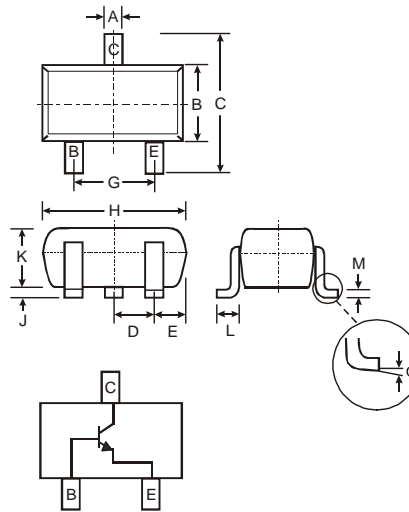


**Features**

- Epitaxial Planar Die Construction
- Complementary PNP Type Available (MMST2907A)
- **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
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Terminal Connections: See Diagram
- Marking Information: K3P - See Page 4
- Ordering & Date Code Information: See Page 4
- Weight: 0.006 grams (approximate)



SOT-323		
Dim	Min	Max
<b>A</b>	0.25	0.40
<b>B</b>	1.15	1.35
<b>C</b>	2.00	2.20
<b>D</b>	0.65 Nominal	
<b>E</b>	0.30	0.40
<b>G</b>	1.20	1.40
<b>H</b>	1.80	2.20
<b>J</b>	0.0	0.10
<b>K</b>	0.90	1.00
<b>L</b>	0.25	0.40
<b>M</b>	0.10	0.18
<b>α</b>	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	$V_{CB0}$	75	V
Collector-Emitter Voltage	$V_{CE0}$	40	V
Emitter-Base Voltage	$V_{EB0}$	6.0	V
Collector Current – Continuous (Note 1)	$I_C$	600	mA
Power Dissipation (Note 1)	$P_d$	200	mW
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	625	$^\circ\text{C/W}$
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-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	75	—	V	I <sub>C</sub> = 10μA, I <sub>E</sub> = 0	
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	40	—	V	I <sub>C</sub> = 10mA, I <sub>B</sub> = 0	
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	6.0	—	V	I <sub>E</sub> = 10μA, I <sub>C</sub> = 0	
Collector Cutoff Current	I <sub>CBO</sub>	—	10	nA	V <sub>CB</sub> = 60V, I <sub>E</sub> = 0	
Collector Cutoff Current	I <sub>CEX</sub>	—	10	nA	V <sub>CE</sub> = 60V, V <sub>EB(OFF)</sub> = 3.0V	
Emitter Cutoff Current	I <sub>EBO</sub>	—	10	nA	V <sub>EB</sub> = 3.0V, I <sub>C</sub> = 0	
Base Cutoff Current	I <sub>BL</sub>	—	20	nA	V <sub>CE</sub> = 60V, V <sub>EB(OFF)</sub> = 3.0V	
<b>ON CHARACTERISTICS (Note 5)</b>						
DC Current Gain	h <sub>FE</sub>	35	—	—	I <sub>C</sub> = 100μA, V <sub>CE</sub> = 10V	
		50	—			I <sub>C</sub> = 1.0mA, V <sub>CE</sub> = 10V
		75	—			I <sub>C</sub> = 10mA, V <sub>CE</sub> = 10V
		100	300			I <sub>C</sub> = 150mA, V <sub>CE</sub> = 10V
		40	—			I <sub>C</sub> = 500mA, V <sub>CE</sub> = 10V
		50	—			I <sub>C</sub> = 10mA, V <sub>CE</sub> = 10V, T <sub>A</sub> = -55°C
35	—	I <sub>C</sub> = 150mA, V <sub>CE</sub> = 1.0V				
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	—	0.3 1.0	V	I <sub>C</sub> = 150mA, I <sub>B</sub> = 15mA I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA	
Base-Emitter Saturation Voltage	V <sub>BE(SAT)</sub>	0.6	1.2 2.0	V	I <sub>C</sub> = 150mA, I <sub>B</sub> = 15mA I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA	
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Output Capacitance	C <sub>obo</sub>	—	8	pF	V <sub>CB</sub> = 10V, f = 1.0MHz, I <sub>E</sub> = 0	
Input Capacitance	C <sub>ibo</sub>	—	25	pF	V <sub>EB</sub> = 0.5V, f = 1.0MHz, I <sub>C</sub> = 0	
Current Gain-Bandwidth Product	f <sub>T</sub>	300	—	MHz	V <sub>CE</sub> = 20V, I <sub>C</sub> = 20mA, f = 1.0MHz	
Noise Figure	NF	—	4.0	dB	V <sub>CE</sub> = 10V, I <sub>C</sub> = 100μA, R <sub>S</sub> = 1.0kΩ, f = 1.0kHz	
<b>SWITCHING CHARACTERISTICS</b>						
Delay Time	t <sub>d</sub>	—	10	ns	V <sub>CC</sub> = 30V, I <sub>C</sub> = 150mA,	
Rise Time	t <sub>r</sub>	—	25	ns	V <sub>BE(OFF)</sub> = -0.5V, I <sub>B1</sub> = 15mA	
Storage Time	t <sub>s</sub>	—	225	ns	V <sub>CC</sub> = 30V, I <sub>C</sub> = 150mA,	
Fall Time	t <sub>f</sub>	—	60	ns	I <sub>B1</sub> = I <sub>B2</sub> = 15mA	

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

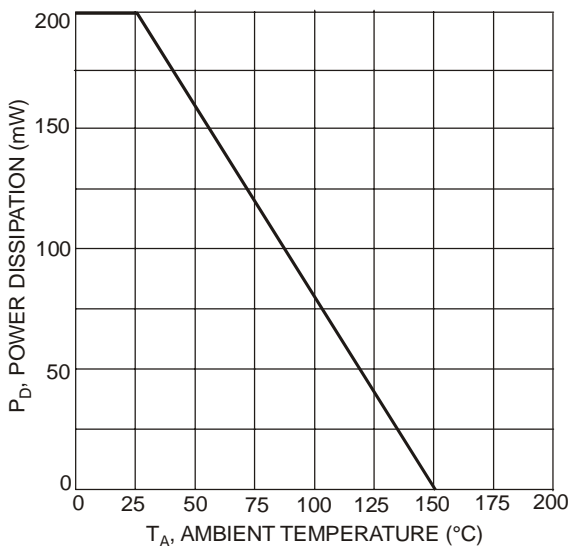


Fig. 1 Max Power Dissipation vs. Ambient Temperature

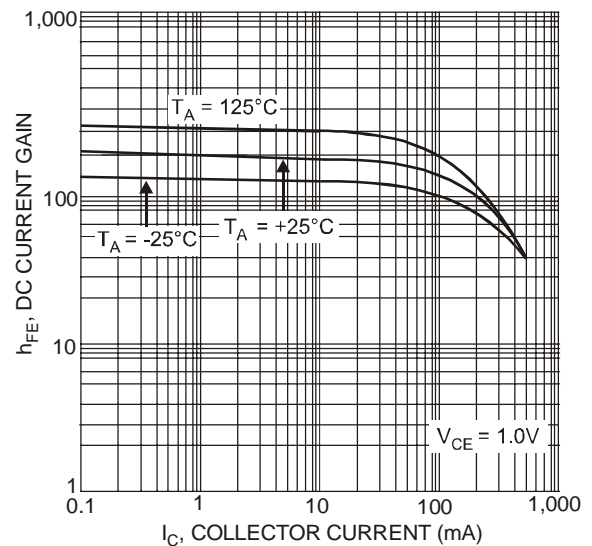


Fig. 2 Typical DC Current Gain vs. Collector Current

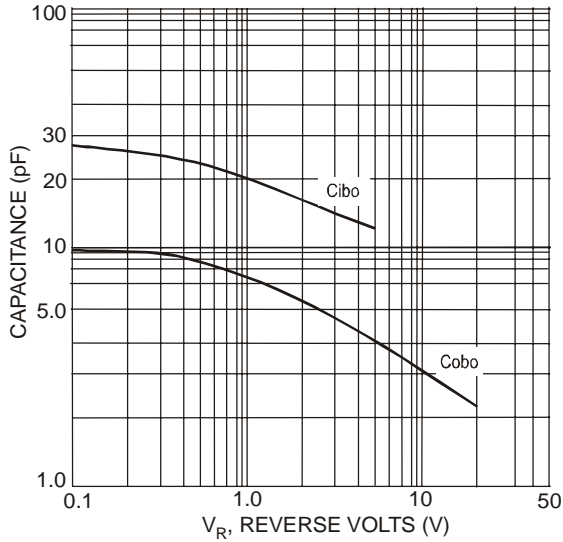


Fig. 3 Typical Capacitance Characteristics

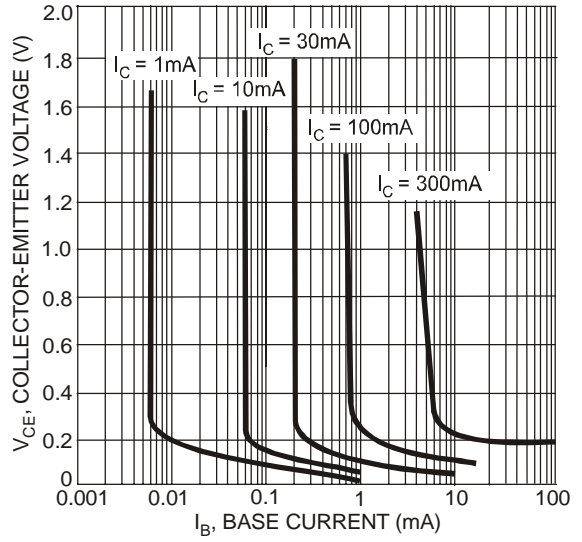


Fig. 4 Typical Collector Saturation Region

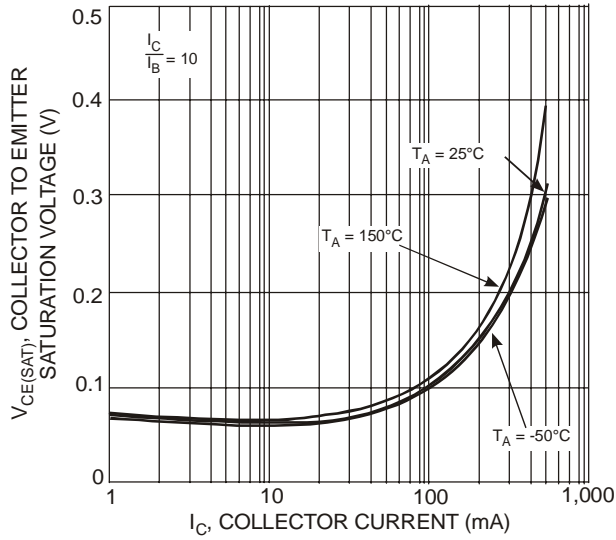


Fig. 5 Collector-Emitter Saturation Voltage vs. Collector Current

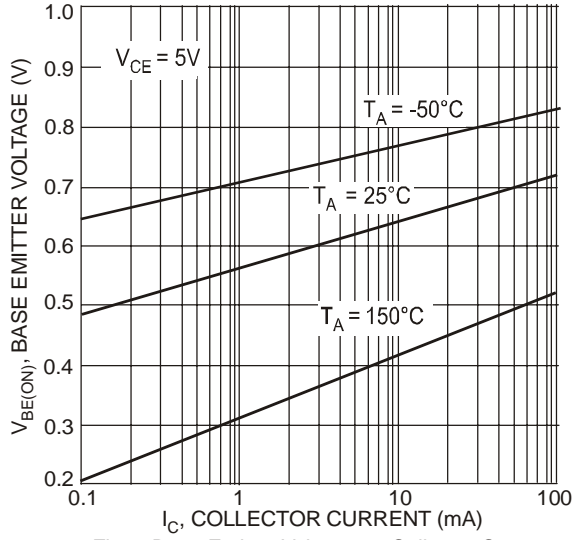


Fig. 6 Base-Emitter Voltage vs. Collector Current

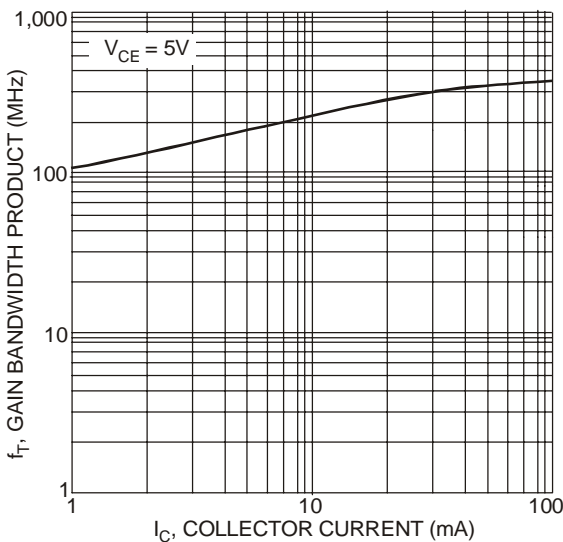


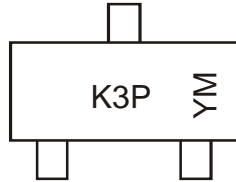
Fig. 7 Gain Bandwidth Product vs. Collector Current

## Ordering Information (Notes 4 & 6)

Device	Packaging	Shipping
MMST2222A-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



K3P = Product Type Marking Code  
 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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