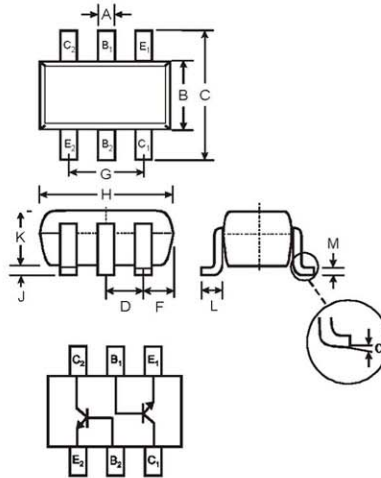


## ● Features

Epitaxial Planar Die Construction  
 Complementary PNP Type Available (MMDT5401)  
 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 Information: K4N, See Page 3  
 Ordering & Date Code Information: See Page 3  
 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
$\alpha$	0°	8°
All Dimensions in mm		

## ● Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CB0}$	180	V
Collector-Emitter Voltage	$V_{CE0}$	160	V
Emitter-Base Voltage	$V_{EB0}$	6.0	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	$^\circ\text{C/W}$
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  
 2. Maximum combined dissipation.  
 3. No purposefully added lead.

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

Characteristic	Symbol	Min	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 6)</b>					
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	180	—	V	$I_C = 100\mu\text{A}, I_E = 0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	160	—	V	$I_C = 1.0\text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	6.0	—	V	$I_E = 10\mu\text{A}, I_C = 0$
Collector Cutoff Current	$I_{CBO}$	—	50	nA $\mu\text{A}$	$V_{CB} = 120\text{V}, I_E = 0$ $V_{CB} = 120\text{V}, I_E = 0, T_A = 100^\circ\text{C}$
Emitter Cutoff Current	$I_{EBO}$	—	50	nA	$V_{EB} = 4.0\text{V}, I_C = 0$
<b>ON CHARACTERISTICS (Note 6)</b>					
DC Current Gain	$h_{FE}$	80 80 30	— 250 —	—	$I_C = 1.0\text{mA}, V_{CE} = 5.0\text{V}$ $I_C = 10\text{mA}, V_{CE} = 5.0\text{V}$ $I_C = 50\text{mA}, V_{CE} = 5.0\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	0.15 0.20	V	$I_C = 10\text{mA}, I_B = 1.0\text{mA}$ $I_C = 50\text{mA}, I_B = 5.0\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	1.0	V	$I_C = 10\text{mA}, I_B = 1.0\text{mA}$ $I_C = 50\text{mA}, I_B = 5.0\text{mA}$
<b>SMALL SIGNAL CHARACTERISTICS</b>					
Output Capacitance	$C_{obo}$	—	6.0	pF	$V_{CB} = 10\text{V}, f = 1.0\text{MHz}, I_E = 0$
Small Signal Current Gain	$h_{fe}$	50	250	—	$V_{CE} = 10\text{V}, I_C = 1.0\text{mA}, f = 1.0\text{kHz}$
Current Gain-Bandwidth Product	$f_T$	100	300	MHz	$V_{CE} = 10\text{V}, I_C = 10\text{mA}, f = 100\text{MHz}$
Noise Figure	NF	—	8.0	dB	$V_{CE} = 5.0\text{V}, I_C = 200\mu\text{A}, R_S = 1.0\text{k}\Omega, f = 1.0\text{kHz}$

Notes: 6. Short duration pulse test used to minimize self-heating effect.

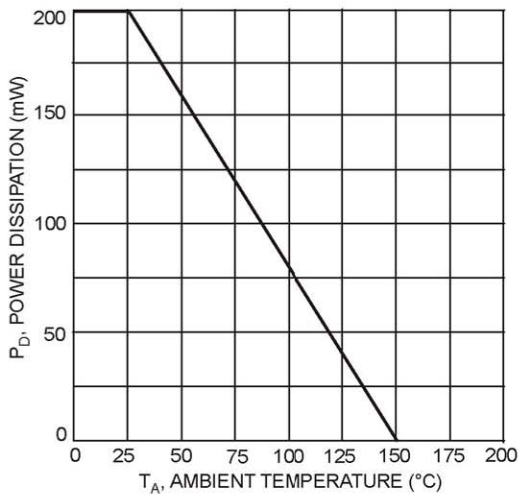


Fig. 1, Max Power Dissipation vs. Ambient Temperature

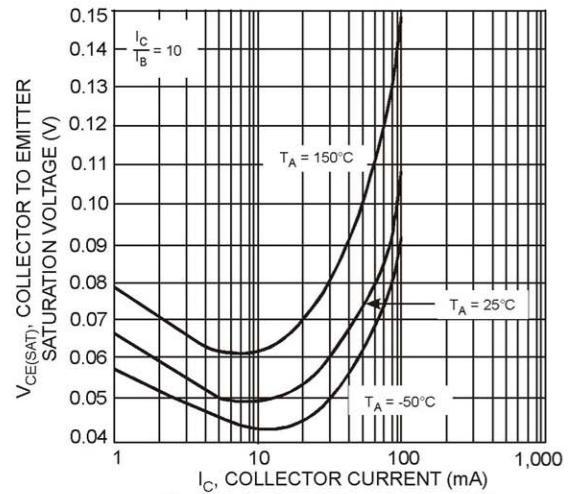


Fig. 2, Collector Emitter Saturation Voltage vs. Collector Current

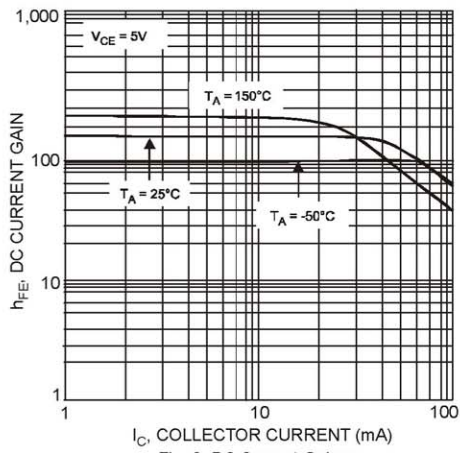


Fig. 3. DC Current Gain vs. Collector Current

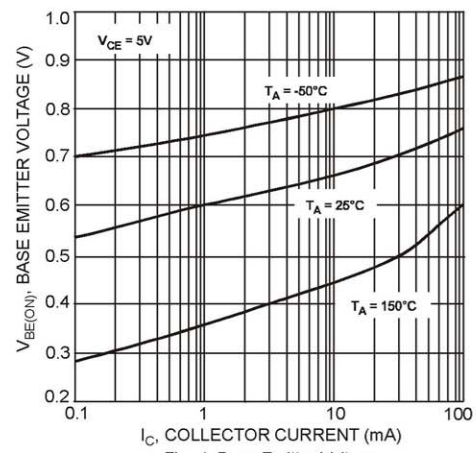


Fig. 4. Base Emitter Voltage vs. Collector Current

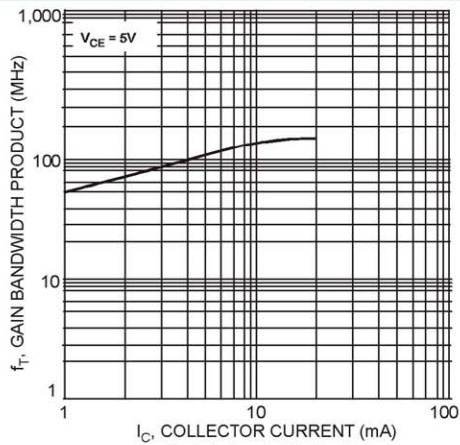


Fig. 5. Gain Bandwidth Product vs. Collector Current