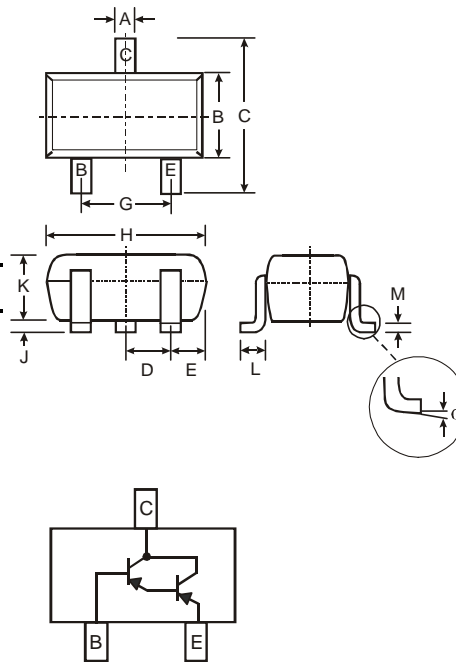


**Features**

- Epitaxial Planar Die Construction
- Complementary NPN Types Available (MMSTA13/MMSTA14)
- Ultra-Small Surface Mount Package
- Ideal for Medium Power Amplification and Switching
- High Current Gain
- **Lead Free/RoHS Compliant (Note 2)**
- **"Green" Device (Note 3 and 4)**

**Mechanical Data**

- Case: SOT-323
- Case Material: Molded Plastic, "Green" Molding Compound, Note 4. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminal Connections: See Diagram
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- MMSTA63 Marking K2E, K3E, See Page 3
- MMSTA64 Marking K3E, See Page 3
- Ordering & Date Code Information: See Page 3
- Weight: 0.006 grams (approximate)



SOT-323		
Dim	Min	Max
A	0.25	0.40
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
E	0.30	0.40
G	1.20	1.40
H	1.80	2.20
J	0.0	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.18
$\alpha$	0°	8°
<b>All Dimensions in mm</b>		

**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

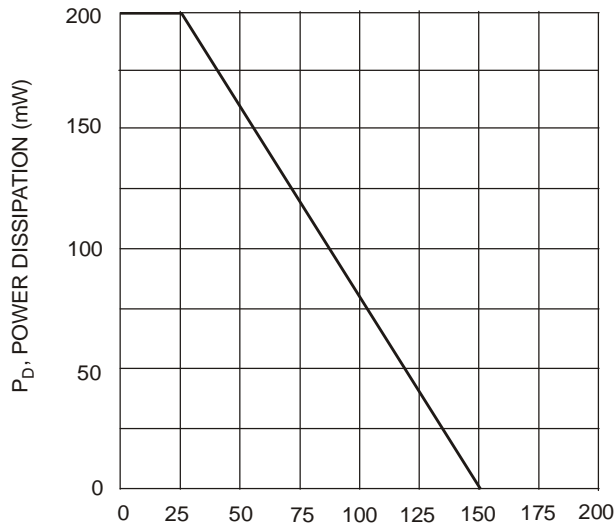
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	-30	V
Collector-Emitter Voltage	$V_{CEO}$	-30	V
Emitter-Base Voltage	$V_{EBO}$	-10	V
Collector Current - Continuous	$I_C$	-500	mA
Power Dissipation (Note 1)	$P_d$	200	mW
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	625	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_j, T_{STG}$	-55 to +150	$^\circ\text{C}$

- 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. No purposefully added lead.
  3. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php)
  4. Product manufactured with Date Code 0627 (week 27, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0627 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

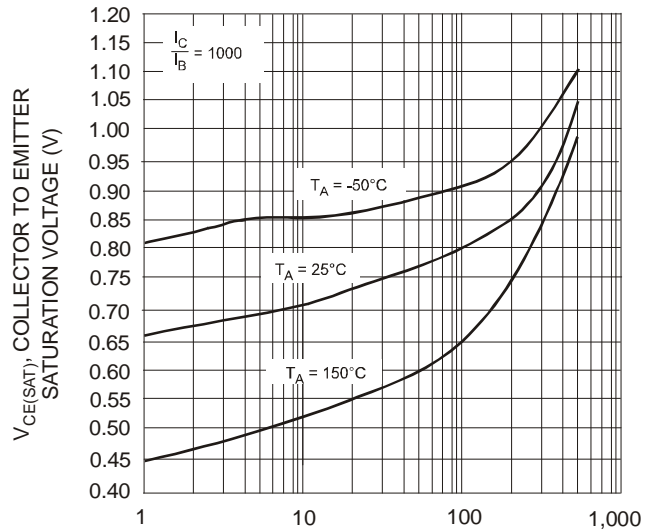
## Electrical Characteristics @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 5)</b>					
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	-30	—	V	I <sub>C</sub> = -100μA, V <sub>BE</sub> = 0V
Collector Cutoff Current	I <sub>CBO</sub>	—	-100	nA	V <sub>CB</sub> = -30V, I <sub>E</sub> = 0
Emitter Cutoff Current	I <sub>EBO</sub>	—	-100	nA	V <sub>EB</sub> = -10V, I <sub>C</sub> = 0
<b>ON CHARACTERISTICS (Note 5)</b>					
DC Current Gain	MMSTA63 MMSTA64 MMSTA63 MMSTA64	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

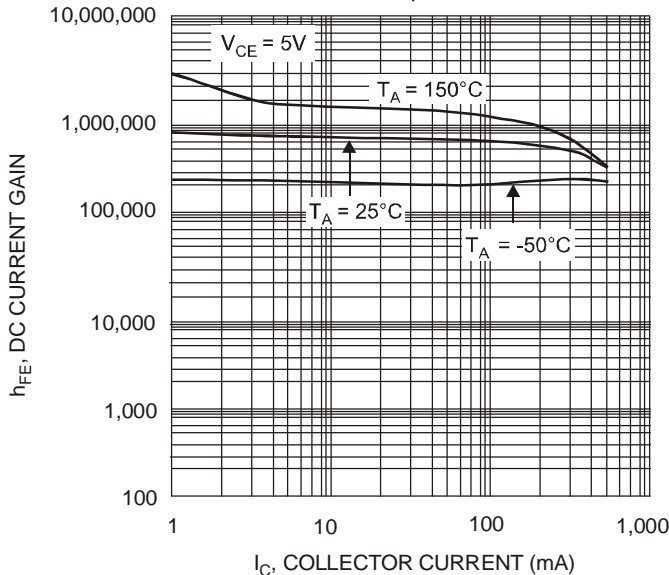
Notes: 5. Short duration pulse test used to minimize self-heating effect.



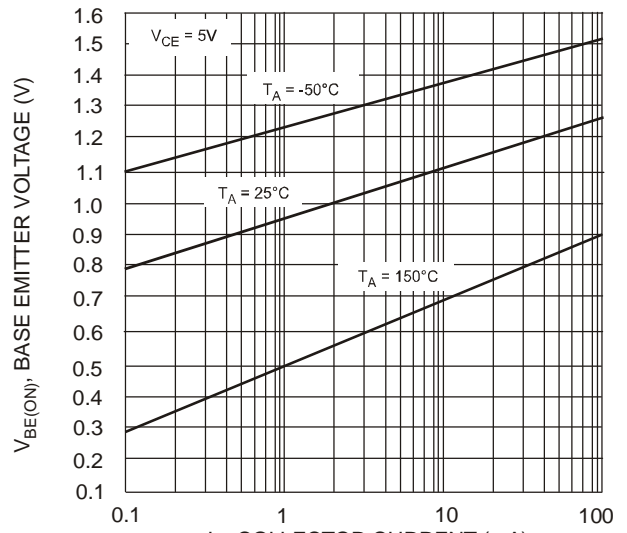
T<sub>A</sub>, AMBIENT TEMPERATURE (°C)  
Fig. 1, Max Power Dissipation vs. Ambient Temperature



I<sub>C</sub>, COLLECTOR CURRENT (mA)  
Fig. 2, Collector Emitter Saturation Voltage vs. Collector Current



I<sub>C</sub>, COLLECTOR CURRENT (mA)  
Fig. 3, DC Current Gain vs. Collector Current



I<sub>C</sub>, COLLECTOR CURRENT (mA)  
Fig. 4, Base Emitter Voltage vs. Collector Current

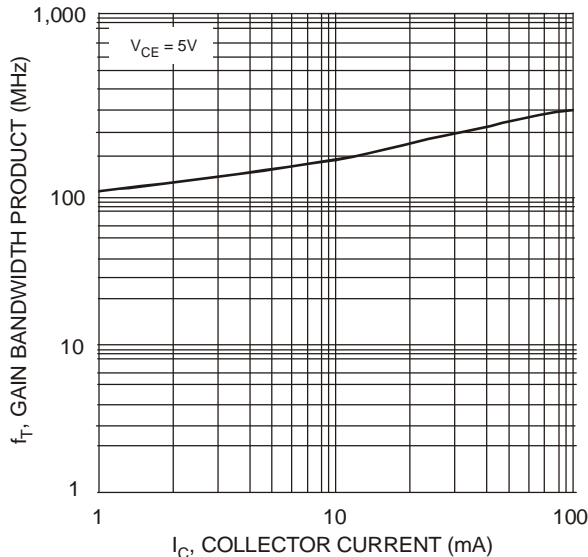


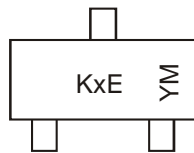
Fig. 5, Gain Bandwidth Product vs. Collector Current

## Ordering Information (Note 4 & 6)

Device	Packaging	Shipping
MMSTA63-7-F	SOT-323	3000/Tape & Reel
MMSTA64-7-F	SOT-323	3000/Tape & Reel

Notes: 6. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



KxE = Product Type Marking Code, e.g. K2E = MMSTA63  
 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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