Features

- BV_{CEO} > -40V
- Low Saturation Voltage -0.75V max @ I_C = -500mA
- 200mW Power Dissipation
- Complementary NPN Type Available (MMST4401)
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at https://www.diodes.com/products/automotive/automotive-products/.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. https://www.diodes.com/quality/product-definitions/**

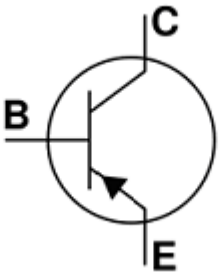
Mechanical Data

- Package: SOT323
- Package Material: Molded Plastic, "Green" Molding Compound, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Lead-Free Plating (Matte Tin Finish Annealed over Alloy 42 Leadframe). Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.006 grams (Approximate)

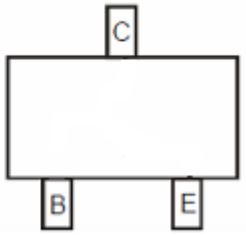
SOT323



Top View



Device Symbol



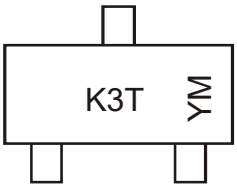
Pinout – Top View

Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
MMST4403-7-F	SOT323	K3T	7	8	3,000	Reel

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/.

Information



K3T = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: M = 2025)
M = Month (ex: 9 = September)

Date Code Key

Year	2005	-	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Code	S	-	M	N	P	R	S	T	U	V	W	X

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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Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-40	V
Collector-Emitter Voltage	V_{CEO}	-40	V
Emitter-Base Voltage	V_{EBO}	-5	V
Collector Current – Continuous (Note 5)	I_C	-600	mA
Power Dissipation (Note 5)	P_d	200	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	625	°C/W
Thermal Resistance, Junction to Case (Note 6)	$R_{\theta JC}$	150	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 5. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.
6. Thermal resistance from junction to the top of the case.

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)					
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-40	—	V	I_C = -100µA, I_E = 0
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-40	—	V	I_C = -1mA, I_B = 0
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5	—	V	I_E = -100µA, I_C = 0
Collector Cutoff Current	I_{CEX}	—	-100	nA	V_{CE} = -35V, $V_{EB(OFF)}$ = -0.4V
Base Cutoff Current	I_{BL}	—	-100	nA	V_{CE} = -35V, $V_{EB(OFF)}$ = -0.4V
ON CHARACTERISTICS (Note 7)					
DC Current Gain	h_{FE}	30 60 100 100 20	— — — 300 —	—	I_C = -100µA, V_{CE} = -1V I_C = -1mA, V_{CE} = -1V I_C = -10mA, V_{CE} = -1V I_C = -150mA, V_{CE} = -2V I_C = -500mA, V_{CE} = -2V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	-0.40 -0.75	V	I_C = -150mA, I_B = -15mA I_C = -500mA, I_B = -50mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	-0.75 —	-0.95 -1.30	V	I_C = -150mA, I_B = -15mA I_C = -500mA, I_B = -50mA
SMALL-SIGNAL CHARACTERISTICS					
Output Capacitance	C_{ob}	—	8.5	pF	V_{CB} = -10V, f = 1.0MHz, I_E = 0
Input Capacitance	C_{eb}	—	30	pF	V_{EB} = -0.5V, f = 1.0MHz, I_C = 0
Input Impedance	h_{ie}	1.5	15	kΩ	V_{CE} = -10V, I_C = -1.0mA f = 1.0MHz
Voltage Feedback Ratio	h_{re}	0.1	8.0	x 10^{-4}	
Small-Signal Current Gain	h_{fe}	60	500	—	
Output Admittance	h_{oe}	1	100	µS	
Current Gain-Bandwith Product	f_T	200	—	MHz	V_{CE} = -10V, I_C = -20mA f = 100MHz
SWITCHING CHARACTERISTICS					
Delay Time	t_d	—	15	ns	V_{CE} = -30V, I_C = -150mA $V_{BE(OFF)}$ = -2.0V, I_{B1} = -15mA
Rise Time	t_r	—	20	ns	
Storage Time	t_s	—	225	ns	V_{CE} = -30V, I_C = -150mA I_{B1} = I_{B2} = -15mA
Fall Time	t_r	—	30	ns	

Note: 7. Short duration pulse test used to minimize self-heating effect.

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Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

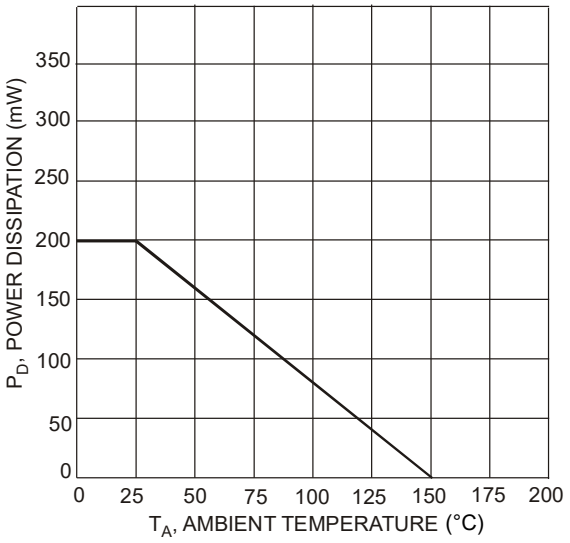


Fig. 1 Max Power Dissipation vs. Ambient Temperature

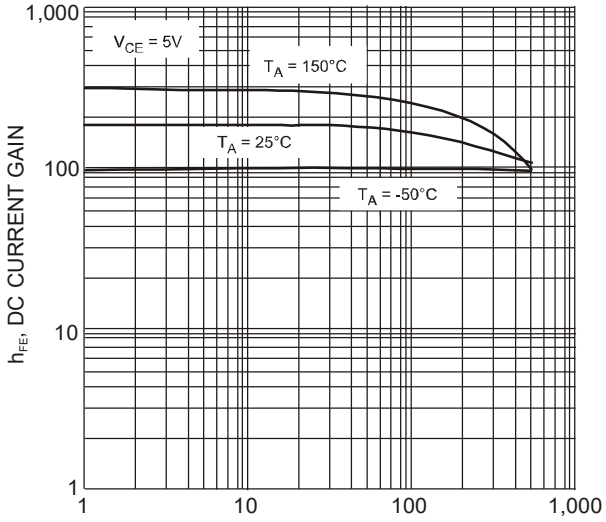


Fig. 2 DC Current Gain vs. Collector Current

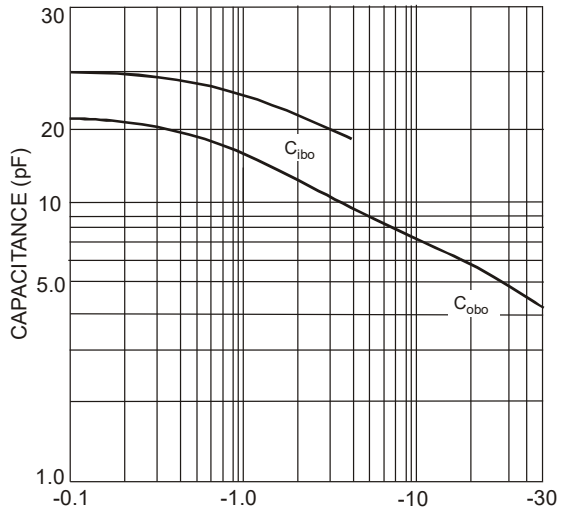


Fig. 3 Typical Capacitance

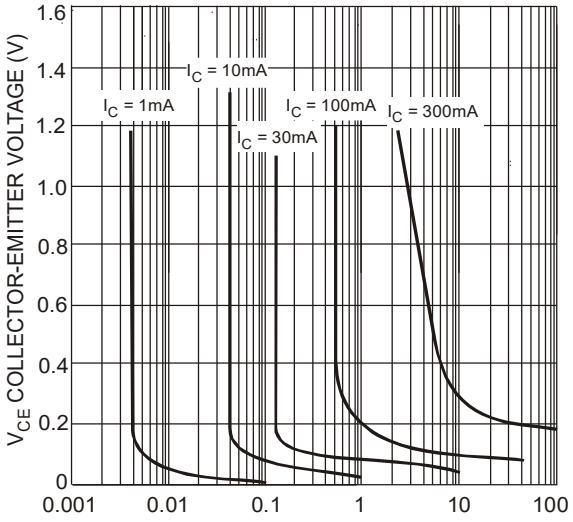


Fig. 4 Typical Collector Saturation Region

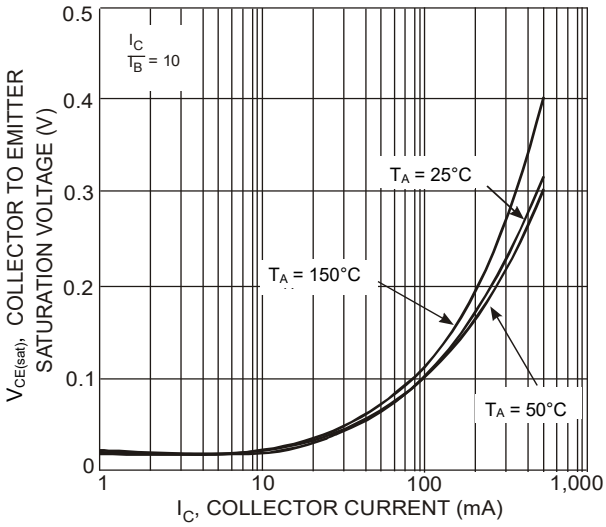


Fig. 5 Collector Emitter Saturation Voltage vs. Collector Current

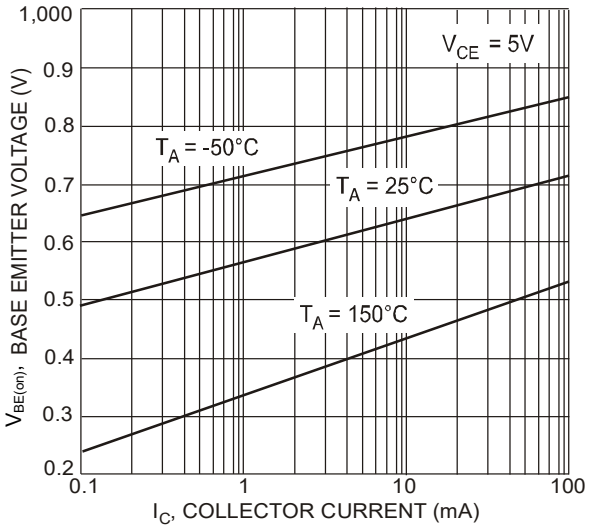


Fig. 6 Base-Emitter Voltage vs. Collector Current

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Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.) (continued)

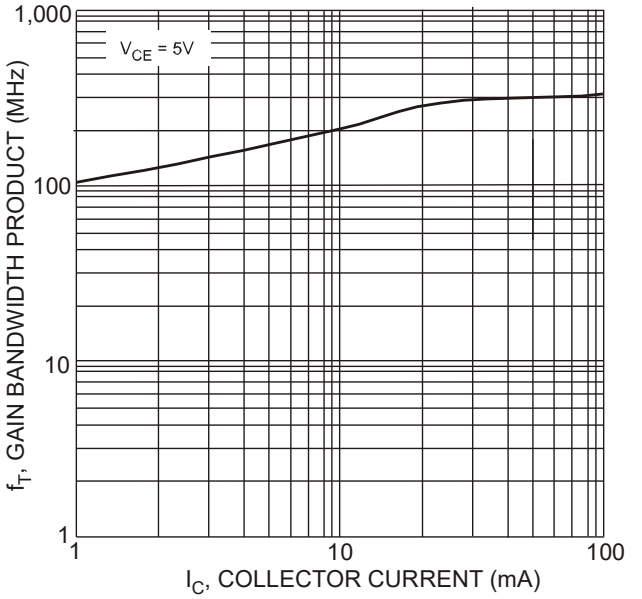


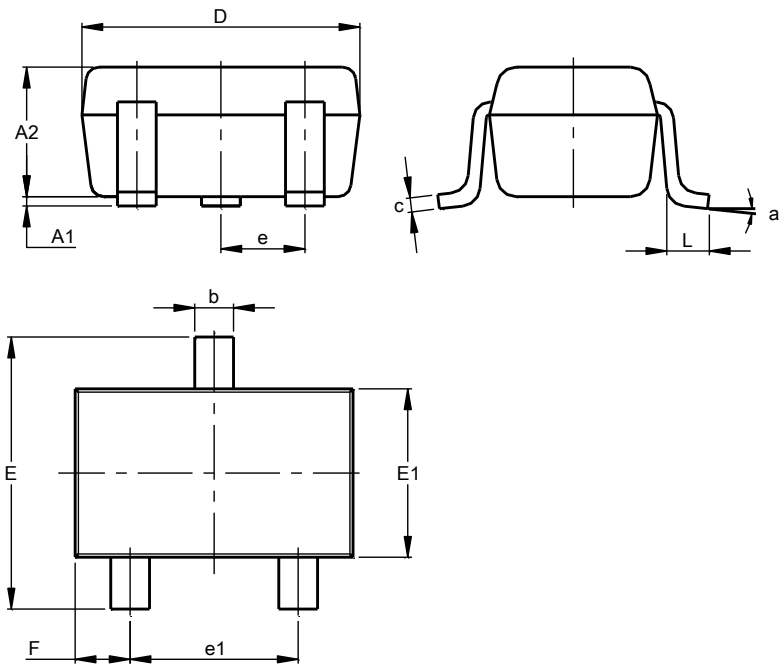
Fig. 7 Gain Bandwidth Product vs. Collector Current

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Package Outline Dimensions

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

SOT323

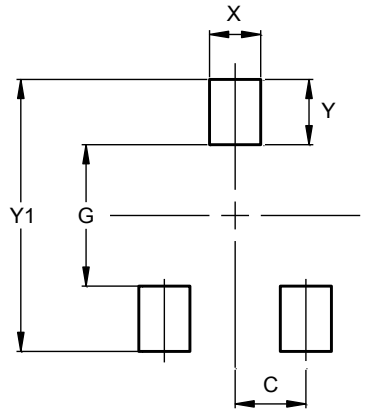


SOT323			
Dim	**Min**	**Max**	**Typ**
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.25	0.40	0.30
c	0.10	0.18	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
e1	1.20	1.40	1.30
F	0.375	0.475	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT323



Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.470
Y	0.600
Y1	2.500

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