MMDT5401

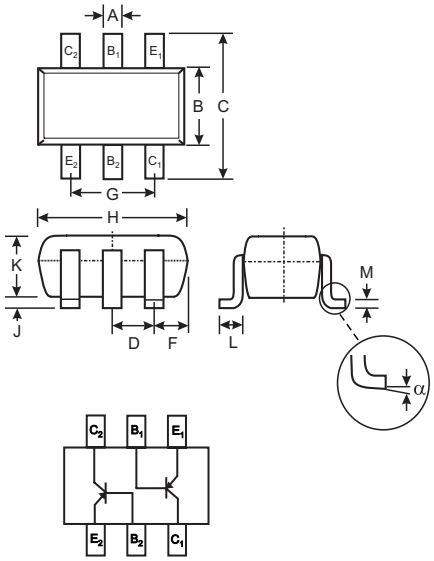
DUAL PNP SMALL SIGNAL SURFACE MOUNT TRANSISTOR

Features

- Epitaxial Planar Die Construction
- Complementary NPN Type Available (MMDT 5551)
- Ideal for Medium Power Amplification and Switching
- Ultra-Small Surface Mount Package
- **Lead Free/RoHS Compliant (Note 3)**

Mechanical Data

- Case: SOT-363
- Case Material: Molded Plastic. 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 (See Page 2): K4M
- Order & Date Code Information: See Page 2
- Weight: 0.006 grams (approximate)



SOT-363		
Dim	**Min**	**Max**
A	0.10	0.30
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
F	0.30	0.40
H	1.80	2.20
J	—	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.25
α	0°	8°
All Dimensions in mm		

Maximum Ratings @ T_A = 25°C unless otherwise specified

Characteristic	Symbol	MMDT5401	Unit
Collector-Base Voltage	V_{CBO}	-160	V
Collector-Emitter Voltage	V_{CEO}	-150	V
Emitter-Base Voltage	V_{EBO}	-5.0	V
Collector Current - Continuous (Note 1)	I_C	-200	mA
Power Dissipation (Note 1, 2)	P_d	200	mW
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	625	K/W
Operating and Storage and Temperature Range	T_j, T_{STG}	-55 to +150	°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. Maximum combined dissipation.
3. No purposefully added lead.

Electrical Characteristics @ T_A = 25°C unless otherwise specified

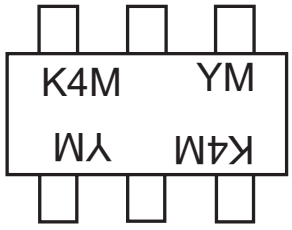
Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 4)					
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-160	—	V	I_C = -100μA, I_E = 0
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-150	—	V	I_C = -1.0mA, I_B = 0
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5.0	—	V	I_E = -10μA, I_C = 0
Collector Cutoff Current	I_{CBO}	—	-50	nA μA	V_{CB} = -120V, I_E = 0 V_{CB} = -120V, I_E = 0, T_A = 100°C
Emitter Cutoff Current	I_{EBO}	—	-50	nA	V_{EB} = -3.0V, I_C = 0
ON CHARACTERISTICS (Note 4)					
DC Current Gain	h_{FE}	50 60 50	— 240 —	—	I_C = -1.0mA, V_{CE} = -5.0V I_C = -10mA, V_{CE} = -5.0V I_C = -50mA, V_{CE} = -5.0V
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	-0.2 -0.5	V	I_C = -10mA, I_B = -1.0mA I_C = -50mA, I_B = -5.0mA
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	-1.0	V	I_C = -10mA, I_B = -1.0mA I_C = -50mA, I_B = -5.0mA
SMALL SIGNAL CHARACTERISTICS					
Output Capacitance	C_{obo}	—	6.0	pF	V_{CB} = -10V, f = 1.0MHz, I_E = 0
Small Signal Current Gain	h_{fe}	40	200	—	V_{CE} = -10V, I_C = -1.0mA, f = 1.0kHz
Current Gain-Bandwidth Product	f_T	100	300	MHz	V_{CE} = -10V, I_C = -10mA, f = 100MHz
Noise Figure	NF	—	8.0	dB	V_{CE} = -5.0V, I_C = -200μA, R_S = 10Ω, f = 1.0kHz

Ordering Information (Note 5)

Device	Packaging	Shipping
MMDT5401-7-F	SOT-363	3000/Tape & Reel

Notes: 4. Short duration test pulse used to minimize self-heating effect.
5. For Packaging Details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information



K4M = 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

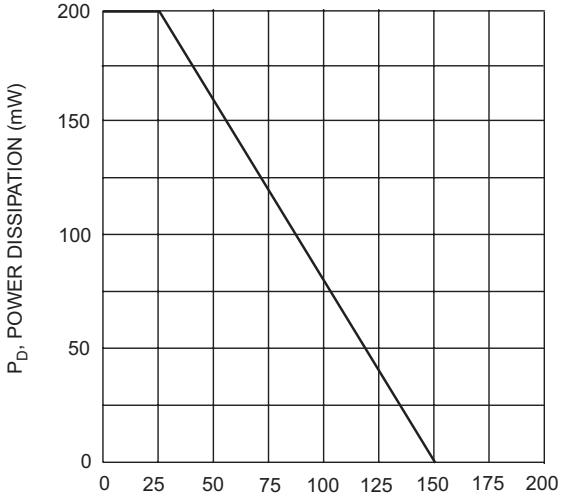


Fig. 1, Max Power Dissipation vs Ambient Temperature

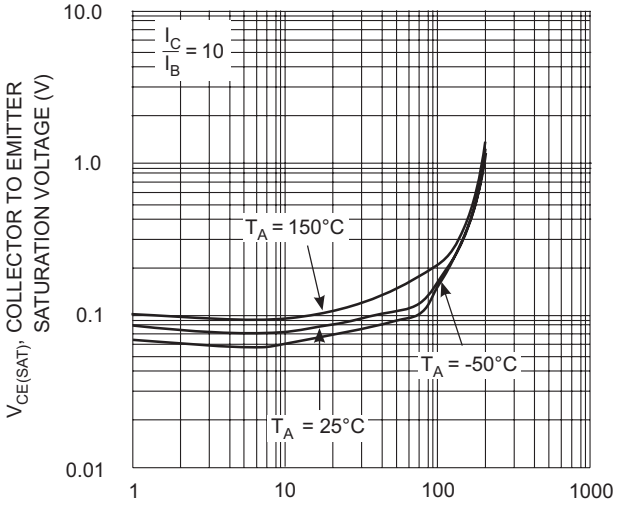


Fig. 2, Collector Emitter Saturation Voltage vs. Collector Current

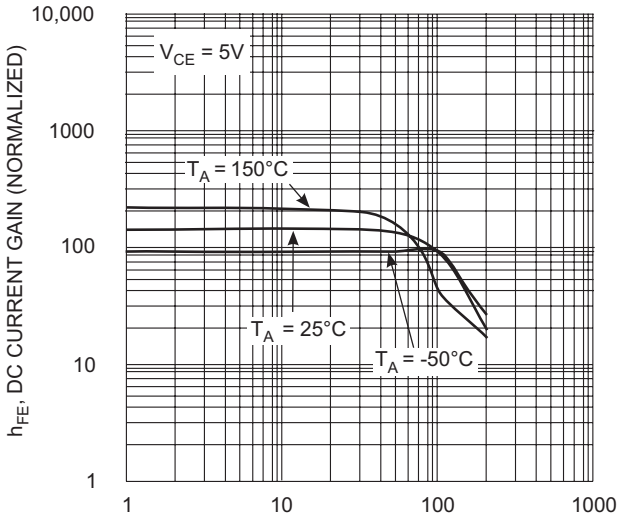


Fig. 3, DC Current Gain vs. Collector Current

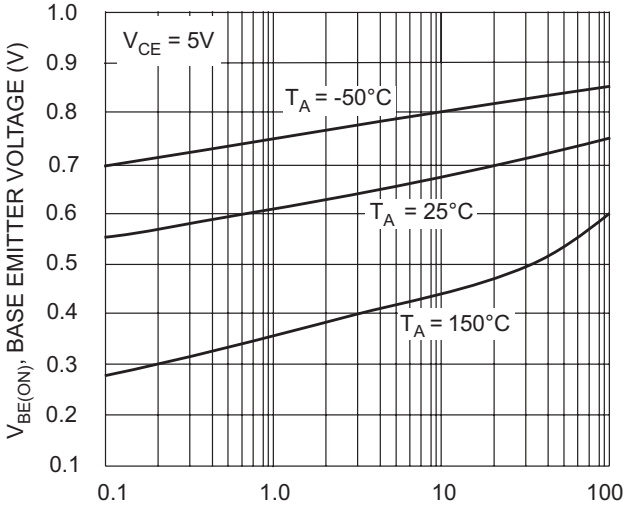


Fig. 4, Base Emitter Voltage vs. Collector Current

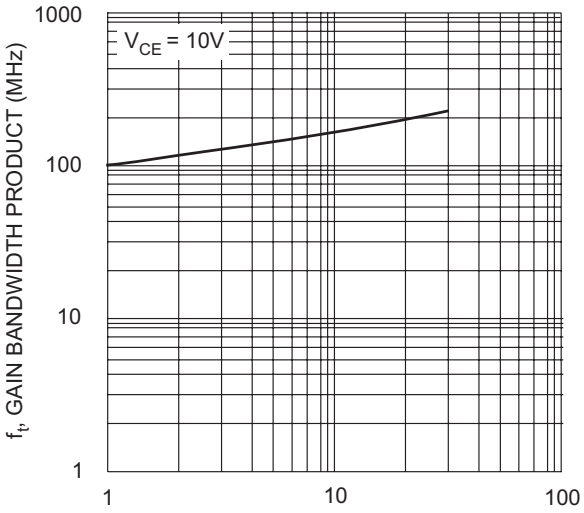


Fig. 5, Gain Bandwidth Product vs Collector Current

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