

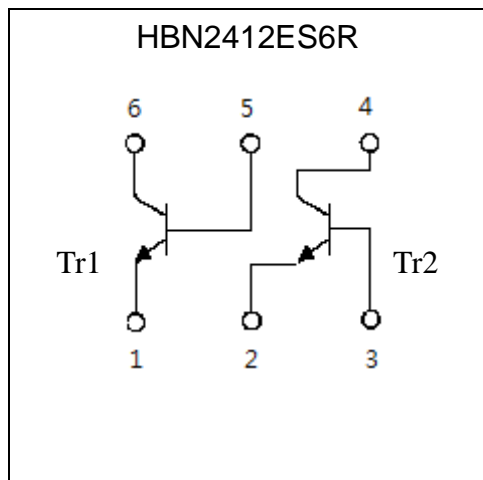
**General Purpose NPN Epitaxial Planar Transistors
 (dual transistors)**

HBN2412ES6R

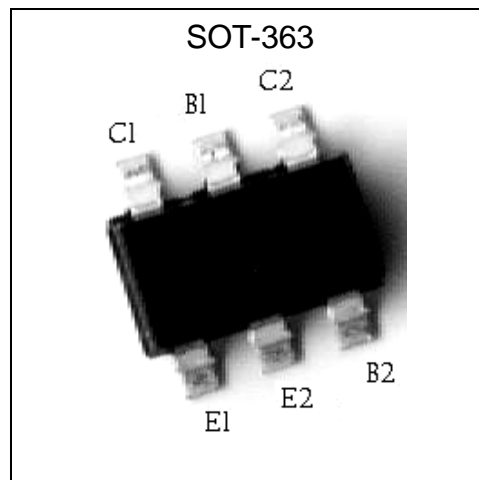
Features

- Two BTC2412 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 Cob. Typ. Cob=2.0pF.
- Complementary to HBP1037ES6R.
- Pb-free package.

Equivalent Circuit

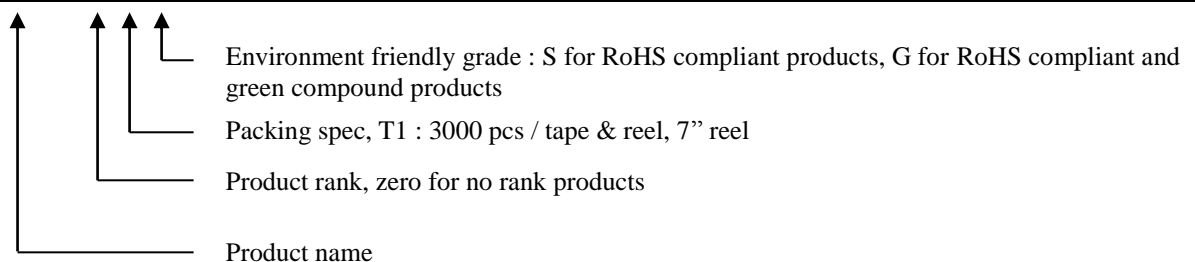


Outline



Ordering Information

Device	Package	Shipping
HBN2412ES6R-X-T1-G	SOT-363 (Pb-free lead plating and halogen-free package)	3000 pcs / tape & reel





The following characteristics apply to both Tr1 and Tr2

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V _{CB0}	60	V
Collector-Emitter Voltage	V _{CEO}	50	V
Emitter-Base Voltage	V _{EBO}	6	V
Collector Current	I _C	200	mA
Power Dissipation	P _D	200(total) (Note)	mW
Thermal Resistance, Junction to Ambient	R _{θJA}	625	°C/W
Operating Junction Temperature Range	T _j	-55~+150	°C
Storage Temperature Range	T _{stg}	-55~+150	°C

Note : 150mW per element must not be exceeded.

Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV _{CB0}	60	-	-	V	I _C =100μA
BV _{CEO}	50	-	-	V	I _C =1mA
BV _{EBO}	6	-	-	V	I _E =50μA
I _{CB0}	-	-	100	nA	V _{CB} =60V
I _{EBO}	-	-	100	nA	V _{EB} =5V
V _{CE(sat)}	-	-	0.3	V	I _C =100mA, I _B =10mA
V _{BE(sat)}	-	-	1	V	I _C =100mA, I _B =10mA
h _{FE 1}	120	-	420	-	V _{CE} =6V, I _C =1mA
h _{FE}	25	-	-	-	V _{CE} =6V, I _C =150mA
f _T	300	-	-	MHz	V _{CE} =20V, I _C =10mA, f=100MHz
Cob	-	-	4	pF	V _{CB} =5V, f=1MHz

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

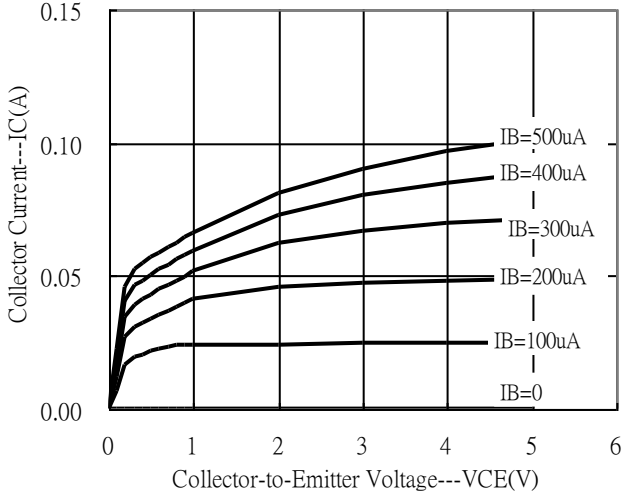
Classification of h_{FE 1}

Rank	Y	G
Range	120~240	200~420

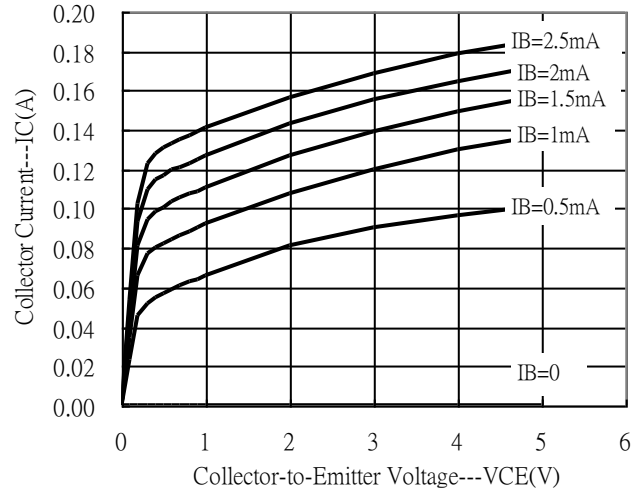


Typical Characteristics

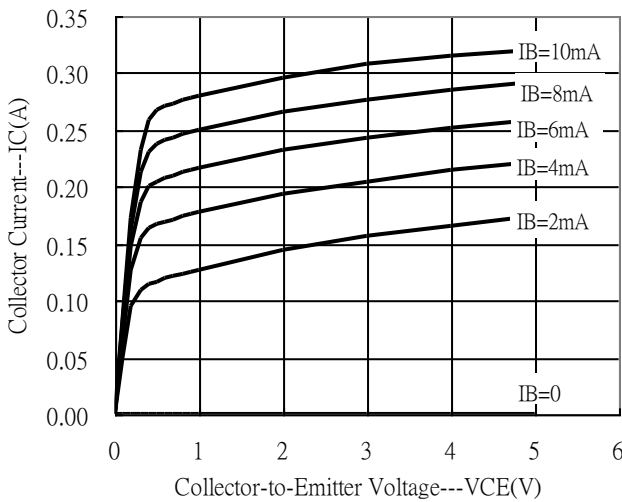
Output Characteristics



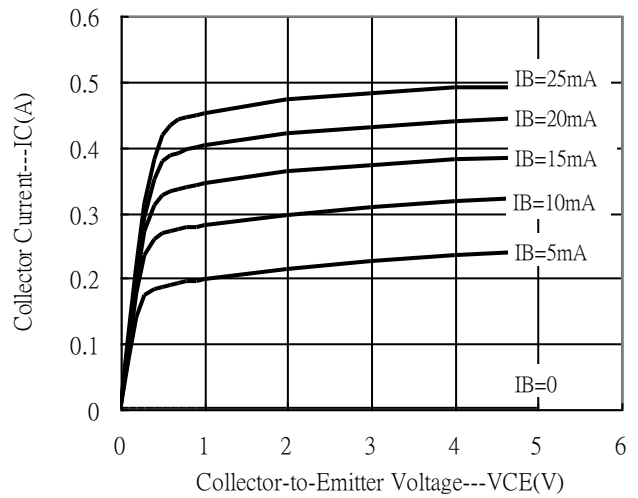
Output Characteristics



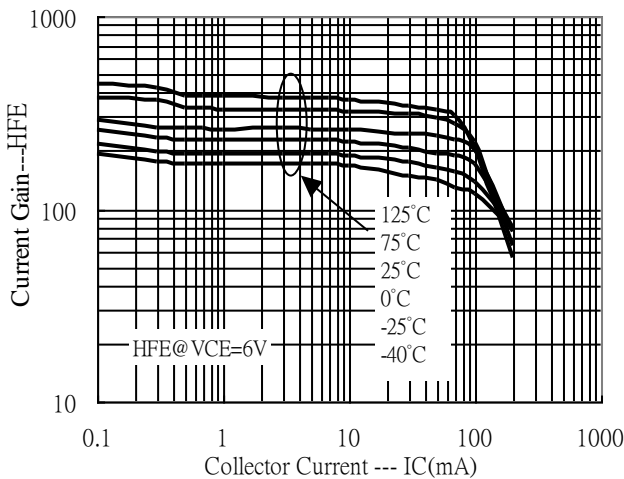
Output Characteristics



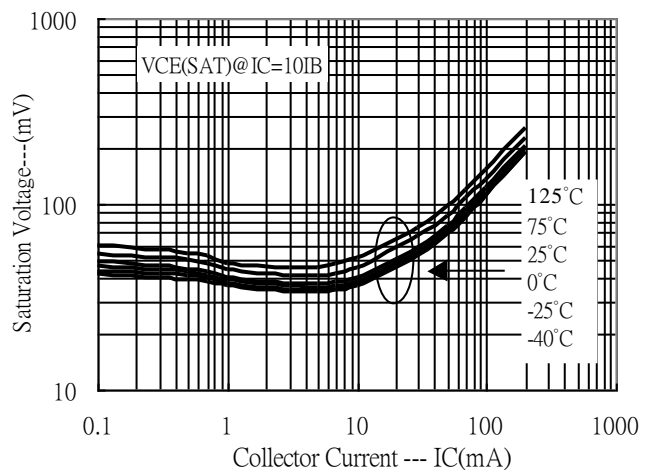
Output Characteristics



Current Gain vs Collector Current

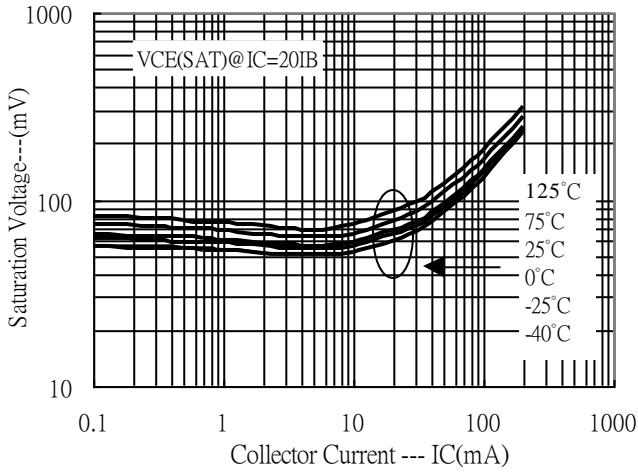


Saturation Voltage vs Collector Current

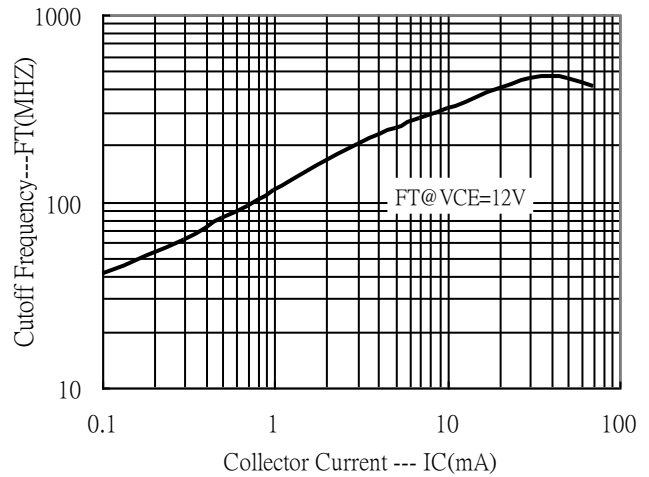


Typical Characteristics(Cont.)

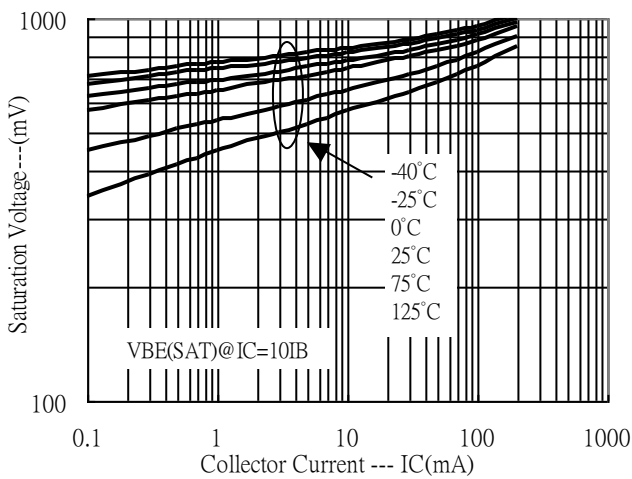
Saturation Voltage vs Collector Current



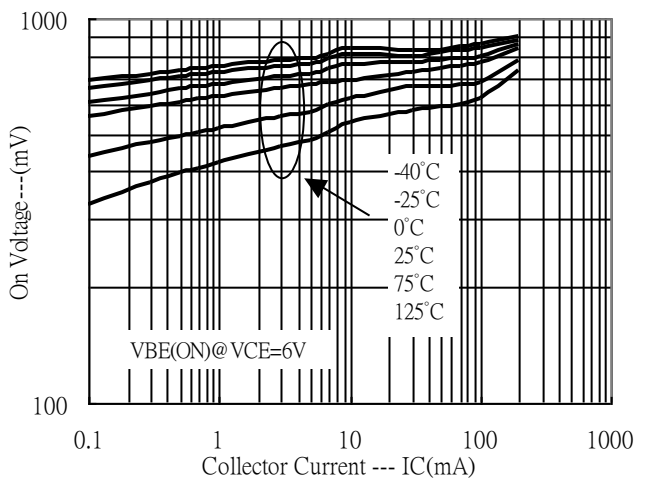
Cutoff Frequency vs Collector Current



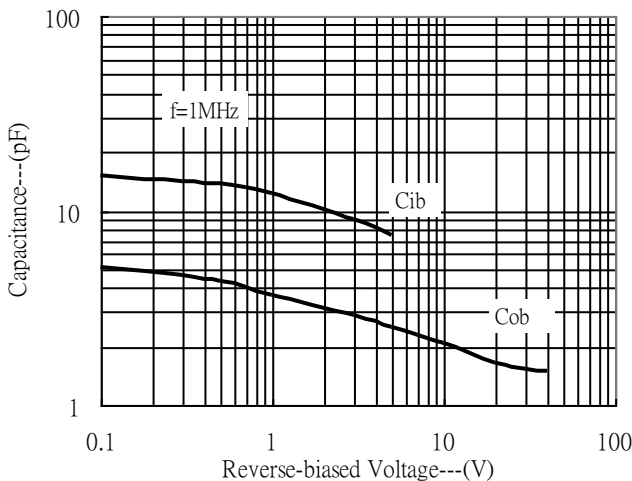
Saturation Voltage vs Collector Current



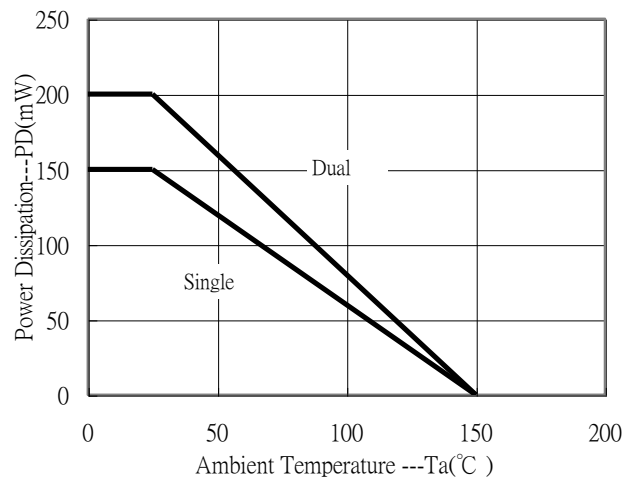
On Voltage vs Collector Current



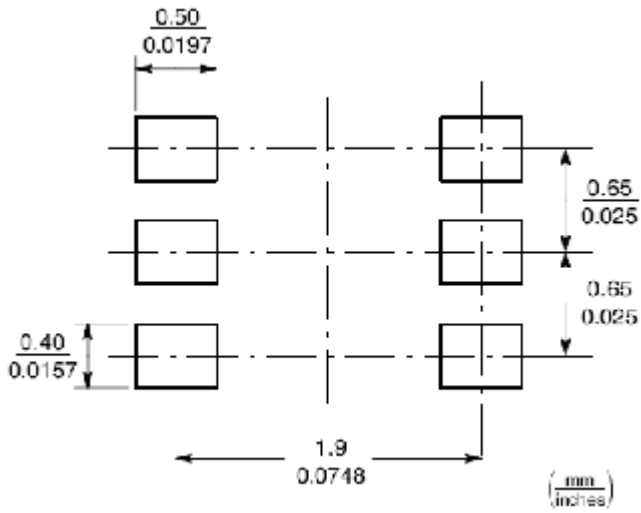
Capacitance Characteristics



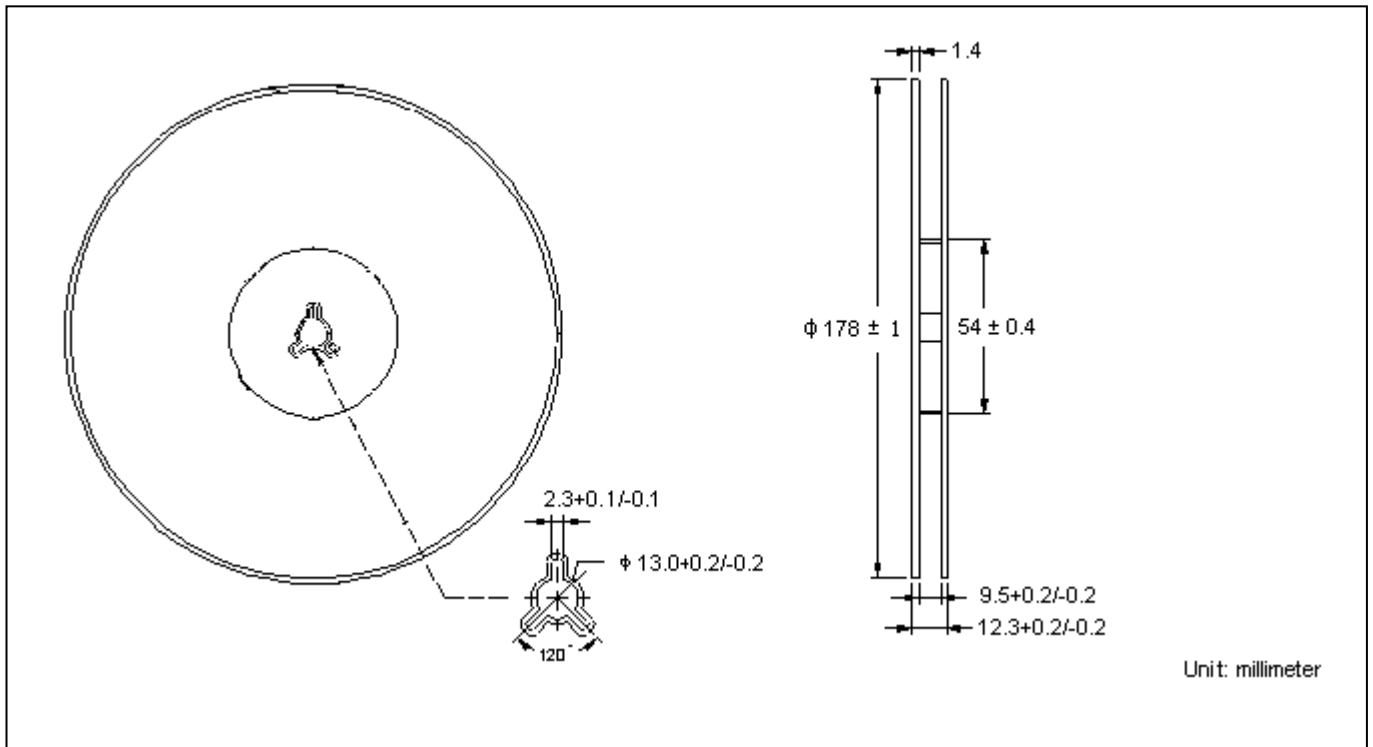
Power Derating Curves



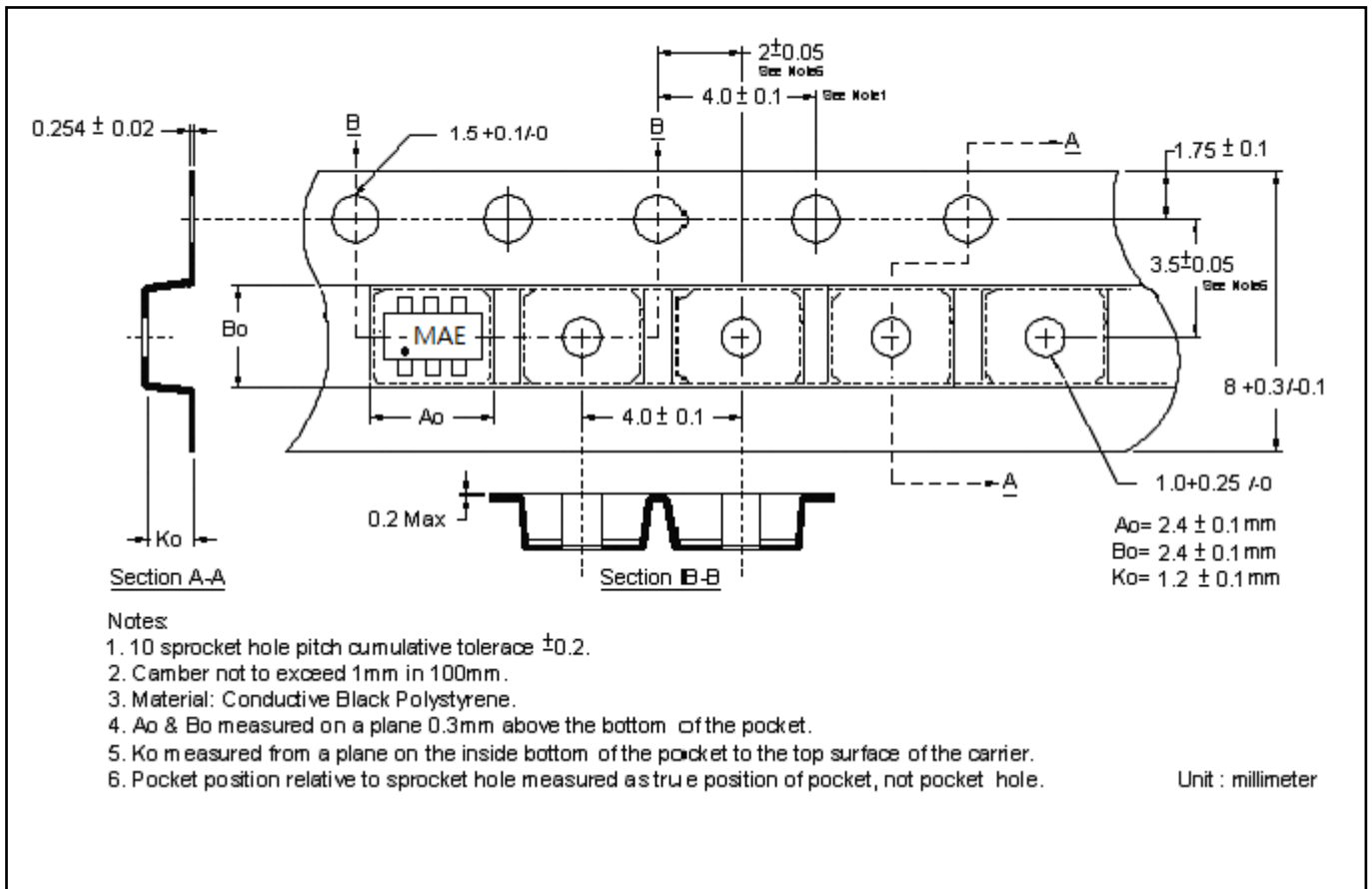
Recommended Soldering Footprint



Reel Dimension



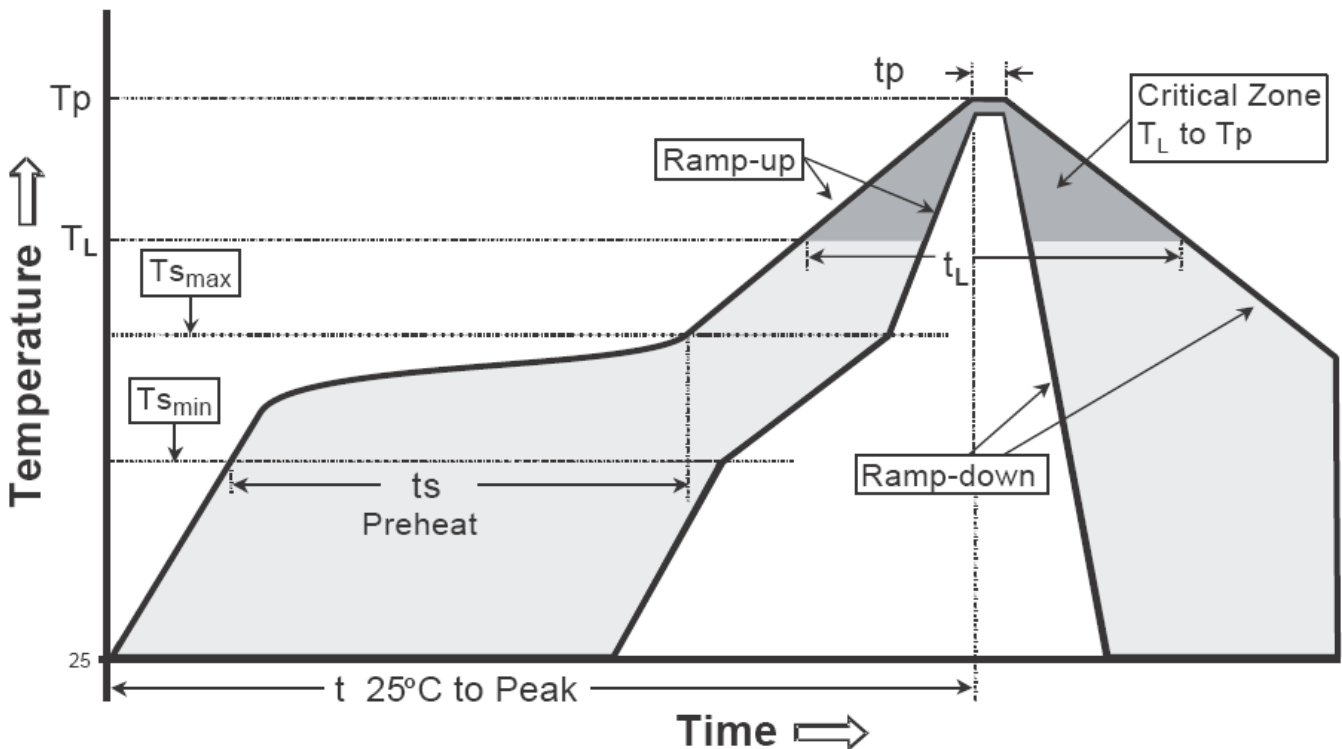
Carrier Tape Dimension



Recommended wave soldering condition

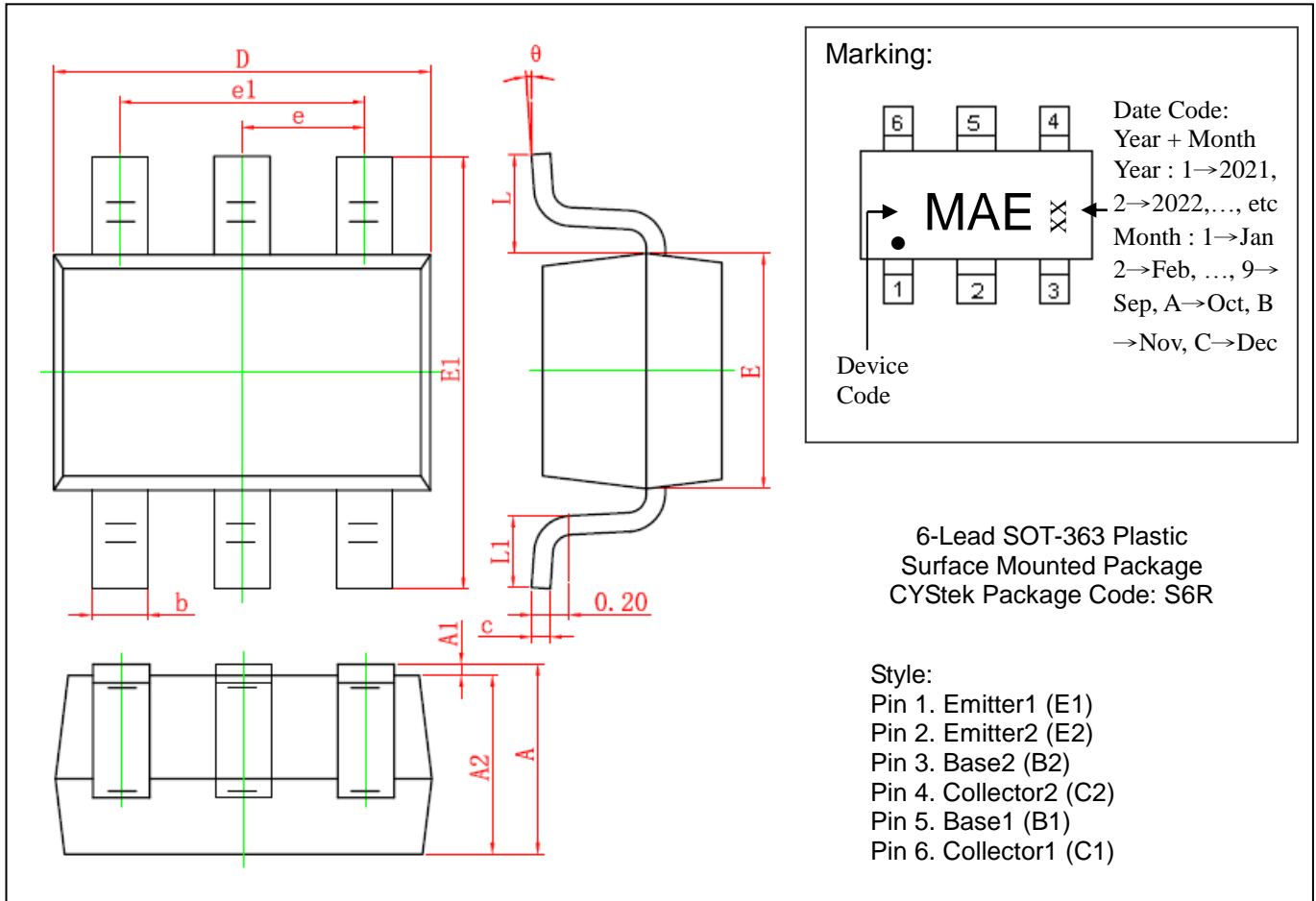
Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

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(Ts min)	100°C	150°C
-Temperature Max(Ts max)	150°C	200°C
-Time(ts min to ts 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.

SOT-363 Dimension



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.

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