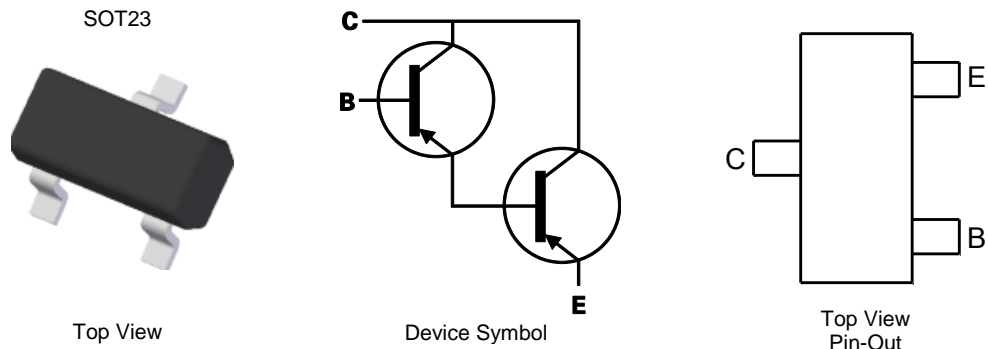


## Features

- Epitaxial Planar Die Construction
- Ideal for Low Power Amplification and Switching
- High Current Gain
- Complementary NPN Type: MMBTA13 /MMBTA14
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish-Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.008 grams (Approximate)

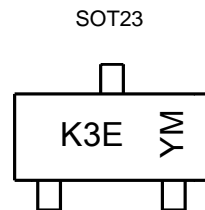


## Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
MMBTA63-7-F	AEC-Q101	K3E	7	8	3,000
MMBTA64-7-F	AEC-Q101	K3E	7	8	3,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



K3E = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: F = 2018)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Code	F	G	H	I	J	K	L	M	N	O	P	Q

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

**Absolute Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	-30	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-30	V
Emitter-Base Voltage	V <sub>EBO</sub>	-10	V
Collector Current - Continuous	I <sub>C</sub>	-500	mA

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	300	mW
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	417	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**ESD Ratings** (Note 6)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
- 5. For a device mounted on minimum recommended pad layout 1oz copper that is on a single-sided FR-4 PCB; device is measured under still air conditions whilst operating in a steady-state.
  - 6. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

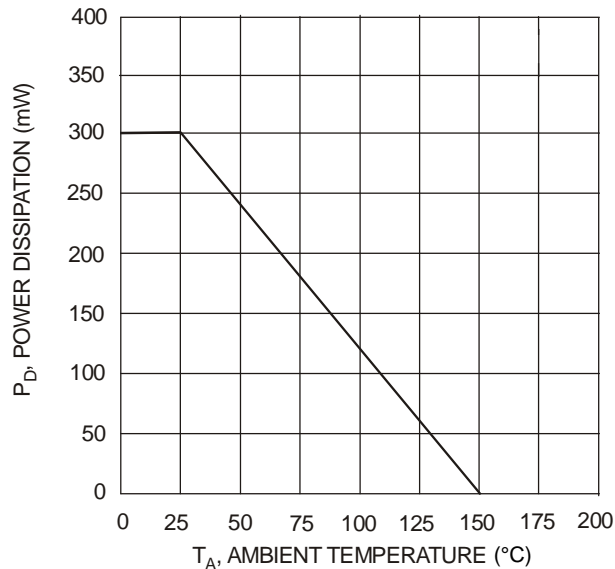


Fig. 1, Max Power Dissipation vs. Ambient Temperature

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>					
Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	-30	—	V	I <sub>C</sub> = -100μA, V <sub>BE</sub> = 0V
Collector Cut-Off Current	I <sub>CBO</sub>	—	-100	nA	V <sub>CB</sub> = -30V, I <sub>E</sub> = 0
Emitter Cut-Off Current	I <sub>EBO</sub>	—	-100	nA	V <sub>EB</sub> = -10V, I <sub>C</sub> = 0
<b>ON CHARACTERISTICS (Note 7)</b>					
DC Current Gain	MMBTA63 MMBTA64 MMBTA63 MMBTA64	h <sub>FE</sub>	5,000 10,000 10,000 20,000	—	I <sub>C</sub> = -10mA, V <sub>CE</sub> = -5.0V I <sub>C</sub> = -10mA, V <sub>CE</sub> = -5.0V I <sub>C</sub> = -100mA, V <sub>CE</sub> = -5.0V I <sub>C</sub> = -100mA, V <sub>CE</sub> = -5.0V
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	—	-1.5	V	I <sub>C</sub> = -100mA, I <sub>B</sub> = -100μA
Base-Emitter Saturation Voltage	V <sub>BE(SAT)</sub>	—	-2.0	V	I <sub>C</sub> = -100mA, V <sub>CE</sub> = -5.0V
<b>SMALL SIGNAL CHARACTERISTICS</b>					
Current Gain-Bandwidth Product	f <sub>T</sub>	125	—	MHz	V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -10mA, f = 100MHz

Note: 7. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

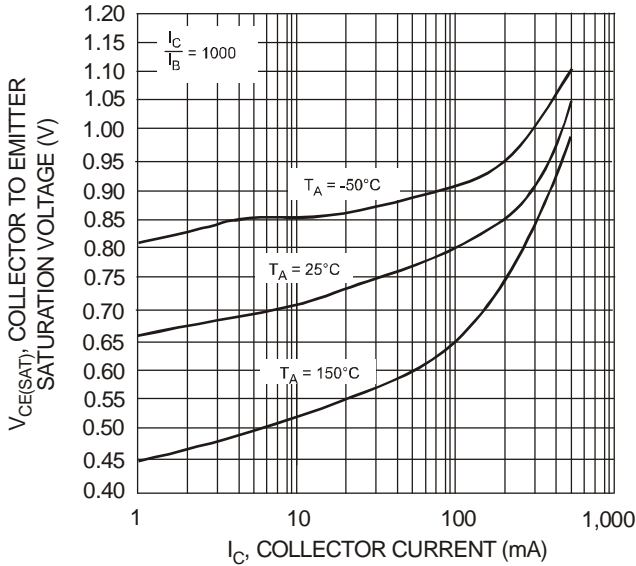


Fig. 2, Collector Emitter Saturation Voltage vs. Collector Current

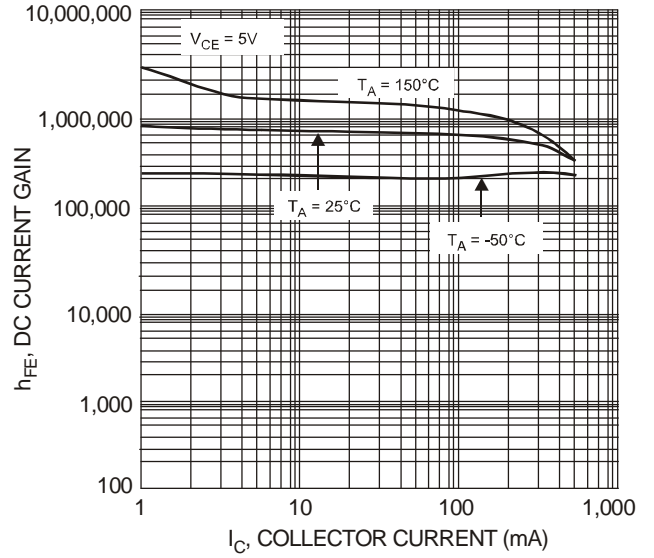


Fig. 3, DC Current Gain vs. Collector Current

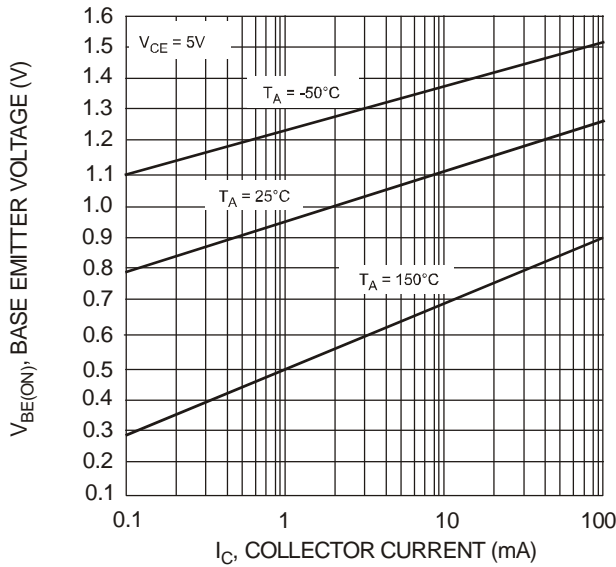


Fig. 4, Base Emitter Voltage vs. Collector Current

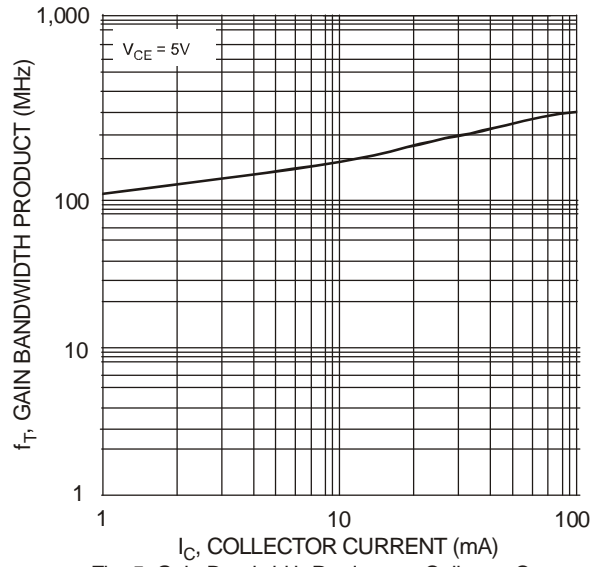
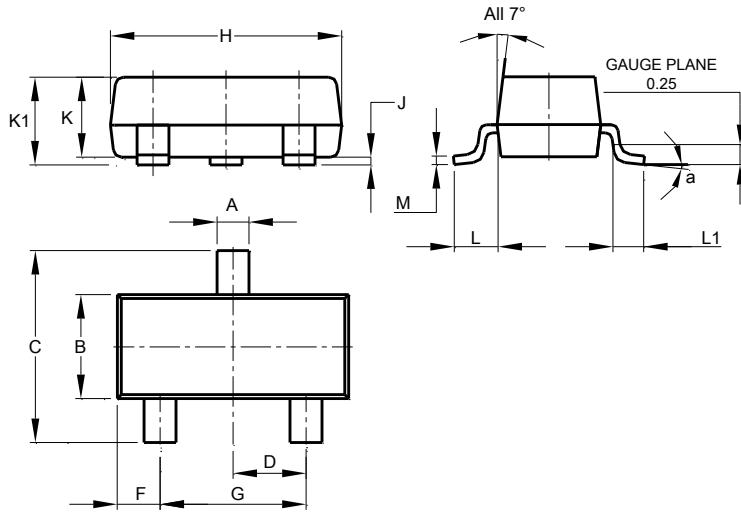


Fig. 5, Gain Bandwidth Product vs. Collector Current

**Package Outline Dimensions**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT23**

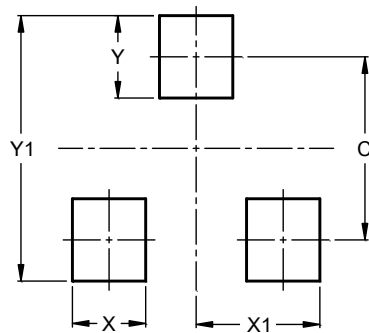


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

**Suggested Pad Layout**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT23**



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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