



MMDT3906

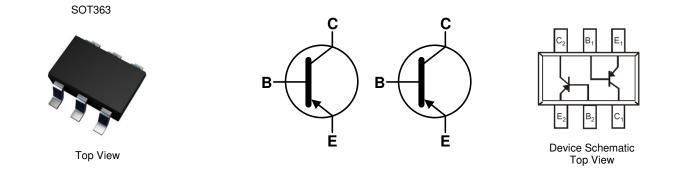
40V DUAL PNP SMALL SIGNAL TRANSISTOR IN SOT363

Features

- BV_{CEO} > -40V
- I_C = -200mA High Collector Current
- Epitaxial Planar Die Construction
- Ideal for Medium Power Amplification and Switching
- Ultra-Small Surface Mount Package
- Complementary NPN Type: MMDT3904
- 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 3
- Weight: 0.006 grams (Approximate)



Ordering Information (Note 4)

Product	Status	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
MMDT3906-7-F	Active	AEC-Q101	K3N	7	8	3,000

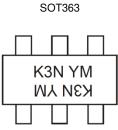
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.

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. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



 $\begin{array}{l} \text{K3N}=\text{Product Type Marking Code}\\ \text{YM}=\text{Date Code Marking}\\ \text{Y or }\overline{\text{Y}}=\text{Year (ex: D=2016)}\\ \text{M or }\overline{\text{M}}=\text{Month (ex: 9=September)} \end{array}$

Date Code Key

Notes:

Year	201	6	2017	2018	2019	2020	2021	202	2 20	23 2	2024	2025	2026
Code	D		E	F	G	Н		J	ł	<	L	М	Ν
Mont	h	Ja	n Fe	b Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	•	1	2	3	4	5	6	7	8	9	0	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}	-5	V
Collector Current	lc	-200	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	PD	200	mW
Thermal Resistance, Junction to Ambient (Note 5)	R _{0JA}	625	°C/W
Operating and Storage Temperature Range	TJ, T _{STG}	-55 to +150	°C

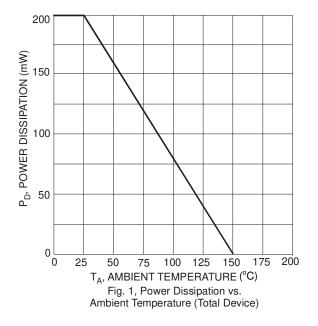
ESD Ratings (Note 6)

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

Notes: 5. For the device mounted on minimum recommended pad layout FR-4 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





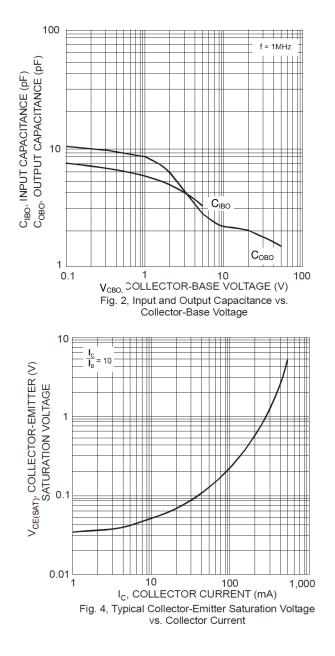
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

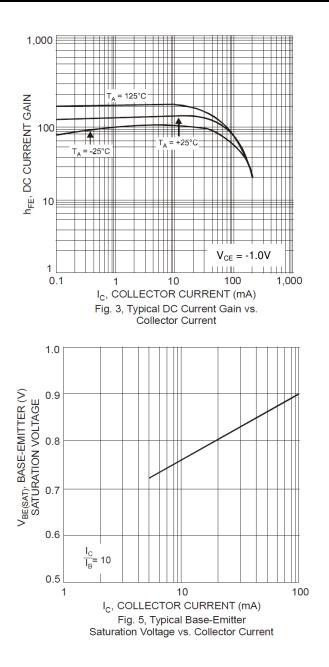
Characteristic	Symbol	Min	Max	Unit	Test Condition			
OFF CHARACTERISTICS								
Collector-Base Breakdown Voltage	BV _{CBO}	-40		V	$I_{\rm C} = -10 \mu A, \ I_{\rm E} = 0$			
Collector-Emitter Breakdown Voltage (Note 7)	BV _{CEO}	-40	_	V	$I_{C} = -1mA, I_{B} = 0$			
Emitter-Base Breakdown Voltage	BV _{EBO}	-5		V	$I_E = -10\mu A, I_C = 0$			
Collector Cut-Off Current	ICEX	_	-50	nA	$V_{CE} = -30V, V_{EB(OFF)} = -3.0V$			
Base Cut-Off Current	I _{BL}	_	-50	nA	$V_{CE} = -30V, V_{EB(OFF)} = -3.0V$			
ON CHARACTERISTICS (Note 7)								
DC Current Gain	h _{FE}	60 80 100 60 30	 300 		$\begin{split} & I_{C} = -100 \mu A, \ V_{CE} = -1V \\ & I_{C} = -1.0 m A, \ V_{CE} = -1V \\ & I_{C} = -10 m A, \ V_{CE} = -1V \\ & I_{C} = -50 m A, \ V_{CE} = -1V \\ & I_{C} = -100 m A, \ V_{CE} = -1V \end{split}$			
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$		-0.25 -0.40	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	Сово	_	4.5	pF	$V_{CB} = -5.0V$, f = 1.0MHz, I _E = 0			
Input Capacitance	CIBO	—	10	pF	$V_{EB} = -0.5V$, f = 1.0MHz, I _C = 0			
Input Impedance	h _{ie}	2	12	kΩ				
Voltage Feedback Ratio	h _{re}	0.1	10	x 10 ⁻⁴	$V_{CE} = -10V, I_C = -1.0mA,$			
Small Signal Current Gain	h _{fe}	100	400	—	f = 1.0kHz			
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	N _F		4.0	dB	$V_{CE} = -5.0V, I_C = -100 \mu A,$ $R_S = 1.0 k\Omega, f = 1.0 kHz$			
SWITCHING CHARACTERISTICS	· · ·				·			
Delay Time	tD	_	35	ns				
Rise Time	t _R	_	35	ns	V _{CC} = -3.0V, I _C = -10mA,			
Storage Time	t _S		200	ns	$I_{B1} = I_{B2} = -1.0 \text{mA}$			
Fall Time	tF		50	ns				

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



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

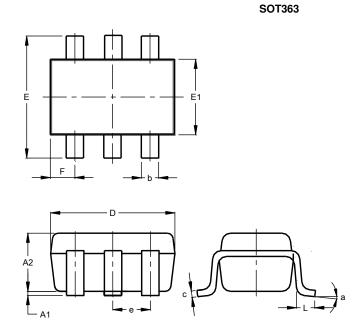






Package Outline Dimensions

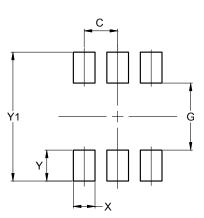
Please see http://www.diodes.com/package-outlines.html for the latest version.



SOT363							
Dim	Min	Max	Тур				
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				
Е	2.00	2.20	2.10				
E1	1.15	1.35	1.30				
e	C).650 E	SC				
F	0.40	0.45	0.425				
L	0.25	0.40	0.30				
а	0°	8°					
All	Dimen	sions	in mm				

Suggested Pad Layout

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



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

SOT363



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