

Features

- $BV_{ce0} > 25V$
- $I_c = 200mA$
- Complementary PNP Type Available (MMDT4126)
- Ideal for Medium Power Amplification and Switching
- Ultra-Small Surface Mount Package
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

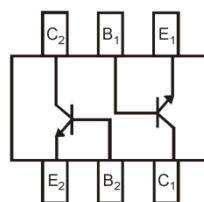
Mechanical Data

- Case: SOT363
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Finish; Solderable per MIL-STD-202, Method 208 Ⓔ
- Weight: 0.006 grams (Approximate)

SOT363



Top View



Device Schematic
Top View

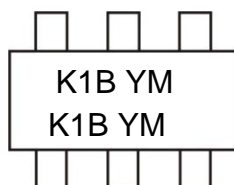
Ordering Information (Note 4)

Product	Status	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
MMDT4124-7-F	NRND	AEC-Q101	K1B	7	8	3,000
MMDT4124-7	Active	AEC-Q101	K1B	7	8	3,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. NRND = Not Recommended for New Design. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information

SOT363



K1B = Product Type Marking Code
 YM = Date Code Marking
 Y or \bar{Y} = Year (ex: A = 2013)
 M or \bar{M} = Month (ex: 9 = September)

Date Code Key

Year	2013	2014	2015	2016	2017	2018	2019	2020
Code	A	B	C	D	E	F	G	H

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

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	30	V
Collector-Emitter Voltage	V _{CEO}	25	V
Emitter-Base Voltage	V _{EBO}	5.0	V
Collector Current	I _C	200	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P _D	200	mW
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	625	°C/W
Operating and Storage and Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 6)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
5. For the device mounted on minimum recommended pad layout FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 6. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristic and Derating Information

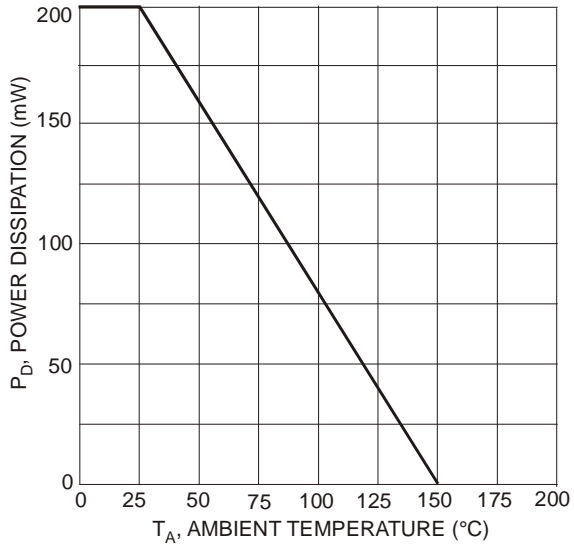


Fig. 1, Power Dissipation vs.
Ambient Temperature (Total Device)

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS					
Collector-Base Breakdown Voltage	BV _{CBO}	30	—	V	I _C = 10μA, I _E = 0
Collector-Emitter Breakdown Voltage (Note 7)	BV _{CEO}	25	—	V	I _C = 1.0mA, I _B = 0
Emitter-Base Breakdown Voltage	BV _{EBO}	5.0	—	V	I _E = 10μA, I _C = 0
Collector-Base Cut-Off Current	I _{CBO}	—	50	nA	V _{CB} = 20V
Emitter-Base Cut-Off Current	I _{EBO}	—	50	nA	V _{EB} = 3V
ON CHARACTERISTICS (Note 7)					
DC Current Gain	h _{FE}	120 60	360 —	—	I _C = 2.0mA, V _{CE} = 1.0V I _C = 50mA, V _{CE} = 1.0V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	—	0.30	V	I _C = 50mA, I _B = 5.0mA
Base-Emitter Saturation Voltage	V _{BE(sat)}	—	0.95	V	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
Small Signal Current Gain	h _{fe}	120	480	—	V _{CE} = 1.0V, I _C = 2.0mA, f = 1.0kHz
Current Gain-Bandwidth Product	f _T	300	—	MHz	V _{CE} = 20V, I _C = 10mA, f = 100MHz
Noise Figure	NF	—	5.0	dB	V _{CE} = 5.0V, I _C = 100μA, R _S = 1.0kΩ, f = 1.0kHz

Note: 7. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

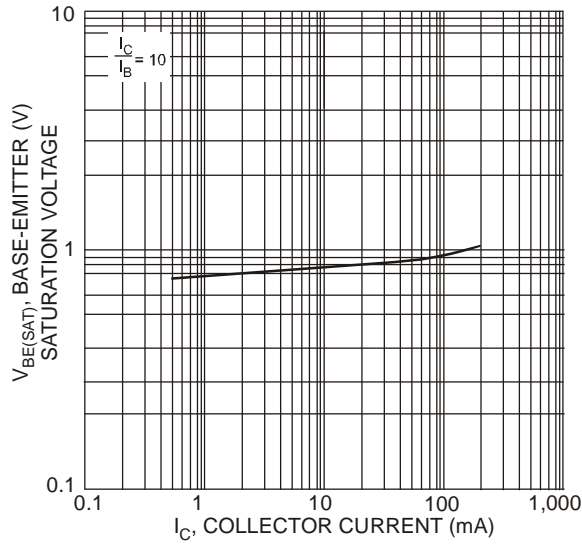


Fig. 5, Typical Base-Emitter Saturation Voltage vs. Collector Current

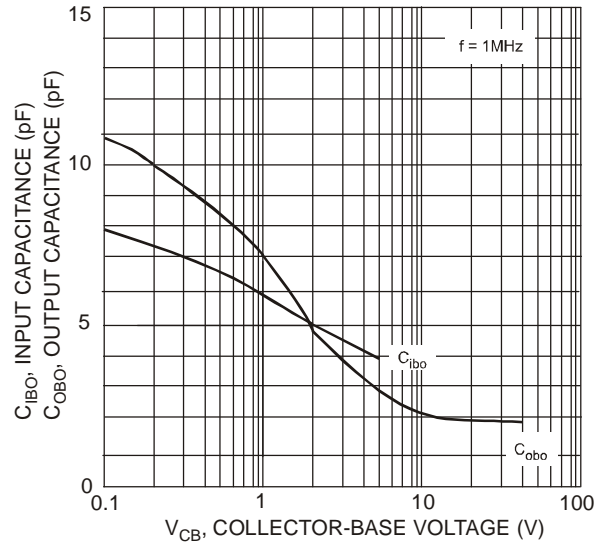


Fig. 2, Input and Output Capacitance vs. Collector-Base Voltage

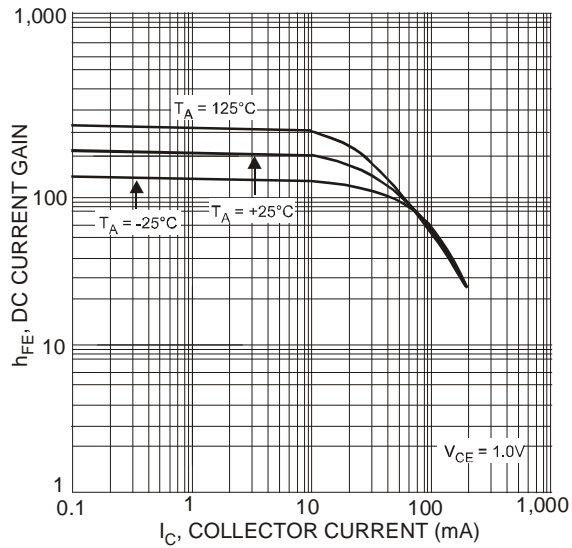


Fig. 3, Typical DC Current Gain vs. Collector Current

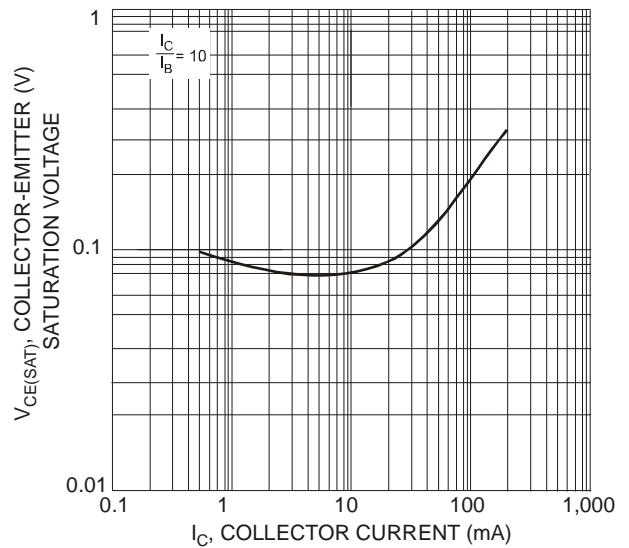
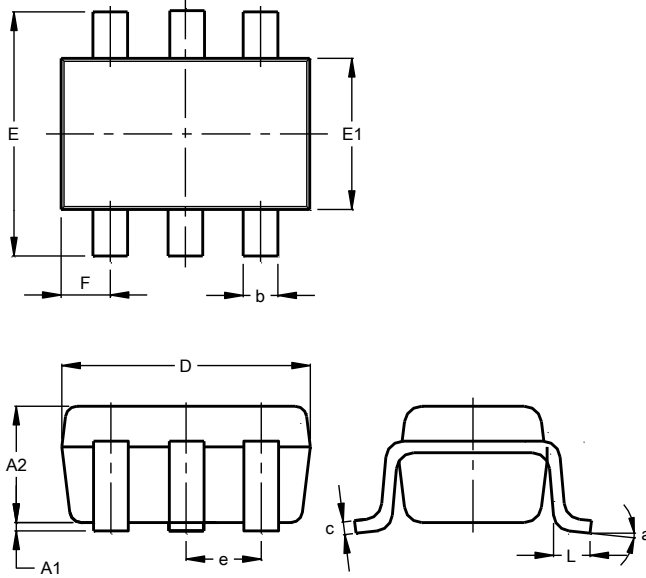


Fig. 4, Typical Collector-Emitter Saturation Voltage vs. Collector Current

Package Outline Dimensions

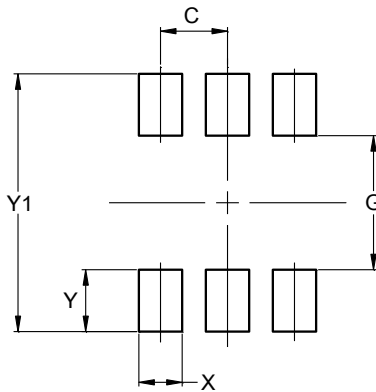
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



SOT363			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.90	1.00	1.00
b	0.10	0.30	0.25
c	0.10	0.22	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
F	0.40	0.45	0.425
L	0.25	0.40	0.30
a	8°		
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.



Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.420
Y	0.600
Y1	2.500

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