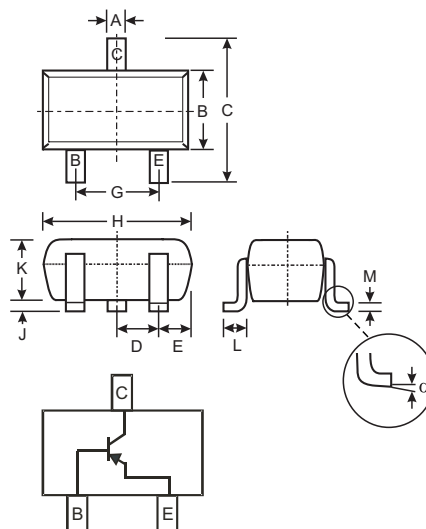


### Features

- Epitaxial Planar Die Construction
- Complementary NPN Type Available (MMST4401)
- 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
- Terminals: Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Marking (See Page 2): K3T
- Ordering & 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	MMST4403	Unit
Collector-Base Voltage	$V_{CBO}$	-40	V
Collector-Emitter Voltage	$V_{CEO}$	-40	V
Emitter-Base Voltage	$V_{EBO}$	-5.0	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	K/W
Operating and Storage 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 0609 (week 9, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0609 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

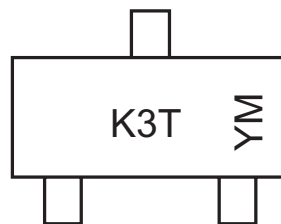
**Electrical Characteristics** @  $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Min	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 5)</b>					
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-40	—	V	$I_C = -100\mu\text{A}$ , $I_E = 0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-40	—	V	$I_C = -1.0\text{mA}$ , $I_B = 0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5.0	—	V	$I_E = -100\mu\text{A}$ , $I_C = 0$
Collector Cutoff Current	$I_{CEX}$	—	-100	nA	$V_{CE} = -35\text{V}$ , $V_{EB(OFF)} = -0.4\text{V}$
Base Cutoff Current	$I_{BL}$	—	-100	nA	$V_{CE} = -35\text{V}$ , $V_{EB(OFF)} = -0.4\text{V}$
<b>ON CHARACTERISTICS (Note 5)</b>					
DC Current Gain	$h_{FE}$	30 60 100 100 20	— — — 300 —	—	$I_C = -100\mu\text{A}$ , $V_{CE} = -1.0\text{V}$ $I_C = -1.0\text{mA}$ , $V_{CE} = -1.0\text{V}$ $I_C = -10\text{mA}$ , $V_{CE} = -1.0\text{V}$ $I_C = -150\text{mA}$ , $V_{CE} = -2.0\text{V}$ $I_C = -500\text{mA}$ , $V_{CE} = -2.0\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	-0.40 -0.75	V	$I_C = -150\text{mA}$ , $I_B = -15\text{mA}$ $I_C = -500\text{mA}$ , $I_B = -50\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	-0.75 —	-0.95 -1.30	V	$I_C = -150\text{mA}$ , $I_B = -15\text{mA}$ $I_C = -500\text{mA}$ , $I_B = -50\text{mA}$
<b>SMALL SIGNAL CHARACTERISTICS</b>					
Output Capacitance	$C_{cb}$	—	8.5	pF	$V_{CB} = -10\text{V}$ , $f = 1.0\text{MHz}$ , $I_E = 0$
Input Capacitance	$C_{eb}$	—	30	pF	$V_{EB} = -0.5\text{V}$ , $f = 1.0\text{MHz}$ , $I_C = 0$
Input Impedance	$h_{ie}$	1.5	15	k $\Omega$	$V_{CE} = -10\text{V}$ , $I_C = -1.0\text{mA}$ , $f = 1.0\text{kHz}$
Voltage Feedback Ratio	$h_{re}$	0.1	8.0	$\times 10^{-4}$	
Small Signal Current Gain	$h_{fe}$	60	500	—	
Output Admittance	$h_{oe}$	1.0	100	$\mu\text{S}$	
Current Gain-Bandwidth Product	$f_T$	200	—	MHz	$V_{CE} = -10\text{V}$ , $I_C = -20\text{mA}$ , $f = 100\text{MHz}$
<b>SWITCHING CHARACTERISTICS</b>					
Delay Time	$t_d$	—	15	ns	$V_{CC} = -30\text{V}$ , $I_C = -150\text{mA}$ , $V_{BE(off)} = -2.0\text{V}$ , $I_{B1} = -15\text{mA}$
Rise Time	$t_r$	—	20	ns	
Storage Time	$t_s$	—	225	ns	$V_{CC} = -30\text{V}$ , $I_C = -150\text{mA}$ , $I_{B1} = I_{B2} = -15\text{mA}$
Fall Time	$t_f$	—	30	ns	

**Ordering Information** (Note 4 & 6)

Device	Packaging	Shipping
MMST4403-7-F	SOT-323	3000/Tape & Reel

- Notes: 4. Product manufactured with Date Code 0609 (week 9, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0609 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.
5. Short duration test pulse used to minimize self-heating effect.
6. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**


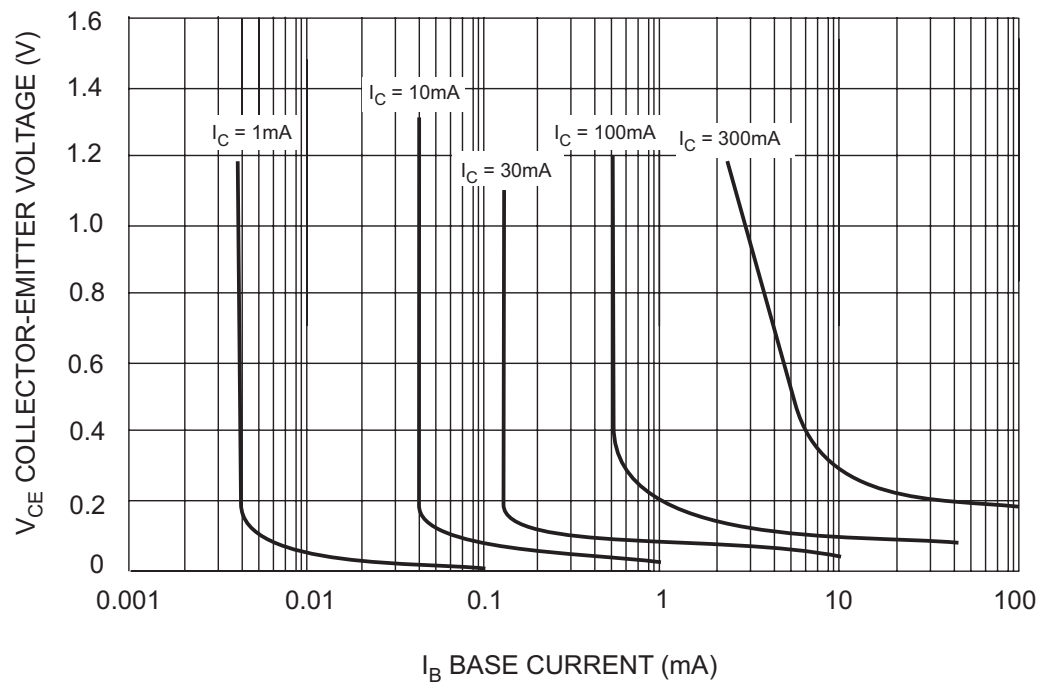
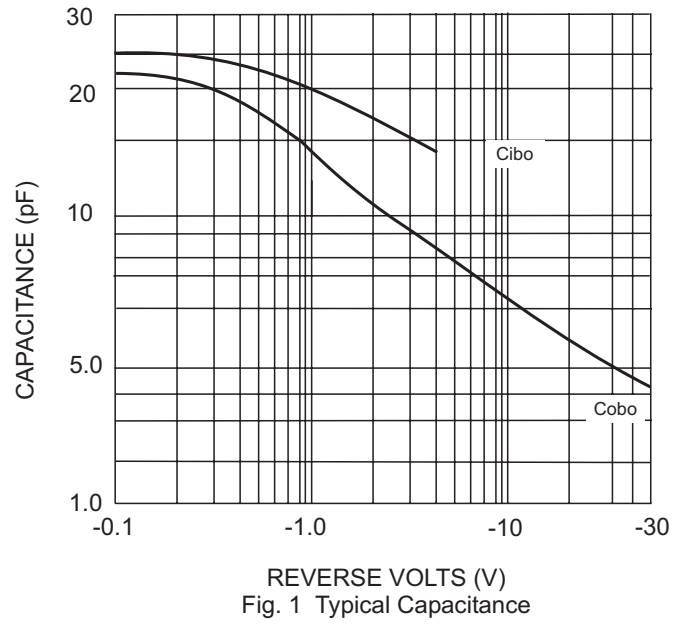
K3T = Product Type Marking Code  
YM = Date Code Marking  
Y = Year ex: N = 2002  
M = Month ex: 9 = September

**Date Code Key**

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

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



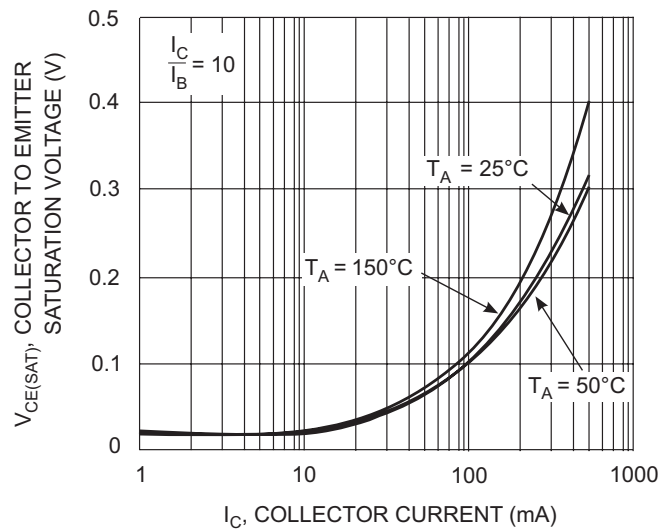


Fig. 3 Collector Emitter Saturation Voltage vs. Collector Current

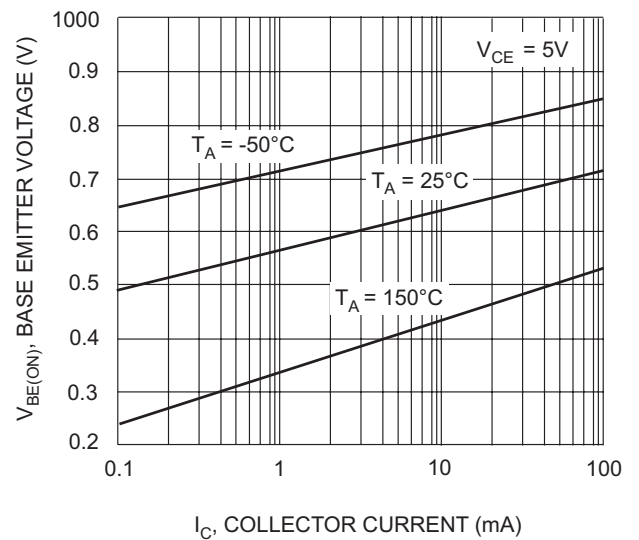


Fig. 4 Base-Emitter Voltage vs. Collector Current

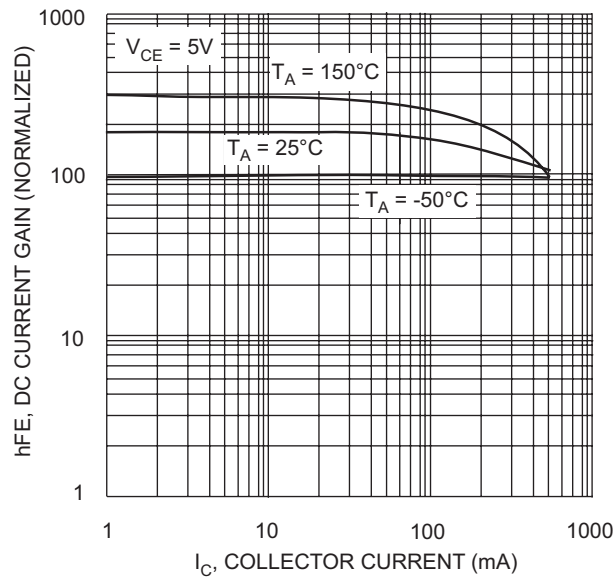


Fig. 5 DC Current Gain vs. Collector Current

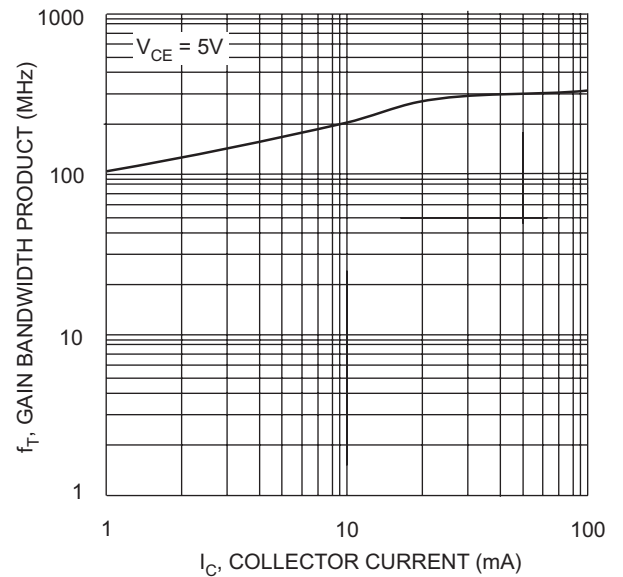


Fig. 6 Gain Bandwidth Product vs. Collector Current

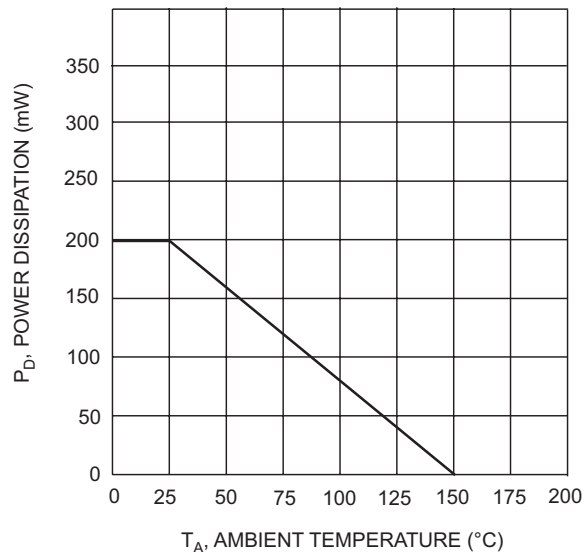


Fig. 7, Max Power Dissipation vs Ambient Temperature

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