

/ Descriptions

SOT-23 NPN Silicon NPN transistor in a SOT-23 Plastic Package.

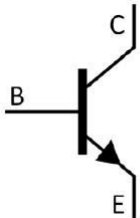
/ Features

High Current Gain.

/ Applications

General purpose amplifier.

/ Equivalent Circuit



/ Pinning



PIN1 Base PIN 2 Emitter PIN 3 Collector

/ h_{FE} Classifications & Marking

h _{FE} Range	380 630
Marking	HAK

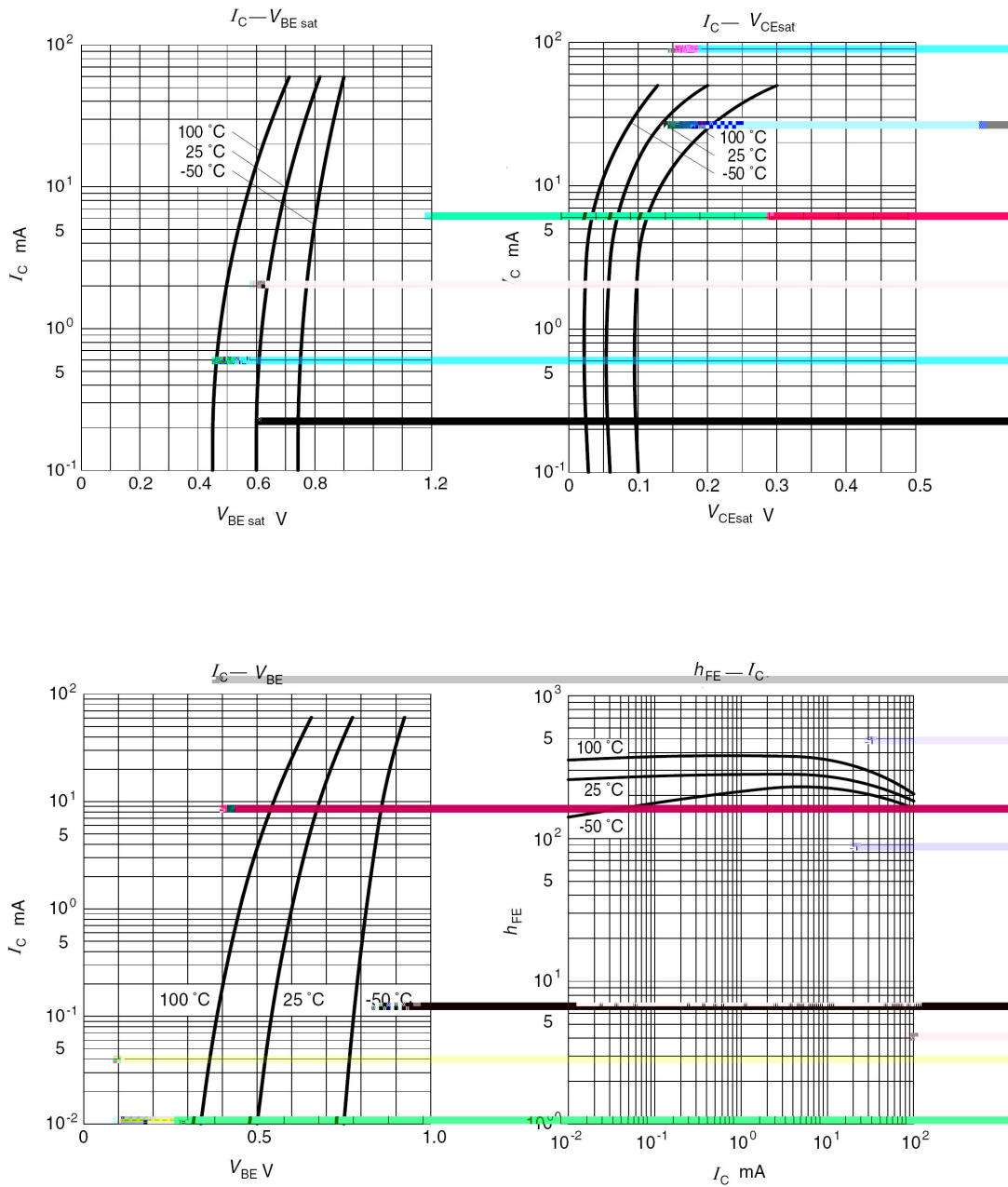
/ Absolute Maximum Ratings(Ta=25)

Parameter	Symbol	Rating	Unit
Collector to Base Voltage	V_{CBO}	45	V
Collector to Emitter Voltage	V_{CEO}	45	V
Emitter to Base Voltage	V_{EBO}	5.0	V
Collector Current(DC)	I_C	200	mA
Collector Power Dissipation	P_C	350	mW
Storage Temperature Range	T_{stg}	-55 150	

/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Emitter Breakdown Voltage	V_{CEO}	$I_C=2.0mA$ $I_E=0$	45			V
Emitter to Base Breakdown Voltage	V_{EBO}	$I_E=1.0 A$ $I_C=0$	5.0			V
Collector-Emitter Cut-off Current	I_{CES}	$V_{CB}=32 V$ $I_{BE}=0$			0.02	A
Emitter Base Cut-Off Current	I_{EBO}	$V_{EB}=4.0V$ $I_C=0$			0.02	A
DC Current Gain	$h_{FE(1)}$	$V_{CE}=5.0V$ $I_C=2.0mA$	380		630	
	$h_{FE(2)}$	$V_{CE}=5.0V$ $I_C=10 A$	100			
	$h_{FE(3)}$	$V_{CE}=1.0V$ $I_C=50mA$	100			
Collector to Emitter Saturation Voltage	$V_{CE(sat)(1)}$	$I_C=10mA$ $I_B=0.25mA$			0.35	V
	$V_{CE(sat)(2)}$	$I_C=50mA$ $I_B=1.25mA$			0.55	V
Base to Emitter Saturation Voltage	$V_{BE(sat)(1)}$	$I_C=10mA$ $I_B=0.25mA$	0.6		0.85	V
	$V_{BE(sat)(2)}$	$I_C=50mA$ $I_B=1.25mA$	0.7		1.05	V
Base-Emitter On Voltage	$V_{BE(on)}$	$V_{CE}=5.0V$ $I_C=2.0mA$	0.55		0.75	V
Transition Frequency	f_T	$V_{CE}=5.0V$ $I_C=10mA$ $f=100MHz$	125			MHz
Output Capacitance	C_{ob}	$V_{CB}=10V$ $f=1.0MHz$			4.5	pF
Noise Figure	NF	$V_{CE}=5.0V$ $I_C=0.2mA$ $R_g=2.0k$ $f=1.0MHz$			6.0	dB
Turn-On Time	t_{on}	$I_C=10mA$ $I_{B1}=1.0mA$			150	ns
Turn-Off Time	t_{off}	$I_{B2}=1.0mA$ $V_{BB}=3.6V$ $R_1=R_2=5.0K$ $R_L=990$			800	ns

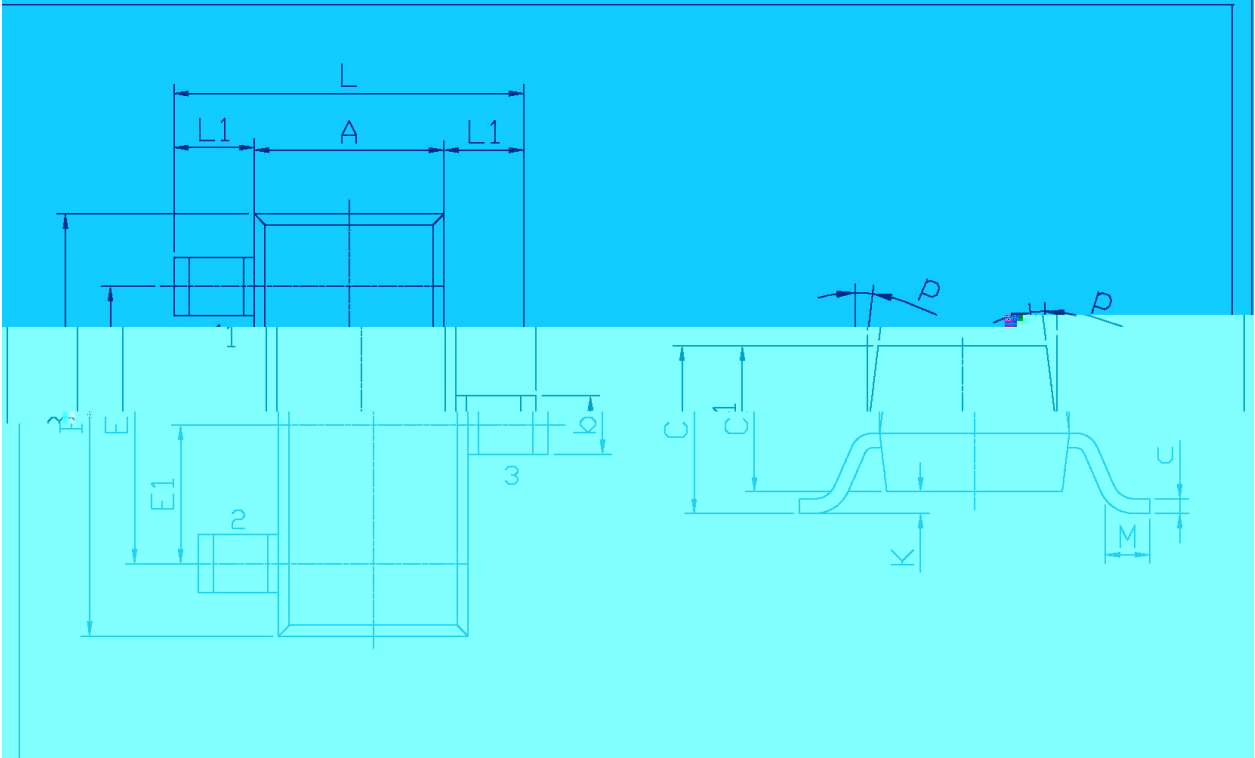
/ Electrical Characteristic Curve



/ Package Dimensions

SOT-23

单位: mm



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
L	2.2	2.7	C	1.30Max	
L1	0.45	0.65	C1	0.90	1.20
A	1.15	1.50	c	0.05	0.20
R	2.70	3.00			

/ Marking Instructions



H

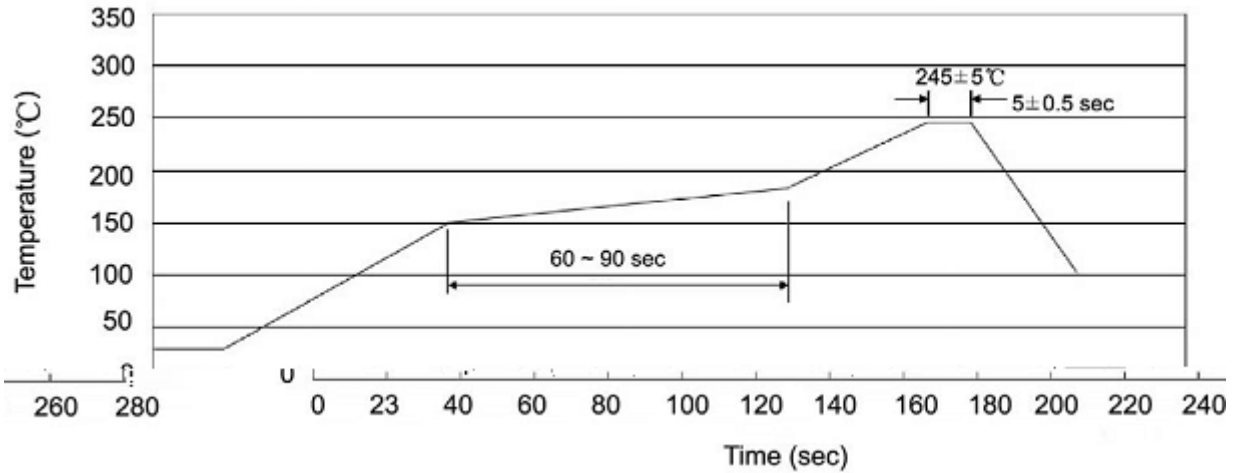
AK

Note:

H: Company Code

AK: Product Type Code

() / Temperature Profile for IR Reflow Soldering(Pb-Free)



Note:

- | | | | | | |
|---|-------|-----|-------|--------|---|
| 1 | 25 | 150 | 60 | 90sec; | 1.Preheating:25~150 , Time:60~90sec. |
| 2 | 245±5 | | 5±0.5 | sec; | 2.Peak Temp.:245±5 , Duration:5±0.5sec. |
| 3 | | 2 | 10 | /sec. | 3. Cooling Speed: 2~10 /sec. |

/ Resistance to Soldering Heat Test Conditions

260±5 10±1 sec. Temp.:260±5 Time:10±1 sec

/ Packaging SPEC.

/ REEL

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm ³)		
	只卷盘	卷盘盒	只盒	盒箱	只箱		盒	箱

/ Notices