
Chipsmall
深圳市津利帝科技有限公司
Geelead Technology Limited
Chipsmall
采购部

Lead-free Green

MMST4403

PNP SMALL SIGNAL SURFACE MOUNT TRANSISTOR

Features

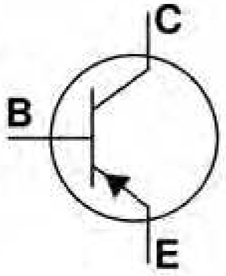
- Epitaxial Planar Die Construction
- Complementary NPN Type Available (MMST4401)
- Ultra-Small Surface Mount Package
- **"Lead Free", RoHS Compliant (Note 1)**
- **Halogen and Antimony Free. "Green" Device (Note 2)**

Mechanical Data

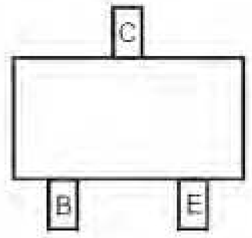
- Case: SOT-323
- Case Material: Molded Plastic, "Green" Molding Compound, Note 4. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Weight: 0.006 grams (approximate)

SOT-323

Top view



Device symbol



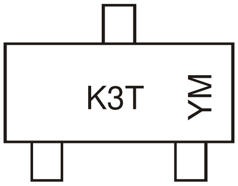
Pinout – top view

Ordering Information (Note 3)

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

Notes: 1. No purposefully added lead.
2. Diodes Inc's "Green" Policy can be found on our website at http://www.diodes.com
3. For packaging details, go to our website at http://www.diodes.com

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	2010	2011	2012	2013	2014	2015	2016	2017
Code	X	Y	Z	A	B	C	D	E

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

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}	-5.0	V
Collector Current – Continuous (Note 4)	I_C	-600	mA
Power Dissipation (Note 4)	P_d	200	mW
Thermal Resistance, Junction to Ambient (Note 4)	$R_{\theta JA}$	625	K/W
Operating and Storage Temperature Range	T_j, T_{STG}	-55 to +150	°C

Notes: 4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch;

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 5)					
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 = -1.0mA, I_B = 0
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5.0	—	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 5)					
DC Current Gain	h_{FE}	30 60 100 100 20	— — — 300 —	—	I_C = -100μA, V_{CE} = -1.0V I_C = -1.0mA, V_{CE} = -1.0V I_C = -10mA, V_{CE} = -1.0V I_C = -150mA, V_{CE} = -2.0V I_C = -500mA, V_{CE} = -2.0V
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}	1.0	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	

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

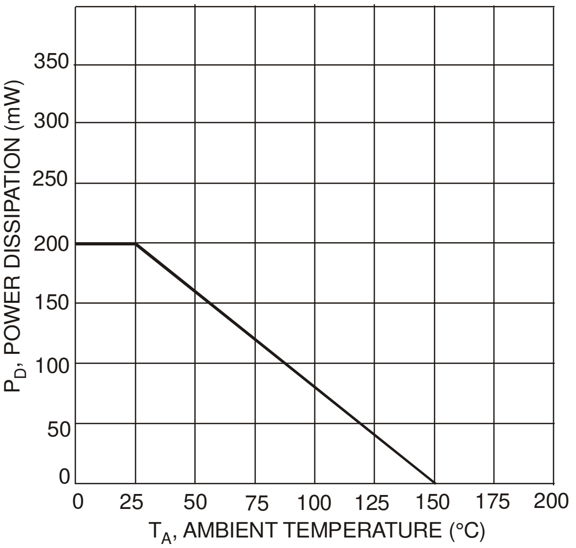


Fig. 1 Max Power Dissipation vs. Ambient Temperature

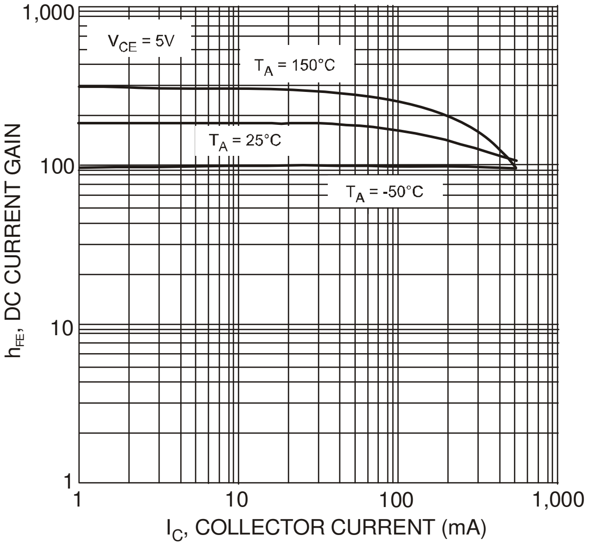


Fig. 2 DC Current Gain vs. Collector Current

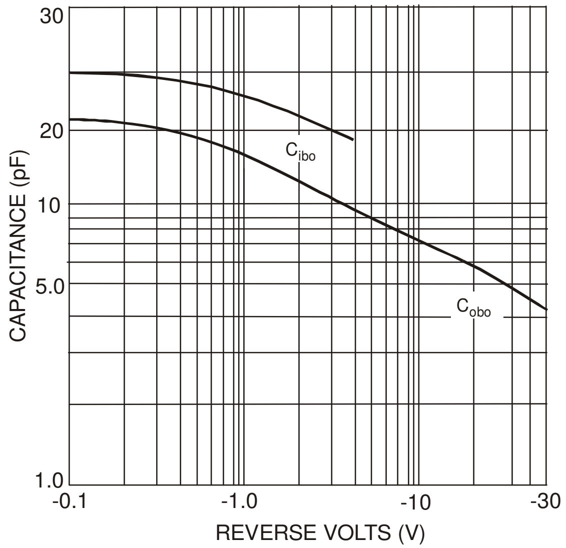


Fig. 3 Typical Capacitance

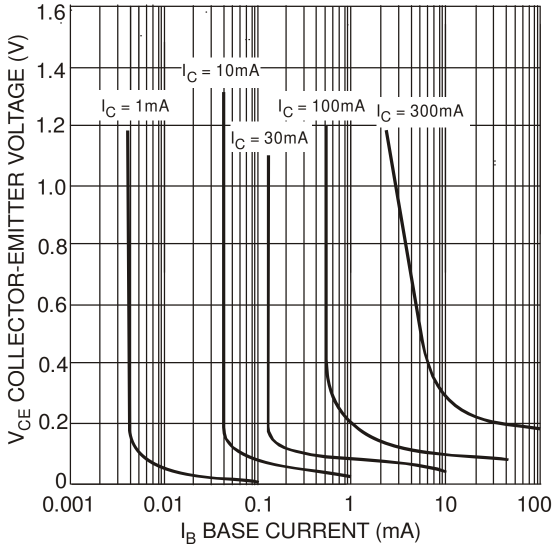


Fig. 4 Typical Collector Saturation Region

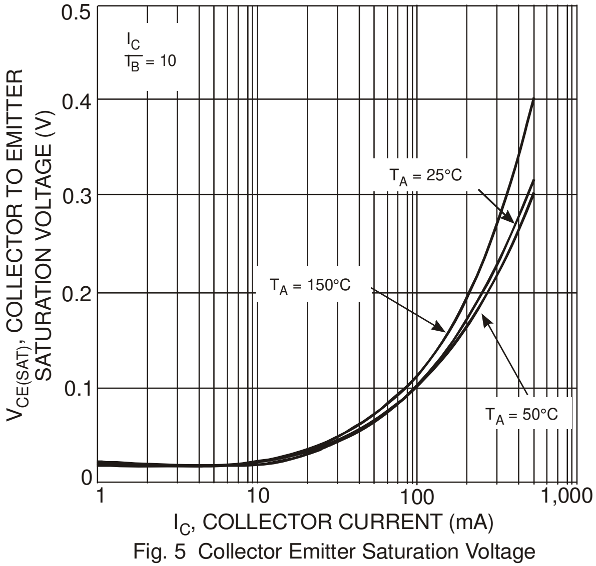


Fig. 5 Collector Emitter Saturation Voltage vs. Collector Current

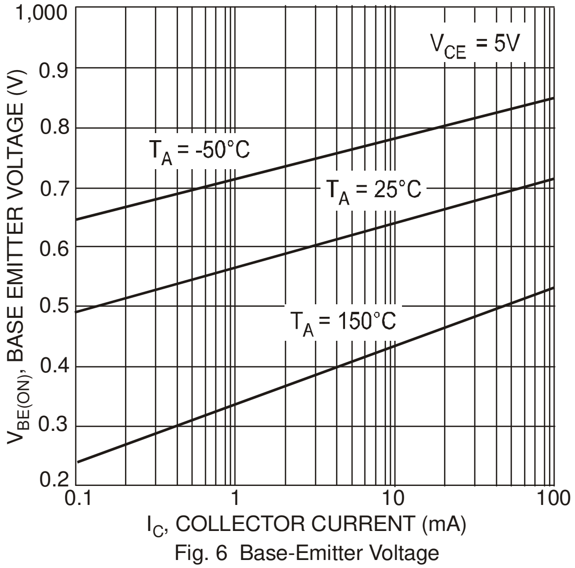


Fig. 6 Base-Emitter Voltage vs. Collector Current

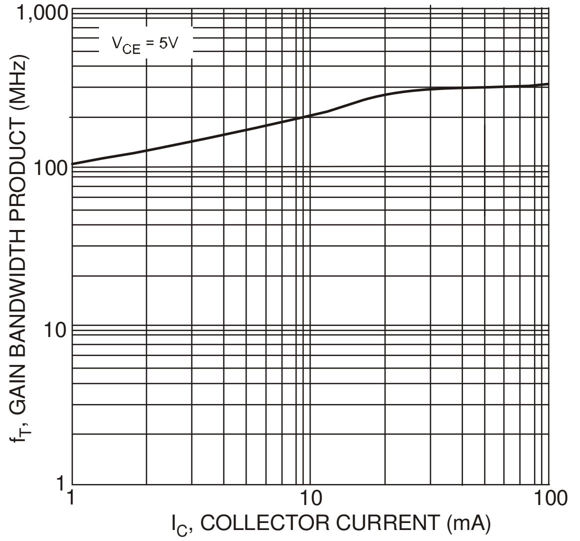
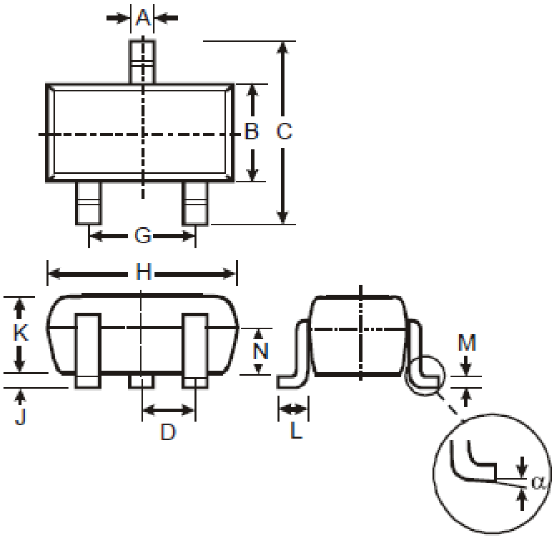


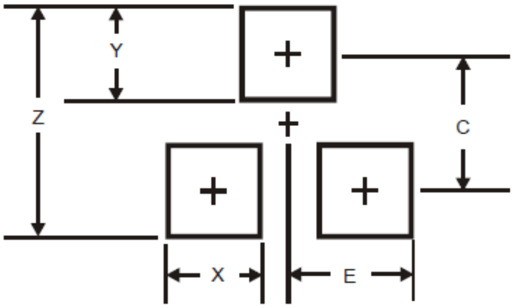
Fig. 7 Gain Bandwidth Product vs. Collector Current

Package Outline Dimensions



SOT-323			
Dim	**Min**	**Max**	**Typ**
A	0.25	0.40	0.30
B	1.15	1.35	1.30
C	2.00	2.20	2.10
D	-	-	0.65
G	1.20	1.40	1.30
H	1.80	2.20	2.15
J	0.0	0.10	0.05
K	0.90	1.00	1.00
L	0.25	0.40	0.30
M	0.10	0.18	0.11
N	-	-	-
α	0°	8°	-
All Dimensions in mm			

Suggested Pad Layout



Dimensions	SOT-323
Z	2.8
X	0.7
Y	0.9
C	1.9
E	1.0

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