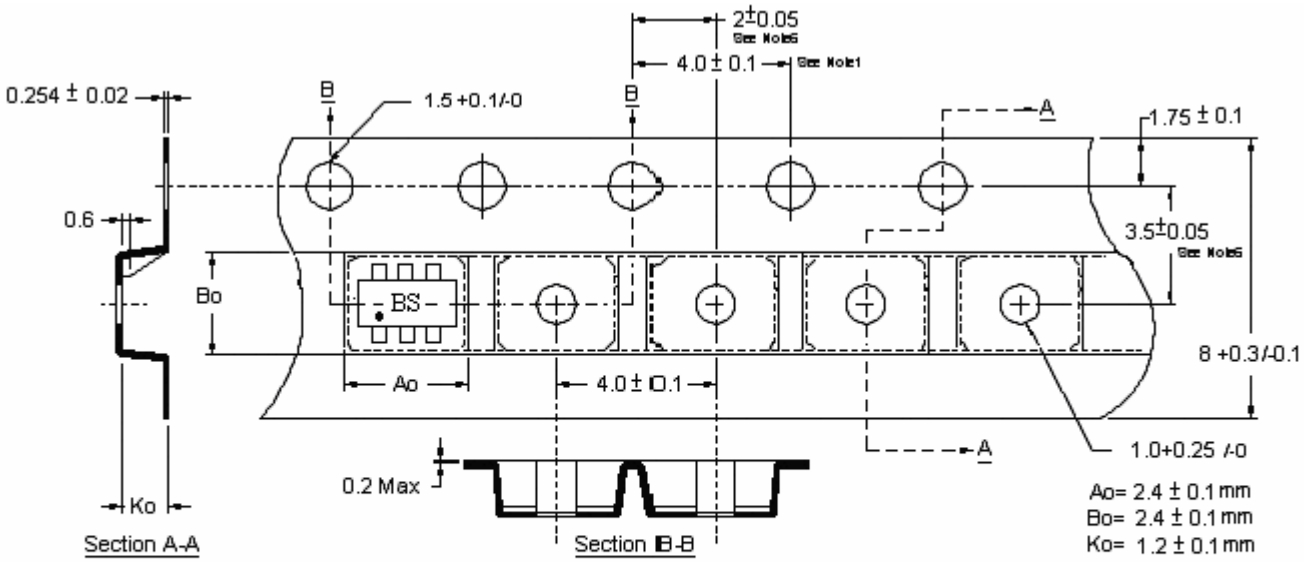
Power Derating Curve



Reel Dimension



Carrier Tape Dimension



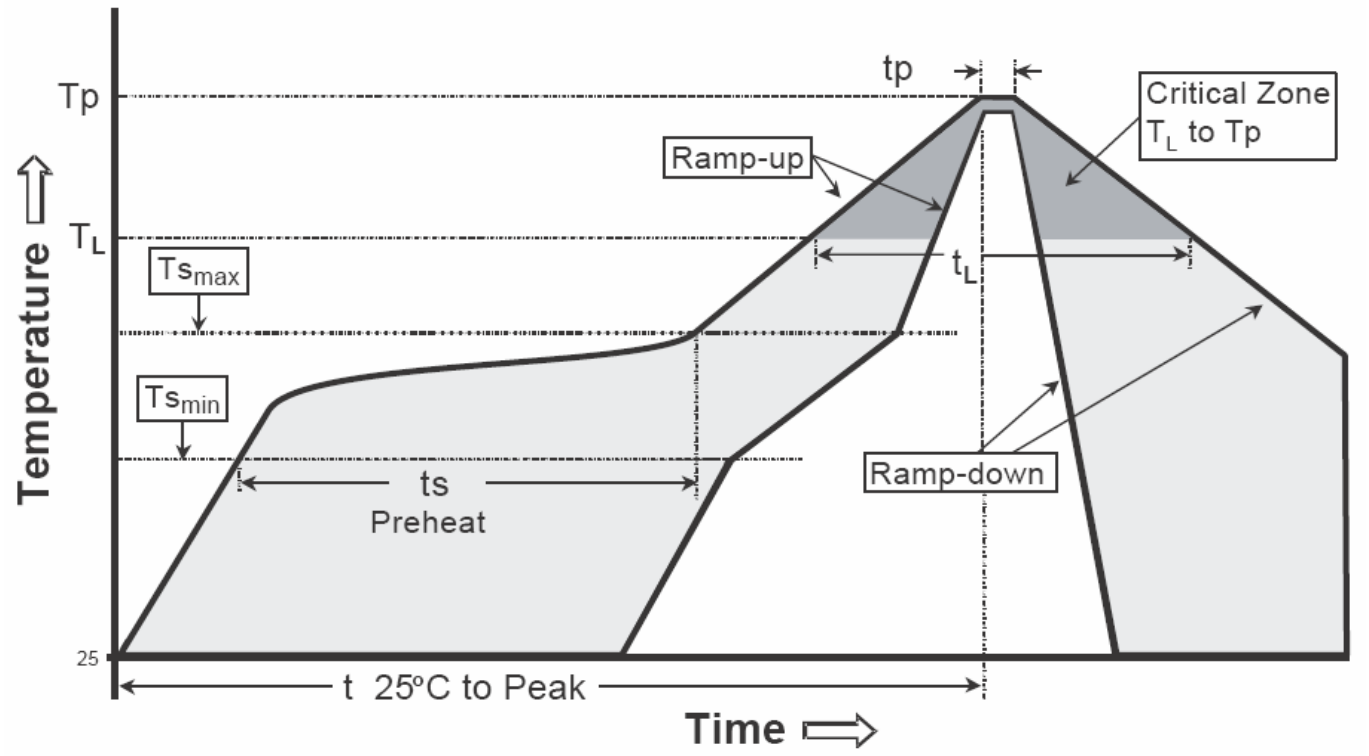
Notes:
1. 10 sprocket hole pitch cumulative tolerace ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: Conductive Black Advantek Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of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

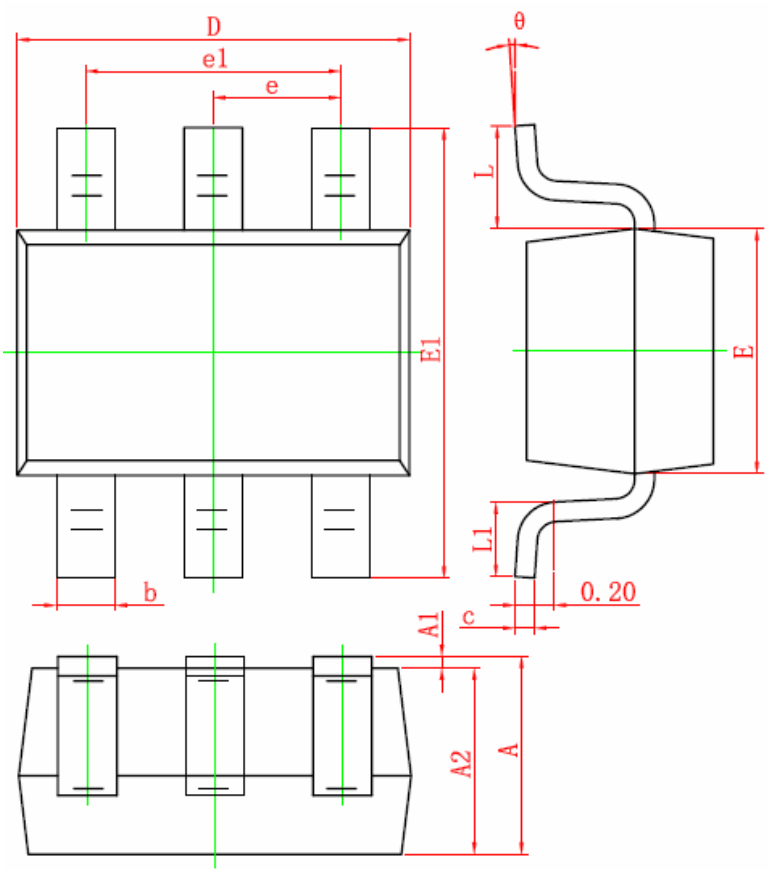
Recommended temperature profile for IR reflow



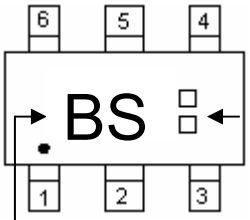
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\ min}$ to $t_{s\ max}$)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (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-363 Dimension



Marking:



Date Code:
Year + Month
Year : 6→2006, 7→2007,…, etc
Month : 1→Jan 2→Feb, …, 9→Sep, A→Oct, B→Nov, C→Dec

Device Code

6-Lead SOT-363R Plastic Surface Mounted Package
CYStek Package Code: S6R

Style:
Pin 1. Emitter1 (E1)
Pin 2. Base1 (B1)
Pin 3. Collector2 (C2)
Pin 4. Emitter2 (E2)
Pin 5. Base2 (B2)
Pin 6. Collector1 (C1)

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043	E1	2.150	2.450	0.085	0.096
A1	0.000	0.100	0.000	0.004	e	0.650 TYP		0.026 TYP	
A2	0.900	1.000	0.035	0.039	e1	1.200	1.400	0.047	0.055
b	0.150	0.350	0.006	0.014	L	0.525 REF		0.021 REF	
c	0.080	0.150	0.003	0.006	L1	0.260	0.460	0.010	0.018
D	2.000	2.200	0.079	0.087	θ	0°	8°	0°	8°
E	1.150	1.350	0.045	0.053					

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.