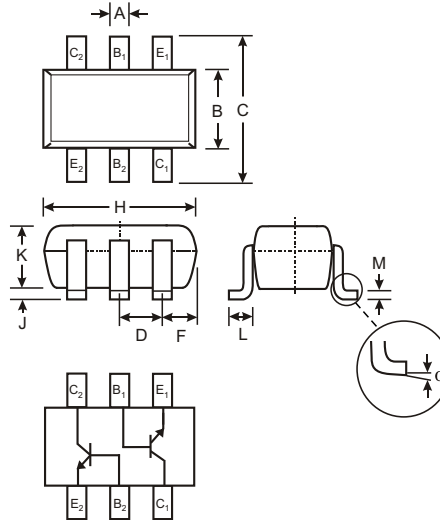


Features

- Epitaxial Planar Die Construction
- Ideal for Low Power Amplification and Switching
- Ultra-Small Surface Mount Package
- Lead Free/RoHS Compliant (Note 3)**
- Qualified to AEC-Q101 Standards for High Reliability**

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): K2X
- Ordering & 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
	0	8
All Dimensions in mm		

Maximum Ratings @ T_A = 25 C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CB0}	60	V
Collector-Emitter Voltage	V _{CE0}	40	V
Emitter-Base Voltage	V _{EB0}	6.0	V
Collector Current - Continuous (Note 1)	I _C	600	mA
Power Dissipation (Note 1, 2)	P _d	200	mW
Thermal Resistance, Junction to Ambient (Note 1)	R _{JA}	625	C/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 @ $T_A = 25\text{ C}$ unless otherwise specified

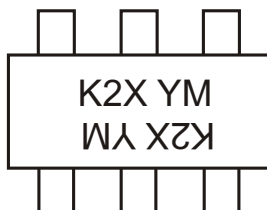
Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 4)					
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	60		V	$I_C = 100\text{ A}, I_E = 0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	40		V	$I_C = 1.0\text{ mA}, I_B = 0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	6.0		V	$I_E = 100\text{ A}, I_C = 0$
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	$V_{CE} = 35\text{ V}, V_{EB(OFF)} = 0.4\text{ V}$
ON CHARACTERISTICS (Note 4)					
DC Current Gain	h_{FE}	20 40 80 100 40	300		$I_C = 100\mu\text{A}, V_{CE} = 1.0\text{ V}$ $I_C = 1.0\text{ mA}, V_{CE} = 1.0\text{ V}$ $I_C = 10\text{ mA}, V_{CE} = 1.0\text{ V}$ $I_C = 150\text{ mA}, V_{CE} = 1.0\text{ V}$ $I_C = 500\text{ mA}, V_{CE} = 2.0\text{ V}$
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 1.2	V	$I_C = 150\text{ mA}, I_B = 15\text{ mA}$ $I_C = 500\text{ mA}, I_B = 50\text{ mA}$
SMALL SIGNAL CHARACTERISTICS					
Output Capacitance	C_{cb}		6.5	pF	$V_{CB} = 5.0\text{ V}, f = 1.0\text{ MHz}, I_E = 0$
Input Capacitance	C_{eb}		30	pF	$V_{EB} = 0.5\text{ V}, f = 1.0\text{ MHz}, I_C = 0$
Input Impedance	h_{ie}	1.0	15	k	$V_{CE} = 10\text{ V}, I_C = 1.0\text{ mA}, f = 1.0\text{ kHz}$
Voltage Feedback Ratio	h_{re}	0.1	8.0	$\times 10^{-4}$	
Small Signal Current Gain	h_{fe}	40	500		
Output Admittance	h_{oe}	1.0	30	S	
Current Gain-Bandwidth Product	f_T	250		MHz	$V_{CE} = 10\text{ V}, I_C = 20\text{ mA}, f = 100\text{ MHz}$
SWITCHING CHARACTERISTICS					
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 5)

Device	Packaging	Shipping
MMDT4401-7-F	SOT-363	3000/Tape & Reel

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

Marking Information



K2X = 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

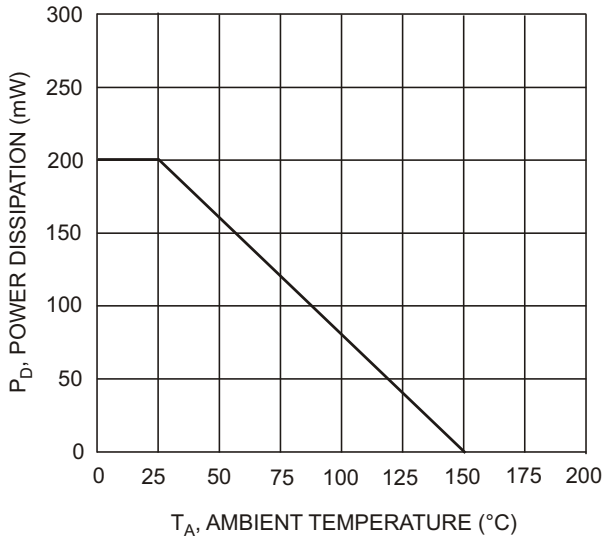


Fig. 1 Max Power Dissipation vs Ambient Temperature

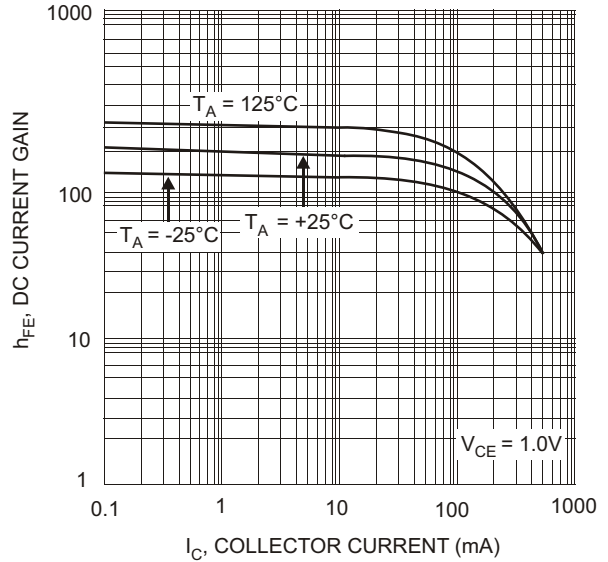


Fig. 2 Typical DC Current Gain vs Collector Current

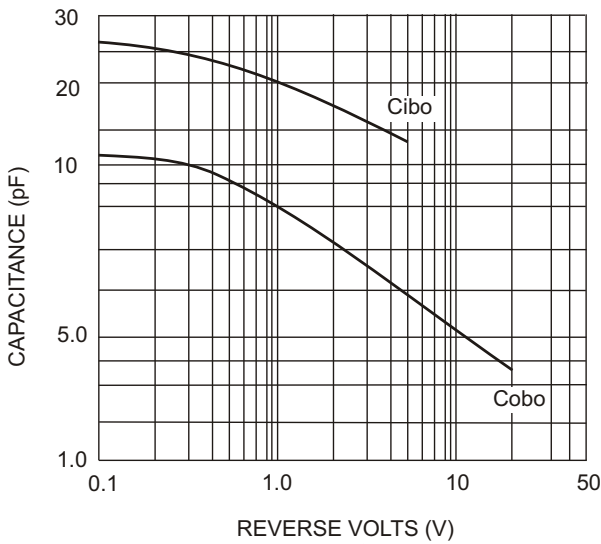


Fig. 3 Typical Capacitance

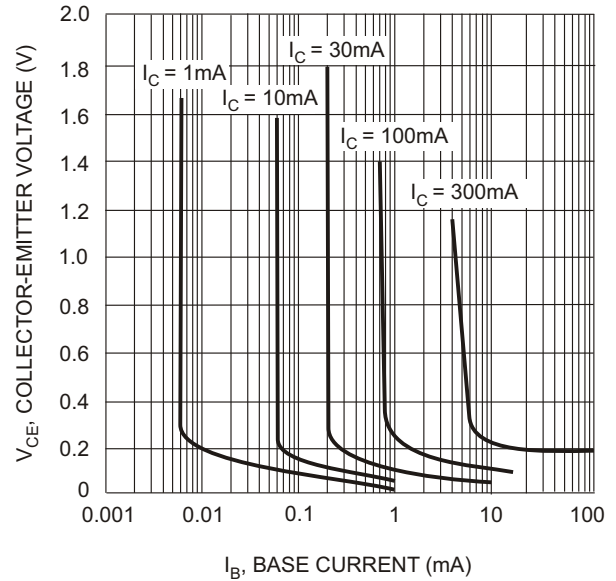


Fig. 4 Typical Collector Saturation Region

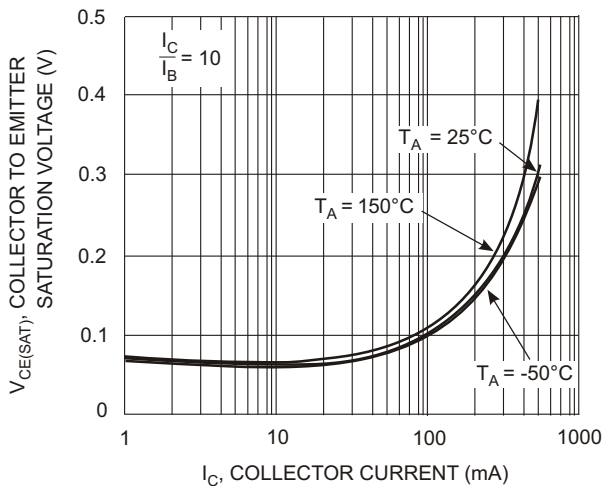


Fig. 5 Collector Emitter Saturation Voltage vs. Collector Current

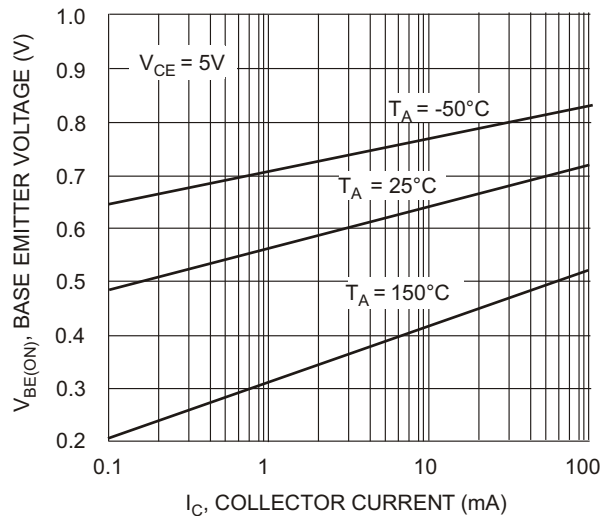


Fig. 6 Base Emitter Voltage vs. Collector Current

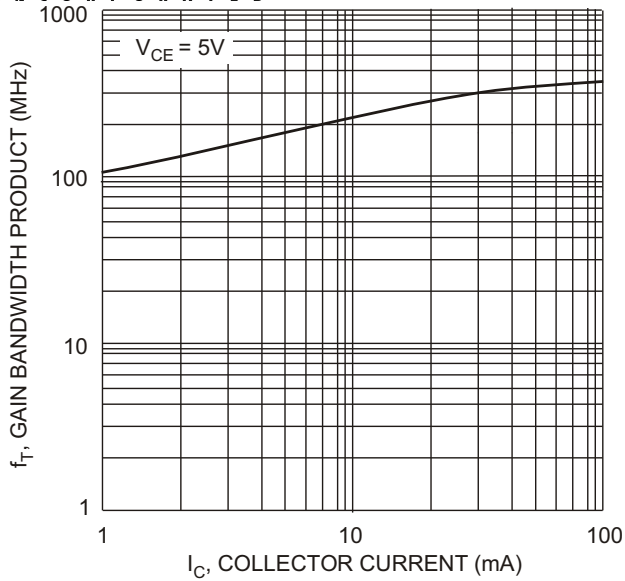


Fig. 7 Gain Bandwidth Product vs. Collector Current

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