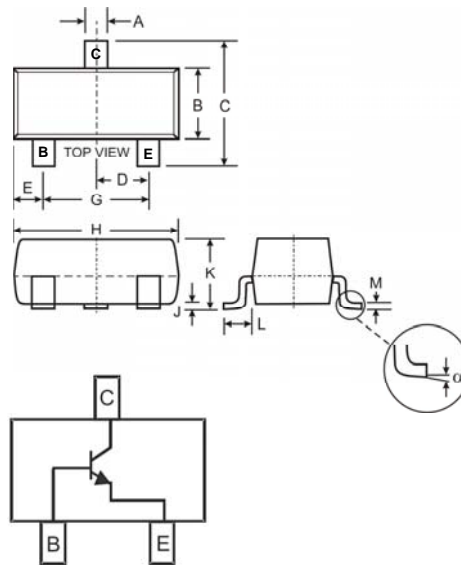


### Features

- Designed for VHF/UHF Amplifier Applications and High Output VHF Oscillators
- High Current Gain Bandwidth Product
- Ideal for Mixer and RF Amplifier Applications with collector currents in the 100 $\mu$ A - 30 mA Range
- **Lead Free/RoHS Compliant (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

### Mechanical Data

- Case: SOT-23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Marking Information: K3H, K3Y; See Page 3
- Ordering Information: See Page 3
- Weight: 0.008 grams (approximate)



SOT-23		
Dim	Min	Max
A	0.37	0.51
B	1.20	1.40
C	2.30	2.50
D	0.89	1.03
E	0.45	0.60
G	1.78	2.05
H	2.80	3.00
J	0.013	0.10
K	0.903	1.10
L	0.45	0.61
M	0.085	0.180
$\alpha$	0°	8°
All Dimensions in mm		

### Maximum Ratings @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	30	V
Collector-Emitter Voltage	V <sub>CEO</sub>	25	V
Emitter-Base Voltage	V <sub>EBO</sub>	3.0	V
Collector Current - Continuous (Note 1)	I <sub>C</sub>	50	mA
Power Dissipation (Note 1)	P <sub>d</sub>	300	mW
Thermal Resistance, Junction to Ambient (Note 1)	R <sub>θJA</sub>	417	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

### Electrical Characteristics @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 2)</b>					
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	25	—	V	I <sub>C</sub> = 1mA, I <sub>B</sub> = 0
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	30	—	V	I <sub>C</sub> = 100 $\mu$ A, I <sub>E</sub> = 0
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	3.0	—	V	I <sub>E</sub> = 10 $\mu$ A, I <sub>C</sub> = 0
Collector Cutoff Current	I <sub>CBO</sub>	—	100	nA	V <sub>CB</sub> = 25V, I <sub>E</sub> = 0
Emitter Cutoff Current	I <sub>EBO</sub>	—	100	nA	V <sub>EB</sub> = 2V, I <sub>C</sub> = 0
<b>ON CHARACTERISTICS (Note 2)</b>					
DC Current Gain	h <sub>FE</sub>	60	—	—	I <sub>C</sub> = 4mA, V <sub>CE</sub> = 10.0V
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	—	0.5	V	I <sub>C</sub> = 4mA, I <sub>B</sub> = 400 $\mu$ A
Base-Emitter On Voltage	V <sub>BE(SAT)</sub>	—	0.95	V	I <sub>C</sub> = 4mA, V <sub>CE</sub> = 10.0V
<b>SMALL SIGNAL CHARACTERISTICS</b>					
Current Gain-Bandwidth Product	f <sub>T</sub>	650	—	MHz	V <sub>CE</sub> = 10V, f = 100MHz, I <sub>C</sub> = 4mA
Collector-Base Capacitance	C <sub>CB</sub>	—	0.7	pF	V <sub>CB</sub> = 10V, f = 1.0MHz, I <sub>E</sub> = 0
Collector-Base Feedback Capacitance	C <sub>RB</sub>	—	0.65	pF	V <sub>CB</sub> = 10V, f = 1.0MHz, I <sub>E</sub> = 0
Collector-Base Time Constant	Rb'Cc	—	9	ps	V <sub>CB</sub> = 10V, f = 31.8MHz, I <sub>C</sub> = 4mA

- Notes:
1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch, pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
  2. Short duration pulse test used to minimize self-heating effect.
  3. No purposefully added lead.

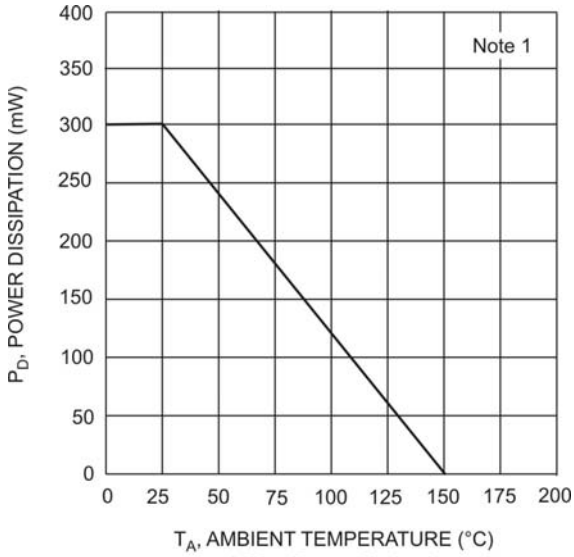


Fig. 1, Max Power Dissipation vs Ambient Temperature

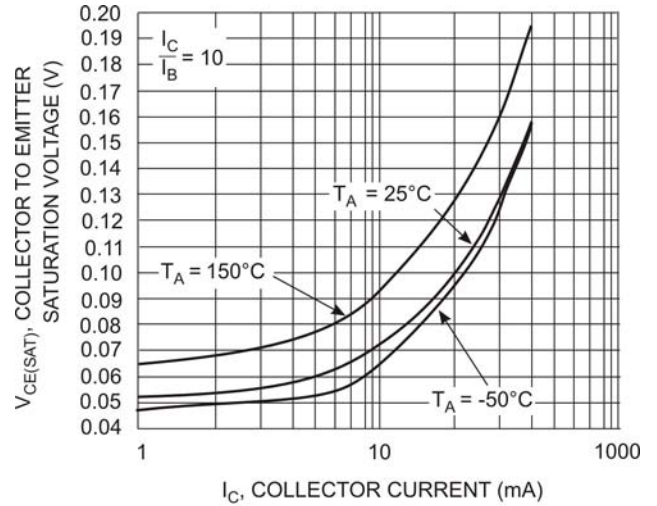


Fig. 2 Collector Emitter Saturation Voltage vs. Collector Current

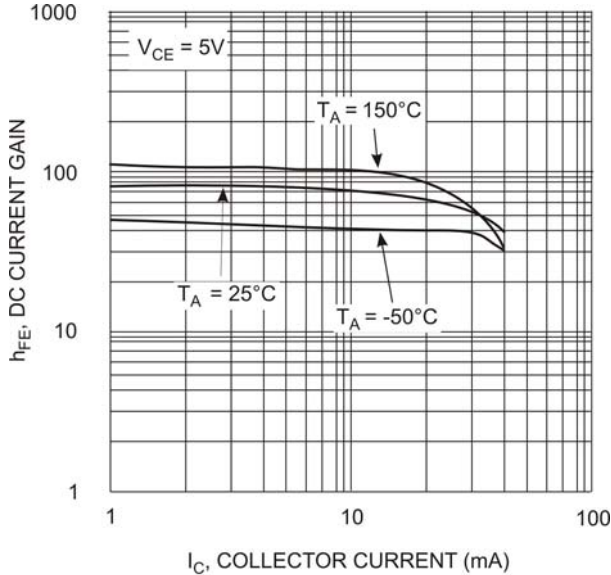


Fig. 3, DC Current Gain vs. Collector Current

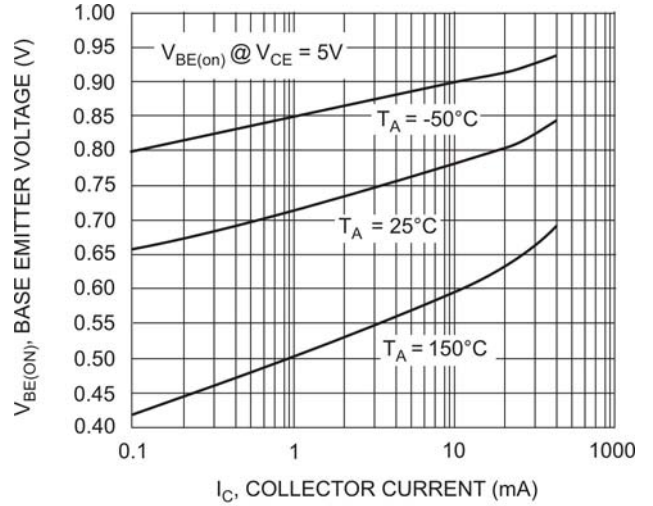


Fig. 4 Base Emitter Voltage vs. Collector Current

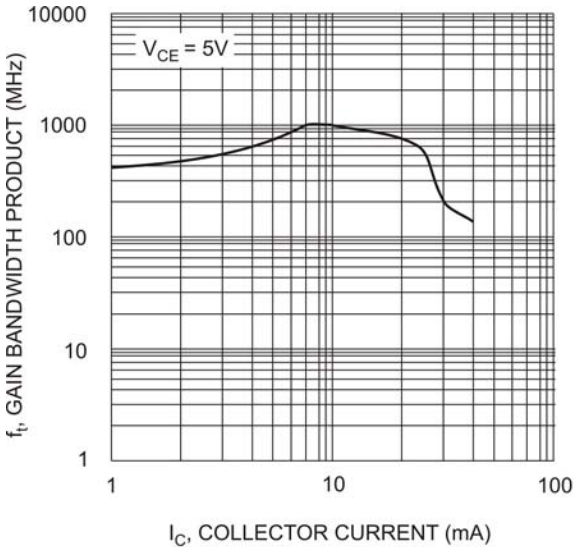


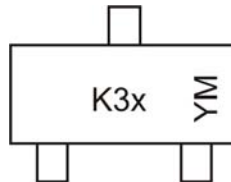
Fig. 5, Gain Bandwidth Product vs Collector Current

## Ordering Information (Note 4)

Device	Packaging	Shipping
MMBTH10-7-F	SOT-23	3000/Tape & Reel

Notes: 4. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



K3x = Product Type Marking Code, e.g. K3H

YM = Date Code Marking

Y = Year ex: N = 2002

M = Month ex: 9 = September

### Date Code Key

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Code	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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