

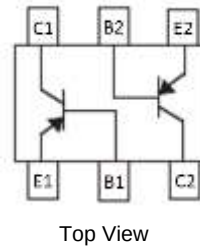
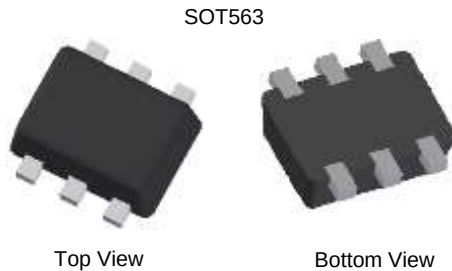
40V DUAL PNP SMALL SIGNAL TRANSISTOR IN SOT563

Features

- $BV_{CEO} > -40V$
- $I_C = -200mA$ High Collector Current
- Epitaxial Planar Die Construction
- Ideal for Low 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: SOT563
- 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: 0.003 grams (Approximate)

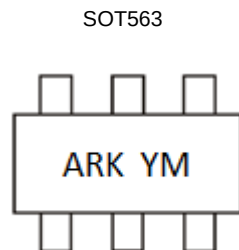


Ordering Information (Note 4)

Product	Status	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
MMDT3906VC-7	Active	AEC-Q101	ARK	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 <https://www.diodes.com/quality/lead-free/> 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. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



ARK = Product Type Marking Code
 YM = Date Code Marking
 Y or $\bar{Y}$ = Year (ex: E = 2017)
 M or $\bar{M}$ = Month (ex: 2 = February)

Date Code Key

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Code	E	F	G	H	I	J	K	L	M	N	O

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}	-40	V
Collector-Emitter Voltage	V _{CEO}	-40	V
Emitter-Base Voltage	V _{EBO}	-6	V
Collector Current	I _C	-200	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P _D	150	mW
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	833	°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:
- 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.
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristic and Derating Information

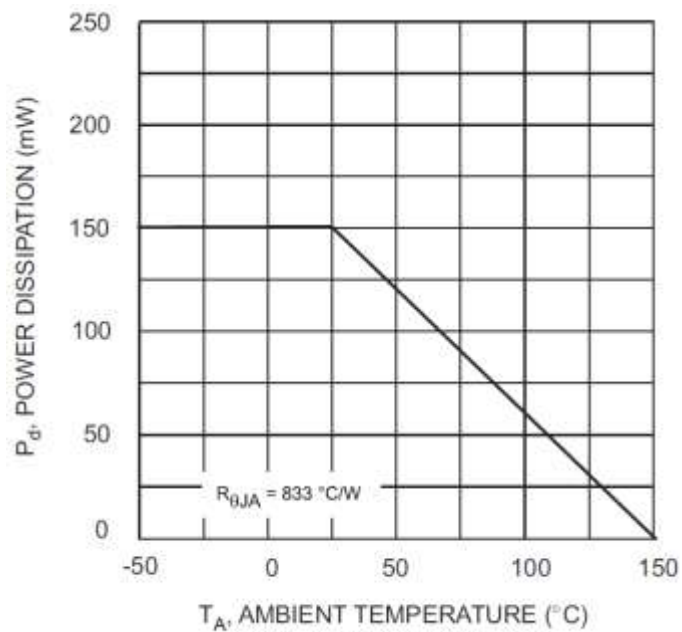


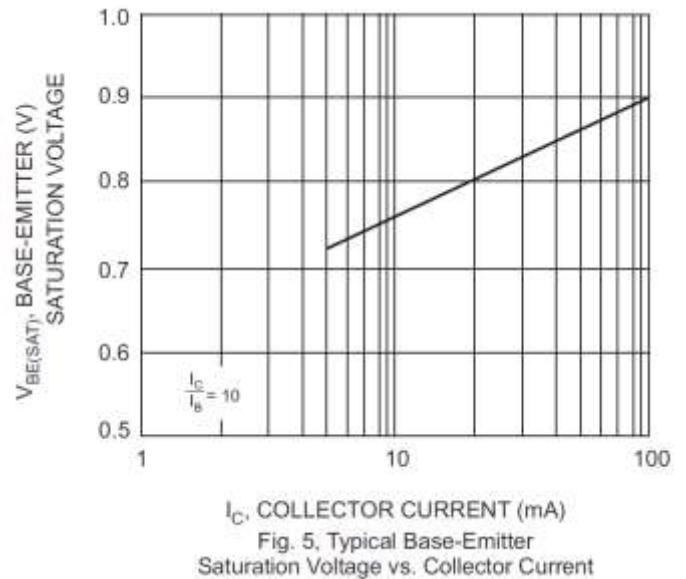
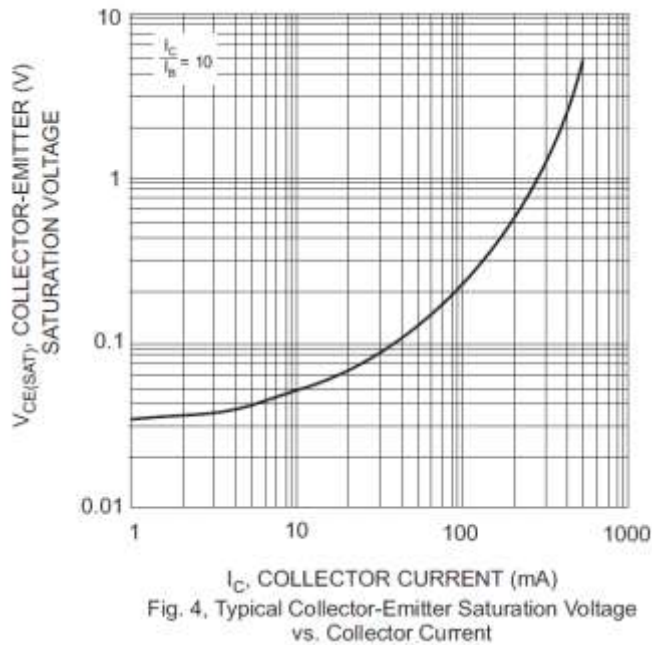
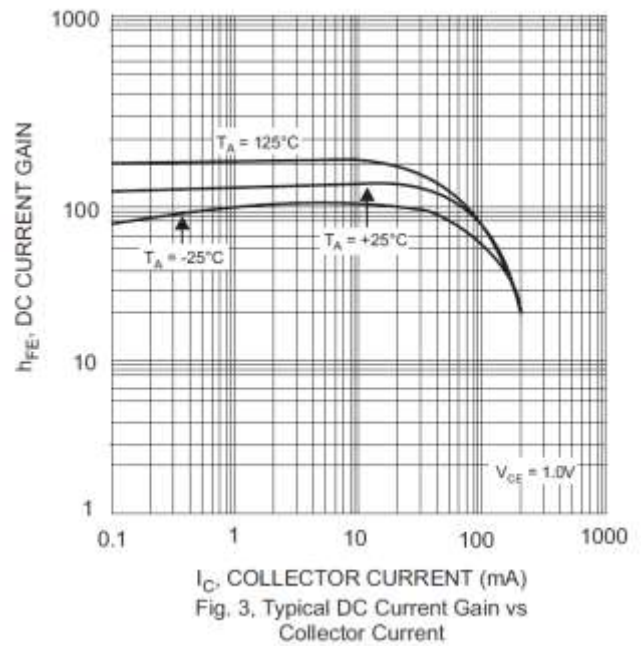
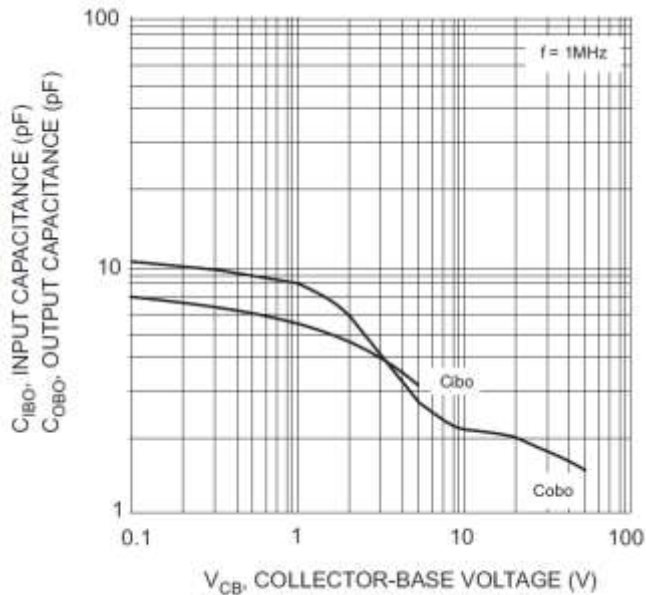
Fig. 1, Derating Curve - Total

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

Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS					
Collector-Base Breakdown Voltage	BV _{CBO}	-40	—	V	I _C = -100μA, I _E = 0
Collector-Emitter Breakdown Voltage	BV _{CEO}	-40	—	V	I _C = -1mA, I _B = 0
Emitter-Base Breakdown Voltage	BV _{EBO}	-6	—	V	I _E = -100μA, I _C = 0
Collector Cut-Off Current	I _{CEX}	—	-50	nA	V _{CE} = -30V, V _{EB(OFF)} = -3V
Base Cut-Off Current	I _{BL}	—	-50	nA	V _{CE} = -30V, V _{EB(OFF)} = -3V
Emitter- Base Cut-Off Current	I _{EBO}	—	-20	nA	V _{EB} = -6V, I _C = 0
ON CHARACTERISTICS (Note 7)					
DC Current Gain	h _{FE}	60 80 100 60 30	— — 300 — —	—	I _C = -100μA, V _{CE} = -1V I _C = -1mA, V _{CE} = -1V I _C = -10mA, V _{CE} = -1V I _C = -50mA, V _{CE} = -1V I _C = -100mA, V _{CE} = -1V
Collector-Emitter Saturation Voltage	V _{CE(SAT)}	—	-0.25 -0.4	V	I _C = -10mA, I _B = -1mA I _C = -50mA, I _B = -5mA
Base-Emitter Saturation Voltage	V _{BE(SAT)}	-0.65 —	-0.85 -0.95	V	I _C = -10mA, I _B = -1mA I _C = -50mA, I _B = -5mA
SMALL SIGNAL CHARACTERISTICS					
Output Capacitance	C _{OBO}	—	4.5	pF	V _{CB} = -5V, f = 1MHz, I _E = 0
Input Capacitance	C _{IBO}	—	10	pF	V _{EB} = -0.5V, f = 1MHz, I _C = 0
Input Impedance	h _{IE}	2	12	kΩ	V _{CE} = 10V, I _C = 1mA, f = 1kHz
Voltage Feedback Ratio	h _{RE}	0.1	10	x 10 ⁻⁴	
Small Signal Current Gain	h _{FE}	100	400	—	
Output Admittance	h _{OE}	3	60	μS	
Current Gain-Bandwidth Product	f _T	250	—	MHz	V _{CE} = -20V, I _C = -10mA, f = 100MHz
Noise Figure	NF	—	4	dB	V _{CE} = -5V, I _C = -100μA, R _S = 1kΩ, f = 1kHz
SWITCHING CHARACTERISTICS					
Delay Time	t _D	—	35	ns	V _{CC} = -3V, I _C = -10mA, -I _{B1} = I _{B2} = -1.0mA
Rise Time	t _R	—	35	ns	
Storage Time	t _S	—	200	ns	
Fall Time	t _F	—	50	ns	

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

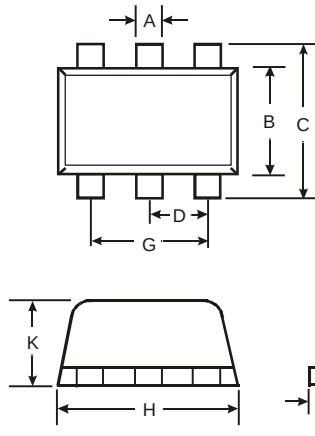
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



Package Outline Dimensions

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

SOT563

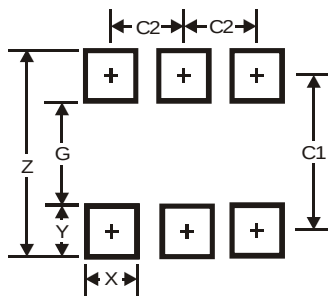


SOT563			
Dim	Min	Max	Typ
A	0.15	0.30	0.20
B	1.10	1.25	1.20
C	1.55	1.70	1.60
D	-	-	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
K	0.55	0.60	0.60
L	0.10	0.30	0.20
M	0.10	0.18	0.11
All Dimensions in mm			

Suggested Pad Layout

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

SOT563



Dimensions	SOT563
Z	2.2
G	1.2
X	0.375
Y	0.5
C1	1.7
C2	0.5

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