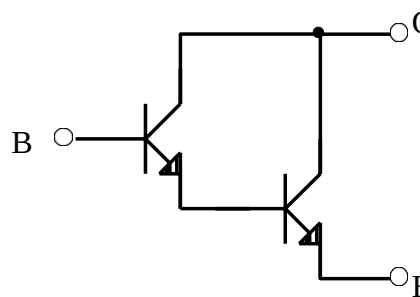
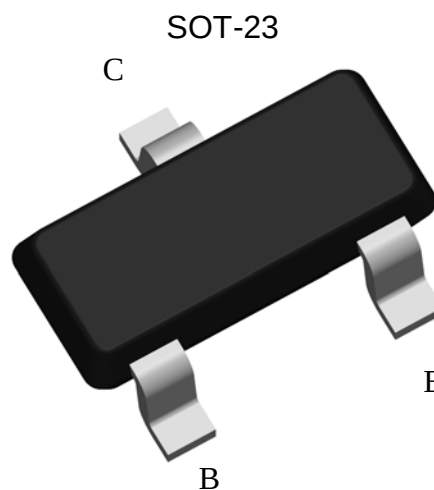


General Purpose NPN Epitaxial Planar Transistor

Description:

- The KWBTNA29 is a darlington amplifier transistor
- Pb-free lead plating and halogen-free package



B : Base
 C : Collector
 E : Emitter

Ordering Information

Device	Package	Shipping
KWBTNA29	SOT-23 (Pb-free lead plating and halogen-free package)	3000 pcs / tape & reel

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V _{CB0}	100	V
Collector-Emitter Voltage	V _{CES}	100	V
Emitter-Base Voltage	V _{EB0}	12	V
Collector Current	I _C	0.5	A
Peak Collector Current	I _{CP}	2	A
Power Dissipation	P _D	500 (Note)	mW
Operating Junction Temperature Range	T _j	-55~+150	°C
Storage Temperature Range	T _{stg}	-55~+150	°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	R _{θJC}	190	°C/W
Thermal Resistance, Junction-to-ambient, max (Note)	R _{θJA}	250	

Note : Device is mounted on an FR-4 PCB, single sided, 1oz. copper, tin plated, mounting pad for collector 15mm x15 mm.

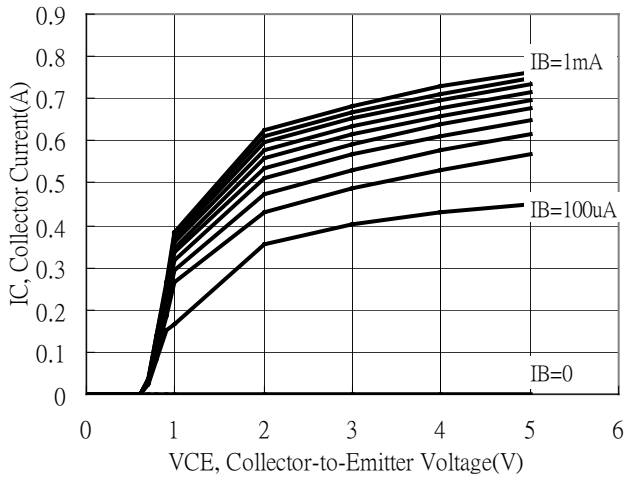
Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV _{CB0}	100	145	-	V	I _C =100μA
BV _{CES}	100	135	-	V	I _C =100μA, V _{BE} =0V
BV _{EB0}	12	18	-	V	I _E =10μA
I _{CB0}	-	-	100	nA	V _{CB} =80V
I _{CES}	-	-	500	nA	V _{CE} =80V
I _{EB0}	-	-	100	nA	V _{EB} =10V
*V _{CE(sat)}	-	0.71	1.0	V	I _C =10mA, I _B =0.01mA
*V _{CE(sat)}	-	0.84	1.1	V	I _C =100mA, I _B =0.1mA
*V _{CE(sat)}	-	-	1.2	V	I _C =500mA, I _B =5mA
*V _{BE(sat)}	-	1.4	1.8	V	I _C =100mA, I _B =0.1mA
*V _{BE(on)}	-	1.35	2.0	V	V _{CE} =5V, I _C =100mA
*h _{FE} 1	10K	-	-		V _{CE} =5V, I _C =10mA
*h _{FE} 2	15K	-	-		V _{CE} =5V, I _C =100mA
*h _{FE} 3	1K	-	-		V _{CE} =5V, I _C =500mA
f _T	125	200	-	MHz	V _{CE} =5V, I _C =10mA, f=100MHz
C _{ob}	-	5	8	pF	V _{CB} =10V, f=100MHz

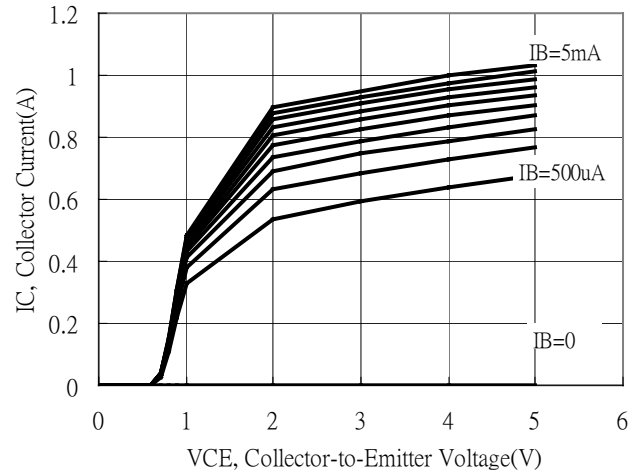
*Pulse Test: Pulse Width ≤300μs, Duty Cycle≤2%

Typical Characteristics

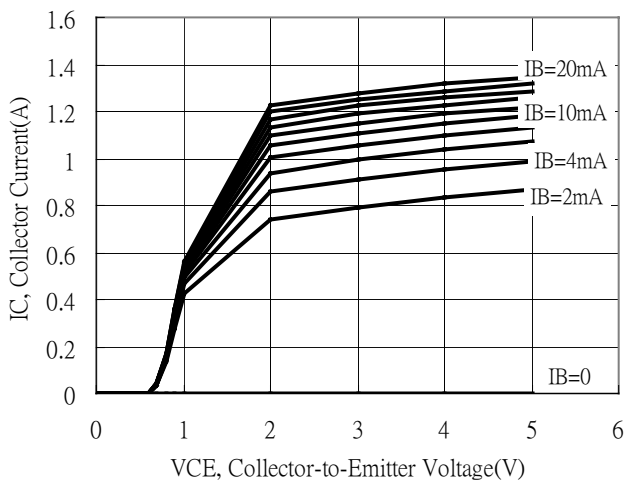
Emitter Grounded Output Characteristics



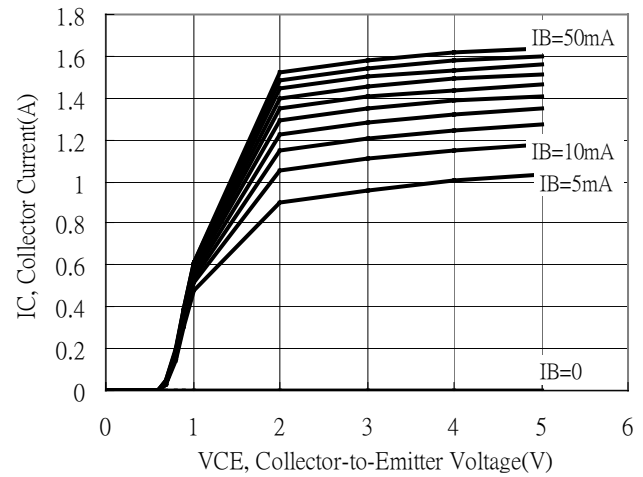
Emitter Grounded Output Characteristics



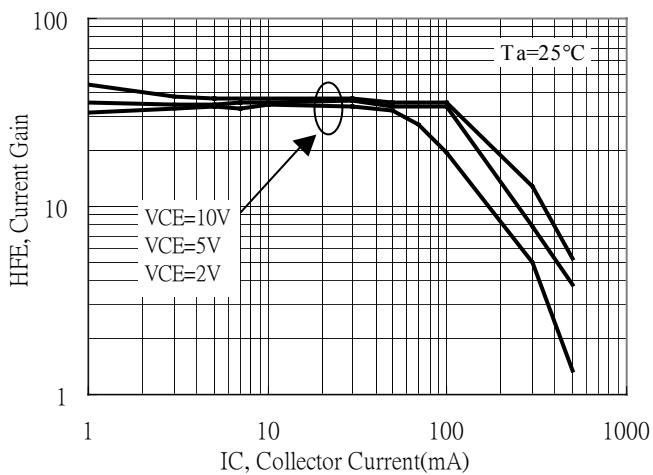
Emitter Grounded Output Characteristics



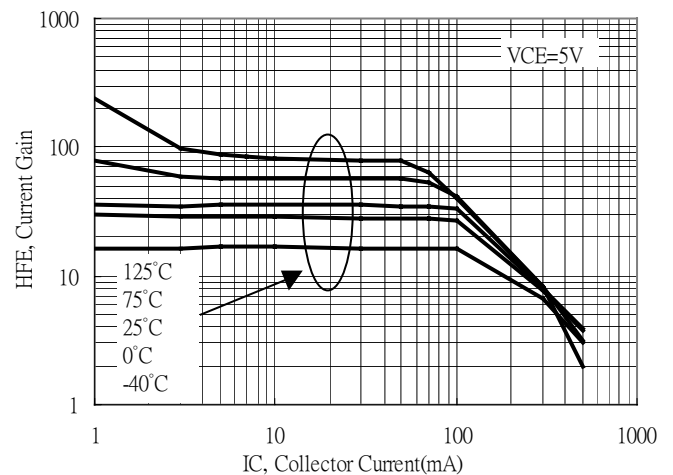
Emitter Grounded Output Characteristics



Current Gain vs Collector Current

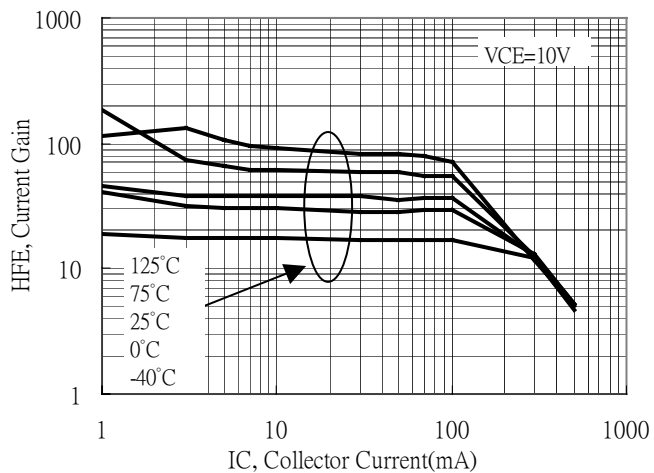


Current Gain vs Collector Current

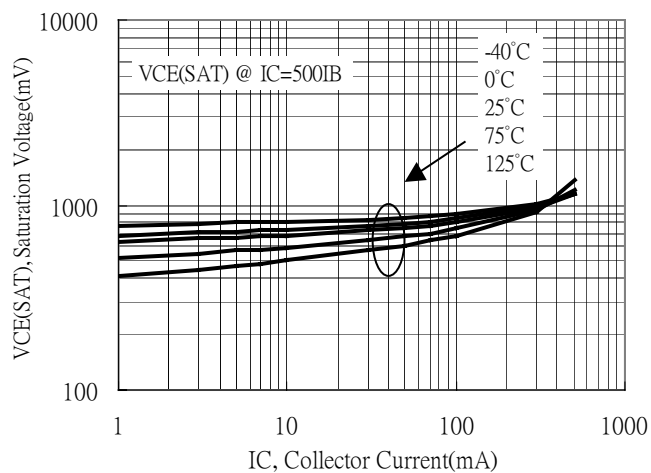


Typical Characteristics(Cont.)

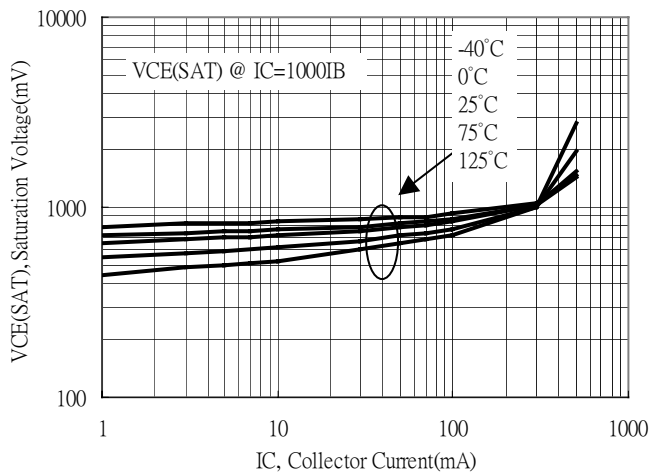
Current Gain vs Collector Current



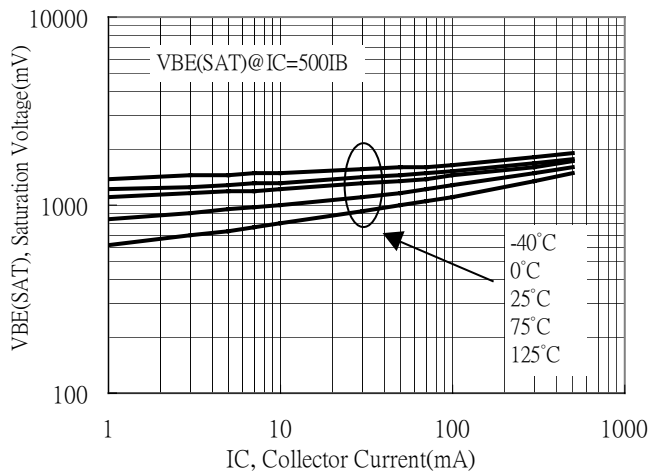
Saturation Voltage vs Collector Current



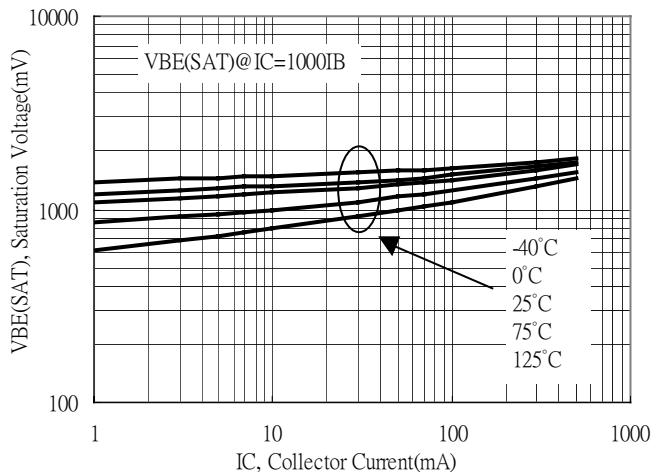
Saturation Voltage vs Collector Current



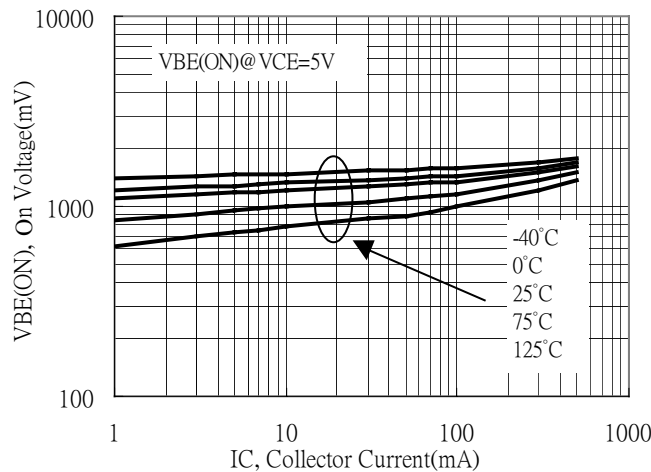
Saturation Voltage vs Collector Current



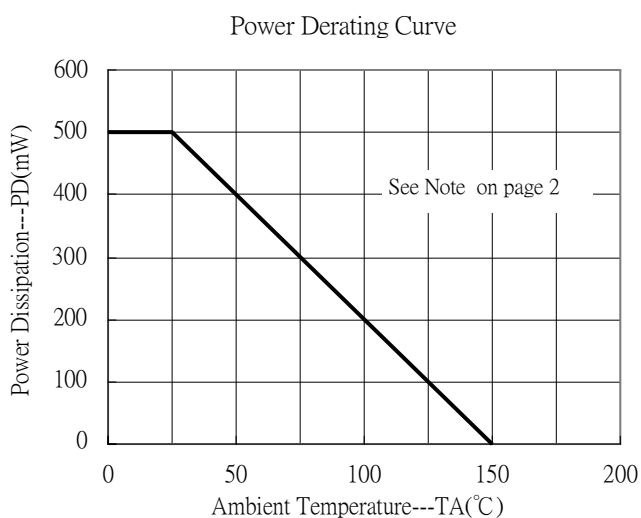
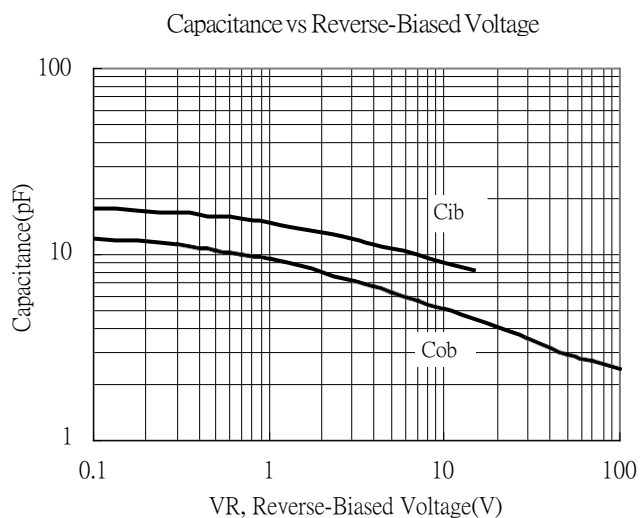
Saturation Voltage vs Collector Current



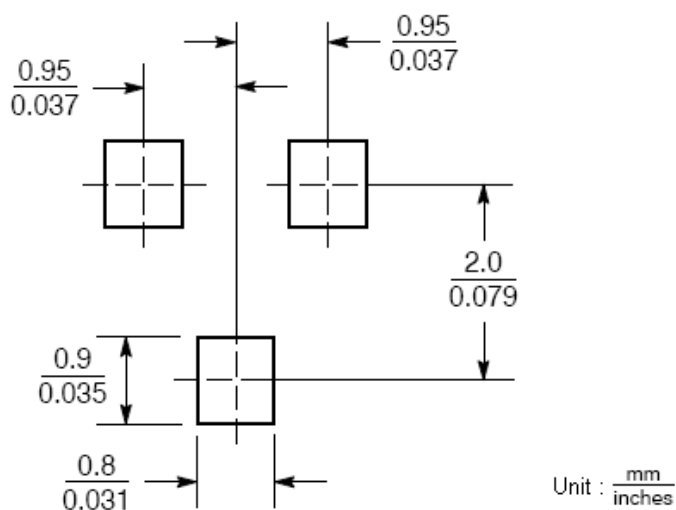
Saturation Voltage vs Collector Current



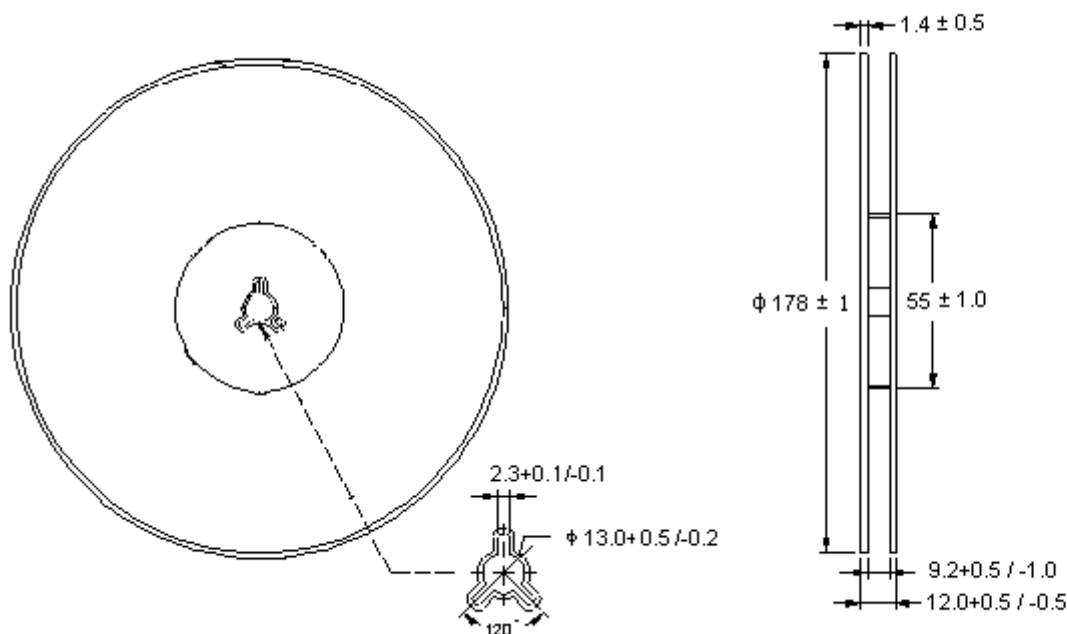
Typical Characteristics(Cont.)



Recommended Soldering Footprint

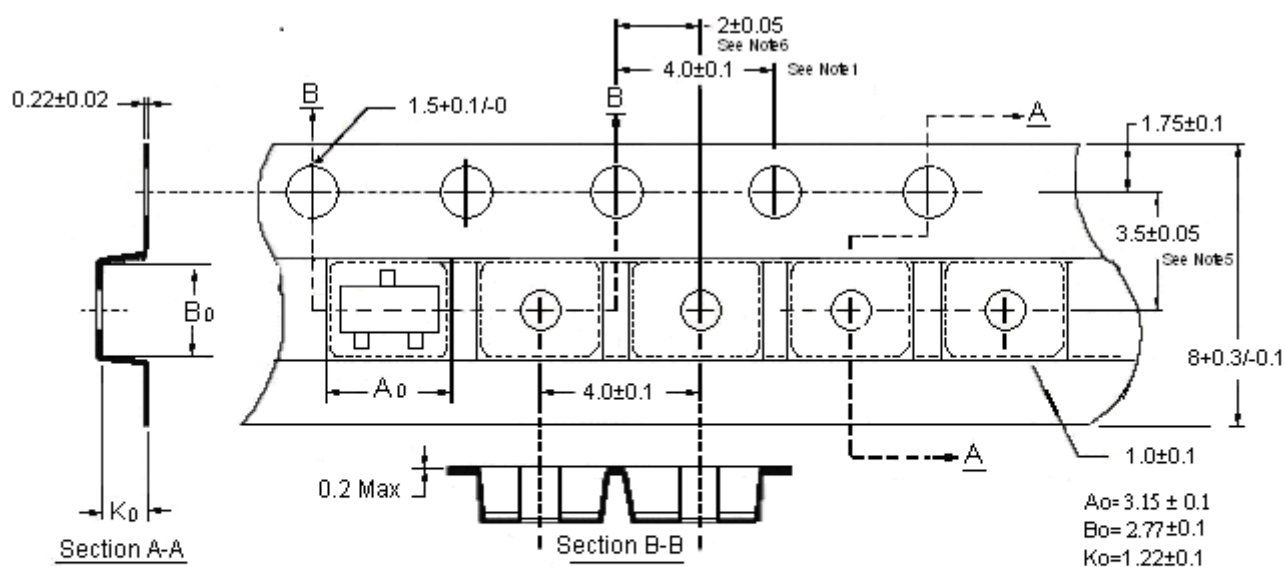


Reel Dimension



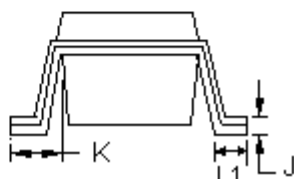
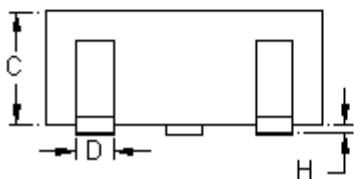
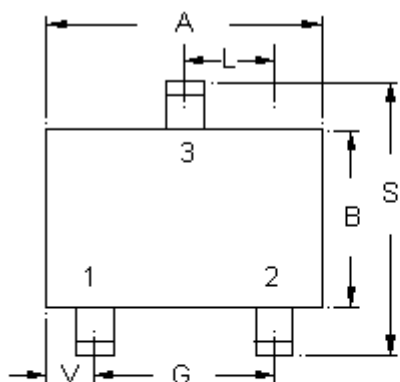
Unit: millimeter

Carrier Tape Dimension



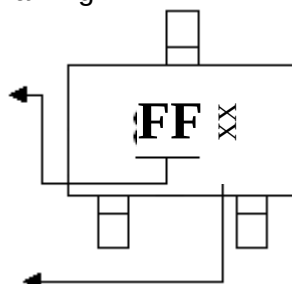
Unit: millimeter

SOT-23 Dimension



Marking:

Product Code



Date Code: Year+Month
 Year: 6→2016, 7→2017
 Month: 1→1, 2→2, . . .
 9→9, A→10, B→11, C→12

3-Lead SOT-23 Plastic
 Surface Mounted Package

Style : Pin 1.Base 2.Emitter 3.Collector

*:Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1102	0.1204	2.80	3.04	J	0.0032	0.0079	0.08	0.20
B	0.0472	0.0551	1.20	1.40	K	0.0118	0.0266	0.30	0.67
C	0.0335	0.0512	0.89	1.30	L	0.0335	0.0453	0.85	1.15
D	0.0118	0.0197	0.30	0.50	S	0.0830	0.1004	2.10	2.55
G	0.0669	0.0910	1.70	2.30	V	0.0098	0.0256	0.25	0.65
H	0.0000	0.0040	0.00	0.10	L1	0.0118	0.0197	0.30	0.50