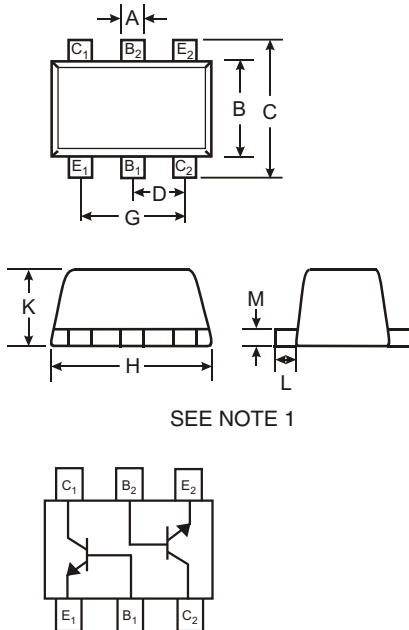


Features

- Epitaxial Planar Die Construction
- Ideal for Low Power Amplification and Switching
- Ultra-Small Surface Mount Package
- Lead Free By Design/RoHS Compliant (Note 4)**
- "Green Device" (Note 5)**

Mechanical Data

- Case: SOT-563
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Finish - Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking (See Page 2): APK
- Ordering Information: See Below
- Date Code Information: See Page 2
- Weight: 0.003 grams (approximate)



SOT-563			
Dim	Min	Max	Typ
A	0.15	0.30	0.25
B	1.10	1.25	1.20
C	1.55	1.70	1.60
D	0.50		
G	0.90	1.10	1.00
H	1.50	1.70	1.60
K	0.56	0.60	0.60
L	0.10	0.30	0.20
M	0.10	0.18	
All Dimensions in mm			

Maximum Ratings @ T_A = 25 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	I _C	200	mA
Power Dissipation (Note 2)	P _d	200	mW
Thermal Resistance, Junction to Ambient	R _{JA}	625	C/W
Operating and Storage Temperature Range	T _j , T _{STG}	-55 to +150	C

Ordering Information (Note 3)

Device	Packaging	Shipping
MMDT3904VC-7	SOT-563	3000/Tape & Reel

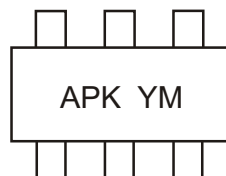
- Notes:
1. Package is non-polarized. Parts may be on reel in orientation illustrated, 180° rotated, or mixed (both ways).
 2. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
 3. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.
 4. No purposefully added lead.
 5. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.

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 = 10 A, 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 = 10 A, I _C = 0
Collector Cutoff Current	I _{CEX}		50	nA	V _{CE} = 30V, V _{EB(OFF)} = 3.0V
Base Cutoff Current	I _{BL}		50	nA	V _{CE} = 30V, V _{EB(OFF)} = 3.0V
ON CHARACTERISTICS (Note 6)					
DC Current Gain	h _{FE}	40 70 100 60 30	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 = 50mA, V _{CE} = 1.0V I _C = 100mA, V _{CE} = 1.0V
Collector-Emitter Saturation Voltage	V _{CE(SAT)}		0.20 0.30	V	I _C = 10mA, I _B = 1.0mA I _C = 50mA, I _B = 5.0mA
Base-Emitter Saturation Voltage	V _{BE(SAT)}	0.65	0.85 0.95	V	I _C = 10mA, I _B = 1.0mA I _C = 50mA, I _B = 5.0mA
SMALL SIGNAL CHARACTERISTICS					
Output Capacitance	C _{obo}		4.0	pF	V _{CB} = 5.0V, f = 1.0MHz, I _E = 0
Input Capacitance	C _{ibo}		8.0	pF	V _{EB} = 0.5V, f = 1.0MHz, I _C = 0
Input Impedance	h _{ie}	1.0	10	k	V _{CE} = 10V, I _C = 1.0mA, f = 1.0kHz
Voltage Feedback Ratio	h _{re}	0.5	8.0	x 10 ⁻⁴	
Small Signal Current Gain	h _{fe}	100	400		
Output Admittance	h _{oe}	1.0	40	S	
Current Gain-Bandwidth Product	f _T	300		MHz	
Noise Figure	NF		5.0	dB	V _{CE} = 5.0V, I _C = 100 A, R _S = 1.0k f = 1.0kHz
SWITCHING CHARACTERISTICS					
Delay Time	t _d		35	ns	V _{CC} = 3.0V, I _C = 10mA, V _{BE(off)} = - 0.5V, I _{B1} = 1.0mA
Rise Time	t _r		35	ns	
Storage Time	t _s		200	ns	V _{CC} = 3.0V, I _C = 10mA, I _{B1} = I _{B2} = 1.0mA
Fall Time	t _f		50	ns	

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

Marking Information



APK = Product Type Marking Code
 YM = Date Code Marking
 Y = Year ex: R = 2004
 M = Month ex: 9 = September

Date Code Key

Year	2005	2006	2007	2008	2009	2010	2011	2012
Code	S	T	U	V	W	X	Y	Z

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

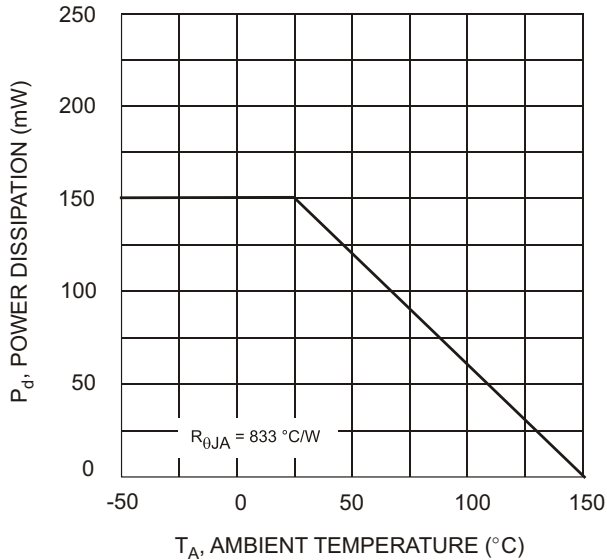


Fig. 1, Derating Curve - Total

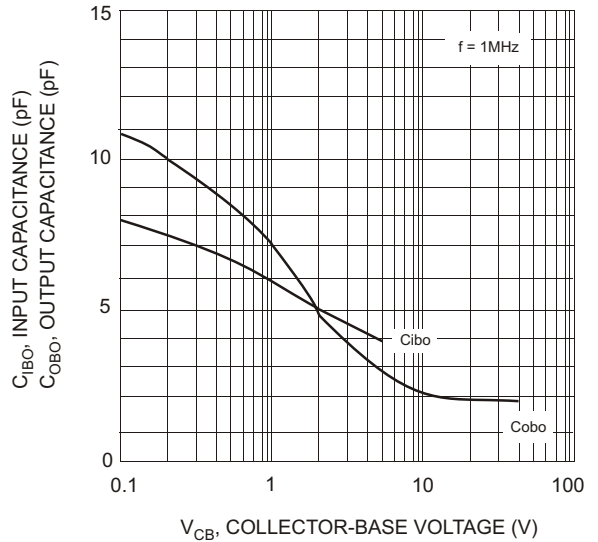


Fig. 2, Input and Output Capacitance vs. Collector-Base Voltage

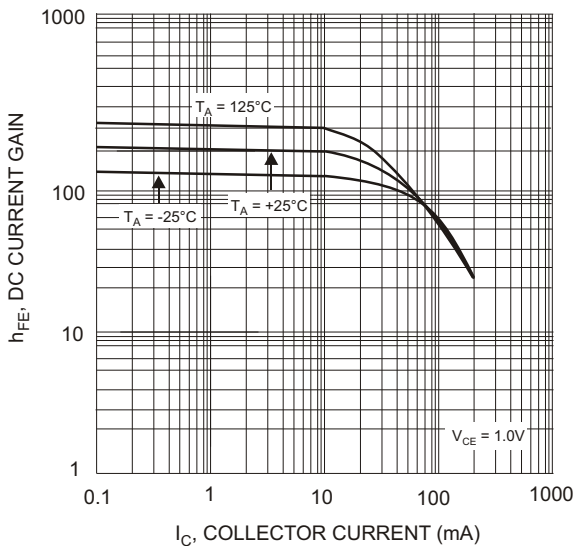


Fig. 3, Typical DC Current Gain vs. Collector Current

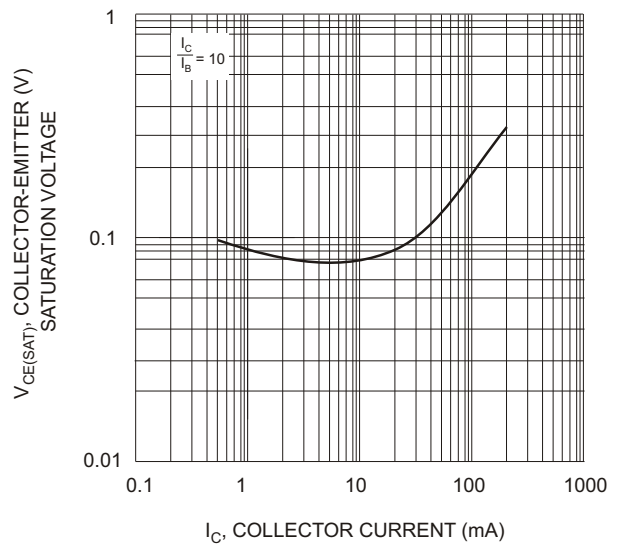


Fig. 4, Typical Collector-Emitter Saturation Voltage vs. Collector Current

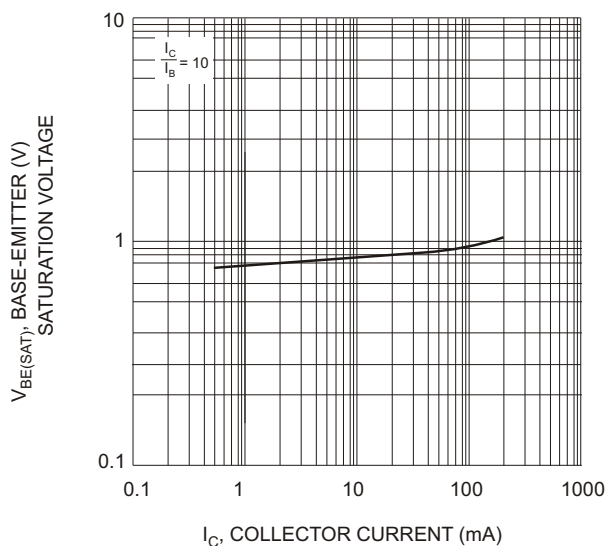


Fig. 5, Typical Base-Emitter Saturation Voltage vs. Collector Current

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