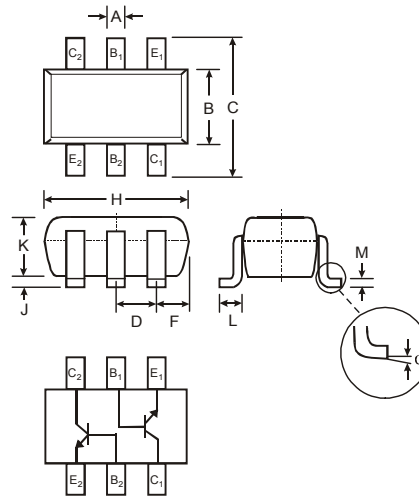


Features

- Epitaxial Planar Die Construction
- Ideal for Low Power Amplification and Switching
- Ultra-Small Surface Mount Package
- **Qualified to AEC-Q101 Standards for High Reliability**
- **Lead Free/RoHS Compliant (Note 3)**
- **"Green" Device (Note 4 and 5)**

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: K2X – See Page 4
- Ordering & Date Code Information: See Page 4
- 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 @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	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)	$R_{\theta JA}$	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; 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.
 4. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
 5. Product manufactured with Date Code UO (week 40, 2007) and newer are built with Green Molding Compound. Product manufactured prior to Date Code UO are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 6)						
Collector-Base Breakdown Voltage	V _{(BR)CBO}	60	—	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}	6.0	—	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 6)						
DC Current Gain	h _{FE}	20	—	—	I _C = 100μA, V _{CE} = 1.0V	
		40	—			I _C = 1.0mA, V _{CE} = 1.0V
		80	—			I _C = 10mA, V _{CE} = 1.0V
		100	300			I _C = 150mA, V _{CE} = 1.0V
		40	—			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 1.2	V	I _C = 150mA, I _B = 15mA I _C = 500mA, I _B = 50mA	
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C _{cb}	—	6.5	pF	V _{CB} = 5.0V, 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}	1.0	15	kΩ	V _{CE} = 10V, I _C = 1.0mA, f = 1.0kHz	
Voltage Feedback Ratio	h _{re}	0.1	8.0	× 10 ⁻⁴		
Small Signal Current Gain	h _{fe}	40	500	—		
Output Admittance	h _{oe}	1.0	30	μS		
Current Gain-Bandwidth Product	f _T	250	—	MHz		V _{CE} = 10V, I _C = 20mA, f = 100MHz
SWITCHING CHARACTERISTICS						
Delay Time	t _d	—	15	ns	V _{CC} = 30V, I _C = 150mA,	
Rise Time	t _r	—	20	ns	V _{BE(off)} = 2.0V, I _{B1} = 15mA	
Storage Time	t _s	—	225	ns	V _{CC} = 30V, I _C = 150mA,	
Fall Time	t _f	—	30	ns	I _{B1} = I _{B2} = 15mA	

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

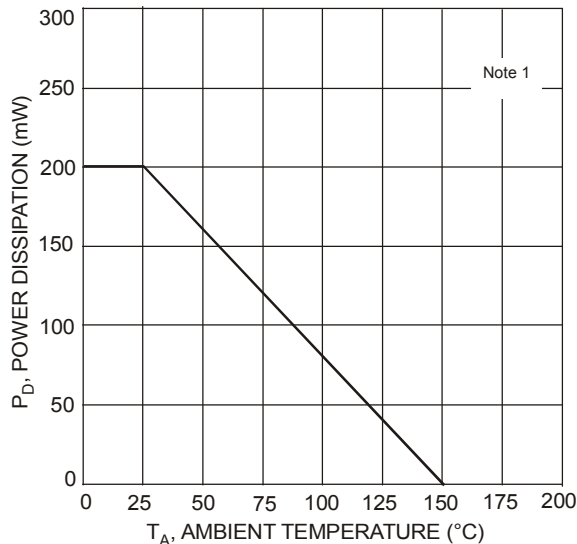


Fig. 1 Max Power Dissipation vs. Ambient Temperature

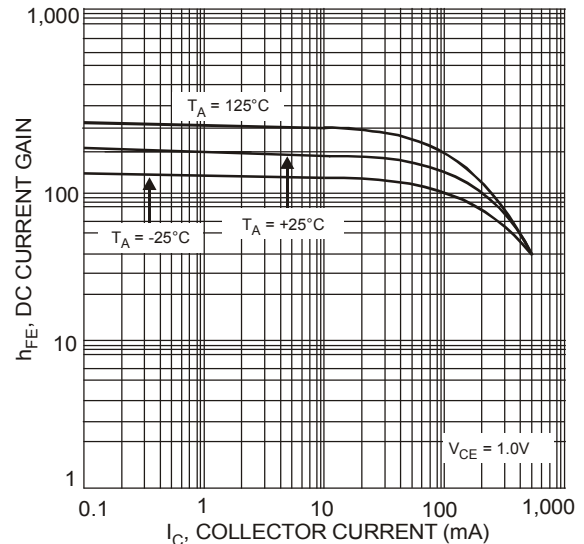


Fig. 2 Typical DC Current Gain vs. Collector Current

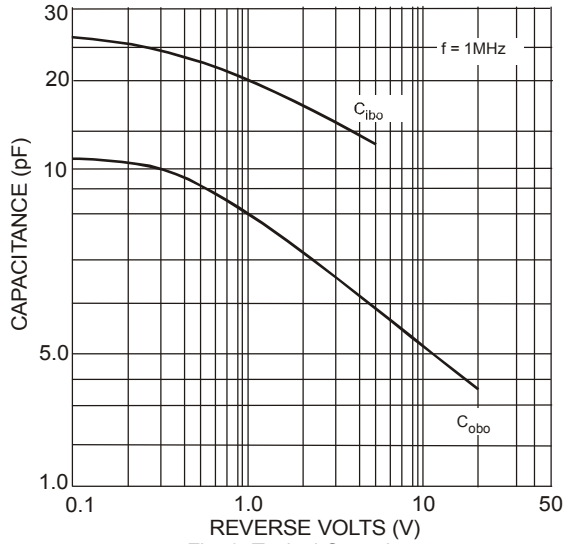


Fig. 3 Typical Capacitance

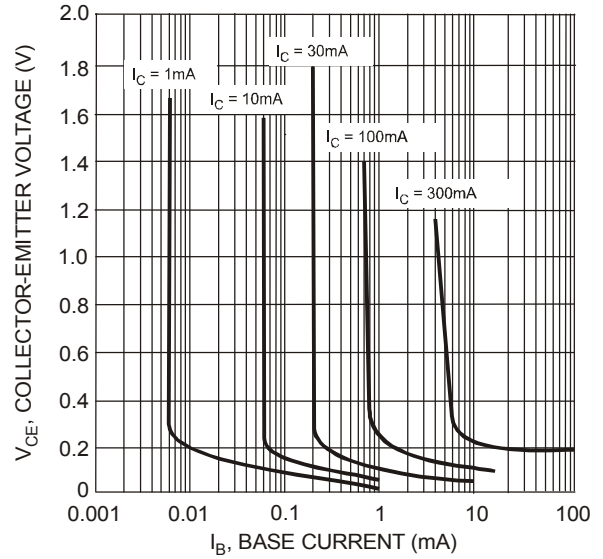


Fig. 4 Typical Collector Saturation Region

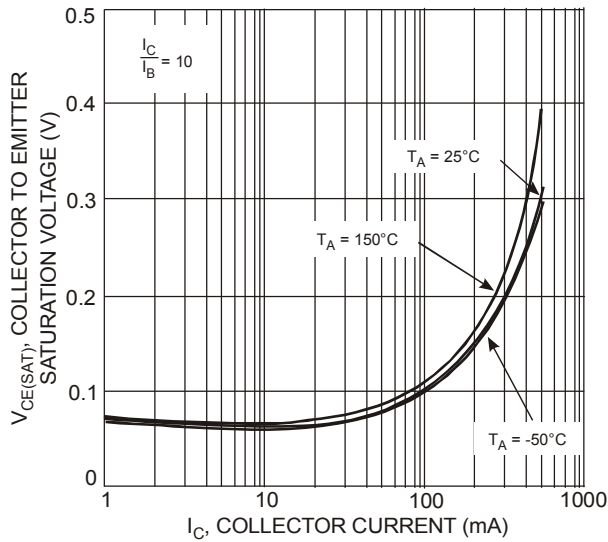


Fig. 5 Collector Emitter Saturation Voltage vs. Collector Current

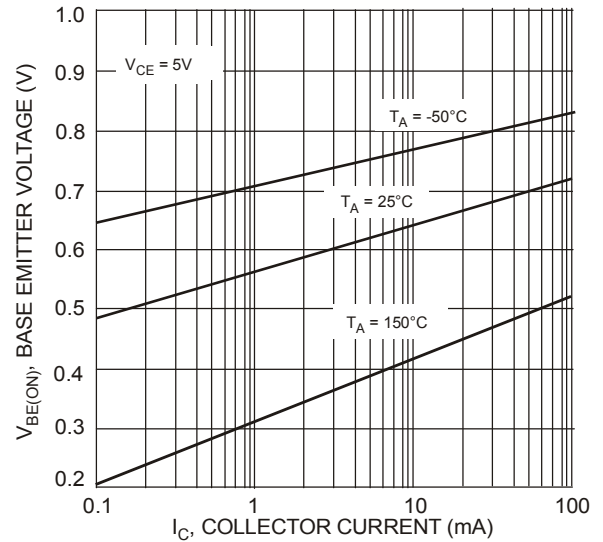


Fig. 6 Base Emitter Voltage vs. Collector Current

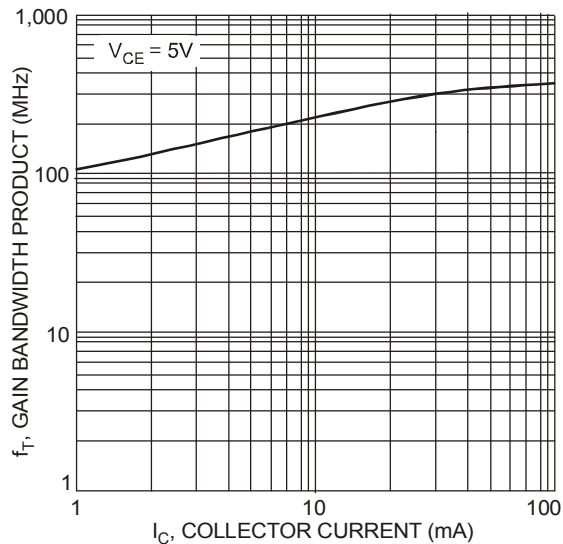


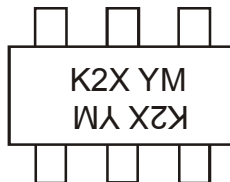
Fig. 7 Gain Bandwidth Product vs. Collector Current

Ordering Information (Note 7)

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

Notes: 7. 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	2010	2011	2012
Code	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z

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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