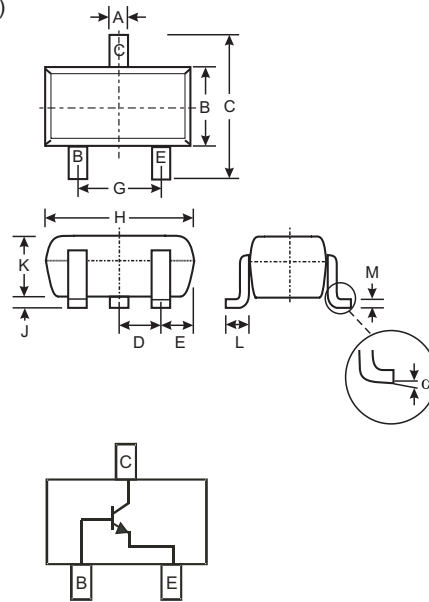


### Features

- Epitaxial Planar Die Construction
- Complementary PNP Type Available (MMSTA55/MMSTA56)
- Ideal for Medium Power Amplification and Switching
- Ultra-Small Surface Mount Package
- **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).
- MMSTA05 Marking K1H, K1G (See Page 2)
- MMSTA06 Marking K1G (See Page 2)
- Order & Date Code Information: See Page 2
- 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°
All Dimensions in mm		

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

Characteristic	Symbol	MMSTA05	MMSTA06	Unit
Collector-Base Voltage	$V_{CBO}$	60	80	V
Collector-Emitter Voltage	$V_{CEO}$	60	80	V
Emitter-Base Voltage	$V_{EBO}$	4.0		V
Collector Current - Continuous (Note 1)	$I_C$	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 and Temperature Range	$T_j, T_{STG}$	-55 to +150		$^\circ\text{C}$

- Note:
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

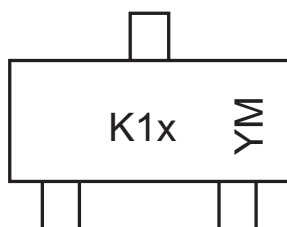
Characteristic	Symbol	Min	Max	Unit	Test Condition	
<b>OFF CHARACTERISTICS (Note 5)</b>						
Collector-Base Breakdown Voltage	MMSTA05 MMSTA06	V <sub>(BR)CBO</sub>	60 80	—	V	I <sub>C</sub> = 100μA, I <sub>E</sub> = 0
Collector-Emitter Breakdown Voltage	MMSTA05 MMSTA06	V <sub>(BR)CEO</sub>	60 80	—	V	I <sub>C</sub> = 1.0mA, I <sub>B</sub> = 0
Emitter-Base Breakdown Voltage		V <sub>(BR)EBO</sub>	4.0	—	V	I <sub>E</sub> = 100μA, I <sub>C</sub> = 0
Collector Cutoff Current	MMSTA05 MMSTA06	I <sub>CBO</sub>	—	100	nA	V <sub>CB</sub> = 60V, I <sub>E</sub> = 0 V <sub>CB</sub> = 80V, I <sub>E</sub> = 0
Collector Cutoff Current	MMSTA05 MMSTA06	I <sub>CES</sub>	—	100	nA	V <sub>CE</sub> = 60V, I <sub>BO</sub> = 0V V <sub>CE</sub> = 80V, I <sub>BO</sub> = 0V
<b>ON CHARACTERISTICS (Note 5)</b>						
DC Current Gain		h <sub>FE</sub>	100	—	—	I <sub>C</sub> = 10mA, V <sub>CE</sub> = 1.0V I <sub>C</sub> = 100mA, V <sub>CE</sub> = 1.0V
Collector-Emitter Saturation Voltage		V <sub>CE(SAT)</sub>	—	0.25	V	I <sub>C</sub> = 100mA, I <sub>B</sub> = 10mA
Base-Emitter Saturation Voltage		V <sub>BE(SAT)</sub>	—	1.2	V	I <sub>C</sub> = 100mA, V <sub>CE</sub> = 1.0V
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Current Gain-Bandwidth Product		f <sub>T</sub>	100	—	MHz	V <sub>CE</sub> = 2.0V, I <sub>C</sub> = 10mA, f = 100MHz

## Ordering Information (Note 4 & 6)

Device	Packaging	Shipping
MMSTA05-7-F	SOT-323	3000/Tape & Reel
MMSTA06-7-F	SOT-323	3000/Tape & Reel

- Notes:
- 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.
  - Short duration test pulse used to minimize self-heating effect.
  - For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

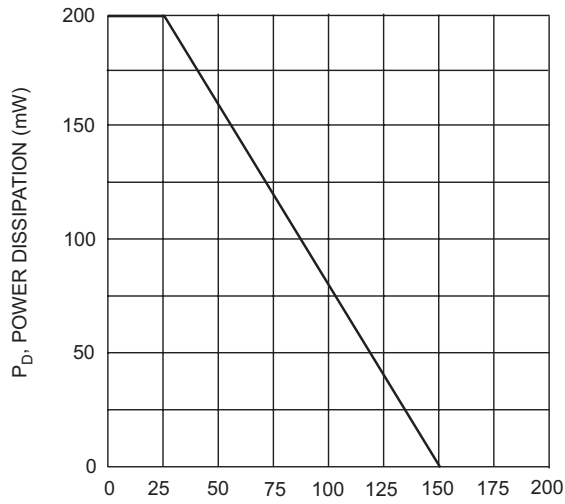
## Marking Information



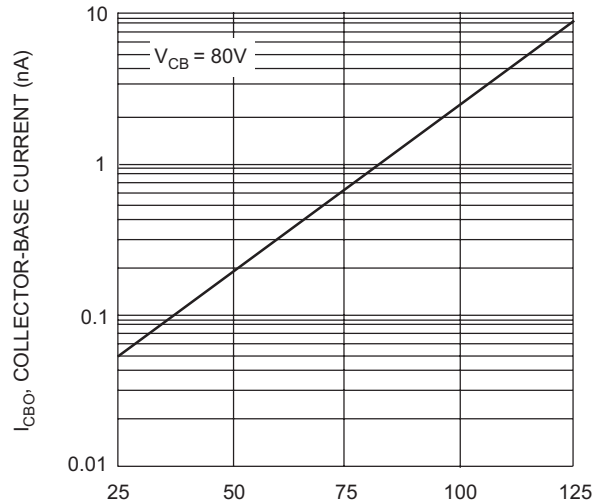
K1x = Product Type Marking Code, ex: K1H = MMSTA05  
 YM = Date Code Marking  
 Y = Year ex: N = 2002  
 M = Month ex: 9 = September

### Date Code Key

<b>Year</b>	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
<b>Code</b>	J	K	L	M	N	P	R	S	T	U	V	W
<b>Month</b>	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Code</b>	1	2	3	4	5	6	7	8	9	O	N	D



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



T<sub>A</sub>, AMBIENT TEMPERATURE (°C)  
Fig. 2 Typical Collector-Cutoff Current vs. Ambient Temperature

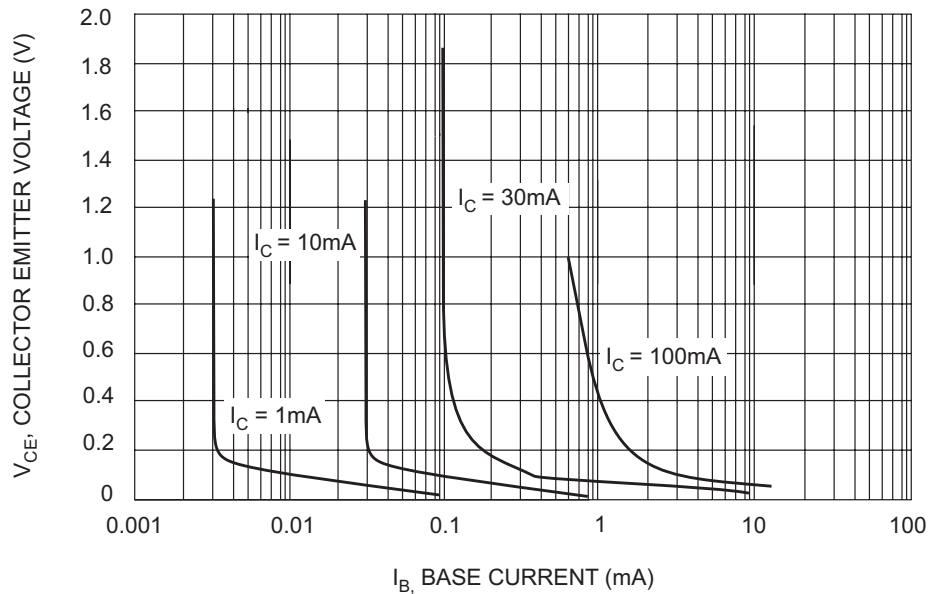


Fig. 3 Typical Collector Saturation Region

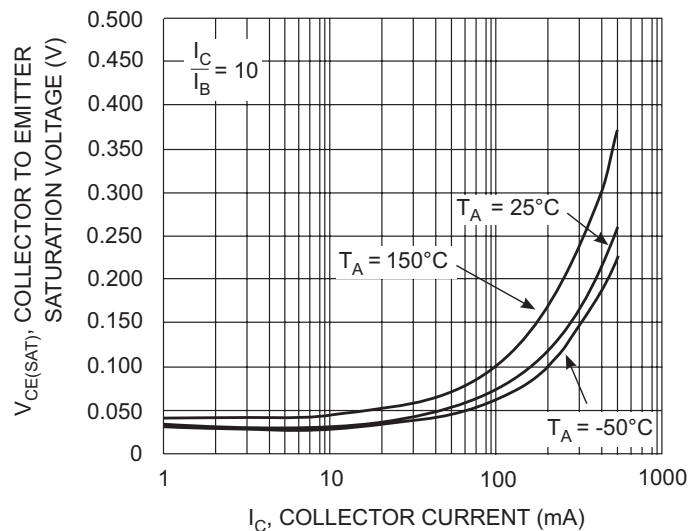


Fig. 4 Collector Emitter Saturation Voltage vs. Collector Current

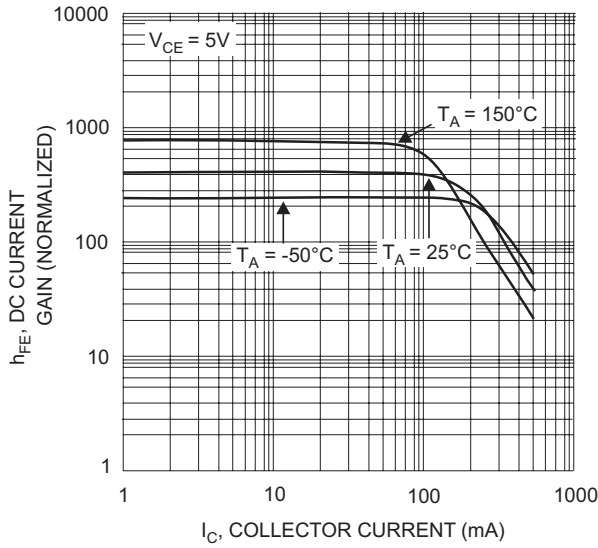


Fig. 5, DC Current Gain vs Collector Current

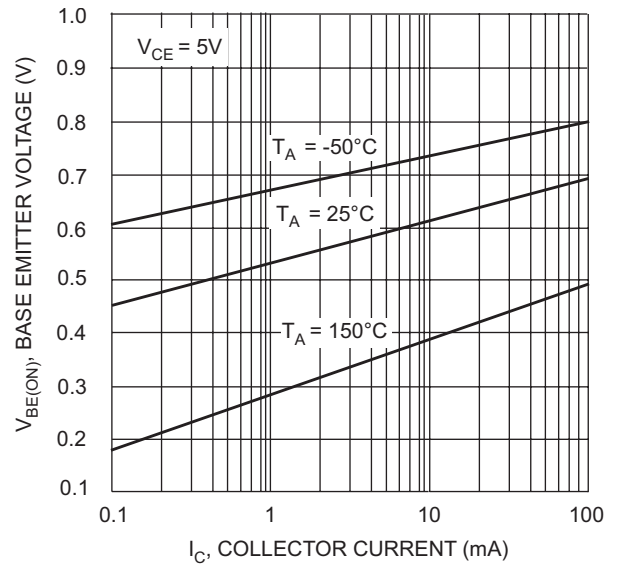


Fig. 6, Base Emitter Voltage vs Collector Current

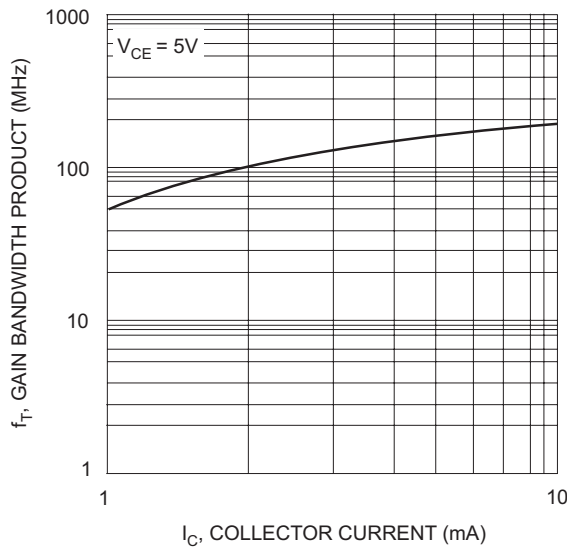


Fig. 7, Gain Bandwidth Product vs Collector Current

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